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INTERNATIONAL URANIUM SUPPLY AND DEMAND

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HEARING

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

OF THE

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

HOUSE OF REPRESENTATIVES

NINETY-FOURTH CONGRESS

SECOND SESSION

ON

ALLEGATIONS THAT URANIUM PRICES AND MARKETS
HAVE BEEN INFLUENCED BY A FOREIGN PRODUCER'S
CARTEL AND OTHER FACTORS WHICH MAY OR MAY NOT
HAVE BEEN RESPONSIBLE FOR THE SEVENFOLD IN-
CREASE IN THE PRICE OF URANIUM

NOVEMBER 4, 1976

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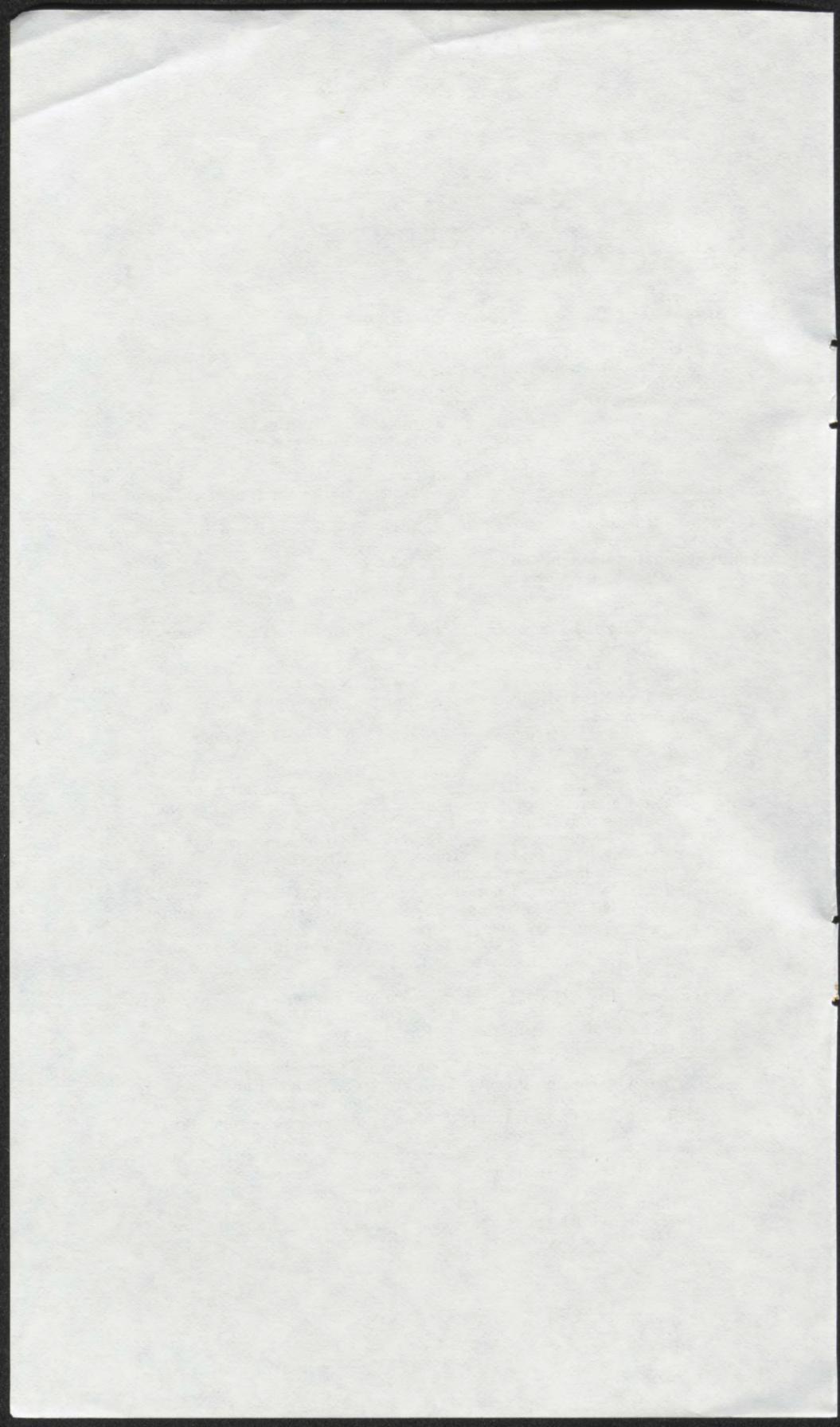
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INTERNATIONAL URANIUM SUPPLY AND DEMAND

THURSDAY, NOVEMBER 4, 1976

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Sacramento, Calif.

The subcommittee met, pursuant to notice, at 10 a.m., in Room 2545 Federal Building, Hon. John E. Moss, chairman, presiding.

Mr. Moss. The subcommittee will be in order.

Whatever the environmental and safety factors attending atomic energy, nuclear power has long held the attraction of being relatively inexpensive. This has been true especially in light of dramatic price rises in fossil fuels, prompted in large measure by the OPEC cartel. At the same time OPEC prices were skyrocketing, however, so too were the prices of uranium. Indeed, the price rise of uranium has been a good deal more dramatic than that of oil—\$6 per pound to some \$41 per pound in about 3 years. For some reason, perhaps because nuclear power is used by the general public only indirectly, in the form of electricity, this dramatic price rise has gone largely unnoticed by the American consumer.

The uranium price rise alone would be reason enough for the Subcommittee on Oversight and Investigations to be concerned. But recently allegations have been lodged to the effect that uranium prices and markets have been influenced by a foreign producers' cartel. Today the subcommittee convenes to examine those allegations and other factors which may or may not have been responsible for the sevenfold increase in the price of uranium. It is appropriate that our inquiry begin in Sacramento, where the documents suggesting the existence of a cartel were initially released.

I refer, of course, to the materials provided to James Harding, special advisor to Commissioner Ronald Doctor of the California Energy Commission, by the Australian chapter of Friends of the Earth. Subsequently Mr. Harding, Commissioner Doctor, and California Public Utilities Commissioner Leonard Ross, among others, released summaries of those documents to the press, the Congress, and the Justice Department. Commissioner Ross and Mr. Harding will be with us today.

The belief that a foreign cartel may have been operating to the detriment of American uranium consumers has enjoyed an unusual amount of publicity in recent weeks because of multibillion-dollar litigation involving the Westinghouse Electric Corp. Westinghouse maintains that it has been a victim of just such a cartel. Today we will also hear from representatives of Westinghouse.

There is opinion to the contrary—to the effect that whether or not a cartel in fact existed, it had little or no effect on the prices Americans pay for uranium. Expressing that point of view this morning will be the president of the Nuclear Exchange Corp., also of northern California, Mr. George White.

Whatever the reasons for the dramatic price rise in uranium, it is of course the American utility ratepayer who ultimately pays the bill. To enlighten us on just what the implications are for the American consuming public, given the current \$41-per-pound price as well as even higher prices projected for the future, we will hear today from representatives of the Pacific Gas and Electric Co. and the Sacramento Municipal Utility District.

I am not unmindful that some of our witnesses today are involved either directly or indirectly in various aspects of the Westinghouse litigation, as well as a Justice Department investigation into possible antitrust violations by a foreign cartel and that those witnesses are naturally anxious not to prejudice their positions in that litigation by statements made here today.

Certainly it is not the intention of this subcommittee to prejudice anyone's lawsuit. However that may be, the right of the people of the United States to know and identify the economic forces affecting their daily lives is constitutionally second to none. So too the power of the Congress of the United States, so that it may intelligently and adequately deal with the energy policies that will affect us all for decades to come.

We will first hear from George White, president of the Nuclear Exchange Corporation; followed by commissioner Leonard Ross who is accompanied by Jim Harding; then from Albert Bethel, vice president and general manager for Uranium Resources of the Westinghouse Corporation; followed by Mr. Ray Benton and Ronald Witzel of the Pacific Gas and Electric Company; and, finally, Mr. John L. Ravera of the Sacramento Municipal Utility District.

Mr. White, would you come forward at this time.

Mr. White, will you be sworn at this time.

Do you solemnly swear the testimony you are about to give this subcommittee will be the truth, the whole truth and nothing but the truth, so help you God?

Mr. WHITE. I do.

Mr. Moss. Please identify yourself to the hearing clerk for purposes of the record.

TESTIMONY OF GEORGE WHITE, PRESIDENT, NUCLEAR EXCHANGE CORP., ACCOMPANIED BY MICHAEL CARROLL, ATTORNEY, AND JAMES BROSNAHAN

Mr. WHITE. My name is George White and I am president of Nuclear Exchange Corporation.

On my right is Mr. James Brosnahan and on my left Mr. Michael Carroll of the law firm of Morrison and Foerster.

Mr. Chairman, I have a prepared statement. May I present it now?

Mr. Moss. Indeed you may.

Mr. WHITE. My name is George White and I am president of Nuclear Exchange Corporation, a company more commonly known to the

uranium industry as Nuexco. Nuexco is basically a metals brokerage company dealing in uranium and plutonium and, as an adjunct to its brokerage activities, Nuexco publishes a monthly report to the industry summarizing information, derived from historical market transactions, about supply, demand and prices.

This monthly report is subscribed to by persons of all shapes, sizes, and inclinations in the uranium industry; producers, utilities, equipment manufacturers, fuel fabricators, consultants, financial institutions, brokers, and, I might add, agencies of the U.S. Government such as the Federal Trade Commission.

Information is received by Nuexco for the monthly report from subscribers on a confidential basis, Nuexco pledging not to disclose the terms of specific transactions or the identities of parties to such transactions. Nuexco uses this information to develop its summaries of historical market information and to make its judgments about current prices, the "Exchange Values" which Nuexco publishes in its monthly reports. Nuexco also does occasional consulting work.

For the information of the subcommittee, I hand you a copy of a small brochure describing Nuexco and its functions, together with a copy of the September 30, 1976 Report to the Industry published by Nuexco.

Mr. Moss. Is it your desire that those be included in the record?

Mr. WHITE. I would be pleased to have them there.

Mr. Moss. Without objection, they will be included in the record.

[See appendixes I and II, pp. 103 and 117, this hearing.]

Mr. WHITE. It is my understanding that the subcommittee is interested in exploring problems with supply and demand in the international uranium market and the reasons behind the very sharp increase in the price of yellowcake, crude uranium, which is the normal article of commerce in our industry. The price in fact has increased from about \$6 per pound in early 1973 to the current level of about \$41 per pound.

Nuexco was urged by many of its subscribers, both buyers and sellers, to issue what we call a "Topical Report" on the reasons underlying the price increase. Such a topical report was prepared by our staff and was distributed under date of October 15, 1976. It had been in preparation approximately 3 months prior to its issue date. I believe a copy of the report was sent to Mr. Atkisson of the subcommittee.

Any report dealing with commodity prices is bound to evoke strong responses, and certainly some persons in this industry may disagree with the conclusions of our recent report. However, we have undertaken in that report to present, to the best of our ability, the significant events which we believe contributed to the price rise.

It is our conclusion that the following events were primarily responsible for the increase:

First, a long-overdue correction in uranium prices from subnormal levels to recognize rapid and large increases in production costs of the mining industry

Second, major short sales of uranium in the fuel fabrication sector of the industry.

Third, ERDA's, that is the Energy Research and Development Administration's, adoption of the long term, fixed commitment enrichment contract with the coincidental requirement that uranium deliveries be rigidly fixed both in time and quantity.

Fourth, the adoption of nationalistic policies relating to all energy sources by foreign governments, including Canada, Australia, France and, of course, the Arabs with their much-publicized action of implementing an oil embargo.

Finally, fifth, severe and continuing problems resulting from the actions or inactions of the Government relating to the reprocessing and recycling of fuel, the timing and extent of changes in the diffusion plant tails assay, the importation of foreign uranium, the construction of additional enrichment capacity, and the many varied and changing requirements of Government agencies such as the Nuclear Regulatory Commission and the Environmental Protection Agency and the effect of such Government actions and inactions on both supply and demand.

It is true that a group of foreign producers did meet on occasion and apparently they did discuss minimum prices for their uranium. The existence of this foreign group was reported by Nuexco to its subscribers from its earliest meeting through its various subsequent meetings, and we do not think that it came as a surprise to anyone in the industry to have the Canadian Government's confirmation that it existed. We do not list the activities of this group as a significant factor in the price rise because both domestic buyers and sellers have noted that the foreign group was ineffective as a price leader in the domestic market, since its prices consistently lagged the current domestic prices.

With reference to the international supply/demand picture, I know of no better source of information than the paper presented on September 14, 1976, by Edward J. Hanrahan of ERDA. I believe this was given at Geneva. He gives United States and foreign cumulative requirements through the year 2000 as 1 million tons and 1.8 million tons, respectively, for a total of 2.8 million tons. Against that demand, he lists reserves producible at forward costs less than \$30 per pound as 800,000 tons in the United States and 1.8 million tons foreign, for a total of 2.6 million tons. Then he adds probable and inferred reserves of another 2.9 million tons in the United States and 1.4 million tons foreign for a grand total of 6.9 million tons of available uranium.

After all, it is generally considered that uranium is the fifth most common mineral in the earth's crust, so that its supply is basically infinite. Its production is simply a matter of economics.

Mr. Chairman, I might observe here, since I prepared this statement, my associates have argued with me as to whether uranium is actually the fifth most common. I think you can say it is sixth, seventh, or eighth, and certainly in the first 10. I don't believe the fact that it is fifth, sixth, or seventh really has much to do with it.

Mr. Moss. We will not hold you to precise limits as to whether it is five or six or seven.

Mr. WHITE. Thank you.

I hope that my appearance as a witness at this hearing will be helpful to the subcommittee, and I would like to thank you for the opportunity to appear.

Mr. Moss. Thank you.

Mr. ATKISSON.

Mr. ATKISSON. Mr. White, the latter part of your statement presents a very comfortable picture of uranium supply as being very plentiful—whether it is fifth, sixth, or seventh—it is plentiful in the Earth's crust.

It would appear from your figures that there is plenty of it to go around. Yet there appear to be opinions to the effect that the price of uranium projected over the next 2 or 3 years could rise from its present \$41-plus price, to \$100, \$115, even more.

First of all, do you agree that the price may go to that level or even higher and, if so, why?

Mr. WHITE. Well, it is certainly conceivable that it could go there. We have undertaken in the past year or so to make a number of studies by the technique that is known as the Delphi analysis, which is a matter of listing the different factors that might affect the price and getting a variety of experts in the industry to give us their judgement as to the probability of each of those effects and the impact of those effects. When you summarize these expert opinions—there are so many combinations you have to do it on a small computer program—we generally come up with numbers of by 1980 prices in the \$50 range and by 1985, 1990, moving on up to maybe \$75, but these are in dollars at time of delivery, not constant dollars.

Mr. ATKISSON. Are you familiar with a report produced by a stock brokerage firm in New York, the Mitchell-Hutchins Co., entitled "Uranium Stocks: Nuclear Industry Kaleidoscope Coming Together," by one David G. Snow?

Mr. WHITE. Yes; I'm quite familiar with it.

Mr. ATKISSON. Do you generally agree with its conclusions, its contents?

Mr. WHITE. Well, it's always been my personal opinion that he is one of the most prolific and one of the most thoughtful writers on the subject of uranium, but I have also thought that his primary purpose in life is selling uranium stocks and I don't want to detract from his work but I don't think he has any reason to make the price any lower than he has to.

Mr. ATKISSON. He suggests in that report, does he not, that the Btu equivalent value of uranium, assuming the value of oil to be \$12 a barrel, the current OPEC, level—the equivalent value of uranium would be something over \$100 a pound, is that correct?

Mr. WHITE. A number something like that is generally used in the industry. I think it depends on how you calculate it. I think it is probably between \$100 and \$125.

Mr. ATKISSON. Mr. Snow also says that because of a concept he calls "overshoot"—frankly, I don't understand it and perhaps you will enlighten us—something approaching an international cartel might "overshoot" to cause prices to go up to or possibly three times the Btu equivalent value, which would mean \$200 or \$300 per pound sometime in the next 2 or 3 years.

Can you tell us, first of all, what "overshoot" is and, second, if you agree with that notion?

Mr. WHITE. Let me observe, from my recollection of the report, he makes the fundamental assumption that we are going to come up short of uranium in the United States from domestic supplies and be dependent on large quantities from overseas and that then the action of the cartel would be effective and, if you will, a squeeze would develop in the market and this could force the prices to \$200 or \$300.

Now, my judgment, sir, is that that will not happen.

Mr. ATKISSON. Is your judgment based on your belief that a cartel, whether or not it exists, simply cannot be effective?

Mr. WHITE. No, because I think the Arabs have shown us that such a cartel can be alarmingly effective. My judgment is based on the fact that this domestic industry is expanding quite rapidly now and unquestionably the requirements for uranium are substantially less than they were calculated to be before. So that our judgment is that the supply/demand picture is in considerably better shape than it was even a year ago.

Mr. ATKISSON. In your statement, Mr. White, you referred to a number of factors that you believe contributed substantially to the dramatic rise in prices in the past several years. You discount the role of any sort of international cartel. I would like to ask you a few questions about that for a moment.

On page 3 of your statement you say that the existence of a foreign group was reported by Nuexco, your corporation, as soon as you learned about its existence. Can you tell us how you learned about its existence?

Mr. WHITE. I believe, if you go through our reports, we probably reported it, I would think, in the first or second quarters of 1972. How we found out about these things is a matter mostly of circumstantial evidence. We make it a practice to call many people in the whole nuclear industry, as frequently as we can.

When we would try to contact, let us say, our Canadian suppliers or our Australian suppliers and found out that they were in Paris at the same time and shortly thereafter our utility subscribers would call us and say they had some new quotations from overseas and they all looked surprisingly alike, you really put two and two together and, well, we are naturally of a suspicious nature, let's put it that way, and it was apparent something was going on.

I think that the main corroboration we had was we developed with one of our subscribers in Canada who was not in the business but who had subscribed, and we call on our subscribers once a year if we can, he seemed to get all of the information on who was at the meetings and what they said and what they decided. At first, I really didn't trust this fellow, but events always proved that he was right. I don't know where he got his information, sir.

Mr. ATKISSON. Did you, when you noticed the coincidence, and with your naturally suspicious nature, see that group affecting prices, first of all, in the world market and, second, here in the United States?

Mr. WHITE. I'm not sure I understood your question.

Mr. ATKISSON. Did you at that time regard what you concluded to be a foreign cartel as having a potential effect on prices worldwide and secondarily here in the United States?

Mr. WHITE. You have to recognize that the United States in 1972 had a total embargo on bringing foreign uranium in and it really was not much importance to this industry.

Mr. ATKISSON. Isn't it true that, where as there's been an embargo on the use of this fuel, there has been no embargo on its importation. Contracts can be made, deals can be made and it can be stockpiled?

Mr. WHITE. To the best of my knowledge, there was very little of that done, however. I know of only two cases of the utilities' actually purchasing.

Mr. Moss. Mr. White, the question was, is that correct?

Mr. WHITE. May I have the question again?

Mr. ATKISSON. The fact is that there is no embargo on the purchase of yellowcake from abroad, it is only on its use?

Mr. WHITE. That is correct.

Mr. ATKISSON. And as a matter of fact, the embargo is being lifted, is it not, progressively, over the next several years?

Mr. WHITE. Stating next year, yes.

Mr. ATKISSON. I would like to quote to you from the Nuexco report of February 1974, as follows:

"Based on various assumptions as to the rate of inflation, changes in monetary exchange rates and other factors, the exchange"—that would be Nuexco, I presume—"calculates that the proposed new yellowcake prices of the club for 1980 delivery are in the range of 10 percent to 20 percent above the present exchange value."

Now, does that not indicate that an influence was being exerted on domestic prices, forcing the prices above the exchange value? Exchange value in that Nuexco report means the current price of yellowcake, is that not correct?

Mr. WHITE. No; I don't think you're correct because what would happen is that they would get together and they would decide on a new price. They would always be trying to catch up with our market. By the time they started—you know, it takes a long time for organizations like this to do anything because they were basically government meetings, sponsored by the governments, operated by them. By the time they got around to making quotations, they were operating in a domestic market where, if you will look at the price curve you will notice a very high upward velocity to it. By the time the quotations came out, they were behind us again.

Mr. ATKISSON. What do you attribute that to, the fact that these fellows who belong to the cartel were just slow on their feet? Is it that transportation was so slow that by the time they got home the price had gone beyond the level they had set? To what do you attribute the fact that the cartel fixed price lagged behind the American price?

Mr. WHITE. Typically, it—let us say the South Africans—we are talking about 1974. I would say parenthetically there was very little material available for sale from overseas sources at this particular time. But if we make this hypothetical, the South Africans were at the meeting. South African uranium is all sold through a single group called NUFCOR. I don't know whether this is a governmental or an industrial organization. I have always thought of it as a mixture. But by the time they went back and talked to all of their members and got them all to agree to it, at least a month had gone by.

Then let us say a German utility had an inquiry out to buy uranium. By the time they got up there, gave them the price, and these negotiations stretch out over a period of months. You know, when you negotiate with a buyer you always have to give away some of your price. By the time the transaction was ready to sign, our price had invariably moved up above that level.

Mr. ATKISSON. I would like to call your attention to the quote I just gave you. You do say in one of your Nuexco reports: "The proposed new yellowcake prices of the club for 1980 delivery are in the range of 10 to 20 percent above the present exchange value." I'm confused.

I would like the two notions reconciled, yours that the cartel consistently lagged behind exchange prices and this statement which says that the proposed cartel price is 10 to 20 percent above it.

Mr. WHITE. At the time they were decided upon, they were above the prices which we were currently publishing. The time they were made effective, they were below.

Mr. ATKISSON. Your statement again refers to the present exchange value. You are saying that by the time the 10- to 20-percent rate became effective, the then present exchange value was even higher?

Mr. WHITE. That is correct.

Mr. ATKISSON. In your statement you also refer to major short sales of a segment of uranium in the fuel fabrication sector. I presume you are referring to the Westinghouse Electric Corp., correct?

Mr. WHITE. They were certainly the principal ones. In fact, for all intents and purposes it applies to them, yes.

Mr. ATKISSON. Can you explain, for those of us who might not know exactly what a short sale is, just what it is and how it affects the market?

Mr. WHITE. What a short sale does is to satisfy demand while at the same time taking no supply out of the market, so that the demand figures on any supply/demand statistics go down but the supply figures do not go down.

This was a very important matter to the uranium industry in 1968-71 perhaps. But, of course, when the markets started to move up sharply, it was not of any consequence. I believe that most market observers feel that, if the demand during those years had been filled in a normal manner, that the price would have started moving up possibly in 1968 or 1969, maybe to levels approaching where it was now, but possibly not at quite such a high peak.

In other words, I'm saying that it is our judgment that the short sales produced a rapid increase in 1974 and 1975 instead of a steady increase starting back at an earlier date.

Mr. ATKISSON. Do we wind up at the same point ultimately?

Mr. WHITE. No. I think because of the way this has worked out we probably have a higher peak today than we would have had. The reason for that statement is during the 1960's and early 1970's I believe something like 15 uranium mills went out of business. The price was so low it was bankrupting the industry. I think if the price had moved up earlier, we would have had a greater supply today and, therefore, a somewhat lower price.

Mr. ATKISSON. If it is possible to attribute a portion of the increase from \$6 or \$7 to the present \$41, to the Westinghouse shortening of the market, what figure would you come up with?

Mr. WHITE. I'm afraid I wouldn't want to guess that. I don't know, honestly.

Mr. ATKISSON. Could you say if we are talking about dollars or cents, a few cents, a few dollars, a lot of dollars? What is the order of magnitude?

Mr. WHITE. Mr. Atkisson, I believe that we were pressed to issue a topical report which we issued a few months ago on the question of what effect it would have had on the price. I believe our conclusion, and we weren't very proud of this analysis because you have to do these very roughly, we concluded that price based on the increase in Gov-

ernment indexes, labor, materials, changes in ore assays, thinks like that, my recollection gave what you might consider a normal price today around \$30—I forget the exact number.

Mr. ATKISSON. Mr. White, I presume you make it your business to know what the constituent members of this industry are feeling about governmental decisions, and economic factors affecting their present and future business. Can you describe what the attitude of uranium producers has traditionally been toward the embargo which is now being lifted?

Mr. WHITE. During the period when prices were at a starvation level for the industry, as you would expect, their attitude was that they wanted to keep it at all costs. The act, as I recall, required the Atomic Energy Commission to hold the embargo until the domestic production industry became viable. The word "viable", of course, is not an easily defined word, but, certainly, during those early years it was not viable and they let the Government know that.

I believe that sometime in the early 1970's the Joint Committee had some hearings on the question of the embargo and, if my memory serves me correctly, the American Mining Congress Committee on Uranium presented a paper there requesting that the embargo be continued another period of years.

Mr. ATKISSON. Was there a definite point in time when the attitude shifted, if you can recall?

Mr. WHITE. It shifted on the part of some of the members of the industry when the price started to move up very rapidly. Some of the members of the industry, I might even say the more thoughtful ones, said, look here, this is bad for our industry to have these prices move so fast and we ought to take this embargo off. But I don't believe that was unanimous at all and I'm not sure that I could identify who said what at that particular time.

Mr. ATKISSON. Can you give me just a year? I'm thinking particularly of early 1973. Does there seem to be any sort of shift, dramatic or otherwise, in the producer sector, from being against the embargo to being for the embargo?

Mr. WHITE. I don't think there was any dramatic shift. The thing that the industry kept saying to the Atomic Energy Commission was—

Give us the decision, we don't care what it is but, before we spend money to expand, we have to know whether you are going to let a lot of foreign uranium in here. The price is going up fast. The only way to keep the price down is to expand. You have to tell us.

Mr. ATKISSON. The prices did begin to go up at that time, did they not?

Mr. WHITE. Right.

Mr. ATKISSON. So, in fact, the attitude—maybe we have a chicken-and-egg situation here, whether it was because prices were going up that the attitude shifted, or whether the attitude shifted and then the prices went up. But, in any event, is it fair to say in early 1973 the industry's attitude toward the embargo changed?

Mr. WHITE. You said early 1973?

Mr. ATKISSON. Yes.

Mr. WHITE. No.

Mr. ATKISSON. It was later?

Mr. WHITE. I would have said it was in 1974. If you could refresh my memory as to when the Joint Committee held hearings on that.

Mr. ATKISSON. I don't know the answer to that myself. I had reference to an allegation which has been made by Westinghouse Corp. that it was about March 1973 when a rather involved quid pro quo arrangement was consummated between producers and certain cartel members. It was agreed that producers would not oppose lifting the embargo in exchange for not selling below the American price. Do you have any knowledge whatsoever of such an arrangement, or any discussions?

Mr. WHITE. No; I'm not aware of any such thing.

Mr. ATKISSON. Did you or any member of your company attend a seminar sponsored by the Atomic Industrial Forum in March 1973?

Mr. WHITE. I didn't attend it. I believe the only member of our company who did was Mr. Payne Kibbie, who is chairman of the board and works part time for us.

Mr. ATKISSON. Mr. Kibbie, as I understand it, has also been—I don't know if he was at all times—a member of the so-called Mining and Milling Committee of the Atomic Industrial Forum?

Mr. WHITE. That is correct.

Mr. ATKISSON. And also the Steering Committee which is a smaller group within that committee?

Mr. WHITE. I believe he was at the time of the meeting to which you refer.

Mr. ATKISSON. By the way, I meant to ask earlier, just so we know how Nuexco functions: Nuexco makes its money, aside from its service to subscribers, basically by putting deals together, does it not, taking commissions?

Mr. WHITE. Yes.

Mr. ATKISSON. And, as I understand it, the price of yellow cake in any particular transaction does not affect Nuexco's commission. You charge on a volume basis, not on a price basis, is that correct?

Mr. WHITE. That is not uniformly so. Most of the transactions are just a fixed number of pennies per pound. In some cases our customers insist on a percentage basis where we use one-half of 1 percent and this is particularly true in mineral deals. This is where a man will bring a lot of land to us and ask us to arrange with a utility to finance the exploration and development of the property. Those are almost always on a percent of the money we are able to get for his development work.

Mr. ATKISSON. Does Nuexco buy uranium? Does it ever have title to uranium?

Mr. WHITE. May I answer you this way. We never take a position in uranium. We frequently buy in our own name with a bank letter of credit when the purchaser does not want to be known, show himself in the marketplace.

Mr. ATKISSON. Why would a purchaser not want to show himself in the marketplace?

Mr. WHITE. I think the most interesting case was when new management came in at the Susquehanna Corp., which would have been, I think, 1973 or 1972. They took a look at the uranium division and saw that it was losing much money, that they had a very rundown plant,

the mines were in bad shape, and they made the management decision to get out of the business.

They had delivery commitments for 4 or 5 million pounds, I forget the exact quantity now, and they didn't want the industry to know that they had to cover because they were afraid, as you can imagine, that the price would suddenly go up to them. So they arranged with banks to give us the backing to go and buy that material in our own name. We did not profit by that in any way. We just took our normal fee on it.

Mr. ATKISSON. Turning your attention for just a moment to the future, first of all, I gather you acknowledge there is no dispute that the cartel exists. The question in your mind is as to its effectiveness, is that correct?

Mr. WHITE. Let me say I didn't mean to advertise our own service excessively in reporting. You will find in all of the trade journals all of the meetings were recorded, all of the prices were reported, all of the terms and condition were reported. We were not unique in this. Perhaps we had a little quicker information than some of the other people.

Mr. ATKISSON. But certainly you were interested in its potential and in its existence, were you not?

Mr. WHITE. Really, not very.

Mr. ATKISSON. I find that surprising. I would think that the suggestion that an international cartel along OPEC lines might exist would be of outstanding interest to a reporting service such as Nuexco.

Mr. WHITE. Mr. Atkisson, I know they wouldn't appreciate this, but we thought they were pretty humorous. Let me tell you why.

Today, let's say within the past couple of weeks, we do some overseas business, as much as we can, and the cartel people were telling the customers in Europe that the real price of uranium is \$30, it's not \$41. Why should I worry about that?

Mr. ATKISSON. Well, let me ask you about the future.

You say that the cartel was ineffective largely because of that kind of maneuver, lagging behind prevailing prices.

Given the fact that there are various figures—say, a quarter of our forward commitments in a very few years must come from foreign sources—it has been said that as much as 45 percent of our uranium needs a few years down the road will have to come from foreign sources. That 45 percent figure, incidentally, has a ring of familiarity to it, that's the extent of our dependence on OPEC.

Doesn't this put us at their mercy? If we would have to get 45 percent of our uranium from foreign sources, doesn't that put the American consuming public, the energy-consuming public, at a terrific disadvantage facing just what we have faced in the past few years with OPEC?

Mr. WHITE. I thought I observed earlier that I don't think that's the case and, apparently, our Government people in Washington, if they believe these number which are brand new, apparently they don't think so, either.

Mr. ATKISSON. You say you don't believe it is the case, but don't you think it could be the case. The people we've been talking about are Australian producers, South African producers, French producers

and Canadian producers who have been slow on their feet in the past, but don't you think they might get their act together and start running a little faster?

Mr. WHITE. If you are asking me, if we need the foreign material and if the cartel operates, could they squeeze us, the answer is yes.

Mr. ATKISSON. Mr. Chairman, I have no further questions.

I would ask that two things be admitted to the record.

First, Mr. White referred to the Canadian government's acknowledgment of participation in the cartel. I would like the statement, which has already been released to the public by the Minister of Energy, Mines and Resources in Canada, dated September 22, 1976 to be admitted to the record.

Second, Mr. White referred to a report of Edward J. Hanrahan, September 14, 1976. I would like that report admitted for the record.

Mr. Moss. That will be admitted for the record immediately following the previous item.

[Testimony resumes on p. 43.]

[The documents referred to follow:]

STATEMENT BY THE HONORABLE ALASTAIR GILLESPIE, MINISTER OF ENERGY, MINES AND RESOURCES, OTTAWA, CANADA, AND, A BACKGROUND PAPER ON THE CANADIAN URANIUM INDUSTRY'S ACTIVITIES IN INTERNATIONAL URANIUM MARKETING—SEPTEMBER 22, 1976

The federal government has approved a regulation under the Atomic Energy Control Act to prevent the removal from Canada of information relating to uranium marketing activities during the period 1972-1975.

The action was taken in the light of the sweeping demand for such information by U.S. subpoenas, which while served upon officers of United States companies, call for the presentation of information in the possession of subsidiary or affiliate companies "wherever located".

During the early 1970's the Canadian tried to elicit consuming-nation support for the uranium industry and its dependent mining communities which were suffering from an oversupply and low price situation. The problems were compounded by United States policies which closed the large U.S. market to foreign uranium and, at the same time, moved uranium from the U.S. government stockpile into the international market through conditions imposed on foreign users of U.S. uranium enrichment facilities. Concurrently, U.S. corporations were competing aggressively for sales outside of their protected domestic market.

Lacking support from consuming nations, and convinced that a viable nucleus of the producing industry was essential in the light of all projections of future demand, the Canadian government initiated discussions with producing nations which led ultimately to an informal marketing arrangement among non-U.S. producers.

Canadian producers acted with the approval and, in some cases, at the specific request of the federal government. The arrangements excluded U.S. market. The government supported the initiative by directing the Atomic Energy Control Board to reject any export of uranium at prices below those called for by the marketing arrangements. The minimum prices adopted were almost without exception below those reported within the protected U. S. market at that time and ranged from \$5.40 to \$8.20 per pound U₃O₈ for immediate delivery in 1972 and 1974 respectively.

The dramatic demand for uranium following the oil crisis of late 1973 propelled prices well above any agreed minimum price structure. Demand suddenly exceeded supply. Because the marketing arrangement had been overtaken by market forces, the Canadian government withdrew all minimum price directives in early 1975.

Given this background, it is not surprising that the Canadian material called for by the U.S. subpoenas contains information in respect of activities approved and supported by the Canadian government. Clearly this must be regarded as an issue of sovereignty. The government has therefore moved to prevent the removal of such documents from Canada.

The Canadian government's policy on marketing has always supported an effective consumer-producer dialogue. Although government to government initia-

tives have so far failed to develop such a mechanism for this essential commodity, it is hoped that the efforts of the producers to achieve a better consumer/producer understanding through the Uranium Institute of London will prove successful.

BACKGROUND PAPER ON THE CANADIAN URANIUM INDUSTRY'S
ACTIVITIES IN INTERNATIONAL URANIUM MARKETING

The past boom and bust cycle of the Canadian uranium industry is illustrated in Figure 1. In the 1950s, the Canadian government encouraged development of the Canadian uranium industry to meet the needs of the United States Atomic Energy Commission and the United Kingdom Atomic Energy Authority. By 1959, revenue from uranium exports ranked fourth in value for all commodities and first in value of metal production. In 1959, the USAEC notified Canada that it would not exercise its options to purchase additional Canadian uranium but agreed to stretch out deliveries under existing contracts to the end of 1966. The UKAEA contracts were stretched out to 1971.

The problems of the Canadian uranium industry were accentuated in August 1964 when President Johnson signed into law the Private Ownership of Special Nuclear Materials Act. One of the provisions of this Act permitted domestic and foreign uranium customers to use the government (USAEC) owned enrichment facilities. However, as a means of protecting the domestic US uranium industry, the Act made provisions to exclude foreign uranium enriched in the facilities from US markets. When the USAEC formally established in 1966 its criteria for enrichment services, foreign producers had been effectively barred from competing in the US market (which represented at that time 70% of the "free world" market).

The next year, 1967, the USAEC indicated its willingness to sell to domestic and foreign customers enriched uranium with the natural uranium feed component of the charge based on \$8 per pound of U_3O_8 . This effectively placed a ceiling of \$6 per pound on the price which non-U.S. producers could hope to achieve in the international market.

The Canadian government repeatedly advised the United States government that, in their opinion, the restriction on utilization of foreign uranium was in contravention of the General Agreement on Tariffs and Trade. However, no corrective action on the part of the United States government was taken. In fact, on October 13, 1971, the United States Atomic Energy Commission requested comments on their plan to defer any decision on relaxing the restriction on the enrichment of foreign uranium for use in domestic reactors until the latter part of the decade. At the same time the USAEC asked for comments on its plan to sell surplus uranium stocks held by the USAEC to domestic and foreign customers. While the proposal contained detailed provisions to safeguard the viability of the domestic industry, it made no explicit provisions to avoid disruptions of foreign markets.

After considering comments on the disposal of its large stockpile of uranium, the USAEC in 1972 adopted the so-called "split tails" approach for operating its diffusion plants to dispose of the surplus. At the same time it deferred any relaxation of the foreign uranium restrictions until late in the decade.

The quantity of uranium feed to an enrichment plant and the amount of enriching services required for the enriched uranium product is dependent upon the percentage of U-235 left in the waste or tails. As the percentage of U-235 in the tails increases, more uranium feed is required to produce the same product, but the amount of enrichment services (separative work) is reduced. The waste material is not discarded but is stored by the USAEC for possible recycling through the enrichment plant to recover some of the residual U-235 later, if and when it is economic to do so.

Normally an increase in the tails assay would have opened up an additional market for international uranium producers who could sell to non-U.S. utilities using the U.S. facilities to enrich their fuel supplies. However, under the "split tails" approach proposed by the USAEC, while the diffusion plant would be operated at a tails assay in the range of 0.275 to 0.301 U-235, the enrichment transaction would be computed on the basis of a 0.20% tails assay. The extra uranium feed requirements would be supplied from the USAEC stocks and customers would be billed for more enrichment services than were actually necessary to enrich the uranium. Hence the USAEC exchanged uranium from its stockpile for increased revenue from the sale of enrichment services. This increased revenue has been calculated as being equivalent to \$10.50 to \$12.00/lb. for the uranium from the stockpile when the price for enrichment services was \$32/unit of separative work.

Uranium was then selling in the non-U.S market at distress prices of about \$5.50/lb U_3O_8 , well below historic levels.

In the face of declining markets, and to prevent total erosion of its uranium industry and its dependent communities the Canadian government instituted two successive uranium stockpiling programs at a cost of over \$100 million beginning in 1966 and ending in 1970. In addition the government entered into a joint venture stockpiling agreement with a Canadian producer to maintain minimum production levels over the period 1971 to early 1974. Producers themselves also had to stockpile uranium to maintain a nucleus of a uranium industry in Canada.

By 1970, the commercial market outside the United States still was not sufficient to maintain the viability of an international uranium industry so the Canadian government initiated a dialogue with the governments of countries who were customers for Canadian uranium. The discussions as to how the marketing problems could be alleviated were pursued by both Ministers and officials of the Canadian government in 1970 and 1971. Lacking any positive results from these discussions Canadian officials then explored with government officials of producing countries some means for orderly marketing of uranium in the residual market available to them.

The initial Direction of August, 1972 was from their distressed levels. Nonetheless, the minimum prices acceptable to Canada were almost without exception below those reported for the protected United States market.

A press release announcing the issuance of the initial Direction to the Atomic Energy Control Board and the announcement of the regulations in the Canada Gazette is attached to this note.

Because uranium prices were such that the specified minimum price levels had long since been overtaken by market forces. Since early 1974, in fact, international uranium producers were concerned not so much with the price of uranium but how to meet the burgeoning demand from the limited available production. Consequently the informal arrangements have been ineffective although meetings continued intermittently until October, 1975.

The first indication of the market turnaround was the response to an enquiry by the Tennessee Valley Authority in October 1973 for some 86 million pounds of uranium oxide. Two U.S. producers responded at prices reported to be in the range of \$12 to \$16 per pound ZrO_2 plus escalation from 1973, well above prevailing prices in both the non-U.S. and U.S. markets. Following this test of the market in the U.S., Canadian producers in early 1974 quoted prices of \$12.50/lb. ZrO_2 , well above the Canadian government minimum directed price. Soon thereafter pressures by utilities to purchase and stockpile uranium for future needs, while production capacity was still available, contributed to an upward spiral in the price of uranium.

In April, 1974 the Secretary of State for External Affairs, noting that the uranium market had turned around, stated in a speech to the General Assembly of the United Nations that Canada as both a major exporter and substantial importer of various raw materials supported international commodity arrangements in which both exporters and importers were represented. In particular, he mentioned that Canada as one of the principal exporters of uranium would be willing to develop mechanisms for consultation between importers and exporters of that commodity.

To further that goal the Canadian government encouraged the establishment of the Uranium Institute to provide a permanent forum for producer/consumer consultation. Two formal preparatory meetings were held in London, England prior to formation of the Institute in 1975. Four meetings of Council and two general meetings have been held since establishment of the Institute. The institution originally provided full membership for uranium producers and associate membership for consumers, but in January 30, 1976 it was amended to provide for full membership for Consumer/Processor members. The Articles of Association specifically exclude discussion and consultation on uranium pricing.

In October, 1974 the USAEC announced that the restriction on the enrichment of foreign uranium for domestic use would be gradually removed starting in 1977 when 10% of the feed furnished by a U.S. consumer under all his enrichment contracts in 1977 might be of foreign origin. In subsequent years, the allowable percentage may increase, so that by 1984 there should be no restriction. In announcing the relaxation, the USAEC stressed it "will monitor U.S. dependence on foreign uranium supply and will take appropriate measures if it determines that the

extent of domestic use of foreign uranium threatens to impair the Nations' common defense and security of the viability of the domestic uranium producing industry."

Since the USAEC announcement, a number of contracts have been concluded by Canadian producers with U.S. consumers. Although some concern persists about the long term adequacy of uranium supply, the dramatic recovery of the price since 1974 has prompted an equally dramatic increase in exploration activity. If successful, these exploration activities should permit Canadian producers to continue to be significant international suppliers while still protecting adequate reserves for future Canadian requirements.

"World Requirements and Supply of Uranium"

Edward J. Hanrahan, Director of Analysis, Richard H. Williamson, Assistant Director for Systems Analysis, and Robert W. Brown, Operations Analyst, of the Office of Planning, Analysis and Evaluation, U.S. Energy Research and Development Administration.

Presented by Edward J. Hanrahan at The Atomic Industrial Forum, "International Conference on Uranium" — September 14, 1976, Geneva, Switzerland.

Introduction

Forecasting the supply and demand of any commodity very far into the future is an extremely presumptive activity. Experience has shown us that forecasts are almost always wrong, no matter if they are done by elegant and elaborate methods or merely by judgment. Energy supply and demand forecasting is a good illustration of this phenomenon and nuclear power forecasts provide the ultimate example. To paraphrase a most articulate British leader, "never has anything been so poorly projected by so many for so long."

With full knowledge of this, we plunge ahead and forecast. This is not a lemminglike action. We must plan, we must make decisions today, we must take actions, even in the face of a myopic view of the future. No one expects a plan or a forecast to last forever or even for very long. It is only as good as the data inputs and we should never expect anything more. Plans and forecasts are subject to change whenever there is new or better information and whenever circumstances change. We simply alter our plans and go on, knowing full well that we will have to change them again. The important attribute of a well conceived plan is that it does not foreclose any reasonable future. It incorporates flexibility to allow for change and for adapting to new information and environments as they become apparent.

With these thoughts in mind, nuclear forecasts will be presented based on today's knowledge about energy systems, economic trends, public attitudes, governmental policies, and the many factors that affect energy demand and nuclear power growth.

United States Forecast

The U.S. Energy Research and Development Administration has submitted two annual National Plans for Energy Research, Development and Demonstration^{1/2} to the President and the Congress in June 1975 and April 1976. In developing the Plan, ERDA concluded that the United States must exploit all its energy options in the quest for energy independence. Coal and nuclear power will be paramount energy sources in the near-term through 1985, and very important in the mid-term from 1985 to 2000. In the long term, we expect to rely on inexhaustible energy sources such as breeder reactors, solar energy and fusion power. Other technologies such as geothermal and solar heating and cooling will act as supplements and also provide backups in the event of failure or delay in the development of the inexhaustible technologies. Conservation including the improvement of energy efficiency is most important in using our energy as wisely and efficiently as possible, thus reducing demand. The forecasts which follow have been developed in the light of these expectations.

The methodology for making these projections for the United States involves the use of five analytical models. These economic and energy models have been individually developed by different energy modeling groups and have been combined into an integrated model set under ERDA's direction. This paper will not go into the details of the methodology since they have been described elsewhere.³ The models are: the Data Resources Incorporated Macroeconomic Growth Model, the Hudson-Jorgenson nine-sector econometric model of interindustry transactions, the Brookhaven National Laboratory-University of Illinois Input-Output Model, the Brookhaven Energy System Optimization Model, and the Bechtel Energy Supply Planning Model.

The basic forecasts conducted by ERDA cover the period 1985-2000, aligning with projections through 1985 made by the Federal Energy Administration.

General assumptions adopted for the projections include:

- The economy continues to grow at normal rates in pursuit of prosperity;
- World energy prices generally prevail and increase slightly in real terms;
- and Domestic price regulation and tax policy are selectively used, but market controlled values are not greatly different from postulated market clearing values.

Energy conservation measures are incorporated into the forecasts but not to the extent that these measures would cause significant changes in lifestyles. New technologies must compete with existing technologies based on projected costs and efficiencies of processes; large subsidy programs are not used to bring new technologies into the market place. Rates of implementation of both supply and conservation technologies are judgmentally assessed based on analysis of historic technological penetration rates and any special physical constraints on gearing up industrial activity.

Adjustments are made to account for recent legislation that mandate certain energy saving activities and to provide for specific energy form choices, such as electric energy to space heat and process heat, which seem to be made on grounds other than least cost.

The macroeconomic projections, using inputs such as population growth, labor productivity, relative prices of capital and labor, and government expenditures, yield a real growth rate in GNP of 3.5 percent for the basic energy forecast cases in the 1985-2000 period. The components of GNP are further disaggregated by the inter-industry model to provide a set of economic activity values that consume energy. Based on technological coefficients of energy use to satisfy activity requirements, a set of final and end-use demands for energy is generated. The energy patterns to provide the end-use requirements are determined by a resource allocation program with the aid of a Reference Energy System network diagram.

The results of this analysis indicate that total energy inputs grow for the most probable energy future from 71×10^{15} Btu in 1975 to 97×10^{15} Btu in 1985 and 144×10^{15} Btu in 2000. This represents an annual average growth rate of about 3.1 percent through 1985 and 2.7 percent from 1985-2000. This total energy growth rate is significantly lower than the 3.7 percent average annual growth rate from post-World War II through the 1973 oil embargo. Higher or lower energy futures are also postulated from different sets of economic and fuel price assumptions and different success rates for energy research, development and demonstration programs including conservation programs.

The forecast output most pertinent to this paper is the amount of final demand upon the electrical sector. This is where nuclear power is expected to contribute in the foreseeable future. Three electric utility

systems have been defined which fit with the energy scenarios analyzed thus far and are expected to be suited to most cases yet to be developed. We will call the case which derives from our expected energy forecast the MID Case. The installed electrical generating capacity for this case grows from the current 500 GWe to 725 GWe in 1985 and 1400 GWe in 2000. HIGH and LOW Case electric utility systems have also been formulated to be coupled with appropriate energy forecasts. Table 1 shows the three utility systems described.

TABLE 1
U.S. ELECTRIC UTILITY SYSTEM
 1976 Forecast
 (Gigawatts Electric)

	<u>LOW Case</u>	<u>MID Case</u>	<u>HIGH Case</u>
1975	500	500	500
1985	715	725	740
2000	1200	1400	1600

In the past, at least until the latest economic recession, electricity production grew at an average annual growth rate of about 7 percent; the annual growth rate was lower in recession years and higher in expansion years. The fraction of total energy inputs going to the production of electricity has been increasing over the years; in 1975, the production of electricity consumed about 29 percent of total energy inputs. As with total energy, electricity is expected to grow more slowly in the future than in the past particularly as some markets become saturated and

adjustments are made in response to expected real price increases. Our MID Case shows an average annual growth rate of 5.2 percent between 1975 and 1985 and of 4.5 percent between 1985 and 2000. Electricity production in 2000 is expected to consume about 44 percent of total energy inputs.

The nuclear power contribution to the electric utility system is dependent on several factors among which are the economic competitiveness of nuclear power with fossil fuels, the emergence of new technologies, the closing of the nuclear fuel cycle, and public attitudes. The nuclear power forecast through 1985 is based on an evaluation of plants in operation, under construction or announced. Variations in the forecasts for this period are caused by applying different degrees of optimism in estimating completion dates for plants under construction. For the period after 1985, each case takes on its own character driven by specific economic, energy, and electricity growth assumptions.

The MID Case reflects assumptions that nuclear power remains economically competitive in many regions of the country, but that new technologies are implemented and conservation measures are successful. The LOW Case is based on the assumption that the nuclear fuel cycle is not closed thus reducing the attractiveness of the nuclear option. The HIGH Case will be coupled with energy forecasts having higher economic growth rates, hence larger total energy and electrical energy requirements. Table 2 gives the installed nuclear capacity associated with these three cases.

TABLE 2

U.S. INSTALLED NUCLEAR CAPACITY
1976 Forecast
(Gigawatts Electric)

	<u>LOW Case</u>	<u>MID Case</u>	<u>HIGH Case</u>
1975	39	39	39
1980	60	67	71
1985	127	145	166
1990	195	250	290
2000	380	510	620

Foreign Forecast

The foreign forecast covers all countries except the United States and Eastern Bloc countries. This group includes a wide spectrum of economies from highly developed to relatively primitive systems. Furthermore, they are developing at vastly different rates and the structure of society and industry is very different in each country. It is, therefore, impractical to create an analytical model which defines the energy requirements of this group. Furthermore, we do not have available to us detailed data on the economic and energy systems for each country. Thus it is impossible for us to make the kind of economic and energy analysis for other countries that we make for the United States. In order to make this forecast, we have relied on published national programs, reports by international organizations and our own subjective judgments. In particular, this forecast relies on the recent report published jointly by the Organization for

Economic Cooperation and Development Nuclear Energy Agency (OECD) and the International Atomic Energy Agency (IAEA) entitled "Uranium - Resources, Production and Demands" dated December 1975.⁵ This report is a compilation of data on OECD/IAEA countries excluding the USSR, Eastern Europe and China.

In addition we made use of work done jointly by the OECD and International Energy Agency⁶ last winter. For some countries, the forecasts in the above two references represent national nuclear program goals. Achievement of these goals was considered to be unlikely so adjusted estimates were substituted where appropriate to provide a consistent forecast. Table 3 provides a comparison of these forecasts. Foreign nuclear capacity is expected to be between 230 GWe and 325 GWe at the end of 1985 and between 1030 GWe and 1480 GWe at the end of the year 2000. As indicated above the low end of this range of values is believed to be the most realistic future.

TABLE 3

FOREIGN NUCLEAR CAPACITY
1976 Forecast
(Gigawatts Electric)

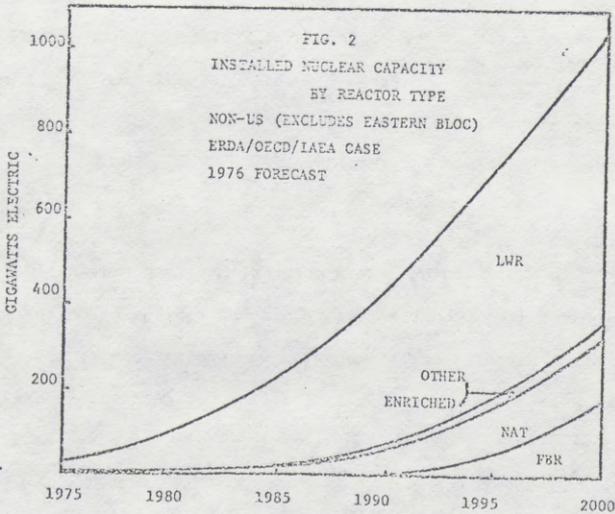
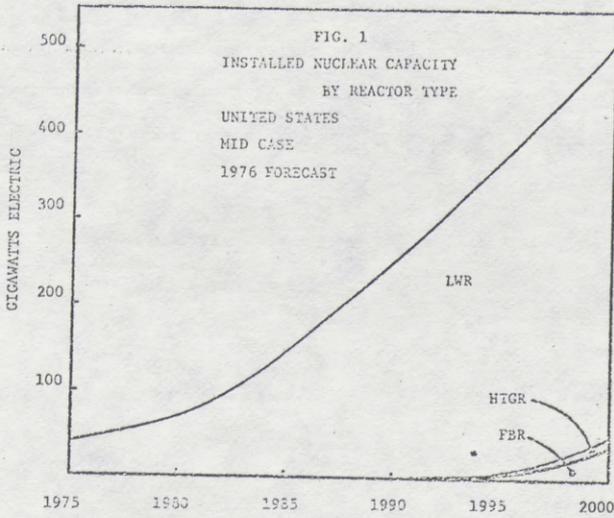
	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>2000</u>
OECD/IAEA High	29	112	325	619	1480
OECD/IAEA Low	29	103	294	535	1205
OECD/IEA (Modified by USA evaluation)	29	100	230	425	1030

It is obvious from a comparison of the U.S. and foreign forecasts that foreign nuclear power is expected to grow more rapidly than U.S. nuclear power capacity. The reasoning behind this expectation is that there is more incentive to develop nuclear power outside the U.S. because energy has been traditionally more expensive and choices are often limited by short supply of domestic energy resources. There is also a great deal of public concern over nuclear power in the United States which serves to slow the move to nuclear power. These same public concerns are developing in other countries and it remains to be seen how nuclear power growth will be affected.

Reactor Mix

The installed nuclear capacities just derived are assigned to the various reactor types using informed estimates of the likely penetration of each reactor type. Fast breeder reactors are assumed to begin commercial operation in the United States in 1995. High temperature gas-cooled reactors (HTGR's), for which all outstanding orders have been cancelled, are assumed to re-enter the market in the mid 1990's. The remainder of the plants are light water reactors (LWR) which dominate the reactor mix throughout this century. Figure 1 shows this mix for the MID Case.

Outside the United States a greater number of reactor designs have emerged. Natural uranium fueled reactors are expected to be built in Canada and possibly India and some developing countries. The United Kingdom initiated plans, now undergoing review, to install the steam generating heavy water reactor. A reactor that combines the features of Canadian and U.K. designs,



the advanced thermal reactor, is expected to find some acceptance in Japan. Fast breeders are assumed to be commercially available in some countries in 1990. As in the U.S., the LWR's dominate, but to a much lesser degree. Figure 2 illustrates the expected reactor mix spectrum anticipated.

Other Constraints

Before the nuclear electrical generating capacity can be used to derive uranium requirements we must quantify a few more items, such as:

1. Reactor characteristics
2. Capacity factor
3. Spent fuel reprocessing
4. Plutonium recycle
5. Enrichment plant tails assay.

Reactor characteristics have changed little in recent years and are essentially the same as in previous forecasts.^{7/8} Some additional time is allowed between uranium procurement and fuel use to recognize utility conservatism by having fuel on hand well ahead of possible need.

Capacity factors for nuclear plants have not measured up to what utilities expected when they ordered nuclear plants or when they originally contracted for enriching services. Many utilities did their planning on the basis of an 80 percent or higher capacity factor. Our projections assume that nuclear plants operate at 70 percent capacity factor under equilibrium conditions. Pre-equilibrium operation involves a short period at 40 percent capacity factor and two years at 65 percent. It is assumed that the capacity factor for

each plant declines two percentage points per year after the fifteenth year of operation to a minimum of 40 percent. Plants are retired after 40 years. The foreign case assumes a capacity factor pattern similar to that of the United States. A lower capacity factor is expected for developing countries which may lack large industrial loads and adequate distribution systems. However, maintenance of lower reserve margins and leadership in the area of load management are expected to compensate so that a standard capacity factor assumption will apply world-wide.

Fuel reprocessing projects have been lagging in the United States and are currently awaiting policy decisions relating to plutonium and waste handling matters. The Allied-General Nuclear Services Fuel recovery plant (1500 metric tons per year) is essentially complete but operation must await the resolution of these policy issues and construction of the required follow-on facilities. We have assumed effective operation of this plant in 1982. Two other, smaller reprocessing plants have had technical and financing problems as well as regulatory delays and have been omitted from consideration in the current exercise. Additional 1500 MT/year plants are assumed for 1985, 1988 and as required after 1990. This schedule results in working off the spent fuel backlog by the end of the century.

A similar situation exists outside the United States. There are small reprocessing plants in operation mostly for natural uranium and prototype fuel and the growth of the industry is expected to lag behind demand for at least the next twenty

years. Reprocessing of fuel from enriched reactors is assumed to begin in about 1980 and to be on a current basis by the end of the century. A backlog of unprocessed fuel from natural uranium fueled reactors remains by the year 2000.

To allow for these reprocessing bottlenecks, our fuel cycle calculations include constraints that limit the availability of uranium from spent fuel until reprocessing capability is available as indicated.

Plutonium recycle is also a problem. In the United States there have been delays in the regulatory and licensing area due primarily to safeguards questions and the reprocessing questions just discussed. The issuance of the environmental impact statement, which is a prerequisite to licensing the use of mixed oxide fuels, is still some time off. Consequently, we have deferred the assumed start of plutonium recycle in the United States to 1983 to allow for resolution of these problems. Plutonium recycle for the foreign case was started in 1981 in recognition of their continued progress in this area and greater incentive. As discussed earlier, however, the full benefits of plutonium recycle are not realized immediately because of reprocessing restrictions. Breeder reactor plutonium requirements are satisfied before plutonium is recycled in thermal reactors.

Enrichment plant tails assay is a major determinant of the amount of uranium and enrichment services required to supply a given demand for enriched uranium fuel. Uranium requirements are 20 percent greater if the enrichment plants operate at a 0.30 percent ^{235}U tails assay than if 0.20 percent is used.

The opposite is true for separative work requirements where 20 percent less is needed when the enrichment plant is operated at 0.30 percent tails as compared to 0.20 percent.

It is possible to calculate the optimum tails assay (the optimum yields the lowest cost enriched uranium fuel) as a function of uranium oxide price, separative work price and the cost of conversion to UF_6 . However, these prices are subject to variation in response to market forces. Moreover, it is necessary to enter into long-term contracts for enriching services which may not allow the customer to choose the tails assay. Our calculations provide data at several tails assays to permit the evaluation of a variety of strategies for planning this important part of the fuel cycle. Multiple tails assays also provide the opportunity for sensitivity analysis.

United States Uranium Requirements

Uranium requirements are calculated for the cases described by the installed nuclear capacity schedules shown in Table 1 with the various constraints on fuel reprocessing and plutonium recycle. The LOW Case is part of a scenario that presumes that the fuel cycle is not closed and uranium requirements for this case, shown in Table 3, include no credit for spent uranium or plutonium. Uranium requirements for the MID Case, Table 4, and the HIGH Case, Table 5, include credits associated with both plutonium and spent uranium recycle.

The range of values for uranium requirements for the U. S. at 0.20 percent tails assay is 29,000 to 36,000 STU_{308} in 1985 and 65,000 to 74,000 STU_{308}

in 2000. Cumulated requirements (from 1976) range from 190,000 to 230,000 STU_3O_8 in 1985 and 925,000 to 1.13 million STU_3O_8 in 2000. Expected values for the MID Case are 31,000 STU_3O_8 in 1985 with 200,000 cumulated and 65,000 STU_3O_8 for 2000 with cumulated uranium requirements of 925,000 again for 0.20 percent tails assay. Tables 3, 4 and 5 include additional data for other time periods and other tails assays. Complete annual data can be provided on request.

TABLE 3
US LOW CASE URANIUM REQUIREMENTS

1976 Forecast
 (Thousands of Short Tons of U_3O_8)

	<u>0.20% Tails</u>		<u>0.25% Tails</u>		<u>0.30% Tails</u>	
	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>
1976	10	10	11	11	12	12
1980	17	65	18	71	20	78
1985	29	190	32	205	35	225
1990	43	375	47	410	52	450
2000	74	985	81	1070	89	1175

NOTE: No Recycle of Uranium or Plutonium

TABLE 4

US MID CASE URANIUM REQUIREMENTS

1976 Forecast

(Thousands of Short Tons of U_3O_8)

	<u>0.20% Tails</u>		<u>0.25% Tails</u>		<u>0.30% Tails</u>	
	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>
1976	11	11	12	12	13	13
1980	19	73	20	79	22	87
1985	31	200	34	220	37	240
1990	41	390	45	430	50	475
2000	65	925	71	1015	80	1130

NOTE: Uranium and Plutonium Recycled on a Constrained Basis

TABLE 5

US HIGH CASE URANIUM REQUIREMENTS

1976 Forecast

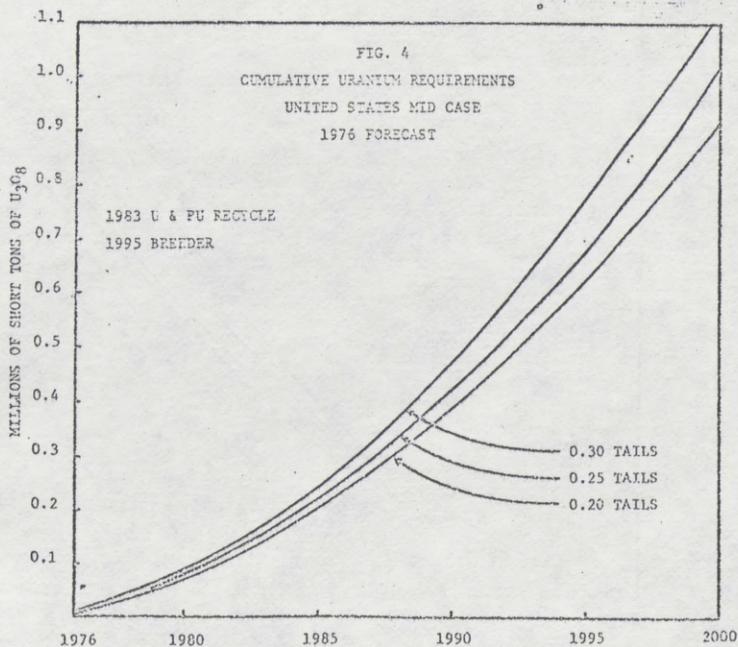
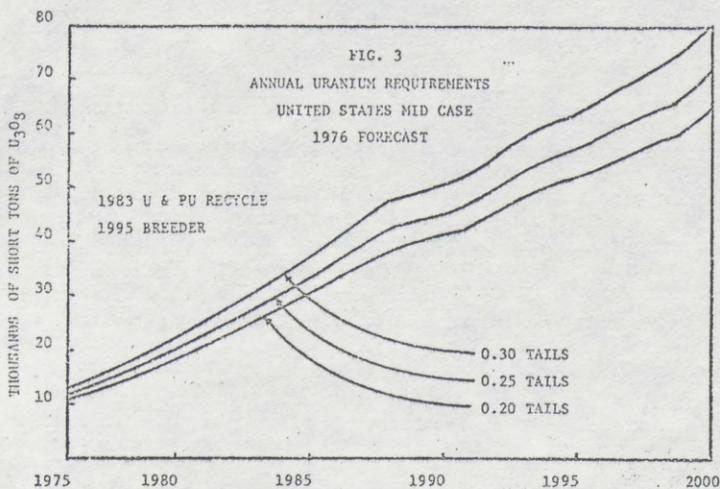
(Thousands of Short Tons of U_3O_8)

	<u>0.20% Tails</u>		<u>0.25% Tails</u>		<u>0.30% Tails</u>	
	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>
1976	12	12	13	13	14	14
1980	22	80	24	87	26	95
1985	36	230	40	250	44	275
1990	51	460	56	500	62	555
2000	74	1130	82	1240	92	1380

NOTE: Uranium and Plutonium Recycled on a Constrained Basis

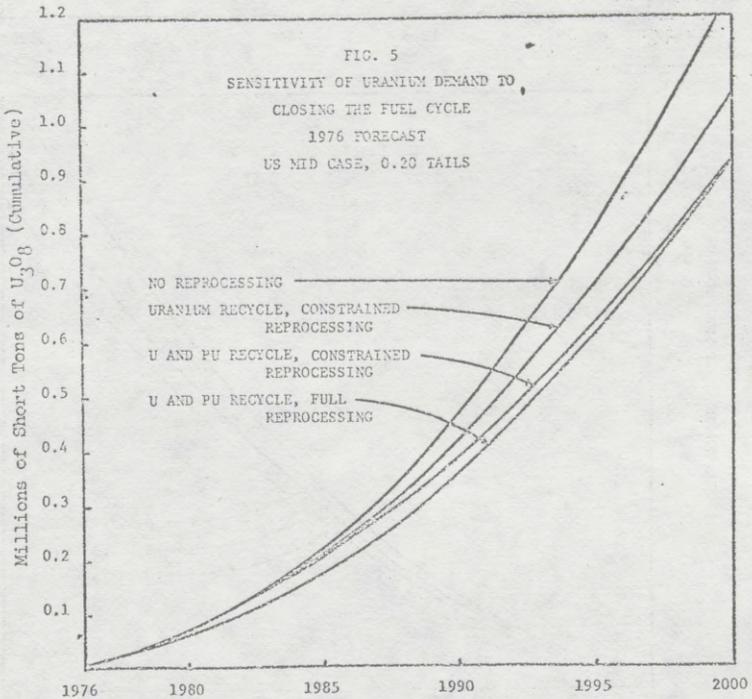
It is important to note that the uranium requirements presented here provide for delivery of uranium on a real-time basis with normal procurement lead times. Any delays in bringing reactors on line also delays the uranium requirement, contracts notwithstanding. Furthermore, no allowance is made for uranium inventory build-up at any point in the fuel cycle.

Figures 3 and 4 are graphical presentations of the annual and cumulative uranium requirements for the MID Case. Figure 5 shows the effect of the various recycle assumptions on annual uranium requirements for the MID Case and 0.20 tails assay. The difference between curves illustrates the sensitivity of uranium requirements to the various recycle options.



Compared to the case where spent fuel is reprocessed and recycled without constraints, Figure 5 shows that:

- If uranium and plutonium are recycled on a constrained basis with no remaining spent fuel backlog in the year 2000, there is no significant effect on cumulative uranium demand. However, during the 1980's and early 1990's, interim uranium demands are up by 10-20 percent.
- If only uranium is recycled, about 13 percent more uranium is needed.
- With no reprocessing, 1/3 more uranium is required.



Foreign Uranium Requirements

For the foreign (excluding Eastern Bloc) case, uranium requirements data are analyzed only for the modified case which is the lowest case shown in Table 2. The constraints on reprocessing are as discussed earlier. Uranium requirements at 0.20 percent tails assay are 53,000 STU_{308} in 1985 with 315,000 cumulated from 1976 and 115,000 STU_{308} in 2000 with 1.66 million STU_{308} cumulated. Table 6 provides data on uranium requirements for this case for additional time periods and other tails assays. As with the data for the United States, additional details can be made available. Figures 6 and 7 are plots of these data showing annual and cumulative uranium requirements as a function of time.

TABLE 6

FOREIGN URANIUM REQUIREMENTS

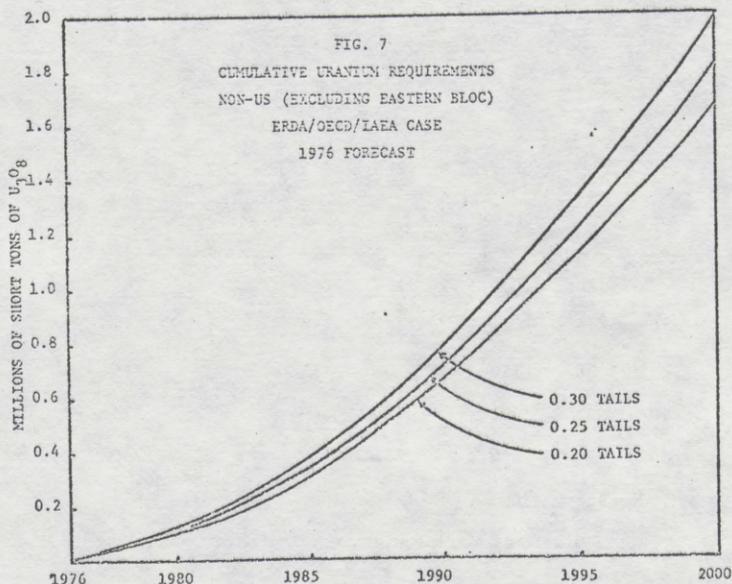
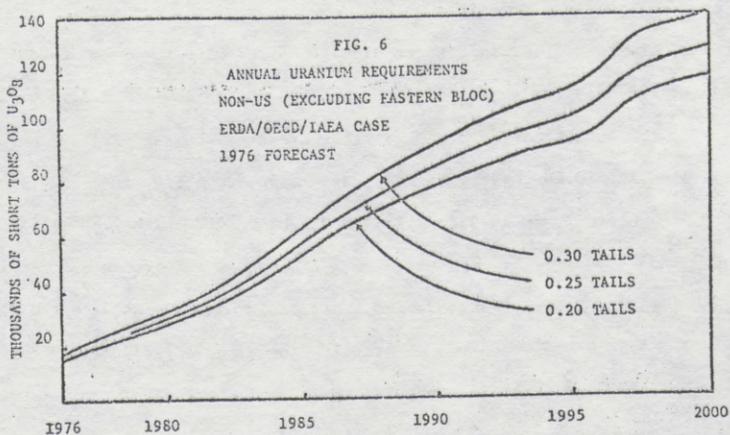
1976 Forecast

(Excludes Eastern Bloc)

(Thousands of Short Tons of U_{308})

	<u>0.20% Tails</u>		<u>0.25% Tails</u>		<u>0.30% Tails</u>	
	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>	<u>Ann.</u>	<u>Cum.</u>
1976	15	15	16	16	17	17
1980	28	110	30	115	33	125
1985	53	315	58	340	63	370
1990	79	670	86	720	94	790
2000	115	1660	125	1805	140	1980

NOTE: Uranium and Plutonium Recycled on a Constrained Basis.



U. S. Uranium Resources

The United States Energy Research and Development Administration published in June 1976 the "National Uranium Resource Evaluation, Preliminary Report."⁸ This report contains the results of the initial phase of the National Uranium Resource Evaluation (NURE) program which is a comprehensive nationwide program to evaluate uranium resources and to identify areas favorable for uranium exploration. The major program milestone is the publication of a comprehensive report in 1981. In the interim, updated uranium reserve and potential resource statistics will be published yearly. Estimates of uranium resources in the United States, as of January 1, 1976, are given in Table 7, taken from the above report. These estimates consist of reserves and potential resources. Potential resources are further divided into probable, possible and speculative classes. Reserves are the firmest element of resources; probable, possible, and speculative potential resources are less firm estimates in order of declining reliability. The estimates are also grouped into cost categories. The costs used are those operating and capital costs, in 1975 dollars, not yet incurred at the time the estimate is made. Operating costs cover labor, materials, ore transport, power, royalties, and taxes directly applicable to the operation. Capital costs cover mine development and construction of mill and related facilities required for a production unit. Profit and costs already incurred, such as past expenditures for property acquisition, exploration, and mine development are not included. Therefore, these costs should in no way be considered market prices at which the estimated resources might be sold.

TABLE 7

UNITED STATES URANIUM RESOURCES

(As of January 1, 1976)

Thousands of Short Tons U_3O_8

$\$/lb U_3O_8$ Cutoff Cost	Reserves	Potential		
		Probable	Possible	Speculative
\$10	270	440	420	145
\$15	430	655	675	290
\$30	640	1,060	1,270	590
By Product* 1976-2000	140			
Total	780	1,060	1,270	590

*Estimated by-product of phosphate and copper production.

The resources in each cost category include the resources in all lower cost categories.

Non-U.S. Uranium Resources

The previously mentioned joint OECD/IAEA report on Uranium⁵ contains information on uranium resources in 26 countries. The information is presented under two categories, "Reasonably Assured Resources" and "Estimated Additional Resources" and is subdivided into two cost ranges, less than \$15/lb U_3O_8 and between \$15 and \$30/lb U_3O_8 . The category "Reasonably Assured Resources" is equivalent to the "Reserve" category in the U. S. estimates. The "Estimated Additional Resources" is equivalent to the "Probable Potential Resources" in the U. S. estimates. There are no available foreign estimates equivalent to the U. S. categories of "Possible and Speculative Potential Resources." Table 8

presents this data for 25 countries (excludes United States) with adjustments for Australia and Canada to reflect more recent information.

TABLE 8

NON-US^a URANIUM RESOURCES(As of January 1975)^bThousands of Short Tons U₃O₈

<u>\$/lb U₃O₈</u> <u>Cutoff Cost</u>	<u>Reasonably</u> <u>Assured</u>	<u>Estimated</u> <u>Additional</u>
\$15	1100	630
\$30	1800	1400

a. Includes: Algeria, Argentina, Australia, Brazil, Canada, Central Africa Republic, Denmark, Finland, France, Gabon, West Germany, India, Italy, Japan, Korea, Mexico, Niger, Portugal, South Africa, Spain, Sweden, Turkey, United Kingdom, Yugoslavia, Zaire.

b. Includes more recent information for Australia and Canada.

The resource estimates must be viewed only in the context in which they are made. Each category of resources has some probability associated with it. "Reserves" or "Reasonable Assured Resources" have the highest reliability as they are based on direct measurements from drilling and sampling of the deposits. Estimates of resources in the higher cost range of this category are less reliable due to fewer sample measurements and lack of mining experience with these lower-grade materials. The "Potential Resources" categories and/or "Estimated Additional Resources" category are of lower reliability than the reserve category. This category is made up in large part of undiscovered uranium deposits.

Therefore, the existence of potential uranium resources is not a certainty. The existence or absence of these resources must be considered as well as the possible limitations of these estimates since there are regions which have not been explored or for which estimates have not been made. There is an additional question of producibility of estimated resources. Can the uranium be mined and milled at the required production levels or on the time scale needed to meet demands? It is important to bear in mind that these resource estimates are not intended to be estimates of ultimate recoverable resources, but only as limited estimates based on the present state of knowledge, economics and mining and milling technology. There are additional known high cost resources such as the uranium in sea water or the Chattanooga shales in the United States. This uranium exists and the quantity can be reasonably well estimated, but it cannot be economically extracted with today's technology.

Conclusions

The forecasts presented here indicate that nuclear power should be a very significant contributor to the world's energy supply. The growth of this industry will be large, of the order of 13 percent annually world-wide. A sustained growth rate of this magnitude over a 25 year period will be an unusual phenomenon which has rarely been achieved before. If this growth comes to pass, the availability of fuel will be the major concern. The information we have today indicates that there is a good possibility that uranium will be available at reasonable prices. But this can hardly be

taken for granted; a great deal of work will need to be done and large investments made to insure that adequate uranium supplies will be available when needed. In summary, the nuclear industries have a very difficult task ahead in achieving the potential of nuclear power.

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7. U. S. Atomic Energy Commission. Nuclear Power Growth 1974-2000, WASH-1139 (74), February 1974.
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Mr. Moss. Without objection, the Chair will place into the record items numbered 1 through 37 in the hearing folder before the members and those will be referred to from time to time as you move along in your questioning, but they will be in the hearing record as appendix III (see p. 144).

Mr. ATKISSON. Mr. Chairman, for the record perhaps we could clarify the documents to which you refer. They are the so-called Australian documents supplied to the subcommittee by Mr. James Harding, who will be appearing in just a few moments.

Mr. MOSS. Mr. Moffett.

Mr. MOFFETT. Thank you, Mr. Chairman. I just have a few questions for Mr. White.

Mr. White, you were urged to issue a topical report.¹ Was it on the cartel itself or on its impact with regard to prices? You indicated you were urged by your subscribers to issue a topical report. Would that be on the cartel and its activities?

Mr. WHITE. No. The basic urge to do this arose from the fact that the press and everybody was getting very interested in what we call this sevenfold increase in prices. Utilities, the purchasing people were getting inquiries from their local people, why is this going on. The producers were being deluged with questions about it. We in our own offices, our phones were lit all day long with questions on it.

What we thought it was appropriate to do was to try to gather together in one place a list of those factors and to give our interpretation of them. I hope we have covered all of the factors; whether people will agree with our interpretations is something else again.

Mr. MOFFETT. So the reasons that you submit in your testimony are basically taken from your topical report?

Mr. WHITE. Yes; this is a summary.

Mr. MOFFETT. Thank you. I'm still a little confused about the difference between this cartel and the OPEC cartel and the assertion that this cartel is quite ineffective up to this point, although, as you indicated and we all know, the OPEC cartel has been quite effective.

What reason is there to believe that this cartel cannot become effective? Is it your testimony that it does not hold the promise of becoming effective?

Mr. WHITE. So far, we have not needed their uranium. I was expressing a judgment that we really don't ever have to be depending on them, it just depends on our reserves being produced in time to meet the demand in this country, which, again, is a matter of price. You must recognize that, at a price of \$40 per pound, there are a lot of people starting to go into the uranium business and we are starting to get increased supplies moving into the market. I think it is our judgment that the normal economics of price are serving their function of bringing more into the market.

Now, if the foreign people, let us say, Australia, were to be opened up, flooded the world market, drove the price down, you could wreck our industry again and then, perhaps, they could be effective. I wasn't trying to deny that a cartel can be effective.

Mr. MOFFETT. I understand.

¹ The report referred to appears as app. IV, p. 363, this hearing.

Could you expand a bit upon the industry, what it is like, the structure of the industry? Do you view it, for example, as a competitive industry?

Mr. WHITE. Well, we always have. Our little company handles a surprisingly high percentage of the transactions in the United States. I have already observed that I lived long enough in the world to be slightly suspicious of people. I think I would have spotted something if there was something wrong in that industry and I must say that I don't think there has been.

Mr. MOFFETT. We have read a great deal in the press about large companies dominating uranium as we have had about oil companies dominating not only oil but other fuels. Do the oil companies have a prominent role in this market and can you tell us something about the role of the major oil companies if there is one?

Mr. WHITE. Well, the first oil company in the business and still the biggest factor in the business is the Kerr-McGee Co., if you consider it as one of the big international companies. It is a pretty good sized company.

The other major factors were people like Anaconda, Phelps Dodge, Utah, Homestake, United Nuclear is one of the major companies.

Then, after that first period went by, there was a shakeout in the industry. A lot of people went out of it because of the low prices and the lack of market. Then you saw a whole new tier of people come in. You saw, probably, more money—I believe this has to be a speculation—but it is our judgment that more money is being spent in this industry today by Exxon than any other company. Gulf has been very active. Then you have a whole series of oil companies that are just now getting into the business. There is Union Oil; Standard Oil of California; Continental Oil, although they got in awhile ago; Pioneer, which is a gas company and really not a giant company.

Mr. MOFFETT. Are they dominating at this point?

Mr. WHITE. No. I think probably the mineral industry, if you would include Kerr-McGee, and they have been a long-time member in this industry, are the dominant ones.

I think you have to say, looking ahead, that the company that spends a lot of money in exploration and mine development today is going to be the fellow who is the big part of the business tomorrow.

We believe that people like Gulf, Exxon, Phillips has made a big new discovery, I would suspect that the part played by the oil companies will grow faster than the other companies. That would be my—

Mr. MOFFETT. Following up on that, Mr. White, how do you feel about oil company ownership of uranium? Some of us have expressed concern about oil company domination in the various fuels. How do you feel about that?

Mr. WHITE. You mean from the narrow viewpoint of my business?

Mr. MOFFETT. Both from the narrow viewpoint of your business and then in terms of public policy.

Mr. WHITE. From the narrow viewpoint of my business, the more small independents the better because we do more business with them than the big companies with their professional marketing staffs. But I think that's a selfish view of the thing.

As far as public policy is concerned, there have been a number of numbers published as to the number of billions of dollars that will have to be spent between now and 2000 to bring our production to where it needs to be. I would surmise that the industry needs some of that capital infusion from the big oil companies. I think it is going to be necessary. I wouldn't like to see personally, from a public policy standpoint, the industry being totally dominated by oil companies.

Mr. MOFFETT. But it could happen?

Mr. WHITE. Yes.

An interesting development, sir, if may mention another thing, which I didn't think about, both United States Steel Corp. and Bethlehem are taking quite an active part in this business now, too. You may have noticed that United States Steel just bought ARCO's position.

Mr. MOFFETT. Yes. I did notice that.

In your testimony you cite the Hanrahan paper from ERDA with regard to our requirements. At the same time you mentioned, if I'm not mistaken, that requirements are considerably less than they were once calculated to be. Does Hanrahan take that into account? Do you think that Hanrahan's figures on requirements are fairly accurate?

Mr. WHITE. I think they are up to date. I haven't analyzed them, frankly, but it is my understanding that they are substantially lower than the earlier Government numbers. I have to give you that as hearsay.

Mr. MOFFETT. What happens if we have a massive conservation effort between now and the year 2000, including incentives for conservation? I'm sure either of us could recite a list of things that could be done, some of which are being done, that might slow the rate of growth of electric usage and diminish the need for more and more nuclear plants. Do you see that happening and, if so, what kind of picture does it present for the market?

Mr. WHITE. Well, I wouldn't attempt to comment on conservation as such, I don't think I'm qualified to. But, if the demand goes down, I think the price will go down and there will be some people who would drop out of the business. That is the normal cycle.

Does that answer your question?

Mr. MOFFETT. It simply concerns me that we see nuclear power projections from utility companies and ERDA which frequently fail to take into consideration the potential for some dramatic conservation. What does that mean for the industry and for the price of uranium?

Mr. WHITE. I would observe that such things that you referred to are very slow-moving and I'm sure the industry would adjust itself to whatever requirements there were.

Mr. MOFFETT. What about the profits of producers? As I recall in looking over the testimony from Westinghouse, there was some assertion about monopolistic profits. You gave us some picture of what the industry is like. Can you help round that out with a picture of what the profit picture has been like?

Mr. WHITE. Well, sir, giving the average cost of uranium is very misleading because there is no average uranium mined. I was reading, maybe you saw it. I forget what the SEC form involved is in the *General Electric-Utah Merger* case. They have relatively high-grade, open-pit, cheap operations. I think their costs which they gave for a period of 3 or 4 years, recent years—these were just bare costs without over-

head or profit, a lot of things that you have to put in—my recollection was that they were in the \$8 or \$9 range. If you add 50 percent to that, make it \$12, I would think Utah would make a lot of money.

On the other hand, if you had underground mines in New Mexico, deep, had a lot of water, a lot of miners, people do not like to go underground anymore, so you have to pay them a lot of money, I think these fellows probably are not making excessive profits even at \$41.

I'm afraid I'm not an expert in this field, but I have read a number of these reports and I think there's a very, very wide spectrum in the profit picture.

Mr. MOFFETT. One final question. There seems to be a tremendous contrast between your perception of this foreign group, as you call it, and the degree of openness in their deliberations. You seem to be saying it is fairly open. Westinghouse seems to be saying it is a very closed kind of operation. In fact they say it concealed its activities through elaborate bid-rigging, deceptive devices intended to deceive the public into believing that uranium prices were set by competition. Is there as much of a contrast there as I'm suggesting between the position of your testimony and that of Westinghouse?

Mr. WHITE. I think that Westinghouse's statement that it was done in great secrecy is correct.

Mr. MOFFETT. Is not?

Mr. WHITE. It is correct. We in our way, perhaps naively, we deal with all these people. We asked our people we talked with about these things directly. I'm talking about the people who are involved in it. We got complete denials about it. They wouldn't even admit that they had met with each other, and I'm not so sure if that still isn't the case, so I think you have to say it was done in great secrecy.

I do believe this, though, that in any secret which involves a lot of people, there is going to be leakage, and there was sufficient leakage that, as I say, all of the trade press carried quite accurate accounts of their meetings and everything.

Mr. MOFFETT. You mention this, what was it, the Susquehanna example?

Mr. WHITE. Yes.

Mr. MOFFETT. In your response to counsel's question, you said that they were afraid of that, if the industry knew that they had to cover, I think that was the term you used, then they were afraid the price to them would go up.

Mr. WHITE. Yes.

Mr. MOFFETT. That's not exactly a free market situation, is it, if they can be held hostage in that respect?

Mr. WHITE. You know, there are not a lot of people in this business and small producers like the Cotter Corp. had a million pounds and if he realized that the Susquehanna fellow really had to have a million pounds, I'd think he would have put another two bits on his price. Now, that doesn't seem like much today, but that was a big bite in those days. You argued for a week over a nickel.

You could do that if you knew the fellow had to buy as opposed to responding to an invitation by Pacific Gas & Electric Co. to supply uranium to him. Then you would be competing with 12 other sellers.

My only point was that, by, let's say, camouflaging his presence, he thought he could get uranium at a lower price.

Mr. MOFFETT. Thank you very much.

Thank you, Mr. Chairman.

Mr. MOSS. I have just a few questions.

First, Mr. White, the date of the hearing by the joint committee, the hearings were held on September 17-18, 1974.

Mr. WHITE. 1974, did you say?

Mr. MOSS. Yes.

The title of those hearings was "Proposed Modification of Restrictions on Enrichment of Foreign Uranium for Domestic use," in the event Mr. Atkisson wants to come back to them.

Have you been aware of the Australian documents since their first mention in the press?

Mr. WHITE. I've never seen them. I read about them in the paper.

Mr. MOSS. You have not sought to have an opportunity to review them? They are public records.

Mr. WHITE. We didn't really think—we were not interested.

Mr. MOSS. You reached the conclusion that they had no value?

Mr. WHITE. We thought we already knew what was in them.

Mr. MOSS. Weren't you curious just a tiny bit to determine whether or not you were right as to what was in them?

Mr. WHITE. We should have been, but we were very busy.

Mr. MOSS. I find I was most curious.

In your statement on page 2 you set down four criteria as being responsible primarily for the increases.

The first is a long-overdue correction in uranium prices from sub-normal levels to recognize rapid and large increase in production costs of the mining industry.

Did you study any cost data in reaching the conclusion that that was a significant factor?

Mr. WHITE. I believe that's in the topical report in the record [see appendix IV]. We gave the changes in the Department of Labor indexes for chemicals, mine labor, and things like that.

Mr. MOSS. You did not go into any more refined cost data?

Mr. WHITE. No. I said this was a very rough effort to arrive at—

Mr. MOSS. Therefore, in order to finally accept that as a valid basis for the rapid escalation in costs—again, I want to emphasize how very rapid it has been, because we were at a low of \$5.95, not \$6, and we were up to about \$41 within the 3-year period—that's a very rapid escalation in prices—this committee, then, in studying impacts should certainly, if it is to accept a cost basis, actually examine the costs beyond the point the Department of Labor or the Department of Commerce statistical indexes would indicate. Isn't that, in your judgment, a prudent course?

Mr. WHITE. Yes, Mr. Chairman.

I would like to once more make a point, though, that, when you are dealing with an industry, all you can use is averages. If you want to go into detail, I think you have to take two or three companies and examine them.

Mr. MOSS. That's what we will undoubtedly have to do. That's what we have been doing for the past year in the area of natural gas.

You answered the next question I had, the major short sales, you are referring primarily to one.

The adoption of the nationalistic policies: those are policies which, in effect, are protective of the domestic industry within those countries? Is that your conclusion?

Mr. WHITE. Yes; they are a little different in each country. Would you like me to say a little bit about them?

Mr. MOSS. I think we have it. I just wanted to be certain that that was the basis, that was reflecting these drives to protect national resources in energy.

Mr. WHITE. Yes, sir.

Mr. MOSS. Are you aware of the involvement of any American domestic interests in the cartel operation?

Mr. WHITE. No; I am not, but I think you have two situations which might be argued. One of the big mines which has been opened recently is Rabbit Lake in Canada. Rabbit Lake is owned 50 percent by a German company, Vranerzbergbau, and 50 percent by Gulf of Canada, which—I don't know if it's fully owned by our American company but I'm sure it is controlled by them, and I don't know what their status is.

The other one which comes to mind would be Faraday Mines in Canada and I believe they renamed that with some Indian name. I know it as Faraday Mines which is owned 51 percent by a company called Federal Resources, and I don't know their relationship to the Canadian Government situation other than to know that the Canadian Government has set a policy of, how do you say this—you cannot get an export permit for uranium from Canada without their approval of your price.

Whether that makes these two companies part of the cartel or not, I'm not sitting in judgment on, but these are the only two situations I know of.

Mr. MOSS. Do you suspect any others?

Mr. WHITE. No; I don't.

I would say there is one other that I'm aware of and I forgot about this. Getty Oil Co. owns, I believe, 30 percent of Pan Continental in Australia but they are not in production, they haven't even started producing and I would doubt very much if they have gotten involved in any pricing or anything like that.

Mr. MOSS. Apparently we have moved toward the horizontal integration of energy. As an independent operator, what is your view as to the probable impact on prices brought about because of horizontal integration? I'm not talking about the warmer issue in the Congress of possible vertical integration problems. I'm talking about horizontal integration problems.

Mr. WHITE. So that I understand you, you mean——

Mr. MOSS. Where you have one controlling factor in energy undertaking to control competing types of energy or energy-producing materials.

Mr. WHITE. Your questions?

Mr. MOSS. What is your reaction as to its probable effect on prices?

Mr. WHITE. I would think that its effect would be to add stability to prices. When you say that, you probably are saying that the prices would probably stabilize at a somewhat higher level. The reason I say this is that when prices tend to start going down, a company with a great deal of capital would just not sell into that bad market. A company like, let us say, the Atlas Corp., which is one of the uranium

producers in this country, I don't know their capital structure but it's a small company and I'm sure the time would come sometime when they would have to make a sale to meet their payroll.

Mr. Moss. As a matter of fact, they might, in the pattern of increasing horizontal integration, have to sell the company or merge?

Mr. WHITE. That's possible.

Mr. Moss. It has been the pattern traditionally, of movement of larger and larger forces into the market. They tend to gain domination in a variety of ways, one of which is to absorb competitors, is that correct?

Mr. WHITE. Yes.

May I suggest another influence here?

Mr. Moss. Certainly.

Mr. WHITE. One of the developments that is gaining momentum is for the electric utilities themselves to get into this business. I don't know whether you appreciate that.

Mr. Moss. I do appreciate it and I appreciate the fact that they have been faced with the problem of being called upon to put up some front-end money and we in this committee have tended to frown on too much pouring in of front-end money.

Mr. WHITE. One evidence of it, of course, the other extreme is Commonwealth Edison, for example. bought the Cotter Corp. TVA bought the Edgemont Mill and Mines and properties of Susquehanna. I think that, as more and more of these people go into exploration, mining and milling—I believe Southern California Edison Co. is going into a mill now—this is another diversity in this market that will tend to dilute the effects of any kind of concentration which you may be seeing take place.

Mr. Moss. It should be interesting to watch. We shall be watching, I assure you.

Mr. White, unless there are other questions, I want to express the appreciation of the committee for your appearance here this morning.

You are excused.

Our next witness will be Commissioner Leonard Ross, accompanied by Mr. Jim Harding of the California Energy Commission.

Will both of you gentlemen be testifying?

Mr. Ross. Yes.

Mr. HARDING. Yes.

Mr. Moss. Then will you be sworn.

Do you solemnly swear the testimony you are about to give this subcommittee will be the truth, the whole truth and nothing but the truth, so help you God?

Mr. Ross. I do.

Mr. HARDING. I do.

Mr. Moss. Will you identify yourself for the record.

TESTIMONY OF LEONARD ROSS, MEMBER, CALIFORNIA PUBLIC UTILITIES COMMISSION, ACCOMPANIED BY JIM HARDING, SPECIAL ADVISER

Mr. Ross. I am Leonard Ross, commissioner of the California Public Utilities Commission.

Mr. HARDING. I am Jim Harding, special advisory to the California Energy Commission.

Mr. ATKISSON. If I may interpose, Commissioner Ross has a 12:30 plane to catch at the Sacramento Airport. We promise to be out of here about 10 minute to 12.

Mr. Moss. We would be most pleased to have Commissioner Ross' testimony immediately.

Mr. Ross. I'm testifying on my individual capacity, not as a spokesman for the California Public Utilities Commission.

I would like to just review a couple of comments in Mr. White's testimony. First of all, his remark that we do not think it came as a surprise to anyone in the industry when the cartel's existence was confirmed.

It certainly came as a surprise to the members of the California Public Utilities Commission. I think it came as a surprise to the staff. I asked questions about the uranium industry before that. I think it came most importantly as a surprise to the California Legislature, which undertook the most extensive consideration of the future of nuclear industry of probably any legislature in the United States in the late months of 1975 and the early months of 1976.

I haven't checked the record but I don't recall hearing about any discussion that our whole nuclear future might be at the mercy of a foreign cartel.

It came as a surprise to commissioners, including those with special interest in the nuclear field from Maine, Wisconsin, New Jersey, other States, who called me after the release of the document. What that may say simply is that commissioners don't read Nuexco reports and don't read the nuclear trade press. I'm trying to change my habits since learning of this. Perhaps the staff should have reported on it, but I think there is also an obligation on the part of the utilities to say something now—and they should have said something in the past about the existence of an international cartel, even if it is not totally clear that the cartel was responsible for the astonishing price increases which will cost consumers in the State of California over \$1 billion in extra utility costs at a minimum through the year 1990.

I might also state that I have heard from one of the leading energy reporters in the country that he has never encountered as closed and frightened a response in asking questions as in talking to utility executives about the uranium market. His interpretation of this was that it was closed and frightened, not because they were participants in any kind of conspiracy, but because the market is so tight, the difficulty of obtaining uranium is so great, prices are escalating so rapidly and, as Mr. White said, the industry is so small that it functions, in that well-chosen word for the people who met in Paris, London, Johannesburg, it functions as a club.

Meaning no disrespect to Mr. White, I think that his statement, we do not think it came as a surprise to anyone in the industry, is symbolic of the clubiness of the uranium industry, perhaps to some degree the utility industry. It is a club that excludes the public and I think, at least with respect to the foreign uranium industry, we now have strong evidence that it exploits the public.

The real stakes here are three: First, billions of dollars; second, energy independence; and, third, and it may seem to be going a bit far afield—I don't think it is—plutonium.

I was interested that Mr. White mentioned plutonium as one of the minerals his firm is involved in. The importance of plutonium is twofold. First of all, it's been the standard assumption of the nuclear industry in the United States that the supply of uranium is not sufficient to maintain low-cost nuclear power over any substantial limits of time. It's always been part of the plan of the industry, the Atomic Energy Commission and the Nuclear Regulatory Commission to move from a uranium-fission economy to a mixed plutonium-uranium-fission economy, and then to a breeder reactor which depends upon plutonium. So when we are talking about the supplies of uranium, we are talking about the possibility of a foreign cartel being able to control the supply of uranium and increasing pressure for moving quickly toward plutonium energy.

That's the implication from Mr. White's remarks that I interpret to be critical of the Government's delay in its decision on reprocessing plutonium.

The other important fact about plutonium is that it is directly usable to make nuclear weapons. If we move to a plutonium economy, by the estimates of the International Atomic Energy Agency, by the year 2000 enough plutonium will be in circulation in the world so that the diversion of 1 thousandth of 1 percent of that amount will be sufficient to make just a small nuclear weapon.

I raise this scare because I think it is scary and I think it is relevant. One of the rumors I have heard, and I think it is a vague rumor, probably vaguer even than the rumors that might have been around about the existence of a nuclear cartel, is the possible existence of a black market in plutonium. There were rumors surrounding the *Kerr-McGee* case. I don't think any of those have been validated at all. I don't give any credence to them. I have heard from people studying nuclear industries that there is a notion that a black market may soon exist, the strongest statements I've heard, and I give it great credence because of the institution and the person from which it comes, a person who, in general, takes a skeptical view of the likelihood of nuclear terror.

According to Dr. Brian Jenkins, who is the Rand Corp. expert on terrorism, and I'm quoting him from a conversation I had with him some months ago, "definitive steps have already been taken toward the formation of a black market in plutonium involving the international arms trade."

So I think it is important to take an overview of the entire nuclear economy. I think the questions which are raised by the existence of a cartel are questions which are absolutely vital to determining the extent which we should commit ourselves in the future to a nuclear future. I'm not saying this as a belated propaganda statement for proposition 15, which I did not endorse. I'm not saying this as relevant to the arguments about nuclear safety, in which I have no expertise. I'm saying this, keeping fully in mind that there are no longrun alternatives to fission power which are simultaneously easy, cheap, clean and presently available.

These are not easy choices and I'm not saying that, because we have received documents from Australia, we ought to then turn around our entire energy future. What I'm saying is that the debate about nuclear energy in this country has gone on uninformed about the existence of

the foreign cartel, uninformed about what's been going on, that the decisions of State agencies and the State legislature in California have not had the benefit of that information, and that what is needed is a national, high-level Presidential Commission modeled on the British Royal Commission which recently has been headed by the founder of Britain's nuclear power program.

They came up with the conclusion, and I'm not sure this is necessarily the right conclusion for us, the astonishing conclusion for the royal commission as thus constituted, that further nuclear development should be postponed as long as possible. Sir Brian Flowers, Britain's leading nuclear scientist, said—

That doesn't mean stop. It means, for heaven's sake, stop to think!

Without that kind of review, I think we are left to the often shrill and misleading debates of political referendum, I think on both sides in the case of proposition 15. We are left to arguments, very important arguments, about the reactor safety which I don't mean to dismiss but I think is only part of what we should be focusing on and making choices about nuclear energy. I think relatively we may have spent too much energy and too much attention on that and not enough on the economics.

The documents received by Mr. Harding and turned over by him to Commissioner doctor and California State officials, I'm now convinced are authenticated because of government statements and independent attempts to authenticate them by reporters for the San Francisco Chronicle and the New York Times, each of whom apparently talked with executives of Mary Kathleen Uranium, Ltd. and obtained confirmation of those documents being correct copies of documents and files.

Secondly, the astonishing increase in the world price of uranium since 1972 cannot help but have had a dramatic effect on the domestic price of uranium. In fact, just as a standard economic assumption, one would imagine that those were directly linked.

The terms in which uranium is now being offered to utilities, I understand, include market escalation prices which directly tie the domestic price to the world market price, so that, apart from the embargo that we have had on the use of foreign uranium, the fact that the price abroad is going up affects not only imports—and we have under contract 45,000 tons of foreign uranium for import which amounts to approximately \$3.600 million at current prices—not only imports but our entire uranium expenditure is affected by the world market prices.

The question, of course, is what effect the cartel has had on that price. I don't know. I certainly do not have the expertise that Mr. White does in this business.

I do question whether representatives of an international mining corporation controlled by the French Rothschilds with interests in uranium and other minerals of many continents and high-level government officials would go to the literal and figurative lengths that they went to in meeting all around the world and contriving a brazen scheme of fraudulent bidding which is reminiscent of Judge Gary's dinners or actually of an earlier, more recent cartel in the electric generating industry.

Whether all of this would have gone on for as little purpose and with as much comic relief as Mr. White suggests, it is certainly possible. Clearly there were events that the cartel maybe did not appreciate, such as the increase in oil prices.

If we continue with the planned expansion, nuclear power in the United States may become as vulnerable to the uranium cartel as it is to OPEC today. ERDA, in its April 1976 survey of U.S. uranium marketing activity said that:

Uranium supply arrangements for planned U.S. nuclear fuel capacity do not provide extensive coverage of future needs. Procurement efforts in 1974 and 1975 did not significantly improve the situation.

ERDA estimates nuclear domestic requirements in the 1980's in the range between 30,000 and 35,000 tons a year from domestic commitments to domestic buyers as of January 1 of this year. In 1982, delivery of 10,500 tons, then going down to 8,300 then 5,700 then rapidly going down afterwards, so utilities, as of the beginning of this year, had not covered themselves; for the year, I believe, 1986 onward, their import commitments for uranium exceeded their commitments to obtain domestic uranium. There is no question, of course, that if it is sufficiently high priced, uranium will be available. At a sufficiently high price, shale oil can be produced. But that doesn't answer the question of what happens if we are heavily committed to a fission economy and there is a sudden threat of cutoff, either for political reasons or unless price demands are met.

It doesn't answer the question, which I really think is the important one, of the effect of the uranium price on our own crucial decisions about plutonium, both about plutonium processing, a decision to be made budgetarily within the next year and by the Nuclear Regulatory Commission, and the decision about the breeder. If you read any analysis of those decisions, the key element is the price of uranium.

So we have to know about these things.

[Mr. Ross' prepared statement follows:]

TESTIMONY OF COMMISSIONER LEONARD ROSS, CALIFORNIA
PUBLIC UTILITIES COMMISSION

Thank you for inviting me here today. I am testifying in my individual capacity and not as a spokesman for the California Public Utilities Commission.

I would like to summarize what I think we know and don't know about the international uranium cartel, and what questions we must ask.

1. From 1972 until at least 1974, an international cartel attempted to rig the foreign market for uranium. The cartel included government representatives from some of our closest allies and trading partners.

The documents turned over by Friends of the Earth to Mr. Jim Harding of the California Energy Resources Conservation and Developing Commission purport to be copies of documents from the files of Mary Kathleen Uranium Ltd., an Australian affiliate of Rio Tinto Zinc, a multinational corporation with uranium interests in several continents. I understand that newspaper reporters from the San Francisco Examiner and the New York Times have confirmed the authenticity of these copies in telephone conversations with officials of Mary Kathleen and its affiliates. To my knowledge there has been no denial of the authenticity of the documents or of their accurate representation of the meetings and activities of the uranium producers "Club." I am now convinced that the Club existed and functioned as described during 1972-1974.

As described in the documents, the Club consisted of producer and, in some cases, government representatives from Australia, South Africa, Canada and France, and representatives of Rio Tinto Zinc. The Club's originally stated inten-

tion, as described in the minutes of its February 1-4, 1972 meeting in Paris, was to "agree upon a price for uranium from time to time . . ." Seventeen producer meetings (three of them involving Australian producers only) are recorded for the period February 1972 through May 1974. Meetings took place in Paris, Johannesburg, London, Las Palmas, Sydney and Toronto. The business of the Club included setting market quotas, discussing means of discrimination against American reactor producers, agreeing on fixed prices, and setting up a detailed formula for the submission of rigged bids. In blunt terms, the Club was a price-fixing conspiracy.

Press reports indicate that the Westinghouse Corp. has filed an antitrust action against American uranium mining firms and a branch of an American trade association as well as foreign members of the Club.

2. There has been an astonishing increase in the world price of uranium since 1972—from \$6 a pound to between \$40 and \$50 today. This increase will cost American consumers \$3 billion a year or more in extra utility bills during the 1980's.

American uranium prices are tied to the world price. We do not know what portion of the world price increase was due to cartel activity. World inflation and the rising price of competing fuels would have resulted in uranium price increases even without the cartel. But producers in the four cartel countries, together with Rio Tinto Zinc, have dominated the market for uranium outside the United States and the Soviet bloc¹ and may well have had a major influence on the world price escalation.

3. If we continue with the planned expansion of nuclear power, the United States may become as vulnerable to a uranium cartel as it is to OPEC today.

America's plans for energy independence rely heavily on nuclear power to meet future energy needs. Import restrictions on uranium are being lifted and the United States is projected to become a net importer of uranium. American utilities already have under contract 45,400 tons of foreign uranium, almost entirely from countries which have been involved in the cartel. ERDA concluded in its April 1976 Survey of United States Uranium Marketing Activity that:

"Uranium supply arrangements for planned U.S. nuclear fuel capacity do not provide extensive coverage of future needs. Procurement efforts in 1974 and 1975 did not significantly improve the situation."

4. To the best of my knowledge, neither the U.S. State Department nor the Energy Research and Development Administration has done anything to protest the existence of the cartel, to inform the American public about it, or to raise the issue in trade negotiations.

Descriptions of the Club's meeting have appeared contemporaneously in the trade press, and on January 15, 1975, Forbes Magazine published an article which suggested the basic activities and purposes of the Club. Articles in the Canadian press prior to the release of the Mary Kathleen documents have also described price-fixing and market sharing by the Club. But there has been no indication that ERDA or the State Department has taken an interest in protecting American consumers against the cartel. There has, to be sure, been an active U.S. Justice Department investigation of the cartel since mid-1975. But the existence of a uranium cartel raises concerns which go far beyond the antitrust laws. Utilities and regulatory Commissions need to know about the impact of a cartel on the price and reliability of nuclear fuel supply. The American consumer should be protected by vigorous representation in trade negotiations. And Congress might wish to consider expanding our legislation providing for retaliation against unfair foreign trade practices to include price-fixing cartels.

5. For years, the nuclear industry and the U.S. government have planned to use plutonium to stretch out our domestic reserves of uranium. But there is increasing recognition that a "plutonium economy" would raise the risk of nuclear war.

Plutonium, unlike the kind of uranium used in current reactors, is directly usable for atomic weapons. With a plutonium economy, enough plutonium would be in circulation by the year 2000 so that diversion of one-thousandth of one percent would be enough for an atomic bomb. *According to Dr. Brian Jenkins, a RAND Corporation expert on terrorism, "definitive steps have already been taken toward the formation of a black market in plutonium involving the international arms trade."*

6. We urgently need to reassess the future of nuclear power from fission reactors.

¹ For the year 1975, for example, these producers supplied 97 percent of the annual uranium requirements of non-U.S., non-Soviet consumers.

The President should appoint a high-level commission, to assess not only the safety and waste problems associated with nuclear fission, but the overriding question of whether we have the uranium resources to sustain a fission economy or whether continued nuclear expansion will force us to use plutonium.

Last week an Australian government enquiry, while approving the mining of uranium, concluded that "the nuclear power industry is unintentionally contributing to an increased risk of nuclear war" through the proliferation of plutonium-producing nuclear reactors. A British Royal Commission, headed by the founder of British's nuclear power program, urged that further nuclear development be postponed "as long as possible." *Sir Brian Flowers'* summary statement should serve as a watchword for American policy: "That doesn't mean stop. It means, for heaven's sake, stop to think!"

There are no long-run alternatives to fission power which are simultaneously easy, cheap, clean, and presently available. But we must decide soon, on a full review of the evidence, whether to continue our emphasis on nuclear fission or to shift our billions of dollars of energy research to other alternatives.

Mr. Moss. The Chair recognizes counsel, Mr. Atkisson.

Mr. ATKISSON. You are a member of the California Public Utilities Commission. Do you know of any studies, formal or otherwise, about just what has caused the price rise to the current \$41 level?

Mr. Ross. I initiated an informal inquiry in, I believe, late July and received responses from Pacific Gas & Electric and Southern California Edison Co. We have not moved forward with an investigation on uranium supply and price pending finding out just where the Energy Commission is going with its general investigation of nuclear power in California. I assume we will resolve that very quickly and, certainly, these questions will be gone into in detail by at least the Energy Commission. I think there are aspects of it which should be covered separately in detail by the Public Utilities Commission.

Mr. ATKISSON. What I'm alluding to is the fact that I have been told that each \$10 in price of yellowcake, preenrichment, amounts to something more or less than a tenth of a mill per kilowatt hour to the final consumer buying this power. That doesn't sound like a lot, but I wonder. I think one of the subcommittee's worries might be, because those numbers seem so small, that commissions on their own may tend not to notice those price rises, there seems to be a lot of room in those figures.

Mr. Ross. The multiplier is large. According to the Pacific Gas & Electric and Edison responses, the cumulative amount that they will spend on uranium through the year 1990 \$1.5 billion—assuming a \$40 price that ignores all the escalation, which will take place by 1990; it also ignores lower prices in some of the earlier years because the uranium was under contract—and the \$6 price, it would come out somewhere in the neighborhood of \$200 million, so we are talking about an extra \$1.3 billion over the next 15 years that will be loaded onto the consumers of California as a result of these price increases.

Mr. ATKISSON. I have no further questions.

Mr. Moss. In order to accommodate your schedule, we are happy to excuse you at this time and then we will have the testimony of Mr. Harding.

Mr. ATKISSON. I take it you want your prepared remarks submitted for the record.

Mr. Ross. Yes; I would like that.

Mr. Moss. They will be included in the record following your summation [see p. 53].

Mr. Harding, you may proceed.

TESTIMONY OF JIM HARDING

Mr. HARDING. I would also like to thank the subcommittee for inviting me to testify here today.

Commissioner Ross took a fairly broad view of the policy questions involved in the uranium cartel issue and I'm going to take a narrow one but I would, nevertheless, like to be brief.

As Commissioner Ross noted, I received a set of documents on the uranium cartel in mid-August from my former colleagues at Friends of the Earth in Australia. The materials were delivered to my office at the California Energy Commission in Sacramento and appear to have been reproduced from papers in the internal files of Mary Kathleen Uranium, Ltd. As you know, these papers explicitly describe the meetings of an international uranium cartel that sought to fix prices, rig bids, eliminate competition, divide up market shares, and control supplies. Whether they have been successful in this effort, I cannot say. Uranium prices have, nevertheless, risen eightfold since the cartel's first meetings in 1972.

Upon receiving the materials, I called the U.S. Justice Department which has been conducting an antitrust investigation of the uranium industry since mid-1975. Two copies of the papers were forwarded immediately. I also asked Commissioners Ross of the Public Utility Commission and Doctor of the California Energy Commission to join me in releasing the documents to the press. Both Westinghouse and their attorneys asked for and received copies. George White, Jr., of Nuexco asked for and presumably received a set as well.

Largely on the strength of these documents, Westinghouse has filed a complaint in the Illinois District Court accusing some 29 foreign and domestic uranium producers of restraint of foreign and domestic commerce in violation of the Sherman Antitrust and Wilson Tariff Acts. Westinghouse asserts that these producers in the United States, Canada, South Africa, Britain, and Australia have:

- (1) Agreements establishing a minimum floor price for the sale of uranium by the defendants and their unnamed coconspirators;
- (2) Invitations to quote prices above prevailing levels which were adopted by the various producers;
- (3) Agreements to rig or fix prices by assigning a low bid to one producer, with another designated as runner-up, and others not bidding;
- (4) A common understanding that uranium for future delivery was to be set only on "world market price", a price that would then be fixed and stabilized by the producers;
- (5) Assurances by foreign producers that they would not compete with domestic cartel participants for the U.S. market in return for an agreement from U.S. producers that they would not oppose the lifting of the uranium import embargo;
- (6) Agreements to divide up market shares among the world's producers;
- (7) Concerted refusals to sell material to Westinghouse or to sell at discriminatorily high prices;
- (8) Exchanged marketing information with respect to anticipated prices, inventories, production, bidding, and contracting practices, demand, supplies and conditions of sale.

The other subject I would like to address myself to is one Mr. Atkisson brought up a few minutes ago, that is, the impact of the cartel on the economics and viability of the nuclear enterprise. It is often asserted that uranium fuel is a domestic fuel in large supply and that price rises in this fuel will have little impact on the delivered cost of a kilowatt hour from nuclear fission. Commissioner Ross has addressed the first point and I will address the second.

Most nuclear plants operating today produce electricity for about 10 to 15 mills per kilowatt hour, slightly over 1 cent. One-third to one-fifth of that cost is for fuel, rest generally capital charges for building of the plant. Of the third to a fifth that pays for fuel, only one-third represents the cost of raw uranium yellowcake. Therefore, the industry asserts, and correctly, that, holding all other factors constant, a price rise of perhaps \$100 per pound in the cost of fuel will have, at most a 25-percent impact on the cost of nuclear electricity.

The fact is that none of the other factors which are held constant in the sensitivity analysis remain constant. While the cost of yellowcake has octupled in current dollars since the first meetings of the uranium cartel, fuel performance at nuclear plants continues to be poor, the rate at which energy is produced from fuel continues to be poor, the cost of enrichment has risen by about 20 percent per year, and the cost of reprocessing has risen by an even greater factor.

In fact, the last commercial reprocessing facility operating in the United States, the West Valley, N.Y., plant, recently told customers who had contracts to pay \$35 per kilogram of reprocessed fuel that reprocessing could not be obtained for less than \$1,000 per kilogram. They added that the value of products recovered, that is, of the unspent uranium and the plutonium created by the fission would be, therefore, less than the cost of reprocessing. In other words, the reprocessing program is, from the electric utility point of view, uneconomical.

When all of these factors are taken together, the cost of fueling a new nuclear plant is roughly equivalent to the total cost of a currently operating plant, such as Rancho Seco, that has older contracts for fuel cycle services. That is, instead of a fuel cost of, say, 3 to 5 mills per kilowatt hour, the utility industry is faced with an incremental cost four times higher. This is partly as a result of the cartel's activities and partly the fault of the manufacturers. It is my opinion that these fuel costs are not distinguishable from those for coal plants, nor is the nuclear industry as insensitive to inflation rates as is commonly assumed.

The Ford administration offered many proposals to offset uncertainties and protect nuclear power from inflation processes. Among these proposals were massive subsidy programs for enrichment, reprocessing, and waste disposal. With a new administration, such loan guarantees and outright bailouts may not be forthcoming. Reprocessing to recover unused uranium and plutonium is likely to be postponed indefinitely.

The potential hazards of the reprocessing technology are not matched by compensatory benefits. In this case, it will be important to optimize the nuclear fuel cycle to protect against higher uranium prices without reprocessing. This can be done within current reactor limits by dropping fuel enrichment levels, refueling slightly more

often, and dropping the percentage of uranium that is present in the dregs at the enrichment plants.

Fuel costs to the utility under this scenario would drop about 10 percent; total uranium consumption would fall about 35 percent, and existing enrichment capacity could be stretched to cover demands through at least 1990 without the terribly expensive Bechtel addition. Reprocessing would remain uneconomic for decades. Such a proposal not only has the advantage of limiting the economic advantages or assumed advantages from reprocessing, but also has the ability to test the control of the uranium cartel over world prices.

I don't want to finish my prepared comments without adding a few final notes on energy planning in the face of such uncertainties about price and availability.

When high capital costs for nuclear capacity and fuel costs are combined and distribution and transmission costs are also considered, nuclear fission electricity becomes an extremely expensive form of energy. It is my view that we are perhaps substituting in very uneconomic ways energy that should not be met with electricity but rather with direct fuels. In delivered energy to the consumer, the cost of a nuclear kilowatt approaches \$100 per barrel of oil.

No electric technology has been spared from this situation. The question we must begin to ask ourselves is whether increasing electrification is, in fact, worth the enormous expense in capital, and whether energy needs at the point of end use justify the capital intensity of the electric technologies.

I do not have the time and this is not the forum to address this question but I would commend to your attention an article in the October 1976 issue of "Foreign Affairs," a copy of which I will leave with the subcommittee, by a former colleague of mine from Britain. The article is entitled, "The Road Not Taken."

Mr. Moss. Mr. Atkisson.

Mr. ATKISSON. I would like to know a little bit more about how you came by these documents. You said you received them from your former colleagues. Did they just arrive in a plain brown wrapper one Sunday morning a couple of months ago?

Mr. HARDING. It is my understanding that they did arrive in a plain brown wrapper about halfway through August.

Mr. ATKISSON. Without comment of any sort?

Mr. HARDING. That is correct.

Mr. ATKISSON. But a return address indicated to you that they were from former colleagues at Friends of the Earth?

Mr. HARDING. They arrived at Friends of the Earth in Australia, which is based in Sydney, in a plain brown wrapper. They were sent to me by a Friends of the Earth employee who was at that time traveling to Britain, who stopped in San Francisco and delivered them to my office in Sacramento.

Mr. ATKISSON. Did that Friends of the Earth employee write you a note of any sort, a letter along with that?

Mr. HARDING. There was no note. In fact, I was not present when she arrived.

Mr. ATKISSON. But, as far as you are concerned, any knowledge of their source is speculative?

Mr. HARDING. That is correct.

Mr. ATKISSON. The reason I ask the question, it has been suggested by certain cynical people that the timing of the leak of these documents is less than casual.

Mr. HARDING. What would it have been timed for?

Mr. ATKISSON. There is some serious litigation going on concerning the affairs of Westinghouse Electric Corp. and how the cartel may have affected their lot in life. As I said, certain cynical people have suggested that the timing is something other than casual.

Mr. HARDING. That may be correct, but I wouldn't have any control over that. They were released in Australia a week and a half before they were released in this country.

Mr. ATKISSON. To the press?

Mr. HARDING. Yes.

Mr. ATKISSON. You are familiar with the documents, of course. You reviewed them extensively, I assume. Would you review for us quickly who the members of the alleged cartel were?

Mr. HARDING. There are five principal members identified in the documents. One is a private firm, the others appear to be a combination of private firms under some sort of national control. The firm is British based, Rio Tinto Zinc Services, RTZ, a large mining conglomerate.

The other participants are NUF COR which Mr. White mentioned earlier, based in South Africa; Uranex, which is a French corporation; Australia; and Canada.

Mr. ATKISSON. Did one of those countries or companies attributable to one of those countries appear from your reading of the documents to be more in the driver's seat than those of any other country? Who started the cartel?

Mr. HARDING. It is not at all clear from the documents who is responsible for starting the cartel. It is fairly clear that Rio Tinto Zinc, which has holdings in many of the countries—

Mr. ATKISSON. As a matter of fact, Rio Tinto Zinc has a subsidiary which, in turn, has a subsidiary which has an interest in this country, is that correct?

Mr. HARDING. That's correct.

Mr. ATKISSON. Earlier this morning I referred to a report done by a stockbrokerage firm in New York, which lamentably I found out costs \$100 a copy, but I suspect you have a copy.

Mr. HARDING. I do, in fact, have a copy.

Mr. ATKISSON. It speaks well for your budget.

Australia is referred to in that report as the Saudi Arabia of something, a term coined by Mr. Snow, who wrote the report, as UPEC, a new term to replace OPEC, meaning uranium producing exporting countries. From your reading of the documents, can you tell if that is a fair characterization of the role of Australia in the cartel?

Mr. HARDING. The size and rate at which Australian supplies of uranium enter the world market will exert an enormous influence on price.

Mr. ATKISSON. Referring to No. 5 of your charges on page 2 of your prepared statement, you say that the cartel produced assurances by foreign producers that they would not compete with domestic cartel participants for the U.S. market in return for an agreement with U.S. producers that they would not oppose lifting the uranium import embargo.

Can you locate for us, either now or for the record later, the documents which back up that charge?

Mr. HARDING. That is an assertion which Westinghouse makes in their brief filed in district court in Chicago. I do not at present have a copy of the documents which would support that charge and I can assure you that they are not present in the material that I received from Australia.

Mr. ATKISSON. I see.

By the way, did you read the brief of Westinghouse in the case?

Mr. HARDING. Yes.

Mr. ATKISSON. That is your source, then, for this allegation?

Mr. HARDING. That is what I state on the top of page 2.

Mr. ATKISSON. From your reading of the documents, not from your reading of the Westinghouse brief, and turning your attention to No. 7, why did you believe that the cartel refused to sell material to Westinghouse or sold a discriminatorily high prices? Can you point to specific documents in the package from Australia?

Mr. HARDING. Yes; I have done an abstract of the documents because, as you can understand, they are pretty thick and hard to go through, especially in a forum like this.

There was a letter of August 29, 1972, in which it was stated the following: "As you know, they"—let me make sure the they I have is Westinghouse.

Mr. ATKISSON. Mr. Harding, let me refer you to two I find. I am referring to Document No. 24.

For the member at the dais and the Chairman, it would be Document No. 9 and Document No. 24. These are minutes stemming from the Las Palmas meeting of the cartel November 23, 1973, under the heading entitled "negotiations with middlemen". Quote, "It was agreed that nobody would enter into serious discussions with Westinghouse before coming back to the club."

Do you have any idea from your reading of the documents what the motive would be for such an edict, such a proscription against serious discussions with Westinghouse?

Mr. HARDING. Westinghouse, of course, competes with the uranium producing companies on the worldwide market, especially for sales of uranium to the Westinghouse pressurized water reactors that are built overseas. Whether the fuel for those reactors is supplied by Westinghouse or by some of the uranium producers mentioned in this document is a matter that the cartel would well be concerned with.

Mr. ATKISSON. What, precisely, is the concern, being undersold?

Mr. HARDING. They would prefer to supply the uranium rather than having Westinghouse supply the uranium.

A complicating concern would be the difficulty of getting enrichment services for foreign uranium which, in all likelihood, would have to come from the United States, so the negotiations would necessarily be a little touchy.

Mr. MOSS. Mr. Moffett.

Mr. MOFFETT. Thank you, Mr. Chairman.

I have a few questions.

You perhaps heard my question earlier to Mr. White with regard to the implications of a rather dramatic conversation effort nationwide. Would you care to respond to that question? What impact did you see it having on the development of this cartel?

Mr. HARDING. There is no doubt but that I would agree with Mr. White. It would weaken the influence of the cartel, both with regard to price and with regard to supply uncertainties. In other words, if you are supplying a smaller portion of the total U.S. electric demand from foreign sources, then your position in dealing with the cartel is strengthened considerably.

As to the question of what the potential impact of conservation measures could be, I believe that one could essentially stop building reactors at this point and substitute effective conservation measures without any slowing in prosperity. That's a position that requires fairly detailed investigation. However, I think there is substantial technical support for such a position.

Mr. MOFFETT. Of what nature? Do you mean something like the Hayes study on conservation, for example?

Mr. HARDING. The Hayes study is one example of an overview. There are a number of others, some detailed investigations by Mark Ross and Robert Williams who are currently at the center for environmental studies at Princeton. Others concerned with increasing energy supply through efficiency rather than burning more fuels reveal the possibility for major generation of electricity through cogeneration. Cogeneration takes existing industrial facilities with process heat requirements and generates by-product electric power from waste heat for sale to utilities. You get essentially twice as much benefit out of the same amount of fuel as you would if you separated the two.

There are a number of additional studies that confirm the prospects of conservation. I would be happy to supply the committee with many references.

Mr. MOFFETT. When we are dealing with the question of the use of oil, my region of the country, which is the New England region, is at the mercy of the oil cartel, particularly the foreign oil cartel. Is it also true that because we are currently more reliant on nuclear power, it is fair to say that the impact of a uranium cartel would be felt more strongly in our region than in others?

Mr. HARDING. Yes; although I think that the greatest effect would probably be felt in Illinois which has an even higher dependence than I believe Connecticut does.

Mr. MOFFETT. I was unaware of that.

Mr. HARDING. That's my recent reading of the situation. If it is not true now, it possibly will be because Northeast Utilities has slowed its construction program for nuclear plants substantially whereas Commonwealth Edison has quite a few under construction in Chicago.

Mr. MOFFETT. We also asked Mr. White about the horizontal integration picture. Would you have any prescription for the 95th Congress with regard to horizontal integration and what we should do about it?

Mr. HARDING. I'm a bit of a conservative economist. I believe that when the old Standard Oil trust was broken up we created a much more competitive market in the petrochemical business. We created quite a bit more useful products, and broke up monopolies that had stultified both creativity and development of alternatives. My feeling is that some form of horizontal divestiture could accomplish the same thing. The exact details of how that would be brought about I have not made up my mind on.

Mr. MOFFETT. Thank you.

Mr. Moss. Mr. Harding, we thank you for your testimony. You may be excused.

At this time, we will hear from Mr. Albert Bethel, vice president and general manager of Uranium Resources for the Westinghouse Electric Corp.

Mr. Bethel, do you solemnly swear the testimony you are about to give this subcommittee shall be the truth, the whole truth and nothing but the truth, so help you God?

Mr. BETHEL. I do.

TESTIMONY OF ALBERT L. BETHEL, VICE PRESIDENT AND GENERAL MANAGER, URANIUM RESOURCES, WESTINGHOUSE ELECTRIC CORP., ACCOMPANIED BY SAMUEL A. HAUBOLD, COUNSEL

Mr. BETHEL. I am Albert L. Bethel, vice president and general manager of Uranium Resources for the Westinghouse Electric Corp. I have with me Mr. Samuel A. Haubold, of the law firm of Kirkland & Ellis in Chicago, who is outside counsel for Westinghouse.

Mr. Moss. You may proceed.

Mr. BETHEL. Thank you.

Mr. Chairman, I am here today at the expressed request of the committee to discuss the serious threat posed to Westinghouse and the American consumer by what we believe to be a massive, worldwide conspiracy to fix and control uranium prices. I would also like to comment upon possible attempts to prevent disclosure of facts relating to the structure and operation of the conspiracy.

As the committee is aware, Westinghouse is a party to five actions which involve issues concerning the alleged uranium conspiracy. Three of these are pending in Federal district courts, one is pending in the Pennsylvania State court, and one in the Swedish courts. In the most recent of these actions, Westinghouse filed suit on October 15 against 29 foreign and domestic uranium producers under the anti-trust laws alleging existence of a worldwide conspiracy to increase uranium prices; to boycott certain purchasers of uranium, including Westinghouse; and to curtail and restrict the sale of uranium throughout the world, including the United States.

Westinghouse has alleged that the impact of the conspiracy has been a substantial cause of artificially high and noncompetitive uranium prices and, further, that this condition has resulted in monopolistic profits accruing to defendants and their coconspirators.

Westinghouse seeks in this action not only monetary damages for its own injuries, but, in addition, appropriate injunctive relief to restore uranium prices to competitive levels. The antitrust complaint has previously been made available at the request of the committee staff.

In view of the pending litigation, I have been advised by our attorneys that there are a number of areas where specific comment by me would be inappropriate at this time. A substantial portion of the evidence developed through court discovery processes cannot be disclosed by Westinghouse or any other party without order of the court. I trust the committee will appreciate why, under the present circumstances, I must respectfully refrain from commenting on the most sensitive matters. However, I am at liberty to discuss in general terms

some of the broader issues with which I understand this committee is particularly concerned.

Current rumors of an imminent oil price hike by OPEC recalls the shock transmitted to the United States and the world economy by the oil cartel. OPEC's first moves to increase prices more than 2 years ago were accompanied at the time by widely expressed belief that the cartel could not last.

OPEC has not only lasted but enjoys power and influence over the U.S. economy to a degree which no one could have anticipated. Nuclear power promises and has actually delivered for the consumer comparatively low-cost energy. As part of a balanced energy program, nuclear power represents the possibility of billions of dollars of savings to the American consumer. The economic advantage of nuclear power, however, is significantly diminished if uranium is available only at artificially high and noncompetitive prices.

A new worldwide cartel and conspiracy has apparently appeared on the scene whose aims are to control the supply of uranium and to achieve artificially high prices. Such actions threaten to deprive the American consumer of part or all of the benefits of this low-cost energy source. As revealed by the recently released Australian documents, there are similarities between the uranium cartel and the OPEC cartel, but there appear to be also several important differences.

OPEC was composed largely of so-called third world countries; the uranium cartel is apparently composed of private corporations residing in such developed countries as South Africa, Canada, Australia, England, and the United States. OPEC's price-fixing actions are openly announced; the uranium cartel, on the other hand, has concealed its activities through elaborate bid-rigging devices, intended to deceive the public into believing that uranium prices are set by competition.

There have been several attempts in the press to discount or minimize the impact of the uranium cartel by claiming that this conspiracy was entirely foreign in nature and that there is little, if any, interaction between foreign and domestic uranium markets.

We have alleged in our complaint and will be prepared to prove in court the fallacy of this reasoning. While we have detailed in our complaint the involvement of specific U.S. corporations in the conspiracy, for the reasons previously stated, I am unable to comment further on this point. However, the broader claim that little interaction exists between United States and foreign uranium markets is demonstrably false for a number of reasons:

First, foreign cartel sellers have for some time occupied a significant position in the U.S. domestic market. According to recently released ERDA figures, over one-fourth of all forward commitments to U.S. buyers came from foreign sources. In fact, during the crucial year of 1974, foreign sellers accounted for 90 percent of the increase in forward commitments to domestic purchasers. It would be reasonable to assume that most, if not all, of these arrangements specify cartel-type "world market price clauses." Thus, domestic purchasers are already being impacted to a substantial extent by the so-called "foreign" producers.

Second, during 1974, the apparent success of the cartel in raising foreign prices above domestic levels resulted in both a surge in U.S.

uranium prices and a disruptive influx of foreign buyers into the domestic supply market.

A number of examples have already been covered in earlier testimony and questioning. However, I think it is interesting to refer back to Nuexco's monthly reports which documented these factors. For example:

1. On February 19, 1974, NUEXCO reported:

Based on various assumptions as to the rate of inflation, changes in monetary exchange rates, and other factors, the Exchange calculates that the proposed new yellowcake prices of "The Club" for 1980 delivery are in the range of 10% to 20% above the present Exchange Value. (NUEXCO, 2/19/74.)

2. On April 19, 1974, NUEXCO announced the price impact on the U.S. market of cartel actions:

With uranium prices materially lower in the U.S. than in the world market, there continues to be aggressive efforts by non-U.S. companies to purchase yellowcake in the U.S. market. As noted elsewhere in this Report, such purchasing activity has contributed materially to the sharp increase in prices for near term deliveries. (NUEXCO, 4/19/74.)

3. On June 19, 1974, NUEXCO again reported:

The sharply rising price trend is further accelerated by the growing presence of foreign buyers in the U.S. market, competing for limited supplies in both the near and long term. (NUEXCO, 6/19/74.)

Westinghouse believes that a full investigation of all the facts will reveal the broad impact of uranium cartel activities in the United States as well as abroad.

A review of the Australian documents further reflects the identity of cartel members who are either owned, controlled, or affiliated with U.S. corporations. We believe that a full investigation will reveal that many of the so-called "foreign" members of the conspiracy currently engage in major economic activities within the United States, including the exploration, production, and sale of uranium.

Having received the protection of U.S. laws in furtherance of their economic interests, these corporate entities should not be permitted to escape responsibility for their actions simply because they claim to be controlled from a foreign source.

Recent reports have circulated in the press to the effect that certain U.S. corporations have refused to disclose potentially incriminating information held by foreign subsidiaries in reliance on statements attributed to foreign government officials. The official or officials reportedly are attempting to frustrate the production in the United States of certain foreign documents dealing with any uranium price-fixing conspiracies. If true, such reports of a possible conspiracy coverup are particularly disturbing for they suggest the possibility of immunizing conspiracies by merely retaining outside of the United States the information of such actions by foreign subsidiaries. Westinghouse will strongly oppose in its litigation any similar attempts by parties to resist disclosure of facts by this or any other device.

Mr. Chairman, Westinghouse commends the committee for its investigation of this important subject and its desire to bring the facts to light. Our private antitrust suit in Chicago is directed toward repairing the serious injury which we allege the uranium conspiracy has caused us. In a broader sense, we recognize that the elimination of competition and the raising of uranium prices to artificially high levels impacts all American consumers.

Consistent with the necessities of litigation in which we are currently engaged, Westinghouse stands ready to assist the committee in any way in the furtherance of its inquiry.

Thank you.

Mr. Moss. Thank you.

I want to observe at this time that the committee does plan to pursue its inquiry until it has satisfied itself as to the nature of any cartel, its impact on the domestic markets, any domestic participants in the cartel. The committee is prepared to fully use the entire range of its powers to compel the production of any document that it seeks.

In the case of Westinghouse, I have acted to communicate with the courts. We determined that, if we require the material, the courts have indicated their desire to be cooperative. Of course we have always asserted a greater right to that material than even the courts possess, and we are not at all reluctant to enforce that.

Mr. Atkisson.

Mr. ATKISSON. Thank you, Mr. Chairman.

Mr. Bethel, what kind of numbers are we talking about if you lose every one of these lawsuits?

Mr. BETHEL. A very wide range of numbers has been reported in the press, ranging initially back to shortly after the suits were filed, numbers in the range of somewhat over a billion dollars until more recently in the opening statements of the Duquesne trial there were some flamboyant remarks which came out in the range of \$2.5 billion.

I think the actual question of damages gets to be a very complicated matter of legal interpretation, at what point the damage could be assessed, and so on like that, so I think I would rest on the statements just made.

Mr. ATKISSON. Well, in any event, it is in the billion-plus category?

Mr. BETHEL. I would say yes. If we have a total finding against us on every issue, it would likely be that.

Mr. ATKISSON. It seems to me from your testimony this morning and that of Mr. White that we have a fairly clearcut disagreement about some things, that is, whether or not a cartel existed. Assuming for the sake of argument that it definitely did exist, it just wasn't effective, according to Mr. White, because prices were set rather slowly by cartel members, just not very fancy footwork and prices lagged behind the American market.

You refer in your prepared testimony at the bottom of page 4 and the top of page 5 to the apparent success of the cartel in raising foreign prices above domestic levels. Mr. White says no. Is he simply wrong?

Mr. BETHEL. I believe in this case that he is wrong in his interpretation of whatever data he used in preparing his topical report because the conclusions in the topical report simply don't square with the information contained in a whole series of monthly reports which Nuexco puts out. We are subscribers of Nuexco and, therefore, have been reading their reports for many years.

It is clear, when one compares the assertions in the Nuexco reports in and around the time that the various levels of fixing the prices by the cartel—remember, we are looking at only a very narrow slice of information when we are looking at the Australian documents. They

start with whatever the first document in the file was and they end with the last one and we don't know what documents were ahead or what documents were after. So we are looking perhaps through a very narrow window.

But, in looking through that window, you see that the very first reports in the minutes of price levels were, indeed, below the U.S. prices as reported by Nuexco and using Nuexco's now price as a criterion. They were 10 or 15 percent below. But within a very short time they were 10 to 20 percent higher and then within another 6 months after that they were another 20 to 30 percent higher than that.

The reason for the range of numbers here is that the prices that we are referring to are prices by year, so they span several years, so there are variations in the forward prices for each year.

Now, another item here that I think is extremely important is that we seem to have lost sight—at least I haven't heard evidence here this morning—that the setting of prices was the first step of the cartel activities with regard to pricing. The second step was to shift away completely from stated price or fixed price contracts with escalation and go to contracts in which a stated price would be the floor but the price actually to be paid would be the world market price in effect at the time the delivery was actually made, so that, if you moved away from saying the price is going to be \$20 or whatever, up to where a floor is established, the price will be higher and it will be higher by whatever is then the world market price.

Now, a world market price which is being managed by a cartel can only be established by looking at a few specific dollar sales, and we've seen some information that suggests perhaps the plan was to sell about 5 percent of the material at least on a stated price basis, so that would set the world market price which then would set the price for that year for the other 95 percent of the material, so, I think it is important to keep these two phases in mind as to what the cartel was trying to do.

In face of this, and I have studied these documents in detail—Mr. White apparently has not—I think it is quite evident that there was a substantial effect by the cartel on present and on future prices.

Mr. ATKISSON. I don't know that the documents, at least as I have read them, indicate effect; they only indicate intent to affect prices. Correct me if I'm wrong. Is there something in the Australian documents which would indicate success on the part of the cartel in setting prices?

Mr. BETHEL. No. I don't recall any references to that in the minutes, but I think there is another effect here where we can see the effect in the United States in which it was reported, I think by the ERDA representative at a recent meeting and also reported in several Nuexco reports, that we found in May of 1974, in talking with Mr. Momsen, who, at least then, worked for Nuexco, a talk he made to the American Power Conference, and I can summarize, I don't know that I have a quote here. Foreign prices are being set at or above domestic levels and the future prices by foreign producers are only floor prices, the actual would be negotiated above that. Shortly after that, we find references to a large influx into the U.S. uranium market by foreign purchasers which suggests to me that foreign purchasers are going to where the lower prices are which, in turn, suggests, yes, the cartel's increasing price levels were being effective.

Mr. ATKISSON. How much uranium has been purchased, relatively speaking, in the United States by foreign interests? We export very little, don't we?

Mr. BETHEL. We have so far exported relatively little, but we have substantial forward commitments for export. I don't have the numbers in my head. I think rather than try to rustle through documents I would like to submit that later for the record, if I could.

Mr. MOSS. Without objection, the record will be held at this point to receive that information.

[The following tables were received for the record:]

TABLE IV.—URANIUM IMPORT COMMITMENTS BY DOMESTIC BUYERS AS OF JANUARY 1, 1976

[Tons of U₃O₈]

	Annual	Cumulative
Year of U ₃ O ₈ delivery:		
1975	1,100	1,100
1976	2,800	3,900
1977	2,500	6,400
1978	3,300	9,700
1979	3,200	12,900
1980	4,100	17,000
1981	4,200	21,200
1982	3,900	25,100
1983	3,900	29,000
1984	3,700	32,700
1985	3,400	36,100
1986	2,400	38,500
1987-90	(¹)	45,400

¹ Less than 2,000 per year.

Source: Survey of United States Uranium Marketing Activity, April 1976.

TABLE V.—URANIUM SALES COMMITMENTS TO FOREIGN BUYERS BY DOMESTIC PRODUCERS AS OF

JANUARY 1, 1976

[Tons of U₃O₈]

	Annual	Cumulative
Year of delivery:		
1966-74		7,000
1975	500	7,500
1976	1,000	8,500
1977	1,400	9,900
1978	800	10,700
1979	300	11,000
1980 and later	0	0

Source: Survey of United States Uranium Marketing Activity, April 1976.

Mr. ATKISSON. You are familiar with the October 15 topical report of Nuexco. There are some 11 items summarized in that part, which in the opinion of Nuexco are responsible for the dramatic price rise. I trust you heard Mr. White's testimony earlier in which he summarized the same 11 points. Do you disagree with any one of those, leaving the cartel out of it?

Mr. BETHEL. He doesn't mention the cartel as one of the 11.

Mr. ATKISSON. Do you disagree with the notion that the existence prior to 1973 of production overcapacity and market weakness brought about by a combination of commercial considerations and government policies is a factor in the dramatic price rise in the last few years?

Mr. BETHEL. No. I would say that, in the main, we agree with most of the 11 points that George made.

I think we might disagree on the relative effect of some of them.

Mr. ATKISSON. You might disagree, I take it, on No. 2 which is large short sales of uranium by a major fuel fabricator?

Mr. BETHEL. Well, I certainly have a substantial difference of opinion with George. I can make a couple of comments about it. Although it is not implicit in that statement No. 2, I think it is later in that October 15 report that reference is made to the actions by manufacturers of selling uranium to their fuel customers that concealed that demand from the uranium industry.

I'd like to give a little background, first, if I may, and start with the demand for powerplants. I'm not an economist but I'll use a couple of economists' words. The demands for powerplants, whether they be fossil-fired or nuclear or whatever, is totally inelastic. A utility does not decide to buy a powerplant because the price is low this year. The projects are so large, they are so costly, they have such an impact on the financial structure of the corporation, of the utility, that they agonizingly project what their load growth is likely to be. Lately they have been seeing that the efforts of conservation have been slowing down the consumption of electricity.

It is a very major decision on the part of a utility when they decide to order a new powerplant, so there is nothing that Westinghouse or General Electric or any other manufacturer of power equipment is going to do to influence the decision to build plants. It is a major event in the life of a utility.

Mr. ATKISSON. May I interrupt just a second? Before I lose this train of thought, isn't it a fact, that a uranium producer—I see what you are saying; a plant is in place and, as a producer, I ought to see that a certain demand is going to accompany that plant. Is that what you are saying?

Mr. BETHEL. That's my next point, that once the decision is made by a utility to order a plant, it is such a rare event in the nuclear industry—I include the uranium sector as part of the nuclear industry—that it is immediately quite well known. Therefore, the ordering of that plant, a nuclear plant, immediately sets a certain total demand of uranium that is going to be required to fuel that plant over its lifetime, subject only to the uncertainties of which year the plant is going to start. Is it going to meet its schedule or is it going to have licensing and regulatory delays and have it slip a few years? But the basic shape of that demand curve is known. It may shift back and forth a little bit, but it is not going to change dramatically.

Mr. ATKISSON. As a producer, I'm looking at a national announcement by a major corporation that it is going to supply the uranium that that plant is going to need, so as a producer, one of Westinghouse's competitors, I'm not going to expand my production in order to meet that demand because, so far as I know, that demand has already been met with your supply. Wouldn't it follow, then, that, if you announced suddenly that you had, in fact, not obtained the supply necessary to meet the commitment to that plant, that I would suddenly want a lot of uranium to try to meet that demand myself which would put a tremendous crunch on the market, thereby driving prices up?

Mr. BETHEL. First of all, there is no case in which Westinghouse had undertaken at the time of the sale of the plant and the fuel to supply all of the uranium for any plant. That simply is not the case. In fact, most utilities followed a practice of only buying at the time,

or only ordering at the time of their plant decision, uranium and fuel fabrication for the first few years. The reason they did that is because Nuexco was telling them and their consultants were telling them that uranium prices are going to be stable. In fact, they might even sag a little bit, although they are a little more likely to go up a little bit. No one was buying for the whole life cycle of the plant because it was presumed that supplies were plentiful and prices were going to be stable. We never sold a full plant life cycle's worth nor, to my understanding, did anyone else who has supplied uranium.

So the demand that was being siphoned off to us by virtue of a utility wishing us to furnish uranium along with the fuel fabrication was only a small part of the total. Further, it was well known to the uranium producers that Westinghouse is not and was not a producer of uranium. It was clear that the uranium that we were going to provide was going to have to be on a purchase resale basis, which the cartel documents refer to as the middleman. So it seems to me it is a perfectly transparent situation.

Mr. ATKISSON. But there was such an apparent lack of concern in that purchase and resale situation. Is it not logical for competing producers to assume that you already had the deal bottled up sufficiently to supply those commitments?

You referred to this being a small part of the total. Let me just corroborate some figures. Is it or is it not a fact that this, I've heard various figures, 60 million pounds, 65 million pounds, 70 million pounds Westinghouse is ostensibly committed to supply, for 1976 through 1980, accounts for no less than 20 percent of domestic demand for yellowcake in this country? If you want to extend that to 1985, you are talking about 10 percent. That's a lot, a big, big share of the domestic demand from Westinghouse. I don't think those numbers are to be poo-pooed.

Mr. BETHEL. There is no question but what it was a significant part of the total amount of uranium that is going to be required.

Mr. ATKISSON. Do you not think it likely that the rest of the world, that is, the real world outside the confines of Westinghouse, believed that Westinghouse had that 65 or 70 million pounds of uranium committed in some fashion?

Mr. BETHEL. No, I don't believe they thought that.

Mr. ATKISSON. Is it unreasonable for them to have believed that?

Mr. BETHEL. I believe so. Mr. White made the observation in his testimony that this is a small industry.

Mr. ATKISSON. Can you expand on that? That is a point that should be in the record. If it is not plausible for the industry to believe that Westinghouse had firm access to that 65 or 70 million pounds of uranium, we would like to know why. Was the information available?

Mr. BETHEL. There is another nuclear fuel information service. Nuexco has gotten all the publicity here today but there is another one. It is called Fuel Track.

Mr. ATKISSON. You are referring to Nuclear Assurance Corp. based in Atlanta, Ga.?

Mr. BETHEL. Yes, sir.

Mr. ATKISSON. Which publishes something called Fuel Track?

Mr. BETHEL. That's right. They certainly provided to the industry, I think, a fair picture, maybe not in precise detail but certainly pretty broad outlines of exactly what the situation was.

Mr. ATKISSON. You are saying, with information from Fuel Track, the rest of the industry should have been able to tell that Westinghouse did not, in fact, have sufficient uranium under contract to meet its commitments?

Mr. BETHEL. Well, yes. I think that, in fact I'm quite certain, the general situation was reasonably well known.

Another set of data which I ought to mention is the fact that during the latter part of 1973 and during 1974 we were making attempts to consummate large purchases of uranium, multimillion-pound lots. Late in 1973 we went out for proposals for supply and we got no bids. We went out again in June of 1974, July of 1974, and again we got no firm quotations. During 1975 we made several bids for parcels that were on the market and were unsuccessful. We bid what we thought was a reasonable price and got no takers.

Even in early 1976, this year, we went out again to more than 40 producers and suppliers and got not one quotation to supply us with material. It had to be obvious to the uranium producers and dealers that we were attempting to buy large quantities of uranium, and we were not successful.

The only major buy we were able to make during that whole period was 2 million pounds from a utility who found itself with an inventory excess.

Mr. ATKISSON. That was true of other large buyers as well, was it not?

Mr. BETHEL. You will find the exact history repeated on the part of utilities as well.

Mr. ATKISSON. Part of the reason you may have had trouble, I think we have to acknowledge from reading the Australian documents, is that, for whatever reason, members of the club did not want to do business with Westinghouse. There is reference to that in the documents.

Let me ask you this about that. Were your attempts to purchase uranium abroad designed to satisfy your sales abroad, exclusively?

Mr. BETHEL. When you put the word "exclusively" on, I have a little trouble. I could say generally they were; generally, yes, they were.

Mr. ATKISSON. I take it that the gravamen of the complaint in the Swedish case is that you could not supply because of problems that arose in obtaining certain supplies with the Swedes; you were trying to obtain uranium to supply the Swedes from foreign sources?

Mr. BETHEL. That's true.

Mr. ATKISSON. So in those foreign transactions you were, in fact, acting as a middleman?

Mr. BETHAL. We were acting as a middleman in every transaction because we are not a producer.

Mr. ATKISSON. Generally speaking, the middleman role in the foreign market was separate from the middleman role in the domestic market?

I'm not trying to be cagey. I'm looking for the motive of the cartel. It seemed to me they were talking about eliminating the middleman. You have heard it said that in terms of absolute numbers they didn't have much going in the U.S. market. I'm anxious to know why it is they wanted to eliminate the middleman. I gather it is because Westinghouse was underselling them.

Mr. BETHEL. I don't have any direct evidence available to me that I could cite to prove that. A great deal of the more sensitive factors,

particularly as it relates to prices, has been disclosed to us, given to us under discovery under a category which places it especially confidential which is privileged only to the lawyers.

Mr. ATKISSON. I'm not asking for those things.

Mr. BETHEL. I'm just saying that's the reason I can't respond. In reading the briefs and so on, I have some reason to believe that to be the case, but I don't have access to the evidence.

Mr. ATKISSON. You have familiarized yourself with the Australian documents, have you not?

Mr. BETHEL. Yes.

Mr. ATKISSON. They have been released to the public?

Mr. BETHEL. Yes.

Mr. ATKISSON. You haven't come into possession of those documents through the discovery process in your lawsuit?

Mr. BETHEL. That's true.

Mr. ATKISSON. And you also have some independent personal knowledge of your own of what you were selling uranium for, acting on behalf of Westinghouse, is that not true?

Mr. BETHEL. That's true.

Mr. ATKISSON. That knowledge did not come to you through the discovery process of the lawsuits. I'm asking you, Whether, from your knowledge of the Australian documents and your own personal knowledge of Westinghouse, if Westinghouse was underselling the cartel.

Mr. BETHEL. In a couple of specific negotiations, the customer accepted our proposal in preference to at least one or two other proposals of members of the cartel, so I have to assume that our prices were lower.

Mr. ATKISSON. I would assume it was not because your yellowcake was more yellow than their yellowcake.

Mr. Bethel, you referred in your statement to your displeasure with the fact that certain information which would be useful both in your litigation and to this committee is being suppressed because companies are hiding behind a kind of foreign veil.

I would like you to comment on a quote for the record from the Chicago Tribune of October 16, 1976. "Gulf president, James Lee, told the Tribune recently that Gulf Canada attended cartel meetings abroad 'at the direction of the Canadian Government,' contending that 'when you are in a country, you've got to operate under their rules and regulations', but he insisted that none of our acts is culpable."

Westinghouse does business abroad. If you were doing business in a banana republic that told you to violate antitrust laws, would you do it?

Mr. BETHEL. No; and we wouldn't make political contributions there, either.

Mr. ATKISSON. What do you see, incidentally, as a remedy to this for Congress and the courts for getting at the information that does seem to be sealed up abroad? I don't think I'm imposing on your lawsuit. As I see it, we'll run into the same problem when we seek information from the foreign subsidiaries.

Mr. Moss. We have a variety of avenues open to us that run the gamut.

Mr. BETHEL. We don't vote on foreign aid appropriations in Westinghouse, unfortunately.

Mr. Moss. We also deal with the matter of regulating firms publicly traded on our securities markets. There are disclosure requirements that can extend—as the SEC has demonstrated in the unveiling of the information on the political payments overseas—very deeply into the activities of the foreign subsidiaries.

The committee will not hesitate to use those powers to get the information.

Mr. BETHEL. Let's not lose sight of the fact that that issue, in our opinion, has two aspects to it. One is subsidiaries of U.S. corporation in other countries; the other is subsidiaries of majority foreign ownership who are living here and doing business in this country. I think it is being claimed that they can just spirit this material out and be held harmless because you can't get at the facts.

Mr. ATKISSON. Rio Algom is just such a company, is it not?

Mr. BETHEL. Yes; they are.

Mr. ATKISSON. Mr. White earlier, when I asked him about American company involvement, referred to Rabbit Lake being 50 percent owned by Gulf of Canada and a German company and Faraday Mines 51 percent owned by a company known as Federal Resources, and a third situation he couldn't remember. Does that square with your notion of domestic American involvement in the foreign cartel that has been brought to life in the Australian documents?

Mr. BETHEL. I think the third one mentioned was the Getty interest in the Jabiluka Deposit together with Pan Continental.

Mr. ATKISSON. That's correct.

Mr. BETHEL. I don't recall any additional ones. However, if it would be helpful, I would certainly be willing to review our information and report back to you.

Mr. Moss. Would you like to hold the record at this point and receive that information in writing?

Mr. Bethel, we will hold the record at this point to receive the information and ask that you supply it to the committee as promptly as possible.

[Mr. Bethel subsequently reported that he did not have additional input to the subcommittee at this time.]

Mr. ATKISSON. Mr. Bethel, among the allegations in your lengthy, unusually detailed complaint filed in Chicago some weeks ago, Westinghouse alleges that during a series of meetings, among them an important one in Oak Brook, Ill., in March of 1973, sponsored by the Atomic Industrial Forum, a type of quid pro quo arrangement was consummated whereby American producers would not oppose lifting the foreign uranium embargo in exchange for not selling below the American market. You are familiar with that allegation?

Mr. BETHEL. Yes; I am.

Mr. ATKISSON. I would like to read a description of that meeting to you and ask you to comment on it. It says that at that meeting, which was public, there were about 190 participants. They represented buyers, sellers, consultants, and, as a matter of fact, even representatives of the Atomic Energy Commission, from the United States, Canada, England, France, Australia and Japan.

I'm trying to imagine 190 people in a hotel, from the Government and various private interests. I just can't believe that that's the stuff cartels are made of. If it was a cartel, it would be a damned inefficient one, it would seem to me, with 190 folks running around a hotel.

Mr. BETHEL. I don't think we are alleging that the public meeting at Oak Brook was in any way a cartel. I think that what the facts will show is that there was a meeting at or about the same time as that of a small group of producers at which the quid pro quo was discussed.

Mr. ATKISSON. And that small group would be the so-called ad hoc embargo committee?

Mr. BETHEL. I'm not familiar in detail. Again, this is something in the discovery material, but that's my general impression, yes.

Mr. ATKISSON. Mr. Chairman, I'm going to recommend to the subcommittee in due course that we should obtain all of the discovery materials from all three lawsuits that are proceeding in the United States, because I think these materials, rather than badgering the witness, should be viewed so we can come to our own conclusions.

Mr. MOSS. The committee, of course, is prepared to do that. It isn't necessary at this point to make any order on the record for that purpose, but something the Chair is authorized under the rules to direct the staff to take steps to accomplish.

Mr. ATKISSON. I do have one final question. Perhaps the members would like to expand on it.

I have not myself been able to get a satisfactory rendition of nuclear production costs. As Mr. White earlier said this morning, there is no such thing as a typical uranium mine. I gather that that's the case. Do you have any comment upon what the price of uranium would be if there were a reasonable return on investment? What prospects do you see for the future?

Mr. BETHEL. As to the question of mining costs, I mentioned earlier that Westinghouse is not currently a uranium producer. Therefore, we have no experience in that. The knowledge that we obtained, or at least the knowledge I have, I have obtained from reading the various talks that have been made by producers at conventions, articles that they have written in various publications, in other words, information which is in the public domain and which, at least until fairly recently, they were not at all reluctant about explaining what the cost structure was, what they then thought a reasonable price would be, and even predicting in some cases what they thought it would be out into the early 1980's. If you like, we could summarize that published information, extract and summarize it for you.

Mr. ATKISSON. What I had in mind, is \$40 a price sufficient to encourage uranium producers to pull that stuff out of the ground?

Mr. BETHEL. My impression is that \$40 is quite a handsome price and that price could be substantially lower than that and still encourage producers to explore and show an adequate return on investment.

Mr. ATKISSON. But is your impression based on anything that you could supply for this record?

Mr. BETHEL. Yes; I can supply some articles and excerpts from speeches that producers have made.

Mr. MOSS. We will hold the record at this point to receive the material and ask that that be submitted promptly for the record.

[Testimony resumes on p. 88.]

[The following documents were received for the record:]

Uranium Fuel Prices

Douglas M. Johnson

Uranium, unlike hydrocarbon fuels, has only one significant commercial use—as a fuel in large stationary electric power generating stations. There are several benefits associated with the use of nuclear power, including at least the following: a major fuel cost saving to the utility and its customers; a contribution to the solution of our energy, environmental and balance-of-payments problems; and conservation of our very valuable hydrocarbon resources for better uses than burning in these large furnaces.

A nuclear plant has a higher initial cost than a coal or oil fired plant, but a much lower fuel cost. Nuclear plants will therefore be intended as base load plants, and because the future availability and price of oil and gas are now too uncertain for that service, a new nuclear plant must compete economically with a new coal fired plant. The price of uranium should therefore be determined, within a broad range, by considering two questions: (1) What is uranium worth as a fuel, in comparison to coal? (2) What will it cost to produce uranium and provide a reasonable profit to the producer? The long-term selling price of uranium should

normally fall between the two extremes represented by these questions, with the actual price at any time governed by shorter range supply-demand factors.¹

Its fuel value

Although the capital cost for a nuclear plant is substantially higher than for either a coal or oil fired plant, the greatly reduced fuel cost much more than compensates for this disparity. The total cost of producing power in a large new plant is estimated to be 34.2 mills/kwh for coal and 23.3 for nuclear.² This difference would amount to about \$75 million per year in pre-tax saving to the utility for an 1,150 megawatt plant, even after taking into account the higher capital charge for the nuclear plant. These comparisons are based on effective fuel prices of about \$42 per ton for coal, and \$30 per pound for uranium. If these prices seem high, one must remember that they apply in the 1980s and 1990s.

Another way of making comparative assessments is to determine the price at which uranium would break even with coal and oil in the 1980s and '90s. A pound of uranium produces as much electricity in a light water reactor as burning about 10 tons of coal or 40 barrels of oil. Price comparisons must also take into account the difference in capital costs of the plants, as well as the additional costs of the nuclear fuel cycle, such as uranium enrichment, fuel fabrication and reprocessing. Using oil and coal prices projected for the next decade or so, nuclear power plants would break even at prices in the range of \$100 to \$200 per pound of uranium.

Production cost

Predicting the future production cost of uranium requires evaluation of uranium resources as a function of production cost and a matching of these resource estimates with future requirements.³

As one might expect, as lower and lower grade ores are counted, costs go up, and \$15 reserves are obviously greater than \$8 reserves. Known U.S. reserves

¹ Throughout this article quantities and prices of uranium are given in terms of pounds of U₃O₈, which is the standard article of commerce in the uranium industry.

² The data for these estimates are derived from a study prepared by Arthur D. Little, Inc., in early 1974, with adaptations by the author. The values discussed are expected power costs in mills per kilowatt hour for a plant of 1150 MW capacity to begin operation in the 1981-1984 time period.

³ The Atomic Energy Commission compiles and publishes data from the industry with regard to both resources and requirements.

⁴ Forward cost means only future cash expenditures with no allowance for past costs and no interest on investment or profit. In this case, these are current costs, without allowance for inflation.

Mr. Johnson is president, United Nuclear Corporation.

that can be produced for forward costs⁴ of \$15 per pound or less are about 1 billion pounds. In addition, Atomic Energy Commission geologists have inferred another 2 billion pounds as potentially available in geologically favorable areas, for a total of about 3 billion pounds—the quantity that we can say today is reasonably certain of being available for the nuclear program at forward costs of \$15 or less.

The cumulative U.S. requirements for uranium were forecast by the AEC in January of 1974. Its estimates indicate that although the known \$15 resources may be exhausted by about 1985, the potential \$15 resources should last until about the end of the century. Of course, these are costs and not selling prices and are based on 1974 cost factors with no allowance for inflation. Our own estimates, based on typical capital costs and production schedules, tell us that selling prices need to be about 50% higher than cash costs in order to provide a 15% return on investment after taxes. With allowance for cost escalation, it would appear that prices in the neighborhood of \$25-\$30 per pound U_3O_8 may be reasonable during the 1980s.

Short-range supply and demand

I have said that uranium may be "worth" \$100 to \$200 per pound compared with coal and oil in the 1980s and '90s, but that costs of production alone might justify selling prices more like \$30 per pound. A look at supply-demand relationships may suggest more exactly where uranium prices will settle.

AEC purchases of uranium, which really established today's uranium mining and milling industry back in the early 1950s, rose to a high of about 36 million pounds of U_3O_8 per year in 1961—then dropped to zero in 1971. As this drop occurred, the commercial demand, which first began in 1965, was slow to pick up. Thus total uranium deliveries have experienced a marked trough over recent years. For the future, however, a comparison of requirements with my own estimate of the realistic production capability of the U.S. industry from presently known reserves indicates that the industry may go from an oversupply to a shortage condition in about 1979 or 1980.

This is a somewhat different conclusion than was drawn when we were considering all resources available at costs up to \$15. Because of low prices in the past, the industry has not been able to plan production of reserves costing more than about \$8 per pound; and it has not been able to finance adequate exploration to define the "potential" resources that make up two-thirds of the total resource base previously considered. Therefore, to close the gap between supply and demand that we

foresee in the 1980s, it will be necessary to develop higher cost resources, find more reserves and, just as important, bring these new reserves into production. On account of the lead times required in the mineral exploration and production industry, the time remaining is rather short.

An interesting aspect of this situation is that the Atomic Energy Commission has accumulated a large inventory of uranium, much of which has been in the form of natural uranium which is now being used to supply some of the needs of present enrichment customers, as well as to preproduce enriched uranium for future commercial requirements. A portion of the inventory also exists as highly enriched weapon material which could be converted to nuclear reactor fuel.

Nuclear plant capacity

A closer look at nuclear power growth reveals that the total capacity of nuclear plants on line has been increasing sharply, and now represents more than 7% of the present U.S. electrical generating capacity. Some progressive utilities are much higher, and in Chicago, for example, nuclear plants will generate about 35% of Commonwealth Edison's electricity this year. However, the growth of nuclear power production is dwarfed by total nuclear plant commitments, which now exceed 200 million kilowatts.

As to the status of commercial nuclear power plants in the U.S., the AEC reports that on June 30, 1974 there were 212 plants licensed, being built, or on order. These plants will produce over 200 million kilowatts of electricity, which is equivalent to about 45% of the present electrical generating capacity of this country. These 212 plants will need more than 60 million pounds of U_3O_8 each year—which exceeds the present U_3O_8 production capacity of the U.S. by a factor of about 2. In addition to that steady annual demand, each plant will require about 1 million pounds of U_3O_8 for its initial fuel load.

It is of obvious importance to view these quantities in terms of alternative fuels. To generate this amount of electricity by burning oil would increase our oil consumption by about 2 billion barrels per year, and if this had to be imported, it would add about \$30 billion per year to oil imports. To generate the same amount of electricity from coal would require about 500 million tons per year, which is more than two-thirds of present U.S. coal production.

We have heard recently of a great many deferrals of plant schedules, both nuclear and fossil, as well as a few outright cancellations. In spite of these cutbacks, the summary of nuclear plants released on September 30,

1974 showed a net increase of nine plants and 11,800 megawatts over the AEC's June total.

An international context

In the rest of the free world the AEC estimates that total demand will be about the same or a little larger than in the U.S. American demand for uranium between now and the year 2000 is expected to be about 46% of the total free world requirements.

At the outset of 1974, however, the U.S. had only 30% of the known reserves in the noncommunist world. There has been an embargo on the use of foreign uranium for domestic nuclear power plants, but the AEC now plans to release this embargo gradually, starting in 1977. Because foreign resources are larger, relative to requirements, than those of the U.S., it was considered possible that relaxation of the embargo would tend to reduce uranium prices materially. But a comparison of world *production capability* with requirements indicates a situation very comparable to that in the U.S.—that is, the present excess capacity abroad will probably change to a deficiency by 1979 or 1980 unless more new production is brought on line than is now contemplated.

In making this comparison of requirements and reserves it is notable that the U.S. is almost the only country with a reasonable balance between forecast requirements and known reserves. This is clearly a fortunate circumstance, since any imbalance between reserves and needs can lead to future problems—tight supplies and international payments disparities such as we have seen in the case of petroleum.

Meanwhile, however, Australia, which has practically no domestic requirements, has embargoed all foreign sales of uranium. Canada, with estimated requirements to the year 2000 of some 200 million pounds and probable reserves nearly nine times that, has recently established export restrictions, and not long ago put stringent restrictions on foreign ownership of uranium reserves. In South Africa much of the production and reserves are by-products of gold mining; the concurrent production of uranium cannot be expanded to contribute substantially to increasing requirements. France, which has been a seller of uranium, has increased significantly its commitment to nuclear power and has withdrawn from selling uranium in the world market.

Present prices

What has been the impact of all these factors on domestic uranium prices? Commercial spot prices have over the past several years stayed in the neighborhood

of \$6 per pound⁴ of U₃O₈, at least until last year. This is in marked contrast to the \$8 per pound paid by the Atomic Energy Commission during most of its 20-year buying program. Taking into account cost escalation, the \$8 per pound received by the industry in the 1950s would be equivalent to about \$12 per pound today.

As of April 1973 the spot price was still about \$6 per pound, while prices for forward delivery ranged upward to about \$9 per pound for delivery in 1980. These figures reflect the impact of the oversupply situation touched on earlier, and were typical of a buyer's market, with prices close to cash costs and inadequate to provide an acceptable return on investment for most producers.

A year later, though, both the spot and forward prices had moved up sharply in response to general awareness of a coming tight market. The market continues in a dynamic state, and the current spot price of about \$15 per pound can now promise an attractive return on new investment. As a result, exploration activity has almost doubled in the last year. Whether prices will stabilize near the present level or closer to the equivalent fuel value of uranium depends on a number of factors: the success of the exploration programs; the ability to bring new production facilities on line; and whether or not the nuclear and utility industries are able to solve their capital and public acceptance problems and achieve the growth now forecast. 

⁴The only regularly published price information is put out by Nuclear Exchange Corporation. The figures quoted here are derived from their reports.

Excerpt from hearings before the Joint Committee on Atomic Energy, Congress of the U.S., 93d Congress, September 17 and 18, 1974, entitled "Proposed Modification of Restrictions on Enrichment of Foreign Uranium for Domestic Use"

KERR-MCGEE NUCLEAR CORP.,
Oklahoma City, Okla., February 14, 1974.

Attention: Chief Public Proceedings Staff

SECRETARY OF THE COMMISSION,
U.S. Atomic Energy Commission,
Washington, D.C.

DEAR SIR: We wish to comment on the Atomic Energy Commission notice of a proposed modification of the restrictions on enrichment of foreign uranium for domestic use published in the *Federal Register* November 27, 1973. This proposal concerns an issue of paramount importance to attainment of national self sufficiency in energy supply. Uranium, like coal, oil and natural gas, is a primary energy source. It is a fuel of rapidly growing importance in the United States. If adopted, the AEC proposal to allow uranium imports will significantly affect the ability of the United States to become self sufficient in energy. Because of the importance of an assured source of uranium supply to the nation, we hope that the following comments will receive the studied attention of the Commission.

Although specific quantitative benchmarks for the various domestic energy sectors are still being formulated under "Project Independence", current estimates are that a major share of United States energy supply will be derived from uranium. In our judgment, the present energy crisis cannot be corrected without the rapid development and use of nuclear energy. It follows that we have a compelling need to devote our efforts and direct our national commitment toward rapid expansion of uranium production capacity and exploration for new deposits in this country. The AEC's proposed program would allow our nuclear power industry to become unduly reliant on foreign uranium and is incompatible with this national commitment. Policies allowing increasing dependence on imported oil have led this country into its present circumstance of insecure oil supply. We urge that the Commission carefully consider the parallel with oil of its proposed import program and avoid a similar insecure uranium supply situation.

The immediate effect of the proposed AEC program through opening the U.S. raw material market to foreign supply will be to discourage new investment in domestic exploration and mine-mill construction. Policies which delay domestic uranium development could significantly limit the nation's ability to install needed nuclear capacity in the future.

Among other adverse impacts of becoming dependent on foreign uranium is the control that would then vest in foreign governments as to where and at what price the enrichment is done. Over the long term, enriched uranium could become the imported product impairing further this nation's security of supply, cost of fuel and balance of payments. Because of the importance of this matter, we would like to review our understanding of the proposal and its implications in detail.

THE AEC IMPORT PROPOSAL

Based on the *Federal Register* publication of the AEC's proposal for removal of the restriction on enrichment of foreign produced uranium intended for domestic use and the current AEC forecast of uranium demand, our calculations of the maximum imports allowed under the proposal, if it is adopted, are shown below:

TABLE I.—AEC URANIUM IMPORT PROPOSAL

Year	Adjusted demand ¹ (millions of pounds U ₃ O ₈)	Maximum imports under AEC proposals	
		Maximum percent	Quantity (millions of pounds U ₃ O ₈)
1974	23.0		
1975	30.2		
1976	35.2		
1977	39.6	10	3.9
1978	49.0	15	7.4
1979	57.0	20	11.4
1980	63.2	30	19.0
1981	72.8	40	29.1
1982	81.6	60	49.0
1983	111.8	80	89.4
1984	126.4	100	126.4

¹ AEC most likely case adjusted for stockpile sales.

The actual impact of the AEC's proposal on the uranium market is, however, far greater than is indicated from the percentages shown in Table 1, because a large share of the demand through 1980 and a smaller portion after 1980 is already committed under existing purchase contracts. Table 2 shows a comparison between possible imports and the remaining available uranium market.

These figures show that almost 50 percent of the *uncommitted* domestic utility requirements between 1977 and 1981 could be supplied by imported uranium under the AEC proposal. It is emphasized that the uncommitted requirements in these years represent today's market. It is this remaining market that will support *new* production capacity and new exploration. We are, today, dependent on imported oil for only one-third of our requirements and the Federal Energy Office estimates that the current energy crisis is caused by an import shortfall of less than 15 percent of demand.

TABLE 2.—PROPOSED IMPORTS COMPARED TO THE AVAILABLE U₃O₈ MARKET

Year	Millions of pounds U ₃ O ₈		Percent imports of available market
	Uncommitted U ₃ O ₈ requirements ¹	Maximum imports	
1974.....	0.7		
1975.....	1.7		
1976.....	5.2	3.9	75
1977.....	12.5	7.4	59
1978.....	29.6	11.4	39
1979.....	40.6	19.0	42
1980.....	55.8	29.1	57
1981.....	67.6	49.0	72
1982.....	101.8	89.4	88
1983.....	116.0	126.4	100

¹ The estimates of the utility industry's requirements allow for a workoff of excess inventories, but do not provide for any possible short positions in uranium by the fuel fabrication vendors. The AEC makes an annual survey of market commitments and requirements during January of each year. As soon as the results of the 1974 survey are compiled and made available, the figures as shown in table 2 can be confirmed.

In regard to the market estimates shown above, the available uranium market seems to shrink with each annual revision of the AEC's nuclear power growth forecast. Along with other factors, this reactor schedule uncertainty over the past several years has introduced a corresponding uncertainty in uranium raw material investments and has consequently affected future supply.

THE MARKET SITUATION

During the last half of 1973, there was a substantial increase in the level of uranium market activity. In this period, our company received 28 requests from domestic utilities to bid on over 260 million pounds of U₃O₈. We believe that most of the utility companies that submitted these requests have now contracted for their early years uranium requirements (through about 1980) from domestic producers or their reactor vendors. However, approximately 80 percent of the uranium requested was for delivery after 1980 and a large portion of this demand is still uncommitted. Since most U.S. uranium mines have a life of only eight to ten years, much of the supply for the 1980's must come from new ore deposits not yet ready for the market. In some cases, ore delineation and mine planning must be completed before reserves can be committed. Additionally, new deposits must be discovered. If large investments in new production capacity and exploration are to be economically attractive, moderately higher prices must develop in the uranium market.

Kerr-McGee's knowledge of recent sales prices is limited to the one new contract that our company has negotiated, however, we estimate that most sales concluded in recent months for uranium to be delivered during the 1976 to 1985 period are at prices in the range of \$8-12 per pound of U₃O₈ in 1974 dollars. These prices reflect increased operating costs at existing mines but are not at a level that will provide incentive for investment in major new mining and milling projects. In our judgment, market prices must increase about 25 percent to yield acceptable returns on the next generation of uranium mining investments and to bring forth the necessary production capability. Kerr-McGee has not been able to sell in this price range.

For perspective, the AEC established a price of \$8 per pound of U_2O_8 in April 1962. This is equivalent to approximately \$12 per pound of U_2O_8 in terms of today's dollars. Even at considerably higher prices, the cost per million Btu attributable to the uranium component of nuclear fuel costs is substantially below fossil fuel costs.

THE DOMESTIC SUPPLY PICTURE

Because the commercial nuclear industry inherited a mature uranium industry with production capacity substantially in excess of demand, there has been an oversupply of uranium and constant buildup of inventories since the beginnings of the commercial market. Even though inventories continue to overhang the market, the three to five year lead time required for new mine development, the additional three to five years required for exploration and the projected growth in uranium demand indicate that uranium raw material investments are already lagging. It has been estimated that \$5 billion must be invested over the next ten years, about \$2.5 billion in uranium exploration and an equal amount in new mining and milling facilities in order to meet the projected demand. These investments must be made in the United States if we are to maintain long term self sufficiency in uranium.

Domestic uranium resources are clearly adequate to support the necessary production capacity for the foreseeable future provided the required exploration and construction investments are made in time. Current uranium ore reserves of 520,000 tons U_2O_8 estimated to be minable at \$15 per pound or less forward costs are in excess of cumulative U.S. requirements thru 1985 and measurable potential resources at \$15 per pound are nearly three times as great. Further, we believe that yet unexplored regions of the United States offer many times this potential.

We expect improvements in mining and ore recovery technology in the years ahead, however, these factors are unlikely to offset increases in costs due to the trends toward recovery of lower grade ores and deeper mines. Prices in constant dollars must reflect these basic cost trends and will gradually increase. However, these increases will be reasonable so long as there exists a strong, competitive domestic industry willing to invest in exploration and new production.

EFFECT ON THE DOMESTIC URANIUM PRODUCERS

Although the AEC announcement states that the proposed plan represents a "gradual relaxation" of existing restrictions, its adoption could, in fact, have a marked and sudden impact on the remaining U_2O_8 market. The adoption of this program would allow substantial quantities of imported uranium from surplus capacity and government controlled stockpiles outside of the United States to be made available in this country for a few years at prices below those that would maintain a viable domestic industry. If approved, the AEC proposal on imports could result in the following developments:

1. The industry would fail to achieve the quantum jump needed now in domestic uranium exploration to supply the requirements of the 1980's. Instead, a substantial portion of the capital that might be invested in domestic exploration is likely to be spent overseas in virgin prospecting areas.
2. The industry would be forced to delay expansion of the domestic production base.
3. Existing mines and some new mines would continue in production taking only the higher grade ores, thus failing to conserve large quantities of lower grade material that might otherwise be recovered before existing mines are retired.

CONCLUDING REMARKS

We recognize that the growing nuclear power generation capacity must have an assured uranium supply for a reasonable forward period. We do not think becoming largely dependent on imported uranium gives that assurance. At this point, the nation has no need to become reliant on imported uranium and can remain effectively self sufficient. This can be accomplished by continuing the ban on imports of foreign uranium and holding the existing government stockpile to bridge any gaps in supply that may develop while the domestic industry is building up the required exploration and development effort. The Atomic Energy Commission, starting from scratch in 1948, created in ten years, a uranium raw material industry that was capable of supplying uranium in excess of its requirements. The AEC accomplished this by offering a market at attractive prices for the uranium discovered and produced. The same approach will work equally well in the private market.

We have the further opportunity to expand and to conserve our secure domestic uranium resources in three areas; first, through new exploration; second, by mining lower grade or otherwise marginal ore deposits as uranium prices increase; and, third, through use and development of technology more efficient in uranium utilization including the convertor and breeder reactors and the recovery of more U_{235} in enrichment. Surely these alternatives will serve the nation much better than becoming dependent on imports for another of our primary fuels.

Very truly yours,

R. T. ZITTING,
President.

[Excerpt from "Project Independence--November 1974," prepared by the Interagency Task Force on Nuclear Energy under the direction of the Atomic Energy Commission for the Federal Energy Administration, Project Independence Blueprint--final Task Force report]

The cumulative requirements, in short tons of U_3O_8 on which this study is based are:

(BAU)	<u>1977</u>	<u>1980</u>	<u>1982</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>
Scenario 1	44,700	131,700	207,300	342,000	490,500	783,000
Scenario 2 (Accelerated)	56,400	167,700	274,000	510,800	731,500	1,141,600

Scenario-1 requirements are based on a GDP tails assay of .20% through 1985 and .30% thereafter. Scenario 2 assumes a tails assay of .20% through 1983 and .30% thereafter. This operates the enrichment plants in a manner which delays the addition of new capacity as much as possible, while disposing of the AEC's natural uranium stockpile of 50,000 short tons.

Beginning in 1986 for scenario 1, and 1980 for scenario 2, it is anticipated that the projected production from current uranium resources would not be able to meet requirements. The reason for this and actions which could be taken to overcome projected deficiencies are described under "Constraints" and "Actions."

The following discussion on estimated costs, manpower, and equipment associated with each scenario assumes that the requirements for the given scenario would be met from domestic production regardless of difficulties. In addition to covering uranium exploration, development, facility construction, and production to meet requirements through 1990, estimates also include:

- a. Development, by early 91, of the forward reserves which must be available to insure production during 1991 through 1998, total production for this latter period is estimated at 1,016,00 and 1,485,00 tons $U_{30}O_8$ for scenarios 1 and 2 respectively.
- b. Construction, during the late 1980's, of facilities needed to handle production increases during the 1990's for 6 new mine/mill complexes for scenario 1 and 8 for scenario 2. The average capacity of these is estimated at about 15,000 tons ore per day with an average grade of about .075% $U_{30}O_8$ and a recovery of about 85%.

Capital expenditure, manpower, and drilling needed both to develop identified potential uranium resources and to discover and develop unidentified resources are estimated as follows:

	<u>1977</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Scenario 1				
\$ Million yearly	300	390	470	740
\$ Million cumulative	825	1,920	4,125	7,200
No. people employed	3,200	4,000	5,000	6,500
Million feet drilling,				
yearly	80	115	145	220
Million feet drilling				
cumulative	195	520	1,190	2,100
Scenario 2				
\$ Million yearly	400	480	595	880
\$ Million cumulative	1,120	2,450	5,200	9,000
No. people employed	4,100	5,300	7,000	8,600
Million feet drilling,				
yearly	100	145	180	260
Million feet drilling,				
cumulative	240	640	1,470	2,600

Capital costs include those for geologic field exploration, airborne surveys, land acquisition, and exploration and development drilling. Overall exploration costs are estimated at \$1.60 per pound recoverable U_3O_8 developed. Critical professional manpower needs are exploration

geologists, geochemists, and geophysicists. Chief technical and labor items are surveyors, semiprofessional field crews, and drillers. During 1973 there were between 1,500 and 1,800 people employed in exploration activities.

The most critical item for exploration will be the availability of drill rigs and accessory supplies. As of 1/1/74, there were about 210 drill rigs involved in uranium exploration and development activities. These were drilling an average of 80,000 feet per year each (~ 16 million feet total). Most of these rigs are capable of drilling to depths of 1,000 or 1,500 feet and have an average life of about 10 to 12 years. There will be increasing utilization of larger, oil-exploration type rigs which can drill to depths over 4,000 feet.

The estimated production rate (in tons of ore from conventional resources available up to costs of \$30 per pound U_3O_8), number of mills, and associated capital costs and manpower for mining and milling are:

	<u>1977</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Scenario 1				
Million tons ore, yearly	9.5	19.5	47	120
Million tons ore,				
cumulative	22	68	234	685
No. plants operating	21	27	38	80
\$ Million capital, yearly	80	100	275	430
\$ Million capital,				
cumulative	370	670	2,050	3,800
No. people employed*	1,400	1,700	3,500	7,000
Scenario 2				
Million tons ore, yearly	12	30	85	165
Million tons ore,				
cumulative	28	95	395	1,050
No. plants operating	25	41	58	123
\$ Million capital yearly	150	180	370	590
\$ Million capital,				
cumulative	470	1,000	2,900	5,500
No. people employed*	2,200	3,000	5,500	9,000

(*Approximate number involved in work charged to capital costs.)

Tons of ore production are based on the estimated grade (and percentage of uranium recovery) of the material which will be processed in the given year. The average production grade is currently about 4.4 lbs. per ton (.22% U_3O_8) and is expected to drop to less than 2 pounds per ton (.10% U_3O_8) in the later 1980's. A 60/40 split was used for open pit versus underground operations. Capital costs are those for mill construction, mine plant construction and primary development. The latter would include shaft sinking and underground work preparatory to ore production for underground operations and overburden removal for open pit mines. There are about 5,100 people currently involved in the uranium mining/milling industry (exclusive of exploration) and less than 20 percent of these are involved with capital expenditures activities.

Critical manpower needs on the professional level will be mining and geologic engineers, metallurgists, and chemical engineers. Critical labor needs will include skilled miners, heavy equipment operators, electricians, and pipefitters.

Listed below is a range of likely average prices (per pound U_3O_8 in 1/1/74 dollars) expected to exist in the milestone years. If exploration during the next 6 to 10 years results in development of significant quantities of low-cost resources, then the prices in 1980 and beyond

could be close to the lower end of the ranges; otherwise they will approach the higher values.

	<u>1974</u>	<u>1977</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Scenario 1	\$7.50	9-11	10-15	18-25	<u>+30</u>
Scenario 2	\$7.50	9.50-12	15-20	28-35	<u>+40</u>

Prices are based on the production costs of these resources which are expected to be mined and processed during the years of this study as well as the cost required to find and develop these resources prior to production. A 15 percent rate of return on investment is assumed.

Mr. ATKISSON. Thank you.

Mr. MOSS. Mr. Moffett.

Mr. MOFFETT. Thank you, Mr. Chairman.

Mr. Bethel, at what point do we really begin to lose the economic advantages of nuclear power that you refer to several times in your testimony?

Mr. BETHEL. You lose them every time any of the elements of cost go up.

Mr. MOFFETT. Are we at a point now where we ought to be reassessing the earlier optimism about the relative inexpensive fuel?

Mr. BETHEL. No; I don't think that we are. A very important point was raised by one of the earlier witnesses on the question of some of the uncertainties that are inherent because of the uncertainty over uranium-plutonium recycle and whatever the cost is going to be in long-term storage, certainly some uncertainties, but I believe we are still quite a ways before we are in danger of being noncompetitive with coal or oil, certainly the price levels of coal and oil.

Mr. MOFFETT. But not long ago it wasn't even a question of simply being on a par, with them; it was being said, at least by people in your industry, that there was a distinct and clear advantage with regard to cost. It seems to me that in my part of the country, New England, Connecticut, for example, there is no longer this promotion of nuclear power as a cheap alternative. I wonder if, given the cartel, and we have had different interpretations here today of its effectiveness, if we are not going to reach a point fairly soon where we will be unable to produce evidence that nuclear power is that much of a bargain.

Mr. BETHEL. I was trying to find quickly here a reference to some statements that were made in an article on perhaps a forward look at pricing theories by uranium producers. I can submit this—in fact, I will put this in the record. I'm talking about it. Just let me summarize briefly. I may not have the numbers right but the argument was, in January of 1975, that we now have uranium prices up to a point where we are pretty comfortable as an industrial situation. So for the future perhaps we should think about the appropriate price for uranium being somewhere between the lower limits of a price which will pay all of the direct costs, all of the future exploration and provide return on investment and a value cost which would be the price at which the cost of generating power would equal the cost of power generation from oil or coal.

This particular spokesman estimated that to be as high as \$100 to \$200 a pound. They said the price ought to be between those two, above a reasonable return on investment and somewhere up, so where does that extra money go? It goes into profits.

Mr. MOFFETT. What has been the profit picture as far as producers are concerned? Mr. White attempted to answer that question but he simply stated, as I recall, that there was a great variation. Can you give us a characterization?

Mr. BETHEL. Certainly, in the mid-to-late 1960's when the Government stepped out as the sole customer for uranium and we were then almost guaranteed price levels starting to sag, it was a severe, wrenching experience for the uranium producers and I think by and large that profits reflected that. But in the last couple of years, I don't own a single share of stock in any uranium-producing company but I do

read a lot of their literature and you do see that their share values have gone up pretty handsomely. I can only attribute that to what they are telling their shareholders about their profitability and their expectations of future profits.

Mr. MOFFETT. What about the role of the major oil companies? I asked Mr. White earlier about that and he indicated they could dominate this market although that would probably not be a very good thing. Do you agree with that?

Mr. BETHEL. I'm not a global economist. I have a technical background. I don't really think I'm qualified to comment on this issue of horizontal integration.

Mr. MOFFETT. Thank you, Mr. Chairman.

Mr. MOSS. I have no questions at this time.

We want to express our appreciation for your appearance today and ask if any of the materials we requested for the record are supplied you do so promptly.

We excuse you with our thanks.

Mr. BETHEL. Thank you very much. We will respond promptly.

Mr. MOSS. The committee will now take a recess until 2:10.

[Whereupon, at 1:10 p.m. the subcommittee recessed, to reconvene at 2:10 p.m.]

AFTER RECESS

[The subcommittee reconvened at 2 p.m., Hon. John E. Moss, chairman, presiding.]

Mr. MOSS. The subcommittee will be in order.

Our next witness will be Mr. Ray Benton, manager of materials division, Pacific Gas & Electric Co., accompanied by Mr. Ronald B. Witzel, director, project purchasing, Pacific Gas & Electric Co.

Gentlemen, will you both be testifying?

Mr. BENTON. I will be testifying.

Mr. MOSS. Will you please stand and be sworn, and you too Mr. Ravera. Do you solemnly swear the testimony you are about to give this subcommittee shall be the truth, the whole truth and nothing but the truth, so help you God?

Mr. BENTON. I do.

Mr. RAVERA. I do.

Mr. MOSS. Identify yourself to the reporter for the hearing record.

TESTIMONY OF RAY P. BENTON, MANAGER, MATERIALS DIVISION, PACIFIC GAS & ELECTRIC CO., ACCOMPANIED BY RONALD B. WITZEL, DIRECTOR, PROJECT PURCHASING

Mr. BENTON. I am R. P. Benton, manager of materials for P.G. & E.

With me, on the right, is Mr. Ronald Witzel, to provide technical support for any questions that may arise.

Mr. MOSS. You may proceed.

Mr. BENTON. Mr. Chairman, members of the subcommittee, I am R. P. Benton, manager, materials department of Pacific Gas & Electric Co., a gas and electric public utility company serving most of northern and central California.

As part of our electric generation, we have one nuclear plant of 65 megawatts at Humboldt Bay, near Eureka, and two nuclear plants of

approximately 1,100 megawatts each at Diablo Canyon, near San Luis Obispo, which are under construction and, we hope, will be on line in 1977. We are also involved in planning nuclear plants for future development elsewhere in California.

It is, I presume, as a result of this experience in the field of nuclear energy that we have been invited to appear here today to assist this subcommittee in its investigation of uranium pricing and supply. Probably the best way to provide such assistance would be to provide you with brief answers to four questions which were posed to us by a member of your staff, and then be available to answer any questions you may have which fall within my particular field of experience and offer to obtain for you answers to questions which may be within the company's area of knowledge but not my own.

The four questions and our answers are as follows:

Question: What is the impact on the public (ratepayers) of the uranium price increase?

Answer: The answer to this question has two aspects, the effect of the increase on the cost of electricity and the effect on the future supply of uranium.

(1) The Increase in the Cost of Electric Energy.

Based on our projections for our two units at Diablo Canyon, if all electric customers in the United States were supplied entirely by similar modern nuclear powerplants, an increase from \$8 to \$40 per pound in the cost of uranium fuel, such as has taken place over the past few years, would increase the cost per kilowatt-hour by approximately 3 mills. Comparatively, an increase in the price of fuel oil from \$12 to \$14 per barrel would increase the cost of generating a kilowatt-hour by about the same amount. In order to measure the relative impact on consumers, we should compare the 3-mills-per-kilowatt-hour increase to total domestic rates which range, on a regional basis throughout the United States, from an average of about 25 mills to 50 mills.

It must also be remembered that the actual impact on our system, for example, which is not, in fact, all nuclear, will be diluted by the total generating mix using various sources of energy, such as gas, oil, geothermal steam, and hydroelectric energy. While any increase is quite important, it may be noted that the cost of nuclear-generated electricity is relatively insensitive to changes in uranium prices because it takes so little uranium to generate a kilowatt-hour. That is one of the primary reasons why nuclear power is such an important option. Because electric customers in most areas of the United States are only partially supplied by nuclear-generated power, the impact on ratepayers of this change in uranium price would be only a fraction of the 3 mills per kilowatt-hour.

(2) The Future Supply of Uranium.

Future availability of uranium, which has been projected for many years to be in limited supply at a market price as low as \$8 per pound, should be reasonably available in this century at a market price of \$40 per pound. A strong effort in exploration and development is presently underway in the industry. The present market price provides the incentive for production of known lower grade uranium deposits and for development of new mining technology. The higher price has also stimulated an interest in retrieving the residual ore from uranium mine tailings which has been economically unattractive until recently.

Question 2: What has P.G. & E.'s experience been in procuring uranium, both as to price and supply?

Answer: P.G. & E.'s experience in procuring uranium has been that, increasingly, producers with existing productive capacity are offering relatively short-term supply commitments, 5 years or less, at buyer auctions with the seller setting the basic conditions. Such conditions have included the requirement for substantial advance payments and a base price near current market price with escalation to be added until the date of delivery, or a future market price, whichever is higher. Suppliers who have not offered material at auction, preferring private negotiations, have also structured their proposals along similar lines. Uranium suppliers seeking to develop new productive capacity are increasingly requiring substantial prepayments to be used for capital development without assurance of supply and with supply geared to market price.

P.G. & E. has declined to respond to any auctions, and we have thus far declined to offer to pay so-called front money in a commodity purchase contract in which the front money provides no ownership benefits but just a credit against future purchase. We have held to the position that we are prepared to pay a stated price plus escalation or to pay a market price to be determined periodically during the life of a contract for an assured supply. We are also interested in obtaining an equity position for a portion of our uranium requirements.

Question 3: Does P.G. & E. believe that the alleged international cartel has affected the domestic price of uranium?

Answer: P.G. & E. has seen published reports of an alleged international uranium cartel. Other than that, we have no basis for knowing whether there is, or has been, such a cartel.

There are conditions in the international market for uranium which have affected price. One is that, by Federal regulation, until 1977 foreign uranium cannot be imported for use in domestic reactors. Another is that the principal offshore producers of uranium, South Africa, Australia, and Canada have been, until recently, reluctant to enter into new uranium supply contracts. They are now making some sales on an infrequent and limited basis.

In the case of Canada and Australia, it also appears that the activities of the producing companies have been dominated by, or controlled by, their Federal Governments. Their unwillingness to enter into commercial sales of uranium has increased the market pressures on the U.S. supply of domestic uranium which has been available for sale to foreign purchasers.

Question 4. What Government decisions does P. G. and E. believe contributed to the uranium price increases? By Government decisions I mean the United States.

Answer. P. G. and E. believes that a series of Government and private actions and inactions have added pressure to increase the price of uranium in the United States. The AEC in late 1972 ceased offering requirements type enrichment contracts which allowed customers the flexibility to delay uranium requirements as construction of plants was delayed. In February 1973 a new contracting criteria was announced by the AEC which required new customers to enter into long-term fixed commitment agreements which provided for delivery and payment for fixed quantities of enrichment on a predetermined schedule. The in-

stitution of this type of contract firmed up demand and was the primary stimulus for the initial price rise.

One inaction is the failure of the Federal Government to suspend the export of domestic uranium to new offshore buyers during such time as South African producers were reluctant to sell to new buyers and the Australian and Canadian governments had embargoes on export sales. The result was that Japanese and European users competed with U.S. users for the limited supply of uranium being mined in this country.

Because Federal enrichment capacity is limited, it became expedient to produce more enriched uranium by not "refining" the raw natural uranium quite so completely. This is commonly known as increasing the tails assay. In January 1975 the AEC announced that the tails assay would be increased which will require more natural uranium to be supplied for a given quantity of product specified. The uncertainty surrounding the timing and magnitude of this action has further added to the pressure on the U.S. market price for natural uranium.

A nongovernment action which intensified demand during 1974-1976 was the announcement of Westinghouse that it would not meet its uranium supply commitments. This added substantially to the number of buyers competing in the uranium market.

That's the end of my statement.

Mr. Moss. I think it might be helpful at this time if we would ask you to stand aside until we get the testimony of the next witness and then we will have the two representatives of the utilities tabled together for purposes of responding to questions.

Our next witness is John L. Ravera, manager of purchases and store department, Sacramento Municipal Utility District.

Mr. Ravera, if you will come forward please.

Will you identify yourself to the reporter for the hearing record.

TESTIMONY OF JOHN L. RAVERA, MANAGER, PURCHASES AND STORE DEPARTMENT, SACRAMENTO MUNICIPAL UTILITY DISTRICT

Mr. RAVERA. My name is John L. Ravera. I am manager of purchases and store department of the Sacramento Municipal Utility District, commonly called SMUD around here.

We do have a nuclear powerplant approximately 35 miles from here, which is operating right now, and it is with this experience that, I believe, you invited us here to testify today.

I would like to read to you the report that I gave you that is quite brief and gives the general experience we've had as well as some of our impressions of the market.

Early in the planning stages of the Rancho Seco nuclear generating plant, it was recognized that a reliable yellowcake supply was needed. After unsuccessfully trying to publicly bid for these requirements, the following contracts were negotiated with Utah International, Inc., then called Utah Construction and Mining Co.

In December of 1967, approximately 1,010,000 pounds was purchased for delivery in 1971, at an approximate price of \$7 per pound. The represents the base core material for our nuclear plant which is now in place.

In March of 1969, we purchased 1,254,000 pounds for delivery over 3 years, 1973, 1974, and 1975, at an approximate price of \$8.15 per pound, and this represented our first three reloads.

Since the nuclear plant was still under construction, the district did not actively try to purchase yellowcake from this time until well into 1974. For this reason, our appraisal and interpretation of the market was limited. By late 1974, with the nuclear plant nearing completion, the district decided to purchase additional yellowcake. At this time it became apparent to us that the prices being quoted (and accepted) were twice what they were a year earlier. In our discussion with others, we learned yellowcake suppliers appeared not to be responding to public bidding requirements. We continued through this phase of our requirements with little real hope of success.

In February of 1975, we sent our bid request to 25 potential bidders located in the United States and Canada. The request included a requirement for 2,815,000 pounds of U_3O_8 to be delivered over 6 years, through 1983. As a result of this solicitation, we received only one partial bid which offered to supply 45 percent of our requirements. The price quoted was \$40 per pound plus escalation. This price was considered unreasonable and the bid was rejected by our board of directors. The main reasons given to us for not bidding was either that the suppliers had already committed their available supply and associated facilities, or that they desired to withdraw from the market to re-evaluate their costs and future potential. In April 1975, after we knew the results of our bidding effort, we sent a letter to the same suppliers indicating a desire to negotiate a possible purchase with any of them.

During the remainder of 1975, we actively pursued the yellowcake market. Our attempts included discussions and/or written correspondence with some 40 or 50 potential suppliers (or self-declared hopefuls). We also gave serious consideration to the possibility of joining with others in selected joint ventures. None of these attempts proved successful. We could not find experienced suppliers with proven resources who were willing to seriously discuss purchase terms. Many who had questionable potential required front end risk money with no guarantee of delivery. Except for spot deliveries, market price was about the only acceptable definition of purchase price. In some cases a minimum guaranteed price was also required. While some suppliers apparently had the potential for mining the ore, they had no demonstrable ability to mill the ore into yellowcake. In those cases where spot deliveries were offered to us, the quantities had no relationship to our needs and were confused with impossible time restraints for acceptance. Additionally, we usually received information that several other potential buyers were simultaneously considering the same material. Some potential suppliers even tried to enter the market by requesting our involvement. When we quizzed them, it was obvious they did not understand the basic technology required for supplying yellowcake.

During the early part of 1976, even though most of the market characteristics described above were still evident, there did appear to be the emergence of suppliers in the market who were interested in contracting for the future supply of yellowcake. During this same time, it was also noted that the market price's rapid increase, which has prevailed for many months, was clearly tapering off. For these reasons, and because we had not yet satisfied our future requirements, in August

we initiated contact with 18 well-chosen, experience yellowcake suppliers. This contact set forth our requirements through 1983. Three of those contacted have now indicated a desire to try to meet all or part of our needs. Two of them have submitted to us contract drafts. One of these drafts requires market price pricing with no mention of maximum or minimums. The other contains a fixed base price with positive escalation only. We are continuing to negotiate with all three suppliers. It is our present impression that we could possibly fulfill our present needs from among these three potential suppliers; however, it appears we have practically no flexibility in deciding price or other terms and conditions. We must accept what is being offered in these areas, or the threat is that the supplier will take up negotiations with someone else.

Mr. Moss. Thank you.

Mr. Moss. I wonder, Mr. Benton, if you would like to return to the witness table.

Mr. Atkisson.

Mr. ATKISSON. Mr. Benton, you mentioned, with reference to a potential cartel, that you had seen published reports, and other than that you had no basis for knowing whether there is or has been such a cartel. It is a fact, is it not, that Pacific Gas & Electric was invited to be a member of whatever it was known as, the club or—

TESTIMONY OF RAY P. BENTON AND JOHN L. RAVERA—Resumed

Mr. BENTON. We were invited to a meeting of the club in London.

Mr. ATKISSON. And did Pacific Gas & Electric attend that meeting?

Mr. BENTON. No, we did not.

Mr. ATKISSON. Why did you not?

Mr. BENTON. That was an additional concern.

Mr. ATKISSON. Something, in other words, caused that apprehension in P.G. & E.'s collective mind. I wonder what that was, rumor or—

Mr. BENTON. There were public reports that the international producers, as I understood it, were attempting to organize the market, and this club meeting, one meeting we were invited to, was clearly sponsored by and conducted by the same people. It was the combination of affairs that caused us to have a concern.

Mr. ATKISSON. As a matter of fact, your experience is common to most, well, all American companies, so far as we know. My understanding is that many, many consumers and producers were invited from this country.

Mr. BENTON. I think that's true.

Mr. ATKISSON. So that the perception of the cartel possibly running a foul of American antitrust laws was pretty widespread?

Mr. BENTON. I think so.

Mr. ATKISSON. I presume that obtains as well for the cartel's successor, what is now known as the Uranium Institute, which is still meeting?

Mr. BENTON. Yes.

Mr. ATKISSON. As a matter of fact, in the last 2 weeks?

Mr. BENTON. Yes.

Mr. ATKISSON. P. G. & E. was not represented at that meeting, I take it?

Mr. BENTON. Not by anyone authorized by P. G. & E.

Mr. ATKISSON. You also indicated in your statement, Mr. Benton, that you felt the \$40 per pound price, should be pretty stable, that at \$40 per pound it should be reasonably available in this country and in adequate supply.

Mr. BENTON. Well, I have a fundamental belief in supply and demand mechanisms. What I was intending to convey is that with such a substantial increase as that I had reason to believe that a substantial additional supply would become available to relieve the possibility of short supply and to provide pressure on the level of price.

Mr. ATKISSON. I take it, then, that you disagree with the report, the New York stock broker's report that I mentioned earlier, which anticipated a price of \$100, or the OPEC equivalent price of \$115 or with something known as overshoot, possibly even \$200 per pound sometime in the next 2 or 3 years.

Mr. BENTON. I think those kinds of assessments are worthwhile, I understand, to have, but I don't agree with his conclusion that the prices will rise without any other action reacting against the rise in price.

Mr. ATKISSON. Now, if a cartel did exist, which was effective—I realize that's a large hypothetical—if such cartel did exist and it could effectively set prices in the world market, excluding the United States, is it your opinion that the U.S. price would follow the cartel price?

Mr. BENTON. If there is a free flow of material, then, if the rest of the world had a fixed price, the domestic price would follow that price. If there was an inhibition in flow of material, then it would not necessarily follow the rest of the world price.

Mr. ATKISSON. By an inhibition in flow of material, do you mean embargoes, things of that nature, governmental action?

Mr. BENTON. Yes, sir.

Mr. ATKISSON. You are not talking about allocation within a cartel?

Mr. BENTON. No.

Mr. ATKISSON. And the rest of the world takes in essentially only the supplying world? I should say takes in essentially only four countries, is that correct, Canada, Australia, South Africa, and France?

Mr. BENTON. Yes, sir.

Mr. ATKISSON. So if those four countries effectively managed to keep their own producers, and some of them are at least partially owned by the national governments, only those four countries got together on the world price of uranium, then in all probability it follows that they would be setting the price of uranium in this country, isn't that what we're saying?

Mr. BENTON. With the one proviso that if there were free flow of material and less supply than demand, then the highest price set anywhere would be the world price.

Mr. ATKISSON. All right. Well, the embargo is being lifted over the next few years in this country.

Mr. BENTON. Controls one direction of flow. I'm referring to both directions.

Mr. ATKISSON. Export?

Mr. BENTON. Yes.

Mr. ATKISSON. Assuming for the moment that the flow would not be interrupted, then, I take it, you agree that the price would follow an

international cartel, if there were one, and it could keep its own members in line?

Mr. BENTON. So long as demand exceeds supply.

Mr. ATKISSON. All right. At the present moment it is a seller's market, is it not?

Mr. BENTON. Yes.

Mr. ATKISSON. That means the demand exceeds supply?

Mr. BENTON. Yes.

Mr. ATKISSON. Are you saying that at \$40 a pound you anticipate that the happy result will be that supply and demand will reach equilibrium and that there will no longer be excess on one side or the other?

Mr. BENTON. I'm convinced that there will be a balancing. I don't know whether there will be excess supply, but I'm convinced there are moves to increase supply going on right now.

Mr. ATKISSON. P. G. and E. has also said it is desirous of obtaining equity position in supply. That's a long-handed way of saying they're trying to buy uranium production facilities, getting into the uranium business.

Mr. BENTON. Trying to buy uranium in the ground.

Mr. ATKISSON. TVA is doing the same on a large scale?

Mr. BENTON. Yes.

Mr. ATKISSON. Are you doing this as a hedge against inflation or just because it seems like a good idea anyway?

Mr. BENTON. I don't know which. There are two considerations. I don't know which order to put them in. The high priority is assurance of supply; right behind that would be some moderation in what the future costs increases are going to be, which are primarily affected or affected by both inflation and possibly future shortages.

Mr. ATKISSON. You also mentioned the kind of contracts you are facing, and Mr. Ravera, so did you, so perhaps both of you would like to comment on this. As a lawyer, knowing that the law requires that contracts have consideration flowing in both directions, my impression of the contracts you described being offered to you are not contracts at all. In effect, the suppliers are saying, "I will give you yellowcake sometime in the future at whatever price the traffic will bear." There's absolutely nothing flowing in your direction except assurance of supply.

Mr. BENTON. In some cases not much assurance of supply.

Mr. ATKISSON. Not even much assurance of supply. What are your remedies in the contracts that you're faced with? If your supply is cut off, are there liquidated damages clauses, provision for specific enforcement, or is that, too, left to the vagaries of the future?

Mr. BENTON. The ones I've seen, the suppliers are insistent on having full freedom whether they supply or not. But if some is available, then the price will be either escalated base price or market price. Hardly any definition of how markets would be determined in the future. The only resolution that I recall any, stating in what countries, what specific arbitration would occur, if we failed to agree.

Mr. ATKISSON. Well, that's pretty indicative of a strong seller's market really, there isn't any genuine bargaining power there?

Mr. BENTON. That's right.

Mr. RAVERA. I think all I can say is we're in the process of negotiating, and the penalties for nonsupplying are not very heavy. How-

ever, in both cases that we're talking about where we have draft contracts now, there is some way out for the supplier if he can't produce, but there's also some benefits to the utility if, for example, the mine is shut down that it is coming from, then the utility can, in fact, produce in that mine, so it is insured with the material in the ground.

Mr. ATKISSON. Again, to both of you. I don't know if you were both present earlier today when the other witnesses were here. But Mr. Bethel, representing Westinghouse, suggested that because of the fixed demand associated with a new plant, a new reactor, that everybody in both the supply end and the demand end of the nuclear equation really ought to have known just how much uranium was around and ought to have known that Westinghouse did not, in fact, have some 65 million pounds of yellowcake in its basement. That's my memory.

I gather that both of you make it your business to know as much as you possibly can about uranium markets at any given time. Did you in the early 1970's have any notion that a massive shortage was about to occur?

Mr. RAVERA. Speaking for Sacramento, no.

I would like to make a comment here, that supply and demand, both change, and there are forces on both sides of the equation, and I think that you can't really talk about one without the other. For example, all the forces to reduce nuclear power right now affect the demand side, so even if you knew exactly how much uranium was out there, you still only know one half of your equation.

Mr. BENTON. As I understood the question, one part of your question was did we know what the total demand situation was and what do we know about the Westinghouse situation. I guess my answer to that is that you keep trying, but it is a pretty dark tunnel you're looking into. Specifically we have no basis for knowing whether Westinghouse was covered completely, 100 percent, or any other percentage of their commitment.

Mr. ATKISSON. Do you subscribe to this service known as "Fuel Track," published by the Nuclear Assurance Corporation in Atlanta?

Mr. BENTON. No, we don't.

Mr. RAVERA. For the record, we do.

Mr. ATKISSON. All right, you do.

Did the Fuel Track—I've seen one of those. It is a big thing, about this thick [indicating], and has lots of tabs in it, pretty colored dividers and graphs and charts. Did you perceive from your copies of Fuel Track just what the Westinghouse position in the market was?

Mr. RAVERA. No. Fuel Track covers many areas of nuclear fuel, and that would have been just one aspect of it. Since we were not interested in that particular portion, we would not know.

Mr. ATKISSON. Mr. Benton, you stated you're in strict agreement with George White who testified earlier that an ERDA decision in early 1973 affected price. For the benefit of the panel here and the public, can you explain to us just how that worked and what it means? I, myself, am a bit baffled because it is a highly technical subject. Perhaps you can enlighten us a little bit.

Mr. BENTON. I didn't say it increased price. I said it increased demand for uranium; I believe that affects price. But in the increasing of the tails, had on the positive side part, that all utilities were interested in, expanded the capability of ERDA to produce enriched ura-

niium suitable for fabricating in the field, but by increasing the percentage that is unused, in order to get a fixed output, it requires a larger input to the process. It required more pounds to be fed into the—and they enriched it more thinly, which then enabled them to produce more enriched product with the same capacity. We had to favor the expansion of the enrichment capacity because there was a concern for that capacity. But the effect of the total situation was to require every organization needing fuel to supply more uranium feed stock, which increased the demand for the uranium.

Mr. ATKISSON. I guess what I don't understand is the rationale for ERDA's decisions to expand enrichment capacity.

Mr. BENTON. Yes, that was the primary objective.

Mr. ATKISSON. What about the time factor? It was another ERDA decision which lengthened the time. People who wanted their uranium enriched had to plan, had to supply themselves with enough feed stock, isn't that correct?

Mr. BENTON. Yes. It is called a long-term fixed contract. The characteristics of it are that the contractor, the utility, has to pay money to secure the contract, has to agree to a rigid schedule for the amount of uranium to be enriched without regard, except for one reopened, without regard to any possible changes in the startup date of the reactor or to any possible difficulties in the percent of the reactor utilization which affects the need, the timing of the need, for additional enriched fuel.

Mr. ATKISSON. Why did ERDA make that decision?

Mr. BENTON. We're speculating, but we believe it was done to make it economically attractive for private enrichment to be added to Government enrichment.

Mr. ATKISSON. The effect, however, was to greatly increase demand, was it not? Is my impression correct that before this decision one could plan on the very short term, and be pretty footloose and fancy free with the commitment he had to make with respect to feed stock?

Mr. BENTON. Yes. You keep the inventory in the form of the lowest cost, which is just yellowcake, but now we have to feed the yellowcake, thus have it in a higher cost form.

Mr. ATKISSON. The rationale would have been that with the certainty of the long term commitment it would be more economically viable for private industry to stay afloat? That was, I believe, a well known policy of the Nixon administration.

Mr. BENTON. We think that.

Mr. ATKISSON. Mr. Ravera, you said you "initiated contacts with 18 well chosen, well experienced, yellowcake suppliers." Are these the 18 largest in the United States, by any chance?

Mr. RAVERA. They were not selected by size. They were selected by having known capacity of mills and so forth. They may just incidentally be the 18 largest.

Mr. ATKISSON. The number 18 strikes me because in a conversation with an ERDA official a few weeks ago I asked how many suppliers there were, how many producers there were, in the United States, and he said, well, 18 big ones, then a whole bunch of little ones. I was just wondering if you happened to contact the biggest.

Mr. RAVERA. No. They were selected on the basis of knowing that they had existing mills, which is one of the slower points of uranium, yellowcake, supply right now.

Mr. ATKISSON. One final question for both of you. As the price of yellowcake goes up, do you anticipate that associated fuel costs will go up right along with it? Enrichment cost, for example? Has ERDA followed the cost of yellowcake?

Mr. RAVERA. No, they have not, but there has been inflation in the other areas of the fuel cycle. Our experience is that there are about four portions to the cycle. The first is the yellowcake; the second is conversion; the third is enrichment; and the fourth is the fabrication of fuel. The conversion has gone up slightly with inflation. The enrichment has gone up with inflation. The fabrication, from our experience, has not gone up very much at all.

Mr. BENTON. I think I essentially agree with John's statement. There is very little connection between uranium prices and the rest of the fuel.

Mr. ATKISSON. Thank you, Mr. Chairman.

Mr. MOSS. Mr. Moffett.

Mr. MOFFETT. Thank you, Mr. Chairman. Mr. Benton, I would like to go back to the comments you made with regard to the impact upon consumer utility bills. It is my assumption that you disagree with the gentleman from Westinghouse who said the following, "The economic advantage of nuclear power is significantly diminished if uranium is available only at the artificially high and noncompetitive prices." He was referring to the impact of cartel. You seem to disagree with that, is that correct?

Mr. BENTON. It is hard to disagree with that statement, but I think I disagree with his perception of where the market is going.

Mr. MOFFETT. He uses the word "significantly," which is a key word here. He says, the advantage of nuclear power is "significantly" diminished. You seem to be saying it doesn't really make too much difference with the kind of price rise we've seen, which has alarmed some people.

Mr. BENTON. I related it to the dollar increase in oil deliberately. Some people believe that by the middle of December oil prices will increase something of the order of 10, 15 percent, which is a dollar and a half or so. That's just this review, if that's what happens. That's equivalent to everything that's happened in this disruptive period in reigning prices, so you can use very large numbers, but really that obscures the relativity of these things.

Mr. MOFFETT. I wonder, though, if the analogy to the OPEC oil price rise is valid in that there is a shock wave that is sent through the economy by \$1 increase per barrel of oil. Isn't there a ripple effect, you wouldn't have as much with this—

Mr. BENTON. Well, my point was that we don't consider closing down oil-fired and fossil plants. We're not building any because oil goes up \$2. I fail to understand why we get so upset about as large a rise as there has been in uranium. Seems to me there's going to be a reaction which will tend to offset that rise.

Mr. MOFFETT. That, again, of course, assumes that you have some free market forces at play and it leads to the question that I asked Mr. White earlier about the structure of this industry and whether or not we really do have a free market supply and demand situation. You seem to feel that we do.

Mr. BENTON. I'm sure there are attempts to organize it, but I'm also sure there are vigorous forces trying to keep it free or unorganized.

Mr. MOFFETT. And who is winning, in your opinion? I am very serious about this. Mr. White testified, for example, that the oil companies are playing a more dominant role in the uranium market. I wonder who is in control.

Mr. BENTON. Well, I have faith, and I think I have some reasons to believe, that supply will increase and that if there is Government influence, but not Government smothering of the situation—I'm talking about the U.S. Government—it is possible to get through this in spite of if there is an external cartel, and I think come out well in the interest of the uranium mining industry, which needs to be kept viable, and in the interest of the American electric consumer.

Mr. MOFFETT. Let me make an analogy of oil now. Some of us have become rather skeptical of the approach of raising prices in order to increase supply, because in the area of domestic oil it hasn't seemed to work. I don't really mean to get into that area, and we could argue about that all afternoon. But we did see a dramatic increase, in the price of new oil without any accompanying increase in domestic oil production. Again, I wonder what Government action are you talking about when you mention Government influencing rather than smothering the situation?

Mr. BENTON. If I may, I would like to keep the analogy in the uranium business. I'm aware of at least three situations in which uranium supply, the large investments, have been committed recently, and I know enough about the operation to believe that the cost of the operation, including return of capital and a reasonable return on investment, is in the middle \$20. Now, that supply would not, could not, ever have been brought to market at a \$6 or \$8 price. It is simply not feasible.

Now, getting back to the Government situation, it seems to me that the Government has smothered the oil problem and ignored in a vast way, the Federal Government now, the uranium situation during the time when foreign producers were unwilling to enter into any contracts. We were, domestic users were, excluded from being in the market. Foreign users were not able to buy foreign material either. The only market open to them was the American market. And the combination was devastating, I believe, in terms of forcing prices up.

Mr. MOFFETT. You mentioned that so long as demand exceeds supply. That would be a situation in which our price would follow the world price, is that correct?

Mr. BENTON. Yes.

Mr. MOFFETT. What about efforts to decrease demand, and what would be the impact of those efforts if adopted on a broad scale nationwide with regard to the problem of uranium prices?

Mr. BENTON. If we're talking about conservation of electric energy, then we have some pretty vigorous programs, I think most utilities do, to teach consumers how to get by with less energy. To the extent those programs are successful—and we're talking about existing plants, or in our case two plants—to the extent that conservation reduces our need to produce electric energy from what we had planned, then we would reduce the output from the highest cost plants, and those would not be nuclear plants; they would be our older, smaller, fossil fire plants. So we'd still need uranium, even in our case, even if conservation succeeds to a greater extent than even the enthusiastic belief is possible.

Mr. MOFFETT. Thank you very much for your testimony, gentlemen.

Mr. MOSS. I think, Mr. Benton, you would have urged the Government to remove the embargo upon the importation of uranium for use in domestic reactors, or perhaps both, to have instituted some program of limiting the sales to countries other than U.S. users. Am I correct in that conclusion?

Mr. BENTON. That's correct.

Mr. MOSS. And then in the matter of the policies dealing with enrichment, directed at bringing private companies into operation, because I don't believe we have any domestic enrichers in the private field now, have we?

Mr. BENTON. We have none.

Mr. MOSS. And it was aimed at the Bechtel-Goodyear package that was presented to Congress about 2 years ago?

Mr. BENTON. Yes.

Mr. MOSS. And which appears to be one that's going to flop?

Mr. BENTON. It feels like it at this moment.

Mr. MOSS. It looks very unlikely that it is going to go anywhere, so that may have been, then, ill-considered or ill-conceived policy by the Government, that had an adverse impact that did not necessarily achieve anything constructive for the industry; is that correct?

Mr. BENTON. It appears that way, looking at it now. The motives at the time sounded right.

Mr. MOSS. I'm glad to hear that, because at the time it was offered I felt it looked that way to me, 2 years ago, and I voiced my views on it at that time.

Do either of you have any knowledge—and if you haven't, why I would not expect you to speculate, because we will go directly to the source—but do you have any knowledge that the U.S. Department of State or through its foreign economic operation, the Department of Commerce, has attempted to take any action which would lessen the possibility of this cartel emerging full blown from this whole package of rumors that we keep hearing?

Mr. BENTON. I'm not aware of any.

Mr. RAVERA. Neither am I.

Mr. MOSS. The staff will be instructed to prepare the necessary interrogatories to be sent to the Department of State to make that determination. The probability is that the committee will want to hear from the State Department and the Department of Commerce on this matter as it pursues this, its further inquiry. I think with all of the witnesses who have appeared today that it will be very helpful to the committee.

You have helped us, not just to get answers to a problem but to more precisely define the areas where we must make intensive inquiry if we are to have all of the facts upon which to base a sounder judgment. We appreciate the cooperation we have received from you. You are now excused.

The committee will stand adjourned.

[Whereupon, at 3:04 p.m., the hearing was adjourned.]

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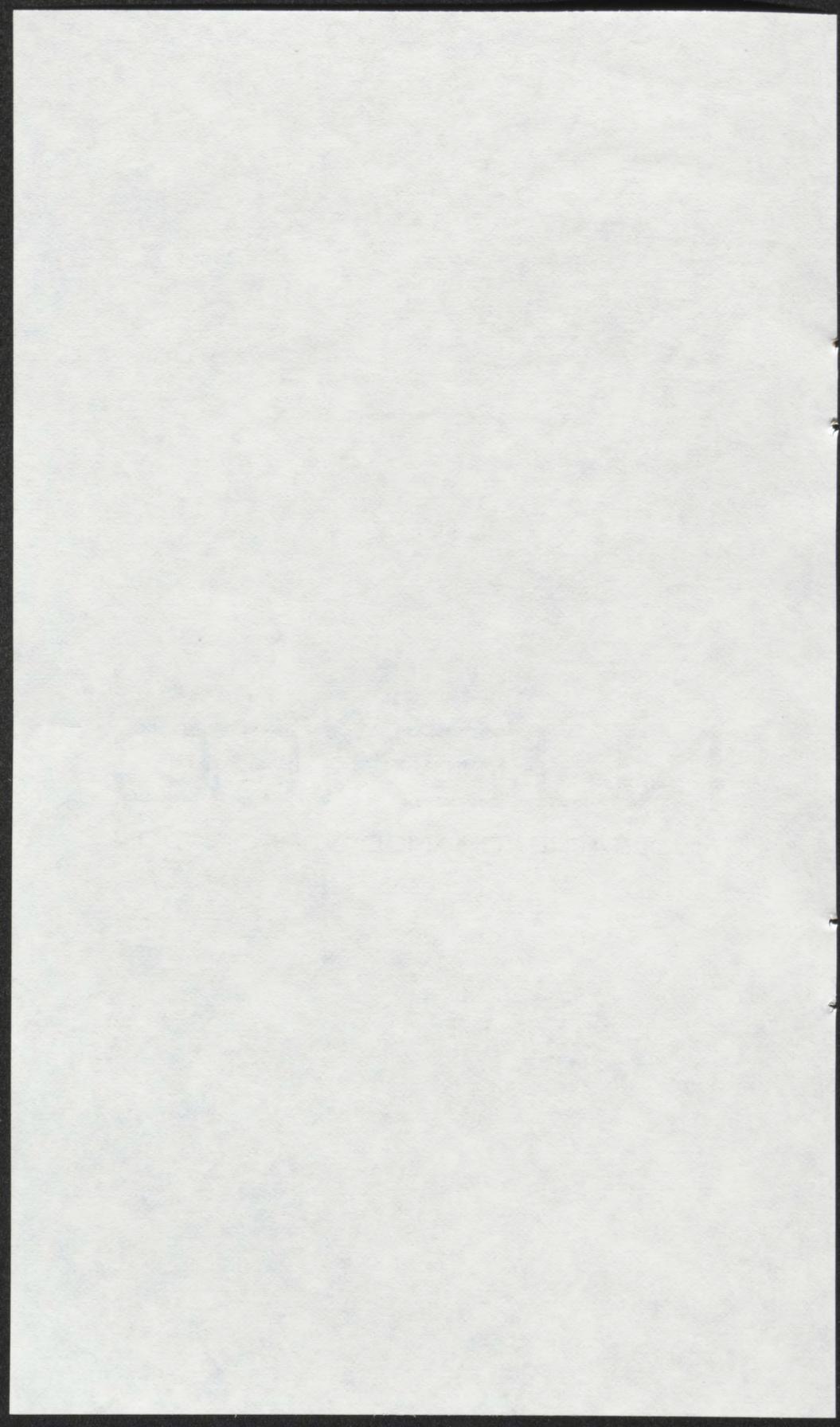
APPENDIXES

APPENDIX I

NU EX CO

NUCLEAR EXCHANGE CORPORATION

(103)



NUCLEAR EXCHANGE CORPORATION

Nuclear Exchange Corporation (Nuexco) provides marketing and information services to Subscribers to the Nuclear Exchange, a commodity market for nuclear raw materials. Nuexco manages the Exchange, acts as a broker, arranges inventory loans, collects market data, publishes the *Monthly Report to the Nuclear Industry*, and advises and assists Exchange Subscribers.

The Exchange is composed of its Subscribers: electric utilities, mining companies, nuclear manufacturers, engineering firms, exploration companies, financial groups, government bodies, trade associations and the news media. Another facet of the Exchange is its associated foreign companies through which international transactions are handled—the Japanese trading company, Marubeni, operating in Asia, and the German firm, NUKEM, operating in Europe. Business in North and South America, Australia and Africa is transacted from the Exchange's headquarters in California.

WHAT ARE NUEXCO'S FUNCTIONS?

Brokerage

Acting as a broker, Nuexco assists Subscribers to buy and sell nuclear fuel materials in the domestic and foreign markets. It is Nuexco's experience that the parties to a transaction are best served when Nuexco does not act as agent for either party, but instead remains neutral and makes its expertise and ideas available to both parties, confining its role to finding common ground for agreement between buyer and seller.

For its services, Nuexco earns standard fees which are related to the types and magnitudes of transactions. To maintain its neutrality and to avoid any situation in which it could benefit from changes in the price of nuclear fuel, Nuexco never buys or sells for its own account.

Trading practices are similar to those of the national securities exchanges. Nuexco's policy is to offer market opportunities to Subscribers in the order those Subscribers list their requirements with the Exchange. Subscribers always are given preference over non-Subscribers.

Inventory Loan Brokerage

Nuexco lists inventory available for loan in its Monthly Report and arranges loan transactions. Users borrow material as part of an overall procurement strategy or when market circumstances make a loan advantageous.

Minerals Resources Activities

In its minerals resource activities Nuexco arranges exploration programs, *in situ* uranium sales, and other uranium transactions which in form, production method, or contractual structure may be appreciably more complex than conventional sales of concentrates. To this end, Nuexco advises buyers and sellers of market conditions affecting such transactions and assists the parties in structuring contracts that are consistent with the prevailing market conditions.

Market Reporting

Nuexco offers the nuclear industry an important source of current, documented market information. Nuexco publishes the *Monthly Report to the Nuclear Industry*, which lists and analyzes price data, describes industry activities, interprets market conditions, and reports supply and demand for uranium and plutonium. Periodically the *Report* is supplemented by topical reports on fuel inventories, foreign markets, and other subjects of current interest.

The Exchange staff always is available to full-service Subscribers for informal consultations.

Special Services

Nuexco has a limited capacity to provide consultation directed towards specific aspects of raw material marketing and procurement, including market surveys, price forecasts, marketing or procurement strategies and plans, and the development of financing arrangements. Since these services are beyond the scope of the general and informal consultation available to all Exchange Subscribers, appropriate consultation fees are charged.

WHY USE THE NUCLEAR EXCHANGE?

Since the value of nuclear materials is so great that even the smallest enhancement of a purchase or sale can amount to a worthwhile gain, the use of the best services and advice available is advisable. Nuexco contributes three vital elements to any market transaction: information, trading opportunities, and market experience.

Information

Because the Exchange is recognized as a center of international activity in nuclear commodities, it gives its Subscribers access to practical information needed to understand and transact business in the complex nuclear fuel markets. The Exchange's monthly listing of current

prices (known as Exchange Values) is accepted as a standard reference throughout the world. More important, Nuexco's market information is up-to-date and immediately available in usable form through the *Monthly Report to the Nuclear Industry* and through informal telephone contacts with the Exchange.

Trading Opportunities

Through the Exchange, Subscribers can often take advantage of special opportunities overlooked or not generally available in the market. Some buyers and sellers trade solely through Nuexco to avoid the time and expense needed to build their own market organizations; this is particularly true of new producers. Some market participants use Nuexco in order to remain unidentified in the early stages of a transaction, since anonymity allows them to explore market opportunities and negotiate terms without revealing that they are in the market.

Nuexco gives buyers and sellers access to foreign markets and market information through its associated foreign companies and through foreign Subscribers to the Exchange.

Market Experience

Thorough knowledge resulting from direct activity in the market and innovation in buying and selling are essential. Nuexco supplies both requirements. Its long-standing policy of neutrality gives buyers and sellers confidence that Nuexco's forecasts, statistical analyses, and recommendations are objective. Nuexco often is entrusted with information which parties ordinarily conceal from each other; with this knowledge it can construct a transaction tailored to fit a specific situation and the needs of both parties, at the same time scrupulously protecting the confidences of Subscribers. Nuexco can be particularly helpful in developing and arranging complex multi-party transactions when normal commercial channels are blocked.

In short, Nuexco acts as a catalyst by finding common ground for agreement between buyer and seller and smoothing negotiations, so transactions are more often closed with a minimum of effort and delay.

RECORD OF ACCOMPLISHMENT

Acceptance of Nuexco by the industry is indicated by the number of its Subscribers and the volume of its business. As of August 1976, the subscription list includes:

78	utility companies
106	producers, potential producers and exploration groups
33	financial institutions
12	manufacturers, convertors, reprocessors
20	governmental and industry organizations
51	engineering firms, consultants, agents and individuals
<u>300</u>	

Included in this total are 80 non-U.S. subscribers.

Through June 1976, Nuexco has brokered the following uranium sales and loan transactions. They involve U_3O_8 as well as natural and enriched UF_6 , and have delivery dates ranging from immediate through 1990.

	<u>Sales</u>	<u>Loans</u>
Number of Transactions	88	14
Pounds of U_3O_8	64,100,000	6,500,000
Number of Different		
Subscribers Involved	68	19
Smallest Transaction	1,000 lbs.	100,000 lbs.
Largest Transaction	10,000,000 lbs.	1,300,000 lbs.

Additional uranium sales, estimated at 64 million unprocessed pounds, have been handled by Nuexco through transactions involving ore, proven properties, new prospects, reserves in the ground, new processes, unconventional recovery technologies, and variations of conventional techniques. All categories of transactions total about 135 million pounds U_3O_8 which, when compared to the ERDA report that all commercial transactions made by U.S. producers from 1966 through 1975 total about 411 million pounds, make it apparent that the Exchange has played a significant role in the market.

The Exchange has also developed innovative financing concepts for various aspects of the nuclear fuel cycle and handled a number of uranium nationality swaps and plutonium transactions. Assignments of ERDA enriching services contracts and other SWU transactions have been completed by Nuexco, but are now normally handled by its affiliated company, Separative Work Unit Corporation (SWUCO).

SUBSCRIBING TO THE EXCHANGE

Exchange Subscriptions are designed to meet the needs and industry status of the user. The several categories of Subscription give the Exchange broad exposure to the industry and enable Nuexco better to serve all Exchange Subscribers. Regular Subscribers receive:

1. *Monthly Report to the Nuclear Industry.*
2. Special Topical Reports.
3. Access to Nuexco Market Facilities.
4. Unlimited informal consultation with the Exchange staff, and consulting visits on request.

Other categories of Subscribers also receive the *Monthly Report* and receive other services according to their needs.

To join the Exchange or obtain further information simply call 415-854-1510 or write:

James E. Vaughan, Marketing Manager
Nuclear Exchange Corporation
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Menlo Park, California 94025

NUEXCO MANAGEMENT



A. PAYNE KIBBE, Chairman and co-founder of Nuexco, brings to the Exchange a wealth of business experience in minerals development, raw materials finance, and investment banking. From 1954 to 1966, Mr. Kibbe was successively President of Lisbon Uranium Corp., Hidden Splendour Mining Company, and Atlas Corporation, with responsibility for the management of twelve uranium mines and two mills.

Mr. Kibbe is President of the raw materials consulting firm of Kibbe & Associates, Chairman of the Board of Monroc, Inc., and a Director of First Security Bank of Utah and Surety Life Insurance Company.



GEORGE WHITE, President and co-founder of Nuexco, is recognized internationally as one of the principal architects of nuclear power. Mr. White originated many Exchange concepts and fuel cycle innovations now accepted as standard by the industry.

As President of Vitro Uranium Company, Mr. White developed Vitro's mining and milling operations. Later, he organized

General Electric's entry into the commercial nuclear power field, managed construction of the world's first private reactor, and was General Manager of G.E.'s commercial nuclear power business for eleven years. Mr. White has directed Nuexco's operations since 1968.

Mr. White has served on the Boards of Japan Nuclear Field Company, Kernreaktorteile (Germany), Fabbrecazoni S.P.A. (Italy), and Vitro Corporation of America.



GEORGE WHITE JR., Executive Vice President, joined Nuexco in 1971 and heads up its brokerage activities. He was previously associated with the investment banking firms of Stone & Webster and Drexel Firestone. Mr. White is a former U.S. Army officer.



SANFORD C. ANDERSON, Vice President and Treasurer, joined Nuexco in 1973 and heads up its mineral resource activities. He was previously an auditor and small business consultant with Arthur Andersen & Company. He earned an M.B.A. degree from Stanford University and is a former Navy nuclear engineering officer. Mr. Anderson is a certified public accountant.



JAMES E. VAUGHAN, Secretary and Marketing Manager, joined Nuexco in 1975. He has previously served as fuel management engineer with the Yankee Atomic group of companies; regional marketing manager with General Atomic Company; and energy systems consultant with NUS Corporation. Mr. Vaughan is a registered professional nuclear engineer and is also a licensed attorney.



THOMAS A. BOYDEN, Manager—Raw Materials, came to Nuexco in 1974 and brought 23 years of experience in uranium exploration, mine development and production. A geologist, Mr. Boyden has a broad background in property acquisitions and joint venture management.



WAYNE FOWLER, Manager—Business Development, joined Nuexco in 1975. Mr. Fowler served in the Navy prior to receiving his degree in engineering from UCLA. Since then his eighteen years in the nuclear industry have been in the area of nuclear fuel development for the General Electric Company and Manager of Uranium Supply and Services for the General Atomic Company.



LANDON B. PHILLIPS joined Nuexco in 1976. He was previously a Market Analyst for Kerr McGee Nuclear Corporation. Mr. Phillips is a graduate of the U.S. Naval Academy and a former Navy nuclear engineering officer. He is a member of the American Nuclear Society.

NUEXCO ASSOCIATES



RAY C. FREEMAN has been associated with Nuexco since 1973. He has been active in the electric power industry since 1929 through his career at General Electric Company. He was instrumental in establishing General Electric both as a government contractor in nuclear power reactor research and development and as a major factor in the commercial reactor sales market. Mr. Freeman was the first President of Separative Work Unit Corporation (SWUCO), an affiliate of Nuexco, and is currently a director of that organization.



HAROLD C. LINDBERG became associated with Nuexco in 1970 following his retirement from the General Electric Company after more than 40 years of service. Mr. Lindberg, an electrical engineer, was Manager of Electric Utility Sales Empire District, Northeast Region and was heavily involved in General Electric's entry into commercial nuclear reactor sales.

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August, 1976

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MONTHLY REPORT TO THE NUCLEAR INDUSTRY

NO. 97

AUGUST 31, 1976

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NUEXCO

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NUEXCO

TRANSMITTAL

Here is your copy of Report No. 97.

The general section of this Report contains a brief discussion of the events which we believe have influenced the price of uranium over the past several years. A special topical report which considers this subject in greater detail is in final preparation. Distribution of this Report, to all full service Subscribers, will be in late September.

Nuexco will be represented at the Annual Meeting of the American Mining Congress in Denver, Colorado, September 26th to 29th, 1976. We will have a hospitality suite at the Denver Hilton and look forward to meeting with many of our Subscribers there.

The Exchange

HIGHLIGHTS AND COMMENTS

GENERAL

The Federal Grand Jury investigation of the uranium industry continues to be a topic of major interest. It appears that the sharp rise in uranium prices over the past three years was probably the principal driving force behind the investigation, and that the aim of the Justice Department in impaneling the Grand Jury is to determine if there is any evidence of anti-trust law violations involved in the price increases.

Comments from a number of industry observers, including both buyers and sellers, appear to indicate a belief that the price increases are attributable to a combination of political, economic and geologic factors. Their views can be summarized as follows:

1. The uranium supply industry was created and grew under government stimulation. The end of the AEC's procurement program was not matched by a coincident growth in commercial procurement, so overcapacity in the supply segment of the industry coupled with the AEC's disposition of approximately ten million pounds of U_3O_8 through the early termination of the "stretchout" purchase program led to distress prices from the very beginning of the commercial uranium market.
2. Prices remained low through 1972 as a result of utility buying practices, a number of short sales, and government inaction on two key issues: the disposition of the government stockpile and the contemplated relaxation of the embargo.
3. During 1973, demand was crystalized and indeed became an urgent concern because of the adoption by the government of the fixed commitment SWU contract, which suddenly altered utility buying patterns. In addition, the following were also important factors which, in sequence, placed enormous pressure on the buy side of the market: the actions by foreign governments in the past few years to maximize the financial return from their national energy resources, the threat of a higher tails assay, dimmer prospects for uranium and plutonium recycle, the appearance of foreign buyers in the U.S. uranium market, unprecedented inflation, increases in uranium production costs well in excess of such inflation, and the announcement by a major supplier of its inability to deliver.

In Report No. 96, it was pointed out that, with respect to ERDA's implementation of the phased lifting of the embargo on the use of non-U.S. feed, there was some uncertainty as to whether the calendar year to which non-U.S. origin feed material is to be attributed is the year of feed delivery or the year of related toll enrichment. Nuexco's affiliated company, Separative Work Unit Corporation (SWUCO), pursued this question within ERDA and has received a response. It is ERDA's policy that the embargo percentages are to be applied against the year of feed delivery as opposed to the year of enrichment. This consideration is important in the case where feed deliveries occur late in a calendar year or where feed is being delivered early due to an "Open Season" adjustment. ERDA has also noted that embargo percentages must not be exceeded *at any time* during the calendar year. The effect of this is to preclude an enrichment customer from making its foreign feed deliveries early in the year with the balance of its feed requirement to be provided from domestic sources later in the year. ERDA customers will be required to certify that they are not exceeding embargo percentages at any given point in time.

GENERAL (Continued)

A number of Exchange Subscribers have indicated concern with respect to the implications for the uranium market of recent decisions by the U.S. Court of Appeals of the District of Columbia Circuit relating to certain NRC licensing actions. These decisions have resulted in a moratorium on the issuance of new operating licenses, construction permits, and limited work authorizations by the NRC. Inasmuch as the sixty nuclear units currently licensed to operate are not directly affected by the moratorium, and since most plants not yet licensed to operate are covered by fixed commitment SWU contracts, the effect on the uranium market of a short term licensing moratorium should be minimal or nonexistent.

The Atomic Industrial Forum will hold a topical conference on uranium in Geneva, Switzerland, September 13 to 16, 1976. The Exchange has noted a general reluctance on the part of U.S. uranium producers to attend this conference, probably as a result of the current Federal Grand Jury investigation.

The series of lawsuits involving the major supplier which announced last year that it was unable to meet its uranium supply commitments has continued as a topic of industry interest. The first trial involving this supplier is scheduled to begin in a state court in early October 1976. Additional trials in U.S. District Courts are expected to begin shortly thereafter.

A number of major financial institutions have recently issued research reports on the uranium industry. One such research paper reports that the nine largest U.S. producers hold domestic reserves of approximately 600,000,000 pounds U_3O_8 which are economically recoverable at current market prices, and that approximately two thirds of these reserves are as yet uncommitted.

U.S. URANIUM MARKET

The 1976-1977 supply/demand situation is set forth below:

CHANGES IN 1976-1977 MARKET SITUATION
(Millions of Pounds U_3O_8)

Item	Report No. 97	Report No. 96	Change
Loan Inquiries	2.3	2.0	+0.3
Available for Loan	5.2	5.3	-0.1
Demand	2.0	2.8	-0.8
Supply	5.1	5.9	-0.8

Loan inquiries increased somewhat as a new borrower entered the marketplace. Buying for inventory continued to be strong, and as a result, near term supply and demand both decreased by nearly one million pounds.

Several large transactions are shown in this month's Report. One of these was the result of a major renegotiation of an existing long term contract, with this additional material sold as part of the renegotiation. Another large contract represented the output of a new uranium

U.S. URANIUM MARKET *(Continued)*

producer. Also indicated is a major sale involving the transfer of interest in a mill and reserves. In addition, there were a number of smaller spot transactions. A major U.S. uranium supplier held a much publicized auction this month. The Exchange understands that an award has been made, but that no public announcement is planned.

A note has been added to the uranium supply and demand bar chart indicating that the demand data is based on the assumption of complete inventory liquidation prior to the creating of new demand for the individual consumer. In a recent topical report on inventories published by the Exchange, it was concluded that domestic inventories would be maintained at least at current level, or even increased. Consideration of the industry inventory situation should always be factored into the reader's interpretation of the supply/demand statistics depicted in the bar chart.

NON-U.S. URANIUM MARKET

Situations are developing in international affairs which are serving to add to the uncertainty and complexity of the nuclear industry. The need for a free international uranium market is self-evident. This applies not only to natural uranium, but also to enriched material. Accordingly, buyers and sellers alike have cause for concern when the course of events develop in a manner which threatens the free interchange of material.

Undoubtedly, non-U.S. suppliers of uranium are concerned about the U.S. Justice Department's investigation of the uranium industry in the United States. The subtleties of U.S. anti-trust statutes are not very well understood outside of the United States, and accordingly, many observers expect to see foreign suppliers pulling back from the U.S. market in the months ahead to await the outcome of the present investigation and determine what steps may be safely taken to enter the market in the future. In this connection, some industry observers are worried that the investigation could prove counter-productive if, as a result, U.S. buyers elect to increase their buying pressure in the domestic market.

Further, the political feeling which is developing in the United States with respect to the products of South Africa and Southwest Africa is beginning to concern a number of people. The public press is carrying stories of efforts by some groups, Congressional and others, to prohibit the use of U.S. enrichment facilities to supply enriched uranium to South Africa, to prohibit enrichment of uranium produced in South Africa and Southwest Africa, and to prohibit nuclear assistance of any type to these two countries, regardless of existing contracts or treaties.

It is not clear whether such extreme positions will influence the final policy of the United States. But it is clear that the agitation has already caused substantial concern among procurement people in the nuclear industry, and could, unless the U.S. policy is clarified in the reasonably near future, have a major influence on the future uranium market.

NON-U.S. URANIUM MARKET (Continued)

The Australian press has recently reported that the interim statement of the Ranger environmental inquiry headed by Mr. Justice Fox will not be published until September. While the commission has not officially changed the date for submitting the Report, it would now appear that the schedule has slipped at least another month. The press has also reported on the activity among the Australian labor unions in opposition to the development of the Australian uranium industry. Labor difficulties have resulted in a temporary shutdown of one uranium operation in Australia. It is reported that the Labor Party, while currently out of power, still has strong political influence within the trade unions, and is on record as opposing development of Australian uranium resources by private enterprise. Sources in Australia believe there will be a considerable amount of debate surrounding the report of the Fox commission as a result of the union position. These same sources continue to believe, however, that the Commission's recommendations will ultimately be followed.

Canada continues its negotiations on bilateral safeguards agreements with the national governments of its uranium customers. It appears that one such agreement with a foreign country may not be completed as a result of political considerations, and that a large uranium supply arrangement will be terminated as a result. However, negotiations on safeguards treaties between Canada and a number of other nations appear to be going well. Canadian government officials expect that, as long as negotiations are proceeding in good faith and on a reasonable schedule, uranium shipments will continue to be made even in the absence of a formal treaty.

EXCHANGE VALUES

Of the completed transactions reported on Page 2, two of the largest were priced at the higher of market price or an escalated floor price. In such transactions, it is typical that one of the principal items of negotiation is the establishment of the floor price, and there has been quite a wide variation in the final figures adopted. As a generalization, it appears that most floor prices are now being established in the range of 10% to 25% below the current market price.

There continues to be a large number of medium to small sized lots of uranium offered for sale, either for immediate delivery or within the next year or so. Five such trades are reported this month, four at around \$40.00, and the other at a price about 5% above that level.

As the month of August closes, a number of bids above \$40.00 are in the market, and it appears that the market has resumed its upward trend after four months of stability. In addition, there were a few bids at or above the \$41.00 level during the month, but it does not appear that there is adequate support for such a price now and accordingly, an increase of \$0.40/lb. U_3O_8 is reported in the Immediate Exchange Value.

EXCHANGE VALUES (Continued)

The new Values listed on Page 3 are as follows:

Delivery Date	Exchange Value (\$/lb. U_3O_8)
Immediate	40.40
July 1, 1977	43.10
July 1, 1978	46.50
July 1, 1979	50.25
July 1, 1980	54.25

An informal survey of a number of utilities, producers, and fuel manufacturers indicates that most are now using higher assumptions with regard to the rate of expected increase in those Bureau of Labor statistics indexes which are most commonly utilized in uranium pricing. Accordingly, when year to year price differences are calculated using escalation assumptions, an increase of 8% annually will be used instead of the previously assumed 6½%.

For the first time in several months, the Exchange has information on firm bids for specific delivery in 1978, 1979, 1980 and beyond. While these bids are somewhat higher than the current Exchange Values for these dates, the quantities of material covered by the bids is judged insufficient, in view of total demand and total supply in those years, to warrant establishing the Exchange Values at such levels.

While most sellers appear to anticipate immediate delivery prices in the range of \$40.00 to \$42.00/lb. U_3O_8 , they continue to evidence a reluctance to make firm offers to sell, preferring instead to respond to buyer bids. The logical extension of this preference has been the development of the seller's auction, a procedure that has now been adopted by a number of sellers. While buyers dislike the auction procedure, the sellers note that the procedure is the fairest, giving all buyers an equal chance, with price being the sole determinant. It should be noted that the auctions have been characterized by successively higher minimum prices which have, in each case, been attained. Longer term, it will be interesting to see if and how buyers will continue to respond to such minimum bid requirements and the auction procedure generally.

RAW MATERIALS

A sharp increase in uranium exploration activity in northeastern Washington is currently underway. An estimated 35 to 40 companies, including at least 25 major oil and mining concerns, are presently exploring. The primary attraction is the highly successful exploration and mining project at the Midnite Mine located near the town of Wellpinit, Stevens County.

Uranium mineralization was first discovered at the Midnite site in 1954. Midnite Mines, Inc. was immediately formed to exploit the discovery. In 1955, Dawn Mining Company was formed jointly by Midnite Mines and Newmont Mining Corp. Dawn Mining Co. began property development in 1956 and eventually built a 440 ton per day acid leach/ion exchange

RAW MATERIALS (Continued)

processing plant that began production in 1957. The mine and mill have operated for 15 of the past 20 years, and to date production has been approximately 8.5 million pounds U_3O_8 from ore averaging 0.23%. Remaining ore reserves are estimated at about two million pounds.

Uranium mineralization at the Midnite site occurs in oxidized and unoxidized metamorphic rocks and primarily in the unoxidized zone of related igneous rocks. In the oxidized zone, the most important uranium mineral is autunite, a secondary mineral. Primary minerals of pitchblende and coffinite are more common to the unoxidized zones. Mineralization is primarily concentrated along fracture planes in the highly contorted metamorphic rocks adjacent to the contact area with igneous rocks. It is postulated that economic ore deposition probably resulted from the redistribution and precipitation of uranium during the lateral and downward migration of the mineral-bearing solutions following the period of intrusive activity.

Although the geologic environment of the Midnite deposit is uncommon to uranium deposits in the U.S. (it is one of two mines producing from igneous and metamorphic rocks — the other being the Schwartzwalder Mine near Golden, Colorado), it is a common environment for major reserves in Canada and Australia. It now seems apparent that the exploration groups recognize the potential that exists within the district, and any new discoveries will stimulate future exploration efforts within other areas of similar geologic environment.

SEPARATIVE WORK UNITS (SWU)

The Nuclear Fuel Assurance Act (NFAA) bill has been passed by the House of Representatives in a form basically as expected. Senate action on the bill is expected after the Labor Day recess. Activity in the SWU markets began to pick up toward the end of the month, following several months of relative quiet. Several sales are in negotiation at this time, and the contract assignment market is also showing signs of renewed life.

ERDA has announced an increase in the price for its enrichment services. Effective August 25, 1976, the charge under requirements contracts was increased from \$60.95 per kilogram unit of separative work, or "SWU," to \$65.83. This price is provisional and subject to adjustment to be based on final indexes expected to be available in November 1976. The charge for requirements contracts will be further increased on January 27, 1977 to \$69.80 or the ceiling charge, whichever is lower. An increase in the charge for fixed-commitment contracts was also announced. The present charge of \$59.05 for fixed-commitment contracts will be increased to \$61.30 on October 1, 1976.

PLUTONIUM

Two small purchases of plutonium by non-U.S. buyers are currently in negotiation.

The U.S. market remains quiet and there seems to be little likelihood of any early change in this situation. The reasons include: non-availability of plutonium from commercial

NUEXCO

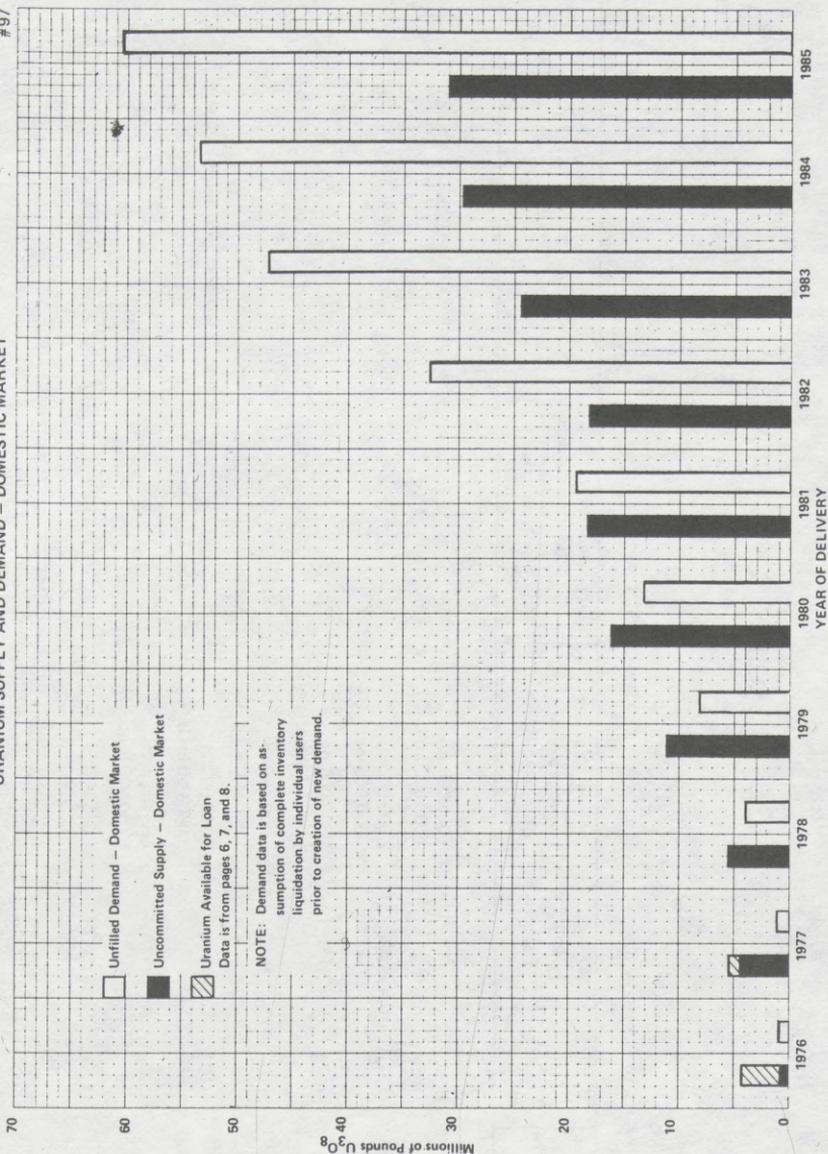
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PLUTONIUM *(Continued)*

U.S. sources; unwillingness of overseas sources to consider sales or even loans without absolute assurance of repayment (assurance that no U.S. borrower can offer); unwillingness of potential users to expend time and effort given the present uncertainties surrounding the timing and outcome of the GESMO hearings; and finally, the decision by the U.S. Court of Appeals of the Second Circuit against even interim recycle. In the event that the Court's decision were overturned, the other obstacles, even to test or demonstration programs, are formidable.

NJEXCO

URANIUM SUPPLY AND DEMAND - DOMESTIC MARKET



NUJEXCO

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TRANSACTIONS

Reference	Material	Delivery Date	Approximate Quantity	Approximate Price as % of:		Remarks
				Current Ex. Val.	Ex. Val. on Transaction Date	
T-412	U ₃ O ₈	-	3,000,000 to 5,000,000 lbs U ₃ O ₈	-	-	Sale of mill and reserves
T-418	UF ₆	1982-86	2,000,000 to 3,000,000 lbs U ₃ O ₈	-	-	Price is higher of base or market
T-420	U ₃ O ₈	1976	300,000 to 500,000 lbs U ₃ O ₈	105	106	
T-426	U ₃ O ₈	1977	300,000 to 500,000 lbs U ₃ O ₈	100	101	
T-427	U ₃ O ₈	1979-87	3,000,000 to 5,000,000 lbs U ₃ O ₈	-	-	Price is higher of base or market
T-431	U ₃ O ₈	1976	Less than 50,000 lbs U ₃ O ₈	99	100	
T-432	U ₃ O ₈	1976-77	600,000 to 1,000,000 lbs U ₃ O ₈	99	100	Foreign buyer and seller
T-433	U ₃ O ₈	1976	50,000 to 100,000 lbs U ₃ O ₈	99	100	

NUEXCO

EXCHANGE VALUES

Delivery Date	Exchange Value (\$/lb U_3O_8)
Immediate	40.40
July 1, 1977	43.10
July 1, 1978	46.50
July 1, 1979	50.25
July 1, 1980	54.25

URANIUM HEXAFLUORIDE — To convert the U_3O_8 value to the value of the uranium in UF_6 , divide the U_3O_8 value by 0.84376 and add the cost of conversion.

USE CHARGE

Loan Commencement Date	Annual Use Charge Rate %
Within next 6 months	Floats with prime rate.

USE CHARGE — The Exchange's judgment of the annual interest rate which a borrower would have to pay to obtain a near term uranium loan. It is based upon transaction data, the money market prime rate, and the relationship between uranium inventory, supply and demand.

NUEXCO

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NUEXCO PRICE DATA

EXCHANGE VALUES are the Exchange's judgment of the price purchasers will pay for uranium concentrate (yellowcake). The Exchange derives the Values solely from current bids to buy and does not take into account offers by sellers or prices at which deliveries are being made under old contracts.

The Exchange does not predict prices. Exchange Values are today's prices for future delivery, not a forecast of future prices. In today's seller's market, they are essentially the upper limit of a range of prices being bid by purchasers. In a buyer's market, the Exchange would again report the lower limit of prices being offered by sellers, as in the past.

The Values are expressed in dollars paid at time of delivery, and include Nuexco's estimate of any price escalation. Exchange Values are determined on the last day of each month; they are intended to reflect the market for uranium at the close of business on that day. They may be used by Subscribers either prospectively or retrospectively, as may suit their purposes, with the understanding that new Exchange Values will not be published until the end of the following month. Due to the fact that relatively little new data becomes available in any reporting period, the Exchange does not believe more frequent publication of Exchange Values is warranted at this time.

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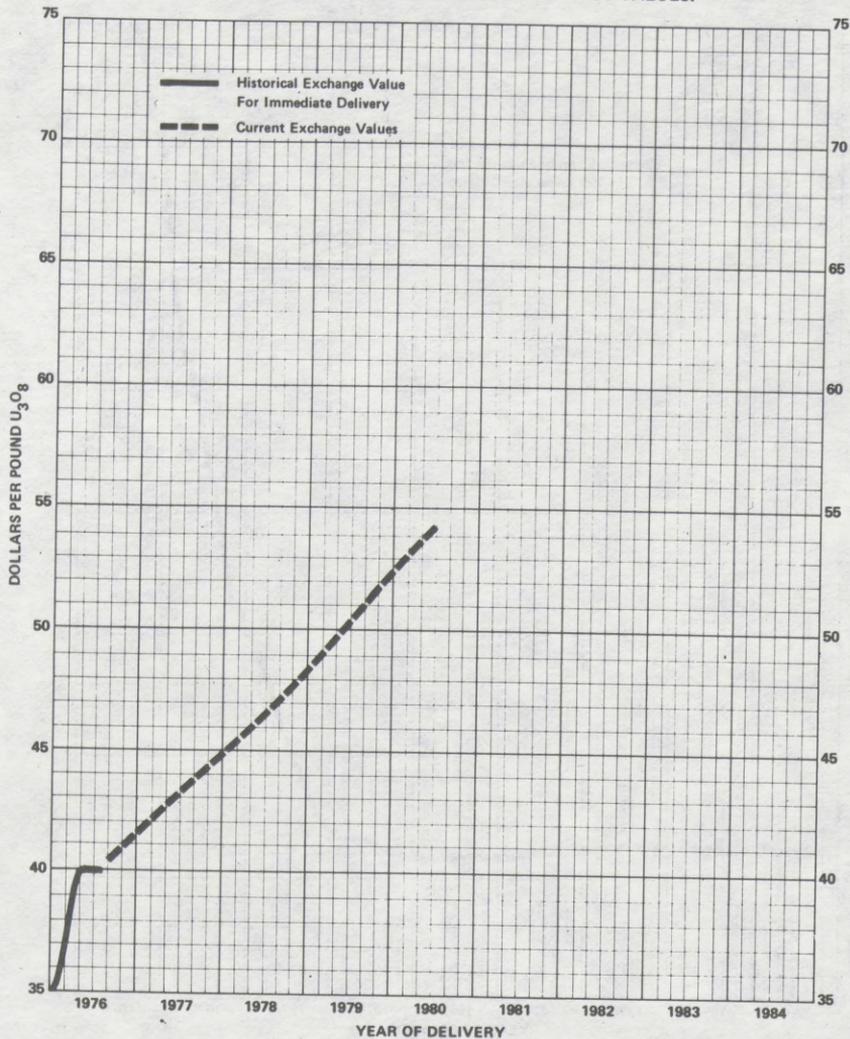
FIGURE II - HISTORICAL U_3O_8 EXCHANGE VALUE FOR IMMEDIATE DELIVERY
1976 TO PRESENT AND CURRENT EXCHANGE VALUES.

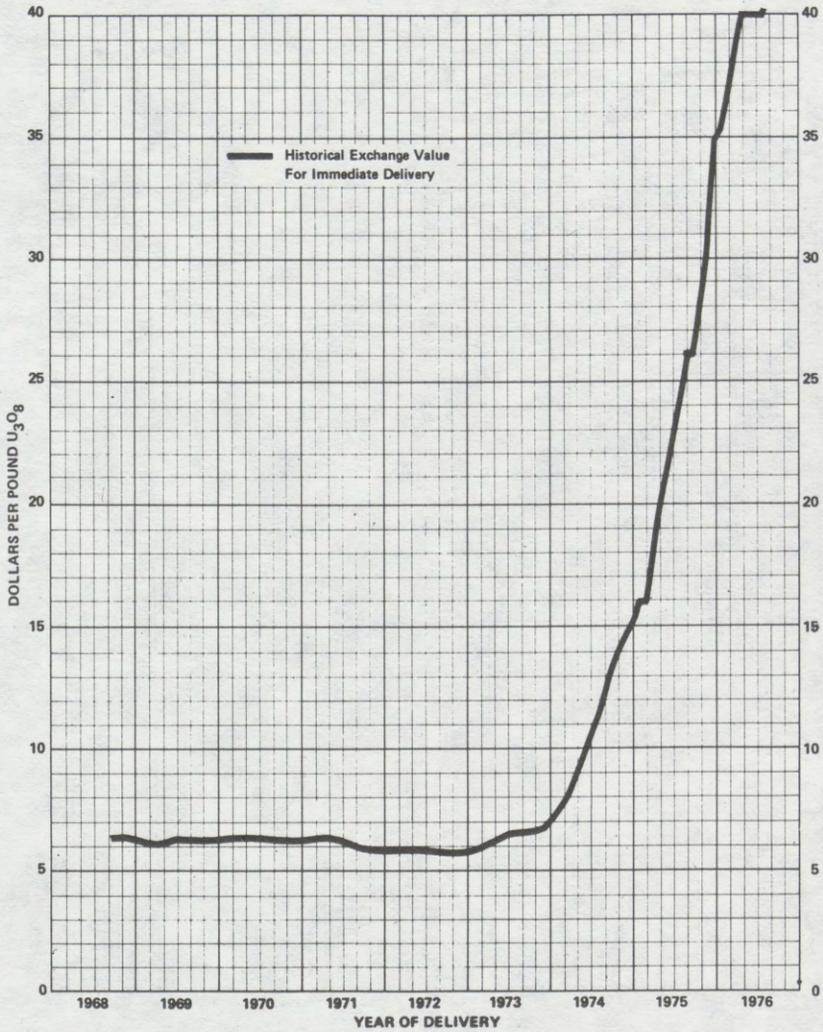
FIGURE I - HISTORICAL U_3O_8 EXCHANGE VALUE FOR IMMEDIATE DELIVERY 1968-1976

FIGURE III - HISTORICAL U_3O_8 EXCHANGE VALUES 1967-1975

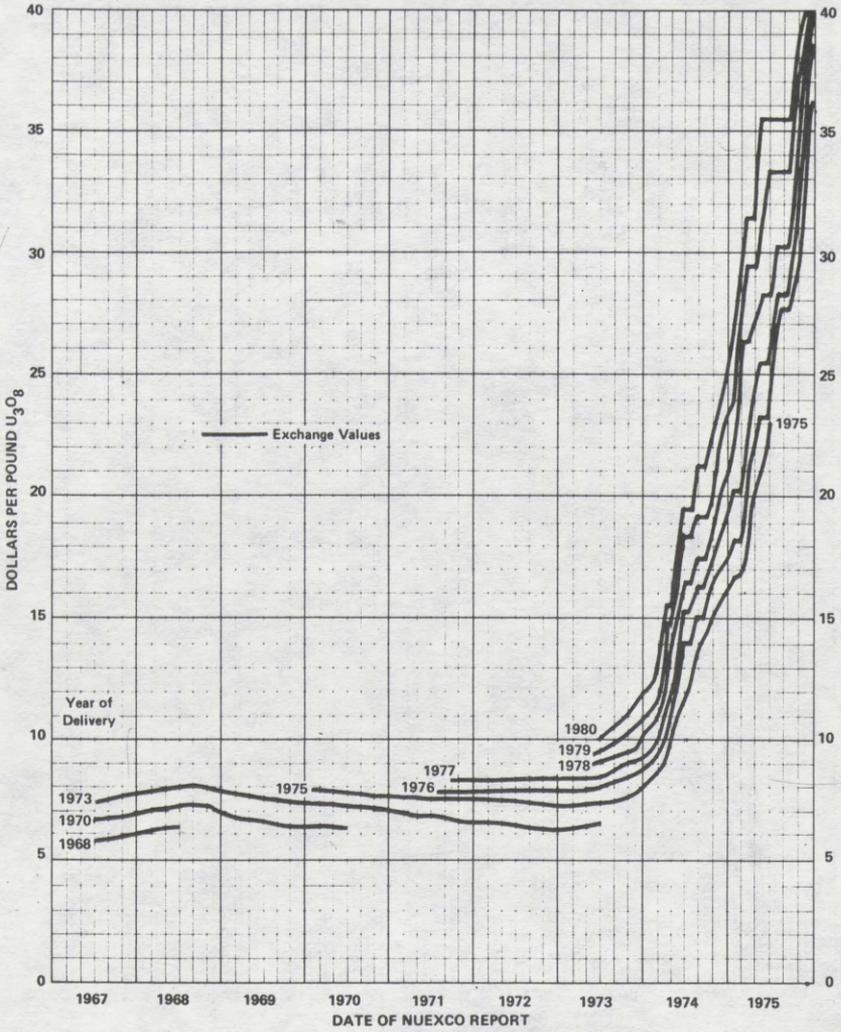
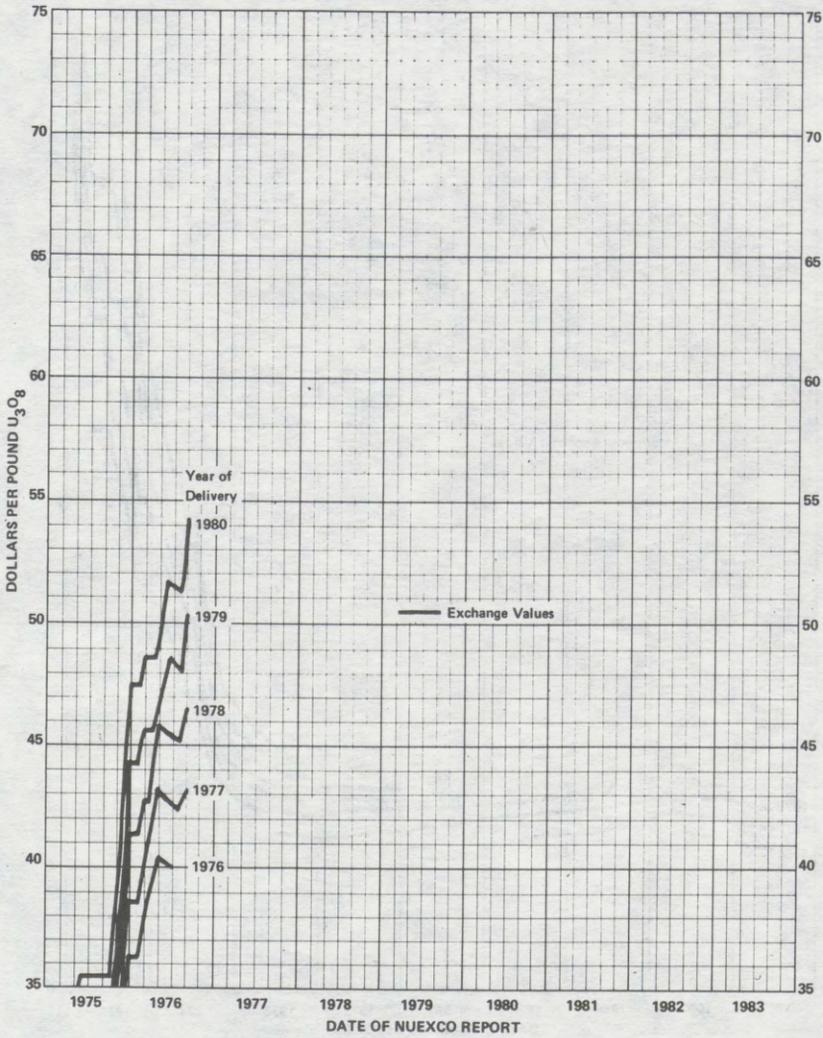


FIGURE IV - HISTORICAL U_3O_8 EXCHANGE VALUES 1975 TO PRESENT

MINERAL OPPORTUNITIES

- P-662 An exploration joint venture is available with a major mining company. The firm controls 60,000 acres of lode claims and scattered state leases in Wyoming. A number of high potential prospect areas have been identified as a result of geologic evaluation of surface and subsurface exploration data within the area of interest. An equity interest of 49% in the venture is available for \$500,000 to be spent directly on property evaluation over a period of 18 months, followed by 49% of ongoing expenditures for property acquisition, exploration and development. The mining company will be the operator for property exploration and development.
- P-800 An exploration and mining lease is available on about 4,300 acres. Electric logs for three of six reconnaissance drill holes identify a three to nine foot thickness of significant radioactivity in a highly productive host formation at a depth of 1,200 to 1,300 feet. The property is available from the seller under the following conditions:
- \$20,000 cash for a six-month option to evaluate the property.
 - \$90,000 cash payment to purchase the lease.
 - The property will not be burdened with production royalty payments.
- Property potential is estimated to be good to excellent based upon the drill hole information. The property is available for immediate consideration and is subject to prior sale.
- P-801 A producing mine is for sale. Unmined ore reserves reportedly total about 12,000 tons at an average grade of 0.20% U_3O_8 . The property consists of approximately 350 acres, of which about 300 acres remain to be explored. The potential to expand ore reserves onto the unexplored ground is estimated to be very good. The asking price for the property lease is \$150,000 down, followed by ore production payments totalling \$100,000. Mining equipment is not included in the sale. The property will be sold free of production royalty obligations and is subject to prior sale.
- P-631 Withdrawn.
- P-651 Sold
- P-657 Optioned

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URANIUM LOAN INQUIRIES

Delivery Year	Pounds U_3O_8 (1000's)	Return Year	Reference	Remarks
1976	1000	1980-81	P-561	Foreign material may be acceptable.
	1000	1980-81	P-593	Foreign material is acceptable. -- Tentative.
	250	1977	P-726	Foreign material is acceptable.
	2250			

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URANIUM AVAILABLE FOR LOAN

This table lists uranium inventory offered for loan and other year-end inventory not shown separately.

Delivery Year	Pounds U ₃ O ₈ (1000's)	Return Year	Reference	Remarks
1976	500	1977	L101	
	250	1977	L102	As UF ₆
	500	1978	L101A	
	250	1978	L102A	As UF ₆
	200	1978	L107A	
	200	1980	L103	Foreign
	1000	1980	L112	Foreign, as UF ₆
	700	1980	L114	As UF ₆
	—	3600		
		48,000	—	—
1977	700	1981	L110	Foreign, as UF ₆
	500	1980	L115	As UF ₆
	400	1980	L116	
	—	1600		
	55,000	—	—	Other Year-End Inventory
1978	69,000	—	—	Year-End Inventory
1979	69,000	—	—	Year-End Inventory
1980	61,000	—	—	Year-End Inventory

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URANIUM DEMAND - DOMESTIC MARKET

This table lists bids to buy and active inquiries, both foreign and domestic, and all unfilled domestic requirements not shown separately.

Delivery Year	Pounds U ₃ O ₈ (1000's)	Bid Price to Buy Relative to Exchange Value	Reference	Remarks
1976	20	97%	B646	
	450	100%	AA	
	200	100%	B728	
	200	100%	B717	
	50	100%	B700	
	920			
1977	1100		Note 1	
1978	450		AA	
	90		AE	
	500		AI	
	3000		Note 1	
	4040			
1979	1300		B717	
	450		AA	
	50		AE	
	525		AI	
	500		B707	Foreign
	5300		Note 1	
	8125			

Note 1: Unfilled domestic requirements not shown separately.

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URANIUM DEMAND - DOMESTIC MARKET

This table lists bids to buy and active inquiries, both foreign and domestic, and all unfilled domestic requirements not shown separately.

Delivery Year	Pounds U ₃ O ₈ (1000's)	Bid Price to Buy Relative to Exchange Value	Reference	Remarks
1980	450		AA	
	480		AE	
	525		AI	
	800		B707	Foreign
	350	103%	AL	
	10,600		Note 1	
	<u>13,205</u>			
1981	1300		B717	
	475		AA	
	340		AE	
	600		AK	
	200	101%	AL	Price based on straight line extension of 1980 Exchange Value
	16,600		Note 1	
	<u>19,515</u>			
1982	550		B717	
	475		AA	
	1920		AE	
	550		AI	
	100	98%	AL	Price based on straight line extension of 1980 Exchange Value
	1200		AK	
	28,000		Note 1	
	<u>32,795</u>			

Note 1: Unfilled domestic requirements not shown separately.

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URANIUM DEMAND — DOMESTIC MARKET

This table lists bids to buy and active inquiries, both foreign and domestic, and all unfilled domestic requirements not shown separately.

Delivery Year	Pounds U ₃ O ₈ (1000's)	Bid Price to Buy Relative to Exchange Value	Reference	Remarks
1983	550		B717	
	475		AA	
	2130		AE	
	1200		AK	
	43,000		Note 1	
	47,355			
1984	3410		AE	
	1200		AK	
	49,000		Note 1	
		53,610		
1985	2260		AE	
	1200		AK	
	57,000		Note 1	
		60,460		

Note 1: Unfilled domestic requirements not shown separately.

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URANIUM SUPPLY - DOMESTIC MARKET

This table lists offers to sell, material actively being considered for sale, and uncommitted domestic production capacity not shown separately.

Delivery Year	Pounds U ₃ O ₈ (1000's)	Offer Price to Sell Relative to Exchange Value	Reference	Remarks
1976	200		S728	
	20		S646	
	50	100%+	S700	
	15		S729	
	400		Note 1	
	685			
1977	75	100%+	S700	
	4300		Note 1	
	4375			
1978	250		S596	
	75	100%+	S700	
	500		S705	
	4900		Note 1	
	5725			
1979	500		S705	
	500		S596	
	75		S700	
	200		S723	
	9800		Note 1	
	11,075			

Note 1: Uncommitted domestic production capacity not shown separately.

NUEXCO

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URANIUM SUPPLY - DOMESTIC MARKET

This table lists offers to sell, material actively being considered for sale, and uncommitted domestic production capacity not shown separately.

Delivery Year	Pounds U ₃ O ₈ (1000's)	Offer Price to Sell Relative to Exchange Value	Reference	Remarks
1980	500		S705	
	500		S596	
	200		S723	
	15,000		Note 1	
	16,200			
1981	500		S705	
	500		S596	
	200		S723	
	17,100		Note 1	
	18,300			
1982	500		S705	
	200		S723	
	17,500		Note 1	
	18,200			
1983	500		S705	
	200		S723	
	23,900		Note 1	
	24,600			
1984	500		S705	
	200		S723	
	29,000		Note 1	
	29,700			
1985	500		S705	
	200		S723	
	30,300		Note 1	
	31,000			

Note 1: Uncommitted domestic production capacity not shown separately.

NUCLEAR EXCHANGE CORPORATION

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 TWX: 910-373-1760

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 Telephone: 919-949-3622

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 TWX: 710-474-3553

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 George White, Jr., Executive Vice President
 James E. Vaughan, Secretary, Marketing Manager
 Thomas A. Boyden, Manager—Raw Materials
 Fred Klingler, Manager—Administrative Services

George White, President
 Sanford C. Anderson, Vice President, Treasurer
 Jules Pearlman, Counsel
 Wayne D. Fowler, Manager—Business Development
 Landon B. Phillips, Marketing

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Energy Services Company
 Uranium Trading Company

AFFILIATED COMPANY

Separative Work Unit Corporation (SWUCO)
 Walt H. Wolf, Vice President
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 Gaithersburg, Maryland 20760
 Telephone: 301-948-4878
 TWX: 710-828-0548

FOREIGN EXCHANGES ASSOCIATED WITH NUEXCO

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 Nukem GmbH — Hanau, Germany

BANK

Wells Fargo Bank
 735 Santa Cruz Avenue
 Menlo Park, California 94025

APPENDIX III
DOCUMENTATION

Document No.	Description	Date
1	Uranium	Feb. 25, 1972.
2	Melouney letter to Carnegie	Mar. 6, 1972.
3	"Notes on Meetings Held in Canberra . . ."	Do.
4	Melouney letter to Carnegie	Mar. 7, 1972.
5	Mazel letter to Carnegie	Mar. 30, 1972.
6	Mazel letter to Melouney	May 2, 1972.
7	Melouney memo to Carnegie	July 12, 1972.
8	Mazel letter to Melouney	July 24, 1972.
9	Melouney memo to Espie	Aug. 8, 1972.
10	do	Do.
11	Proud letter to Carnegie	Aug. 22, 1972.
12	Proud letter to Melouney	Aug. 29, 1972.
13	Melouney letter to Rodd	Sept. 21, 1972.
14	Australian Producer Club, agenda	Oct. 30, 1972.
15	Mazel letter to Melouney	Nov. 3, 1972.
16	do	Dec. 4, 1972.
17	Melouney letter to Mazel	Dec. 21, 1972.
18	Mazel letter to Melouney	Jan. 22, 1973.
19	Mazel ("Louis") telex to Melouney	Feb. 15, 1973.
20	Wolverson letter to Petit	Oct. 17, 1973.
21	Baylis letter to Melouney	Oct. 26, 1973.
22	Mazel telex to Carnegie	Nov. 28, 1973.
23	Mazel telex to Melouney	Do.
24	Draft minutes of the 9th operating committee held in Las Palmas on Nov. 23, 1973.	Dec. 5, 1973.
25	"Working Paper"	Do.
26	"Orderly Marketing"	Jan. 28, 1974.
27	"Fourth session of Policy Committee"	Jan. 31, 1974.
28	The Uranium Institute, draft constitution	Jan. 30, 1974.
29	Daniel letter to Petit	Apr. 5, 1974.
30	Note for file of H. F. Melouney	May 2, 1974.
31	Mackay letter to Carnegie	June 26, 1974.
32	"Financial Situation of Participants"	July 8, 1974.
33	Petit letter and enclosures	July 19, 1974.
34	Carnegie memo to Harding	July 14, 1976.
35	"A Radioactive Leak"	Aug. 16-21, 1976.
36	"How the Uranium Club Began"	Do.
37	"The Uranium Men Discover . . ."	Do.

Note: The above notations apply to either the 1st dated page or the 1st complete page of the individual documents as they were collated upon receipt in this office.

URANIUM

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INDICATION OF MARKETING CAPABILITIES AND
PRODUCTION PLAN.

NOTES ON MATTERS AFFECTING PARTICIPATION.

25th February, 1972.

GENERAL COMMENTS

1. C.R.A. will need some certain tonnage, presumably ex Rossing, to fortify its claims of access to markets beyond that available to M.K.U. The "uncommitted" 5,000 tons to 1977 is still to materialise; progressive estimates continue to reduce the estimated demand until 1977.
2. A contract into the 80's from Westinghouse would help ensure availability of financing. It must start in the 70's to have any real meaning.
3. A 50% interest for CRA/Westinghouse would be very costly and unpopular politically and with the Australian mines concerned. 40% looks the maximum assuming 15% Westinghouse, leaving 25% C.R.A. which still makes C.R.A. the biggest individual shareholder.
4. C.R.A. would become very much the minority shareholder as EZ/Peko/QM would form a solid Australian block on contentious issues. However, present indications are that responsible and experienced people will represent those interests.
5. Ways may be devised whereby we could dominate marketing and subsequently processing, should we do desire, but at present this does not seem to be important.

25th February, 1972.

ACTION - MONDAY 28/2/72.

In prospect the interested but slightly detached attitude suggested appears best, taking the best opportunity, after the official story has been given, to make the points -

- . C.R.A. is comfortably filling the M.K.U. needs.
- . It has access to greater tonnages and is confident it could go further in the mid-late 70's and beyond.
- . At a time when 100% overseas ownership by foreign companies was commonly sought RTZ/CRA developed M.K.U. on a basis of majority Australian beneficial ownership.

If it was thought appropriate for C.R.A. through M.K.U. to co-operate in a major scheme again it would be happy to do so and would again take national aspirations concerning ownership and more advanced processing fully into account. If not it will happily proceed as planned with M.K.U. within the context of the large R.T.Z. interests in uranium and the other developing interests of C.R.A.

As regards Mr. Proud - it is several years since I met him. At that time he and his colleagues were advanced thinkers regarding mining technologies and methods of evaluation - they spent much time philosophising. They were also intensely loyal to Peko. How good he will be in representing an industry view I do not know, but think he could do this. Whether he could also head a consortium company would need more checking out.

25th February, 1972.

PLAN FOR FURTHER ACTION

1. Gain entry on the basis of marketing ability.
 - be willing to accept responsibility for sales of 1,000 tons in 1975 rising to 4,000 tons in 1978 and thereafter.

2. Entry terms -
 - Offer - to buy 100% of M.K.U. and put that in with its tax-free funds.
 - + sales package as above.
 - + \$5m. to cover feasibility studies.

 - For - 40% of total company on the understanding that 15% will go to consumer(s) providing long term contracts.

3. Westinghouse - to have first offer of the consumer(s) 15% for a contract of 13,000 tons starting 1978, plus \$10m. in cash.

4. Feasibility studies to determine plan for mine openings including whether M.K.U. will open (with another) in 1975/6, or be deferred.

INDICATION OF MARKETING CAPABILITIES AND
PRODUCTION PLAN

	M.K.U. Contracts and Projects	ex Rossing	ex Uncomm- itted Tons	Westing- house	S/T	'Other'	Avail- able	Produc
1975	.7		.3		1		1	1
6	1	2	1		4		4	3
7	1	1	2		4		4	4
8	1			1	2	1	3	4
9	.8			2	2.8	1.2	4	4
1980	.8			2	2.8	1.7	4.5	4½
1	.7			2	2.7	2.3	5	5
2	.6			2	2.6	2.4	5	5
3	.4			2	2.4	3.1	5.5	5½
4				2	2	4	6	6
5				2	2	4	6	6

- . 3,000 Tons ex Rossing
- . Westinghouse in 1978/9
- . Assume uncommitted sales are available beyond 1978 additional to Westinghouse.

NOTES ON MATTERS AFFECTING PARTICIPATION

CRA/MKU has 10,000 Tons reserves.

Tax free funds.

Access to Contracts = ^{7,500 reserved incl. financing etc.} 10,000 T. excl. 'uncommitted'
 13,300 T. incl. " to 1977
 36,300 incl. Westinghouse.

Westinghouse - Provides contracts from 1978 or 1980 only.

EZ/Peko - 70,000 tons 7 lb. reserves.

Nabarlek - 10,000 tons 44 lb. reserves.

? What of Noranda.

Comment - Westinghouse would have to put in cash to earn even 10% share in pooling of assets but may buy in to 15%.

C.R.A. owning 100% of M.K.U. may earn 25% at most without heavy cash contributions which would not be welcomed.

Possibly -	C.R.A.	25	
	Westinghouse	<u>15</u>	40
	EZ/Peko		40
	Nabarlek		20

Valuation =	Assume Nabarlek NPV	\$14m.
	Ranger "	\$35m.
	M.K.U. "	\$12m.
	At \$12m. - M.K.U. =	20%
	\$21m. "	30%
	\$32m. "	40%
	\$49m. "	50%

∴ C.R.A. must put in M.K.U. + a NPV of \$37m. to get 50%.



MARY KATHLEEN URANIUM LTD.
(INCORPORATED IN QUEENSLAND)
 95 COLLINS STREET, MELBOURNE, 3000

6th March, 1972.

②
 P.O. BOX 3810
 TELEPHONE 61-0491
 TELEGRAMS "CONRIO"
 TELETYPE AAM108

STRICTLY CONFIDENTIAL

Mr. R. H. Carnegie,
 c/- Rio Tinto-Zinc Corporation Limited,
 6 St. James's Square,
 London SW1Y 4LD,
England

Dear Rod,

Attached is copy of notes made on the uranium producers' meetings in Canberra and Sydney. I think I have covered the main points.

Would you kindly look over what I have written and amend where necessary. I suggest you let Mr. R. Wright have a copy which he might like to circulate to Louis Mazel and Barry Lloyd.

We are having a look at the possible production aspirations of the various Australian companies and I will send details to you tomorrow.

I trust you had a pleasant flight across and that things are going well for you in U.K.

Regards,

Yours sincerely,

H. F. Melouney

H. F. Melouney

It was expected that the marketing of uranium posed many difficulties for producers during most of the seventies

STRICTLY CONFIDENTIAL

6th March, 1972.

Notes on Meetings held in Canberra
on February 28 and Sydney on March 2

1. Canberra Meeting

The meeting was called by the Department of National Development primarily to brief potential uranium producers in Australia on the results of discussions which had taken place in Paris on 1-4 February, 1972.

The meeting was chaired by Mr. L. F. Bott, Secretary of the Department of National Development. Details of company representatives and government officials at the meeting are set out in Attachment I.

After opening remarks by the Chairman, Mr. D. J. Gates presented a detailed report on the discussions which had taken place in Paris. Details are set out in Attachment II.

Mr. Bott stated that the Commonwealth Government would like to see a logical and profitable development of Australian uranium resources with particular interest in the important discoveries in the Northern Territory which fell in its jurisdiction. The Government would do what it could to assist in this objective but believed that the industry itself must supply the initiative and take a major role. He suggested that the various uranium companies should join together and set up a representative committee with a spokesman to liaise with the Commonwealth Government and with world producers at further meetings proposed at Paris.

Various company representatives gave their views on Mr. Gates report and Mr. Bott's suggestion. Generally, it was agreed that the marketing of uranium posed many difficulties for producers during most of the seventies

- 2 -

and that some form of co-operation on a world basis was desirable. However, it was considered that the allocation of sales tonnage to Australian producers, proposed by the current producers at the Paris meetings, was unrealistically low and could not be contemplated.

At Mr. Bott's suggestion a recess was given and the company representatives held a brief meeting and appointed Mr. John Proud their representative to the next round of discussions in Paris on March 13-14. It was also agreed between company representatives that a further meeting would be held in Sydney on March 2 to discuss the formation of an industry committee or association, and to formulate ideas for the Paris talks.

Mr. W. J. Ricketts of the Department of National Development gave a brief address on the regional development proposed by the Commonwealth Government for the general area in the Northern Territory where the new deposits are located (see Attachment III). The position is complicated as most of the area is a native reserve and portion is proposed as a national park.

Mr. Ricketts also outlined the Government attitude to development in the Northern Territory. Exploration licences would be given for most areas (an area of about 100 sq. miles had been excluded from the national park area due to its particular scenic attractions) but the Government would impose certain conditions including the progressive relinquishing of area. In the case of companies having a successful programme, the Government was proposing that such companies would sign a 10 year development agreement, covering many important factors such as environmental preservation, pollution, health, etc., in order to get title.

Sir Philip Baxter gave an interesting address on the further processing and enrichment of uranium. Main points were:-

- (1) Conversion of UF₆ in Australia would add to the value of exports by the Australian uranium industry.
- (2) There would only be scope for one UF₆ plant for the foreseeable future.
- (3) The A.A.E.C. is developing a novel UF₆ process which shows the possibility of much lower cost.
- (4) The U.S. enrichment plants will become saturated around 1978-82 and new plants will have to be built urgently.
- (5) The A.A.E.C. is discussing with France and U.S.A. sharing of their enrichment technology. U.K. is not interested as it believes that the gas centrifuge is likely to prove better than the current gaseous diffusion plants. (Baxter believes also that the gas centrifuge will win.)
- (6) Lead time for a new diffusion plant is 8-10 years.
- (7) It may prove sensible in the short term to buy enrichment services from U.S.S.R. which is believed to have surplus capacity of 10,000-20,000 tons separative work.
- (8) Current price of enrichment in gaseous diffusion plants is US\$32 per kg of SW in U.S.A. and US\$26 in U.S.S.R. A new plant to be built starting now is unlikely to get below US\$45 and could be as high as US\$60.
- (9) Breeder reactor prototypes will be coming on stream in U.K. in 1973 and in France in 1974. U.K. is planning to have a commercial unit

- 4 -

of 1,300 MW(e) operating in 1980. It is certain that a large number of breeder reactors will be built in the mid eighties.

- (10) Breeder reactors will slow down the rate of demand for uranium. However, the total demand will show an upward trend at least until the end of this century.

2. Meetings held in Sydney on March 2

Arising from the Canberra meeting, a further meeting of interested companies was held in the offices of Peko-Wallsend Ltd. in Sydney on March 2.

All companies with current Australian prospects for uranium were represented. The meeting was called to set up a form of organisation for Australian producers and to formulate policy for the coming Paris talks.

Type of Organisation

Considerable discussion took place on the type of organisation best suited to the Australian scene. Three different types were considered:-

- (a) forum type
- (b) association type
- (c) Nufcor type

It was agreed that the less formal forum type was more relevant at this early stage but, at a later stage, a formal association type could ~~be required.~~

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Some members indicated possible conflicts of interest and difficulties which might arise from anti-trust legislation in Australia and elsewhere. For example, Pancontinental were associated with Getty Oil and the latter might have difficulty with U.S. anti-trust laws. To remove possible doubts as to the position of M.K.U., Mr. R. Carnegie gave details of the R.T.Z. organisation and its world interests in uranium.

Objectives of Organisation

The prime objectives of organisation were considered to be:-

- (a) to collate information about the Australian Industry
- (b) to liaise with the Commonwealth Government (and possibly relevant State Governments)
- (c) to liaise with overseas groups.

Paris Meetings

Discussion took place on the coming talks in Paris on March 13-14. It was confirmed that Mr. J. Proud would be the representative of the Australian Producers at these talks.

The general view was that Australia should be prepared to co-operate with other world groups but only if Australia was treated fairly. Companies such as Peko and Electrolytic Zinc were sufficiently advanced in their planning and marketing that they intended to proceed in any case.

It was considered that overseas groups, which had met earlier in Paris, really did not appreciate the very strong position of Australia. In fact, if Australia chose to stay outside of a world producers' club, it was likely that the idea would collapse.

Mr. Proud stressed the need for extreme secrecy.

ATTACHMENT IURANIUM DISCUSSIONSIn Attendance

Chairman	Mr. L. F. Bott, Secretary Department of National Development
C.R.A.	Mr. R. H. Carnegie Mr. H. F. Melouney
Exoil	Mr. C. W. Siller Mr. D. McKenzie
Noranda	Mr. T. A. Rodgers Mr. C. W. Duchatel
Pancontinental	Mr. G. Byrnes Mr. J. Rowntree
Peko - E.Z.	Mr. J. S. Proud Mr. G. B. Lean Mr. Tennison-Woods Dr. Mayers
Queensland Mines	Dr. R. Hutchinson Mr. P. Stork
Western Mining Corporation	Mr. A. H. Parbo Mr. J. Munro
A.M.I.C.	Mr. G. P. Phillips
A.A.E.C.	Sir Philip Baxter Dr. R. Warner
Interior	Mr. F. L. Ahrens
National Development	Mr. J.B.R. Livermore Mr. W. J. Ricketts Mr. L. C. Noakes <hr/> Mr. D. J. Gates
Trade and Industry	Mr. P. Connolly
Meeting Secretary	Mr. W. J. Curnow

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TELEPHONE 61-0491

TELEGRAMS "CONRIO"

TELEX AA30104

7th March, 1972.

Mr. R. H. Carnegie,
c/- Rio Tinto-Zinc Corporation Limited,
6 St. James's Square,
London, SW1Y 4LD,
England

Dear Rod,

Since you left, we have been having a look at the likely production aspirations of potential uranium producers in Australia. Attached for your information is copy of a paper prepared by Malcolm Baillie which sets out our ideas.

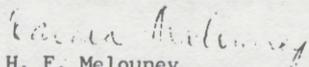
Clearly the anticipated market possibilities until around 1980 will not allow these aspirations to be achieved for all producers. Some will just have to be patient. Longer term, in the eighties, the position is expected to improve dramatically.

We think it reasonable that Australian producers could expect to get new sales of around 4,000 tons during the period to 1977 and 18,500 tons by 1980. This programme would involve some concessions from the world producers club.

I have written briefly to Roger Knott to put him in the picture and I have told him that John Proud will be representing Australian producers at the next Paris talks.

With regards,

Yours sincerely,


H. F. Melouney

ASSESSMENT OF SALES ASPIRATIONS OF
AUSTRALIAN URANIUM PRODUCERS

General

The market position for uranium is at present not favourable to uranium producers. Potential production to 1978 exceeds the available market, and it will not be until the early 1980's that the supply-demand situation becomes more balanced.

In view of this situation, an attempt has been made by suppliers on a world scale to agree on a co-ordinated market approach. Australian producers, while subscribing in principle to such an approach, are not willing to accept an arbitrary portion of the limited market - each company having aspirations of its own regarding the development of its particular deposit.

In this paper, the uncommitted uranium market as it is known is stated. This is then compared with possible company aspirations and finally, what is considered to be a reasonable objective for Australian uranium producers, as a group, is suggested.

The Uncommitted Uranium Market

Based on R.T.Z. estimates, the following table has been prepared. It includes all known uncommitted market requirements for non-U.S. applications plus an estimated 20 percent of the increase in U.S. requirements from 1979 - assuming the U.S. embargo is lifted in that year.

- 2 -

Uncommitted Uranium Market(Short tons)
1000's

Year	74	75	76	77	78	79	80	81	82	83	84	85
Non-U.S.	1.9	5.8	9.1	9.6	13	16	23	29	35	40+	45+	50+
U.S.*	-	-	-	-	-	0.5	1	2	3	4	5	5+
Total	1.9	5.8	9.1	9.6	13	16.5	24	31	38	44+	50+	55+

* Available to non-U.S. producers.

Individual Company Aspirations

Appendix I details our assessment of individual company objectives together with some notes on the state of development of their projects. The data are summarized below, together with the planned production schedule for M.K.U., indicating in that case the existing contracts and required additional tonnages. A total of required tonnage for Australia on this basis is shown both in absolute terms and as a percentage of the uncommitted market for each year.

- 3 -

Individual Company Aspirations

Year	75	76	77	78	79	80	81	82	83	84	85
M.K.U. (Contracts)	0.6	0.8	0.8	0.8	0.8	0.5	0.3	0.3			
M.K.U. (Addit.)	0.4	0.2	0.2	0.2	0.2	0.5	0.7	0.7			
Q.M.		1	1	1	1	1	2	2	2	2	2
Ranger			2.5	2.5	2.5	5	5	5	5	5	5
Noranda					2	2	2	2	2	2	2
Transoil						2	2	2	2	2	2
Pancon- tinenta						2	2	2	2	2	2
W.M.C.											
Total New	0.4	1.2	3.7	3.7	5.7	12.5	13.7	13.7	13	13	1
% Uncom- mitted	7	12.6	38.5	28	34	52	44	36	<30	<25	<3

It is clear that the total new tonnage indicated in the above table is an unrealistic expectation for Australian producers, and that some of the deposits will not open up as early as the owners may hope.

Reasonable Group Objective

The following table sets out our assessment of what may be a reasonable objective for Australian producers as a Group. It

- 4 -

is based on the view that a portion of the uncommitted market of from 10-15% can be obtained in the period to 1977 and that this could increase to 25-30% from 1978.

Reasonable Group Objective

Year	75	76	77	78	79	80	81	82	83	84	85
M.K.U. (New)	0.4	0.2	0.2	0.2	0.2	0.5	0.7	0.7			
Q.M.		1	1	1	1	1	1	2	2	2	2
Ranger			1.3	2.5	2.5	2.5	2.5	2.5	4	5	5
Noranda					1	2	2	2	2	2	2
Transoil								1	2	2	2
Pancon- tinenta							2	2	2	2	2
W.M.C.											4
Total New	0.4	1.2	2.5	3.7	4.7	6	8.2	10.2	12	13	17
% Uncom- mitted	7	13	25	28	28	25	26	27	<27	<26	<30

M. G. Baillie

7th March, 1972.

QUEENSLAND MINES (Nabarlek)A. State of Development of Deposit

<u>Exploration</u>	<u>Reserves</u>	<u>Development Program</u>
Nabarlek deposit adequately explored. Other anomalies not yet defined.	Defined in region of 10,000 tons of high grade ore. Additional reserves of the order of 20,000 tons possible.	Metallurgical testing underway. Feasibility study in preparation. Some market contacts

B. Earliest Timing of Completion of Definition of

<u>Scope</u>	<u>Design</u>	<u>Construction</u>	<u>Operation</u>
Mid 1973	Early 1974	Mid 1975	Late 1975

C. Possible Company Objectives

<u>Scale of Operation</u>	<u>Startup</u>
1,000 tpa	Jan. 1976
2,000 tpa	1980

D. Notes

High grade permits smaller economic plant and earlier penetration of market at required level.

RANGERA. State of Development of Deposit

<u>Exploration</u>	<u>Reserves</u>	<u>Development Program</u>
Some areas thoroughly explored but considerable additional potential.	In excess of 70,000 s. tons proven at 6-8 lb. U ₃ O ₈ per ton. Total reserves may be double this figure.	Metallurgical testing underway. Preliminary pit plan and feasibility study complete. Some market contacts.

B. Earliest Timing of Completion of Definition of

<u>Scope</u>	<u>Design</u>	<u>Construction</u>	<u>Operation</u>
Late 1973	Early 1975	Early 1977	Early 1977

C. Possible Company Objectives

<u>Scale of Operation</u>	<u>Startup</u>
2,000-3,000 tpa in 1977	1977
4,000-5,000 tpa by 1980	

D. Notes

Grade requires output of more than 2,000 tpa to be economic. Large size of deposit gives company considerable strength in its approach to the market.

NORANDAA. State of Development of Deposit

<u>Exploration</u>	<u>Reserves</u>	<u>Development Program</u>
Jim-Jim program well advanced.	Not published but estimated in region of 20,000 s. tons.	Preliminary testing has been completed.

B. Earliest Timing of Completion of Definition of

<u>Scope</u>	<u>Design</u>	<u>Construction</u>	<u>Operation</u>
Early 1974	Mid 1975	Mid 1977	Early 1978

C. Possible Company Objectives

<u>Scale of Operation</u>	<u>Startup</u>
2,000 tpa	1979

D. Notes

This is a large realistic company, not interested in a quick, cheap sale. Recognizes market problems.

TRANSOIL/EXOIL (AND OTHERS IN FROME AREA)A. State of Development of Deposit

<u>Exploration</u>	<u>Reserves</u>	<u>Development Program</u>
Active programs in progress.	10,000-12,000 tons proven. Possible 20,000-30,000 tons in area.	Metallurgical testing has begun.

B. Earliest Timing of Completion of Definition of

<u>Scope</u>	<u>Design</u>	<u>Construction</u>	<u>Operation</u>
1975	1977	1979	1980

C. Possible Company Objectives

Initial objective must be to prove up in excess of 20,000 tons U_3O_8 which would be minimum for economic development. A minimum production rate of around 2,000 tpa would be necessary and may be hoped for by company around 1980.

D. Notes

Deposit is deep and of only fair grade (4-6 lb. U_3O_8 /ton). It would require a major mining effort and will lag behind Northern Territory deposits in development.

PANCONTINENTALA. State of Development of Deposit

<u>Exploration</u>	<u>Reserves</u>	<u>Development Program</u>
Very active. No details known.	As yet not proven.	Not commenced.

B. Earliest Timing of Completion of Definition of

<u>Scope</u>	<u>Design</u>	<u>Construction</u>	<u>Operation</u>
Early 1975	Early 1976	Early 1978	Mid 1978

C. Possible Company Objectives

Initial objectives would be to prove reserves. Because of association with Getty, may aim at production concurrent with easing of U.S. embargo at end of decade - say 1980.

Production rate would need to be ~ 2,000 tpa if ore is comparable to Noranda/Ranger.

WESTERN MINING CORPORATIONA. State of Development of Deposit

<u>Exploration</u>	<u>Reserves</u>	<u>Development Program</u>
Actively proceeding.	Not published but may be in vicinity of 50,000 tons U ₃ O ₈ at 3-4 lb./ton.	Not well advanced.

B. Earliest Timing of Completion of Definition of

<u>Scope</u>	<u>Design</u>	<u>Construction</u>	<u>Operation</u>
1975	1977	1980	After 1980

C. Possible Company Objectives

Ore deposit is remote, patchy, low grade and poses metallurgical problems. Requires price rise. Unlikely that W.M.C. expects to exploit before mid 1980's, and will require an output of around 4,000 tpa.

D. Notes

This is a marginal prospect in relation to other existing undeveloped orebodies.

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 Telex 24639

GPD/LCM/mm

Mr. R. Carnegie,
 Conzinc Rio Tinto of Australia Limited,
 P. O. Box 384D,
 Melbourne,
 Victoria 3001,
 AUSTRALIA.

30th March, 1972.

Dear Rod,

As Mr. Wright probably told you, the discussion's amongst the uranium producers are not as yet successful but we hope they will continue on April 20th/21st.

In order to maintain, and hopefully to improve, the uranium prices it will be necessary to come to a quota arrangement. The two main problems are the uncertain position of the Rabbit Lake deposit in Canada together with its sales contract with Uranertzbergbaugesellschaft, and the Australian position in general.

I think that most producers were very much impressed by John Proud however, equally amazed about the large quantities he felt should be produced by the Australians during the latter half of this decade. After several discussions, I believe that John Proud now understands that an Australian production (new mines) of 5,000/8,000 tons per annum during the years 1977/79 is a bit unrealistic, bearing in mind that only a very limited amount of uncommitted tonnages is available. John Proud indicated that it might be possible to re-arrange the Australian planning in such a way that only one new Australian mine would be in operation with a 3,000 t. p. a. plant for the years 1977 through 1979.

At the meeting quotas through 1977 and quotas for the years 1978/1980 were discussed but current ideas involve one quota for the period 1972/79. We estimate that for this period about 44,000 tons are available*excluding the captive markets. During the Paris meeting 4 groups were established; Canada, France, South Africa and the "D" Group, the latter consisting of the new Australian producers, MKU, Palabora and Rossing.

* Per contracting

RT
 2200

- 4 -

Taking the total quantity of 44,000 tons and assuming that agreement can be reached on dividing it equally amongst those 4 groups, this would mean that "D" group has available 11,000 tons, plus 650 tons for an Australian reactor.

We still have to do some further investigations but all three, MKU, Palabora and Rossing will require some additional tonnages during the years concerned but we feel that it should be possible that the new Australians would get a share of somewhere between 8,000 to 9,000 tons. Based on John Proud's remark this might be acceptable to the new Australian producers as he mentioned that the first 3,000 p.a. mine could be brought into production with a start-up anytime during 1977.

You can imagine that the Canadian group regards it as unreasonable to bring in new producers with such large quantities but the others feel that it is in the interests of all of us if full co-operation can be achieved whilst improving uranium prices although selling lesser quantities. A point of concern is whether John Proud really represents all the new Australian producers such as Western Mining and Queensland Mines.

The current U_3O_8 offers have all prices of around \$1 higher than the quotations of about 6 months ago. The moment one producer undercuts these prices, most of us will follow such downward trends. We do not know the outcome of John Proud's report to the other producers but we understand that he will be back at the Paris meetings of April 20th and 21st. We would be grateful if you could give this matter some thought and let us know whether he will discuss matters on behalf of the Australian producers and whether we can expect the same kind of co-operation as he gave during the last meeting.

The details of a 1972/79 quota were not really discussed but if you have the opportunity you could perhaps mention this to some of the new Australian producers. Attached is a schedule of uncommitted demand totalling 45,835 and after deducting the captive Australian, Canadian and South African markets you will arrive at a figure of approximately 44,000 tons.

I would like to take this opportunity to mention that Prof. Mandel of RWE and Dr. Gärtner of UEGB will be visiting Australia in late April. Prof. Mandel is Vice Chairman of RWE (Germany's largest utility providing about 40% of West Germany's generating capacity) in charge of all RWE's nuclear affairs. Dr. Gärtner is a man very much behind the scenes in UEGB. We know both gentlemen quite well and they have indicated that they would like to meet some CRA people whilst in Melbourne.

I realise that 25th April is Anzac Day but as Harald Melouney suggested I should be in Melbourne during the last week of April to discuss some draft contracts with John Rodd and the 25th is their only evening available in Melbourne, I suggested dinner for that evening but I would very much appreciate it if you could perhaps invite them for dinner.

With kind regards,

Looking forward seeing you again,
Yours sincerely,

Louis Mazel

Louis Mazel

March 1

RTZ ESTIMATE OF THE UNCOMMITTED URANIUM MARKET THROUGH 1979

Short tons U₃O₈

COUNTRY	1973	1974	1975	1976	1977	1978	1979	Total
Austria	-	-	-	180	180	55	155	560
Belgium	-	-	360	345	310	620	605	2,240
Denmark	-	-	-	155	155	55	115	480
Eire	-	-	-	130	130	130	50	310
Finland	-	-	155	155	60	115	105	590
Germany	-	-	500	660	630	1,095	1,855	4,730
Greece	-	-	-	-	-	115	115	230
Italy	-	-	240	770	855	875	1,115	3,835
Netherlands	-	-	-	200	270	330	435	1,235
Norway	-	-	-	-	-	130	130	260
Portugal	-	-	-	-	155	135	55	345
Spain	-	-	-	-	-	1,450	1,915	3,395
Sweden	-	105	580	1,070	1,330	1,690	1,705	6,470
Switzerland	-	-	215	605	475	525	600	2,420
Turkey	-	-	50	50	70	120	120	410
UK	-	-	-	-	-	-	520	520
Total Europe	-	105	2,100	4,150	4,620	7,540	10,015	28,570
Argentina	-	-	-	155	155	60	350	720
Australia	-	-	-	130	130	180	225	665
Brazil	-	150	305	215	435	480	295	1,680
Canada	-	-	-	-	-	-	750	750
Chile	-	-	115	115	40	75	190	535
Hong Kong	-	-	-	-	115	115	40	270
India	70	110	110	140	190	375	425	1,420
Japan	50	680	370	1,045	1,090	1,440	1,210	5,885
Korea	-	-	45	115	125	320	525	1,130
Mexico	-	-	155	390	290	200	275	1,310
New Zealand	-	-	-	-	-	115	115	230
Pakistan	-	-	75	40	175	175	100	640
Philippines	-	-	-	115	115	150	190	570
South Africa	-	-	-	130	130	50	225	535
Taiwan	-	-	-	-	55	355	390	800
Thailand	-	-	-	-	-	-	130	130
Total Non USA	120	1,120	3,275	6,760	7,665	11,650	15,245	45,835

MKU 50 4 1
⑥

RTZ

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GPD/LCM/mm

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Mr. H. F. Melouney,
Melbourne Office

2nd May, 1972.

Dear Harald,

I did intend writing to you last week but as you suggested, I awaited your letter dated 27th April which I received this morning.

The discussions in Paris made further progress and we have now arrived at figures which are acceptable to the Canadians, French and South Africans, however, the Australians, including MKU, have retained the position of reconsideration on the understanding that a reply will be forthcoming not later than 23rd May, 1972.

During a dinner which I had with John Proud, George Leane and Dr. Meyer prior to the Paris meetings, I stressed that MKU should be regarded as part of the Australian producers and as such an internal Australian agreement, regarding tonnages, had to be reached. I mentioned that MKU would probably be willing to partake in the club if it had a quota of 900 tons through 1977.

At the formal meetings John Proud acted on behalf of all Australians but when squeezing became necessary he felt that he was in a rather difficult position to act on behalf of MKU as he did not know your position and consequently referred the matter to us. Alistair MacMillan on behalf of Rossing realised MKU's problem and kindly suggested that subject to Rossing Board approval, the 1976 Sydskraft and Tepco tonnages might be supplied by MKU for a consideration of, say, 5-10% of the revenue. However, this will require further discussion.

It was made very clear to the meeting that the 2% MKU share required MKU's approval but in order to avoid a similarly difficult position at the next meeting on May 29th in Johannesburg I hope that you will be present yourself.

- 2 -

From your letter I am glad to note that MKU's Board agreed to the suggested quota and Alistair MacMillan's idea. I would like to mention though that the quota is not 400 tons but 2% of 26,000 tons (the 1977 Shikoku tonnages apply against this). This means that if the total turns out for instance to be 10% less, your quota would be reduced by 10% as well (and based on to-day's knowledge we feel that 24,000 tons would have been nearer the mark).

	<u>%</u>	<u>s.t. U3O8</u>	<u>Contracted as of 1/1/72</u>	<u>Uncommitted s.tons</u>
Canada	33.5	8,710	4,500 (Spain 150 (Neckar)	4,060
Nufcor	23.75	6,180	190 (NWH)	5,990
CEA	21.75	5,650	230 (NWH) 50 (Shikoku)	5,370
Rossing	2	520	-	520
MKU	2	520	120 (Shikoku)	400
New Australians	17	4,420	300 (Shikoku)	4,120
	<u>100%</u>	<u>26,000</u>	<u>5,540</u>	<u>20,460</u>

We fully appreciate the problem that MKU is a public company but as you know companies such as Denison, Gulf, Rio Algom and the South African mining houses also have substantial percentages of their equity traded at the various stockmarkets. A typical example is that West Rand Consolidated very recently announced to its shareholders that they are planning to close down their uranium milling capacity as they have not been able to secure further uranium contracts.

You know that where possible I have always tried to obtain contracts for MKU but as your mineable reserves are only 8,000 tons with a limited annual production and a limited number of years of production, this together with the U₃O₈ over supply over the next 7 - 8 years is not always easy. Adding to this will be your recent problem regarding the possible refusal of the AAEC for approval of the 110 ton GKT contract. Could you let us know the actual position?

As far as the Commonwealth Edison position is concerned, we realise full well that it will be difficult for MKU if indeed deliveries were to be delayed by a few years. In practical terms, however, it would seem to be the most obvious way to solve the problem. A possibility would be the delaying of the 1976 and 1977 tonnages to 1980 and 1981 and the 1975 delivery of 125 tons to 1977, subject to CE's unconditional acceptance and at the contractual escalated prices.

An alternative (as per contract) is that Commonwealth Edison sells the tonnages concerned at the price of, say, \$2-3.00 lower than the contractual price,

- 3 -

e. g. MKU would receive \$1-1.50 less per lb. As these tonnages would probably be sold on the non-U. S. market, it would further reduce the previously mentioned 26,000 tons, or alternatively it has to be counted against a quota.

Your suggestion of stockpiling by Commonwealth Edison should also be considered but would appear to have little attraction for C. E. as the 1980 price, based on the 1975 price of \$7.25 compounding at 8%, would be \$10.63.

Irrespective of the arrangements which can be made with C.E., any additional tonnages which MKU might wish for should, I feel, come out of the Australian total tonnage of 4,940 tons and should be settled within the Australian group.

Regarding tonnages for 1975, I agree that the HEW tonnages are still available but without the club such tonnages would be out of the reach, price-wise of MKU (competing against stockpile) and in the case of an overall arrangement it will have to be divided whereby we might get 150-200 tons, at the maximum.

I have put some figures together based on the actual tonnages contracted plus the tonnages which might become available as a result of an overall arrangement and agree with you that 1975 and 1976 look rather depressing for MKU. You enquired about the possibility of borrowing U_3O_8 and I am confident that MKU can make an arrangement with the French for borrowing tonnages in 1975 and returning in either 1976 or 1977. The cost of borrowing could probably amount to \$0.01 per lb. U_3O_8 per month. Considering such borrowing it could open the possibility of commencing MKU's commercial start-up by late 1975, but MKU would then have a virtually full order book for 1976 and 1977. Might this be a solution?

In general terms discussions were also held in Paris regarding a quota system for the years 1978-80 and equal division between 5 groups (the Canadians, French, South Africans, Australians and RTZ) was suggested. This would mean that MKU would have no difficulty whatsoever to get further tonnages of, say, 200 tons per year during 1978-80.

I hope that this letter has answered most of your queries and although the uranium picture is a depressing one, we are convinced that it will be even more depressing if no general agreement can be reached.

In your letter you mention a word which we would not even like to mention as some members of the club are rather worried about informal price agreements. I would like to stress very strongly that under all circumstances there can only be an unofficial agreement and whatever agreement is struck it should be on a strictly confidential basis. For the outside world all Paris and subsequent meetings will be in connection with the exchange of marketing information.

- 4 -

I hope that some of my comments will be helpful to you.

With kind regards,

as always
Yours sincerely,

L. C. Mazel

L. C. Mazel

cc: Mr. R. Carnegie,
Conzinc Rio Tinto of Australia Ltd.
Melbourne.



MARY KATHLEEN URANIUM LTD.

(INCORPORATED IN QUEENSLAND)

95 COLLINS STREET, MELBOURNE, 3000

CONFIDENTIAL

P.O. BOX 384D

TELEPHONE 63 0491

TELEGRAMS "CONRIO"

TELEX AA19108

12th July, 1972.

Memorandum to : R. H. CARNEGIE, ESQ.

Copy to : F. F. Espie, Esq. ✓

From : H. F. Melouney *H.F.M.*

URANIUM

Thank you for your memorandum of 10th July, 1972.

Regarding the Rio Algom share of the uranium market I have attached a statement giving the position as we understand it. We know the total Canadian allocations for the two periods but the division between producers is an internal matter. However, we have reason to believe the figures are as set out.

You are correct that we did receive considerable information from Doug Gates in Canberra. However, you will recall that his data was mainly referable to government meetings which had been held prior to the inaugural producers' meeting in Paris. Australian producers had been excluded from this latter meeting.

MARY KATHILEEN URANIUM LTD.

- 2 -

John Proud attended subsequent meetings in Paris on behalf of the Australian group and he gave us brief reports on his return. However, Mazel had been present at all the producers' meetings and he gave me a detailed rundown on what transpired. He has been very helpful.

I am not sure what you mean by your reference to Mazel. Perhaps we can discuss this on your return.

Sgt. H.F.M.

H. F. Melouney

MARY KATHLEEN URANIUM LTD.

Rio Algom Share of Uranium Market

At the Johannesburg meeting it was agreed that the Canadian allocation of the available uranium market would be 33.5% and 23.22% respectively for the periods (a) to 1977 and (b) 1978-1980. At that time the estimated markets for the two periods were 26,000 tons and 45,000 tons respectively. The former figure has since been revised downwards to 24,000 tons.

The allocation to individual producers in Canada is an internal matter and we have no firm information. However, we believe the following is more or less correct.

1. Period to 1977 incl.

Estimated tonnage to Canada (33.5% of 24,000)	8,040 tons
--	------------

Allocation

Special Denison sale to Spain	4,300
Denison	840
Rabbit Lake (UEGB)	1,500
Eldorado	560
Rio Algom	840

2. Period 1978-1980 incl.

Estimated tonnage to Canada (23.22% of 45,000)	10,450
---	--------

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- 2 -

Allocation

Rio Algom	1,600/1,700
Other Producers (details not known)	8,750/8,850

H.F.M.

12th July, 1972.

RTZ. Services Limited

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LCM/mm

Mr. H. F. Melouney,
 MELBOURNE OFFICE

24th July, 1972.

Dear Harald,

We had a further meeting of the "Uranium Marketing Research Organisation" in France on July 6th, 1972. As a result of the Johannesburg meeting early in June it was decided that working level meetings would be held at regular intervals, in principle on a bi-monthly basis. Each of the 5 groups (Canada, France, South Africa, Australia and RTZ) will be represented by two members. During the meeting it was decided that Mr. Andre Petit, presently the representative of the CEA with Euratom, would for the time being act as Secretary for the "Research Organisation", based in Paris. A provisional annual budget estimate of French Francs 180, 000 (plus or minus R30, 000) was agreed.

It was further agreed, with some slight amendments, that the notes of the meeting in Johannesburg (of which please find a copy attached) would be adopted. It has been suggested by the Secretary that as few copies as possible be made in order to avoid eventual difficulties.

You will note that based on the average tonnages for the whole period through 1980, RTZ's contribution to the cost of the "Research Organisation" will amount to 10% which, based on the division of the RTZ tonnages would mean 6.4% to Rossing, 2.4% to MK and 1.2% to PMC. The Secretary asked for a total advance of N. Fr. 50, 000. I will ask the accounts department to remit N. Fr. 5, 000 and debit the respective companies accordingly.

One of the major points was the discussion regarding outstanding quotations, amongst others to HEW, and it has been agreed that both Nufcor and Mineral Services (on behalf of MKU) would be allowed to maintain their present quotation to HEW until the end of this month at the prices currently offered, which are below the minimum prices of the Club. We have very little hope that these quotations will turn into contracts.

Another point of great debate was the Chubu position. By refraining some time ago to quote lower prices, Chubu gave a Letter of Intent to both Nufcor (1300 tons) and Ranger (1300 tons), whereas the French and ourselves did not expect any contract at all. This did put Mitsubishi in a rather embarrassing position as Chubu insisted that they wanted to buy a small quantity through Mitsubishi, at the same prices, terms and conditions as Nufcor, from RTZ. The Nufcor and Ranger quotations were made during a period of co-operation but prior to an agreement on minimum prices and we could not now offer the same prices as Nufcor without referring to the Club. There was great resistance within the Club for RTZ to accept those Nufcor prices but in order to avoid serious difficulties with Mitsubishi it was finally agreed that we would be allowed to quote for 100 tons in both 1977 and 1978 (which we hope will be delivered by Rossing) at the same prices as Nufcor but with a penalty to RTZ of 5% on the tonnages to be delivered against our quota. As we felt that this was reasonable we have requested Mitsubishi to act accordingly. There are still various difficulties with Chubu on this matter as they want more tonnages for these prices and rather difficult terms and conditions but we hope to sort this out in due course.

It has also been agreed that the Australians and Nufcor will work out a scheme whereby they will be leading in regard to a quotation for Taiwan; the French and Nufcor will make similar arrangements for a quotation in Yugoslavia. I would like to mention that this does not mean we will not be quoting and it will still mean that we have to pursue it actively, but there is very little chance of our getting any of this business bearing in mind that we want pro-rata to increase our newly contracted tonnages under the quota system. Attached is our latest schedule regarding tonnages contracted for under the Club arrangement and the relevant percentages. I think the schedule is self-explanatory although it should perhaps be mentioned that it is sincerely hoped the French will obtain a contract in Sweden which would bring their percentages more or less in line with the other producers.

It was agreed that the next meeting of the Club be held in Sydney on October 2nd and 3rd and the following one in Toronto immediately after the AIF on 17th November. If you and John agree, I would like to suggest that you and I represent the RTZ Group in Sydney and John and myself represent RTZ in Toronto.

I believe I have outlined the major points of the "Uranium Marketing Research Organisation" to date and trust that if you have any comments you will let us know.

With kind regards,
Yours sincerely,

Louis Mazel

L. C. Mazel

6/72

1. SECRETARIAT

- (a) It was agreed that, on a temporary basis, the Secretariat should be located in Paris.
- (b) It was considered desirable that the permanent location should be in a neutral country.
- (c) It was agreed that the position of Secretary must be clearly divorced from any of the member groups of the organisation although it was further agreed that the Secretariat would be directed by an operating committee consisting of one representative and an alternate from each participating group.
- (d) Expenses of the Secretariat would be borne by the five participating groups in relation to their average market quotas over the period 1972-80 inclusive. These quotas were determined as :-

Canada	27%
NUFCOR	21%
Uranex	20%
Australia	22%
RTZ	10%

Billings will be made to each group on a quarterly basis.

- (e) The Secretariat should be designated as the "Uranium Market Research Organization".

/2.

2. MARKETS AND MARKET QUOTAS

(a) The following market quotas were recorded :-

<u>Group</u>	<u>1972-77</u>	<u>1978-80</u>
Canada	33.50%	23.22%
NUFCOR	23.75%	19.26%
Uranex	21.75%	19.26%
Australia	17.00%	24.44%
RTZ	4.00%	13.82%

(b) Market areas to be excluded from the present arrangements are :-

(i) The domestic markets of France, South Africa, Australia and Canada.

(ii) The United States domestic market.

(c) Sales to count against quota allocations are :-

All new sales after January 1, 1972, including -

(i) Spanish contract (Denison - UCAN)

(ii) Neckarwerke (WG and UCL)

(iii) Sweden

(iv) Shikoku (Queensland, RTZ, Uranex)

(v) Kyushu (Ranger, NUFCOR)

(vi) Chubu (NUFCOR, Ranger)

/(d)

(d) For tonnages in excess of those excluded under (e) and (f) below the RTZ-Rossing contract with UG, the Uranex/Somair contracts with UG and Agip Nuclear, and the UCL contract with HEB will be included in quotas.

(e) Sales to be excluded from quota allocations are :-

All sales concluded and options granted prior to January 1, 1972, including -

- (i) Brazil - Furnas (NUFCOR)
 - (ii) Westinghouse - Beznau (Rio Algom)
 - (iii) Tohoku (Denison, RTZ, NUFCOR)
 - (iv) Kansai spot sale (Rio Algom, NUFCOR, Uranex)
 - (v) Gundremmingen (NUFCOR and UCL)
 - (vi) GXT (NUFCOR, UG)
 - (vii) ENEL 4 (Uranex)
 - (viii) THTR/VEW (UG)
 - (ix) Steag/Muhleberg (UG)
- (f) Also excluded from the quotas will be UCL sales to RWE of 3 200 tons during 1972-77 and 3,000 tons during 1978-80 inclusive.

3. TERMS AND CONDITIONS

- (a) For future bids and re-bids the following minimum prices were agreed to for U308, c.i.f. conversion facilities:-

<u>Years</u>	<u>Japan, Taiwan & Korea</u>	<u>Others</u>
	<u>U.S. \$/lb. U308</u>	<u>U.S. \$/lb. U308 c.i.f.</u>
1972	5,60	5,40
1973	5,95	5,75
1974	6,30	6,10
1975	6,65	6,45
1976	7,00	6,80
1977	7,35	7,15
1978	7,70	7,50

In the case of quotations expressed in terms of UF6, these prices will become in U.S. \$ per pound of U contained in UF6 delivered franco U.S.A.E.C. :

<u>Years</u>	<u>Japan, Taiwan & Korea</u>	<u>Others</u>
1972	7,90	7,65
1973	8,35	8,10
1974	8,80	8,55
1975	9,30	9,05
1976	9,75	9,50
1977	10,20	9,95
1978	10,70	10,45

These prices include weighing, sampling, conversion losses but exclude interest charges.

(b) It was agreed that the preceding c.i.f. prices would apply to any converter. If f.o.b. prices are requested then reductions of up to 10c/lb. U308 through 1975 and 15c/lb. 1976-78 can be made.

(c) Quotations after 1978 should be made on the basis of one of the following alternatives :-

- (i) Escalation from a base price not less than the appropriate minimum price.
- (ii) Negotiated world market price with or without a floor.

It was agreed that there should be no effective ceiling price quoted lower than the world market price and there should be no escalation with a ceiling on the rate of escalation. The possibility of equity participation was discussed and it was accepted that this was outside the control of the agreement, but that the price in respect of the material should not be contrary to the rules.

(d) Standard conditions for payment would be :-

- 95% within 30 days after delivery at converter's facility or U.S.A.E.C. or f.o.b. as the case may be.
- the balance upon final acceptance or within 60 days after the delivery, whichever is the earlier, provided that if the final weight is not known within 60 days in the case of CIF delivery or 90 days for FOB delivery, adjustment can be made afterwards.

/Any

Any other terms of payment which deviate from the minimum will have to take into consideration a basic standard minimum rate of interest of 8% per year.

(e) Currency

For any quotations, if not made under the U.S. \$ system, they would be made out under the par rate existing at the time of quotation; if a par rate does not exist, at the average of buying and selling rates at that time.

Quotations can be made in either the buyer's or seller's currency, in U.S. Dollars or in any major European currency.

On the question of currency protection it was agreed that all members would give this further consideration and report back to the next meeting.

(f) Flexibility

On tonnages, initial cores or unspecified requirements: $\pm 10\%$ maximum on the contracted quantities.

Reloads : $\pm 15\%$ maximum on the contracted quantities.

Flexibility for a variation in tails assay content could be given in addition to the above.

(g) Lead time for flexibility condition

18 months before the start of any delivery year, the customer must identify provisional delivery

/months

months within that year, and the tonnage within the limits specified above.

9 months before the provisional delivery month or the actual delivery month, whichever is the earlier, the exact delivery date will have to be fixed within ± 2 months from the provisional delivery month at which time $\pm 5\%$ variation would be allowed provided the total variation does not exceed the limits specified under (f) above.

In case this flexibility leads to delivery in adjoining years, the minimum price for that year should apply as the absolute minimum.

(h) Force Majeure

(i) It was agreed that producers would not accept nuclear plant break down or permit withdrawal or lack of operating licences as a force majeure item.

(ii) In addition it was agreed that no one would accept a consequential damage clause.

(iii) It was agreed that no producer would waive a force majeure condition for any period in order to guarantee delivery.

(i) Replacement of late deliveries

Liability for late delivery would be limited to converter's surcharges in the case of delivery in U308 and U.S.A.E.C. surcharges in the case of delivery in UF6.

/In

In any short fall or rejection situation a minimum of one month should be required to make up the material. If contract specifications for U308 or UF6 are to be altered, any consequential increase or decrease in costs to be for the buyer's account.

(j) Taxes, Duties & Other Imposts

Suppliers will accept taxes and duties in their country, but not in any other country.

(k) Storage

Suppliers will provide free storage of U308 if there is space available. If there are any additional costs involved for storage, they would be for purchaser's account.

If storage is required after the agreed delivery date, then full payment shall be made on that date subject to adjustment later on determination of final weights and assays.

(l) Storage in UF6

Any storage charges for UF6 would be at the buyer's cost.

(m) Options

No tonnage options will be granted to the consumer.

(n) Validity period

The maximum validity period for any quotation shall be 90 days unless there is a prior agreement to the contrary. Any extension shall be consistent with the rules in force at the time the extension is granted.

/(o)

(c) Post 1980 business

It was agreed that there would be no restraints on post 1980 business other than the pricing mechanisms referred to under item (c) above and the obligation to report such business to the Secretary.

4. WORKING MECHANISMS FOR ALLOCATIONS(a) Allocation of sales

It was agreed that :-

- (i) Allocation of sales would be based upon up-to-date estimates of the market potential remaining.
- (ii) The allocations would be initially based on contracted tonnages and as far as possible each group's quota would be filled at a uniform rate.
- (iii) Final resolution of quotas for each quota period should be based on actual deliveries.
- (iv) Any adjustments necessary for each quota period will be realized through adjustments to future deliveries.
- (v) The Secretary will report on a quarterly basis on markets, contracts, deliveries and positions vis-a-vis quotas.
- (vi) The Secretary will be provided with copies of all contracts and invoices of actual deliveries.

/(b)

(b) Disclosure of Information

The following action will be taken when contracts are provided to the Secretary :-

- (i) The Secretary will vet the contract to ensure that it complies with the rules.
- (ii) The Secretary will attempt to resolve with the contracting supplier any apparent discrepancies or deviations from the rules.
- (iii) The Secretary will distribute price and quantity information to members on a routine basis.
- (iv) The contracting supplier will advise the Secretary whether or not the contract is available for inspection by other members. If the contract is not available for inspection then the supplier concerned shall at the request of any group representative explain at a meeting of the Operating Committee the reasons for non-disclosure. If the Committee considers that the reasons given do not justify non-disclosure then the group representative concerned may have access to the contract in question.
- (v) If there are discrepancies or deviations under (ii) above which cannot be resolved the Operating Committee may review the situation at its next meeting.

Letters of Intent, enquiries and quotations should also be provided to the Secretary for his use and vetting and for any necessary discussion with the producer.

/(c)

A leader and runner-up will be selected by the Secretary in consultation with the Committee. The selection will be based on the five participating groups rather than individual companies. The group selected as leader or runner-up will where appropriate designate a company within the group as a leader or runner-up as the case may be.

It was agreed that :-

- 
- (i) The leader would have the right to go to the appropriate minimum price then applicable.
 - (ii) The runner-up would have the right to go to the minimum price plus 8c/lb. for U308 or plus 15c/lb. for U in UF6.
 - (iii) All "Other Producers" would have the right to go to the minimum prices plus 15c/lb. for U308 or plus 20c/lb. for U in UF6.

The leader does not have to open bidding at the minimum prices but should not quote above the minimum figures applicable to the "Other Producers". The leader should advise the Secretary of his opening quotation.

5. ATTITUDE TOWARDS COMPETITORS

(a) Uranium Suppliers

It was agreed that if a supplier not associated with the organization should quote under the minimum price, the leader will not match that quotation and the Operating Committee will review the situation and decide on a course of action as soon as possible.

/(t)

(b) Fuel, reactor manufacturers, or any other middle men

All quotations to this type of purchaser should be made on the basis of the minimum prices applicable to Japan plus 15c/lb. for U308 or 20c/lb. U in UF6 as the case may be.

It was also agreed that no quotations will be made unless the end use of the material is known.

In making quotations to such purchaser it is recognized that the producer will have the right to quote direct to the end user.

The above shall not be applied to effectively exclude any member of the organization from any market.

CONTRACTS CONCLUDED

Short tons U₃O₈

	Spain	Neckar	Shikoku	Chubu	Kyushu	Chugoku	Total	Agreed Allocation	Total a Allocat
CANADA									
through 1977	4,472	285	-	-	-	-	4,757	8,710	54.6
1978-1980 (incl. R.A.)	-	255	-	-	-	-	255	10,450	2.4
1980 +	-	85	-	-	-	-	85	-	-
URANEX									
through 1977	-	260	90	-	-	-	350	5,655	6.2
1978-1980	-	50	-	-	-	-	50	8,665	0.6
1980 +	-	-	320	-	-	-	320	-	-
NUFCOR									
through 1977	-	185	-	1,000	100	-	1,285	6,175	20.8
1978-1980	-	35	-	300	300	-	635	8,665	7.3
1980 +	-	-	-	-	500	-	500	-	-
RTZ									
through 1977	-	-	120	100	100	-	320	1,040*	30.8
1978-1980 (excl. R.A.)	-	-	320	100	400	-	820	6,220*	13.2
1980 +	-	-	620	-	2,200	-	2,820	-	-
AUSTRALIA									
through 1977	-	-	300	200	125	100	725	4,420	16.4
1978-1980	-	-	260	700	625	150	1,735	11,000	15.8
1980 +	-	-	1,670	400	2,250	250	4,570	-	-
TOTAL									
through 1977	4,472	730	510	1,300	325	100	7,437	26,000	28.6
1978-1980	-	340	580	1,100	1,325	150	3,495	45,000	7.8
1980 +	-	85	2,610	400	4,950	250	8,295	-	-
TOTAL	4,472	1,155	3,700	2,800	6,600	500	19,227	-	-

*RTZ quota will be reduced by 5 tons

12 July 1972

RTZ FCM/pm

JUL 25 1972

	Through 1977	1978/80	Expenses % of N. F. 50,000	Total
Total RTZ	4% (1040)	13.82% (6220)	10% 5,000	(7260)
R. U.	2% (520)	9.22% (4150)	6.4% 3,200	(4670)
MKU	2% (520)	2.60% (1170)	2.4% 1,200	(1690)
PMC	-	2.00% (900)	1.2% 600	(900)

Figures in () are s.t. U_3O_8

⑨



MARY KATHLEEN URANIUM LTD.
 (INCORPORATED IN QUEENSLAND)
 95 COLLINS STREET, MELBOURNE, C.1

P.O. BOX 344
 TELEPHONE 63-0491
 TELEGRAMS "CONRIO"
 TELEX AA30108 AND AA30260

CONFIDENTIAL

8th August, 1972.

Memorandum to : F. F. LEVIE, ESQ.

Copies to : R. H. Carnegie, Esq.
 R. H. Harding, Esq.
 J. T. Ralph, Esq.
 J. M. Podd, Esq.

From : H. F. Melouney

URANIUM PRODUCERS' MEETING

Yesterday, I attended in Sydney a meeting of representatives of the Australian uranium industry. Copies of the agenda and list of representatives are attached for your information. Sir Reginald Swartz, Minister for National Development, attended the luncheon and gave a friendly and encouraging address.

The main purpose of the meeting was to inform government representatives of developments in the "producers' club" and to advise areas where government co-operation or assistance is likely to be required in the future.

Most of the agenda items were of a general nature and no decisions were required at this time. However, I attach copy of notes made on the more important aspects discussed.

H. F. Melouney

MARY KATHLEEN URANIUM LTD.

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Western Mining Corporation	Mr. H. O. Clark Mr. J. G. Munro
Noranda Australia	Mr. T. A. Rodgers
Queensland Mines	Mr. P. R. Stork Mr. M. B. Ferguson
Electrolytic Zinc Company	Mr. G. R. A. Mayers Mr. A. Blain
Peko-Wallsend Ltd.	Mr. J. S. Proud Mr. C. B. Leen Mr. B. C. J. Lloyd

MARY KATHLEEN URANIUM LTD.

Agenda of Meeting of Uranium Industry
at Sydney, August 7, 1972

1. Preliminary sessions:
To receive any points from both government and industry, not elsewhere appearing on the agenda presented.

2. B.C.J. Lloyd
To report on:
 - . Johannesburg conference
 - . Carnes conference
 - . Forthcoming conferences

3. To note the intention that world producers will convene on a policy basis as and when appropriate (telex Taranger).

4. To seek guidelines from Government as to its general attitude to forward uranium marketing, so that Australian producers may negotiate both with customers, and act with confidence within the arrangements prescribed by the world group of producers.

To seek degree of disclosure formally required by Government.

5. To discuss with Government its position regarding requests for:
 - (a) Back up material
 - (b) Export payment finance

6. The industry wishes to be kept informed as far as possible of the progress of government policy concerning the establishment of a nuclear industry in Australia relative to conversion, enrichment, power generation.

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- 2 -

7. To raise the problem of possible new economic discoveries which may be capable of being equipped as viable operations on the world price basis prior to at least 1980 and the consequences of such a situation.
8. To discuss whether action should be taken on registration under the Trade Practices Act, or whether this may be withheld pending gazettal of proposed amending legislation relative to uranium.
9. Relative to Northern Territory producers, to note their views relative to leasing conditions; and its consequential effect on Australian ownership and control of the resource.
10. Points to be submitted at meeting.

Conclusion: To seek some expression of the merit of this meeting; and if so whether there should be further meetings and if so the probable frequency of those meetings.

MARY KATHLEEN URANIUM LTD.

Notes on Uranium MeetingAgenda Item

2. Barry Lloyd gave a full report on the various conferences and advised that the next meeting of the working party would be in Sydney on October 2-3. The following meeting would be in Toronto on November 17.

Lloyd gave the proposed pricing policy for consumers in the Japan area and European area. He reported that sales to middlemen, such as reactor manufacturers, e.g. Westinghouse, General Electric, was to be discouraged and that any quotations given were to be 15 cents per lb. U_3O_8 higher than for equivalent sales to utilities.

Timbs of A.A.E.C. considered that the Australian government would have problems with this above policy towards middlemen as these were almost exclusively U.S.A. organisations. Discrimination in this area might bring U.S. government retaliation against Australia in regard to enrichment services. Timbs believed that the Japanese were overbuying intentionally with a view to establishing over the next decade a stockpile of up to 100,000 tons U_3O_8 which could be used as a base for an enrichment plant.

5. John Proud stated that the Japanese utilities were seeking government back-up or guarantee of supply of U_3O_8 before entering into supply

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- 2 -

contracts with the new Australian producers. He asked for a definition of government attitude.

Timbs stated that the government was not prepared to give any guarantee but would be prepared to loan U_3O_8 from the national stockpile of U_3O_8 of approximately 2200 short tons. Actual policy was not yet determined and this may take until mid 1973. Timbs indicated that the government intended to sell portion of the stockpile.

The question of export payment finance relates primarily to an enquiry from Taiwan for U_3O_8 . Previous purchases by Taiwan had been from U.S.A. and favourable long term finance had been arranged through the Export-Import Bank and Taiwan was now seeking a similar arrangement from Australia. George Weber had been following this matter specifically with A.I.D.C. and other financial institutions without much success to date.

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7. It was considered likely that further discoveries of uranium will be made in Australia before 1980. However, the

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- 3 -

lead time before an operation could result is around 5 years so 1976 might be the earliest time for this problem to really occur.

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8. A subcommittee under Hugh Clark had been set up to examine whether the broad agreements between producers required to be registered under the Trade Practices Act be registered under the Trade Practices Act.

Complete agreement was not reached but it was considered that a minimal submission should be made at this stage. Hugh Clark is to draft a relevant submission. John Gator undertook to discuss the matter informally with a deputy commissioner with a view to getting some indication of the official view.

During the meeting, I took up the question of M.K.U. membership of the Australian Club. I confirmed our earlier advice that we intended, at an appropriate time, to join with the Australian producers rather than remain as part of the R.T.Z. group. John Kroud suggested that we

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- 4 -

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H.F.M.

8th August, 1972.

MARY KATHLEEN URANIUM LTD.

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Mr. John S. Proud				
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. Paris No. 2	Apr/May 72	136.90*	241.89	378.79
		(Zurich, London, Paris)		
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Mr. C. B. Lean				
. Paris No. 1	Mar 72	2,049.40	4.14	2,053.54
. Paris No. 2		2,049.40	178.60	2,228.00
				<u>4,281.54</u>
Dr. G. R. Meyers				
				<u>2,529.33</u>
				<u>11,439.01</u>

2. Allocation(a) Estimated Sales of U₃O₈

	<u>Noranda</u>	<u>GM</u>	<u>WMC</u>	<u>Ranger</u>
1975-7	947	1,053	947	1,473
1978	900	500	1,450	1,450
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	<u>3,647</u>	<u>2,553</u>	<u>5,297</u>	<u>5,823</u>

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- 2 -

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Share of Market to 1980 - %	21.06	14.74	30.58	30.62
(b) Share of Expenses				
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10 (9) dup.
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CONFIDENTIAL

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Peko-Wallsend Ltd.	Mr. J. S. Proud Mr. G. E. Lean Mr. B. C. J. Lloyd

Most of the uranium ore in Australia is produced by the
Queensland Mines, Peko-Wallsend, and Electrolytic Zinc
companies. The Queensland Mines company is the largest
producer of uranium ore in Australia. The Peko-Wallsend
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MARY KATHLEEN URANIUM LTD.

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- 2 -

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REF 2107

PEKO-WALLSEND LTD.

JOHN S. PROUD

47 MACQUARIE STREET, SYDNEY
TELEPHONE 273641

27-9861

August 22, 1972.

Mr. R. H. Carnegie,
Director,
Cinzinc Riotinto of Australia Ltd.,
G.P.O. Box 3840,
MELBOURNE, Victoria, 3001.

Dear Mr. Carnegie,

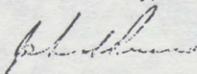
Enclosed are copies of letters of yesterday respectively to the Ministers for National Development and the Interior.

You will recognise that these follow the pattern dictated by the meeting of August 7th.

I have been under pressure from both secretaries for these letters to be submitted and I regret that pressure of work caused them to be so delayed that it was not practical to have them recirculated before mailing. However the material contained is the material which has previously been submitted to members of the group.

In view of the Pan Continental announcement today it is most appropriate that the letters should receive governmental consideration as early as possible.

Yours sincerely,



(JOHN S. PROUD)
Chairman of Directors.

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- acting as the
- members of the group may be disclosed and brought into production (and under consumer control) by circulating out a party to the arrangement.
5. If this happens, the total assets available to the group will be limited to the amount of the assets held by the group at the time of the disclosure, and the group will be unable to raise further funds.

PEKO-WALLSEND LTD.

47 MACQUARIE STREET, SYDNEY, N.S.W., 2000, AUSTRALIA. TELEPHONE 27-9861

August 21, 1972.

Sir Reginald Swartz,
Minister for National Development,
Parliament House,
CANBERRA, A.C.T., 2600

Dear Sir Reginald,

**URANIUM MARKETING AND THE CURRENT BELIEF THAT A NEED
EXISTS FOR A NATIONAL URANIUM POLICY**

The principles enunciated in this letter were raised in Sydney on August 7th when the Secretary of your Department and other officers together with the Secretary of the Department of the Interior were good enough to meet with potential uranium producers to discuss matters of common interest.

One such matter which particularly affects the Department of the Interior is referred to in a letter of today's date addressed to Mr. Hunt, a copy of which is attached for your information.

There are two specific matters which the industry wishes to place before you which are now stated under the respective heads of marketing policy and uranium resource policy. More particularly these are as follows:-

MARKETING POLICY

1. The Australian Government has asked the Australian producers to come to an arrangement which will ensure orderly marketing of uranium and will maintain the price of uranium at a reasonable level during the market surplus.
2. The six companies which presently intend to produce uranium in Australia (Peko-Wallsend, E Z Industries, Noranda Australia Limited, Queensland Mines Limited, Mary Kathleen Uranium Limited, and Western Mining Corporation Limited) are now parties to an arrangement which could meet the Government's wishes.
3. The world uranium market will be in substantial over-supply until the early 1980s. It is believed that the demand/supply ratio will be in balance in the mid-1980s and that there might be a shortage of uranium towards the end of the 1980s.
4. The greatest danger to maintaining the world marketing arrangement while there is a market surplus is that further substantial uranium deposits may be discovered and brought into production (by force and/or company control) by companies not a party to the arrangement.
5. If this happens, the total market available before, say, 1985, will be insufficient to meet the requirements. The industry is currently engaged in a study of this problem.

6. As the Government has expressed its strong wish to have orderly marketing of uranium, the Government might consider whether it should be prepared to take action to prevent new discoveries from upsetting such an arrangement.
7. The previously named producers will be able to meet Australia's share of the world market well into the 1980s.
8. The minimum position would be for the Federal Government to decide that it will not grant export permits for uranium to other than the previously named producers from already known deposits, until such time as the world market situation improves.
9. In the Northern Territory the Federal Government could also refuse to issue any further exploration licences for uranium until the market situation improves. The Commonwealth Government cannot prevent the issue of exploration tenements in the states, but would probably influence the states by taking this action.
10. The operation of the existing Northern Territory exploration licence ordinance requires that an exploration licensee may explore the entire area granted to him for a maximum period of only two dry seasons, thereafter reducing by half to a maximum retention for any part of the original area for a total of five years.

In these circumstances, farm-ins for parts of such important resource areas as those held by Queensland Mines (4,000 square miles) and E.Z.-Peko (2,720 square miles) are being sought by a number of interests which are not parties to the world producer arrangements.

URANIUM RESOURCES POLICY

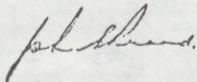
1. The uranium discoveries in Northern Territory and Western Australia in recent years have given Australia world ranking as a potential producer of uranium. There is little doubt that further discoveries will be made.
2. The markets for Australia's uranium are overseas. Because of uranium's strategic importance as the main source of energy in the future, all consuming countries are dealing with uranium on a national policy level.
3. Producing countries, specifically Canada, are recognising the need for a national policy regarding uranium and in this respect we attach a letter of June 22, 1972 from Mr. O. J. C. Runnalls, Senior Adviser, Uranium and Nuclear Energy to the Government of Canada, setting out the position in that country.
4. We believe Australia should also have a national policy regarding uranium. Uranium is expected to be an increasingly important resource of the future and in view of the Canadian experience of overseas ownership of its mineral resources and indeed our Australian experience in the alienation of our major mineral resources to overseas ownership and control, there is yet time to follow the Canadian example of securing to Australian ownership and control this new important energy source.
5. Such a policy could be considered on two levels:
 - (a) Australia's position in world markets,
 - (b) Uranium as a strategic mineral.

END LTD.

6. The Commonwealth Government could enforce such a policy by announcing that export permits for uranium will not be granted to any future projects with less than the requisite major Australian equity.
7. The Government may also wish to place limits on foreign ownership of Australian deposits for strategic reasons. In this connection exploration for uranium is being undertaken by a number of overseas companies, none of which is a party to the world producers arrangements.
8. It would appear reasonable for the Government to decide that all future uranium finds in Australia should be under Australian control, i.e. at least a majority equity interest. In this connection the policy established by the Canadian government is of particular interest.
9. Overseas companies holding exploration areas before the new policy is effected could be encouraged to follow the example of Noranda Australia Limited and to plan for at least 50% Australian ownership in any finds that may be made on their areas.
10. The best estimate of the uncommitted uranium market through to 1900 is 75,000 tons U_3O_8 and for sales emerging in the 1900s there is already in Australia adequate proven uranium to maintain Australia's competitive position with the world suppliers. Thus there is no urgent need to bring into production new uranium sources within the next decade.
11. The cost of establishing uranium production relative to the sale value of the product is possibly the lowest of any mineral so that two matters follow:-
 - i) That to develop its own uranium resources to capacity within the capacity of Australia's domestic capital resources,
 - ii) On the other hand to overdevelop the milling side of this industry in its infancy would place undue stress on the borrowing credibility of the emergent Australian producers.

The above is submitted as matters which it is believed merit serious Government consideration and in view of the splendid relationship which is emerging between Government and the uranium industry we are encouraged to believe that such consideration will be generously given.

Yours sincerely,



(JOHN S. PROUD)
Chairman of Directors.

rh.

c.c.: The Hon. Ralph J. Hunt,
Minister for the Interior

PEKO-WALLSEND LTD.

47 MACQUARIE STREET, SYDNEY, N.S.W., 2000, AUSTRALIA. TELEPHONE 27-9861

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The Hon. Ralph J. Hunt,
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Parliament House,
CANNERRA, A.C.T., 2600

Dear Mr. Hunt,

**URANIUM MINING TITLES IN THE NORTHERN TERRITORY - PRACTICAL
DIFFICULTIES OF MEETING REQUIREMENTS OF EXPLORATION LICENCES**

On Monday 7th instant representatives of potential uranium producers (that is those companies who have defined economic resources) met representatives of government including Mr. George Warwick Smith, Secretary to your own Department, and Mr. Lloyd Bott, Secretary to the Department of National Development, who was accompanied by Mr. D. J. Gates and Mr. W. Ricketts.

Those representatives of industry whose mining titles are located in the Northern Territory raised amongst the matters discussed at that meeting the very serious problem which they are encountering regarding the detailed exploration of their Exploration Licences under the requirements of those licences.

The operation of the existing Northern Territory exploration licence ordinance requires that an exploration licensee may explore the entire area granted to him for a maximum period of only two dry seasons, thereafter reducing by half to a maximum retention for any part of the original area for a total of five years. The right to convert selected prospects or areas of interest to long term mineral tenure under leases or other mining tenements is very dubious under existing conditions. Applications for leases in the Northern Territory uranium provinces have been held up for over eighteen months since court hearings have determined applications legal in all respects and recommended approval.

In these circumstances, farm-ins for parts of such important resource areas as those held by Queensland Mines (4,000 square miles) and E.Z.-Peko (2,720 square miles) are being sought by a number of interests which are not parties to the world producer arrangements.

Such farm-ins are considered adverse to the long term interests of the Australian community and particularly to the Australian uranium industry. In fact as far as many of these interests are concerned, these are antagonistic to the nearby interests of Australia as the discovery and exploitation by any of these interests will immediately subtract from the market otherwise available to Australia and jeopardize the large investments in the new uranium mining and milling plants being planned for both the Northern Territory and Western Australia.

A slowing down of the rate of work would also result in a more systematic approach and more effective use of exploration funds.

..../2

Mineral exploration in the South Alligator uranium province in the Northern Territory would benefit technically by a slower rate of exploration. The area is practically unique in being one of the only uranium provinces in the world in a low lying tropical area where lateritic and semi-lateritic cover is developed ubiquitously. New techniques for effective uranium exploration have to be developed and each new technique as it is applied has to be patiently tested for its effectiveness. Much more efficient exploration will result by a systematic approach to the problem of uranium exploration over an extended period.

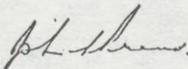
Should existing exploration licence holders be shown to be satisfactorily exploring the areas in their possession, tenure should be reasonably continuous and in the event that they be shown not to be satisfactorily exploring their area, the areas it is then suggested should revert to the Crown for reallocation to Australian interests in accordance with policy from time to time as required.

The implementation of a policy generally in accordance with the requirements suggested above could in no way prejudice Australia's export of uranium concentrate, as between MKU, the Northern Territory mill and the Western Australian mill there could exist capacity to export not less than 12,000 tons U_3O_8 per annum by 1900, which total market tonnage could not be considered available by that date.

Concurrently with this submission to you a submission is also being made to the Minister for National Development comprehending matters also raised at the same meeting and as these two problems are in some measure reciprocal we have taken the liberty of enclosing with this letter a copy of the letter forwarded to the Department of National Development, and with the letter to the Department of National Development a copy of this letter to you.

It is the belief of the uranium industry that although the reward of this industry will not be of great significance before the end of the 1970s, that Australia will develop a very important uranium industry into the 1900s and beyond, and the little time left should be believe be used to Australia's best advantage.

Yours sincerely,



(JOHN S. PROUD)
Chairman of Directors.

rh.

c.c.: Sir Reginald Swartz,
Minister for National Development.

BOX 8211, P.O. ROYAL EXCHANGE, SYDNEY, N.S.W. 2000. CABLES: WALLSEND SYDNEY. TELEX 21107

12

PEKO-WALLSEND LTD.

47 MACQUARIE STREET, SYDNEY, N.S.W., 2000, AUSTRALIA. TELEPHONE 27-9861

August 29th, 1972.

Harald Melouney Esq.,
General Manager,
Mary Kathleen Uranium Ltd.,
95 Collins Street,
MELBOURNE. 3000

Dear Harald,

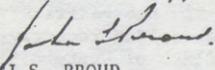
As you know, the other Australian uranium producers have always thought that the logical place for MKU was within the Australian camp. We were, therefore, pleased to have you with us at our recent meeting with Government.

I gathered that you are still clarifying the MKU/RTZ situation, but I hope that this will soon be resolved so that a free exchange of ideas can take place within the Australian uranium industry.

We do of course, accept that MKU would be entitled to retain that part of the world market which it feels could be secured under the RTZ umbrella. However, should any factor outside the current general understanding between Noranda/Western Mining/E.Z. and Peko require rethinking of the Australian situation then it would seem logical that MKU should be treated on the same basis as these other companies.

I hope that you will soon find it convenient to confirm that this is your understanding of the situation.

Yours sincerely,



J.S. PROUD,
Chairman of Directors.

Principal operating companies
Peko Mines N.L., Orlando Mines N.L., The Newcastle Wallsend Coal Company Pty. Limited
Mount Morgan Limited, Geopko Limited, A. F. Toli Transport Ltd., H. H. Chadwick Transport Limited
King Island Scheelite Ltd., Warnier Equipment (International) Ltd.



MARY KATHLEEN URANIUM LTD.
(INCORPORATED IN QUEENSLAND)
 95 COLLINS STREET, MELBOURNE, C.1

(13)

C.1. CRA 50 3 2 A.

P.O. BOX 344D

TELEPHONE 61-0491

TELEGRAMS "CONRIO"

TELEX AA3108 AND AA30569

21st September, 1972.

Mr. J. M. Rodd, C.B.E.,
 Arthur Robinson & Co.,
 447 Collins Street,
 Melbourne, 3000

Dear John,

As you know, M.K.U. as part of the R.T.Z. Group is a member of the Uranium Producers Club. This Club, comprising virtually all the free world producers of U_3O_8 with the exception of U.S.A., was set up late last year to regulate sales of U_3O_8 with a view to improving prices.

The Australian Group comprising the following companies:-

Peko Mines No Liability
 Electrolytic Zinc Company of Australasia Limited
 Noranda Australia Limited
 Western Mining Corporation Limited
 Queensland Mines Limited

has been concerned with the position of the various Australian companies vis-a-vis the Restrictive Trade Practices Act 1971. It was decided recently, I think on the advice of Mr. Hugh Clark of Western Mining Corporation, that each company would register their agreement with the Registrar. Unofficially, I have obtained a copy of a typical submission and this is attached for your information.

MARY KATHLEEN URANIUM LTD.

- 2 -

M.K.U. is not a member of the Australian Group but is part of the R.T.Z. Group and I am not clear of our position in relation to the Restrictive Trade Practices Act. I would appreciate your opinion whether it would be advisable for M.K.U. to make similar registration at this time. If so, I would like to see a draft of an appropriate submission.

Please let me know if you require any additional information.

Kind regards,

Yours sincerely,

Sgd. H.F.M.

H. F. Melouney

AUSTRALIAN PRODUCER CLUB

AGENDA

OCT 30 8 11 AM '72

FOR MEETING TO BE HELD AT 47 MACQUARIE STREET, SYDNEY, AT 10.30 AM ON WEDNESDAY, 1ST NOVEMBER 1972

1. REVIEW OF GENERAL MARKET SITUATION

THE AVAILABLE MARKET HAS BEEN REDUCED BY THE SLIPPAGE IN REACTOR PROGRAMMES, DELAYS CAUSED BY LICENCING DIFFICULTIES, AND BY THE GENERAL DOWNTURN IN POWER GENERATING REQUIREMENTS. SOME UTILITIES HAVE SURPLUS URANIUM INVENTORIES AND THE MARKET REMAINS IN A STATE OF GENERAL OVERSUPPLY. COMPETITION MUST BE EXPECTED FROM WESTINGHOUSE, AND OTHER US REACTOR VENDORS. REPORTS OF NEW FINDS IN AUSTRALIA CONTINUE TO GIVE CONFIDENCE TO THE UTILITIES AND GENERAL OPPOSITION TO THE CLUB WILL RESULT IN UTILITIES DELAYING THE AWARDING OF SUPPLY CONTRACTS.

2. ATTITUDE OF AUSTRALIAN PRODUCERS TO WESTINGHOUSE, OTHER MIDDLE MEN AND OTHER COMPETITORS

3. ATTITUDE OF AUSTRALIAN PRODUCERS TO NEW POTENTIAL PRODUCERS IN AUSTRALIA.

4. FORWARD PRICING

IN THE SSPB NEGOTIATIONS, WESTINGHOUSE OFFERED FIXED PRICES THROUGH 1985. THIS MADE THEIR OFFER MOST ATTRACTIVE AND WE MAY BE REQUIRED TO OFFER FIXED PRICES AT LEAST THROUGH 1979. THIS IS TO BE DISCUSSED AT TORONTO.

5. QUOTAS

THE PRESENT QUOTA SYSTEM DIVIDES THE YEARS UP TO 1980 INTO TWO PERIODS. THIS CAUSES DIFFICULTIES IN ALLOCATING CONTRACTS WHICH OVERLAP THESE PERIODS. IT HAS BEEN SUGGESTED THAT THE PERIODS SHOULD BE MERGED AND THIS MATTER WILL BE DISCUSSED IN TORONTO.

WHICH OVERLAP THESE PERIODS. IT HAS BEEN SUGGESTED THAT THE PERIODS SHOULD BE MERGED AND THIS MATTER WILL BE DISCUSSED IN TORONTO.

6. OTHER MATTERS TO BE DISCUSSED IN TORONTO

7. EFFECTIVE WORKING OF THE AUSTRALIAN CLUB

- (A) INFORMATION FLOW
(B) DISTRIBUTION OF COSTS.

8. ALLOCATION OF CONTRACTS WITHIN AUSTRALIA

WITH PARTICULAR REFERENCE TO THE POSSIBILITY OF SUBCONTRACTING WITH URANEX FOR PART OF THE SSPB BUSINESS.

9. POSITION OF MKU AS A MEMBER OF THE AUSTRALIAN CLUB.

10. SALE OF 1,000 TONS TO CEA

AUSTRALIAN PRODUCERS TO DECIDE ON THE SUBSTANTIAL POINTS AND THE WAY IN WHICH THESE NEGOTIATIONS SHOULD BE PROCESSED.

11. ANY OTHER BUSINESS

...BARRY LLOYD

FOR:

MR T RODGERS
NORANDA

MR H CLARK
WESTERN MINING

J MILNER/P STORK
CLD MINES

AJ PAYHE / GRA HAYERS
EZ

MF MELOUWEY
CONZINC RIOTINTO

PLEASE IDENTIFY IN ORDER

=

4

7 10-0380(

⑮

RTZ

MKU 70 4 1

RTZ Services Limited

PO Box 133
 6 St James's Square London SW1Y 4LD
 Telephone 01-930 2399
 Telegrams Rozinc London Telex SW1
 Telex 24639

LCM/mm

Mr. H. F. Melouney,
 MELBOURNE OFFICE.

3rd November, 1972.

Dear Harald,

Thank you for your letter of October 16th, dealing with the negotiating and concluding of MKU's uranium contracts. I fully appreciate that MKU, and you in particular, wish to be closely and actively involved and fully informed regarding uranium matters which we try to handle for and on behalf of MKU and I like to think that, especially over the last twelve months we have made serious efforts to achieve some a full involvement.

I would be very happy if you were to attend all the committee meetings of the Uranium Club but I see it more as a question of setting off usefulness against expenditure. As you will remember, we discussed and agreed that you would participate in the Paris Club meeting during May and at the same time you and I would go to HEW and discuss the progress of their Brunshüttelkoog reactor. If you want to attend the London meeting, as you know the dates are January 8th and 9th, you would be most welcome and I would be grateful if you could let me know so that we can inform the Club accordingly.

As you heard at the meeting in Sydney, Nucor will arrange a meeting in March in South Africa and, as we discussed, I had in mind to ask a representative of Rossing Uranium to attend this meeting, but if you feel strongly about it you would be equally welcome to be in Johannesburg at that meeting.

On the marketing side you know that we are in the process of transferring 300 tons for Tepco and 140 tons for Sydkraft from Rossing to MKU and this is really a case of transferring and not negotiating. In other words, it is indeed a matter, as you expressed, of "take it or leave it".

- 2 -

The latest negotiations in Japan were with Shikoku and you actively participated in these negotiations in Tokyo. During my last visit to Melbourne earlier this month we discussed the final points of the Shikoku Minserve/MKU back to back contract. During my subsequent visit to Japan we finalised a 200 ton deal with Chubu and had an introductory discussion with Kyushu. We only to-day suggested that further negotiations be held in Fukuoka with Kyushu in the week beginning December 11th and, here again, you would be most welcome to join Spencer and Robert who will, in principle, be dealing with this matter. We discussed to-day a re-draft for the Minserve/Kyushu contract as there were some comments by Kyushu which we would like to include in the contract. We hope to send you a copy of this re-draft early next week, which will also include most of John Rodd's comments made earlier this month.

I feel that in essence all negotiations should be carried out by either Rossing, MKU or Palabora but due to the present circumstances of a combination of deliveries from different mines and delivery of U²³⁵, we have perhaps had a very strong lead in the negotiations, but it has always been our intention to have full consultation and agreement with Rossing, MKU, Rio Algom and Palabora.

As you mentioned in your letter, I am now not only dealing with uranium matters and as head of what is now called the "Energy Department", in so far as necessary, either Robert or ultimately Peter Daniel will give me a hand with the somewhat lengthy detailed negotiations, particularly the Japanese.

It is always difficult to express one's feelings precisely in a letter but I hope that I have clearly put the message across that we want MKU, as well as Rossing, Rio Algom and Palabora, to participate actively in any form of negotiations we might carry out on their behalf regarding uranium which might be delivered by either of these companies.

I do hope that we will have a chance to discuss the matter in more detail when we are both in Washington in early November.

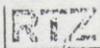
I look forward to seeing you again.

Yours sincerely,

L. C. Mazel

L. C. Mazel

From H. F. MELOUNY



✓ MKU 30. 4. 1

16

RTZ Services Limited

PO Box 133
6 St James's Square London SW1Y 4LD
Telephone 01-930 2399
Telegrams Riozinc London Telex SW1
Telex 24639

4th December, 1972.

3 LTT

for your information we
are hoping to hear something
before from Commonwealth

Edwin Shortly

? in relation to MKU

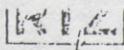
November and I am glad that we had
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that MKU plays an important role in RTZ uranium operations. The Policy meeting
in Paris is, as you know, on April 11th and I would think that in one way or another a
dinner will be arranged in Paris on Tuesday evening. I will, in due course, arrange
that we will be with FIEW on April 12th.

Spencer and Robert will be with Kyushu from December 11th until the 16th
and I do not think that any further meetings will be held in Japan this year. I myself
hope to be in Japan during the second week of January but this will be mainly to
strengthen our ties with Tepeco and Kansai, pay a courtesy call on Takamatsu and discuss
with Hishimaru what progress they think they might be able to make during 1973.

I hope that Spencer will be able to send you a draft contract for Mitsurugi/
MKU in relation to the Sydraft tonnages and a letter for the transfer of the Tepeco
tonnages regarding the point whether or not to increase the commission or reduce the
price for this particular deal. I will certainly give this matter some thought and let you
know in due course. It is indeed not an easy deal but we are making progress.

As you know, I rang George Rifakes from Montreal last week but he indicated
that they were still evaluating our proposition. I grasped from George that they have made
a deal of some kind with Westinghouse and when I indicated to George that we would be
rather unhappy to assign the tonnages concerned to Westinghouse, he stated very clearly
that if he bought the material there would be no way in which we could stop him passing it
on to Westinghouse. Nevertheless, he indicated that there might be some merits in



 RTZ Services Limited

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 6 St James's Square London SW1Y 4LD
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 Telex 24639

LCM/mm

Mr. H. McLouney,
 Melbourne Office.

4th December, 1972.

Dear Harold,

Thank you for your letter of 28th November and I am glad that we had the opportunity to talk over a few things in Washington and Toronto. I am extremely glad that it was finally possible for you to come to Toronto as it confirmed once more that MKU plays an important role in RTZ uranium operations. The Policy meeting in Paris is, as you know, on April 11th and I would think that in one way or another a dinner will be arranged in Paris on Tuesday evening. I will, in due course, arrange that we will be with HEW on April 12th.

Spencer and Robert will be with Kyushu from December 11th until the 16th and I do not think that any further meetings will be held in Japan this year. I myself hope to be in Japan during the second week of January but this will be mainly to strengthen our ties with Tepeco and Kansai, pay a courtesy call on Takamatsu and discuss with Hishimaru what progress they think they might be able to make during 1973.

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delaying part of the tonnages. He said he would let us know within the next 2-4 weeks but knowing Commonwealth Edison it might take a little longer.

I think that is all for the moment, I will keep you posted of further developments.

With kind regards,

Yours sincerely,

L. C. Mazel

L. C. Mazel

(17)



MARY KATHLEEN URANIUM LTD.
(INCORPORATED IN QUEENSLAND)
95 COLLINS STREET, MELBOURNE, C.I

P.O. BOX 36D
TELEPHONE 63-8491
TELEGRAMS "CONRUJ"
TELEX AA30108 AND AA30568

December 21, 1972

Mr. L.C. Mazel,
Rio Tinto-Zinc Corporation
Limited,
6 St. James's Square,
London SW1Y 4LB

Dear Louis,

Thank you for your telex of November 6.

Our legal advisers have informed us that the statement contained in the telex is insufficient to justify a conclusion on their part that R.T.Z. has not given undertakings to the world producers club which could be regarded as binding M.K.U. They have requested that we obtain from you answers to the following questions:

1. Has R.T.Z. ever undertaken to ensure that M.K.U. adheres to the terms and conditions contained in the world producers Agreement?
2. Do the other members of the world producers club operate on the understanding that M.K.U. is bound by an undertaking given by R.T.Z. to comply with the terms and conditions of the world producers club Agreement?
3. If the answer to either of the above two questions is "yes", has R.T.Z. taken any steps to inform the other members of the club that M.K.U. is not bound by virtue of R.T.Z.'s membership?

We look forward to receiving your advices as to the above at an early date.

JAN 25 1977

MARY KATHLEEN URANIUM LTD.

- 2 -

With reference to the last paragraph of our letter of October 16, you will know that since then there has been a change of Government in Australia. While it seems likely that the new Government will amend our Trade Practices legislation some time next year, it is by no means certain that the exemption contained in the previous Bill will be included.

Regards and very best wishes,

Yours sincerely,

H.F. Malouney

(18)

RTZ**RTZ Services Limited**

PO Box 133
 6 St James's Square London SW1Y 4LD
 Telephone 01-930 2399
 Telegrams Riozinc London Telex SW1
 Telex 24639

LCM/mm

Mr. H. F. Melouney,
 MELBOURNE OFFICE.

22nd January, 1973.

Dear Harald,

I still have on my desk your letter dated December 21st, 1972. I am very much afraid that there is not a straight answer to any of the three questions; the only thing that I feel is right to say is that on neither of the first two questions is the answer a straight "yes". This is perhaps a devious way of answering but I will try to elaborate.

As you know, we have always maintained that MKU is an independent Australian company for which we cannot make any decisions whatsoever. Therefore, in any discussions with other uranium producers, or for that matter with utilities, we always indicate, if no representative of MKU is present, that we will have to discuss the relevant matter with MKU and hopefully be able to persuade them to take certain action.

It should be said that there is no "Producers' Agreement" or anything like it. Some of the uranium producers discovered, during the exchange of information on supply and demand, that there are some similarities of ideas and each producer is applying these in its own way.

As an answer to your first question, RTZ has never undertaken to ensure that MKU will adhere to certain terms and conditions.

The answer to your second question is perhaps slightly more complicated but as you have attended several meetings with the other uranium producers yourself there are no real undertakings amongst the various producers but it is hoped that in

the spirit of co-operation and in order to get some order in the uranium marketing, producers will not always give in to the demands of the utilities and/or fuel manufacturers.

I hope that with this letter we have provided you with sufficient information.

With kind regards,

Yours sincerely,

L. C. Mazel

L. C. Mazel

1/18/73 10:40

CRASERVE 282

FEB 15 9 26 AM '73

FOR THE ATTENTION OF MR H.F. MELOUNY

RE YOUR 288.

YES I AGREE WE ARE CAUGHT UP IN THE INTERNATIONAL CURRENCY SITUATION AND ARE APPALLED BY THE FACT THAT OUR GOOD FRIENDS IN SOUTH AFRICA AND AUSTRALIA ARE NOT DEVALUING AS WELL.

I FULLY AGREE WITH YOU THAT THIS OUGHT TO BE DISCUSSED DURING THE NEXT CLUB MEETING BUT AS THE COST TO THE U.S. PRODUCER HAS NOT BEEN INCREASED, AN INCREASE IN THE NON-USA PRICES COULD MEAN EVEN MORE SEVERE COMPETITION FROM U.S. PRODUCERS AND REACTOR MANUFACTURERS. WHAT IS HAPPENING IS THAT IN PRINCIPLE THE AUSTRALIANS ARE OUT-PRICING THEMSELVES WHICH DOUG GATES PRINCIPALLY AGREED TO DURING LUNCH TODAY. ADVANCING THE MEETING TO MARCH WILL MEET WITH ALL KINDS OF PRACTICAL DIFFICULTIES AND WOULD NOT REALLY CHANGE VERY MUCH AS THERE ARE, APART FROM TAIWAN AND MEXICO, NO MAJOR QUOTATIONS OUTSTANDING.

IF THE AUSTRALIAN GOVERNMENT WERE TO INSIST ON CONTRACTS IN AUSTRALIAN DOLLARS THIS WOULD MAKE IT EVEN MORE DIFFICULT TO OBTAIN CONTRACTS FOR AUSTRALIA AND MKU BUT AGAIN IT IS A POINT WHICH I THINK REQUIRES FURTHER DISCUSSION.

ALTHOUGH I HAD IN MIND THAT YOU WOULD BE IN PARIS ONLY FOR THE SENIOR MEETING ON APRIL 11TH, I WOULD BE VERY HAPPY IF YOU WANT TO ATTEND THE JUNIOR MEETING ON THE 9TH AND 10TH AS WELL BUT IF SO COULD YOU PLEASE CONFIRM THAT MY UNDERSTANDING IS CORRECT.

ALTHOUGH I DO NOT KNOW HOW WE MIGHT PUT APRIL 12TH TO BEST USE, I AM THINKING AT THE MOMENT OF COMING BACK TO LONDON AND PERHAPS ARRANGING A MEETING FOR YOU AND ME TOGETHER WITH DOUG GATES.

BEST REGARDS

LOUIS

14TH FEB 1973

•

CRASHAR AA31840

(20)

MR. H. MELOUNEY ✓



MKU 30-4-1

Confidential

R.T.Z. Services Limited

Ref: DEW/km

PO Box 133
 8 St James's Square London SW1Y 4LD
 Telephone 01-930 2399
 Telegrams Riozinc London Telex SW1
 Telex 24639

17th October 1973

Monsieur Andre Petit,
 B.P. 510,
 75752 Paris Cedex 15,
 France.

Dear Monsieur Petit,

I understand from the recent meetings that members of the Club hope to have, by late October, more complete exchange of information with regard to contracts that have been secured before and after the formation of the Club.

An exchange of information on this scale would be an enormous help to me in compiling a more realistic supply and demand picture, which would in turn be of considerably more value to everybody concerned.

I am, therefore, enclosing an up-to-date copy of RTZ contracts for your information in this respect.

Yours sincerely,

Deborah Wolverson
 Deborah Wolverson,

c.c. Mr. M. Houdaille
 Mr. B.C.J. Lloyd
 Dr. J.C. Rennalls
 Mr. R.E. Worroll

(21)

MKV 30-4-1



R.T.Z. Services Limited

H
1733

Ref: KEB/km

PO Box 133
6 St James's Square London SW1Y 4LD
Telephone 01-930 2399
Telegrams Riozinc London Telex SW1
Telex 24639

26th October 1973

Mr. H.F. Melouney,
M.K.U.,
Melbourne.

Dear Harald,

I enclose a copy of the draft minutes of the last Operating Committee Meeting held on October 8th and 9th.

Yours sincerely,

Ken Baylis

K. E. Baylis

Doc N° 73 - 95

Paris, October 17, 1973

Mr. Louis MAZEL
 E. T. Z.
 P. O. Box 133
LONDON S. W. 1 Y 1LD

Dear

Mr. Mazel

Please find enclosed :

- The draft Minutes of the Eighth Session of the Operating Committee held in London on October 8 - 9, 1973. , with their Appendix .
- A letter asking for your financial contribution for the fourth quarter 1973 .
- Table B 24 .

You will receive the Minutes of the Policy Committee and of the Subcommittee held in London as soon as possible, as well as revised version of Table A 37 .

With best regards ,

Yours sincerely .

*Stewart*André PETIT*(as Mr. Petit is away)*

DRAFT MINUTES OF THE
EIGHTH SESSION OF THE OPERATING COMMITTEE
HELD IN LONDON ON OCTOBER 8 - 9, 1973.

I. - APPROVAL OF THE MINUTES.

The draft Minutes of the Operating Committee held in Johannesburg on August 2nd and 3rd, 1973 were approved with the following amendments :

- Page 5. a) fifth line : read "... be added or substituted , between ... " .
- Page 5. c) eleventh line : read 97.75 % instead of 97.95 .
- Page 5. last but one line , read " that , for contracts concluded after club commencement , they should ... " ..
- Page 7. paragraph 21 , fourth and fifth lines , read :
" ... with European customers but such initiative ... " .

II. - REVIEW EXISTING BUSINESS (Table B.22)

- a) The Canadian partners were asked to accelerate the negotiation of the subcontract with the Australians for the Hokuriku contract with Gulf .
- b) Pending further investigation it was agreed to leave the 130 s. t. for Neckarwestheim (C 2b) in the R. T. Z. quota in second period .
- c) The tonnages counted against Uranex quota for Trabel (A. 53) were confirmed until conclusion of this business .
- d) It was decided to switch the INEN - Mexico (A. 26) tonnages from the Australian and Canadian quotas to Uranex .

- e) Concerning the additional tonnages for Neckarwestheim (A. 2 complement) , it was decided to wait for the decision of the customer before including any tonnage in any group's quota . It was also agreed that it was up to Nufcor whether or not to permit the re-selling of part of their Philipsburg tonnages to Neckarwestheim .

III. - NEW BUSINESS .

- a) Leibstadt (A. 55) : The leadership is given to Australians acting in conjunction with Nufcor . All tonnages obtained either by Australians or by Nufcor will be counted against Australian quota . Runner - up will be joint bidding by Uranex and Eldorado . All bidders may seek the form of currency protection they prefer , but may also quote Swiss francs without currency protection . If contracts are granted to runner-up , there will be no obligation to sub-contract.
- b) Westinghouse NOK (A. 60) : Uranex will be leader and Canadaït runner -up .

IV. - RELATIONS WITH MIDDLEMEN .

- a) C. F. P. : R. T. Z. confirmed the contract was for 15 000 s. t. , yearly quantities increasing from 1981 to 1990, at World market price FOB Southern Africa . Shares bought are 10% of Rossing's capital . The tonnages can be re-sold anywhere and Total wishes to be associated with the Club . The contract is open for inspection by the Secretary in R. T. Z.'s offices .
- b) Ranger - ENI : The contract with AGIP is for 10 693 s. t. from 1981 to 1990 at World market price with a floor of Aust. \$ 6 (= U. S. \$ 8. 91) . AGIP get 10% equity in Ranger I and will take 10% of the output at costs in addition to the quantities sold . The tonnages are mainly for Italian Market . The contract is under review by the government and the Secretary will be informed

.../...

as soon as a decision has been taken .

- c) AGIP-Somafr : Latest information given is included in revised version of table A . 37 . It was decided to include this business in Table B. 23 under Uranex quota . Nufcor was also contacted by AGIP but refused to quote .
- d) Westinghouse : Nufcor received from Westinghouse a proposal to buy at 25% below Club prices and declined it .

V. - BORROWING .

There was general agreement to decline borrowing outside the Club .

VI. - SUBCONTRACTING . (INEN)

See above item II. d) .

VII. - POSSIBLE ADJUSTMENT FOR LOW PRICED CONTRACTS .

The possibility of correcting the tonnages counted against one group's quota when low prices have to be quoted in order to match external competition may be contemplated for future business on an ad hoc basis .

VIII. - SALES OF DERIVATIVES OF U₃O₈ OR UF₆ .

R. T. Z. will confidentially indicate to the Secretary the price quoted to P. N. C. (A. 42) and the breakdown of this price in order to enable him to verify that the natural uranium was not counted in this price for a value below leader minimum . In the future the prices quoted to the customers will be disclosed in tables A and the breakdown communicated confidentially to the Secretary .

IX. - ESTIMATE OF THE UNCOMMITTED MARKET .

R. T. Z. 's estimate of the Uncommitted Market dated October 1973 was noted . It was suggested that the 310 s. t. mentioned for Yugoslavia in 1977 should be switched to 1978.

The groups will disclose , if possible before the end of October , the quantities sold from 1973 onwards in contracts concluded before the Club . They will indicate the name of the buyer and the yearly tonnages . The existence of options and if possible their tonnages will also be disclosed .

.../...

X. - DISCLOSURE OF CONTRACTS CONCLUDED UNDER
PARAGRAPH 2 f) OF FIRST JOHANNESBURG MINUTES.

For contracts concluded before Club's operation , only the tonnages will be indicated to the Secretary . For new contracts it is contemplated to communicate them confidentially to the Secretary .

A letter of intent is under negotiation for Mühlheim Kärlich for the following tonnages :

460 M. T. U in 1976 - 77

195 M. T. U in 1979

184 M. T. U in 1980

187 M. T. U in 1981

189 M. T. U in 1982

190 M. T. U in 1983

XI. - NEW LINE OF PRICES.

Following the Policy Committee's decision to increase the rate of escalation of our line of prices , a new line of prices was established as indicated in Appendix to the present Minutes.

There will be no automatic adjustment of this line of prices due to currency movements , but the Secretary will inform all groups if he notes any further depreciation of the dollar . This new line of price will be proposed to the next Policy Committee , but will be applied immediately unless there is formal opposition by anyone of the groups . In particular it will be applied to Leibstadt, Westinghouse and KKN .

Following the Policy Committee's decision, the decision taken in Johannes concerning currency protection was removed .

Emphasis is stressed on FOB - CIF problem which will be considered when designating the leader .

XII. - It was agreed to discuss during the next meeting of the Operating Committee the problem of re-negotiation of prices in Japanese contracts . Nufcor and R. T. Z. will consult bilaterally on re-negotiation of the Austrian contract .

.../...

- XIII. - It was agreed not to quote in any market below the non - Japanese minimum for leader , without prior approval of the Operating Committee .
- XIV. - It was decided to invite UG to discuss their problems with the Operating Committee during its next meeting . Uranerzbergbau will also be invited .
- XV. - Uranium institute . R. T. Z. and Canada will study the possible conditions in which such an institute might function in U.K. and Canada . The Australians will prepare a draft constitution .
- XVI. - Secretary's fifth quarterly report will be examined at the next meeting . It was accepted that a contribution of 100.000 F.F. for the fourth quarter of 1973 should be requested .
- XVII. - Next Operating Committee meetings to be held on :
- . November 23. 1973 most probably in Las Palmas .
 - . January 29. 1974 and possibly on February 2nd . 1974 in Johannesburg .
-

Doc N° 73 - 91

According to the decision taken by the Policy Committee, the Operating Committee has, during its meeting on October 9, 1973, established the new prices as follows :

New minimum prices C. I. F. any converter (1) as from Oct. 9. 1973.

	lb U_3O_8		Kg U in UF6	
	Japan Taiwan Corea	Other countries	Japan Taiwan Corea	Other countries
1973	6.85	6.70	20.75	20.35
1974	7.35	7.20	22.15	21.75
1975	7.85	7.70	23.60	23.20
1976	8.35	8.20	25.00	24.60
1977	9.10	8.95	27.10	26.70
1978	9.85	9.70	29.15	28.75

These price are the agreed minimums for all bidders . For each business , designated leader and runner up may go below these prices with the following rebate :

Leader : - 20 cents for U_3O_8 - 50 cents for UF6
 Runner-up : - 5 cents for U_3O_8 - 15 cents for UF6

It was recalled that the leader could be authorized by the Operating Committee to go below these prices if it was necessary to match external competition .

(1) As previously , in case of quotation F. O. B. , reductions of up to 10 c / lb U_3O_8 through 1975 and 15 c / lb 1976 - 78 can be made .

SERU
SOCIÉTÉ D'ÉTUDES
DE RECHERCHES D'URANIUM

Documentation Department

Tele : 20412 SERUDOC PARIS

Téléphone : 734-80-72
or 273-60-00
Extension 50-90

SERU - Doc
N° 73 - 94
AP / sg

Paris , October 16th 1973

Mr. Louis MAZEL
R. T. Z.
P. O. Box 133
LONDON S. W. 1. Y 4LD

Object : Financial contribution for fourth quarter 1973 .

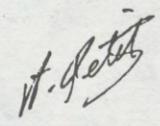
According to the decision taken during our last meeting in London ,
the total financial contribution necessary for our common studies during
the fourth quarter of 1973 is French Francs : 100 000. 00

Your share in these expenses being : 10 % , could you
please send me the sum of : 10 000.00 F. F. preferably by bank draft ,
or by transfer to the following account :

Compte N° 211 - 332
Banque Nationale de Paris
7 Place Vendôme - BP N° 47
75021 PARIS CEDEX 01

Thanks in advance and

Best regards.


André PETIT

(42)

73 NOV 28 8 30

THE COMMONWEALTH
EDISON

CRASERVE 1955

STRICTLY CONFIDENTIAL

FOR MR R CARNEGIECC MR H. F. MELOUNEY
MR G ELLIOTT

RE, MKU

IT IS MOST LIKELY THAT AS A RESULT OF NEXT JANUARY CLUB MEETING PRICES WILL INCREASE SUBSTANTIALLY AND CONSEQUENTLY IT WILL THEN BE MORE DIFFICULT TO PLACE EARLIER TONNAGES WITH LOW FIXED PRICES AT OTHER MINES.

I STRONGLY RECOMMEND COMING TO A FORM OF DECISION ON MKU REGARDING 1975 AND 1976 TONNAGES. IN PRACTICAL TERMS I WOULD SUGGEST THAT WE TRY TO PLACE THE SYDKRAFT 144 TONS, HEW 130 AND 188 TONS, THTR 30 TONS AND GKT 110 TONS POSSIBLY WITH PALABOZA AND/OR RIO ALGOM OR EVEN THE FRENCH. THE TEPCO 300 TONS AND CHUGOKU 200 TONS CAN PROBABLY STILL BE PLACED WITH ROSSING WHEREAS THE COMMONWEALTH EDISON 625 TONS FOR 1975 AND 1976 SHOULD PROBABLY BE CANCELLED COMPLETELY.

THIS WOULD MEAN A START UP OPERATION IN 1977 OF, SAY, 1000 TONS INCREASING TO 1200 TONS BY 1978 UNTIL MKU HAS BEEN MINED OUT.

THERE SHOULD NOT BE TOO MANY DIFFICULTIES IN OBTAINING THOSE TONNAGES FOR 1979/84.

IN ORDER TO AVOID DIFFICULTIES ON THE EARLY TONNAGES I REALLY THINK THAT SOME ACTION OUGHT TO BE TAKEN FAIRLY SOON AND ALTHOUGH I AM ABROAD UNTIL MID-DECEMBER, IF YOU FEEL THAT THIS IS THE CORRECT THING TO DO I WOULD LIKE TO PROCEED WHEN I AM BACK ON DECEMBER 17TH.

NB:

WE HAVE JUST RECEIVED A RATHER SLOPPY ENQUIRY FROM COMMONWEALTH EDISON ASKING FOR TONNAGES 1981/82 WHICH MIGHT WELL GIVE US THE POSSIBILITY OF COMING TO AN OVERALL AGREEMENT WITH COMMONWEALTH EDISON. HAVE AIRMAILED YOU A COPY TODAY.

KIND REGARDS,

LOUIS HAZEL.

27TH NOV 73

73 NOV 20 6 27

CRASERVE 1947

FOR MR H F MELOUNEY

CC: MR R CARLIGIE
MR G ELLIOTTSTRICTLY CONFIDENTIAL

MEETINGS LAST PALMAS WOULD INDICATE WILLINGNESS OF PARTNERS TO CONTINUE WITH CLUB AND IN PRINCIPLE AGREEMENT HAS BEEN REACHED ON THE QUOTA SYSTEM 1981/83 AND LIMITATIONS AS WELL AS OF 1984. ALL OVER DEAL FOR RTZ IS NOT TOO BAD BUT IS SUBJECT TO FINAL DISCUSSION AND APPROVAL BY POLICY MEETING IN JOHANNESBURG LATE JANUARY.

REGARDING RENEGOTIATIONS OF CONTRACTS, THE AUSTRALIAN GROUP DO NOT WANT TO RENEGOTIATE DUE TO THE WEAKNESS OF THEIR POSITION AND WERE AGAINST RENEGOTIATIONS FOR THE TIME BEING. THE CANADIANS HAVE NO DESIRE TO DO SO EITHER AS THEY ALREADY HAVE HIGH PRICES FROM OLD FIXED PRICE PLUS ESCALATION CONTRACTS. AS FAR AS NUFCOR, THE FRENCH AND OURSELVES ARE CONCERNED, THERE IS NO COMMON POINT OF VIEW APART FROM THE FACT THAT, AS YOU ALREADY INDICATED IN YOUR TELEX, THERE IS A HIGHER RATE OF INFLATION THAN ORIGINALLY EXPECTED AND UNFAVOURABLE CURRENCY DISPARITY. IT HAS NOT YET BEEN POSSIBLE TO COME TO A COMMON APPROACH BUT WE WILL PURSUE THIS MATTER IN JAPAN SLOWLY BUT SURELY AND TRY TO OBTAIN AN INCREASE OF FIXED PRICES OF BETWEEN 15 AND 20 PERCENT.

THE TOTAL TONNAGE INVOLVED BETWEEN THE THREE OF US AMOUNTS ROUGHLY TO 15,500 TONS AND GIVING AN INCREASE OF THE PERCENTAGE INDICATED ABOVE THIS WOULD MEAN A TOTAL ADDITIONAL REVENUE FOR THE THREE URANIUM PRODUCERS OF DOLLARS 30M. CONSEQUENTLY YOU CAN IMAGINE THAT IT WILL NOT BE EASY TO CONVINCE THE JAPANESE THAT IT IS THE RIGHT THING TO DO.

REGARDING THE VISIT TO JOHANNESBURG, I DO NOT KNOW AS YET HOW USEFUL AND NECESSARY IT IS FOR YOU TO BE THERE BUT WE MUST REALLY HAVE SOME IDEAS ON MKO'S EARLY TONNAGES AS I AM AFRAID THAT IN A RELATIVELY SHORT TIME IT WILL NOT BE POSSIBLE TO PLACE THESE TONNAGES ANYWHERE.

REGARDS,

LOUIS.



Handwritten notes:
Val
Robert Cole
L. H. ...
...
...
...
...

RTZ. Services Limited

LOUIS C. MAZEL

PO Box 133
6 St James's Square London SW1Y 4LD
Telephone 01-930 2399
Telegrams Riozinc London Telex SW1
Telex 24639

With Compliments

Doc n° 73 - 104

5 Déc. 1973

M:U 50
 Urgent - c2
 T.L. g...
 H. Schutt.
 HFM -
 P.D.
 K.D.

DRAFT MINUTES OF THE 9th ¹² V. 21. 3.
 OPERATING COMMITTEE HELD IN LAS PALMAS
 ON NOVEMBER 23, 1973

1. - Renegotiation of Japanese contracts

The two other groups having no intention to renegotiate their contracts for the time being, it was agreed that RTZ, Uranex, and Nufcor would act in close cooperation in this respect. It was agreed that no reduction of tonnages would be accepted in the framework of such negotiation.

2; - Relations with UG

The Committee had an exchange of views on this subject with the participation of representatives of the companies concerned. As a conclusion it was accepted at least for 6 or 9 months, that UG would adhere to all club rules and that there would be a full exchange of informations between the Operating Committee and themselves through the channel of Uranex and RTZ.

3. - Adjustment of percentages due to Australian situation

According to the present political situation in Australia, it was agreed to accept Australian suggestion that the tonnages they were not able to sell in the first period as a consequence of this situation, should be added to the tonnages they were entitled to sell within the second period. It was also agreed that the Australian would not be given leadership in second period until they get the green light from their Government, or until the moment the Australian producers make under their own responsibility a specific request.

Accordingly the following new percentages for both periods were adopted ad referendum :

	<u>1st period</u>	<u>2d period</u>
Canada	37.3	21.86
Uranex	24.2	18.38
Nufcor	26.4	18.30
RTZ	4.5	13.65
Australia	7.6	27.81

.../...

- 2 -

4. - NOK - Gosgen Däniken

Leadership was given to Uranex for first core and to Canadians for the surplus. There will be no runner-up. Quotations can be made in Swiss francs or US \$ without currency protection.

5. - Negotiations with Middlemen

It was agreed that nobody would enter into serious discussions with Westinghouse before coming back to the club

Denison and Nucor have been approached by Exxon.

6. - Quotations into US market

This item will be discussed again during Johannesburg meeting.

7. - Review of prices

Denison explained that the pricing policy they had announced during the last Policy Committee meeting was not acceptable to their customer, who wanted to extend their contract, but who's lawyers could not accept the world market price concept. They were thus contemplating an escalated price beyond 1985, but based on a price well over the present level of prices. No figures being given for prices, quantities, and duration contemplated, in this particular case, the Committee was only able to recall that, according to the decisions taken by the Policy Committee, no escalated price was acceptable after 1985, but only, if requested, an escalated floor on a negotiated price.

Concerning the possible review of present prices, it was decided to postpone any decision until the next meeting. It was decided not to extend the validity of existing offers beyond the end of January.

8. - Johannesburg meetings

- Monday 28 and Tuesday 29 January : Operating Committee
- Wednesday 30 January : Subcommittee
- Thursday 31 January : Policy Committee
- Friday 1st, February : Operating Committee.

HFR1a1 →

SPECIAL SUB-COMMITTEE OF THE
POLICY COMMITTEE

Supplementary note on additional recommendations agreed at the meetings held on 21 st and 22 nd November 1973 at Las Palmas.

1. - PRODUCERS ASSOCIATION

It was agreed to recommend that

- a) a formal association should be set up ;
- b) membership should; be confined to companies engaged in mining production or marketing of uranium ;
- c) the main office should be located in London.

2. - CONSTITUTION OF THE ASSOCIATION

A draft constitution was tabled by the Australian representatives. This provided for membership to be open to companies other than producer. The Chairman undertook to prepare a modified draft for submission to the Policy Committee after approval by the Sub-Committee at its next meeting.

Las Palmas 23 November 1973

(25)

Doc N° 73 - 103

5 Déc. 1973

WORKING PAPER

SUBJECT : Transfer of Australian tonnages from the first period to the second.

During its 9th meeting in Las Palmas, the Operating Committee agreed in principle to the transfer from first to second period of the tonnages which the Australian will not have been able to sell in first period due to political circumstances. In order to implement this decision, the Operating Committee suggested to modify the agreed percentages for first and second periods so that, on the basis of the present market estimates, the Australian share be reduced with 1383 st in the first period and increased with same tonnage in the second.

It was not made clear what the decision proposed was : to transfer a given tonnage, or to modify the percentages.

If the decision is to transfer from one period to the other the tonnages the Australian would have been entitled to sell in the first period according to the percentages initially agreed upon, it seems better not to do it by the way of a modification of percentages. As a matter of fact, a solution would lead to further modifications of percentages, for example if the Leibstadt business is not concluded as expected, and each time the market estimates will change. For this reason it appears simpler to decide that, when the Australian will resume quoting in second period, a part (for example onethird) of the business allocated to them would not count against their second period quota until the total of the tonnages so deducted equalizes the deficit of Australian sales in first period. The remaining first period business would be shared among the other groups, in proportion of their agreed quotas.

If the decision is to adopt definitively new percentages, irrespective of what may happen in the future on the market, it is even simpler. But one must be aware of the fact that this means that the Australians may actually get, in second period, an additional tonnage much lower or higher than the one they will have lost in first period.

Mc 1116 (26)

STRICTLY CONFIDENTIAL

67

ORDERLY MARKETING

NEW PRICE STRUCTURE : JOHANNESBURG : 28 JANUARY 1974

1. MINIMUM FIXED PRICES : C.I.F. ALL CONVERTERS
OR C.I.F. ALL ENRICHMENT DELIVERY POINTS, AS
APPROPRIATE:

<u>Delivery</u>	<u>U308 US \$/lb.</u>	<u>% Increase</u>	<u>UF6 US \$/kg U in UF6</u>
1974	8,50	18	25,20
1975	9,35	21	27,50
1976	10,30	26	30,10
1977	11,35	27	32,95
1978	12,50	29	36,10

NOTE:

- (1) Fixed prices may not be offered for deliveries after 1978
- (2) Above minimum prices to apply without any special premium as formerly applied to purchasers in the Far East and to middlemen
- (3) Leader and runner-up may discount above minimum prices by not more than :

	<u>U308/lb.</u>	<u>UF6/kg U</u>
Leader	\$ 0,30	\$ 0,30
Runner-up	\$ 0,10	\$ 0,25

- (4) For f.o.b. U308 sales, the following maximum reductions are permissible per lb. U308 :

1974 and 1975 : \$0,10

1976 to 1978 : \$0,15

5. UF6 prices include weighing, sampling, conversion, losses during conversion ($\frac{1}{2}\%$) and are calculated according to U308 c.i.f. prices plus conversion at unchanged assumed costs of :

US \$/lb. U

1974	1,35
1975	1,40
1976	1,45
1977	1,50
1978	1,55

2. ESCALATED PRICES

For deliveries after 1978 but not beyond 1985 or as an alternative to the minimum fixed prices in 1. above, escalated prices, on a base price of US \$10,00/lb. U308 c.i.f. all converters (\$29,10/kg U in UF6 c.i.f. all enrichment delivery points) may be offered from any year provided that :

- (a) the escalation formula is to operate from 1974 at the stipulated minimum base price irrespective of the first delivery year in the contract;
- (b) at least 80% of the price is subject to escalation; and
- (c) the "labour" and the "materials" cost components of the escalation formula are at least 30% each.

- (d) a base price for escalation starting in 1975 shall be determined by the Operating Committee before the end of 1974, and annually thereafter.

NOTE:

As in the case of fixed prices, the leader and runner-up may deduct, respectively, 30-c and 10-c from the \$10,00 base (80-c and 25-c per kg U in the case of UF6) and, on U308 sales, the same deductions as in fixed prices may be made for f.o.b. deliveries.

3. ALTERNATIVE NEGOTIATED PRICES

Any supplier may offer negotiated prices in any year - or over any period - subject to discretionary minimum prices but not subject to any ceiling prices; provided that when ultimately negotiating the price, the supplier concerned does not, without prior approval of the Club, agree (subject to contractual arbitration clauses) to a price lower than the minimum Club leader price ruling at the time of negotiation for delivery in the year in question.

FOURTH SESSION OF POLICY COMMITTEE

Thursday, 31st January, 1974 at
9.30 a.m.

A G E N D A

1. Approval of the agenda.
2. Approval of minutes of meeting held in London on 5th October, 1973 - circulated to members (to consider modification proposed by Canadian Group).
3. Uranium Institute : to consider draft constitution.
4. Quotas for period 1981 - 1983.
5. Voluntary restriction on contracts concluded post - 1980.
6. Report by Chairman of Operating Committee on recommendations arising from meetings on 28th, 29th and 30th January, 1974.
7. General.

30th January, 1974.

POLICY COMMITTEE MEETING : JOHANNESBURG - 31 JANUARY, 1974

AUSTRALIA

:

G. Lean
B.C.J. Lloyd
G.A. Mackay
J.G. Munro
J.S. Proud
T.A. Rodgers
P.R. Stork
R.C. Wilson

CANADA

:

G. Albino
M. De Bastiani
N.M. Ediger
L.T. Gregg
W.M. Gilchrist
J. Kostuik
A. Lowell
G. MacNabb
J. Runralls
J.C. Burger

NUFCOR

:

A.W.B. Schumann
J.W. Shilling
R.E. Worroll
J.M. van Riet Lowe

RTZ

:

B.W. Hunt
T.J. Lighterness
G.A. Macmillan
L.C. Mazel
H.F. Melouney
R. Wright

URANEX

:

P. de Penanros
J.L. Dherse
J.Y. Eichenberger
B. Goldschmidt
M. Houdaille
P. Taranger

SECRETARY

:

A. Petit.

POLICY SUBCOMMITTEEPROPOSED QUOTAS FOR THE PERIOD 1981-1985ESTIMATED TOTAL MARKET113767 Short tons

GROUP	QUOTA %	TONS	ESTIMATED TOTAL MARKET
AUSTRALIA	24,57	27960	
CANADA	26,87	30567	
NUFCOR	14,77	16800	
RT2	11,40	12970	
URANEX	22,39	25470	
TOTALS	100	113767	113767

NOTES. 1. Estimated total market includes deliveries under all post-1972 contracts, domestic markets and unfulfilled demands.

2. All deliveries during the period under post-1972 contracts will count against quotas.

3. In the designation of leaders for the allocation of business only business allocations of the 22nd November 1978 will be taken into account.

30/1/74

VOLUNTARY RESTRICTION OF SALES BY
PRODUCER GROUPS AFTER 1983 PENDING
SETTLEMENT OF QUOTAS FOR SUCCEEDING
PERIODS

<u>GROUP</u>	<u>PROPOSED % OF ESTIMATED TOTAL</u> <u>NON-USA MARKET (INCLUDING</u> <u>DOMESTIC MARKETS) TO WHICH</u> <u>PRODUCER GROUPS WILL LIMIT</u> <u>SALES IN THE POST-1983 PERIOD</u>
AUSTRALIA	12.6
CANADA	13
NUFCOR	9
RTZ	15% in 1984 reducing by 1% per year to 9% in 1990
URANEX	6

30/1/74

(28)

DRAFT NO. 3

30th January 1974.

Jcc- F.F.S.

THE URANIUM INSTITUTECONSTITUTIONNAME

1. The name of the organisation shall be "THE URANIUM INSTITUTE".

/OBJECTS ...

OBJECTS

2. (1) The principal object of the Institute shall be to promote the production of uranium for use for peaceful purposes and to promote the co-ordination of production with the requirements for peaceful purposes, of processors, users or consumers of uranium;
- (2) For the attainment of its principal object and without limiting the generality thereof, the further objects of the Institute shall be -
 - (a) to conduct research and to do investigations directed at establishing, from time to time, the world's requirements of uranium for peaceful purposes, the world's uranium resources and the production capacity of uranium producers to meet these requirements;
 - (b) to publish for public information and to arrange public discussion of the outcome of its research or investigations;
 - (c) to consult, for the purposes of its research or investigations, with Governments, with governmental or other agencies and organisations, with owners of uranium resources, with uranium producers and with processors, users or consumers of uranium in any form, for peaceful purposes;
 - (d) to promote research of all kinds connected with prospecting for and the discovery of uranium and with its mining, production, processing and use for peaceful purposes;

/(e) ...

- (e) to provide endowments, scholarships and bursaries to persons undertaking research of work associated with the Institute's objects or likely to promote such objects;
- (f) to employ or appoint and remunerate attorneys, auditors, advisers, agents or other persons for the purposes of the Institute;
- (g) to establish or participate in the establishment of pension, gratuity, medical aid or sick funds for the benefit of the Institute's employees and to contribute to any such fund;
- (h) to acquire and hold, to improve, sell, let, hire, mortgage, donate, dispose of or deal in any other way with property, movable or immovable, for the purposes of the Institute;
- (i) to borrow or raise money for the purposes of the Institute and to pledge as security for the repayment of such money all or any of the property or assets of the Institute;
- (j) to invest or lend any moneys of the Institute and to realise or vary such investment or loan;
- (k) to open and operate a banking account or accounts and to make, draw, accept, endorse, discount, execute, issue or otherwise dispose of bills of exchange, cheques, promissory notes or other negotiable or transferable instruments or securities;
- (l) to establish and maintain a library embracing collections of books or articles of interest to its members;

/(m) ...

- (m) generally, to do all such other things as are necessary, conducive or incidental to the Institute's objects.
- (3) In this constitution, "uranium" shall mean and include uranium, thorium and their ores and compounds.
-

MEMBERSHIP

3. (1) Any company engaged in the production of uranium may be admitted as an ordinary member of the Institute;
- (2) The foundation members of the Institute shall be those companies who are eligible for membership and who agree, in writing, to form the Institute, to adopt this constitution and to become its first members;
- (3) Foundation members shall rank in all respects as ordinary members;
- (4) Any company (other than a foundation member) wishing to become an ordinary member of the Institute shall lodge with the Director a written application to the Board of Management for admission as such and, for the purposes of the application the company concerned shall provide the Board with the company's full name, its registered address, the place and nature of its business and such further information as the Board may require. The application shall be considered at the next ordinary meeting of the Board or, if the Chairman of the Institute so directs, at a special meeting of the Board convened for the purpose

/and ...

and the Board shall then decide whether or not the applicant shall be admitted; provided that such an application, if received less than fourteen days before the next ordinary meeting of the Board shall be considered at that meeting or the meeting following, as the Chairman may direct. After the meeting of the Board at which the application is considered the applicant shall be notified, in writing, by the Director whether or not the applicant has been admitted to membership. The Board shall have absolute discretion as to whether or not an applicant shall be admitted to membership and shall not be required to provide any reason for its decision;

- (5) Any person may be elected by the Board of Management, on such terms and conditions as the Board may decide, as an honorary member of the Institute;
- (6) The liability of ordinary members shall be limited to the amount, if any, payable by way of subscription or otherwise to the Institute by such members;
- (7) As soon as practicable, the foundation members shall lodge with the Director the agreement by which they agreed, in terms of sub-article (2) of this Article, to form the Institute, to adopt this constitution and to become its first ordinary members.

/APPOINTMENT OF
REPRESENTATIVES ...

APPOINTMENT OF REPRESENTATIVES

4. (1) At the time a foundation member agrees to form the Institute, to adopt this constitution and to become an ordinary member, it shall appoint a representative by notice, in writing, to all other foundation members and shall, as soon as practicable, lodge a copy of such notice with the Director. Within fourteen days of the admission to membership of any other company, such member shall similarly appoint a representative by notice, in writing, lodged with the Director. Any such notice shall contain the full names, occupation and address of the representative concerned;
- (2) A foundation or other ordinary member may, at any time, appoint an alternate representative by notice, in writing, lodged with the Director. Such notice shall contain the full names, occupation and address of the alternate representative concerned;
- (3) A foundation or other ordinary member may withdraw the appointment of a representative or alternate representative by notice, in writing, lodged with the Director. In the case of the withdrawal of the appointment of an alternate representative or his resignation, the member concerned may then or at any time thereafter appoint, in the manner prescribed by sub-article (2) of this Article, another in his place. If the appointment of a representative is so withdrawn or if he resigns, the member concerned shall appoint within fourteen days thereafter and, in the manner prescribed by sub-article (1) of this Article, another in his place;

/(4) ...

- (4) The representative or alternate representative of an ordinary member shall cease to be such -
- (a) if he resigns;
 - (b) if his appointment is withdrawn by the member by whom he was appointed; or
 - (c) if the member by whom he was appointed ceases to be a member.

GENERAL PROVISIONS
APPLICABLE TO MEMBERS ...

GENERAL PROVISIONS APPLICABLE TO MEMBERS

5. (1) Any ordinary member may withdraw from the Institute by giving thirty days notice, in writing, to the Director of such member's intention so to do and, upon the expiry of such notice, the member concerned shall cease to be a member;
- (2) Any ordinary member who ceases to be eligible, in terms of Article 3(1), for membership, shall withdraw from the Institute within ninety days of ceasing to be eligible. Thirty days' notice, in writing, shall be given to the Director of such member's intention to withdraw and on the expiry of the notice the member concerned shall cease to be a member;
- (3) Any ordinary member -
- (a) who, having been given written notice by the Director of any amount due by such member by way of subscription or otherwise and of the date on which such amount is payable, has failed to pay the amount concerned within six months of such date;
 - (b) who has been placed in liquidation or under judicial management or under official management or under receivership;
 - (c) who, having ceased to be eligible for membership, has not withdrawn from the Institute in terms of sub-article (2) of this Article; or
 - (d) who has infringed the provisions, of these Articles or any by-laws passed in terms of

Article 7 or who has conducted itself in a way considered to be contrary to the objects or interests of the Institute,

may be excluded from the Institute by decision of the Institute in annual general meeting on the recommendation of the Board or by the Institute in special general meeting on the motion of not less than seven ordinary members and, if so excluded, shall cease to be a member; provided that at least thirty days notice, in writing, has been given to the member concerned by the Director of the Board's intention so to recommend or of the intention of the other members to move the exclusion of such member at the general meeting concerned;

- (4) Any member who withdraws from the Institute or whose membership is terminated by the Institute, in general meeting, shall remain liable for payment of all subscriptions or other amounts due by the member to the Institute and for the discharge of any other obligation to the Institute.

/REGISTER OF MEMBERS ...

REGISTER OF MEMBERS

6. A register of members shall be kept in which there shall be recorded -
- (a) the full name, address and the business of each member;
 - (b) a statement whether the member is an ordinary or an honorary member;
 - (c) the full names of the representative and alternate representative, if any, of each ordinary member; and
 - (d) the date on which each member is admitted to membership of the Institute and the date on which any member ceases to be a member.

CONSTITUTION AND POWERS OF THE BOARD OF MANAGEMENT

7. (1) There shall be a Board of Management which shall consist of not less than ten and not more than fourteen members as, subject to sub-article (2) of this Article, may be decided from time to time by the Institute in general meeting. Only representatives of ordinary members shall be eligible for appointment or election to the Board of Management;
- (2) The first Board of Management shall consist of ten members appointed by written resolution of the foundation members, from amongst their representatives appointed in terms of Article 4 (1);
- (3) Subject to the provisions of sub-article (14) of this Article, the members of the first Board of Management shall hold office until the first annual general meeting of the Institute, when they shall retire but shall be eligible for re-election;
- (4) The members of the Board of Management shall thereafter be elected at each annual general meeting of the Institute by the representatives of ordinary members present and entitled to vote. Each member of the Board shall hold office until the next annual general meeting after his election when he shall retire but shall be eligible for re-election. Each candidate for election to the Board, other than a retiring member, shall be nominated by the representative of an ordinary member, and such nomination shall be lodged with the Director at least fourteen days prior to the date of the annual general meeting at which the election will take place. The representatives of ordinary members shall be the only persons eligible for election to the Board;

- (5) The Chairman of the Institute shall be chairman of the Board and shall take the chair at all meetings of the Board. If the Chairman is not present at any meeting of the Board, the Vice-Chairman shall take the chair, and failing the Vice-Chairman the members present shall elect one of their number to take the chair at that meeting;
- (6) Seven members of the Board shall form a quorum at any meeting of the Board;
- (7) The Board shall meet at least twice a year. The first Board shall meet as soon as practicable after the appointment of its members by the foundation members and at such other times before the first annual general meeting of the Institute as the Board may decide. The second and subsequent Boards shall meet as soon as practicable after the annual general meetings at which their members are elected and at such other times as the Board may decide;
- (8) At least fourteen days notice in writing of each meeting of the Board or such shorter period as the Chairman or the Board may decide shall be given to members by the Director;
- (9) The Chairman may convene a meeting of the Board at any time and the Director shall convene a meeting of the Board if requested, in writing, to do so by at least four members;
- (10) The Board may act notwithstanding any vacancy or vacancies in its number, but if and so long as the number of continuing members is reduced to below the

number fixed as the quorum, such continuing members of the Board may act for the purpose of increasing the number of members to that number, but for no other purpose;

- (11) The Board shall have power to appoint at any time a representative of an ordinary member to fill a casual vacancy on the Board. Any representative so appointed shall hold office as a member of the Board until the next annual general meeting of the Institute when he shall retire but shall be eligible for re-election;
- (12) The Board may co-opt the services of the representative or alternate representative of any ordinary member to such extent and for such purposes as the Board may decide. Such representative or alternate representative may attend, by invitation, any meeting of the Board and may take part in discussion but may not vote;
- (13) At any meeting of the Board a decision shall be taken by a majority of the members present voting by a show of hands. The chairman of the meeting shall have a deliberative vote but no casting vote. The conduct of a meeting of the Board shall be the responsibility of the chairman who, subject to the provisions of these Articles, shall decide the procedure to be followed at the meeting;
- (14) Any member of the Board shall cease to hold office as such if he resigns by giving notice in writing to the Director of his resignation or if he ceases to be a representative of an ordinary member;

/(15) ...

- (15) Subject to the direction and control of the Institute in general meeting, the general administration and the management of the Institute shall be vested in the Board of Management which, in addition to the powers expressly conferred on it by these Articles, may exercise all such powers and do all such acts or things in the name of or on behalf of the Institute as may be exercised or done by the Institute.

Without prejudice to its general powers, the Board shall have power -

- (a) to enter into such contracts in the name and on behalf of the Institute as it thinks expedient for the purposes of the Institute;
- (b) to pass by-laws for the regulation of the business of the Institute not inconsistent with the provisions of these Articles;
- (c) to appoint at such remuneration and on such terms as the Board may decide and to remove employees, attorneys, advisers or agents of the Institute;
- (d) to fix the subscriptions payable to the Institute by ordinary members;
- (e) to acquire and hold, to improve, sell, let, hire, mortgage, donate, dispose of or deal with in any other way, any property, movable or immovable, for the purposes of the Institute;

/(f) ...

- (f) to determine and change at its discretion, the place at which the Head Office of the Institute shall be located;
 - (g) to establish branch offices of the Institute;
 - (h) to institute, conduct, defend or abandon any proceedings by or against the Institute in any court of law or before any arbitrator and to recover by legal proceedings or otherwise any amount due to the Institute;
 - (i) to appoint investigatory or advisory sub-committees for any purposes of the Board and for any purposes of any such sub-committee to authorise the co-option of the services of any person;
- (16) Subject to the provisions of Article 19, members of the Board of Management shall not be paid or receive any salary or other remuneration in respect of their services as Board members.

/CHAIRMAN AND VICE-CHAIRMAN . .

CHAIRMAN AND VICE CHAIRMAN

8. (1) The first Board of Management shall appoint from its members two persons as Chairman and Vice Chairman respectively of the Institute. The Chairman and Vice Chairman so appointed shall hold office as such until the first annual meeting of the Institute when they shall both retire but shall be eligible for re-election;
- (2) At the first annual general meeting and at each annual general meeting thereafter, one of the members of the Board of Management then elected in terms of Article 7 (4) shall be elected Chairman and one other member shall be elected Vice Chairman of the Institute by the representatives of ordinary members present at the meeting and entitled to vote. The Chairman and Vice Chairman so elected shall hold office until the next annual general meeting when they shall both retire but shall be eligible for re-election;
- (3) The Chairman or Vice Chairman shall cease to hold office as such if he resigns from that office or ceases to be a representative of an ordinary member;
- (4) If the office of Chairman or Vice Chairman becomes vacant for any reason, the vacancy may be filled for the unexpired term of the current period of office by the Board.

GENERAL MEETINGS OF THE INSTITUTE

9. (1) The annual general meeting of the Institute shall be held in each calendar year before the first day of April on such day and at such time or place as the Board of Management shall decide. The Director shall give at least thirty days notice, in writing, of such meeting to each member; such notice shall be accompanied by -
- (a) a report by the Board of Management on the activities of the Institute during the past financial year and on any matters material to the affairs of the Institute that have taken place between the end of that financial year and the date of the report;
 - (b) an audited statement of the income and expenditure of the Institute for the past financial year, an audited balance sheet as at the date to which such statement is made up and the report of the Institute's auditors thereon;
 - (c) notice of any business to be dealt with at the meeting on the direction of the Board of Management;
- (2) The business of each annual general meeting shall be -
- (a) to receive the report of the Board of Management and the annual accounts referred to in sub-article (1) of this Article;

- (b) to elect the Board of Management for the ensuing year;
 - (c) to elect the Chairman and Vice Chairman of the Institute for the ensuing year;
 - (d) to consider any recommendations of the Board of Management submitted in terms of Article 5 (3);
 - (e) to consider any request submitted by any ordinary member in terms of Article 11 (6), except where such request has been referred by the Board of Management to a special general meeting of the Institute;
 - (f) to consider any other business placed before the meeting on the direction of the Board of Management;
- (3) The Board of Management may convene a special general meeting of the Institute, at any time, for the consideration of special business and shall do so within forty days of the date on which a request, in writing, is lodged with the Director by the representatives of at least seven ordinary members asking that a Special General Meeting be convened and giving the nature of the special business to be considered. The Director shall give each member not less than thirty days notice, in writing, of each special general meeting and of the nature of the special business to be considered. The only business which may be dealt with at a special special general meeting shall be the business for the consideration of which the meeting was called;

/(4) ...

- (4) Each ordinary member shall be represented at general meetings of the Institute by the representative of such member or, in his absence, by the alternate representative of such member, duly appointed in terms of these Articles;
- (5) The representative or, in his absence, the alternate representative of any ordinary member, shall be entitled to take part in the discussions and to vote at all general meetings of the Institute. An alternate representative of an ordinary member, while acting in the place of the representative of that member, shall exercise all the duties, powers and functions of such representative. If the representative of an ordinary member is present at any general meeting, the alternate representative of that member may also be present and may take part in the discussions, but shall not vote at the meeting on behalf of the member concerned;
- (6) An honorary member may be present, in person, at general meetings of the Institute and shall be entitled to take part in the discussions but shall have no right of voting;
- (7) Any person who has been invited by the Board of Management to be present and take part in the discussions at any general meeting, may do so, but shall have no right of voting;
- (8) The Chairman of the Institute or in his absence the Vice Chairman, shall take the chair at all general meetings of the Institute. If neither the Chairman nor the Vice Chairman is present at a general meeting, the representatives of ordinary members present and

/entitled

entitled to vote shall elect one of their number to be chairman of that meeting. The chairman of a general meeting shall be responsible for the conduct of the meeting;

- (9) The representatives of seven ordinary members shall form a quorum at any general meeting of the Institute. If a quorum is not present ten minutes after the time for which any such meeting is called, the meeting shall stand adjourned until the same day in the next week at the same time and place, or if such day is a public holiday, until the day following, and the representatives then present shall constitute a quorum and may transact the business for which the meeting was originally called;
- (10) If any ordinary member, having been given notice in writing, by the Director of the amount due by such member by way of subscription or otherwise and the date on which such amount is payable, has failed to pay the amount concerned within six months of that date and the amount is still outstanding on the date for which any general meeting of the Institute is originally called, the representative of that member shall not be entitled to be present at or take part in the proceedings of the meeting or any adjournment thereof nor to vote thereat;
- (11) The representative or, in his absence, the alternate representative of each ordinary member present at a general meeting shall be entitled to one vote on behalf of the member concerned;

/(12) ...

- (12) All matters on which a decision has to be taken at any general meeting shall be decided on a show of hands. A declaration by the chairman of the meeting that a resolution has or has not been carried, on a show of hands, shall be final;
- (13) The chairman of a general meeting may, with the consent of the meeting, adjourn the same from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.

/DIRECTOR ...

DIRECTOR

10. There shall be a Director of the Institute who shall be appointed by the Board of Management at such remuneration and on such terms and conditions as the Board shall decide. The Director shall perform such duties and functions as he is required to perform in terms of these Articles or as may be required of him by the Board and, in particular, shall keep or cause to be kept -

- (a) the register of members for which provision is made in Article 6;
- (b) the records and accounts for which provision is made in Article 12;
- (c) the minutes and records for which provision is made in Article 14;

/SUBSCRIPTIONS ...

SUBSCRIPTIONS

11. (1) Subject to sub-article (2) of this Article, the subscriptions payable to the Institute by ordinary members in respect of each financial year shall be fixed by the Board of Management. The subscriptions so payable by ordinary members shall be paid in advance or in arrear at such time or times or in such amount or amounts as the Board, in its discretion, may decide;
- (2) Subscriptions payable by ordinary members shall be fixed on the basis that each member shall be responsible for an equal share of the expenditure incurred by the Institute in carrying out its functions during any financial year;
- (3) An ordinary member admitted after the commencement of any financial year or who ceases to be a member before the end of a financial year shall pay as subscription for that year such amount as may be decided by the Board, but not exceeding the subscription that would have been payable, if the member concerned had been a member for the whole year;
- (4) With the approval of the Institute in general meeting, the Board shall be entitled to impose a levy or levies on ordinary members, in addition to any subscriptions fixed by the Board in terms of this Article. Subject to the direction of the Institute in general meeting, such levy or levies shall be payable by members in such amount or amounts and at such time or times as the Board, in its discretion, may decide;

- (5) Any amount due by ordinary members by way of subscriptions or levy shall be payable to the Institute within thirty days of a date to be notified to it, in writing, by the Director, on the direction of the Board of Management;
- (6) Within thirty days of the date of any notice, in writing, ~~from~~ the Director giving the amount due by any ordinary member by way of subscription and the date on which such amount is payable, the ordinary member concerned may lodge with the Director a request, in writing, that the basis on which such subscription has been calculated and/or the amount of such subscription be reviewed by the Institute, in general meeting. Such a request, if lodged within the period prescribed by this Article but not otherwise, shall be considered at the next annual general meeting of the Institute or, if the Board of Management so decides, at a special general meeting of the Institute convened for the purpose; and the meeting shall then either confirm or determine anew the basis on which the subscription concerned shall be fixed and/or the amount which the ordinary member concerned shall be required to pay, as the case may be. Any decision taken by the Institute, in general meeting, in terms of this Article, shall be final in respect of the subscription or the amount which is the subject of such decision;
- (7) No subscription shall be payable by honorary members.

FINANCIAL YEAR
FURDS AND ACCOUNTS ...

FINANCIAL YEAR, FUNDS AND ACCOUNTS

12. (1) The first financial year of the Institute shall be the period commencing on the date all foundation members agree, in writing, to form the Institute and to adopt this constitution and ending on the 31st December following;
- (2) The second and all subsequent financial years shall be the calendar year;
- (3) A record shall be kept of the subscriptions, if any, due by each member of the Institute and the periods to which such subscriptions relate as also the subscriptions paid by each such member and the periods to which such payments relate. Proper accounts shall be kept of all moneys received and expended by the Institute, of all the matters in respect of which such receipts and expenditure take place and of the assets, credits and balances of the Institute;
- (4) All moneys received by the Institute, from time to time, shall be banked in the name of the Institute, within seven ordinary business days of receipt, with such bank as the Board of Management shall, from time to time, appoint;
- (5) All cheques and other negotiable instruments drawn in the name of the Institute shall be signed by one or more employees of the Institute duly appointed for the purpose by the Board of Management and under such conditions as to signing as may be decided by the Board from time to time;

- (6) All expenditure incurred by or on behalf of the Institute shall be duly authorised by the Board of Management or by the Director or such other employee of the Institute, acting in terms of such authority as shall have been conferred upon him by the Board of Management;
- (7) Subject to the provisions of Article 21, any profits or gains which may accrue to the Institute shall not be distributed to any person, but shall be employed solely for the purpose of investment for the benefit of the Institute or for the carrying out of the Institute's objects;
- (8) The Institute's accounts shall be audited annually and reported upon by the auditor or auditors appointed in terms of Article 13;

/AUDITORS ...

AUDITORS

13. An auditor or auditors shall be appointed to the Institute at each annual general meeting, when the remuneration for the past year's audit shall also be fixed; provided that, if so authorised by resolution of the meeting, such remuneration may be fixed by the Board of Management. The auditor or auditors appointed at each annual general meeting shall hold office until the next annual general meeting, when he or they shall retire, but shall be eligible for re-appointment. Casual vacancies in the office of auditor shall be filled by the Board of Management and any person so appointed shall hold office until the next annual general meeting, when he shall retire, but shall be eligible for re-appointment.

MINUTES AND RECORDS

14. Minutes shall be kept of proceedings of general meetings of the Institute and of the meetings of the Board of Management, as also records of the correspondence and transactions of the Institute.

/PROCEEDINGS ...

PROCEEDINGS

15. (1) All property of the Institute shall vest in two Trustees, duly appointed by the Board of Management, to be held in trust for the members of the Institute according to this constitution and shall be sold, leased, mortgaged or otherwise dealt with by the Trustees as the Board may direct from time to time;
- (2) In the event of a Trustee dying or ceasing to be such, the Board of Management shall appoint a new Trustee in his place;
- (3) All legal or other proceedings by or against the Institute shall be instituted, conducted, defended or otherwise dealt with by the Trustees on behalf of the Institute.

PROPERTY ...

PROPERTY

16. A Trustee shall cease to be such if -
- (a) he resigns; or
 - (b) if his appointment is withdrawn by the Board of Management; or
 - (c) if his estate is sequestrated or placed under receivership.

/SIGNATURE OF DOCUMENTS ...

SIGNATURE OF DOCUMENTS

17. All documents or instruments shall be signed and executed on behalf of the Institute by such member or members of the Board of Management or by the Director or such other employee or employees of the Institute as the Board shall decide.

/NOTICES ...

NOTICES

18. Any notice, written notification or document required by these Articles to be given or sent to any member shall be deemed to have been given or sent if it has been delivered, by hand, at such member's registered address or has been sent through the post or by teleprinter to such member at the member's registered address.

The date on which any such notice, written notification or document is so delivered or is so posted or sent shall be deemed to be the date on which it was given or sent.

/INDEMNITY ...

INDEMNITY

19. Every office-bearer, member of the Board of Management and employee of the Institute shall be indemnified by the Institute against all costs, losses and expenses which any such office-bearer, Board member or employee may incur or become liable to by reason of any contract entered into or act or deed done by him in his capacity as such or in any way in the discharge of his duties.

/ALTERATION OF ARTICLES

ALTERATION OF ARTICLES

20. These Articles shall not be altered or added to except by resolution of a majority of not less than two-thirds of the representatives of ordinary members present and entitled to vote at a special general meeting of the Institute called for that purpose, of which at least thirty days' notice, in writing, has been given by the Director to each member.

Upon any such alteration or addition being made in terms of this Article, the same shall be deemed to be incorporated in and form part of these Articles, in the same manner in all respects as though originally inserted herein, and shall be binding upon all members of the Institute without any further act of assent thereto.

Any notice convening a special general meeting at which an alteration of or any addition to these Articles is to be considered shall be accompanied by a copy of the proposed alteration or addition.

WINDING UP ...

WINDING UP

21. The Institute shall be wound up if, at a special general meeting of the Institute of which at least thirty days' notice, in writing, has been given by the Director to each member and at which voting has taken place by show of hands, a resolution to wind up the Institute has been passed by a majority of two-thirds of the representatives of ordinary members present and entitled to vote. Upon the passing of such a resolution, the liquidator or liquidators, who shall be appointed by the meeting, shall realize the assets of the Institute, in such manner as he or they think fit, liquidate the debts and liabilities of the Institute and distribute any surplus assets among the then ordinary members proportionately to the subscriptions payable by such members for the financial year immediately preceding the year in which the decision to wind up the Institute was taken; but subject at all times and in all respects to such directions as may be given to the liquidator or liquidators by the Institute, in general meeting, either at the time the decision to wind up the Institute is taken or thereafter:

(29)

MAR 20 7
✓

Ref: PD/km

RT
/501

5th April 1974

Mon. Andre Petit,
Societe d'Etudes et de Recherches d'Uranium,
B.P. 510,
75752 Paris Cedex 15,
France.

Dear Andre,

Thank you very much indeed for your letter dated March 12th enclosing a clean draft of the rules established with John Runnalls in Canada. I agree that there are several items to be discussed at our next meeting, and therefore perhaps it might be useful if we set down below some of our own comments with regard to the draft as it exists, and suggestions on those items which require further discussion. Perhaps, therefore, we can make suggestions based on your draft rules in sequence.

I. Secretariat

- (b) Could this perhaps now be worded that there be two representatives from each participating group.
- (c) Can this be shortened to in relation to their average market quotas established as follows.

II. Markets and Market Quotas

- (d) This paragraph appears to be a little unclear and could perhaps be clarified.
- (e) (iii) Could "Uranex" be altered to Uranex/CFA.

- 2 -

- II. (e) Last sentence - In some way it should be made clear at this point that any reference to yearly tonnages in fact refers to actual deliveries as is indicated later in the rules.
- (h) It is not clear what is meant by "tonnages in excess of these". Perhaps this should be discussed at the meeting and clarified.
- (i) We suggest the word "voluntary" be deleted as all club rules are in fact of a voluntary nature.

III. Pricing Rules

We feel that the rules for pricing should be included in the text of the rules and should not be attached as an Appendix.

Dealing with Appendix I as it presently stands, we would suggest that some thought be given to a rewording of 1.(4) for clarity.

IV. Terms and Conditions

- (b) (i) At our meeting it is suggested that in the present market situation we discuss the possibility of adjusting 95% payment terms to 100% payment terms.
- (c) (ii) It is suggested that this paragraph be looked into and clarified with regard to adjustments on exchange rates for quotations made on different dates.

(d) Quantity Flexibility

- (i) We would suggest that this be altered to plus or minus 10%.
- (iv) With regard to the flexibility for tails variation, it is suggested that we either offer a total flexibility of plus or minus 10% without the tails flexibility or alternatively only offer plus or minus 5% together with flexibility for a variation in tails assay.
- (f) (iii) We are not at all clear what this means.

V. Working Mechanisms for Allocations

- (a) (ii) In the same way that we have indicated for period one that named contracts should count against quota allocations (ii. (e)) we feel that similarly for the allocation of business in the third period the relevant contracts should be defined.

- 2 -

- 3 -

V. (b) (iv and v) We would suggest that under current market conditions the rules under these two paragraphs should be further discussed and possibly revised.

VI. (a) (ii) We feel that this clause should be further considered in relation to the actual documentation that should be submitted to the Secretary.

As indicated by yourself, the rules on pages 9 and 10 are clearly for further discussion and possible modification.

In relation to those rules which are perhaps inappropriate to the present market situation, it would obviously be useful to have other members views on possible modifications prior to our meetings later this month.

With kind regards,

Yours sincerely,

CLEAN DRAFT

4 March, 1974

AP/OJCR/HBM/LTG

DOC. 74.24

RULES FOR ORDERLY MARKETING⁽¹⁾0.1 I. SECRETARIAT

✓ (a) The Secretariat is located in Paris. ✓

X (b) The Secretariat is directed by an Operating Committee consisting of one representative and an alternate from each participating group.

X (c) Expenses of the Secretariat shall be borne by the five participating groups in relation to their average market quotas over the period 1972-80 inclusive. These quotas are:

Canada	27%
NUFCOR	21%
Uranex	20%
Australia	22%
RTZ	10%

Billings will be made to each group on a quarterly basis.

II. MARKETS AND MARKET QUOTAS

(a) The following market quotas were established:

(1) The references in the margin "0.1, 2.3" etc.... or "P.1.2" indicate in the minutes of which Operating (O) or Policy (P) Committees the rule was established or last amended.

PRIVATE

CONFIDENTIAL

-2-

Group	Percentage 1st Period 1972-1977	Percentage 2nd Period 1978-1980	Percentage 3rd Period 1981-1985
Canada	37.3	21.86	26.87
P.4 Nufcor	26.4	18.30	14.77
0.9 Uranex	24.2	18.38	22.39
Australia	7.6	27.81	24.57
RTZ	4.5	13.65	11.40

0.1* (b) The U.S. domestic market is excluded from the present arrangements. (Disfers from overseas) (No imports?)

0.1 (c) The domestic markets of France, South Africa, Australia and Canada are excluded from the present arrangements in the first and second periods.

(d) Figures corresponding to the French and Canadian domestic markets in the third period will be charged against the respective quotas in proportion with other business allocated.

(e) Sales to count against quota allocations are all new sales after January 1, 1972 including:

(i) Spain (Denison-UCAN)

0.1 (ii) Neckarwerke (UG and UCL)

X (iii) S.S.P.B. (Uranex] (CED)

(iv) Shikoku (Queensland, RTZ, Uranex)

(v) Kyushu (Ranger, Nufcor)

(vi) Chubu (Nufcor, Ranger)

0.7 Only yearly tonnages involved in the above contracts will be notified to the Secretary.

0.1 (f) For tonnages in excess of those excluded under (g) below, the RTZ-Rossing contract with UG and the Uranex/Somair contracts with UG and Agip Nucleare will be included in quotas once the material is resold.

(g) Sales to be excluded from quota allocations are all

-3-

those sales concluded and options granted prior to January 1, 1972 including:

- 0.1
- (i) Brazil-Furnas (Nufcor)
 - (ii) Westinghouse-Beznau (Rio Algom)
 - (iii) Tohoku (Denison, RTZ, Nufcor)
 - (iv) Kansai spot sale (Rio Algom, Nufcor, Uranex)
 - (v) Gundremmingen (Nufcor and UCL)
 - (vi) GKT (Nufcor, UG)
 - (vii) ENEL 4 (Uranex)
 - (viii) THTR/VEV (UG)
 - (ix) Steag/Muhleberg (UG)

- 0.3
- (h) Also excluded from the quotas are UCL sales to RWE of 3,200 tons during 1972-77 and 3,000 tons during 1978-80 inclusive. Tonnages in excess of these will be counted against the quotas once allocated. Corresponding contracts will be communicated confidentially to the Secretary ^{except} for those contracts concluded before 1.1. 1972, in which latter case only the tonnages involved will be disclosed.
- 0.7
- +0.8

(i) Voluntary restrictions

P.4

Producer groups will voluntarily limit sales in the post-1983 period, pending settlement of quotas for succeeding periods, to the following percentages of the estimated total non-U.S. market (including domestic markets):

Australia	12.6%
Canada	13 %
Nufcor	9 %
RTZ	15 % in 1984, reducing by 1% a year to 9% in 1990
Uranex	6 %

Canadian and French sales in their respective domestic markets will not be charged against these percentages.

III. PRICING RULES

The pricing rules presently in force are attached as Appendix I.

These rules may be changed from time to time by the Operating Committee, subject to the Policy Committee's approval. Pending formal approval, the new pricing rules shall provisionally apply.

IV. TERMS AND CONDITIONS

0.3 (a) Costs of weighing, sampling and assaying at the conversion plant will be for the buyer's account unless the buyer and the conversion plant accept the producer's own weighing, sampling and assaying results.

(b) Standard conditions for payment are:

0.1 100% (i) - 95% within 30 days after delivery at converter's facility or enrichment facility or f.o.b. embarkation point, as the case may be

0.4 - the balance upon final acceptance, or within 60 days after delivery c.i.f. or 90 days after delivery f.o.b., whichever is the earlier; provided that if the final weights and assays are not known within 60 days or 90 days (as the case may be) final adjustment can be made afterwards.

0.1 ? (ii) Any other terms of payment which deviate from the above must use a minimum rate of interest of 8% per year.

(c) Currency

(i) Quotations can be made in either the buyer's or seller's currency, in U.S. dollars or in a major European currency.

0.1 (ii) Any quotations in a currency other than U.S. dollars shall be made at the exchange rate existing at the time of quotation or, if a published exchange rate does not exist, at the average of buying and selling rates at that time. The exchange rate used in the quotation shall be notified to the Secretary at the time of quotation. Any exchange rate used by a member shall provide the necessary margin above the leader's quotation, if applicable.

0.4

New

(d) Quantity Flexibility

(i) Initial cores or unspecified requirements: $\pm 10\%$ -
maximum of the contracted quantities.

0.1

(ii) Reloads: $\pm 15\%$ - maximum of the contracted quantities

0.3

(iii) These flexibilities shall apply to each delivery
year.

(iv) Flexibility for a variation in tails assay content may be given in addition to the above in cases where the buyer's enrichment contractor is entitled to unilaterally change the tails assay.

New(e) Schedule Flexibility

0.3

(i) Twelve months before the start of any delivery year, the customer must identify provisional delivery months within that year, and the tonnage within the limits specified above.

0.1

(ii) Nine months before the provisional delivery month or the actual delivery month, whichever is the earlier, the exact delivery date must be fixed within ± 2 months of the provisional delivery month, at which time $\pm 5\%$ variation will be allowed, provided the total variation does not exceed the limits specified above.

(iii) In case this flexibility leads to delivery in adjoining years, the minimum price for that year should apply as the absolute minimum.

(f) Force majeure

(i) Nuclear plant breakdown, permit withdrawal, or lack of operating licence will not be accepted as a force majeure on the buyer's part.

0.1

(ii) Consequential damage clauses will not be accepted.

(iii) Force majeure will not be waived for any period in order to guarantee delivery.

(g) Replacement of late deliveries or non-specification material

0.1

(i) Liability for late delivery shall be limited to

converter's extra charges in the case of delivery of U_3O_8 and enrichment plant extra charges in the case of delivery of UF_6 .

(ii) In any shortfall or rejection situation, a minimum of one month should be required to make up the material. If contract specifications for U_3O_8 or UF_6 are altered, any consequential increase or decrease in costs shall be for the buyer's account.

(h) Taxes, Duties and Other Imposts

0.4 Suppliers shall not accept liability for taxes and duties in the buyer's country or in the country of delivery specified by the buyer. Suppliers may accept such liability within the country of origin of the material supplied or the country of the supplier, or (in the case of UF_6) the country where the UF_6 is converted, provided that suppliers will not accept any taxes imposed in the U.S.A.

(i) Storage

0.1 (i) Suppliers may provide free storage of U_3O_8 if there is space available. If there are any additional costs involved for storage, they shall be for the buyer's account. If storage is required after the contracted delivery date, then full payment shall be made on that date subject to adjustment later upon determination of final weights and assays.

0.1 (ii) Any storage charges for UF_6 shall be for the buyer's account.

(j) Return of Depleted Uranium

0.10 Suppliers will only accept responsibility for the return of depleted uranium from enrichment plants at buyer's costs.

(k) Options

0.1 No tonnage options will be granted.

(l) Validity Period

0.1 The maximum validity period for any quotation shall be 90 days unless there is a prior agreement to the contrary. Any extension shall be consistent with the rules in force at the

time the extension is granted.

(m) Applicable Law

P.3 As far as possible, contracts should be concluded under either the law of the producer's country or English law. When subcontracting has been decided, the main contractor should negotiate in close co-operation with the subcontractor.

0.3 (n) The source of the material will not be defined if practically feasible.

V. WORKING MECHANISMS FOR ALLOCATIONS

(a) Allocation of New Business

0.1 (i) Allocation of new business will be based upon up-to-date estimates of the remaining uncommitted market.

(ii) Allocations will be initially based on contracted tonnages, and as far as possible each group's quota will be filled at a uniform rate.

P.4 For the allocation of business in the third period, the filling ratio will only take into account business allocated after 22.11.1973.

(iii) Final resolution of quotas for each quota period should be based on actual deliveries.

0.1 (iv) Any adjustments necessary for each quota period will be realized through adjustments for future deliveries.

P.2+0.8 (v) In case some material has to be borrowed by a member for an early delivery, this should only be done from another member.

(b) Procedure for Quotations

P.4+0.1 (i) For all enquiries concerning deliveries to be made prior to 1984 into markets other than the U.S., French, Canadian, South African and Australian markets, a leader and runner-up will be selected by the Secretary in consultation with the Operating Committee.

Handwritten notes:
 0.1
 0.1
 0.1

Handwritten notes:
 P.4+0.1
 P.4+0.1

P.3 (ii) Enquiries from Intermediaries for which the procedure under (i) above is not practicable can be subject to independent bids after reporting to the Operating Committee, provided all rules are observed.

0.1 (iii) The selection of leader and runner-up will be based on the five participating groups rather than individual companies. The group selected as leader or runner-up will where appropriate designate a company within its group as leader or runner-up, as the case may be.

?

0.1 (iv) The leader does not have to open bidding at the minimum prices but should not quote above the minimum figures applicable to the "Other Producers" unless otherwise agreed by the Operating Committee. The leader shall advise the Secretary of his opening quotation.

rdw ?

P.2 (v) If a company not designated as a leader, and having quoted in accordance with the rules, gets an order, it is free to accept the contract provided it offers the possibility of a subcontract to the leader, unless otherwise agreed by the Operating Committee. If a subcontract is offered to and accepted by the leader, the contracting producer is obligated to negotiate the contract in close co-operation with the leader.

VI. DISCLOSURE OF INFORMATION

(a) The Secretary will be provided for his use and vetting, and for any necessary discussion with the producer, with:

0.1 (i) all enquiries and quotations involving deliveries starting within the agreed quota periods, and

+

P.3 (ii) all letters of intent or other commitment documents, contracts and invoices of actual deliveries, except those concerning exclusively the U.S., French, Canadian, South African and Australian domestic markets.

0.1 (b) The Secretary will report on a quarterly basis on markets, contracts, deliveries and positions vis-a-vis quotas.

P.3 (c) In regard to approaches from or negotiations with Intermediaries, the communication under (a) (i) above may be replaced by a verbal report to the Operating Committee.

0.8 + (d) In the case of sales of derivatives of U_3O_8 or natural
0.10 UF_6 , the price actually quoted for the product sold will be disclosed. For all sales of material at a stage of processing beyond natural UF_6 , the minimum price of natural UF_6 must be the one applicable at the date when such natural UF_6 should be, at the latest, further processed in order to deliver the material sold in due time. The Secretary will be provided confidentially with a breakdown of the final product price.

(e) Vetting of the Contracts

The following action will be taken when contracts are provided to the Secretary:

(i) The Secretary will vet the contract to ensure that it complies with the rules.

(ii) The Secretary will attempt to resolve with the contracting supplier any apparent discrepancies or deviations from the rules. If there are discrepancies or deviations which cannot be resolved, the Operating Committee will review the situation at its next meeting.

0.1 (iii) The contracting supplier will advise the Secretary whether or not the contract is available for inspection by other members. If the contract is not available for inspection, then the supplier concerned shall at the request of any group representative explain at a meeting of the Operating Committee the reasons for non-disclosure. If the Committee considers that the reasons given do not justify non-disclosure, then the group representative concerned may have access to the contract in question.
?

VII. OTHER PRODUCERS AND INTERMEDIARIES

(a) Uranium Suppliers

0.1 If a supplier not associated with the organization should quote under the minimum price, the leader will not

match that quotation and the Operating Committee will review the situation and decide on a course of action as soon as possible.

(b) Intermediaries

? (i) When negotiating with fuel and reactor manufacturers, producers should maintain the right to quote direct to end users and should endeavour to obtain a commitment from the buyer to disclose the identity of the buyer's prospective customers.

0.4 (i) No quotations will be made to other intermediaries unless the end user of the material is known.

(c) Urangesellschaft

? 0.9 + 0.10 UG having accepted to sell exclusively in principle members' material and to adhere to all rules, although not becoming a member, there will be, as far as needed for UG sales, a full exchange of information between the Operating Committee and UG through the channel of the Secretary.

UG should make no quotation without telling the Secretary previously the source or backing of the material which it is selling.

APPENDIX I

1. MINIMUM FIXED PRICES: C.I.F. ALL CONVERTERS OR C.I.F. ALL ENRICHMENT DELIVERY POINTS AS APPROPRIATE*

Year of Delivery	U_3O_8	UF_6
	U.S. \$/lb.	U.S. \$/kg. U in UF_6
1974	8.50	25.20
1975	9.35	27.50
1976	10.30	30.10
1977	11.35	32.95
1978	12.50	36.10

*For this purpose F.O.B. destination is considered equivalent to C.I.F.

P.4 NOTE:

- (1) Fixed prices may not be offered for deliveries after 1978.
- (2) Leader and runner-up may discount the above minimum prices by not more than:

	U.S. \$/lb. U_3O_8	U.S. \$/kg. U
Leader	0.30	0.80
Runner-up	0.10	0.25

- (3) For U_3O_8 prices that are quoted F.O.B. mill or port of embarkation, the following maximum reductions are permissible per lb. U_3O_8 :

1974 and 1975	: \$0.10
1976 to 1978	: \$0.15

- (4) UF_6 prices include weighing, sampling and assaying by the converter, conversion, losses during conversion (1/2%) and are calculated according to U_3O_8 C.I.F. prices plus conversion at assumed costs of:

	U.S. \$/lb. U
1974	1.35
1975	1.40
1976	1.45
1977	1.50
1978	1.55

2. ESCALATED PRICES

For deliveries after 1978 but not beyond 1985, or as an alternative to the minimum fixed prices in 1. above, escalated prices, on a base price of U.S. \$10.00/lb. U_3O_8 C.I.F. all converters (\$29.10/kg U in UF_6 C.I.F. all enrichment delivery points) may be offered from any year provided that:

- (a) the escalation formula is to operate from 1974 at the latest at the stipulated minimum base price irrespective of the first delivery year in the contract;
- (b) at least 80% of the price is subject to escalation; and
- (c) the "labour" and the "materials" cost components of the escalation formula are at least 30% each.
- (d) a base price for escalation starting in 1975 shall be determined by the Operating Committee before the end of 1974, and annually thereafter.

P.4 NOTES:

- (1) As in the case of fixed prices, the leader and runner-up may deduct, respectively, \$0.50 and \$0.10 per lb. U_3O_8 from the \$10.00 base (\$0.80 and \$0.25 per kg U in the case of UF_6) and, on U_3O_8 sales, the same deductions as in fixed prices may be made for f.o.b. deliveries.
- (2) There shall be no ceiling on the rate of escalation.

0.1

3. ALTERNATIVE NEGOTIATED PRICES

Any supplier may offer negotiated prices in any year - or over any period - subject to discretionary minimum prices but not subject to any ceiling prices; provided that when ultimately negotiating the price, the supplier concerned does not, without prior approval of the Operating Committee, agree (subject to contractual arbitration clauses) to a price lower than the minimum leader price ruling at the time of negotiation for delivery in the year in question.

P.4

30

14XU 20 7

CONFIDENTIAL

2nd May, 1974.

✓ F.F. Espie, Esq.)
 R.H. Carnegie, Esq.) For information.
 R.H. Harding, Esq.)
 J.M. Rodd, Esq.)

NOTE FOR FILE

Barry Lloyd, General Manager of Ranger Export Co., saw me on 30.4.74 to discuss some matters of mutual interest. During our talk, he told me of the recent meeting of the sub-committee of the Producers Club and, in particular, the concern regarding the current supply situation.

At the present time, few producers are prepared to quote for the supply of U₃O₈. Dealing with each main group!

Australia

Due to the apparent policy of the Labour Government, no company is permitted to enter into new contracts and all companies are keeping out of the market.

South Africa

As a result of the current high price for gold, the mines are operating at a lower cut-off grade which results in a reduced production of U₃O₈. The South African companies have largely withdrawn from the uranium market.

Outside of Nufcor, Rossing is still active in the market although it has little capacity left until the early 80's. A study is being made of the possibility of increasing output but it is understood that water supply is a major problem.

France

Due to a revolt in the Niger, France is in doubt about future supplies for its own requirements.

2.

Canada

In Canada there are two opposing forces. One strong force believes that Canada should withdraw from the Producers' Club and arrange uranium sales on a government to government basis. The other wishes to remain in the Club. The result is that only one Canadian company, Denison Mines, is quoting for business at the present time.

U.S.A.

The Americans are mainly high cost producers. Over the last few years, exploration has lagged and few additional reserves have been established. They are more concerned to supply the local market than the foreign market.

The proposed lifting from 1977 of the embargo on foreign uranium is of considerable concern to US producers.

The supply situation is viewed with such concern by Mr. Roy Wright and others that a special, high-level meeting of the Policy Committee of the Producers' Club will be held in London at the end of May.

Lloyd also told me that Ranger will have to declare force majeure on their contracts in a few months, unless the Government gives permission to them to proceed and to enter into further sales contracts.

H.F. Melouny.

(31)

MKU 50 4 1

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED



TELEPHONE: 60 0891

TELEX: AA30463

TELEGRAMS & CABLES:
"ELECTZINC" MELBOURNEG.P.O. BOX 856K, MELBOURNE
AUSTRALIA, 3001

REGISTERED OFFICE:

300 LONSDALE STREET,

MELBOURNE, AUSTRALIA, 3001

26th June, 1974.

GAM:S

copies FFL

JMR

RHU

RTK

HFA

Mr. R.H. Carnegie,
Managing Director,
Conzinc Riotinto of Australia Ltd.,
P.O. Box 384-D,
MELBOURNE, 3001.

Dear Rod,

AUSTRALIAN URANIUM PRODUCERS' FORUM

At the last meeting of the Australian Uranium Producers' Forum the position of M.K.U. was discussed. Approaches have been made in the past to see if M.K.U. would be prepared to join the Forum, but these have always failed because of the conflict of interest between the Australian Forum and the RTZ Group.

The Forum believes that Australian uranium producers should endeavour to project a unified image. We should work together for the benefit of Australia and of our separate companies. A.U.P.F. is trying to establish itself as a true forum representing all those significant potential producers wishing to see a rational and planned development of the Australian uranium industry. We recognise that M.K.U. obtains advantages through its association with RTZ, but we hope that in view of the increasing awareness of national identity, which is becoming so apparent throughout the world, that you will feel it advantageous to be counted in the Australian camp. As you probably know, Rio Algom is regarded as part of the Canadian group and came within their quota.

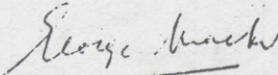
- 2 -

As a result of these views, the Forum is prepared to invite M.K.U. to become a member of A.U.P.F., provided that M.K.U.'s quota under the SERU market sharing scheme is transferred and included in the Australian quota and that M.K.U. undertakes to keep confidential information of a specific Australian nature gained as a result of its participation in the Forum.

You may be interested to know that we have invited Pancontinental to join the Forum.

I would appreciate your comments on this proposal.

Yours sincerely,



G.A. MACKAY,
CHAIRMAN,
AUSTRALIAN URANIUM PRODUCERS'
FORUM.

Doc No. 74 - 75

APPENDIX VI.

FINAL SITUATION OF
PARTICIPANTS ON 31.12.73

CURRENCY : FRENCH FRANCS

PARTICIPANTS	BALANCE ON 1.1.1973	SHARE OF COSTS ON 31.12.1973	CONTRIBUTIONS PAID IN 1973	BALANCE ON 31.12.1973
CANADA 27%	- 303.86	75 898.64	83 700.00	+ 7 497.50
AUSTRALIA 22%	- 247.59	61 843.34	68 200.00	+ 6 109.07
NUFCOR 21%	- 236.34	59 032.27	65 100.00	+ 5 831.39
R.T.Z. 10%	- 112.54	28 110.61	31 000.00	+ 2 776.85
URANEX 20%	+ 9 181.32	56 221.21	51 942.68	+ 4 902.79
TOTALS	FF + 8 280.99	FF 281 106.07	FF 299 942.68	FF +27 117.60

Roughly equivalent to US \$ (at the rate of US \$1 = F.F. 4.9)	US\$ 1 690.00	US\$ 57 369.00	US\$ 61 213.00	US\$ 5 534.00
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8th July, 1974

work on credit files New work file
Productive Club

(33)

19 JUL 1974

Doc N° 74 - 80

AP / sg

Mr. L.C. MAZEL
 R.T.Z.
 6 St. James Square
 P.O. Box 133
LONDON S.W.1 Y 4LD

Please find enclosed :

- The ~~financial~~ eighth quarterly report (Doc N° 74 - 75) with its appendixes .
- Letter N° 74 - 76 asking for your financial contribution .
- Letter N° 74 - 79 with two tables attached to it.
- Revised version of table C 2b) .
- New tables C 92 and C 96 .

With best regards ,

Yours sincerely .

André PETIT

Paris , July 11.1974

EIGHTH QUARTERLY REPORT
FROM THE SECRETARYI. FINANCIAL REPORTA. - Financial information for the second quarter of 1974.

Appendixes I to III give the usual information concerning the second quarter 1974 .

Appendix I shows a cost estimate for telecommunications and post , roughly 20% over the corresponding budget estimate .

But the last two months of the quarter have been estimated by extrapolation of the latest invoices , and it is likely that the actual cost will be somewhat lower . But in any case the actual costs will be higher than initially contemplated , and the Secretary will , with the help of all groups , go on trying to reduce these expenses .

B. - Final accounts for 1973 . - Checking of the books .

As decided during the eleventh meeting of the Operating Committee , representatives of R.T.Z. and Uranex came to the Secretariat in order to check the Secretary's books and final accounts for 1973 . R.T.Z. and Uranex will report on this subject during the next Operating Committee meeting .

During this visit , the following decisions were made concerning some improvements to be made in the drafting of the financial reports :

- At the end of each year , a balance sheet will be established , similar to the one hereto attached as Appendix IV for the year 1973 .

.../...

- Some improvements will be made to the drafting of final standing and final situation of participants as shown in the new draft of these tables for 1973 hereto attached as Appendixes V and VI .

- Inventory will be no more established on a quarterly basis but only yearly .

C. - Contributions for the next quarter .

A letter is being mailed asking for members' contributions for the next quarter on the basis of a total of FF. 60 000.00 .

II. COMMUNICATIONS TO THE SECRETARY

Very little new bids have been made during the quarter . Among them , one (R.T.Z. bid to Agip) has not been communicated to the Secretary .

Concerning letters of intent and contracts , the Canadian group , as announced in Montbazou , is sending summaries , but even such summaries are still missing for some contracts . Some copies of bids , letters of intent or contracts asked from other groups by letter N° 74 - 43 dated April 8. are still missing . Another letter will be mailed in the near future listing the documents still missing .

III. VETTING OF BIDS AND CONTRACTS

Some minor deviations from agreed terms of payment exist in the Nufcor - BNFL contract for Latina (C.27) due to a pre-existing contract between ENEL and BNFL . According to the circumstances of negotiation of this contract , such deviations should be considered as acceptable . The terms and conditions of some bids are still under review .

Doc No 74 - 75

QUARTERLY FINANCIAL STANDING

CURRENCY : FRENCH FRANCS

APPENDIX I

2nd QUARTER 1974 (I)

QUARTERLY ESTIMATE	NATURE OF EXPENSES	COSTS FOR THE QUARTER	CUMULATIVE COSTS SINCE 1.1.1974	CUMULATIVE ESTIMATE SINCE 1.1.1974
27 500.00	Secretary's remuneration	25 341.18	48 711.02	55 000.00
17 500.00	Other wages	16 097.34	29 750.60	35 000.00
4 250.00	Rent and maintenance of offices	3 881.25	7 762.50	8 500.00
2 250.00 (2)	Hiring of office machines	1 163.54*	2 311.23*	4 500.00 (2)
2 500.00	Fittings of office and furniture	0	0	5 000.00
25 000.00	Telecommunications and post	32 197.25*	60 826.52*	50 000.00
12 500.00	Travelling and receptions	7 286.85	25 733.35	25 000.00
750.00	Office requisites	637.03	1 277.53	1 500.00
FF92 250.00	TOTALS	FF 86 604.44	FF 176 372.75	FF 184 500.00

US\$18 825.00	Roughly equivalent to US\$ (at the rate of US\$ = FF 4.9)	US\$17 675.00	US\$35 995.00	US\$37 650.00
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(1) Figures with asterisks are estimated.

(2) Including purchase of a typewriting machine.

8th July, 1974

Doc No 74 - 75

APPENDIX IISTATEMENT OF FINANCESON JUNE 30, 1974CURRENCY : FRENCH FRANCS

<u>ASSETS ON 1.1.1974</u>	71 857.54	<u>PAYMENTS FOR 1973 COSTS</u>	44 739.94
Bank	71 458.25		
Cash	399.29	<u>PAYMENTS FOR 1974 COSTS</u>	122 649.06
<u>CONTRIBUTION OF MEMBERS</u>	199 492.40		
Canada	54 000.00	<u>ASSETS ON 30.6.1974</u>	103 960.94
Australia	44 000.00	Bank	103 657.86
Nufcor	42 000.00	Cash	303.08
R.T.Z.	20 000.00		
Uranex	39 492.40		
<u>TOTAL</u>	<u>FF 271 349.94</u>	<u>TOTAL</u>	<u>FF 271 349.94</u>

8th July, 1974

Doc No 74 - 75

APPENDIX IIIESTIMATED SITUATION OF PARTICIPANTS ON 30.6.1974

CURRENCY : FRENCH FRANCS

PARTICIPANTS	BALANCE ON 1.1.1974	SHARE OF 1974 COSTS ESTIMATED ON 30.6.74.	CONTRIBUTIONS SINCE 1.1.1974	ESTIMATED BALANCE ON 30.6.74
CANADA 27%	+ 7 497.50	47 620.64	54 000.00	13 876.86
AUSTRALIA 22%	+ 6 109.07	38 802.01	44 000.00	11 307.06
NUFCOR 21%	+ 5 831.39	37 038.28	42 000.00	10 793.11
R.T.Z. 10%	+ 2 776.85	17 637.27	20 000.00	5 139.58
URANEX 20%	+ 4 902.79	35 274.55	39 492.40	9 120.64
<u>TOTALS</u>	<u>FF +27 117.50</u>	<u>FF 176 372.75</u>	<u>FF 199 492.40</u>	<u>FF 50 237.25</u>

Roughly equivalent to US \$ (at the rate of US\$ 1 = FF 4.9)	US\$ 5 535.00	US\$ 35 995.00	US\$ 40 715.00	US\$ 10 255.00
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8th July, 1974

Doc No 74 - 75

APPENDIX IVCURRENCY : FRENCH FRANCSS.E.R.U. DOCUMENTATIONBALANCE SHEET AS AT 31st DECEMBER 1973ASSETS

Office machines		2 833.40	
<u>Less</u> Depreciation		(2 833.40)	
Cumulative expenditure from 1.7.72		372 231.49	
Current assets			
- Bank	71 458.25		
- Cash	<u>399.29</u>		
		<u>71 857.54</u>	
		FF <u><u>444 089.03</u></u>	

LIABILITIES

Used contributions to date		372 231.49	
Prepaid contributions by members		27 117.60	
Accrued expenses		<u>44 739.94</u>	
		FF <u><u>444 089.03</u></u>	

8th July, 1974

APPENDIX V.

FINAL STANDING FOR 1973

CURRENCY : FRENCH FRANCS

NATURE OF EXPENSES	CUMULATIVE COSTS FOR 1973	ESTIMATE FOR 1973	DIFFERENCE
Secretary's remuneration	89 466.15	96 000.00	- 6 533.85
Wage expenses of the typist secretary	49 143.81	50 000.00	- 856.19
Rent and maintenance of the office	15 525.00	15 525.00	0
Hiring of office machines	7 265.75	8 500.00	- 1 234.25
Fittings of office and furniture	0	7 500.00	- 7 500.00
Telecommunications and Post	91 447.22	100 000.00	- 8 552.78
Travelling and Receptions	23 609.35	50 000.00	-26 390.65
Books and Publications	478.80	1 000.00	- 521.20
Office requisites	<u>1 926.99</u>	<u>2 000.00</u>	<u>- 73.01</u>
<u>SUB-TOTAL</u>	278 863.07	330 525.00	-51 661.93
Depreciation of office machines	2 833.40	-	+ 2 833.40
<u>TOTALS</u>	FF <u>281 696.47</u>	FF <u>330 525.00</u>	FF <u>-48 828.53</u>

Roughly equivalent to US \$ (at the rate of US \$1 = Fr. 4.9)

US\$ 57 500.00

US\$ - 9 950.00

8th July, 1974

SEKU
SOCIÉTÉ D'ÉTUDES
ET DE RECHERCHES D'URANIUM

Documentation Department

Telex : 20412 SERUDOC PARIS

Téléphone : 734.80-72
or 273-60-00
Extension 50-90

Doc N° 74 - 79

AP / sg

Paris , July 12.1974

Mr. L.C. MAZEL
R.T.Z.
6 St. James Square
P.O. Box 133
LONDON S.W.1 Y4LD

Subject : Tables concerning UG business .

Dear Louis

According to the wish expressed by several groups ,
please find enclosed a first draft of two tables which could
be periodically established in order to help all groups following
the evolution of UG business .

These drafts summarize the best information I have
presently and I sent one copy to Mr. von Kienlin asking for
confirmation or comments . I would be grateful for your
suggestions in order to improve their presentation or their
content .

I apologize for the discrepancies between the two
tables for some figures , which result from some uncertainties
concerning calculations or imputation , and which will of course
be corrected in the final version of these tables .

With best regards ,

Yours sincerely .

A. Petit
André PETIT

First Draft
3.7. 1974

UG SALES (1)

CONTRACTS	BACKING	73	74	75	76	77	78	79	80	81	82	83	84	85	86
NECKAR C2b)	Uranex		147		50	50									
	Nufoor		115		35	35									
	Rio Algom ?		115					65	65	65					
NECKAR C2 Compl.	Uranex		10												
	?		62												
URAEA, Nukem	Uranex		5												
KFA Jülich	Uranex		12												
	C59														
KWU	Uranex		53												
	C64														
STUDSVIK	Uranex		2												
	C66														
BAYERNWERK	Uranex				248	172	300	247	247	143	163	162	163	162	
	C67				291										
R.W.E.	Uranex						390								
	C71														
NUKEM-JAPAN	Uranex		4												
	C73														
EURATOM BR2	Steag		17												
	C77 NC.														
A.A.E.C.	Steag		(1)												
	A78														
ONTARIO HYDRO	Steag		7												
	A81														
PETTEN	Steag		(3)												
	A85														
R.B.G. 1974	Brunehlde		(22)												
	A85														
N.K.W. PREAG (2)	Steag				376	505	775	578	578	578	513	663	500	500	500
	A85														
TOTAL (3)		12	537 (26)						266 162	266 162	370 162	350 162	501 162	337 162	338 162

(1) Figures in brackets are offers.

(2) If this indication given by UG is confirmed by R.T.Z. and Uranex, the corresponding tonnages will be counted against the relevant quotas.

(3) Discrepancies between these totals and those in table concerning UG's buying and selling commitments are due to the rounding of some figures and to the way of taking into consideration the Neckar sale for 1979-81.

First Draft
3.7.1974

UG's BUYING AND SELLING COMMITMENTS OR OPTIONS (1)

Year	Somair		Rössing		Steag		Brunehilde		Others		Total		Net available	Sales with case backing	Total sales	Observations
	Buying	Selling	Buying	Selling	Buying	Selling	Buying	Selling	Buying	Selling	Buying	Selling				
1933							22	(22)			22	(22)	22	12	12	(22)
1974					22	17	100		62		122	79	43	458	537	(4)
1975					25						25		25			
1976																
1977			250	250							250	250	0	376	376	
1978			350	392							350	392	-42	257	507	
1979	163	163	350	350					(65)		513	513	0	385	777	513
	(162)	(162)									(162)	(227)	?			
1980	163	163	350	350					(65)		513	513	0			513
	(162)	(162)									(162)	(227)	?			
1981	163	163	350	350					(65)		513	513	0			513
	(162)	(162)									(162)	(227)	?			
1982	163	163	350	350					(65)		513	513	0			513
	(162)	(162)									(162)	(162)	0			
1983	163	163	500	500							663	663	0			663
	(162)	(162)									(162)	(162)	0			
1984			500	500							500	500	0			500
1985			500	500							500	500	0			500
1986			500	500							500	500	0			500
TOTAL	815	815	4000	4042	47	17	122	(22)	62		4984	4936	48	1488	6424	(26)
	(810)	(810)				(4)			(195)		(810)	(1031)	(39)			

(1) For each year, firm commitments are indicated on the first line, options or offers in brackets on the second.

CUSTOMER : NECKARWESTHEIM

CONTRACTOR : URANGESELLSCHAFT

Table C N° 2.b)
 Issued on : APRIL 4, 1974
 Revised on 18.6.1974.

LETTER OF INTENT : Date :

Received by Secretary :

Content :

CONTRACT : Date :

Received by Secretary :

Special conditions : Sub-contract with Uranex and other subcontracts between Uranex and Nufcor (April 21. 1972)

Observations : Prices and contract not to be disclosed.

Additional letter of intent for 2200 Kg U in UF6 in 1974 dated 15.11.1973, which tonnage has not been included yet in tables B and D.

ACTUAL SUPPLIERS : Nufcor for 220 s.t. - Uranex for 297 s.t. - Rio Algom for 115 s.t.

PRICE AND QUANTITIES :

	1974	19	1976	1977	1978	1979	1980	1981	19	19	Observations
Quantities contracted	147		50	50	50						Uranex (1) 297
	115		35	35	35						Nufcor 320
Prices contracted	377		85	85	85	(65)	(2)(65)	(65)			Rio Algom 115
	+ 3										Total 632 s.t.
Actual deliveries and prices											(2) Tonnages for 1979 & 1980 were supposed to be sold by R.T.Z. but have not been contracted yet and have been deducted from R.T.Z. quota in table B 33.
- 1st. delivery	77 st.	(3)									(3) Invoices 74-24
Price											(4) Invoices 74-25 and 74-2
- 2nd. delivery	88 st.	(4)									(5) Invoices 74-37 and 74-4
Price											
- 3rd. delivery	99 st.	(5)									
Price											
- 4th. delivery											
Price											

(1) Total through 1977 being 247 s.t. whereas 260 were mentioned in R. T. Z. table dated July 12. 1972 and included in tables B , 13 s.t. have been deducted from Uranex quota in table B 19.

Table C N° : 96
 Issued on : 24. 6. 1974
 Revised on :

CONTRACTOR : URANEX

CUSTOMER : K.W.U. 1974

Received by Secretary : 20. 6. 1974

LETTER OF INTENT : Date : 14. 6. 1974

Content :

CONTRACT : Date : Received by Secretary :

Special conditions :

Observations :

ACTUAL SUPPLIERS :

PRICE AND QUANTITIES :

	1974	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	Observations	
Quantities contracted in UF6	18																				
Prices contracted # U.S.\$	182																				
	36.98																				
Actual deliveries and prices																					
- 1st. delivery																					
Price																					
- 2nd. delivery																					
Price																					
- 3rd. delivery																					
Price																					
- 4th. delivery																					
Price																					
																					# 13.08 \$ per 1b.U.0g.

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MINING INSTITUTE OF AUSTRALIA LIMITED

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 Telex AA30 5

14th July, 1976

Memorandum to : R.H. HARDING, ESQ.
 copies to : F.F. Espie, Esq.
 D.F. Fairweather, Esq.
 from : R.H. Carnegie

I had lunch yesterday with Bob Hawke who stressed that the uranium issue would be a major political and union problem. He asked me what my own attitude was to the exports of uranium. I replied there are three separate aspects.

1. There would be no risk at all to any Australian in the mining, milling or shipment of yellowcake.
2. Australia is part of the world and the products of nuclear reactors worry me in two respects.
 - (a) The possibility of terrorists getting hold of materials from which bombs could be made. I thought this was not very likely since easier targets for terrorism existed. It could be met by Australia emphasising that purchasing Governments take particular care to defend potentially fissionable material.

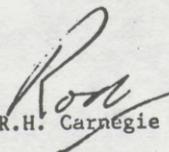
2.

(b) Radio active wastes and their disposal.
I said the wastes could not be proved to be safe but I assessed the risks as being less than those from road accidents and technology is improving all the time in the ability to handle.

3. Australia will need all the uranium exports it can get in the early 80s to pay for the oil imports.

Bob asked me about solar energy and I said that I could see merit in investing some of the royalty income from uranium sales in solar energy investigation. I said I thought technology would be available in about 50 years but I doubted if it would make a major impact on energy production before that time.

Bob's comments confirmed Paul Keating's comments that we have difficulties in the uranium business ahead.


R.H. Carnegie

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THE NATIONAL TIMES, AUGUST 16—21, 1976

A
RADIOACTIVE
'LEAK'

By BRUCE STANNARD

Friends of the Earth
drop a bomb on
the miners

An environmental protection group has obtained a copy of the documents from uranium miners. The US says the export of uranium from Australia has peaked and a clamp and dagger operation against a major mining company.

The group, the Friends of the Earth, has obtained "leaked" copies of hundreds of pages of documents from the files of Mary Kathleen Uranium.

And last week they placed the documents on the public record by submitting them to the inquiry chaired by Mr Justice Fox, which is investigating the environmental and other aspects of the proposed Ranger Uranium development in the Northern Territory.

Late last week Mary Kathleen executives asked the Commission to return the documents.

The disclosures in the documents are going to cause Australian uranium producers considerable difficulties and embarrassment. Some of the key points in the documents:

- They offer strong support for the already widespread belief that uranium producers controlled by the Western developed countries formed a producers' club in 1972 to fix prices and establish quotas in markets all around the world.

This club, referred to as The Producers' Club in internal memorandum among uranium producers, is already the subject of a US Justice Department investigation to see if it is a restraint of trade.

US officials can be expected to pay considerable attention to the documents leaked to the FOE. At its worst, the disclosures could help the US force down prices for Australian uranium exports.

- The document includes a confidential memo written by Mr Rod Carnegie, chairman and chief executive of Conzinc Riotinto Australia Limited, in which Mr Carnegie refers to a mid-July lunch with ACTU chairman Bob Hawke. He acknowledges the possibility of terrorists obtaining material from which bombs could be made and also that radio-active wastes could not be made safe.

"Bob's comments," Mr Carnegie wrote in a memo to CRA executives," confirmed Paul Keating's comments that we have difficulties in the uranium business ahead."

The documents also contain a copy of a letter from the US Justice Department to the Australian Atomic Energy Commission in 1972. The letter is a direct challenge to the AEC's position on uranium enrichment. It is a direct challenge to the AEC's position on uranium enrichment. It is a direct challenge to the AEC's position on uranium enrichment.

- In 1972 the Australian Atomic Energy Commission believed that the Japanese were over-buying uranium to establish a stockpile which could be used as the basis for an enrichment plant. The document suggests, too, that the AEC was worried about supporting the producers club's tough-nosed attitude towards middlemen, because it might cost us American support for uranium enrichment.

- The documents also quote a member of the Australian Atomic Energy Commission as suggesting the use of American intermediaries to sell Australian uranium to Taiwan because of "a very difficult safeguard system with Taiwan".

Although Australia in fact has never sold uranium to Taiwan and government policy is now to insist only on direct Australia-to-customer sales, FOE describes the 1972 statement as the "clearest indication yet of the Australian Government's intention to try to get around safeguards against uranium being used for weapons making."

When The National Times obtained a copy of the documents we approached Mr G. D. Woods, a senior lecturer in law at the University of Sydney and Friends of the Earth counsel at the Commission.

He said the original documents were sent anonymously to FOE's Melbourne office. "I am convinced the documents are genuine," he said. "Their significance is a matter for the Commission and for public opinion."

"They relate to a matter in which I am involved as counsel so I can make no comment about them. As soon as they came to my notice I took steps to put them in the right hands. You can draw your own conclusions by reading them."

A review of the documents by The National Times indicates that the most damaging aspect of the documents to the industry is the evidence provided about international price-

The US Justice Department could use the material to threaten the uranium producers. American motives for the Justice Department's inquiry are not entirely those of apostasy of the free market.

It is in American interests to keep uranium prices down as America will have to import foreign uranium. The Friends of the Earth action may therefore assist in depressing Australian export revenues from uranium but the view of FOE is that the lower the profits, the less likely Australian mining is.

A full report of the document's account of the establishment of the uranium producers' club is on page 4.

Friends of the Earth in their submission to the Ranger Inquiry accompanying the documents say the clearest indication of the Australian Government's intention to get around the safeguard requirements is demonstrated in a document entitled "Notice of Uranium Meeting" on Mary Kathleen notepaper.

FOE says these notes appear to have been supplied by the former general manager of Mary Kathleen Uranium, Mr H. G. Melouney, to Mr Frank Espie (deputy chairman of the mining giant CRA and chairman of MKU).

FOE says:

"At the meeting in Sydney on August 7, 1972, Mr M. C. Timbs of the Australian Atomic Energy Commission said there existed a very difficult safeguard situation with Taiwan which effectively compelled Australian producers to sell to Taiwan through a USA reactor supplier."

FOE claim this shows "a clear intent to allow the spread of nuclear materials [in the knowledge that the users had insufficient safeguards]."

In fact inquiries by The National Times indicate that no Australian uranium has ever been exported to Taiwan. At the time that Mr Timbs made his proposal Australia had a bilateral safeguard agreement with America and America had a bilateral safeguard agreement with Taiwan, so that it may not be fair of FOE to accuse Mr Timbs of seeking to evade safeguards.

The documents also contain a fascinating memorandum concerning the relations of the chief of CRA, Mr Rod Carnegie, with union leaders such as Bob Hawke: (CRA effectively controls Mary Kathleen.)

This is the full text of Mr Carnegie's memorandum to Mr R. H. Harding, CRA General Manager, Corporate Development.

"I had lunch yesterday with Bob Hawke who stressed that the uranium issue would be a major political and union problem. He asked me what my own attitude was to the exports of uranium. I replied there are three separate aspects.

1. There would be no risk at all to any Australian in the mining, milling or shipment of yellowcake.
2. Australia is part of the world and the products of nuclear reactors worry me in two respects.

(a) The possibility of terrorists getting hold of materials from which bombs could be made. I thought this was not very likely since easier targets for terrorism existed. It could be met by Australia emphasising that purchasing Governments take particular care to defend potentially fissionable material.

(b) Radioactive wastes and their disposal. I said the wastes could not be proved to be safe but I assessed the risks as being less than those from road accidents and technology is improving all the time in the ability to handle.

3. Australia will need all the uranium exports it can get in the early 80s to pay for the oil imports.

"Bob asked me about solar energy and I said that I could see merit in investing some of the royalty income from uranium sales in solar energy investment. I said I thought technology would be available in about 50 years but I doubted if it would make a major impact on energy production before that time.

"Bob's comments confirmed Paul Keating's comments that we have difficulties in the uranium business ahead."

Friends of the Earth claim

senior executives of CRA and MKU. These seem and remain very worried about the effectiveness of the environment movement. In their second summary of the documents they say the companies are taking steps to closely monitor the activities of the environment groups.

"H. F. Melouny, who retired on June 30 as General Manager and a director of Mary Kathleen Uranium, has in particular been worried for more than the past year about this," according to FOE.

"On March 12, 1975 he wrote a confidential memo to Mr R. W. L. Austin, formerly deputy head of the Australian Secret Intelligence Service, now head of CRA Corporate Relations, noting the 'increasing emphasis in the press and elsewhere on the alleged dangers to world health from nuclear reactors' and seeking Austin's views on 'what steps might be taken to combat the environmentalists' propaganda.' He also noted that 'MKU cannot effectively combat the campaign,' but 'what is needed is someone not directly involved and more authoritative on the general subject.'

"He pointed out that the Australian Atomic Energy Commission 'may not be happy to oppose the environmentalists' and that the Australian Mining Industry Council 'would lack credibility.' He suggested 'a combination of suitable academics writing appropriate articles in the press and other media could be the answer'."

Friends of the Earth say that since that memo was written there have been "a continuous run of articles by academics" and these have been circulated from Austin's office to senior MKU executives.

On June 28, two days before Mr Melouny's retirement he wrote to Mr D. F. Fairweather, General Manager of MKU, that "the uranium industry has been doing far too little in the area of public relations. We are being beaten by the opposition and I find this both disappointing and frustrating."

Friends of the Earth claim the "paranoia" of the company

in relation to the environmental issue and the news media also surfaces in a transcript of a Four Corners program on ABC television which dealt with uranium in June this year.

FOE say James Blyth, a member of Mr Austin's staff circulated a transcript of the program among senior executives. Various comments were noted on the transcript. Where compere Caroline Jones introduces the report by Peter Ross and Richard Thwaites there is a handwritten but uninitialled note that Ross was "responsible for anti-EZ (Electrolytic Zinc) program on Derwent R."

At another stage, after Mr Leslie Kemeny, a lecturer in Nuclear Engineering at the University of NSW, has spoken, the compere says: "That is one Australian scientist's point of view about the disposal of nuclear waste."

In the margin opposite there is a note that Kemeny migrated to Australia from England 10 years ago. Later when Mr Miyazawa, the Foreign Minister of Japan says "no one has come up with a good answer (to the problem of nuclear waste disposal) so we are really, without an answer" a note in the margin says: "This will be used against us."

Friends of the Earth spokesman Leigh Holloway claims the documents are the most damaging evidence Australian environmentalists had uncovered in their battle against the uranium mining companies.

"Time and time again they refer to 'the club'," he said.

"That's an organisation they say that for the outside world will appear to be for the exchange of marketing information but quite clearly the intention throughout the documents is price fixing.

"I think Carnegie's statement to Hawke is tremendously important. It doesn't sound much in itself to say that the waste cannot actually be proved to be safe until you think about what that actually means.

"It means you've got the most dangerous materials ever known which you have to store for 250,000 years and if you can't do that safely then you could kill not just one or two people but thousands. Saying that it's probably safer than the road toll is not a very great reassurance to people. Road deaths account for over 3,500 deaths a year in Australia. We hardly need anything else of that magnitude.

"Sir Phillip Baxter has consistently said terrorists could never make bombs from the stuff, but here we have Mr Carnegie conceding that it is possible. I find it absolutely astounding that anyone who admits that those possibilities exist can then still wish to go ahead with a nuclear industry purely for profit.

"The other thing in these documents is the illustration of how the companies are worried about environmentalists and about unions.

This is demonstrated by the memos and letters from Mr Melouny who has been consistently urging that the industry step up its public relations counter-attack against the environmentalists. They have been monitoring what's being said in the newspapers and on television and radio. They've got the activists singled out."

THE FINANCIAL TIMES, AUGUST 16—21, 1976

HOW THE URANIUM CLUB BEGAN

By BRUCE STANNARD

The documents obtained by the Friends of the Earth contain many references to the uranium producers' club, the colloquial name for the organisation set up in 1972 and officially titled The Uranium Marketing Research Organisation.

The club had five members: Canada, France, South Africa, Australia, and Rio Tinto Zinc Corporation, the UK-based mining giant which controls CRA in Australia and through CRA controls Mary Kathleen Uranium.

The group was formed at a time when uranium prices were very low. According to the documents it led to a final agreement in 1974 which fixed the price of uranium to be charged by members from 1974-78.

It also established quotas for the Western world's market for the various members.

And it approved a device of quotas from a price leader and a runner-up who could quote prices at a discount on the club's floor prices — presumably to make sure the quotas of each member were fulfilled.

The club appears to have been wound up in June, 1975, and its place taken by the Uranium Institute, the organisation which accepted carefully selected customers. By that time its job had been done in providing a floor price when uranium production far outran demand.

Some cynical Australian

Government officials also believed that by that time it had fulfilled the ambitions of RTZ which had made sure through the club that prices were high enough for the development of its Rossing uranium project in South-West Africa.

RTZ enjoyed the unique position of being the only company in a club made up of four other nations.

When first set up the club outlined the following quotas for producers (see table A).

By late 1973 the club had taken account of the Labor Government in Australia which banned any new contracts for uranium exports. Revised quotas were established. Australia in the early period of 1974-78 lost most of its quota but gained an increased quota in the later part (see table B).

The Friends of the Earth submission accompanying the documents given to the Ranger Inquiry last week outlines what it claims is the evidence for the existence of the club.

FOE refer to a "strictly confidential" MKU file containing

documents from February 1972 to August 1974 which they claim reveal "a clear intent to fix uranium prices."

A document from this file records a meeting of uranium companies in Sydney on March 1972 called to form an organisation for Australian producers.

"Some members," the document says, "indicated possible conflict of interest and difficulties which might arise from anti-trust legislation in Australia and elsewhere. For example, Pan-continental were associated with Getty Oil and the latter may have difficulty with US anti-trust laws."

Attached to a confidential letter dated March 7, 1972, from H. F. Melouney (former general manager and director of MKU) to Mr Carnegie in London is a paper prepared by Malcolm Baillie (assistant general manager of CRA's General Mining Division) setting out "our ideas and aspirations" on Australian uranium production.

The Baillie assessment notes: "The market position for uranium is at present not favourable to uranium producers. Potential production to

1978 exceeds the available market, and it will not be until the early 1980s that the supply-demand situation becomes more balanced.

"In view of this situation," Mr Baillie says, "an attempt has been made by suppliers on a world scale to agree on a co-ordinated market approach."

In a letter dated May 2, 1972, from Mr L. C. Mazel of RTZ Services to Mr Melouney in Melbourne, Mr Mazel refers to Mr Melouney's letter dated April 27 in which he used "a word which we would not even like to mention as some of the members of The Club are rather worried about informal price agreements."

Mr Mazel says: "I would like to stress very strongly that under all circumstances there can only be an unofficial agreement and whatever agreement is struck it should be on a strictly confidential basis."

"For the outside world, all Paris and subsequent meetings will be in connection with the exchange of marketing information."

In a letter from Mr Mazel to Mr Melouney dated July 24, 1972, he advised: "It has also been agreed that the Australians and Nufcor (South Africa's Nuclear Fuel Corporation) will work out a scheme whereby they will be leading in relation to a quotation for Taiwan." Attached to Mr Mazel's letter are details of the Uranium Operating Committee meeting on May 31 and June 12, 1972, which explain the "Procedure for Quotation."

"The leader and runner-up,"

TABLE A

Group	1972-77	1978-80
Canada	33.50%	23.22%
Uranex (France)	23.75%	19.26%
Nufcor (South Africa)	21.75%	19.26%
Australia	17.00%	24.44%
RTZ	4.00%	13.82%

TABLE B

	1st period	2nd period
Canada	37.3%	21.86%
South Africa	24.2%	18.38%
France	4.5%	13.69%
Australia	7.6%	27.81%

it says, "will be selected by the Secretary in consultation with the Committee.

Notes typist on Mary Kathleen newspaper record a uranium industry meeting in August 1972 in which Mr Barry Lloyd gave the proposed pricing policy for consumers in the Japan area and European area.

This is what the notes say: "He (Lloyd) reported that sales to middlemen such as reactor manufacturers eg Westinghouse, General Electric, was to be discouraged and that any quotation given were to be 15 cents per lb U308 (uranium) higher than for equivalent sales to utilities. Timbs of AAEC considered that the Australian Government would have problems with the above policy towards middlemen as they were almost exclusively USA organisations.

"Discrimination in this area might bring US Government retaliation against Australia in regard to enrichment services. Timbs believed that the Japanese were overbuying intentionally with a view to establishing over the next decade a stockpile of up to 100,000 tons U308 which could be used as a base for an enrichment plant.

The documents also illustrate the lengths to which the companies have had to go to try to lift the union ban on uranium mining and export. In a memorandum to Mr Espie, on June 17 this year, Mr R. H. Harding said he had called to see Mr Jim Scully (secretary, Department of National Resources) and Mr Terry Larkin (first assistant secretary, Department of National Resources) to obtain details of progress towards providing MKU with the final documentation necessary to allow the shipment of uranium oxide to Commonwealth Edison, an American electricity utility.

Mr Harding's memorandum says: "Mr Scully confirmed that discussions on this topic had proceeded last weekend with representatives of the ACTU. The Government provided them with copies of relevant correspondence evidencing approvals (including those given by the Labor Government) for the shipment of U308... After considering the information provided the representatives appeared to be in favour of shipping U308 covered by contracts which had been approved by previous governments.

"They, and particularly Mr Fitzgibbon, as head of the Waterside Workers' Federation said, however, that there was no way they could agree there and then to the shipment of U308 because this would be contrary to the earlier decision by which they were bound. They thought, however, that with the additional evidence now available to them they would be able to influence the other representatives involved, and in turn the rank and file to allow shipment to proceed.

"They agreed to hold a special meeting early next week for this purpose and requested that a senior official of the Department of National Resources be available to answer questions. (This meeting would have taken place yesterday but the knighthood conferred upon Jack Egerton was said to be still too fresh in unionists' minds. A further week would be necessary to allow this issue to blow over sufficiently for representatives to take a reasonable view on MKU matters.)

"Mr Scully said the Government had reached the view it will take a firm stand and ensure that shipments are made. One of the main extreme alternatives may necessitate all shipments being made from the Government stockpile. MKU production may then need to be brought within that stockpile. However, all alternatives using normal commercial methods will be tried first."

THE NATIONAL TIMES, AUGUST 16—21, 1976

RESOURCES

Australia's uranium producers have hired one of Canberra's biggest lobby groups, International Public Relations, to organise their media campaign against the anti-uranium forces.

IPR have just been engaged for a hefty retainer to monitor all media coverage on uranium and supervise the industry's response.

The decision follows deep concern within the companies that they are being defeated in the propaganda battle by a combination of environmentalists led by the hard-headed Friends of the Earth group, Aborigines pushing their land claims and a powerful force of scientific and medical opinion warning about the dangers of uranium development.

This feeling is documented in the secret company memoranda produced in the article by Bruce Stannard elsewhere in this issue, where the former general manager of Marv Kathleen Uranium, Mr H. Melouney, wrote to a colleague on June 28 this year complaining that "the uranium industry has been doing far too little in the area of public relations. We are being beaten by the opposition and I find this both disappointing and frustrating." The same theme also runs through Mr Melouney's correspondence with the head of CRA corporate relations, Mr R. Austin.

IPR have been working for the Ranger uranium partners for the past six months and have now been commissioned by the Australian Uranium Producers' Forum. This comprises the major deposit holders Pancontinental, Peko-Wallend, Queensland Mines, Electrolytic Zinc, Noranda Australia and Western Mining Corporation.

The move follows growing evidence in public-opinion polls that doubts about the nuclear hazards of uranium development are assuming strong proportions in the public mind.

The producers' decision is the clearest sign that they expect the real uranium battle to begin, rather than end, when Mr Justice Fox completes his report on the Ranger environmental inquiry.

While no one has tried to predict the direction the Fox inquiry will take, the consensus is that it will open the way for development with very strictly defined safeguards. It will certainly provide valuable ammunition for both sides.

The Fraser-Anthony coalition, which is anxious to promote uranium development, now finds itself locked into the Fox inquiry, which was set up by the previous Government and whose recommendations it can ignore only at its own political risk.

The uranium men discover they've got a lousy image

By PAUL KELLY

So far the Government has frozen decisions on the uranium front pending the Fox report. But while Mr Anthony has adopted a highly cautious attitude in public the mining companies remain privately sure about his pro-development sympathies.

They will be pressuring the Federal Government to approve new export contracts immediately after the Fox report is presented at the end of this month.

The basis of the advice being given the Deputy Prime Minister from the Department of Natural Resources is that uranium development cannot be considered solely as an economic issue. The minister has accepted this notion in his speeches, and it lies behind the Government's hard-line 75 per cent Australian equity provision for uranium development.

Mr Anthony has gone so far as calling uranium a "special case" and "a commodity of such sensitivity as to be without parallel," making it clear that, at least in public utterances, the Government is aware of the nuclear ramifications of the material and its potential as a huge political issue.

On the question of nuclear safeguards covering the export of Australian uranium, the present Government has taken a tougher stand than the previous Labor Government under Mr Rex Connor.

After examination earlier this year, the Government concluded that future contracts would need to be consistent with the Government's obligations under the nuclear non-proliferation treaty. This requires the application of safeguards administered by the International Atomic Energy Agency for exports to non-nuclear weapon States.

But in addition, the Government plans to seek a prior bilateral agreement with any country wishing to import Australian uranium.

The chief purposes of such an agreement would be twofold: first, to provide that material exported was for peaceful purposes and not diverted for explosive uses; and second, to prevent re-export to another nation without Australian consent at the time of sale.

The Natural Resources Department has backed these moves on the export front, but it still remains whether the Australian Government will be able to secure such conditions at the stage of export negotiations. The extent to which the Government maintains this policy in the face of industry pressure will also be crucial in the political conflict over exports.

So far, the whole question of whether uranium mining should proceed has obscured other problems which will remain well after Mr Justice Fox finalises his report.

These relate to basic divisions within the companies about the nature and pace of uranium development, reflecting their competing interests; and also to the requirements of the Government's new Aboriginal land rights bill which has already been introduced into Parliament and which could necessitate another inquiry about Aboriginal land claims.

Differences between the companies became obvious at Government-industry talks earlier this year which centred on the crucial issue of marketing.

A variety of options were canvassed with the main ones being:

- A central marketing board to allocate sales of uranium among producers, thereby giving the Government the dominating role in determining the pattern of development.
 - Sequential entry of producers into the market in an order determined by the Government.
 - Allocation by the Government of sales among all producers on a pro-rata basis.
 - Minimum government intervention into marketing subject to price guidelines.
- Peko-EZ already have contracts and were the priority uranium development selected by the Labor Government. They support a more interventionist role by the Government, reasoning that in any process of sequential development they will be at the top of the queue while companies like Pancontinental and Noranda will bring up the rear.

"The Uranium Men Discover They've Got a Lousy Image"
National Times, 8/16-21/76

p.2

A policy of sequential development could mean years of delay for these last two operations which would give way in favour of Peko-EZ and Queensland Mines.

In the earlier talks, Peko-EZ favoured a marketing board to supervise development and opposed any laissez-faire approach by the Government.

The companies that first get their feet in the market will want a definite policy of government control to ensure the world price is maintained. This can only be done by controlling the rate of exports from Australia.

The view of the department is that the national Government must play a role in marketing if simply because the dumping of 20 per cent of the world's uranium on the market would cause a big price shake-out.

In the past three years, mainly because of the energy crisis, the price of uranium has risen from \$US7 a pound to about \$US40. The department estimates that on current money values, large-scale mining and export of uranium would yield an export income about \$1,000 million a year, and this figure could be doubled with any uranium-enrichment process.

Apart from the Fox inquiry, the other target of the companies is the Government's Aboriginal land-rights bill. Implicit in the bill are further long delays for the industry. It will not become law until late in the year and provides for any Aboriginal land claims to be heard by a commissioner after an inquiry likely to take around six months.

The Australian Mining Industry Council has made strong representations to the Government to have the bill amended, as have both Northern Territory pastoralists and the NT Legislative Assembly.

If the companies fail to get their amendments and the Aborigines proceed to make their land claims, then the companies will pressure the Government to involve the "national interest" provisions of the bill.

This is the ultimate "escape hatch" to avoid the problem of Aboriginal demands but it would amount to political overkill on a grand scale.

In short, the uranium miners will need all the public-relations men and skill to find a way through the maze that just starts with the Fox report.

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REPORT OF THE DISCUSSIONS IN PARIS ON
THE URANIUM INDUSTRY
1 - 4 February, 1972

The Australian Delegation consisted of:

M.C. Timbs	-	A.A.E.C.
D.J. Gates	-	Department of National Development
C.M. Hill	-	Commercial Counsellor, Australian Embassy, Paris.

The Canadian Delegation consisted of:

G. McNab	-	Assistant Deputy Minister for Mines
W. Gilchrist	-	Chairman, Eldorado Nuclear Ltd.
W.M. Miner	-	Ministry of Commerce and Industry
V. Caron	-	Scientific Counsellor, Canadian Embassy, Paris.

The French Delegation consisted of:

P. Taranger	-	Delegate of the Administrator-General CEA
B. Goldschmidt	-	Delegate of the Administrator-General CEA
Y. Girard	-	Ministry of Science and Industrial Development
P. de Combret	-	Ministry of Foreign Affairs

Meetings were held as follows:

1. Australian and Canadian delegations
2. Australian, Canadian and French delegations
3. Producers meeting in which Australia did not participate
4. Australian, Canadian and French delegations.
5. In addition to the Paris meetings discussions were held with government and industry officials in the United Kingdom and West Germany.

Purpose of Meetings

The meetings were called -

- (i) to review the uranium industry, and in particular the supply and demand for uranium over the next two decades,
- (ii) to consider the position created by the substantial oversupply of uranium in the 1970's, and
- (iii) to discuss ways and means of ensuring an adequate price for uranium in order to attract sufficient investment to the industry.

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Agenda

The agenda of the Paris meetings was as follows:

- (a) demand for uranium
- (b) uranium reserves of the world
- (c) production of uranium
- (d) stockpiles and inventories
- (e) U.S.A. statement of October 13th 1971
- (f) future price trends
- (g) exploration
- (h) possible price stabilization mechanisms

Demand for Uranium

The estimates of demand (Annual and Cumulative) for uranium stated in Table I hereto, are based on the latest available information on nuclear reactor programmes and have been prepared on the assumptions that:

- (i) Plutonium recycling will begin to occur in LWR reactors from 1975 and in D₂O reactors in 1980.
- (ii) "Tails" from U.S. enrichment plants are 0.25%.

The estimates are broadly in line with other reports on the demand for uranium, e.g. the ANEA and IAEA report of September 1970.

The level of accuracy for the demand figures stated is high up to 1980 since most reactors to operate within that time are either committed or are operating at present.

In considering the demand for uranium and the likely Australian share the following factors are relevant:

- (1) The U.S.A. embargo on imports of foreign uranium for domestic consumption.
- (2) The U.S.A. manufacturers of nuclear reactors supply foreign markets by virtue of fuel contracts related to reactor sales.
- (3) France, which produces uranium in Gabon and Niger, will sign contracts only with French producers of uranium. France is also likely to supply French uranium to Switzerland, Belgium and Italy.
- (4) The U.K. uranium market is overstocked at present. Contracts exist with producers for the supply of uranium up to 1984, and Britain is also re-using depleted uranium of which it has large stocks. Furthermore the future of Britain's nuclear reactor programme is in a state of

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uncertainty, pending the outcome of the enquiry by the Vinter Committee which is to report on Britain's future reactor policy. The committee's report is due to be completed shortly.

- (5) Other factors affecting demand in the future which cannot be predicted accurately at present include:
- (i) the advent of fast breeder reactors
 - (ii) releases from government stockpiles
 - (iii) depleted uranium being successfully recycled in gas graphite reactors; France and the U.K. are doing this at present.
 - (iv) the enrichment of depleted uranium - the U.S.A. will not do this in order to help its domestic uranium market. U.S.S.R. has offered to do so and France has sent a quantity to the U.S.S.R. for trial.
 - (v) supplies of enriched uranium from the U.S.S.R.
 - (vi) consumers, e.g. German utilities with captive supplies of uranium Uranerz Bonn - Gulf Oil in the Rabbit Lake project Canada.

Having regard to the above factors the uncommitted uranium for which Australian companies could compete appears to be:

1. for deliveries from 1972 to the end of 1977 - 25,000 tons of which 10,000 tons are expected to be committed by the end of March, 1972, leaving only 15,000 tons.
2. for deliveries 1972 - 1980 excluding already contracted commitments - 75,000 tons. These figures exclude the U.S.A. market. In effect they indicate a market of about 50,000 tons in the 1978-80 period.

It should be noted that a major reason for holding the producers' meeting in February was to explore, amongst producers, the possibility of agreement upon a reasonable price offer by all producers for the 10,000 tons referred to in 1 above for delivery to Spain and other European countries up to 1978 for which contracts will be agreed by end of March.

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Reserves of Uranium

The reserves of uranium in the western world and exploitable at less than \$US10/lb. are shown in Table No. 2 and are regarded as generally reliable.

They indicate reasonably assured reserves of 1,069 thousand short tons and estimated additional reserves of 1,148 thousand short tons of uranium oxide.

Production of Uranium

Table No. 3 gives estimates of production of uranium oxide based on known plant capacities, current levels of production and proposed production by companies.

Because of the existence of Government stockpiles, of about 100,000 tons, it is considered that in looking at production available for consumption existing stockpiles should be taken into account. For example Canada has made it clear its stockpiles are for sale, preferably at a profit. The Federal Republic of Germany under an offset arrangement with the U.S.A. has purchased from the U.S.A. about 8,000 short tons of U_3O_8 , which it has agreed should not be used before 1978.

Production

From about 1977 there are likely to be significant changes in the production pattern for uranium because of new production plant scheduled to come on stream about 1977-78. As shown in Table No. 3 cumulative production of uranium outside the U.S.A. from 1971 to 1977 will be about 90,000 tons. Of this production the French say that at August 1971, the total market for delivery up to end 1977 was 50,000 tons, now it is 25,000 tons of which 10,000 tons will be committed by 31st March. This makes no allowance for any production in Australia. This leaves an uncommitted market of 15,000 tons. From 1972 to 1980 production available for sale and uranium from stockpiles could be of the order of 160,000 tons. This latter figure includes 10,000 tons produced in Australia plus the stockpile.

It is expected that stockpiles will increase to at least the end of 1977.

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The attached graphs, based on production and demand outside the U.S.A. suggest that depending on the level of demand, supply and demand could be in balance in 1981, and if the U.S.A. market is available to other producers this could be in about 1978.

The uranium demand is based on the following installed MWE

	<u>1980</u>	<u>1985</u>
U.S.A.	165,000	300,000
Japan	27,000	60,000
Western Europe	92,000	197,000
Other	24,000	71,000
	<u>308,000</u>	<u>628,000</u>

U.S.A. Statement of October 13th, 1971

It is considered that the U.S. market is not expected to open to foreign suppliers until the latter part of the current decade. It is also possible that in any event the U.S.A. would be unlikely to replace their current embargo by completely opening up their market to all producers. When the United States needs to import supplies to cover the short fall in the domestic market, it could be expected that the U.S.A. would allocate import quotas to cover the short fall only. At present it is realistic to regard the United States market as being closed to non-U.S. suppliers for many years, whilst other world markets would be open to the U.S. - and possibly exploited if the world price for uranium rose to more remunerative levels. For example, if the world price rose to say \$7 per lb. U.S. producers may export to the world market and the U.S.A.E.C. could compensate by releasing quantities from stockpile to the domestic market. This situation may, however, be offset to some extent whilst United States enrichment plants are available for toll processing foreign uranium. U.S. reactor manufacturers (e.g. Westinghouse) tend to purchase uranium in client countries as an inducement to the purchase of FWR reactors. Presently uranium so purchased may be toll processed in the U.S.A. and re-exported as fuel for overseas reactors.

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Future Price Trends

The current price level is about US\$4.50 per lb. The French believe that NUPCOR is primarily responsible for the current situation as it had been desperately in need of a cash flow and therefore had consistently under-cut other producers. The French believe that the South Africans now realise that past policies had been seriously in error and to the detriment of South Africa.

The French consider that producers should be looking towards a price of \$6.25 per lb. U_3O_8 in 1975 and that this price should be escalated by approximately 3% per annum thereafter. The ability to achieve this objective would be influenced by two most important factors:

- (i) consumer resistance
- (ii) the attractiveness of the market to American producers.

It was also pointed out that utilities and other consumers must be made to realise that assurance of supply of uranium after 1980 is heavily dependent on securing now, prices which will encourage exploration for uranium and development of deposits.

The Club

The French company URANEX had taken the initiative to convene a meeting of existing producers. This first meeting was to be used to prepare the climate for future meetings which might lead to the orderly regulation of the uranium market and put it on an acceptable commercial basis. The market would be kept under continuous review. It was stated quite categorically that even after an agreement is reached between existing producers, the Club would be open to potential producers to whom the rules must be acceptable or it would be necessary to renegotiate them on a mutually acceptable basis.

It was envisaged that the Club would agree upon a price for uranium from time to time, having in mind inter alia the need to cover cost of production plus the cost of exploration and an additional factor to cover inflation (a price of \$6.25 was canvassed for 1975 with 3% escalation per annum thereafter).

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The meeting felt that it would be necessary to explain the position fully to consumers since both producer and consumer had an interest in assuring that needs for uranium be met after 1980. This would only be the case if uranium could be marketed at an adequate price in the first half of the decade. In this context it was agreed that a floor price as such would not be sufficient as there were too many ways to circumvent it, for example, discounts, production subsidies and other favourable terms of contract. The French delegation had in mind that producers should agree on a set price covering deliveries from 1975 to 1978 with provision for escalation

It was envisaged that the Club would meet frequently as proposals for contracts came forward and it would examine all aspects of the uranium market and seek to ensure that each producer obtained a fair share of the market.

The aspects which would need examination from time to time would include:

- (i) existing production
- (ii) existing contracts
- (iii) current stockpile
- (iv) special relationships in the world market, e.g.
 - (a) committed markets
 - (b) political relationships.

The French put the view that a market sharing arrangement (for the 15,000 tons currently uncommitted which would be required up to 1977) might be on the following basis, taking into account all aspects:

NUFCOR	20 to 25%
URAMEX	20%
RTZ (including Rio Algom)	20 to 25%
Denison Mines and El Dorado	25%
Australia	8%

These figures were put forward as a basis for discussion with producers and were not agreed. If this approach is to be considered, it will be necessary to have an appropriate allocation of the market after 1977. Generally the scheme in some minds is as above, but Canada would get 25% and

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Australia with Rossing receive 25%.

It was known that M.K.U. had already reached the final stages of negotiation in contract for 5,000 tons of uranium and this had been taken into account in the committed portion of the estimates.

Future Meetings

It is expected that several meetings of producers will be held in the next few months, the next being in early March. Australian producers will be contacted individually within the next month. The broad objective is for the producers themselves to try and obtain an agreement.

However, it was recognised that producers cannot come to an acceptable agreement without collaboration of the respective governments since major policy issues are involved. Every effort will be made to maintain contacts as appropriate between producers and their respective governments.

TABLE NO. 1
ANNUAL AND CUMULATIVE DEMAND FOR URANIUM
at the Mill-Head

	Tons of U ₃ O ₈				
	1970	1975	1980	1985	1990
Most Probable Annual Demand					
Canada	200	600	1,000	2,000	4,000
United States	7,800	22,000	42,000	68,000	99,000
Japan	500	2,900	8,000	16,000	26,000
Western Europe	2,700	12,500	24,000	39,000	53,000
Other	-	1,000	4,000	9,000	18,000
Western World	11,200	39,000	79,000	134,000	200,000
Minimum		37,000	73,000	123,000	185,000
Maximum		43,500	94,000	159,000	266,000
Most Probable Cumulative Demand					
Canada	200	2,000	6,000	14,000	30,000
United States	7,800	83,000	250,000	536,000	970,000
Japan	500	9,000	40,000	102,000	210,000
Western Europe	2,700	40,000	137,000	300,000	540,000
Other	-	3,000	15,000	48,000	120,000
Western World	11,200	137,000	448,000	1,000,000	1,870,000
Minimum		129,000	403,000	930,000	1,730,000
Maximum		151,000	515,000	1,200,000	2,300,000

TABLE NO. 2

Estimated Resources of Uranium Exploitable At Less Than
\$10/lb of U₃O₈^(a)
 (10³ short tons U₃O₈)

	Reasonably Assured (Reserves)	Estimated Additional
Argentina	10	22
Australia	100*	100*
Brazil	1	1
Canada	232	230
Central Africa Rep.	10	10
Denmark	0	0
France	45	25
Gabon	14	7
India	0	0
Italy	2	0
Japan	3	0
Mexico	1	0
Niger	26	39
Portugal	10	8
South Africa	200	15
Southwest Africa	100	0
Spain	11	0
Sweden	0	0
United States	300	680
Others	4	11
TOTAL	<u>1059</u>	<u>1108</u>

Source: Adapted from ENEA-IAEA Publication "Uranium Resources, Production and Demand", September 1970.

* An estimate of potential for purposes of this report.

(a) \$US10 a lb. on September 1971 prices.

TABLE NO. 2
 Estimates of Uranium Production, by Country (a)
 (short tons U₃O₈)

Country	Actual Production				Expected Production				
	1969	1970	1971	1972	1973	1974	1975	1976	1977
Argentina	40	40	70	80	80	80	80	80	80
Australia	200	200	-	-	-	-	-	-	-
Canada	4,100	4,555	4,750	4,850	4,900	4,950	6,000		
Central African Republic	-	-	-	-	-	-	-	-	-
France	1,600	1,700	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Cabon	520	520	520	520	520	520	520	520	520
Italy	-	-	-	-	-	-	-	-	-
Japan	-	-	40	40	40	40	40	40	40
Mexico	-	-	40	40	40	40	40	40	40
Niger	-	-	800	970	970	1,400	1,900		
Portugal	103	103	100	100	100	100	100	100	100
South Africa	3,800	3,970	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Spain	60	60	60	60	100	200	200	200	200
Non-United States	10,423	11,148	12,180	12,460	12,550	13,290	14,840		
United States	12,650	11,500	14,050	15,750	18,000	18,500	19,000		
	25,273	22,748	26,230	28,210	30,550	31,790	33,840		

(a) Excludes U.S.S.R., Eastern Europe and China

- No production.

MAJOR CANADIAN URANIUM SALES, ANNOUNCED SINCE 1966 (As of December 1970)

Producer	Customer	Country	Total Quantity (short tons U ₃ O ₈)	Delivery Period
Denison	Tokyo Electric et al.	Japan	10,500	1969 to 1978
	Urageellschaft M.B.H.	West Germany	400	1968
	Tokyo Electric Power Co.	Japan	16,750	1974 to 1983
Eldorado	Tokyo Electric Power Co.	Japan	500	1971 to 1975
	Kernkraftwerk Obrigheim	West Germany	1,030	1969 to 1980
	Ontario Hydro	Canada	1,300	1968 to 1977
	Kernkraftwerk Lingen	West Germany	212	1969 to 1973
	Oskarshamnsvärkets Kraftgrupp	Sweden	150	1971 to 1973
Gulf Minerals	Chugoku Electric	Japan	119	1971
	Urenzerz-Bonn	West Germany	2,000/yr	unspecified
Rio Algom	UKAEA	Britain	1,100a	1971
	UKAEA	Britain	11,520b	1973 to 1980
Stanrock	Ontario Hydro	Canada	6,300	1970 to 1983
	Tokyo Electric et al.	Japan	5,000	1969 to 1978
	Canadian Westinghouse	Canada	93	1969 to 1970
	Kyushu Electric Power Co.	Japan	270	1972
	Mitsubishi Atomic Power	Japan	28	1969
	Kernkraftwerk Ermsbittel	West Germany	478	1972
	Canadian Westinghouse	Canada	14	1971
	Unnamed reactor manufacturer	United States	total prod.	1967 to 1970

a Remaining under old master contract (1962 UKAEA option); b Includes delivery options.

Source: Canadian Minerals Yearbook 1970 (Preprint)

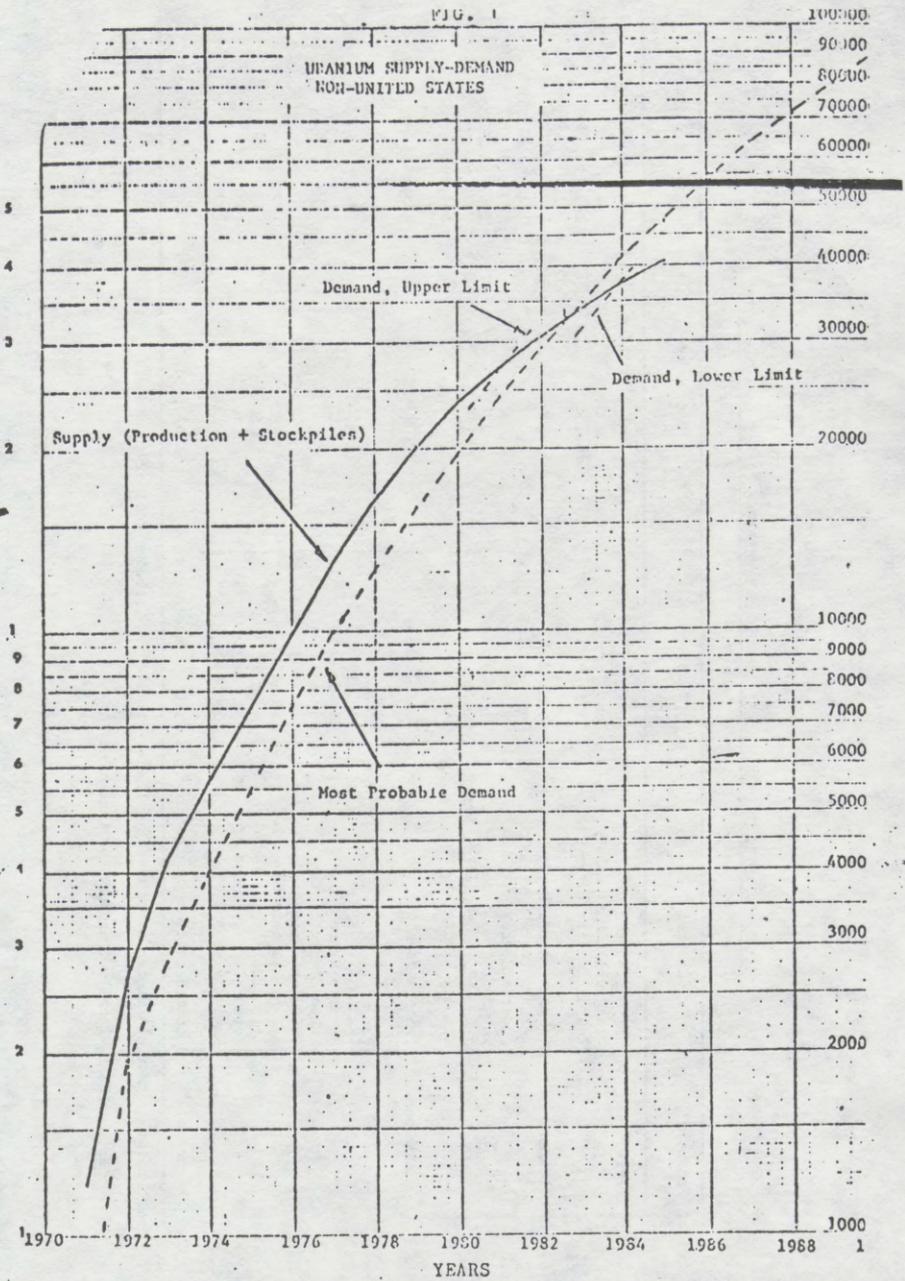
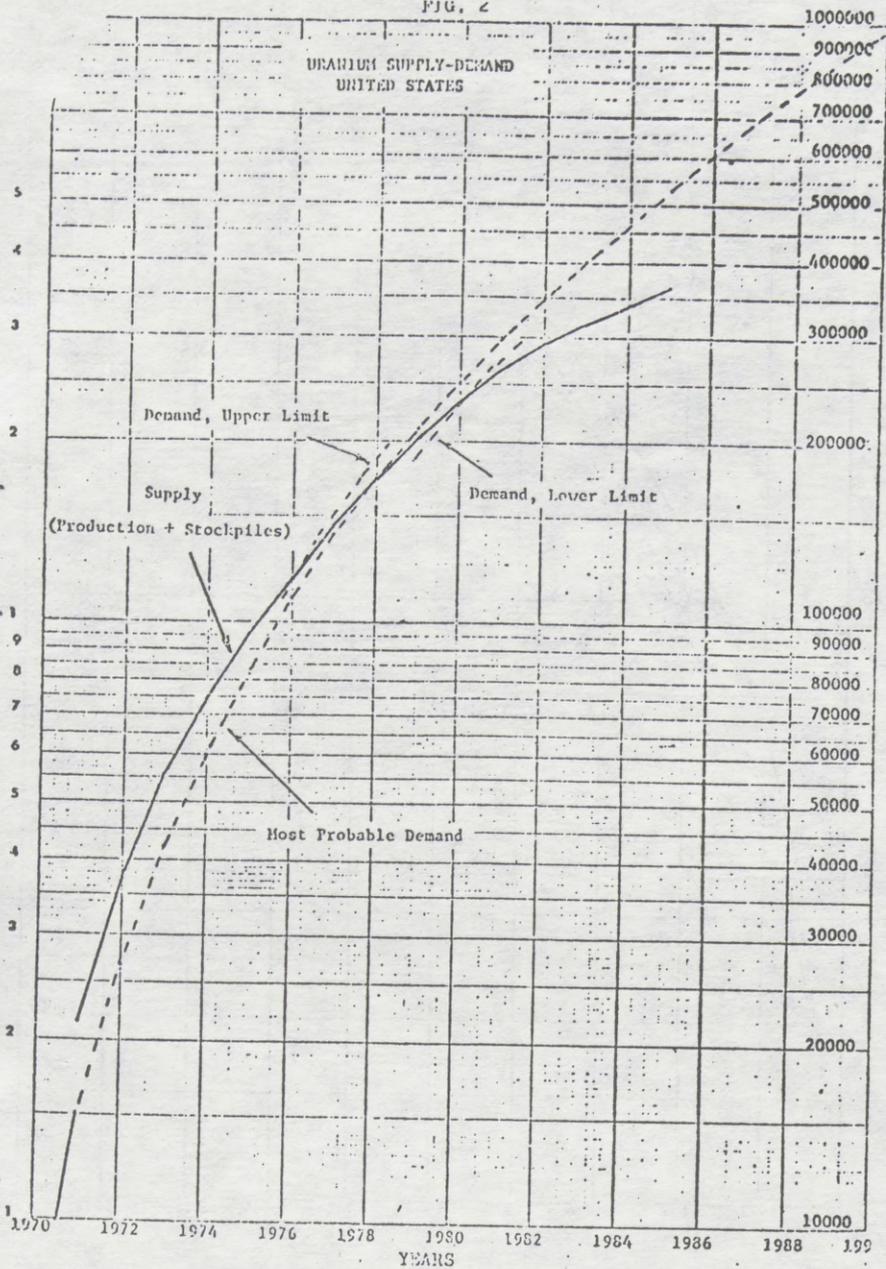
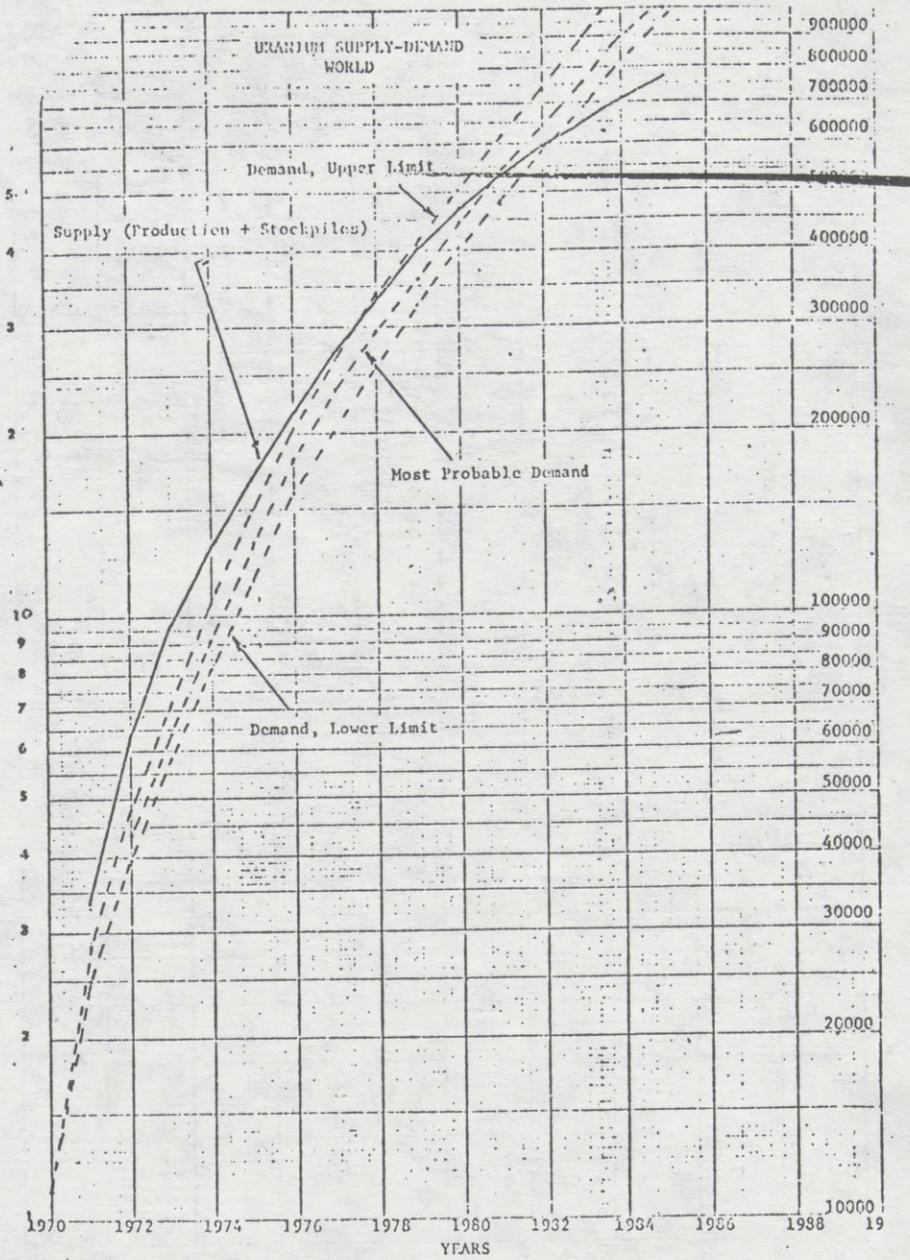
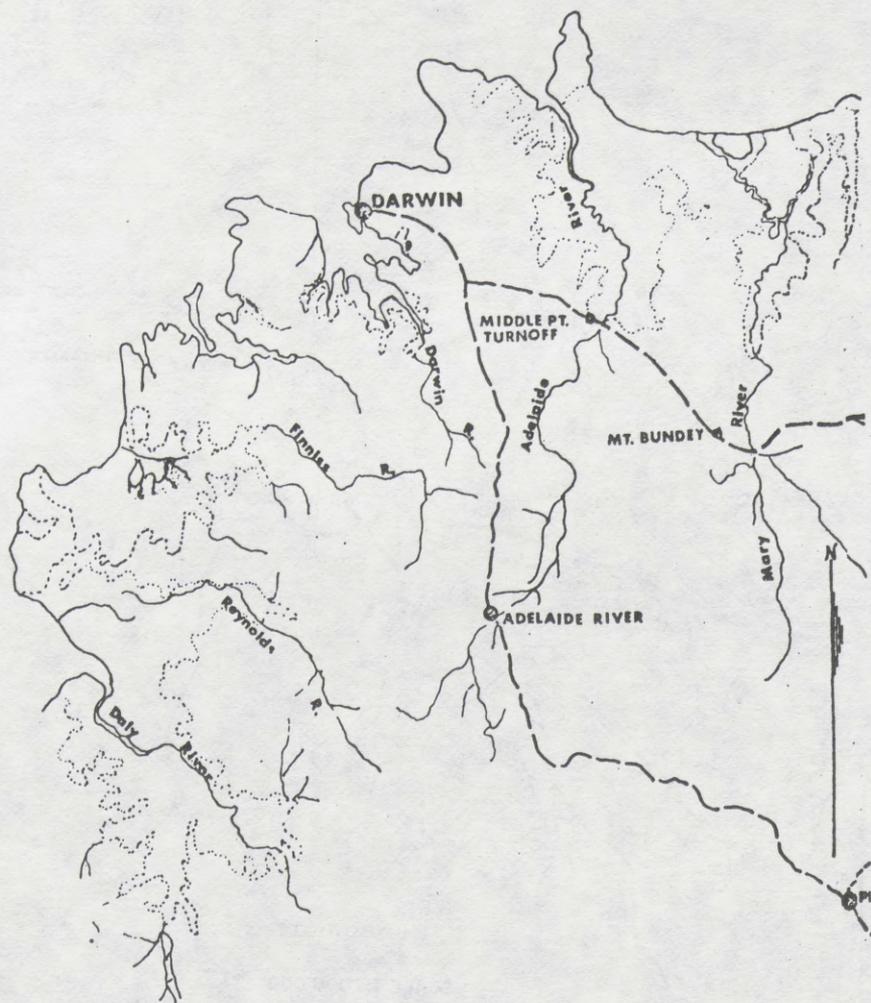
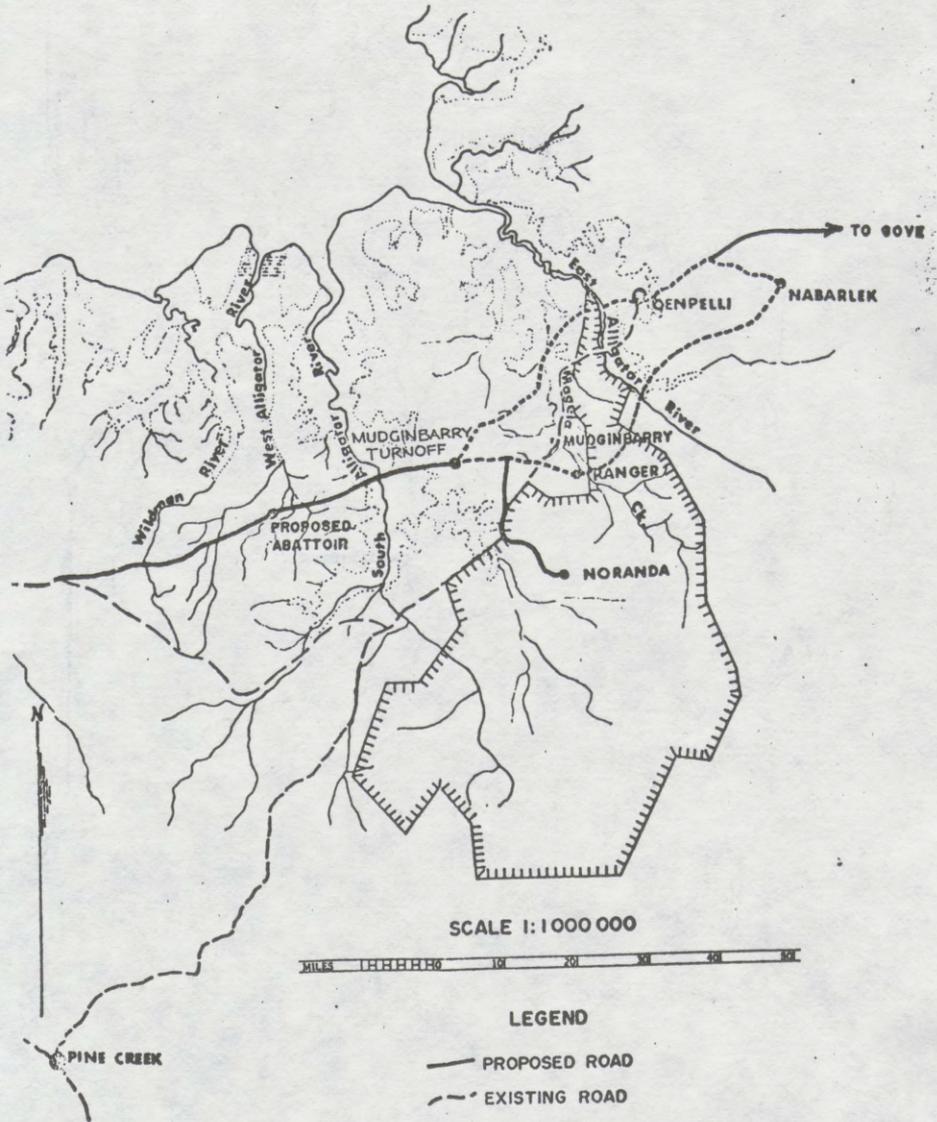


FIG. 2

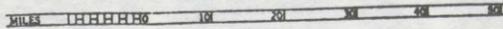








SCALE 1:1000 000



LEGEND

- PROPOSED ROAD
- - - EXISTING ROAD
- ▬ NATIONAL PARK BOUNDARY (PROPOSED)
- · · POSSIBLE ALTERNATIVE ROUTES

AUSTRALIAN URANIUM PRODUCERS

. PRODUCER'S NAME AND ADDRESS:

. REPRESENTATIVE'S NAME AND ADDRESS FOR NOTICES:

. ORE RESERVES (at constant dollars and current costs):

at \$6 U.S.at \$0 U.S.at \$10 U.S.

Indicated

Possible to develop in addition

. PRODUCTION AND SALE OF YELLOWCAKE:

Date of earliest possible start

At \$6.00 U.S.

Minimum production rate

Maximum production rate

At \$8.00 U.S.

Minimum production rate

Maximum production rate

. SALES OF YELLOWCAKE (IF APPLICABLE):

Tons contracted

Tons believed negotiable

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Date of earliest possible start											
At \$6.00 U.S.											
Minimum production rate											
Maximum production rate											
At \$8.00 U.S.											
Minimum production rate											
Maximum production rate											
Tons contracted											
Tons believed negotiable											

Note: 1988

Panama...
 may have...
 ...

- Period Aug
 18 April - 10 May
 - South African to be
 approached re
 invitation

APPENDIX IV

NUCLEAR EXCHANGE CORPORATION
SUITE 285
3000 SAND HILL ROAD
MENLO PARK, CALIFORNIA 94025

TEL. (415) 854-1510

TWX 910 373-1760

SIGNIFICANT EVENTS IN
THE URANIUM MARKET
1969 – 1976

October 15, 1976

SIGNIFICANT EVENTS IN THE URANIUM MARKET: 1969-1976

Introduction

In January 1969, the price of U_3O_8 for immediate delivery, as measured by Nuexco's Exchange Value, was \$6.35/lb. By August 1971, the price had sagged to \$5.95/lb., where it remained for 17 months. In February 1973, the price rose to \$6.00/lb., and has been rising ever since, attaining the level of \$41.00/lb. in September 1976. What happened?

At the request of a number of Subscribers, Nuexco has prepared this Report in an attempt to identify events and situations associated with this dramatic increase in uranium prices. While Nuexco recognizes that a chronicle of events may not fully suffice to explain the price increases, Nuexco believes that an understanding of how these various events were interrelated and how they impacted on then-current buyer and seller attitudes will assist in understanding what happened.

Enumerated below, in no particular order of importance, are those situations and events which, in Nuexco's opinion, affected uranium prices most directly:

1. The existence, prior to 1973, of production overcapacity and market weakness, brought about by a combination of commercial considerations and government policies.
2. Large short sales of uranium by a major fuel fabricator. (A short sale is a commitment to deliver material which the seller neither owns nor has under contract for future delivery.)
3. ERDA's (then AEC) adoption of the long term fixed commitment enrichment contract.
4. The election of a new government in Australia in late 1972.
5. The Arab oil embargo in late 1973.
6. The actions of a producer in leaving the uranium business altogether.
7. Rising uranium production costs which far outstripped even the then-rapidly rising rate of inflation.
8. New environmental, health and safety regulations which increased costs of existing uranium operations and changed the economics of and delayed the startup of new operations.
9. Sharply higher exploration and development costs associated with deeper drilling, lower ore grades and fewer discoveries.
10. The continuing delay of the anticipated onset of reprocessing and recycle, highlighted by the failure of the General Electric Reprocessing Plant to start up and the GESMO decision.
11. Continuing uncertainty about timing and nature of changes in the tails assay.

Each of these major events in turn spawned subsidiary events which, in turn, also impacted on one another and the overall market.

For ease of reading and consistency, the term "price" as used hereafter will, unless otherwise indicated, refer to the Nuexco Exchange Value for immediate delivery.

A REFERENCE POINT: THE MARKET SITUATION PRIOR TO NOVEMBER 1972

Range of Immediate Delivery Uranium Prices (\$/lb. U_3O_8)

January 1969	\$6.35
October 1972	\$5.95

The uranium production industry in the U.S. developed and grew in the late 1950's as the result of stimulation by the U.S. government in connection with its weapons program. In fact, the government's procurement program proved, unexpectedly, to be too successful, and to avoid accumulating an excessive stockpile, the AEC reduced its purchases via the "stretchout" program. Domestic U_3O_8 production, which had averaged about 36 million pounds per year during the 1959-1962 period, averaged only about 22 million pounds per year during the 1965-1968 period. Production in the 1969-1972 period increased somewhat and averaged almost 26 million pounds per year. This data indicates both that production dropped off sharply during the stretchout program, and that commercial demand was not sufficient to restore the production industry to its former level of activity. Thus, the dominant characteristic of this later period was industry overcapacity. While prices, in year of delivery dollars, declined only \$0.40/lb. U_3O_8 , from \$6.35 in January 1969 to \$5.95 in October 1972, the decline in constant dollars was more pronounced, nearly \$1.40, assuming a four percent annual rate of inflation during this period.

As a consequence, serious financial problems faced the uranium production industry. Some producers elected to forego the commercial market and withdrew from the industry entirely. Other producers elected to stay in the business, but suspended or sharply curtailed their operations, an option that was not available to those producers who depended on uranium for their livelihood or who had underground operations that would flood if closed down. Cash flow was essential to their continued operation, and, accordingly, these producers competed aggressively for available business. Price cutting was commonplace, and a buyers' market prevailed. More importantly, sales were made at prices which probably did not cover production costs, let alone the replacement costs of the material being mined. Thus, instead of preparing for expansion, the production industry was conserving cash by high-grading, by reducing staff, and by cutting back on maintenance, exploration, and development.

Specific points to be considered in this context include the following. First, government purchases under the stretchout program were diminished by some ten million pounds U_3O_8 through a mechanism under which this same quantity of material was instead channeled into the commercial market. While it may be argued that this quantity would merely have been added to the government stockpile for later distribution, it was the timing of the decision, as opposed to the decision itself, which was important. The production industry, already suffering from overcapacity and low prices, was deprived of, in effect, ten million pounds of sales to the AEC during this time.

Second, there was the issue of the government's uranium stockpile. Although the uranium production industry and some buyers argued that the national stockpile should be retained as insurance against any future surge in demand, the AEC announced its intention to dispose of the stockpile, estimated to be in the range of 100 million pounds U_3O_8 . A number of proposals for its disposition were discussed publicly before the AEC finally adopted its split tails¹ approach in March 1972. While there was general industry agreement that this approach minimized market disruption, split tails did reduce uranium demand by 20%. Perhaps more importantly, the long uncertainty regarding the disposition of this large quantity of material had a distinct effect on buyers and producers which will be discussed in more detail below.

¹Split tails refers to ERDA's operation of the enrichment plants at a U_{235} tails assay of 0.30% and enrichment customers' providing feed material on the basis of a U_{235} tails assay of 0.20%, with ERDA providing the incremental feed.

Third, there was the matter of the foreign feed embargo. Like the stockpile issue, this was a matter surrounded by uncertainty. Even in this period, it was recognized that potentially large quantities of uranium were going to be available from France, South Africa, Southwest Africa, Canada and probably Australia. In fact, prior to 1973, several long term delivery arrangements were negotiated between U.S. buyers and foreign sellers at prices well below those then prevailing in the domestic marketplace. Thus, the timing and manner in which the embargo was to be relaxed and/or removed were of great concern to both buyers and producers.

It is important to recognize the market impact of the stockpile and embargo situations. Markets of all kinds are sensitive to uncertainty, and in the uranium market of this period the uncertainty regarding the eventual outcome of the stockpile disposition and embargo issues tended to paralyze both buyers and producers. As time passed, there developed an industry consensus that any decision was better than no decision.

Fourth, there were, during this period, substantial quantities of U_3O_8 sold short in the market by fuel fabricators. In connection with these sales it is important to note that, as far as the marketplace was concerned, demand was being filled but supply was not being committed. Thus, no demand was placed on the production side of the business, and any stimulus to higher prices that might have resulted was lacking.

Fifth, the requirements type enrichment contracts offered by the AEC provided little incentive to contract long term for feed materials, since enrichment needs had to be scheduled only six months in advance. Therefore, with enrichment available essentially on an as-needed basis, there was a tendency for buyers to resist longer term uranium commitments, and to concentrate more on their nearer-term needs.

In summary, the buyers' view of the market was colored by the following: a production industry characterized by overcapacity, declining prices, the potential for large quantities of material being made available from the AEC stockpile, the potential of contracting for offshore supply, and long term sales by fuel fabricators at the then-current prices. From the buyers' point of view, the prospect was for an ample supply of uranium at about the same price levels. The buyers saw little reason to contract long term.

The producers viewed the market rather differently though circumstances rendered them helpless to effect any change in the situation. Their industry had too much capacity, the price competition was intense, but it was necessary to generate cash flow to keep mines and mills open and operating. Their pleas that higher prices and long term commitments were necessary to provide exploration incentive and obtain financing went largely unheeded. Aside from financial uncertainty, producers viewed the twin uncertainties of the embargo and disposition of the government stockpile as making market demand forecasts chancy at best.

THE FIRST MOVE UP: NOVEMBER 1972 – JUNE 1973

Range of Immediate Delivery Uranium Prices (\$/lb. U_3O_8)

November 1972	\$5.95
June 1973	\$6.50

In the period late 1972 through mid-1973, a number of events occurred which, in hindsight, were of major importance in the later upward movement of uranium prices. Although not immediately recog-

nized, the AEC's decision in late 1972 to cease offering requirements type enrichment contracts initiated a series of events that was to lead inexorably to increased demand and higher prices.

The new, long term fixed commitment enrichment contracts provided for delivery of and payment for fixed quantities of SWU for delivery up to 18 years into the future. These long term SWU commitments, of course, also locked up a specific demand for feed material. At this time though, most buyers were too consumed with the details of the fixed commitment contract to worry about U_3O_8 .

A second event that occurred in early 1973 which had a significant, but probably a still largely unrecognized effect on U_3O_8 prices, was the decision by a then-producing uranium company to leave the business. The decision was simply an economic one; the producer was losing money at the then-existing prices and it could only see the situation getting worse in future years as costs rose. The producer ceased production and arranged to cover its delivery commitments through a series of spot market purchases. Since secrecy was essential, the producer utilized bank letters of credit, and arranged a series of spot purchases for delivery in 1973, 1974, and 1975. The key point here is that several million pounds of U_3O_8 were removed from the market without any single seller recognizing the full impact of what had happened. Also of interest is the fact that the producer in question left the business because it couldn't live with the existing price level and was not optimistic about the future. The price rise from \$5.95 to \$6.50 during this period is in large measure attributable to the spot market purchases made by this producer.

A third factor that influenced the market in this period was the election of Labor Government in Australia and the subsequent decision to halt the then-formative marketing efforts of potential Australian producers. Even at this time, informed opinion recognized that Australia had large high-grade reserves which would likely be increased substantially, and it was believed that Australia would become a major source of supply. The effect of Australia's withdrawal from the market was not immediately apparent, but it did cast a degree of doubt on the availability of long term supply.

Another event that occurred during this period was the March 1973, Oak Brook, Illinois, uranium seminar sponsored by the Mining and Milling Committee of the Atomic Industrial Forum. The purpose of the seminar was to provide an opportunity for the producers and buyers to explore their mutual needs and problems with respect to uranium contracting. The producers felt that the buyers did not understand the dimensions of the long term supply problem, e.g., the amount of exploration needed, the capital requirement and the lead times associated with developing new production. The buyers in turn believed that producers lacked sufficient understanding of utility needs and constraints, e.g., the need for flexibility in timing and quantity of supply, the regulatory atmosphere, and financial problems. While the seminar was well attended and some observers believe that it was a major turning point in the development of the future market, Nuexco does not believe that its influence was major when compared with the other events that occurred during this period.

By early 1973 it also became evident that the sharp increase in the world price of gold would result in decreased South African uranium production. The higher gold prices changed gold-mining economics to the point that a greater return could be obtained and mine life extended by mining lower grade ores and selling reduced quantities. Since essentially all uranium produced in South Africa is a by-product of gold mining operations, reduced gold production also meant lower uranium production. While not of great significance when compared to other events occurring in this period, any reduction or potential or perceived reduction in near term supply was to impact on the market situation.

Finally, there is the matter of increasing costs. Throughout the period covered by this Report, the impact of rising costs and their actual and anticipated effects on the uranium market were subjects of lively debate within the industry. The impact was a continuous one, and its discussion here is a matter of convenience and should not be taken as an indication that early 1973 was the primary or only period during which cost considerations were of importance.

From the mid-1960's, producers had argued that higher prices were needed to support the greatly expanded uranium industry that was required to support the projected growth in nuclear power. For the most part, their words went unheeded and, as other forces operated to reduce uranium prices, a credibility problem developed. Nevertheless, costs were increasing, as reference to Bureau of Labor Statistics indices indicate. But inflation of labor and material costs was only one aspect of the situation. Environmental, health and safety regulations added new costs both direct and indirect. These and other factors such as decreased labor productivity had immediate effects upon operators then in production. Older facilities whose investment in plant and equipment was fully amortized suffered less than newer operations, but the general industry response was to high grade and reduce exploration expenditures. These problems were further aggravated by the very sharp inflationary pressures that developed in 1974.

For those organizations considering entry into the uranium production business, these problems were compounded by higher interest rates, sharply increased capital costs, and licensing and other regulatory delays which constantly added to the anticipated costs of production. For exploration groups, higher exploration costs resulted from increased land costs, deeper drilling, fewer discoveries and lower grades.

Thus, by early 1973, a considerable reservoir of cost-push potential existed. As the other events chronicled in this Report unfolded, this cost-push potential exerted itself. Producer attitudes hardened, full base price escalation became commonplace, and as inflationary trends continued and intensified and the regulatory climate caused further delays, these increased costs played a major role in pushing and supporting higher prices. In uranium mining, like other segments of the mining industry, immediate increases in supply do not necessarily result from higher prices. The reverse, in fact, often occurs, for higher prices allow mining of lower grade ore and the extension of mine life. This, in turn, translates into fewer pounds of product for milling facilities that are ton-limited. Production can be further reduced when there are insufficient or less-skilled miners involved in the operation.

THE BUYERS COME TO MARKET: MID-1973 – END 1973

Range of Immediate Delivery Uranium Prices (\$/lb. U₃O₈)

July 1973	\$6.50
December 1973	\$7.00

With the signing of the fixed commitment SWU contracts, the buyers next turned their attention to acquiring the uranium feed necessary to fulfill their SWU contracts. Producers were flooded with invitations from buyers requesting sales offers. At one point during the late summer of 1973, at least 15 of these requests were active at the same time. Of importance is the fact that the producers also appreciated the significance of the new developments in the marketplace, and reacted in different ways. Some withdrew from the market to reassess their mining operations. Increasing prices meant that producers and prospective producers could consider mining lower grade ore, which in turn necessitated reevaluation of existing and planned projects.

Other producers chose not to respond to these invitations in favor of negotiating with those buyers who, recognizing early the changing nature of the market, elected to forego the more usual competitive approach in favor of direct negotiations.

Others, the historic price leaders, responded but typically proposed prices, terms and conditions which the buyers found unacceptable and termed "unresponsive."

By and large, the producers felt, and some so strongly that they elected not to respond at all, that the buyers' specifications were totally unrealistic, particularly in view of what was sought in terms of flexibility and cancellation privileges, e.g., the right to alter quantities within six months of scheduled delivery and to cancel entire contracts without penalty at any time prior to two years before the first scheduled delivery. Such provisions were viewed as unacceptable by producers who had to commit funds for exploration, development, engineering studies and mill components many years in advance of production.

During this period, a fuel fabricator continued to make future uranium delivery commitments without making corresponding covering purchases.

During the early fall of 1973, there were only two or three domestic producers responding regularly to buyers' invitations, and while the price increased only \$0.25/lb. U_3O_8 (to \$6.75) between June and November, the 1980 Exchange Value increased from \$10 to \$11.50, signaling the increased pressure being placed in the longer term market. During this period, there was one producer who was very active, committing 15 to 20 million pounds for delivery in the 1976-1980 period, at fixed prices. It was after this material was committed and the Arab oil embargo was imposed that the strains that had developed in the market structure broke loose.

The effects of the Arab oil embargo and the entire emerging energy question on the uranium price structure were several. First was the implicit effect they had on increasing uranium demand by increasing the relative attractiveness of the nuclear option, as opposed to oil. France, for one, committed to full base loading of their electrical system with nuclear units. Similar reactions were evident in other areas of the world, particularly in those nations which did not have fossil energy resource bases.

Second, potential future supply was reduced as France withdrew from the market as a very competitive seller, needing all the U_3O_8 it had, or controlled in Africa, for its own newly expanded nuclear program.

Third, the Arab oil embargo served to drive home as nothing else before had, the importance to exporting countries of their energy resources. There were distinct reactions in Canada, South Africa, and Australia, the latter already having withdrawn from the market. New minerals' policies were developed, and these countries became measurably more difficult to deal with; the proof of this assertion was the sudden and aggressive appearance in the U.S. market of foreign buyers which had been unsuccessful in procuring material elsewhere.

Finally, the new high price of oil as well as higher prices for other fossil fuels provided a psychological basis for higher U_3O_8 prices. Sellers expected higher fuel prices and buyers became resigned to paying them.

A final event of late 1973 is significant for its non-effect on the market. This was the announcement by the AEC of its proposal for relaxation of the embargo on the enrichment of foreign origin U_3O_8 for use in U.S. reactors. Although significant new discoveries had been announced in Australia, the emerging policies of Australia and other uranium resource countries indicated that the governments intended to become involved and to proceed slowly. U.S. buyers began to recognize that there would be no bonanza of cheap foreign material.

THE FIRST PRICE DOUBLE – 1974

Range of Immediate Delivery Uranium Prices (\$/lb. U_3O_8)

January 1974	\$ 7.70
December 1974	\$15.00

Any doubts about the foreign supply situation were dispelled during the early part of 1974, when foreign buyers appeared in the U.S. market. While foreign buyers had previously entered the domestic market from time to time, their appearance in 1974 was different in character; in 1974 they came not to look, but to buy. These buyers, particularly the Europeans, were sophisticated in their approach to market. Their actions indicated that they recognized, well before many domestic buyers did, that the U_3O_8 market was undergoing a fundamental change. Realizing the overseas supply situation had deteriorated, they moved into the U.S. market aggressively and imaginatively, with relatively little regard for price. Coincident but unrelated to this development was the purchase by West Germany of some three million pounds of U.S. origin U_3O_8 under the "Offset" agreement between the U.S. and Germany.

At this point in the chronology, a comment on the much publicized uranium "cartel" is warranted. While this Report expresses no opinion in the legality of the "cartel's" reported activities and will not speculate about the motives of its participants, some comments must be made about the effect of the "cartel." First, it is Nuexco's judgment that the activities of this gathering of overseas producers and potential producers (variously referred to as the "cartel", the Club, and by other names) had little or no effect on domestic uranium prices. Reports that the overseas producers had met on various occasions, both prior to and during 1974, were common knowledge within the industry. The "cartel" and its reported activities had been the subject of numerous articles and commentary in industry publications including Nuexco's Monthly Reports to the Nuclear Industry. Recent headlines in the national media about the activities and discussions between various overseas producers did not come as a surprise to uranium buyers.

Second, it should be recognized that while the "cartel" was composed of individual companies from various nations, it was the governments of these countries which clearly were the dominant parties in determining uranium marketing policies. It has been previously noted that, following the 1972 election of the Labor Government in Australia, uranium sales activity essentially ceased in that country. Similarly, a Canadian official recently stated publicly that the Atomic Energy Control Board of Canada was directed by the Canadian government to deny export licenses for export uranium sales when the prices were below certain established levels. Thus, the ability of the "cartel" to affect the course of prices was sharply circumscribed by political considerations within the countries of its reported members.

Third, and perhaps most important, the prices reportedly established by the "cartel" at its periodic gatherings were, by the time such prices were implemented, below those then prevailing in the domestic marketplace. The "cartel" was, in fact, in a position of trying to catch up with the

domestic market, as opposed to leading it. Thus, the appearance of foreign buyers in the domestic market was not due to the fact that foreign prices were higher, but because relatively secure uranium supplies were available in the U.S., whereas the overseas situation was less definite in terms of both quantity and security of supply.

A second development during 1974 was the emergence of the early procurement strategy, i.e., buying material for delivery several years prior to actual need. For a variety of reasons (uncertainty about reserves, concern about rapidly rising costs occasioned by double digit inflation, and a general unwillingness to contract long term in a period of rising prices), producers were, in the main, unwilling to contract long term. Buyers concerned about where their future supplies were going to come from responded by buying early. Their presence in the market competing with other buyers who had unfilled near term requirements placed additional pressure on near term prices. As a consequence of the spot purchases that had been made for the producer who left the business, there was considerably less near term material available in the market than many buyers had anticipated. The surge of early buying encountered a supply situation that had been unexpectedly reduced and was unprepared for rapid expansion.

The adoption of early procurement strategies was also given added impetus from two other directions. One involved the industry consensus, based on various AEC pronouncements, that the diffusion plant transaction tails assay would be increased probably to 0.25% in 1977 and to 0.30% by 1981. This, of course, represented a 20% increase in demand over the then-current 0.20% tails. Second was the growing recognition that fuel recycle was not imminent. Reprocessing facilities, both the existing NFS plant and the GE and AGNS plants under construction, were facing various licensing, environmental and technical problems as well as court challenges. Their dates of eventual operation became a matter of increasing uncertainty. In addition, the subjects of waste disposal, transportation and security were also emerging as topics of AEC concern promising additional delays. As a consequence, utilities began to assume lengthy delays in the date of onset of recycle and correspondingly increased their estimates about the quantities of U_3O_8 they would require.

The latter part of 1974 also witnessed another milestone in the domestic market, namely, the first large scale buyer acceptance of unpriced future deliveries. While foreign producers and at least one domestic producer had been discussing this approach for several years, it had found little acceptance in the U.S. market. Two domestic buyers took the step in the latter part of 1974 when they announced long term, multi-million pound purchases of foreign origin U_3O_8 with a price provision stating that seller would be paid the higher of market price, as determined by negotiation several years prior to each delivery, or a price designed to guarantee the producer a minimum rate of return on investment. Of significance is the fact that one of these contracts was a public document.

Also during this year, additional short sales were made by a fuel fabricator which had previously been selling short.

In hindsight, it must be noted that the surge in nuclear power plant orders, both foreign and domestic, during 1972, 1973, and 1974 was a factor that had to eventually exert pressure in the uranium market. As this pressure appeared, it was to be magnified by the other events occurring in the marketplace.

1974 was a discouraging year for buyers. They saw foreign competition in the domestic market, increased requirements due to prospective increases in the tails assay, prospective delays in recycling,

and seller reluctance to deal long term. The early procurement strategy placed unusual demands on the near term market and prices increased sharply.

THE SECOND PRICE DOUBLE - 1975

Range of Immediate Delivery Uranium Prices (\$/lb. U_3O_8)

January 1975	\$16.00
December 1975	\$35.00

1975 began much as 1974 ended; i.e., prices were moving up steadily month by month. Domestic buyers, aware of and concerned by the domestic purchasing activities of foreign buyers during 1974, moved to compete aggressively not only with foreign buyers but also with one another. Several well publicized spot purchases of non-U.S. origin material were also concluded. Prices continued to move up under this stimulus.

In June of 1975, ERDA announced its so-called "open season" policy under which enrichment customers were given the opportunity to adjust SWU deliveries under their previously executed long term fixed commitment enrichment contracts. Under this policy, provision was also made for substantial delays in the schedule of uranium feed deliveries. The net result of these changes was a significant reduction in unfilled uranium requirements in the 1978-1985 period. These reductions in demand ranged from 39% in 1978 to 10% in 1984, and averaged 17% overall. The relative uranium price stability during the summer of 1975 was, no doubt, in some measure a result of this reduction in demand. Beginning in May, the Exchange Values for 1980 delivery remained unchanged at \$35.55/lb. U_3O_8 for four months. The 1979 Value stabilized in June and the 1977 and 1978 Values did likewise in July. The immediate delivery price in August was \$26.00.

But another aspect of the situation should not be overlooked, namely, the fact that the personnel involved in the uranium procurement function are, in most utilities, the same personnel involved in the enrichment function. Thus, for a period during the summer of 1975, analysis of the various options available under the open season tended to occupy much of the time and attention of personnel who would have otherwise been involved in the uranium procurement. In addition, until the SWU contract situation was settled, the uranium requirements situation remained uncertain. Thus, the uranium price stability during this period was understandable.

In early September came the announcement by a major fuel fabricator that, due to "commercial impracticability," it would be unable to deliver some 65 million pounds U_3O_8 which it had contracted to sell to various buyers. The reactions of the affected buyers dominated and determined the direction of the uranium market through the remainder of 1975 and into 1976. Since this entire matter is the subject of current and complex litigation, any comment on its eventual resolution is inappropriate in this Report, but certain market developments are a matter of public record.

1. After a month's pause, apparently to take stock and understand the full implication of the new situation, the affected utilities began to appear in the market as aggressive buyers.
2. The affected utilities were competing for uranium not only with one another, but also with other buyers who happened to be in the market at that time.
3. A number of the affected utilities came to market inviting producers to offer material for sale. One took the unusual step of advertising for U_3O_8 in the Wall Street Journal.

Others bought aggressively in the spot market. Still others negotiated directly with sellers without bothering to utilize the time-consuming competitive process.

4. Under such stimulus, the price increased rapidly. In November a sale was announced for 1976-1978 delivery at the higher of market price of \$35.00/lb. U_3O_8 subject to index adjustment. In December the first announcement of a \$40 price appeared with the signing of a letter of intent for 1979 delivery at a price of \$40.00/lb. U_3O_8 with full payment to be made in advance of delivery.

The agreement by these buyers to successively higher, publicly-announced prices, raised the expectations of other sellers. Other buyers, in turn, had to raise their own bids if they wished to compete for material.

NEW PRICE STABILITY — 1976

Range of Immediate Delivery Uranium Prices (\$/lb. U_3O_8)

January 1976	\$35.20
September 1976	\$41.00

Since these events transpired relatively recently, it is difficult to judge which, if any, will prove in the longer term to have had significant market impact. It is possible, however, to note several events which, at this time, appear to have influenced matters. The first of these was the advent of the producer's auction. While one producer had used this selling approach previously, the amounts were relatively small and for near term delivery. In February of 1976, two auctions were announced; they were large, for 3.1 and 1.75 million pounds U_3O_8 respectively, and one was for delivery as late as 1982. Furthermore, the availability of the material being auctioned was widely advertised. The combination of a rising market, aggressive buyers, reliable producers, and producer stipulation of minimum bid prices resulted in premium winning prices. Auctions later in 1976 were to produce similar results.

A second 1976 event that may prove to be important was the Atomic Industrial Forum Fuel Meeting held in Phoenix in March. Buyers and producers were there in force. Of particular note was the presence of a large number of foreign producers. Of even more importance was the sense gained by all present that the producers, both foreign and domestic, had come to Phoenix seriously interested in doing business.

Closing Observations

The events of the past several years in the uranium market suggest several general observations.

The uranium market was marked by near term overcapacity and distress prices prior to 1973. A combination of factors, including short sales, buyer procurement practices, and government policy were responsible. In hindsight, it was clear that the price had to move up; the only question was when, how much, and what would provide the stimulus.

It is Nuexco's view that the move to fixed commitment SWU contracts initiated the price move. Following this came a sequence of events which applied continuous pressure on prices. With hardly an exception, these events either increased demand, reduced potential supply, or created uncertainty—all conditions that inevitably led to higher prices.

As this report is prepared, the exploration, development, and production segments of the nuclear industry appear newly revitalized. A spate of public announcements of new discoveries and new plans portend increased supplies. Concurrently, the number of nuclear power plant delays and cancellations indicate that uranium demand will be less than forecast. This combination of factors suggests the potential for reduced market pressure and the possibility of stable or fluctuating prices.

On the other hand, new concerns are raised about political stability and the security of uranium supply worldwide. Continued concerns exist about the adequacy of future supply, and inventory buying has continued to exert upwards price pressure in the near term market. There is also concern about production capability and the increased costs associated with deeper mines, lower ore grades, labor availability and productivity, higher inflation, and more stringent federal and local regulatory actions.

Finally, the uranium market and, by extension, prices are subject to other factors such as technical breakthroughs in enrichment technology, international politics, and domestic and foreign political consensus on nuclear power.

The relative strength of these powerful and opposing forces will determine the future course of the uranium market and uranium prices. While the future course of prices can be the subject of endless debate, there can be no argument that informed and sophisticated participants are essential, if the market is to achieve the maturity necessary for its continued growth.



