# MAJOR SYSTEMS ACQUISITION REFORM

# HEARINGS

BEFORE THE

## SUBCOMMITTEE ON FEDERAL SPENDING PRACTICES, EFFICIENCY, AND OPEN GOVERNMENT

OF THE

## COMMITTEE ON GOVERNMENT OPERATIONS UNITED STATES SENATE

NINETY-FOURTH CONGRESS

SECOND SESSION

SEPTEMBER 29, 1976

PART 3

ARMY XM-1 TANK PROGRAM

Printed for the use of the Committee on Government Operations

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79-023 O WASHINGTON : 1977

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# CONTENTS



## WITNESSES

WEDNESDAY, SEPTEMBER 29, 1976



## MATERIAL SUBMITTED FOR THE RECORD

# MAJOR SYSTEMS ACQUISITION REFORM

## (Army XM–1 Tank Program)

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WEDNESDAY, SEPTEMBER 29, 1976

U.S. SENATE,
SUBCOMMITTEE ON FEDERAL SPENDING
PRACTICES, EFFICIENCY, AND OPEN GOVERNMENT,
COMMITTEE ON GOVERNMENT OPERATIONS,
*Washington, D.C.*

The hearing was convened, pursuant to notice, at 9:30 a.m., in room 3302, Dirksen Senate Office Building, Hon. Lowell Weicker presiding.

Present: Senator Weicker.

Staff present: Lester A. Fettig, chief counsel and staff director; Ronald A. Chiodo, counsel; Robert E. Coakley, professional staff; J. Brian Walsh, professional staff; Ross Riley, professional staff; Robert F. Harris, chief clerk; Claudia T. Ingram, minority counsel; Mary E. McAuliffe, minority professional staff; Barbara Clarke, minority professional staff; Christine Sheridan Betts, assistant chief clerk; Debra P. Altman, staff assistant; Ronna C. Stone, staff assistant; and Jewel Kahoonei, clerical assistant.

Senator WEICKER. The hearing will come to order.

As our first witness we will hear from Hon. Bob Giaimo from the State of Connecticut, a close friend and a fine legislator.

### TESTIMONY OF HON. ROBERT N. GIAIMO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CONNECTICUT

Congressman GIAIMO. Thank you very much, Senator Weicker. Let me thank you and compliment you on taking the initiative with your Subcommittee on Federal Spending Practices, Efficiency, and Open Government for looking into this matter which I think is of concern to some of us, and I think should be to more.

I am grateful to you for taking the lead in bringing this to the attention of the Senate and hopefully of others in the Government.

I appreciate the opportunity to testify today during the hearings on the acquisition programs and procurement decisions relating to the XM–1 tank program. As a member of the House Defense Appropriations Subcommittee and as chairman of the Budget Committee's National Security Programs Task Force, I am deeply concerned about our national security and the impact of defense spending on our budget. If we are to maintain any control over defense expenditures, we must procure the weapons which meet our military requirements at the lowest possible cost.

I concur with the views of most of my colleagues in the Congress that we need a new tank to counter the Soviet threat in central Europe. For this reason, I have supported the XM–1 tank program during my years on the Defense Subcommittee. Since the XM–1 will be an important component of our conventional deterrence into the 21st century, I want to be certain that we develop, procure, and deploy a tank which not only will meet current threats but also will remain technologically viable for the next 20 years.

I am not here, Mr. Chairman, to repeat the history of the XM–1 tank project or to justify the Defense Department's decision to delay the selection of a contractor for the XM–1. Secretary Rumsfeld recently indicated that "it has been and remains the intention of the Department to develop and produce a cost-effective tank as quickly as possible," and I have no reason to doubt his commitment to this goal.

I am concerned, however, about some of the comments which have been made subsequent to the Department's July 22 decision.

I have followed closely congressional investigations of this decision, and I have noted that most of them have emphasized the hybrid turret proposal and the option of including the 120-mm gun in the new XM–1. During this time, however, various individuals—within the military and elsewhere—have alluded directly or indirectly to the AVCO Lycoming gas turbine engine—the powerplant for the Chrysler model and by implication, the turbine engine included in the addendum to the "memo of understanding with the Federal Republic of Germany."

Even though both the turbine and Continental Teledyne's diesel are competing with a source-selection process and all references to the engines are competition sensitive, statements have been made and repeated which question the maturity of the turbine and its ability to operate effectively in a tank. At the same time, the diesel engine has not been discussed, studied, or debated.

This has created in my mind a potentially poisonous atmosphere. The Congress and the public have been given only a portion of one side of the controversy involving the engine for the XM–1; namely, the shortcomings—real or fictitious—of the turbine engine. If the Congress is not provided with sufficient factual information to counter the unfair or incorrect inferences which already have been made, we will be in no position to decide accurately on future funding for the XM–1 tank itself and whichever engine might be selected for it.

Mr. Chairman, your subcommittee could provide the answers to these question and a balanced record of advantages and disadvantages of both the turbine and the new diesel engine.

Let me illustrate some of the comments which have been made and the questions which they have generated among those of us who, at this time, have not decided whether the turbine or the diesel should power the new XM–1.

The report of the Tank Panel of the House Armed Services Committee said this about the engines of the two models currently under consideration for the XM–1 contract:

> Although the two engines have been subjected to roughly equivalent testing during the XM–1 validation phase, the diesel is generally considered to be the more mature engine owing to earlier testing in the MBT–70/XM–803 program.

This statement raises certain questions: Who generally considers the diesel better? Also, what do they mean by "more mature"? The turbine has been under development since October 1965. The diesel was only recently upgraded to compete with the horsepower rating of the turbine. I see no maturity advantage here.

What is meant by "roughly equivalent testing"? Did one of the engines undergo more advanced testing than the other? I know, for example, that the turbine has been through the sand-and-dust test at Yuma while the diesel has not. If one of the engines has been tested more than the other, these tests could well affect its maturity, reliability, and potential.

The tank panel's report also stated that "the element of technical risk is regarded as less with the diesel" and that the turbine has "significantly higher acquisition cost and higher fuel-consumption rate."

What is meant by "technical risk"? The turbine engine has 31 percent fewer total parts and 62 percent fewer critical parts. It is simpler to maintain than the diesel. It has quicker starts, lower idling time, better mobility than the diesel. Surely, mobility and speed—important factors in insuring the survivability of a tank—should be included in any discussion of an engine's relative worth.

I would look at the life-cycle cost of a program rather than at its initial acquisition cost. It makes no sense to buy a cheaper weapon which may require more maintenance and repair and replacement, if a slightly more expensive engine would cost less once the tank is positioned in the Army.

Finally, consider fuel consumption. The 20-percent increased fuel consumption statement is disputed by AVCO Lycoming. The turbine has characteristics designed to improve fuel consumption over the long run. I would rather have a tank that consumes a little more fuel but has greater survivability than a tank which cannot move fast enough to avoid enemy countermeasures.

The tank panel then concludes with a short disclaimer almost lost within its implied support for the diesel—it says that statistical data to make a definitive choice are still subject to refinement.

Mr. Chairman, I believe that no matter how thorough the discussion of the other components of the memorandum of understanding and its addendum has been, we do not have sufficient information in the public record to judge the relative advantages of either the diesel or the turbine as the powerplant for the XM–1. All we have are allegations, unsupported conclusions, and generalizations which impugn the turbine without any substantive, factual information on the advantages—if any—of the diesel.

I would hope that this subcommittee will secure answers to several of the stated and implied questions which have been asked about the turbine engine.

For example, the addendum to the memorandum of understanding stated that the turbine would be introduced at such time as the United States has incorporated it into the XM–1. Who will validate the turbine as ready for production? How much testing would be required? If after 10,000 hours of testing, 20,000 vehicle-miles, and several NATO test programs, the turbine is not ready, what remains to be done?

How much of a delay would the turbine cause in the total program, if it were chosen for the XM–1? The Army has called the turbine the way of the future. If the turbine is now ready or if it could be ready by the time the initial production takes place, it makes sense—militarily and economically—to begin the XM–1 with the turbine.

Mr. Chairman, a dozen questions could be asked. I would hope that you will see to it that we have a complete, balanced, factual record on the engines under consideration for the XM–1.

I am very concerned about an article which I read recently. Writing in the Armed Forces Journal, Benjamin Schemmer noted:

> When the Army came forward with its source selection recommendation, it became obvious that the * * * engine alternatives had not been studied in the depth required for an informed decision.

I would hate to think that institutional inertia; namely, we have the diesel and should continue it, might have colored the Army's consideration of the turbine engine. If such inertia had been prevalent decades ago, we never would have made the switch from four-legged horsepower to mechanical horsepower in the Army.

Mr. Chairman, I want the best possible tank for our Army. I want one which meets its mission requirements and the enemy's threats. I want to be able to make an informed decision on this subject.

Based on the information which I have seen presented to the Congress to date, however, I cannot make an informed decision. During this hearing on the procurement decisions on the XM–1 tank, I urge you to ask those questions which beg to be asked regarding the turbine engine.

Senator WEICKER. Congressman, thank you very much for a complete statement. Indeed that is the purpose of these hearings. The decisionmaking is in the hands of various other committees of the House and Senate, one of which you are a member.

Let me respond to one question you have raised, what do they mean by more mature. I am reminded of the fact when Robert Fulton made his proposals to the U.S. Navy to change from sail to steam, those proposals were rejected on the basis that it would demoralize the seaman who needs salt spray on his face than go downstairs to tend machinery.

I guess at that time sails were considered more mature than engines.

I appreciate your effort to get all of the facts out on the table to see that an intelligent decision can be made.

Congressman GIAIMO. I want to concur and stress the fact that neither your subcommitte nor I in testifying before this subcommittee are trying to tell the other committees of the Congress or the military what they should do in the way of procurement of tanks or anything else. But some of us are disturbed in the way in which this whole matter is developing: the Army appearing to want to go one way, the Office of the Secretary of Defense appearing to want to go another way. They seem to be directing them to lock in on a certain program and I suspect this is being done before these basic questions concerning the type of engine to be used is decided.

I think if you can get these facts out on the table, it would be helpful in making a decision in this very expensive and very needed program.

Senator WEICKER. Thank you very much, Congressman.

I intend to read into the record my opening statement before hearing Secretary Clements.

## OPENING STATEMENT OF SENATOR WEICKER

Senator WEICKER. The Army's efforts to develop and produce a new, more capable main battle tank have been the subject of a great deal of controversy since the early sixties. More recently this controversy has intensified with the advent of an updated memorandum of understanding to achieve commonality of components between the U.S. XM–1 and German Leopard 2.

Our purpose is not to further enflame the recent debate between the Pentagon and Capitol Hill. This committee has no direct jurisdiction over the XM–1 program in particular. However, we do have jurisdiction over Federal spending practices and the efficiency of programs in meeting their objectives. Systems acquisition reform and case studies of particular programs continues to be a major concern of ours.

In part, because of that interest, we can develop an additional record of facts and options that will prove to be useful to those with direct jurisdictional interests. We can lend some insight and clarify the arguments on the XM–1 program, explore the status of the program, and the pros and cons of the options now open.

To my mind, there are three basic options for the XM–1 program at this point:

(1) Go to full scale development of a single prototype;
(2) Go to full scale development of a hybrid tank; or
(3) Continue competitive testing of hybrid tanks.

What we want is a system which will meet a stated mission need and a system which meets that need the day it is first delivered and fielded.

What we cannot afford is to enter into a commitment on a system, which has projected life of some 20 to 25 years, and find that within 3 to 5 years after first being fielded, it is already outdated, needs to be upgraded, retrofitted, or even scrapped for a more advanced system. All these possibilities raise the specter of hundreds of millions, even billions, ill-spent—not to mention the potential risk of human life.

Obviously, the time to explore these considerations is now, before source selection.

At this point we will enter the prepared statement of Senator Nunn.

[The prepared statement of Senator Nunn follows:]

### PREPARED STATEMENT OF SENATOR SAM NUNN

Mr. Chairman, I support the decision of the Department of Defense to delay source selection for the Army's next main battle tank. The decision was taken for two reasons. The first is to obtain additional competitive proposals from the contractors for a variety of configuration options for enhancement of the basic tank program. These options are essential to an informed management decision if we are to make sure that the XM–1 will in the future be able to accept at minimal cost alterations in main components due to technological advances or to changes in the threat. The second is the desire to develop main components, including the gun, engine, track, and transmission, which would be interoperable with the German Leopard II. Whether the German 120-millimeter smoothbore is superior to the U.S. 105 rifled gun using improved ammunition, or whether the U.S. gas turbine engine is better than the German diesel, are questions best left to the experts. Whatever the final judgment on these and other components, realization of interoperability is imperative if we and our European allies are to begin reducing the waste and inefficiency associated with the lack of interoperable arms and equipment within NATO.

It is also in accordance with the Memorandum of Understanding signed between the United States and Germany in the Fall of 1974. Thus, while I remain disappointed that the Department of Defense for almost two years somehow

79-023 O - 77 - 2

neglected to undertake effective action pursuit to that Memorandum of Understanding, I applaud the action that it has finally taken.

The waste stemming from continued NATO alliance on a museum of armaments inventories incompatible with one another is staggering. According to General Andrew J. Goodpaster, NATO's former Supreme Allied Commander, the combat potential of the Alliance general purpose forces has been degraded by 30% as a result of failure to achieve interoperability. Moreover, the economic penalties of this failure, by conservative estimate, total 10 billion dollars per year. It is absolutely critical that the United States and Germany, whose armies constitute the bulk of the ground forces in the Central Region, adopt main battle tanks whose logistically significant components are interoperable. A 120-day delay in a program with a life expectancy of 25 years is not a stiff price to pay to achieve that objective.

Senator WEICKER. Now, if we could at this time have Secretary Clements, Under Secretary Augustine, General Kerwin, and Mr. Parker come forward.

## TESTIMONY OF WILLIAM P. CLEMENTS, DEPUTY SECRETARY OF DEFENSE; ACCOMPANIED BY NORMAN R. AUGUSTINE, UNDER SECRETARY OF THE ARMY; ROBERT N. PARKER, PRINCIPAL DEPUTY DIRECTOR, OFFICE DEFENSE RESEARCH AND ENGINEERING; AND GEN. WALTER T. KERWIN, JR., VICE CHIEF OF STAFF, DEPARTMENT OF THE ARMY

Senator WEICKER. Gentlemen, it is good to have you here. I have tried to make it clear as to what the objectives are here in this hearing. It is not to put anybody on the griddle; it is to elicit the facts and your opinions so proper decisions may be made.

Secretary Clements, why don't you proceed?

Secretary CLEMENTS. Thank you, Mr. Chairman. I have a short statement I would like to read, after which my colleagues and I are prepared to discuss any aspect of the XM–1 tank procurement that you might want to get into.

As you know, I appeared before your subcommittee just about a month ago, on August 26, to report on the status of our actions at the Department of Defense to implement the policies contained in OMB Circular A–109.

Today, I am here in response to your letter of September 17 to Secretary Rumsfeld in which you explained the desire of the committee to continue its hearings on major systems acquisition reform with particular focus on the Army's XM–1 main battle tank program. With me are Mr. Norman Augustine, Under Secretary of the Army; Mr. Bob Parker, Deputy Director of Defense Research and Engineering; and Gen. Walter Kerwin, Jr., Vice Chief of Staff, U.S. Army.

The Army XM–1 program is indeed a very major DOD weapon system. It is one which is well into the acquisition process and, therefore, an examination of its decisionmaking process is most worthwhile because it reflects today's realities in the working of the process.

I am sure your committee is aware of the many divergent views which have been reported both favorably and unfavorably in the press and elsewhere regarding recent DOD actions on the XM–1 tank program. For these reasons I am pleased to be with you and to discuss in some detail the events of the past few months which have impacted on the Army's XM–1 tank program.

The XM–1 development, which was initiated in 1973, has been carried out in a competitive environment from its inception. The competing contractors have built prototypes for comparative evaluation, and firm design-to-cost goals have been established with the full and active participation of the contractors. At present the XM–1 program is on target for its cost, schedule, and performance goals. This attests to the efficiency and leadership of the Army's project manager and the two industrial teams he is working with.

Building on the success of this program to date, the Department of Defense has taken a number of actions recently to maintain into the future the fine record of the XM–1 tank program.

Let me first address what we have done:

We have deferred making source selection by up to 120 days. We intend to make the source selection between Chrysler and General Motors, and to decide upon the configuration of the XM–1 tank, not later than November 17, 1976.

Design decisions could affect cost, schedule, and capability—that could happen anyway, but in any event, we won't know to what extent, if at all, until the information is in and evaluated between now and November 17.

The approach was designed to obtain proposals from the contractors—while still in a competitive environment—focusing on the same basic tank and developing configuration options which would not otherwise be available. Among these configuration options are the diesel and turbine power packs, alternative tank track and sprocket systems designs, and changes which might improve interoperability—for example, a turret capable of taking either a 105 or 120 millimeter gun, metric fasteners, the gunners' auxiliary telescope.

After exploring several courses of action, we decided that more data was necessary to support a decision on a program of such importance. Therefore, we have asked the companies to submit information, on a competitive basis—and I wnat to emphasize on a competitive basis—which had not previously been provided.

Turning now to the decisionmaking process involved in these actions, I should note that the treatment of the XM–1 program has been consistent with the DOD Directive 5000.1 and the Defense Systems Acquisition Review Council (DSARC) process which gives order to major systems development in the Department of Defense.

In this case, some modifications in the process were carefully planned and scheduled, so that source selection activities would be properly protected, while assuring a complete and thorough DSARC review.

On July 20, 1976, Secretary Hoffmann presented to me and the members of the DSARC, the Army's recommendation that a contractor be selected and then, as desired, requested to bid quotations—on a sole source, noncompetitive basis—for various possible configurations of the tank.

In contrast, my recommendation—with the concurrence of all the members of the DSARC—Dr. Currie, Mr. Shrontz, Mr. Aldridge, Mr. McClary—and the General Counsel—was to have the Army continue both contractors for a short period of time to solicit quotations in a competitive environment for the configuration alternatives of interest—quotations I had anticipated would have been available on July 20, 1976.

In considering the differing views, the Secretary of Defense agreed with my recommendation and the unanimous recommendation of the DSARC principals. We feel that this is the most business-like approach for obtaining the information needed to make key decisions on the future direction of the XM–1 tank program.

Having outlined the basic actions taken and the decisionmaking process involved, I should like to discuss the cost, schedule, and operational impacts of these actions. There have been some suggestions that there will be a large cost increase. We do not believe this to be the case, and instead plan to analyze carefully how costs might change with the various options under consideration. The fact is that we cannot immediately know how, if at all, the cost of the XM–1 program might change. It is for precisely this reason that we feel it is so important to obtain responsible proposals from the contractors in a competitive environment.

The largest uncertainty in cost related to the tank itself involves the decision between diesel and the turbine engines—one of which is anticipated to have lower initial cost, and the other lower operational and support cost.

We will not know which one has the lower life-cycle cost until the current evaluation is completed. Even then, there will be some uncertainty, since long-term costs depend on the frequency of overhaul eventually required for these engines.

Most of the potential growth in the tank program relates directly to the gun and ammunition; we can expect cost growth in this area in the reasonably near future as the threat evolves. A design modification to which we are committed is to make the turret capable of accepting either a 105 or 120-millimeter gun. The project manager's preliminary estimate at the time of our deliberations in July was that this would cost several million dollars in research and development, and possibly $3,000 per tank in acquisition cost.

It has also been estimated that the future retrofit cost for replacing the 105-millimeter turret so that the 120-millimeter gun could be accommodated would be approximately $150,000 per tank, if such a design change were to be made later.

At the same time, anticipating a requirement for a 120-millimeter gun as the threat evolves, we plan to take advantage of the 120-millimeter gun development efforts of our allies, with a consequent reduction in the funds that would be required for an independent U.S. development effort.

It is important to note that the technical risk of the program has not increased significantly. The 120-millimeter gun, which might entail some risk, has had a satisfactory development history by our allies, and would not under any circumstances be introduced until it was fully proven, as was clearly stated in the addendum to the MOU with the FRG. The same is true for the turbine. None of the other changes inyolved perceptible technical risk.

The immediate schedule impact of these actions is a relatively short delay of 4 months or less now, over the projected 48-month period between the start of full-scale development and the initial operational capability (IOC).

We feel it is essential to do this in order to obtain the information necessary for a proper decision on the U.S. tank which will be in the inventory for the next 20 or 25 years.

Any further schedule impact must await an evaluation of the contractor's proposals. Our best estimates are that any further delays would be less than 6 months at most, and could result in no further delay at all.

I should emphasize that we are not considering introduction of the 120-millimeter gun into the first production tank because this could cause a 2-year delay in fielding the XM–1. Instead, we will field the first XM–1 tanks with the 105-millimeter gun installed.

So far I have spoken to certain major influences on the Department of Defense actions which relate primarily to policy guidance as outlined in QMB Circular A–109, that is, as relates to alternative system design, the benefits to be derived by competitive exploration of design concepts, tradeoffs of capability, schedule, and cost.

However, another very important influence has been the need for the United States to take some positive and innovative steps toward accomplishing a degree of standardization with our NATO allies.

Congress has quite clearly stated, in the Culver-Nunn amendment, that the Secretary of Defense is to initiate and carry out procurement procedures that will provide for equipment which is standardized or interoperable with the other members of NATO.

Our activities in the XM–1 tank program have recognized this very unambiguous mandate from Congress. Recognizing that neither the FRG Leopard 2 nor the XM–1 tanks were likely to be sufficiently superior to the other to permit clear selection of a single standardized tank, we have made every effort to provide for interoperability in areas with a significant impact on logistics and field support; for example, engines/fuel, and gun/ammunition.

Before one can assess the combat effectiveness of the tank we must await the technical analysis of the proposals; we do not believe that a perceptible degradation will in any event occur. In fact, as the threat increases in accord with projections, a 120-millimeter gun appears to offer an increase in effectiveness. A 120-millimeter gun should have approximately twice the range capability for any given penetration against NATO standard targets compared to a 105-millimeter gun. Further, we believe it will be difficult to substantiate a measurable decrease in effectiveness of the XM–1 tank, even with the 105-millimeter gun installed, as indicated in the panel report.

The result should be a tank which is at least as good as those proposed on the earlier solicitation in the near term, and superior in the mid-1980's, when the threat may well dictate a larger gun.

We will, in addition, have taken a valuable step forward in our efforts to achieve greater interoperability with our allies, a step which has been urged by the Congress and military leaders over two decades as an important step in improving our military capabilities in Western Europe.

Our actions have been prudent and consistent, and I am proud of our progress on the new tank.

Mr. Chairman, this concludes my statement, Mr. Secretary. As I ask now ready for your questions.

Thank you.

Senator WEICKER. Thank you very much, Mr. Secretary. As I ask the questions the way I would like to handle it, is not direct them to any individual, but to allow you, Mr. Secretary, or any of your colleagues to respond.

PROGRAM SCOPE

As I understand it, current plans call for a projected buy of some 3,312 tanks. Is that correct?

Secretary CLEMENTS. Yes, sir.

Senator WEICKER. How long will these XM–1 tanks be in the force structure?

Secretary CLEMENTS. General Kerwin is with me, and he can certainly express himself here. But the best criteria to judge this would be perhaps how long we have had the M–48 in inventory and how long we would anticipate having our present main battle tanks, the M–60, in our inventory. My judgment would be we would have these tanks in our inventory at least 30 years, assuming the initial operating timetable for the tanks would be plus or minus 1980. For instance, if you add 30 years to that you could certainly expect to have these tanks well into the early part of the 2,000-plus time frame.

General KERWIN. I would agree with that, Mr. Chairman. Roughly the year 2010.

Senator WEICKER. What is the total program cost estimated to be?

PROGRAM COST

Senator CLEMENTS. It is estimated these tanks, through the initial production run of 3,000-plus tanks, will have a unit cost of about $1 million each. Of course, we are still in source selection and I don't want to get too definitive about what our anticipation is. On that basis, you are somewhere between $3 and $4 billion as far as the program unit hardware cost is concerned.

Senator WEICKER. Does that include operation and maintenance?

Secretary CLEMENTS. No, sir, it does not. That is only initial acquisition. I would like to ask Mr. Augustine if he has any difference of opinion.

Mr. AUGUSTINE. No. I think those numbers are substantially right. We expect the unit cost in current year dollars as a little over a million dollars a tank. The total program cost would be approximately $4.9 billion. That includes the spare parts that are part of the initial issue.

Senator WEICKER. I know we are used to dealing with big figures like that here in Washington, but I think that not being the case at home, the response was $3 to $4 billion, it is $4.9 billion, that seems to be the figure.

Secretary CLEMENTS. There are two different numbers here. One is the hardware procurement costs for the tanks only. Mr. Augustine quoted a number which also includes initial spare parts inventories in the depot system.

Secretary AUGUSTINE. That is right.

Senator WEICKER. That is a rather large commitment in both time and dollars as we have found from our major analysis systems, it makes all the sense in the world to spend extra front money to protect a long-term investment, and assure acquisition of the best technology. Are you in agreement on that assessment, spending additional front money now in order to assure capability for a longer period of time in the future and at a better level of operation?

Secretary CLEMENTS. Senator, what you are talking about are life cycle costs and cost effectiveness. All of us at this table agree 100 percent this has to be a primary consideration, no question about it.

Secretary AUGUSTINE. I agree.

Mr. PARKER. I agree.

STANDARDIZATION

Senator WEICKER. I think this is a good time to explore this issue of standardization or interoperability. It is really a new concept, for the American people and maybe this is a good time to explore the issues. Would you begin Mr. Secretary, or any of your colleagues, with an explanation of standardization itself and the reasons why the United States has entered into this memorandum of understanding with the West German Government for standardization of our respective main battle tank programs?

Secretary CLEMENTS. I will start. I am sure all three of my colleagues will have comments in this regard.

Standardization is not a new idea, it is like motherhood; everybody talks about it and everybody believes in it.

But on the other hand, over the past 20 years, there has been much discussion in this regard, but very little standardization and interchangeability of major weapons systems. A lot of talk and not much action.

There is a trade off here in the area of quality. We in the United States, in the Department of Defense, and in this instance in the Army, we do not want under any circumstances to trade off quality to a significant degree for standardization. What we really want to do is optimize both of these things. We want standardization, we want interoperability, and we want interchangeability. But we do not want to give up quality in the process.

We feel quality is the very keystone of our defense posture. We have a relatively small force structure as compared to the Soviets, we must therefore put in the hands of our soldiers the very best possible weapons we can design and produce. I don't know if there is anyone who argues with this.

Therefore, when considering the tank question, we want the best power package, we want the best gun, we want the best sight, and we want the best stabilization devices we can get. Once we have determined a system with technical aspects that interchange with the Germans, a reciprocal license agreement will be made whereby these components can be manufactured and produced in Germany as well as in the United States.

A production base will exist in both countries. But the systems and their parts, down to the smallest, will interchange between the two countries' vehicles. They will be made to the same specifications; they are not just comparable, they will be identical. They will interchange, part for part.

This is a great advantage on the battlefield. It will be a great advantage in the support of a system where you will have to maintain that major system for over 25 or 30 years. So this is a very great advantage for us.

Senator WEICKER. Is this the first major program to work out under the concept of standardization?

Secretary CLEMENTS. Not really. I think the first major program we have undertaken that would be comparable to this is the F–16. It is not exactly the same, but it is comparable. In the F–16 program we entered into an agreement with a so-called consortium of countries, Norway, Denmark, Belgium, and Holland, for the production of the F–16. While it takes off in a little different direction, the two systems and the two programs are similar in the sense we will end up with a great degree of standardization.

Norm, would you care to comment?

Secretary AUGUSTINE. I might elaborate on the latter part of your question. Speaking for the Army, we are now working on two systems—the improved Hawk system and the MAG 38. The Hawk system is being improved here and in a number of countries in Europe.

It is the basic air-to-ground defense system for NATO. We also intend to be using the MAG 58 machinegun developed in Belgium. This is an example that reaffirms the point Mr. Clements made, that we want the best system. That system was picked really because it was the best system we could get. It is fortunate it also supports interchangeability.

Our real objective in seeking standardization in the XM–1 program is to assure we have logistical interchangeability on the battlefield with our allies and we can act tactically in concert. This means it is not important, particularly, that the two tanks look alike on the outside, or the steel in the hull and the steel in the turret be identical. You do not change hulls or turrets on the battlefield. But it is important that you have commonality of those components that dominate the logistical picture such as fuel, track, ammunition, and things of that type. That is what is being sought in the memorandum of understanding with the FRG.

Senator WEICKER. General Kerwin, would you agree with that?

General KERWIN. Yes, Mr. Chairman, as a former commander on the battlefield, I would. I would like to add that General Goodpaster once stated that perhaps we could increase our logistics capabilities by 30 percent if we had standardization. I don't know if 30 percent is the exact figure or not. I think, specifically on the NATO battlefield, you have a great deal to be gained from interchangeability between U.S. and German divisions. There is a great deal to be said nowadays for interchangeability of parts, movement of parts from one tank to another. Of course, if both armies use the same tank with the same parts, you are much better off.

In addition, of course, you have interchangeability of lines of your communication between units. In that case the interchangeability, the standardization of parts, is a great advantage on the battlefield.

I second what Mr. Clements has said and what Mr. Augustine has said. It is what we are seeking. It is the ultimate aim. It is the same situation you find in Germany today, where U.S. units will be fighting with German divisions on their flanks, and because two different languages are spoken, you have no means of communications. You have no standardization, no interoperability.

NATO PARTICIPATION

Senator WEICKER. At the present time as I understand it, correct me if I am wrong, you have the two tanks actually fielded. The British have a Chieftain, the Germans the Leopard, and ourselves the XM–1, is that not correct? I gather there is no chance of including the English in this standardization?

Secretary CLEMENTS. Not so far as the total tank is concerned. You speak of the Chieftain, that includes not only the tank hull but everything in the tank. The answer to the question would be no. On the other hand, I am optimistic that over a period of time perhaps we can achieve standardization, interoperability, and interchangeability on certain systems with the British.

Right now, in the near term of, say, the next 2 years, this is going to work more favorably or more easily with the Germans' Leopard system because it is closely alined to the XM–1 development schedule. But in time, I think we can also achieve similar standardization with the British. I am optimistic about this.

Senator WEICKER. So if there were no attempt toward standardization, we and our allies could very well end up with individual multi-billion-dollar programs, each with his own tank?

Secretary CLEMENTS. There is no question about that. I would add to those three the French. You would end up basically with four different systems if we did not stringently try to move in this direction.

Mr. PARKER. I just wanted to comment, Mr. Chairman, I think it is particularly important at this point, with the U.S. and German efforts, because both of us are going into production on a new tank at this time. The British are about half a generation off in terms of when they will attempt to field something new in the way of a new tank. It is in view of these major production commitments that these kinds of decisions have to be made and the problem for standardization further among our allies is, as we have shown, the benefits between ourselves and the Germans, and we have shown we and the Federal Republic of Germany are willing to take the action necessary in order to have the standardization accomplished.

DOD COMMITMENT TO STANDARDIZE

Senator WEICKER. I gather even though another major system fell in to standardize, the F–16, and this is really coming hard on the heels of the other, this indicates the Department of Defense isn't kidding. This is really the direction you want to go?

Secretary CLEMENTS. Senator, if you have any illusions about us kidding about the program, you should have been at the hearings in the House over the past 3 weeks. We are not kidding. I have no apologies to make whatsoever for the decisions we have made. I have told the various House Members if this decision should come up again today or tomorrow in the same way, I would make exactly the same decision. So let's don't talk about kidding. I am not kidding.

79-023 O - 77 - 3

Senator WEICKER. Let me say this to you. I think we are both well aware of the critical analysis of defense spending whether it be on hardware items for domestic consumption or hardware items for abroad. It is clear to me what the public is demanding here. They are not willing to pay for interservice rivalry. They are not willing to pay for nationalistic feelings. They want the best system. When these factors do not enter into the picture, that is money out of their pockets which could have gone to more productive uses. It is money ill-spent and they do not want to pay for this nonsense.

Secretary CLEMENTS. That is true. And I have to add one additional item: We are not going to pay for and that is the parochial interest of people who want to do certain things with the taxpayers' money and more particularly with the Department of Defense budget, and I don't agree with that, either.

### MEMORANDUM OF UNDERSTANDING

Senator WEICKER. Which components does the Memorandum of Understanding specifically earmark for standardization?

Secretary CLEMENTS. Both Mr. Parker and Mr. Augustine are the Department of Defense representatives in arriving at the Memorandum of Understanding. I would like Mr. Augustine and Mr. Parker to respond to that.

Mr. AUGUSTINE. The principal components identified in the addendum were those items that dominate the logistical burden. Specifically, the gun and the ammunition, the engine, the use of a dual turret that would permit up-gunning to a larger gun, the track, and associated hardware like sprockets, metric fasteners that would allow for interchangability of the major components between the vehicles, so we could exchange an engine from a U.S. tank directly to a German tank right on the battlefield. The night vision devices used within the turret and the gunner's telescope are also selected components.

I believe that covers the main items, unless Mr. Parker recalls another.

Mr. PARKER. No; that is correct.

### GERMAN COMMITMENT TO TURBINE ENGINE

Senator WEICKER. Mr. Secretary, the report of the special panel of the House Armed Services Committee indicates that perhaps neither our Government nor the Germans are really interested in the turbine, but that it was the only quid pro quo which could be struck with the German Government.

Let me quote from the findings of that panel:

> The requirements of the Memorandum of Understanding for a turbine engine appear to have been largely dictated as the only possible quid pro quo for the United States on standardization since the Federal Republic of Germany was totally committed to the 120-mm. gun.

Would you comment on that and, specifically, is the Federal Republic of Germany really serious about putting the turbine in the Leopard 2?

Secretary CLEMENTS. They are perfectly serious about this. The Germans are totally committed. I have the authority to state from the Ambassador right through the Department of Defense in Germany,

from their highest officials, from Mr. Leber, from his assistant, from his deputy, that they are fully committed to this. There can be no question whatsoever about it. The German leaders were recently in this country. Both Mr. Parker and Mr. Augustine, and I think also General Kerwin, were at lunch one day, we all visited with them. The Germans even offered to appear before the House committee and so testify. I did not think that was advisable. But I am authorized to speak for them and I can tell you they are totally committed.

TURBINE ENGINE

Senator WEICKER. Secretary Augustine, would you outline for us the considerations which led both the U.S. Government and the West Germans to conclude that the turbine engine is the way to go in future tanks? Specifically, would you tell us what the advantages of the turbine engine are?

Secretary AUGUSTINE. I would be glad to, Mr. Chairman. The principle factor that led us to conclude the turbine engine was a better long-term standard is the turbine is a simpler device than the diesel. Both engines have advantages, both have disadvantages.

The turbine can be expected to be more reliable, can be expected to be more durable in terms of the time between overhauls. It produces greater horsepower at the sprocket because it does not have the heavy cooling load the diesel has.

The turbine, for these reasons, and others, we would expect to have a lower operating and maintenance cost. It has good growth potential in terms of the horsepower one could get out of it in an upgraded version.

It has good acceleration responsiveness characteristics. It produces very little exhaust plume during acceleration which makes it easier to conceal the location of tanks on the battlefield. All are very important considerations.

I don't want to leave an unbalanced picture. There are pros and cons, Mr. Chairman, but those are the pros in answer to your question.

Senator WEICKER. Let me balance it out. Let me ask General Kerwin. I can imagine, General, since we have never had a turbine engine in our tanks, you are pretty familiar with diesel. I guess my question is twofold. Do you concur in the assessment of Secretary Augustine and would you like to present a picture to me as to the pros for the diesel engine?

ENGINE MATURITY

General KERWIN. I would have to agree, Mr. Chairman, with what Secretary Augustine has said. We get into the question of terminology. People claim the diesel has been with us longer, is more mature. The question is what is meant by mature?

The diesel, of course, has a lower initial cost. The diesel has been with us in many of our armored vehicles. Many people in industry and in the Army have more confidence in the diesel at the present time. The approach, of course, was to initially go to diesel and then to move to the turbine at some point in time in the future. I believe that covers both sides to this question, Mr. Chairman.

POSSIBLE RESISTANCE TO TURBINE

Senator WEICKER. Let's get into this aspect of it. Do you feel there is resistance at any level of the Department of the Army in changing from diesel to turbine because the turbine is a new concept? I don't mean to be overly critical. It is difficult for any of us to change. But I am wondering if that opposition might prevent us from moving forward with the best alternative for the future.

Are there any tank men speaking up for turbines? Or are they pretty much all wedded to the diesel concept because that is what they lived with all of their lives?

General KERWIN. I don't think that is correct, Mr. Chairman. I don't think there are tank men who are against turbines and specifically for diesels. There are things to be said on both sides of this fence. The most clear one is the fact that initially the diesel will cost less. The diesel is supposed to be more mature, in the near term, in the initial tanks and the initial plane. What Mr. Augustine says as far as the potential for growth of the turbine in the out years, there is much to be said on that side also. There is no great feeling for or against turbine in the Army. It is a question whether you look at the near term or the far term.

Senator WEICKER. It seems to me everybody should be in agreement. Everybody is in agreement that the wave of the future is the turbine. Would you agree with that?

General KERWIN. The wave of the future is with the turbine, I think. I don't know if everybody agrees with that or not.

Senator WEICKER. I am asking you.

General KERWIN. Yes. I think the wave of the future is with the turbine.

Secretary CLEMENTS. I would like Mr. Parker to comment on this. He has studied the turbine extensively as to where we are right now with it as opposed to what might be in the future. I would like for him to comment on this while we are discussing it.

Mr. PARKER. Thank you, Mr. Secretary. As a result of the uncertainty of the status of both the engine developments in the minds of some of us, we brought together a panel of experts which were made up of people from the Office of the Secretary, from the various services, and from outside the Department, who were both diesel and turbine experts, and asked them to review the status of both of these developments. We felt it was a very important decision we were about to make and we wanted the best input we could get.

The result of that, both of the engines are mature engines. I think both of the engines are satisfactory for installation in the tank. I think it has been indicated, because there have not been turbines in many ground applications, there are more questions about are there things associated with the uses in such a vehicle as the tank which could cause it to have problems out in the field. Clearly, the thing we ought to avoid is putting something into the field which we find we have to pull out every 100 hours and repair. So we look very critically at that particular issue.

I would say at this point I believe they are comparable in terms of their maturity insofar as the downtime for overhaul. While both are in the same region now, we can expect to see one grow in terms of its time between overhaul and for overall maintenance in the future.

The indication was the turbine would do that. The numbers vary on that. They vary between 50 percent more to 100 percent more in terms of that interval in time. We can only judge, I think, at this point, from the experience we see on aircraft engines and we know there the growth in the meantime between overhaul which would be quite significant.

The kind of things you worry about is what happens when one runs them in a very dirty environment. We are doing further testing to make sure the data does not turn up anything to cause us to have more concern. We are really trying to balance off. There is no question of the overall growth versus the cost. I think when we get the proposals in from the contractors, which will have the same tanks with just different powerpacks in them, we will have a very clear picture of the cost differences and I believe we will have all of the data we need to make a decision on its technical performance, both its current performance, its potential, and also its logistics support information.

Secretary CLEMENTS. Senator Weicker, I think from what has been said by all four of us here today, you can certainly appreciate we consider this engine selection question a very serious one. It is a fundamental building block in the design of the tank. I think our contractors understand that. The Army certainly understands it. The Office of the Secretary of Defense understands it. We all approach it on that basis.

Somewhat facetiously I would say to you, it is amazing the number of engine experts that have been uncovered since this discussion started.

PROGRAM DELAY

Senator WEICKER. Extending the source selection process at this point in the program appeared to some people to be somewhat disruptive. Let me ask the question: Why did you not anticipate these problems and make the changes in a more orderly way? Or did you feel the way was orderly?

Secretary CLEMENTS. No. I certainly think the process could have been done smoother. That is in part hindsight, which is always better as we all know. We could have avoided some of the difficulties we have encountered here and had a smoother and more orderly process. I would say to you as an example, that this dual turret, sometimes referred to as a hybrid turret, we started talking about this with the Army in October last year. This is not a new issue. To read some of the reports and some of the testimony, you would think we only thought of this in late July. That is not the truth. We started talking about it as early as October of last year.

The Army, working with our contractors, made certain conceptual studies of a dual turret. They made some rather rough estimates of what this cost might be and explored the possibilities, both the good points and the bad, as to whether or not it was first of all feasible, and second, whether or not it was desirable.

My understanding was, and I assumed some things I should not have assumed, and I want the record to clearly indicate that, that when we would be presented with the source selection recommendations that among those recommendations there would be the options relating to a dual turret. That is one of the reasons we did not make the selection as recommended. It was not there. It was an option I wanted, I still want,

and we were going to get there shortly. It will be a part of the consideration when we go into source selection in November.

Senator WEICKER. Do I understand then as a result of the delay, both contractors will submit proposals which incorporate diesel and turbine engines as well as the other components earmarked in the memorandum of understanding?

Secretary CLEMENTS. They will. These options will enable us, in a competitive environment, to make the kinds of determination in my judgment and in the judgment of the DSARC principals, my colleagues, will be in the best interest of the Army, the taxpayers, and the Department of Defense. We will have the necessary options to consider at that time. I don't think there is any question whatsoever that by doing this in a competitive environment they are going to get better proposals from the contractors with respect to both price and delivery and innovations, as opposed to doing it under a sole source environment.

TURBINE ENGINE

Senator WEICKER. But the addendum to the memorandum of understanding specifically stated that the United States will go with a turbine in the XM–1. What bothers me about this is that everything I see and hear about the turbine points to it as the engine for tanks, yet testimony refers to it in "when ready" terms.

What I want to know is whether the turbine will be in the first production model XM–1. And, if we are not going to initiate production with the turbine, then how can we justify an agreement which would appear to necessitate dual developments and then either a retrofit program or unique logistic system for a fraction of our XM–1 tanks?

Secretary CLEMENTS. I don't want to get into this to the extent it would preempt the process we are going through on source selection. Therefore, I cannot specifically answer fully and in detail that question. I will say, as Bob Parker has already indicated, as well as Mr. Augustine, that we consider both the turbine and the diesel as competitive. We have told the contractors this. We intend to make a decision in December that will indicate which one of these engines we are going to go into production with and I am not inhibited in any way with respect to the turbine.

It is going to be decided on its merits, on its cost effectiveness, its life cycle costs, its performance, and I consider these two power packages competitive right now. I think that is exactly what Mr. Parker was saying to you. Is that right, Bob?

Mr. PARKER. That is correct, Mr. Chairman, I believe they are competitive. I believe the thought processes that went into the addendum to the memorandum, was one that showed a prudent concern for the status of the development of both engines, and we were in those discussions at the time and did not have access to all of the testing data that was going to be done on the program.

We wanted to make sure we did not commit ourselves to a line of action that was inconsistent with fielding at an early date the capability of the tank. We believe we could put either power pack into the tank and have a very outstanding tank.

Secretary CLEMENTS. Mr. Weicker, if I did not sincerely believe what I have told you in a whole sense of integrity, it would make a farce out of our selection process.

Senator WEICKER. In other words, it is possible, and I agree with you. I don't want to in any way interfere or inhibit with the selection process going on now, but it would be possible to proceed directly with a GM tank with a turbine engine, or a Chrysler tank with a diesel engine, it would be possible to go down the road and change those?

Secretary CLEMENTS. That is absolutely right. As a matter of fact, that is what I contemplate doing.

Senator WEICKER. I just have a few more questions here. I would like to get to the gun for a minute if I might.

Secretary CLEMENTS. Before we go to that, when I say I contemplate doing that, I meant contemplate doing that in the spirit that I consider both of these engines competitive at this time and must be considered in a competitive sense to each other. I did not mean to say I mean to interchange these engines back and forth. I don't want to give the wrong impression here. That is one of the possibilities but that is not necessarily the only possibility.

HYBRID TURRET

Senator WEICKER. I understand. The House Panel concluded, based on General Baer's testimony, that a hybrid turret would degrade performance by 5 to 8 percent. What does that mean? What performance and how were those figures arrived at?

General KERWIN. First of all I want to make it clear, Mr. Chairman, I don't necessarily agree with that. I don't know whether that is correct or not. With all due respect to General Baer, he has made the estimate, I think we will only know what happens when we get that hybrid turret and take a look at it and find exactly what the impacts are.

Secretary CLEMENTS. May I add to that. I agree with General Kerwin. I do not agree with the 5 to 8 percent degradation. That is a result of model calculation in a computer model. I think some of the factors considered could well have been erroneous and we are going through the competitive process right now to make the kinds of determinations that General Kerwin indicated were necessary to allow us to come to that kind of conclusion.

That kind of a conclusion at this point is premature and not valid in my opinion.

COSTS OF RETROFITTING GUN

Senator WEICKER. The tripartite report stated that while the 105mm gun is ideal for the first production of XM–1's, the 120mm gun is the "gun of the future." In light of this, it seems conceivable that at some point in the future we may decide to retrofit the XM–1 with a fully tested, domestically produced 120mm gun. Am I correct in assuming that such a retrofit would be cheaper on a hybrid turret than on a turret designed to accommodate only a 105mm gun?

General KERWIN. That is correct.

Senator WEICKER. What would the unit cost be for retrofitting each turret configuration?

Secretary CLEMENTS. Senator Weicker, I think probably all four of us have a slightly different estimate or opinion in this regard. I would like to have Mr. Augustine address that first, if you would.

Secretary AUGUSTINE. Let me talk first just about the turret, now. The cost, if we put in the hybrid turret now is about $3,000 per tank, the numbers vary anywhere from zero to $4,000; $3,000 is probably a good ballpark figure. If we don't put the hybrid turret on now and do want to up-gun our tanks at a later time, just as we are doing today with our M–48 tanks, in that event the cost per tank would be at least $150,000 to put the 120mm gun and turret on. There, of course, is exactly the answer to the question of why this is being done. Even if the tanks' effectiveness is degraded by 4 or 5 percent, it seems to me to be a very good business judgment to provide the growth potential needed so you can up-gun to a larger gun at such a modest increase in cost.

Mr. PARKER. I might point out, Mr. Chairman, the Army did take action about a year ago to make sure when the conversion was made to a 120mm gun, the chassis and the auxiliary systems would not require change. We believed at that time it was probably one of those things we would see in the mid-eighties and we did not want to have the huge retrofit costs we were sure would be attendant with having to modify the chassis.

So those provisions are already made. It is really a question of whether one takes this hybrid turret and makes the change at the time you make the turret or throw the turret away when you put on the gun. I would agree with Mr. Augustine's ballpark estimates. We will know then in these proposal estimates what the cost is and what the impact is on the overall effect of the tank; the changes associated with this hybrid turret are fairly straightforward again, I believe, and we will have to see the proposals. It looks somewhere between a 1,000 and 1,500 pounds additional weight.

I point out that is in addition to the 116,000 pounds the tank weighs. In addition, there may be some change in its overall profile because of the slightly larger size of the gun. Again, that would reflect on its ability to be killed or immobilized. Those are the numbers we have to have as a result of looking at various specific designs and we will have those in the next few weeks.

General KERWIN. I have nothing to add to that.

Secretary CLEMENTS. Senator Weicker, as far as the estimates are concerned, Mr. Augustine mentioned a range of from zero increase in cost to $4,000 with a probability around $3,000. I think it would be less than that. I think there is a good likelihood that our contractors with their abilities and their innovations could well come in, for any practical purpose with a zero increase in cost by doing this in a competitive environment. Certainly I expect that cost to be less than $3,000.

I would remind you that if indeed the retrofit cost is $150,000 and I have heard as high as $200,000 per tank to retrofit the turret later, if that is the correct number—and I believe it is—somewhere between $150,000 and $200,000 per tank—and you multiply that by 3,300 tanks you are talking about over $600 million that we are in effect saving by going through this exercise right now.

Mr. PARKER. I would like to add one other thing, relative to the Leopard 2—the turret design for the Leopard 2—they made a turret which would take either one of these guns. So your hybrid turret is

not some miraculous new invention. It is a straightforward kind of engineering problem. You will be able to assess its costs and its implications in a very straightforward way as soon as we have the firm design that.

Senator WEICKER. Mr. Secretary, there is one potential weak spot in this XM–1 program decision, and it could be a serious one from the standpoint of our acquisition reforms.

As you know, those reforms place heavy emphasis on hardware test data. Here, the XM–1 program deserves high marks to date. But those reforms also prohibit forced technical transfusion of subsystems from one contractor to another. This can undermine the integrity of the competition and also commit us to a new, untested, and therefore, high-risk paper decision.

Mr. SECRETARY. I would like you to address these points. First, how willing and able were the contractors to bid on alternative configurations?

Secretary CLEMENTS. Senator Weicker, this is a matter of degree. I find contractors are very seldom happy. I am not sure that is too important. They are in business to perform under certain contractual conditions and in this instance, I find both of our contractors are very cooperative. They are addressing the problems in a great spirit of competitiveness in trying to come out with the best possible product. I find no fault with them whatsoever in this regard. They are in a state of full cooperation.

Senator WEICKER. There seems to be some confusion here as to the technical risk associated with the program change. For instance, General Baer, while testifying before the House Panel, made the following statement about the risks associated with the hybrid turret.

It is our preliminary assessment that the delays associated with the hybrid turret are very minimal. I am talking about a month or 2 months, something along that line.

Yet the report of the House Panel states:

The change in the program moves the XM–1 from a program of low technical risk to one of unknown technical risk.

So, in essence, it seems to me you cannot agree with the House Report, is that correct?

Secretary CLEMENTS. I disagree with the House Report 100 percent. The House fully understands my position as does Chairman Stratton, and I have made no bones about it whatsoever.

As a matter of fact, Senator Weicker, I think it is worth saying as far as I know that House Report, as you term it, has no official status at all and was not adopted by the House Armed Services Committee.

Senator WEICKER. What report was it? Was it sort of an ad hoc——

Secretary CLEMENTS. It was, as I understand it, that report can well be termed the Stratton Report.

Senator WEICKER. General Kerwin, is it true a year or year and a half ago, General Motors requested information from the Army on a turbine engine and that request was denied?

General KERWIN. I cannot answer that question, Mr. Chairman. I do not know.

79-023 O - 77 - 4

Senator WEICKER. I am quoting from an article in the Armed Forces Journal where it states:

> As far back as early 1975 General Motors was denied the turbine engine information it needed and asked for in order to submit a reasonable alternative to its tank.

Secretary CLEMENTS. Senator Weicker, I cannot believe that. Mr. Augustine, General Baer, myself, have had many opportunities to discuss that kind of a refusal with the project manager and the officials of General Motors and if they had any such request to make, it certainly would have come to my attention or Mr. Augustine's.

Senator WEICKER. Mr. Secretary, in his testimony submitted to the House Armed Services Committee, Secretary Rumsfeld said the following regarding the delay in a source selection decision on the XM–1:

> However, while standardization is an important issue, and while standardization will be enhanced by the ultimate configuration selected for the Army's new tank, standardization was not the central issue in the decision. Indeed, the delay of a few months would have been required in any case.

If standardization was not the primary reason for the delay in making a decision, what was the overriding consideration?

Secretary CLEMENTS. There was no question whatsoever. The delay was brought about by the need for additional options, the DSARC principals and I wanted to review the best possible competitive evaluations of these two tanks, the options were not presented to us. I said a little earlier, this was my reason for making the decision I did. If I had to make it tomorrow, I would make the same decision. It was not an issue of standardization as has been stated by some people.

It was entirely related to such things as the interchangeability, the price between power packages, the hybrid turret and other facts that should have been considered in a competitive environment.

I was unalterably opposed to making these changes in a sole source environment after the contractor was selected, I wanted to know what those unit costs were, what the delays in the program might be, if any, and have those costs determined competitively between the two contractors. That is the reason we made the decision we did.

### PROCUREMENT REFORMS

Senator WEICKER. As I recall, as a matter of fact when you were up here before this committee last month, you gave a very strong commitment at that time that the Department of Defense would implement our reforms, now embodied in the OMB Circular A–109. A key element of those reforms, of course, was to extend competition as long as possible to keep heat on the contractors. That is exactly the effect we have now. Would you care to elaborate on how bad our experience has been when we have cut short competition and then tried to negotiate changes in a sole source of supply environment?

Secretary CLEMENTS. I can say, Senator Weicker, this is not prudent, it is not good business practice, and as a matter of fact, I think in the long term most responsible contractors would prefer for these issues to be considered in a competitive environment.

I cannot really add anything to that. That is the way we are doing it. That is the way we are going to do it. As long as I am there, I assure you that will be our practice.

Senator WEICKER. The report of the special panel of the House Armed Services Committee accuses the Department of Defense of violating the required procedures in the source selection process, and specifically the report states:

The decisionmaking process in the case of the XM–1 involved a revision of required procedures, a revision designed to avoid leaks of the source-selection information, which aborted the normal safeguards of the weapons-procurement process. These revised procedures prevented the review by an Army Systems Acquisition Review Council (ASARC) and a Defense Systems Acquisition Review Council (DSARC). This prohibited the careful consideration of program alternatives with which the ASARC and DSARC are charged by regulations.

That is a serious charge. Would you care to comment?

Secretary CLEMENTS. Yes. I think it is baloney.

Senator WEICKER. I may have several additional questions, Mr. Secretary.

Secretary CLEMENTS. Senator Weicker, in this connection Secretary Rumsfeld has written to the House Armed Services Committee on three different occasions and I think these letters are all very pertinent to the topic we are discussing in regard to the process of the way the decision was made and these kinds of details. I would like to introduce these into the record, with your permission.

The first is dated September 21 and is addressed to Mr. Stratton. The next one is dated September 22, it is addressed to Mr. Price, and the third is dated September 27 addressed to Mr. Stratton. I think these will add considerably to this hearing that you are having this morning.

Senator WEICKER. They will be included in the record.

[The information referred to follows:]

SEPTEMBER 21, 1976.

Hon. SAMUEL S. STRATTON,
*Chairman, XM–1 Tank Panel, U.S. House of Representative, Committee on Armed Services, Washington, D.C.*

DEAR MR. CHAIRMAN: I have followed the testimony before the Committee's XM–1 panel. As Assistant Secretary William Brehm advised the Committee Counsel last week, I was not able to appear before the panel when requested.

You have heard from the officials directly involved in the program decision, both from OSD and the Army. Attached is a brief statement I have prepared on the subject.

Sincerely,

DONALD RUMSFELD.

Enclosure.

STATEMENT BY SECRETARY OF DEFENSE DONALD RUMSFELD

Selection of a contractor for the XM–1 tank program, originally scheduled for late July, was delayed for up to four months to develop additional tank configuration options, priced out by the contractors in a competitive environment.

It has been and remains the intention of the Department to develop and produce a cost-effective tank as quickly as possible. The selection of the final configuration requires balancing technical risk, growth potential, cost, productivity, maintainability, combat effectiveness, and other considerations. Finding the best balance calls for the analysis and evaluation of alternative configurations throughout the development process, since only through such experience can the list of choices be narrowed while gaining confidence in cost and effectiveness estimates for the final contenders.

In the case of the XM–1, the areas of particular interest have been the relative advantages of the diesel and turbine power plants and of the 105-mm and 120-mm main guns. I am advised that it was the understanding of the OSD executives that the Army was pursuing the XM–1 development program, including the

contractor competition phase begun with the publication of the Request for Proposal in October, 1975, with sufficient flexibility to permit the two competitive tanks to be compared with either power plant or with either gun (or more precisely, with a turret that would accept either gun), even though each contractor might choose to recommend a specific configuration. The cost quotations available in July applied only to the contractors' recommended configurations. This meant that the government could not evaluate the General Motors tank with the turbine engine, the Chrysler tank with the diesel engine, or either tank with the 120-mm gun (or with a turret configuration that had the capability to accept the 120-mm gun at a later date).

On July 20, 1976, the recommendation of Secretary Hoffmann and the Army, as presented to Deputy Secretary Clements and the members of the Defense Systems Acquisition Review Council (DSARC), was to select a contractor and then request bid quotations from that contractor—on a sole-source, non-competitive basis—for possible changes to the tank. Conversely, the recommendation of Deputy Secretary Clements and all the members of the DSARC (Dr. Currie, Mr. Shrontz, Mr. Aldridge, Mr. McClary and the General Counsel) was to have the Army continue both contractors for a limited period of time in order to solicit quotations in a competitive environment for the configuration alternatives of interest—quotations Mr. Clements had anticipated would have been available on July 20.

In considering the differing views, I concurred with the unanimous recommendation of Deputy Secretary Clements and the members of the DSARC.

These management actions appear to have raised two issues in the minds of some members of the XM–1 Tank Panel. The first is whether or not the XM–1 program has been unduly disrupted. The second is whether the best possible tank design will be selected.

First, the XM–1 contractor selection has been delayed until November 17, at the latest, at which time the program will move ahead aggressively into full Engineering Development. In fact, the Army is somewhat ahead of the November 17 schedule at the present time. Since the tank now being considered will be the first-line U.S. tank for the next 25 years, the four months additional effort represents prudent and reasonable management to achieve an increase in overall capability and effectiveness.

Turning to the particular tank design which may result, the features of concern appear to be the following: the engine/transmission package, the hybrid turret, and the main gun. It is my understanding that both the turbine engine and diesel engine have been under consideration for the XM–1 program from the beginning and both are still under consideration. The only revision with respect to the power package is that the Army has now asked both contractors to price out their tanks with the turbine design as well as the diesel so that the full range of options may be evaluated.

On the second point, if a hybrid turret is selected, there could be a slight performance penalty with the 105-mm gun installed when measured against the lower end of the threat spectrum; however, this would seem to be a modest "insurance payment" in that it assures that if the threat does at some point demand a larger gun, the XM–1 will be capable of accepting it, at which time there would, of course, be no penalty. (The first two years' production of the tank will have the 105-mm gun.) In this regard, one cannot help but think of the disadvantage the U.S. would face today in its program to upgrade the M–48 tank if the design of the original M–48 with its 90-mm gun had not included a turret that allowed future upgunning to a 105-mm weapon.

It is interesting to note that the major tank manufacturing nations in the world—the British, French and West Germans—have decided to upgun their tanks to 120-mm. Moreover, the Russians are using 115-mm and 122-mm guns. The West Germans and the French recently agreed that the 120-mm (smoothbore) gun is the optimum solution in the present state of the art for future battle tank armament. Similarly, the US/UK/FRG tripartite working group concluded that, while the 105-mm caliber offered the best basis for future development effort notwithstanding, the U.S. plans to use the 105-mm gun on the XM–1 at least until the 120-mm gun and ammunition have been fully proven. The hybrid turret is an attractive option, because it would preserve the opportunity to retrofit the early XM–1's with the 120-mm gun should that prove desirable.

The matter of NATO standardization also has been raised, and the suggestion made that the standardization issue has driven the Department's decision on the program. As the Committee is aware, in 1974 a Memorandum of Understanding

concerning tank standardization was signed by the United States and the Federal Republic of Germany. However, while standardization is an important issue, and while standardization will be enhanced by the ultimate configuration selected for the Army's new tank, standardization was not the central issue in the decision. Indeed, the delay of a few months would have been required in any case.

The steps which have been taken are appropriate to accomplish objectives that have been sought all along. While it is unfortunate that there will be up to a four-month delay in selecting a contractor, the fact is that the Department is merely proceeding with what was originally planned, namely to arrive in a position to make an intelligent decision regarding the selection of a tank configuration and a tank contractor, and to do so in a timely and business-like manner.

The Department will continue to work closely with the Congress and continue to keep the Committee informed.

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THE SECRETARY OF DEFENSE,
*Washington, D.C., September 22, 1976.*

Hon. MELVIN PRICE,
*Chairman, Committee on Armed Services,*
*House of Representatives, Washington, D.C.*

DEAR MEL: Late Friday afternoon, September 17, 1976, I received a request by Mr. Stratton to appear before the XM–1 Panel on Monday morning, September 20. Because I was scheduled to be in Norfolk on Monday on Department business, and because there obviously was not time to prepare for the hearings, I informed him I could not be there.

After returning from Norfolk Monday afternoon, I spoke with you by phone on various matters and at that time I had no indication that it was desirable for me to schedule an appearance before the Committee on the XM–1. Later, I was told that Mr. Stratton orally suggested that I come on Tuesday. I then prepared and had delivered to the Committee a letter and statement on the subject, and explained that I could not be there on Tuesday.

Now, I am told that one or two members have talked of a subpoena for me to testify. This, on top of the treatment of some Defense witnesses and the unusual requirement that Defense witnesses' statements be under oath, came as a surprise to me.

Because of this confusion, I want you to know that if you feel that I can contribute something beyond that which I have already submitted in writing and what has been provided by the numerous Defense witnesses during lengthy testimony, I can arrange to meet with your Committee on Thursday morning, September 23. If that is your desire, it would be my intention to have Mr. Clements, Mr. Augustine, and General Kerwin accompany me, in that they have been extensively involved in the Department's work in the main battle tank.

Sincerely,

DONALD H. RUMSFELD.

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THE SECRETARY OF DEFENSE,
*Washington, D.C., September 27, 1976.*

Hon. SAMUEL S. STRATTON,
*House of Representatives,*
*Washington, D.C.*

DEAR CONGRESSMAN STRATTON: The report of the XM–1 Tank Panel of the House Armed Services Committee has raised several questions relative to the action on the tank program. The report indicates some misunderstanding of the actions taken, the objective of these actions, the potential effect of the actions and the process by which decisions were taken.

Lest there be any confusion, I am writing you and Congressman Hillis to assure you the following:

The XM–1 program will proceed into full scale engineering development with a single contractor no later than 17 November 1976. Our objectives, as yours, remains to put into the field the most cost-effective tank force at the earliest possible time.

In discussions with the Federal Republic of Germany, we have pointed toward a turret which is compatible with both 105mm and 120mm guns. We believe this is prudent planning in view of the lower total cost, given that the threat of the late 1980's may well require a gun larger than 105mm. A turret capable of being up-gunned is justified by experience with the M–48 tank design, which is currently

being up-gunned from 90 mm to 105mm. However, before changing from a 105mm to a 120mm gun on the XM-1, comprehensive proofing and testing is clearly required, and I assure you that that will be the case. We will enter production of the XM-1 in the 105mm configuration; we have never considered doing otherwise.

The most significant uncertainty in the XM-1 program is that involved in the decision between diesel and turbine power. The former is estimated to have lower initial cost, the latter lower operation and support cost. We will not know which is better on a life-cycle basis until the current evaluation is completed. In any case, the choice will be made based on what is the best power plant for the XM-1; nothing in the addendum to the MOU, or the decision to withhold source selection until not later than November 17, 1976, requires otherwise.

Before one can assess the combat effectiveness of the various possible configurations, we must await the technical analysis of the proposals. I assure you that we remain committed to the most combat effective tank force possible over the lifetime of a tank that will be in the inventory to the year 2000. The decision in November to proceed to full scale engineering development will be made on that basis.

In short, I believe our objectives and those of the Panel are not far apart.

I hope that these commitments on my part are sufficient to clarify any previous misunderstanding, and thereby assure you and the Committee that your expressed goals for this vital program will be achieved.

Sincerely,

DONALD H. RUMSFELD.

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Senator WEICKER. Does anybody have any comments they would care to make?

Secretary AUGUSTINE. Mr. Chairman, I would like to briefly wrap up from the Army's viewpoint. We feel we have the program well under control. On November 17 or before, we will make a selection of a single contractor. At that time we will have a broad latitude of options to select from. We can then move ahead into engineering developments. From the Army standpoint, I think the program should be left to its own. We can move ahead, select a fine tank and move right out.

Secretary CLEMENTS. I agree with that.

Senator WEICKER. Thank you, gentlemen, and I want to thank you for appearing here this morning. When we talk of the XM-1, we know we are talking of the next century. We do not want a system based on the technology of the forties and fifties but one that is based into the future that will grow in the years in which the system is in service, therefore it is important that the system have room to accommodate that growth from the outset without imposing programmatic stress and economic problems. The Nation cannot afford to field a system which will be outdated in 5 to 10 years considering the importance of this program to our defenses. In light of the experience from our past programs, it is prudent to delay a few months and spend a little more at the front end rather than go full speed ahead and discover we made a mistake which is irreversible.

I want to commend you, Mr. Secretary, and all of you gentlemen here, for taking what seems to me to be a very responsible tact, one in which you are going to get some heat.

As you know you don't do anything worthwhile, and I emphasize worthwhile, that it doesn't raise a few hackles around this town. That's the nature of things. Nobody knows it better than I do.

On the other hand, I think it is very clear excellence of performance in the sense of our systems and the acquisitions of those systems is being demanded by the public and rightly so. So frankly, business as usual in the business of defense procurement is not going to work; it is going to wipe us out is what it at least is going to do.

I can only say this. It seems to me everything I read in the paper, you are damned if you do and damned if you don't. Go racing ahead, then you get stuck with cost overruns, equipment that doesn't work, you go slow and you want to do the right job and you have elements of the Congress on your head.

Well, stand in there and take the heat. I think what all of us want is the right decision, and I speak for myself in that regard. I don't care how it affects my particular parochial interests. I think we have got to look beyond that to the future of defense in this Nation.

So with that, I thank you all very much. The hearings are closed.

(Whereupon, at 11 a.m., the hearing in the above entitled matter was closed.)

APPENDIX I

Addendum 1

to

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE UNITED STATES OF AMERICA

REPRESENTED BY

THE UNITED STATES DEPARTMENT OF THE ARMY

AND

THE FEDERAL REPUBLIC OF GERMANY

REPRESENTED BY

THE FEDERAL MINISTRY OF DEFENSE

CONCERNING

THE HARMONIZATION OF

THE US TANK XM-1

AND

THE FRG TANK LEOPARD 2

ADDENDUM 1

TO THE

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES OF AMERICA REPRESENTED BY THE UNITED STATES DEPARTMENT OF THE ARMY AND THE FEDERAL REPUBLIC OF GERMANY REPRESENTED BY THE FEDERAL MINISTRY OF DEFENSE CONCERNING THE HARMONIZATION OF THE US TANK XM-1 AND THE FRG TANK LEOPARD 2 DATED DECEMBER 11, 1974.

The United States Department of the Army (USDA) and the Federal Ministry of Defense (FMOD) of the Federal Republic of Germany (FRG) having entered into the above-mentioned Memorandum of Understanding concerning the harmonization and standardization of the US tank XM-1 and the FRG tank Leopard 2 in 1974, in furtherance of the Memorandum of Understanding the Federal Ministry of Defense and the Department of Defense now desire to identify and specify areas of standardization of their respective tanks and to this end provide as follows:

Responding to the urgency to offset the sizeable effort the Warsaw Pact nations have been devoting in the general purpose forces;

Recognizing the importance of standardization among NATO allies, especially from a logistical and operational standpoint;

Noting the major advantages which can be achieved from standardization in the area of consumables, such as fuel and ammunition, and in those other areas requiring substantial logistical support such as the gun, track, engine, transmission, and fire

control;

- Intending that each party will manufacture all hardware of its production tanks domestically unless it specifically elects not to do so;
- Confirming that it is the intention of both parties that data and license rights on standardized items will be exchanged between them under fair and reasonable conditions;
- Prescribing that the comparative tests of the Leopard 2 and the XM-1 will continue in keeping with the MOU.

In furtherance of these objectives, the parties do agree as follows:

I. Common Standard Items

A. 120 mm gun

(1) The US will immediately initiate development of a turret design(s) for the XM-1 which is compatible with both the 105 mm and the smooth bore and rifled bore 120 mm guns. (The same turret need not accommodate both 120 mm gun configurations.) At least two of the Engineering Development models to be procured under the fullscale engineering development contract which the USDA intends to award within the next several months will be fitted with this new turret. All production models of the XM-1 will incorporate this dual-capable turret.

To facilitate this development effort, the FRG will immediately deliver to the USDA all available technical data required for the installation design of the 120 mm smooth bore gun in the XM-1

turret. Subsequently, the FRG will loan at FRG expense two (2) units of the gun and provide appropriate test quantities of ammunition immediately upon request subsequent to 15 January 1977.

(2) The FRG will observe the US testing of the UK gun and ammunition and will continue investigations of changes required to mount the rifled gun in the Leopard 2 turret.

(3) The FRG and the US and, hopefully, the UK and other NATO nations, will agree by 15 January upon a 120 mm configuration (smooth bore or improved rifled), meeting both the XM-1 and Leopard 2 requirements and suitable for introduction into production by March 1977. The FRG and US will enter into a separate agreement to provide for testing of the FRG smooth bore gun in support of this decision.

(4) The US will initiate production of the 120 mm gun and ammunition at such time as it meets the requirement of being ready for production and is certified as such by the developing nation including all specified unique US requirements, and the manufacturing data used by the developing contractor is made available to the USDA or its contractor(s). XM-1 tanks manufactured subsequent to the availability of domestically manufactured 120 mm guns will be equipped with such guns. The above specified unique US requirements will be defined by the USDA and delivered to the FRG by 15 January 1977. Special test data requirements will be submitted to the FRG by 15 October 1976.

(5) The Leopard 2 tank, to be delivered to the US in September 1976, will be fitted with a 105 mm gun and tested in accordance with the 11 December 1974 Memorandum of Understanding. Following these tests, it will be modified and tested with a smooth bore 120 mm gun. A limited test quantity of 120 mm ammunition will be provided for this purpose by FRG, at FRG expense.

B. Turbine Power Package

(1) The US will continue development of the standard AGT 1500 turbine power package, consisting of an engine and transmission, and will incorporate that power package into the XM-1 at the earliest practicable date. The FRG will initiate production and introduce the standardized turbine power package into the Leopard 2 at such time as it has met the requirements for entry into production, the US has in fact incorporated it into the XM-1 production and has certified it as complying with the specified unique FRG requirements and the manufacturing data used by the developing contractor is made available to the FRG or its contractor(s). The above specified unique FRG requirements will be delivered to the USDA by 15 January 1977.

(2) The US will loan, at its expense, a serviceable turbine power package to the FRG by 1 July 1977 for installation and test in a Leopard 2 tank in the FRG.

C. Other Standard Items

(1) The FRG and US agree that a common track and associated hardware (sprocket, etc.) will be used on the XM-1 and Leopard 2 tanks. These specific hardware items will be selected prior to

January 15, 1977, by the parties based upon the comparative reliability/durability tests of the XM-1 and Leopard 2 conducted at Aberdeen during 1976, and upon life cycle cost considerations. Technical data on the Diehl track will be provided immediately.

(2) Common standard diesel fuel will be used by both countries in Leopard 2 - XM-1 generation tanks incorporating the standard turbine power package.

(3) The FRG will incorporate the US night vision device (FLIR) into initial production of the Leopard 2 tank.

(4) The US will incorporate the FRG gunner's telescope into initial production of the XM-1 tank. Technical data sufficient to permit US contractors to submit cost and technical proposals to the USDA will be provided by the FRG immediately.

(5) Both countries will utilize standard metric fasteners at unit-level maintenance interfaces. The objective is to require only one set of tools on-board the tank.

(6) The US agrees to continue work at its own expense on the advanced kinetic energy 105 mm rounds and to make them available to the FRG and other NATO allies on reasonable terms and conditions for use in existing inventory classes of tanks.

(7) The US and FRG will investigate the possibility of standardizing the fire control system hardware. The results of the testing of the XM-1 and Leopard 2 at Aberdeen are expected to provide the technical basis for decision. In any event, the fire control systems adopted will both be functionally capable of

accepting both 105 mm and the selected standardized 120 mm gun.

II. Technical Data Exchange

1. Each party agrees that there be a total and complete disclosure between them of all technical data pertaining to agreed upon common subsystems; and both parties should take all reasonable steps to insure that such data is made available to the other party in a timely fashion.

2. The parties recognize their mutual and immediate requirements to make available to each other and their industries concerned data on the items to be standardized in order to permit their industries to prepare and submit technical and cost proposals on such items.

3. The parties agree to make the necessary data immediately available to each other and agree that they will furnish it to their industries on condition that it be used only for the purpose of preparing and submitting proposals to their respective governments. No data is required to be furnished by USDA if furnishing such data could in any way delay or jeopardize the ongoing competition for the XM-1 program.

4. The parties also recognize that subsequently there will be a further and mutual requirement for the exchange of more detailed manufacturing data so as to permit the manufacture by both governments of standardized subsystems. The USDA and FRG believe that such data should be obtained by the other party and its contractors directly from the developing contractor, upon fair and reasonable terms and conditions. To facilitate such exchange, each government

will include in its contracts, provisions requiring its contractors to enter into agreement for and to expeditiously transfer such technical data upon fair and reasonable terms and conditions.

III. Technical Know-How

1. In addition to the technical data to be furnished, the developing country, within a reasonable time after the receiving country makes a request therefor, shall make available the services of knowledgeable technicians to consult with and assist the receiving country and its contractors in the initiation and techniques of production of common items. All cost incurred in satisfying requests for technical assistance (including travel and living expenses and regular salaries) shall be the responsibility of the requesting country. The timing, the frequency, and the length of visits must be agreed to by both parties.

2. The developing country, within a reasonable time after the receiving country makes a request therefor, shall also arrange for a reasonable number of the receiving country's technicians to visit plants in the developing country to study and observe and receive instruction in the techniques of manufacturing the common items. All costs incurred in satisfying requests for such visits (including travel and living expenses and regular salaries of the visiting technicians) shall be the responsibility of the requesting country. The timing, the frequency, and the length of visits must be agreed to by both parties.

IV. Task Groups

It shall be the responsibility of the tank program project manager for each government to ensure that the necessary liaison between the governments and between the contractors is established so as to expedite the introduction and production of standardized subsystems. To assist the project managers joint task groups will be established as required.

V. Miscellaneous

1. All actions contemplated by and agreed to in this Addendum by the US and FRG will be implemented within the existing laws and regulations of the two countries. The Ministry of Defense and the Department of Defense agree to seek from their respective Parliament and Congress the support needed to assure continuation of the Leopard 2 and XM-1 programs including the provisions indicated herein.

2. Each country shall keep the other informed of its progress in the development of standardized items, and shall permit representatives of the other to witness and observe all test programs. Copies of significant government test data will be furnished upon request.

3. During the period leading up to the certification for production of the turbine power package and the 120 mm gun, both countries will be able to proceed with the development and test and, if necessary, first-lot production of their current design Leopard 2 and XM-1, respectively, except as agreed above.

VI. Summary

1. The actions described herein have as their objective the

establishment of the following minimum degree of commonality:

| System | Degree of Commonality |
|---|---|
| fuel | common |
| ammunition | common |
| gun | common |
| fire control | functions common, hardware potentially common |
| track (including sprockets and related hardware) | common |
| engine | common |
| transmission | common |
| night vision device (FLIR) | common |
| gunner's telescope | common |
| critical fasteners | common types |
| suspension | separate |
| hull and turret metal parts | common technology but different designs |

2. Upon request, the developing country shall make available to the receiving country production models of agreed upon common items developed by it. (If production models are not available, prototypes will be provided.)

3. The US and the FRG each believes that it is highly desirable that, to the extent feasible, the tank programs of the NATO allies be compatible and lead to greater commonality of our equipment. Accordingly, in the spirit of this agreement the US and FRG will keep the UK

and such other NATO nations as may be appropriate informed of the progress hereunder in order to achieve additional standardization as may be jointly agreed upon.

Bonn, July 28, 1976.

FOR THE DEPARTMENT OF DEFENSE

Under Secretary of the Army

THE FEDERAL MINISTER OF DEFENSE
BY ORDER

Ministerialdirektor

APPENDIX II

# REPORT
# of the
# XM–1 TANK PANEL

OF THE

## COMMITTEE ON ARMED SERVICES
## HOUSE OF REPRESENTATIVES
## NINETY-FOURTH CONGRESS

SECOND SESSION

SEPTEMBER 23, 1976

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1976

## HOUSE COMMITTEE ON ARMED SERVICES

NINETY-FOURTH CONGRESS, SECOND SESSION

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LEROY J. SPENCE, *Counsel*
MICHAEL A. WEST, *Executive Secretary*

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### XM-1 TANK PANEL

SAMUEL S. STRATTON, New York
ELWOOD H. (BUD) HILLIS, Indiana

JOHN J. FORD, *Professional Staff Member*
THOMAS S. HAHN, *Professional Staff Member*
JUSTUS P. WHITE, JR., *Professional Staff Member*

[H.A.S.C. No. 94–67]

# REPORT OF THE XM–1 TANK PANEL, HOUSE COMMITTEE ON ARMED SERVICES

## PURPOSE OF THE PANEL

On July 22, 1976, the Secretary of the Army announced a delay in the XM–1 tank development program.

The full Committee on Armed Services held an initial hearing on this matter on August 10, 1976. Defense Secretary Donald Rumsfeld, invited to appear, designated Deputy Secretary William P. Clements, Jr., and Army Secretary Martin R. Hoffmann to appear for the Department. Chairman Price concluded a further, in-depth study was required and on August 31 appointed the XM–1 Tank Panel, consisting of Mr. Stratton, of New York, and Mr. Hillis, of Indiana, to take testimony and make findings of fact in regard to the decision to delay the tank.

In an attempt to elicit these facts, the panel received testimony from a wide variety of expert witnesses, including representatives from the Defense Intelligence Agency; Maj. Gen. Robert J. Baer, the XM–1 project manager; Maj. Gen. Chester McKeen, chairman of the Source Selection Advisory Council; Mr. Edward Miller, Assistant Secretary of the Army for Research and Development; Gen. William E. DePuy, commander of the Training and Doctrine Command; Under Secretary of the Army Norman R. Augustine; Principal Deputy Director of Defense Research and Engineering Robert N. Parker; Gen. Walter T. Kerwin, the Vice Chief of Staff of the Army; and Lt. Gen. James Hollingsworth, retired, one of the most experienced tank commanders of the U.S. Army.

In a letter to Chairman Price dated August 6, Defense Secretary Rumsfeld stated that "any additional program costs will be related to enhanced capability." Similarly, at the August 10 hearing Mr. Clements and Mr. Hoffmann portrayed improved combat capability as a goal sought at the time of the decision to delay and as of equal or greater weight in the decision than standardization with the Federal Republic of Germany (FRG).

The panel attempted to determine if these statements were borne out by the facts.

They were not.

## BACKGROUND OF CONGRESSIONAL CONCERN

The XM–1 comes after two unsuccessful attempts (the MBT–70 and XM–803) to develop a follow-on to the M–60, the U.S. Army main battle tank since 1960.

2

After the second failure in 1971, the Army structured the XM–1 program to emphasize design-to-cost goals, low technical risk, and responsiveness to congressional intent and the user elements of the Army—areas where shortcomings had led to failure in earlier efforts.

### THE PROGRAM THROUGH JUNE 1976

The XM–1 program was approved for development in January 1973 and entered a 34-month validation phase in June 1973, with competitive contracts awarded to General Motors and Chrysler Corporation. Following competitive evaluation of prototypes in May 1976, the program was scheduled to go into Full-Scale Engineering Development in July, with a single winning contractor.

During the validation phase, in an effort to promote tank standardization or harmonization, the Defense Department made two significant efforts. In December 1974 the United States agreed to test a modified German Leopard II against the same standards applied to the U.S. contracts, and Army Secretary Hoffmann publicly announced that the United States would buy the Leopard if it won the competition. (The FRG has consistently declined to make a similar commitment to standardization.) Between 1973 and August 1975 the Army participated in a trilateral evaluation of tank main gun armaments with the United Kingdom and the FRG, seeking (1) to achieve trilateral standardization on the best gun or (2) failing that, to identify the best gun for the initial production of the XM–1 while developing a trilateral plan for agreement on the main gun of the future. As a result of that study, the 105mm was unanimously recommended for the initial production of the XM–1. It was further agreed that a 120mm gun *might* be needed to counter the threat at some future date and that this matter should be studied further.

In 1975 an amendment was included in the military procurement authorization bill in the Senate to delay engineering development until the German tank was ready for the competitive test since the Leopard II could not meet the U.S. deadline. This was rejected by the House-Senate conference after the Department of Defense strenuously opposed a delay; and the program, at congressional direction, continued on schedule.

In March 1976 Army Under Secretary Augustine proposed, in a memorandum to the Deputy Defense Secretary, a change in procedure for handling the source-selection findings to avoid leaks. The revised procedure obviated the normal review process.

In March 1976 the Director of Defense Research and Engineering (DDR&E), Dr. Malcolm Currie, replying to a GAO study, called the 105mm gun "the only logical choice for the XM–1."

### EVENTS FROM JUNE 3, 1976, TO JULY 22, 1976

On June 3 the Office of the Assistant Secretary of Defense for International Security Affairs circulated a memorandum attempting to get tank commonality on the agenda for a meeting of Defense Secretary Rumsfeld and FRG Defense Minister Leber. The Army, with the support of the Director of Defense Research and Engineering, opposed such efforts.

3

Secretary Rumsfeld met with Minister Leber in Europe on June 12, after which he ordered Defense Department officials to proceed to Europe to negotiate an addendum to the Memorandum of Understanding (MOU) on tank harmonization. He specifically directed, as a minimum, devising a plan for a common engine and a common main gun. Under Secretary of the Army Augustine and Principal Deputy DDR&E Parker negotiated for the United States; a proposed draft was completed on June 24.

Beginning on July 15, the results of the source-selection evaluation were presented to Army and Defense officials by General McKeen, the head of the Source Selection Advisory Council. On July 19 a series of meetings began to work out details of the source-selection announcement scheduled for the 20th. Various witnesses testified that the source-selection results showed a clear winner; and the Secretary of the Army, as source-selection authority, chose a winner and sought approval of that decision by the Secretary of Defense. The meeting apparently surfaced legal concerns related to the transfusion of components that would be required by the addendum to the MOU. Sealed envelopes containing winner announcement were delivered to Capitol Hill on the 20th, but late in the day it was made known that the announcement would be delayed 24 hours.

Army leaders, civilian and military, met through the night of the 20th, attempting to devise a strategy to stave off delay of their program. An alternative, essentially the Army's fallback position, was delivered to Defense Secretary Rumsfeld on the morning of July 21. Late that day the decision was directed by Secretary Rumsfeld to delay the program for four months to seek alternative proposals from the contractors embodying the components planned for standardization.

### THE ADDENDUM TO THE MOU

The MOU addendum provided that the United States agrees to install on all models of the XM–1 a hybrid turret; that is, one capable of mounting the 105mm or 120mm gun, and further agrees to deploy the 120mm gun when available for domestic production.

The FRG agrees to install the turbine engine after it has been adopted and produced by the Americans for their own use and meets FRG operational requirements.

The agreement also calls for commonality in tracks, night sight, gunner's telescope, critical fasteners, hull and turret metal parts, fire-control systems and fuel.

## FINDINGS OF FACT

With this brief background, the panel now presents its findings.

### IS THERE A CRITICAL NEED FOR A NEW TANK?

Yes.

Open and secret testimony by the Defense Intelligence Agency and Office of Technical Assessment in the Joint Chiefs of Staff established that the Soviets have a numerical advantage of 5 to 1 worldwide and about 3 to 1 in NATO's central region, have introduced two new tanks since the M–60 was introduced, and have tank-production capability four times greater than the United States.

4

All witnesses agreed the need for a new tank is critical. In addition, the U.S. Army, Europe, commander told committee staff members that the XM–1 is the No. 1 priority for U.S. European forces.

The present Soviet advantage is such that the United States requires both more tanks in quantity and substantial improvements in quality. The XM–1 will be superior to the Soviet T–72, but the T–72 is deployed; the XM–1, even if the program had not been delayed, would only begin coming off the production line in late 1979.

Nor can we simply rely on superior antitank weapons to maintain the balance. As General Baer observed, "The tank is an offensive weapon. And even in a defensive posture you must eventually go on the offensive if you are going to be successful. Every war that we fought, to include the Yom Kippur War, certainly bears that out."

### DID THE XM–1 PROTOTYPES SATISFY THE ARMY'S REQUIREMENTS?

Testimony in Congress *before* the program change and *in* the panel's hearings uniformly maintained that both U.S. competitors' tanks met all specifications and performed exceptionally in the test. The program was on schedule, within the cost parameters laid down over three years ago, and involved low technical risk. The program has been described as the best-managed program the Army has had in many years. The panel heard testimony indicating that either XM–1 candidate tank, if produced in present form, might well qualify as the best tank in the world.

### DELAY, ADDED COST AND TECHNICAL RISK

As a result of the decision to change the program, there will be delay, added cost and increased technical risk in getting a new tank.

The questions of delay, added cost and increased technical risk are interrelated. To the degree that changes in components are more rapidly instituted, greater technical risk and, correspondingly, greater likelihood of delay, is involved. Conversely, delay could be reduced somewhat by added effort which would require accepting additional increase in costs.

### DELAY IN OPERATIONAL AVAILABILITY

The program has already been delayed four months, assuming that a contract award will be made on November 17, 1976. Based upon testimony, it is apparent that the total delay under certain circumstances could be as much as two years. Some witnesses maintained that the delay after November 17 could be as little as zero to four or six months. The project manager, the most authoritative witness on this subject, could not give a definitive estimate of the additional delay but indicated that six months was optimistic.

### TECHNICAL RISK

The major causes of delay are the technical risks associated with development of a hybrid turret and problems associated with domestic development and production of the 120mm gun and ammunition. Essentially the program has gone from low technical risk to unknown technical risk

The project manager, in a memorandum to the Chief of Staff of the Army in June of 1976, when first informed of the draft MOU addendum, stated that some of the components were still conceptual in nature. Under questioning before the panel he conceded that was still true and that he could not state with certainty the technical risk involved. In an effort to present the change in the program in the most favorable light, the project manager initially referred to his estimate of increased cost as a "worst-case" estimate. However, under questioning, he conceded that the technical risk involved in the change in the program was unknown to the point that at this stage he could not say what the worst case would be.

The head of the Training and Doctrine Command of the Army, General DePuy, stated that he could not estimate the risk involved in the new components because he had never seen them and, in some cases, nobody else had ever seen them. They were at best just drawings. He also stated that he had never seen the drawings.

Even if the program worked in optimum fashion there would be some delay and a significant cost increase, *coupled with* a degradation in combat capability.

INCREASED COST

In his appearance before the committee the Secretary of the Army indicated a possible increase in cost in the program under what must be presumed to be optimum conditions of approximately $600 million.

The project manager and his staff did a cost study in the spring of this year which estimated the increase at $800 million.

In July, as the source-selection decision date approached and the Army fought desperately within the Department of Defense to avoid delay in its program, the project manager submitted cost estimates of the change in the program of $943 million. At the time, the Secretary of Defense, according to documents and testimony available to the panel, rejected the cost estimates as overstated.

Late in August, following the change in the program and the issuance of a request for new proposals to the contractors, the project manager's staff again made an estimate of the increased cost to be expected. The estimate was again approximately $900 million.

On three occasions, therefore—before, at the time of, and well after the decision to change the program—the estimate by the people most knowledgeable concluded that the increased cost as a result of this decision approaches a billion dollars.

The Assistant Secretary of the Army for Research and Development stated to the panel that he had no basis for questioning the estimates of the project manager. The Under Secretary of the Army, the Secretary of Defense's hand-picked agent in negotiating the MOU addendum, stated that he had no basis for questioning the project manager's decisions.

The estimates of the most knowledgeable people on tank procurement and of virtually all the experts who were questioned on that subject conflict sharply with the written statement of the Secretary of Defense that the only added cost involved is related to increase in combat capability. Disagreement with the project manager's cost estimates was voiced by the Principal Deputy DDR&E, one of the Secretary of Defense's agents in negotiating the addendum. Mr. Parker stated the estimates should be restudied. However, he acknowledged that he had not done any independent analysis of his own and that he

did not have any data other than the data of the project manager. He gave no basis for disagreeing with the project manager's projections other than to state that they should be looked at further. Mr. Parker, who has no experience in building tanks, is the only person with a technical background who questioned the estimates of delay, additional costs and additional technical risk or loss in combat capability made by other witnesses.

### THE TURBINE ENGINE

Although the two engines have been subjected to roughly equivalent testing during the XM–1 validation phase, the diesel is generally considered to be the more mature engine owing to earlier testing in the MBT–70/XM–803 program. However, testimony indicates both engines met or exceeded program requirements during the validation phase.

The element of technical risk is regarded as less with the diesel since similar, though less sophisticated, engines have historical tank application.

The turbine engine was the only logical candidate for engine standardization since both the United States and the FRG had satisfactory diesels. Thus, it was chosen for standardization by a process of elimination rather than on the basis of demonstrated superiority of performance. According to Army Under Secretary Augustine's testimony, the FRG was totally committed to the 120mm gun; therefore, the only possible quid pro quo was to standardize on the turbine engine.

Both the testimony and documentary evidence agree that the turbine has significantly greater growth potential than the diesel but it also has a significantly higher acquisition cost and a higher fuel-consumption rate.

The decision confronting the Army is the choice between the greater growth potential of the turbine and greater current maturity and lower initial cost of the diesel. Statistical data to make a definitive choice are still subject to refinement.

### THE UNCERTAINTIES OF THE 120MM GUN

The agreement to accept the 120mm gun requires at the outset that the American tank have a hybrid turret, which will initially result in a decrease in combat capability.

Equally curious is the fact that the 120mm gun was considered and rejected at several points in this very well managed program.

The tripartite study concluded in 1975 considered the 105mm, the 120mm smoothbore and the 110mm rifled bore.

The study concluded that the 105mm gun was the desirable gun for the XM–1 for the near to midterm (mid-1980's). The working group on the study, including the German members, stated that the 120mm gun may be an alternative in the future and should continue to be studied. At higher levels the FRG refused to accept the results of the study working group as stated and delayed release of the report to other NATO countries until the words were changed to more positively imply that the 120mm gun would be required in the future.

There continue to be uncertainties about the 120mm gun, and particularly about the German version thereof. While some optimistically call the turbine engine the wave of the future, no witnesses stated with certainty that the 120mm gun was the wave of the future. It is

clear, however, that the Germans are committed to a 120mm smoothbore gun, are incorporating it into their Leopard II, and have no intentions of changing that decision.

Going to the 120mm gun will not increase standardization within NATO. For many years to come the 105mm will remain the principal main tank gun in NATO. The panel was informed that if the U.S., FRG and U.K. agreed on the 105mm gun there would be 97-percent standardization in NATO by 1995. Additionally, use of the 120mm gun does not increase standardization. It was stated to the panel that the French, the Germans and the British all have a 120mm gun in varying stages of development. This is true. However, the Germans have a smoothbore gun and the British and French have a rifled bore and the ammunition for the three is not interchangeable.

The smoothbore is generally associated with a higher muzzle velocity and is emphasized by the Germans as necessary to provide greater penetration of possibly improved Soviet armor; the 120mm rifled bore is generally associated with greater accuracy. The panel knows of evidence seen in the Middle East in 1973 that the 105mm gun can penetrate the armor of the T–62 Soviet tank, and testimony indicates it is sufficient to defeat the T–72 Soviet tank, as presently known.

No witness volunteered new technical data to dispute previous findings of the project manager that the 105mm gun is adequate.

In addition to the tripartite study of 1975, the project manager, early in 1976, issued contracts to both contractors for a study of the 120mm gun for the XM–1. After these studies, which cost $400,000, the project manager concluded that the XM–1 should retain the 105mm gun.

The initial draft of the addendum to the MOU negotiated by Mr. Augustine and Mr. Parker in June of 1976 called for a decision on the 120mm gun by March of 1977. The final addendum signed on July 28 moved up the date of the decision to January 15, 1977. While Mr. Parker claimed that the date was flexible enough to have a later consideration of the British entry in the competition, most of the witnesses questioned conceded that moving up the decision date had the effect of cutting out the British contender; that is, the rifled bore 120mm gun. This action was taken despite the fact that on July 14 of this year the United States signed a Letter of Understanding with the British agreeing to test and provide a full evaluation of the British 120mm rifled bore gun.

The record overwhelmingly indicates that there is no support within the Army for the FRG smoothbore gun.

While the U.S. Army is not experienced with the 120mm gun, there is particular concern for the smoothbore gun which uses a different type of ammunition with possible problems similar to those encountered in the past with combustible case ammunition in the Sheridan tank. Briefly, these technical problems are susceptibility of the propellant charges to fracture due to rough handling, swelling and degradation due to absorption of moisture, and increased hazards due to incomplete burning in the gun which can result in increased pressures in the gun when the next round is fired.

A further strange result of the program change agreed to by the Department of Defense is that the United States will be committed to a turret capable of carrying a 120mm gun although research could even lead to a smaller-calibre rather than a larger-calibre gun. (For

example, the Army has been conducting research for some time on an improved 75mm gun.)

Finally, there is the consideration that going to the 120mm gun limits the mission capability of the tank, as discussed below under "Degradation of combat capability."

The question of the effectiveness of the 105mm itself has to be considered in light of the ammunition which has been developed for the gun. Presently under development is a depleted uranium rod penetrator. This ammunition, XM–774, has achieved significant armor penetration at all practical ranges. Data has neither been presented nor has it been suggested that the data exists which clearly establish that a 120mm gun exists which can significantly surpass the experimental results achieved with this new 105mm ammunition.

### DEGRADATION IN COMBAT CAPABILITY: THE HYBRID TURRET, THE MISSION LIMITATION

According to expert testimony, the hybrid turret would lead to a degradation in the combat capability of the XM–1. Despite the statements by various Defense leaders that it is part of an effort to get the best tank we can get, the conclusion is inescapable that in the interest of standardization we are likely to get something less than the best tank we can get.

The project manager stated simply to the panel that the XM–1, when required to take the hybrid turret with the 105mm gun, will suffer a degradation of combat capability of approximately 5 to 8 percent and possibly as much as 10 percent. It appears inevitable that the initial version of the XM–1 tank will be so configured. (If the tank were ready to go immediately to the 120mm gun, since the United States is committed to it if proven, there would be no need for the hybrid turret.) The only way the tank could have a domestically manufactured 120mm gun in the first production run would be to accept a delay in fielding the tank variously estimated at as much as two years. Because of the additional weight, the larger silhouette and apertures, the XM–1 with the hybrid turret with the 105mm gun suffers a loss in combat capability. Neither General McKeen nor Under Secretary of the Army Augustine disputed the project manager's analysis that such degradation would take place.

There is also a decrease in combat capability which will occur when the 120mm gun is installed on the hybrid turret because of a restriction on the mission capability. Specifically, the 105mm gun fires five different types of ammunition (the 120mm fires two). For example, the 120mm presently has no antipersonnel round available as does the 105mm. As witnesses testified and the panel had been previously informed, the October War of 1973 in the Middle East demonstrated the importance of this antipersonnel capability. For a tank which is facing troops armed with RPG–7 or similar antitank weapons, it is necessary for the tank to have a capability to attack such personnel.

The panel recognizes that standardization or interoperability of frequently used components and ammunition would be an advantage on a NATO battlefield, particularly as regards logistics considerations. But this standardization, which would take many, many years to achieve under optimum conditions, does not justify, in the panel's

view, a limitation of the combat capability of the tank in its initial deployment.

These restrictions on capability are independent of such maintenance or reliability problems which might arise as a result of the added requirements of the dual capable turret or the new 120mm gun.

### THE PRICE FOR STANDARDIZATION

The panel wishes to make it very clear that it does not oppose standardization and it does not know anybody who does. The panel believes there are many smaller items of equipment where the NATO forces could standardize and achieve cost savings and increased cost-effectiveness. The question is whether standardization should be accepted when it results in delay, increased cost, increased technical risk and loss of combat capability.

In the panel's opinion, the answer is no. This is the answer even if a greater degree of standardization were assured immediately; such, however, will not be the case.

### STANDARDIZATION BY CHANGE ORDER

The conversion to a 120mm gun, while it could eventually lead to increased standardization in Central Europe, will result for some time in decreased standardization in the U.S. Army as a whole and initially will decrease standardization in NATO.

Tank inventories change slowly. Even if the U.S. and German armies agree to commence production of the new tanks with 120mm guns, it would be many years before the 120mm gun became the predominant gun in the tank forces. And going initially to the 120mm smoothbore gun, with all of the attendant problems and technical risk of components still partly in the conceptual stage, would inevitably result in an unacceptable delay in fielding a new U.S. tank—possibly on the order of two years or longer. The technical risks are unknown to the point where the delay cannot now be determined.

Some Defense witnesses, notably Mr. Parker, attempted to insist that the XM–1 could go forward with the addendum in force with only a minimum delay beyond the four months' delay in contract award. It is clear from extensive testimony that the only way this could be achieved is by initially fielding the XM–1 with the 105mm gun and possibly other components which could be changed in follow-on versions. This could involve piecemeal changes which would mean a greater proliferation of tank variations in the U.S. inventory.

While standardization on a later generation of the XM–1 may be the only feasible means of achieving commonality without unacceptable delay or increased costs, the panel questions standardization by change order that the present Defense Department approach threatens to achieve.

### STANDARDIZATION AND DOCTRINE

General Hollingsworth brought to the attention of the panel the importance of tactical doctrine in decisions on standardization. Doctrine bears directly on the relative importance placed on subsystems. In this regard the following colloquy between General Baer, Army

10

Assistant Secretary Miller, and Senator Culver, of Iowa, during a Senate Armed Services Committee hearing this spring is significant:

> General Baer. I think you have touched on a very basic issue here, that we have not, with any degree of success, dealt with for the last 20 years in the NATO discussions. There are still very significant differences in the way in which we see a tank. This is very evident in the tank that we are looking at right now. The U.S. doctrine calls for the tank the way each country sees the requirement. For example, the main gun to be basically an offensive weapon. We believe that the tank has a role in the ground forces that no other vehicle can fulfill.
>
> I think the Europeans, looking at their environment, and what they assess as the unique requirements of the European theater, look at the tank as a defensive weapon. For this reason, there is a much greater concern with long-range firepower. We believe that you can supplement the tank, and its firepower in the long-range role much more effectively with missiles, and air-delivered weapons. If you optimize for the long-range defensive, you compromise the tank's basic capabilities in the offensive role, which we think is predominant.
>
> Senator Culver. If standardization is going to have any real meaning, the essential prerequisite is to have a greater degree of commonality and tactical doctrine.
>
> General Baer. Sir, I agree with you completely.
>
> Senator Culver. It seems to me that if we go through these exercises on weapons systems, in the absence of that it does become a political crap shoot.
>
> General Baer. Very much so.
>
> Mr. Miller. This is the same problem that we had in establishing the source selection criteria and weighing factors. I think I can say that among those who did this, there was not all this unanimous accord on what the rate of speed, for instance, should be, as versus another capability of the tank.
>
> We have arrived at a set of values as a part of the source selection process, which have been adopted. Obviously we cannot disclose what they are while the competition is going on.
>
> Senator Culver. But not with the Germans?
>
> Mr. Miller. The Germans did not participate in the formulation of source selection criteria.
>
> General Baer. The Germans have been provided a prioritized listing of characteristics. It has been discussed. I think, Senator Culver, this was one of the basic reasons why the MBT–70 program was not a success. There was never the ability to arrive at agreements on what should be the priorities of certain of the characteristics.

The panel believes that these comments are particularly significant in considering the relative merits of the 120mm gun. Such improved firepower as is claimed for the gun relates in part to improved penetration at longer ranges. The number of firings at such ranges is limited

in any case; General Hollingsworth stated that tank battles in the NATO environment will be fought at 1,000 to 1,500 meters. In terms of the tactical doctrine of the U.S. Army, the supposed advantages of the bigger gun may be even more questionable.

### ABORTING NORMAL WEAPONS-DECISION SAFEGUARDS

The revised decision-making procedure for the XM–1 devised in March 1976 by the Under Secretary of the Army was, according to his testimony, for the purpose of avoiding leaks from the source-selection process. The panel accepts his explanation. However, the revised procedures had the effect of cutting off normal safeguards of the Army's and Defense Department's weapons-decision process.

Army and Defense Department regulations provide for an Army Systems Acquisition Review Council (ASARC) and a Defense Systems Acquisition Review Council (DSARC) at the end of the validation phase. The ASARC and DSARC processes, which are designed to run independently of the source-selection process, are structured to provide adequate consideration of all factors. Specifically, the regulations provide that the ASARC and DSARC are to consider program alternatives. As a result of the changes in procedure recommended by Mr. Augustine, the ASARC and DSARC were never held on the XM–1 tank program and those program alternatives contained in the addendum to the MOU were never adequately considered.

### UNIFORMED LEADERSHIP CUT OFF FROM THE DECISION PROCESS

The ASARC normally includes of nine general officers who represent the various user elements and other interested commands of the Army. Aborting the ASARC cut off these uniformed leaders from the decision to change the program, and no effort was made to gain their input.

General DePuy, the head of the Training and Doctrine Command, testified that his office is the command through which the opinions of the user elements of the Army would normally funnel to the project manager and to higher Army leadership. General DePuy testified that he was not consulted on the change in the program either before or after the decision.

The Vice Chief of Staff, General Kerwin, concurred that the Army leadership was cut out of the process by the elimination of the ASARC. When asked if he knew of any uniformed officers that concurred in the decision to change the program, General Kerwin answered "No."

### ARMY LEADERSHIP UNIFORMLY OPPOSED TO PROGRAM CHANGES

The panel is at a loss to understand the attempts of the Department of Defense to display the decision to delay the XM–1 as an Army decision or to pretend that all of the top leaders supported the decision.

The panel could find no representative of the Army, civilian or military, who supported the decision to delay the program prior to July 21. Assistant Secretary Miller, Under Secretary Augustine and those Army uniformed witnesses who had an opportunity to express an opinion testified that all of them, and Secretary Hoffmann, opposed

the delay. The fateful, all-night Army meeting of July 20–21 was essentially an attempt to devise a strategy to avoid delay.

The panel believes that the following excerpt from General Kerwin's testimony is significant:

> Mr. FORD. There are nine general officers who are normally on the ASARC representing various user elements of the Army, or elements of commands which would have an input normally into new weapons systems. As a result of not having an ASARC, they did not have the opportunity to make an input or to consider the program alternatives to the XM–1, isn't that basically correct?
>
> General KERWIN. That is correct.
>
> Mr. FORD. So the alternatives; namely, the 120mm gun, or the turbine engine, or the other component changes that were to be made, were not considered at all by the ASARC, one of the principal functions of which is to consider program alternatives. Is that correct?
>
> General KERWIN. That is correct.
>
> * * * * * * *
>
> Mr. FORD. In other words, therefore, it is correct to say that the users of the tank did not have any input into this change in the tank with which they will eventually have to fight, if they have to fight?
>
> General KERWIN. You are correct.

### THE DECISION TO DELAY WAS THE DECISION OF THE SECRETARY OF DEFENSE

The abundance of testimony by all of those who attended the meetings in late July made two things indisputably clear:

(1) The decision to delay the program was made exclusively by the Secretary of Defense.

(2) The decision resulted from the Secretary of Defense's insistence on standardization.

Witnesses who were in the meetings at which the final decision to delay was considered, all understood that the decision was made by the Secretary of Defense. The testimony of the leaders of the Army makes clear that they understood from the outset that the driving force behind the decision to delay was the requirement to standardize with the FRG.

The only witness who maintained that the delay was independent of the standardization was Deputy DDR&E Parker; the panel does not believe Mr. Parker's evasive testimony is credible on this question.

### IRREGULARITIES IN THE DECISION-MAKING PROCESS

Not only did the ASARC and DSARC fail to meet on the XM–1 program, but the Secretary of Defense never approved an established DSARC position on the program as required by Defense Department regulations. Thus the highest leadership of the Department of Defense was ignoring its own regulations.

The degree of confusion in the decision-making process is indicated by conflict in testimony.

Mr. Parker attempted to maintain that a meeting with the Deputy Secretary of Defense on July 20 was, in fact, a DSARC meeting since most of the DSARC principals were present. Other witnesses testified that no DSARC was ever held and that the Army witnesses who attended the July 20 meeting were not informed that they were attending a meeting of the DSARC.

Mr. Parker's testimony also puts his boss, Dr. Currie, in the curious situation of taking a formal position for and against a specific decision on the same day. A DSARC memorandum supporting go-ahead with the XM–1 program as scheduled was forwarded to the Secretary of Defense on July 20, 1976, and was signed by the DSARC principals, of which Dr. Currie would normally be the chairman. It was not signed as a result of a formal meeting of the DSARC but was circulated among the principals. According to Mr. Parker's testimony, Dr. Currie supported the decision to delay the XM–1 program at the meeting on July 20. If, as Mr. Parker maintained, the July 20 meeting was a DSARC meeting, then Dr. Currie is in the position of both supporting and opposing DSARC approval of a program.

### COMBAT CAPABILITY NOT DISCUSSED

There is simply no evidence that prior to July 22 enhanced combat capability was put forth as a reason to delay the program. In the voluminous documentary evidence there is no record of anybody proposing a change in the program for the purpose of improved combat capability. On the contrary, most of the documentation is an expression of concern that changes might result in delay and decreased effectiveness. As already indicated, the known results of the change are some degradation in combat capability or limitation on mission capability.

Witnesses questioned stated that they did not recall anybody putting forward increased combat capability as a rationale for delaying the tank prior to July 22. The following colloquy occurred with General Kerwin:

> Mr. FORD. You say the rationale is the decision to change to standardization. In other words, the move to standardize with the Germans was the only rationale provided?
>
> General KERWIN. That is the only rationale presented that I understood, sir.

### STATE DEPARTMENT INVOLVEMENT

The subject of standardization cannot be raised without concurrently addressing the effects on relations with other nations. The reversal of this relationship has been a question which the panel questioned Defense witnesses about. Were there issues of an international character that might have influenced Defense management to reconsider standardization of the tank force at this time which were not solely the result of armored vehicle assessments? The answer to that question was yes.

Vice Chief of Staff of the Army, General Walter Kerwin, testified that even though he was not aware of communications from the State Department to the Department of Defense until after the panel's hearings had commenced there was a letter which had been sent from

the State Department to Assistant Secretary of Defense McAuliffe on June 7, 1976. The letter from the State Department warned of potential problems in sales of the Airborne Warning and Control System (AWACS), an Air Force system, if further progress in tank standardization with the Federal Republic of Germany was not made. Even though General Kerwin had prime military responsibility for the XM–1 tank in the Army, he testified that at no time was the issue of the relationship of tank standardization and the impact of that on the sale of AWACS to Germany discussed with him nor to his knowledge was it discussed with the Joint Chiefs of Staff.

### CONGRESSIONAL DIRECTION IGNORED

No effort was made at any time prior to July 22 to consult with the Congress over the possible change in the program. Although the project manager expressed concern about loss of credibility with Congress, there is no evidence that such a concern had any impact on the Secretary of Defense.

In July 1975, after disagreement between the House and the Senate over the possibility of a delay in the XM–1 program for the benefit of the German contender, Congress clearly provided in the conference report on the fiscal year 1976 Defense authorization bill direction that the XM–1 program was to go forward on schedule and was to enter Full-Scale Engineering Development in July 1976. The Congress had not changed that direction in considering the fiscal year 1977 Defense funding. In changing the program, the Defense Department violated the terms of congressional approval; and in the opinion of the panel, the action it took is improper without congressional authorization of reprogramming of funds.

The program as changed by the Secretary of Defense calls for a weapon system which, whether better or worse, is clearly different from that justified to the Congress at the time the authorization and appropriation was approved and would involve a cost clearly different from that known by the Congress when the weapon system was voted on.

## SUMMARY OF FINDINGS AND RECOMMENDATIONS

### FINDINGS

(1) There is a critical need for a new Army tank. Open and secret testimony confirmed that the present Soviet advantage is such that the United States requires both more tanks in quantity and improvements in quality. All witnesses agreed to this criticality. The leadership of the Army concurred that a year's delay in obtaining a new tank would be unacceptable.

(2) The XM–1 prototype developed by the two U.S. contractors met or exceeded all of the Army's stated requirements. The program was on schedule, within the cost limits laid down 3½ years ago and involved low technical risk. The panel heard testimony that either U.S. XM–1 candidate might qualify as the best tank in the world.

(3) The decision to delay the XM–1 program to allow standardization with the Federal Republic of Germany (FRG) will result in a delay in the program which could be as much as two years. The project manager, the most authoritative witness on the subject, indicated that

in addition to the already announced delay of 4 months, an additional six months was an optimistic estimate.

(4) The change in the program moves the XM–1 from a program of low technical risk to one of unknown technical risk. The project manager stated that some of the components designated for standardization in the addendum to the Memorandum of Understanding (MOU) with the FRG were still conceptual in nature. The delay in the program could not be determined because the degree of technical risk could not be stated with certainty.

(5) On three occasions—before, at the time of, and well after, the decision to change the program—the project manager's staff estimated that the increased costs that will result from the delay in the program would be between $800 million and $943 million. No acceptable challenge to those cost estimates was received.

(6) The change in the program will result in degradation in combat capability due to the MOU requirement for the United States to immediately install a hybrid turret and to the limitations on mission capability of the 120mm gun. The project manager stated that the hybrid turret with the 105mm gun will result in a degradation of combat capability of about 5 to 8 percent and possibly as much as 10 percent (going immediately to the 120mm gun would mean accepting a delay estimated at as much as two years). The 105mm gun fires five different types of ammunition; the 120mm gun fires two and cannot perform important missions performed by the 105mm gun.

(7) The Secretary of Defense wrote to the committee that "any additional program cost would be related to enhanced capability." The Deputy Secretary of Defense and the Secretary of the Army, in testimony on August 10, portrayed improved combat capability as a goal sought at the time of the decision to delay the program. These statements are not borne out by the facts.

(8) The requirement of the MOU for a turbine engine appears to have been largely dictated as the only possible quid pro quo for the United States on standardization since the FRG was totally committed to the 120mm gun.

(9) The MOU addendum requires standardization on the 120mm gun, and the agreement is written in such a way as to exclude the British rifled-bore 120mm and make the German smoothbore the only choice. A tripartite study (United States, United Kingdom, Federal Republic of Germany), concluded in 1975, found the 105mm gun was the desirable gun for the XM–1 through the mid-1980's; and a further study by both competitors in early 1976, at a cost of $400,000, supported the installation of the 105mm gun. The Director of Defense Research and Engineering, in March 1976, called the 105mm gun "the only logical choice for the XM–1."

The record indicates that there is no support for the smoothbore 120mm gun in the uniformed leadership of the U.S. Army. The FRG smoothbore gun has problems similar to those encountered in the Sheridan tank in the past with combustible-case ammunition. Conversely, ammunition under development for the 105mm gun has achieved significant armor penetration at practical ranges and no data is available which clearly establishes a 120mm gun can significantly surpass the potential results of the 105mm ammunition. Additionally, the panel learned that the 120mm guns of the British, French and German armies do not use interchangeable ammunition.

Some witnesses insisted that the XM–1 could go forward with the addendum in force with a minimum delay beyond the four months' delay in contract award. It is clear from extensive testimony that the only way this could be achieved is by initially fielding the XM–1 with the 105mm gun and possibily other components which could be changed in follow-on versions. This could involve piecemeal changes which would mean a greater proliferation of tank variations in the U.S. inventory.

(10) The decision to delay the XM–1 was made exclusively by the Secretary of Defense. The decision was unanimously opposed by the civilian and military leadership of the Army.

(11) The decision to delay the program resulted from the Secretary of Defense's insistence on standardization with the FRG. The panel found no documentary evidence and heard no oral claims from sworn witnesses that enhanced capability for the tank was put forward as a reason for change of the program prior to the day of the decision in late July.

(12) The decisionmaking process in the case of the XM–1 involved a revision of required procedures, a revision designed to avoid leaks of the source-selection information, which aborted the normal safeguards of the weapons-procurement process. These revised procedures prevented the review by an Army Systems Acquisition Review Council (ASARC) and a Defense Systems Acquisition Review Council (DSARC). This prohibited the careful consideration of program alternatives with which the ASARC and DSARC are charged by regulations. The revision as implemented resulted in the uniformed leadership of the Army being cut off from the decisionmaking process and the users of tanks did not have any input into the changes prescribed in the tank with which they may eventually have to fight.

(13) The Secretary of Defense never approved an established DSARC position on the XM–1 program as required by Defense Department regulations. The Director of Defense Research and Engineering, if the testimony of his principal deputy is to be believed, took formal positions both for and against the XM–1 delay on the same day.

(14) No effort was made prior to July 22 to consult with the Congress on the change in the XM–1 program. The project manager's expressed concern about loss of credibility with Congress was ignored at the Defense Department level. The change in the XM–1 program by the Department of Defense violates the terms of congressional approval and in the opinion of the panel is improper without congressional authorization of reprogramming of funds. The program as changed by the Secretary of Defense calls for a weapon system clearly different from that justified to Congress and involves a cost substantially greater than that known by the Congress at the time the authorization and appropriation for the weapon system was approved. In the opinion of the panel, the actions of the Department of Defense in handling changes in the XM–1 program represent a very grave disregarding of the role of Congress in establishing Defense policy.

RECOMMENDATIONS

The panel believes the action of the Secretary of Defense in delaying and changing the direction of the XM–1 program was improper and beyond the scope of the use of funds authorized and appropriated by

the Congress. The panel believes the action of the Secretary of Defense will inevitably result in delay and increased cost which would make it almost impossible to get the improved tank as early as required and threatens to result in an inferior tank. The panel believes the decision resulted solely from international political considerations without adequate regard for military realities or adequate input by military professionals.

The panel recommends, therefore, that the committee inform the Secretary of Defense by resolution that it does not support the proposed revision of the XM–1 and that it is the intention of the committee that the program should proceed to Full-Scale Engineering Development on the basis on which the program was approved by Congress as quickly as possible.

The panel recommends further that the committee inform the Secretary of Defense by resolution that it is the position of the committee that any change in the major components of the XM–1, including the turret, to achieve standardization should be considered only for later generations of the tank after components have been fully evaluated according to normal validation procedures and only in such a way as to avoid frequent piecemeal changes; and that it is further the position of the committee that any expenditure of funds toward development of such standardized components should commence only after congressional approval of a reprogramming action from sources other than the XM–1 program, or through the normal authorization and appropriation process.

COMMITTEE RESOLUTION

(On September 28, 1976, the Committee on Armed Services approved the following resolution offered by Mr. Hillis of Indiana:)

Whereas the House Committee on Armed Services has reviewed the findings and recommendations of the panel on the XM–1; and

Whereas the Secretary of Defense has stated on repeated occasions that it is his desire to cooperate with, and to seek the support of the Congress with regard to the XM–1 program, and the implementation of the addendum to the Memorandum of Understanding (MOU) with the FRC; now, therefore, be it

*Resolved*, That the Committee inform the Secretary of Defense:

(1) That, while it fully supports the underlying goal of standardization which prompted the addendum to the Memorandum of Understanding with the Federal Republic of Germany (FRG), the Committee regards the decisionmaking time-table prescribed in that addendum as premature and potentially in conflict with the overriding objective of the XM–1 program which is to field the most cost-effective main battle tank at the earliest possible date, and;

(2) That it is the position of the Committee that that overriding objective of the XM–1 program must take precedence over secondary objectives such as standardization or interchangeability of components, and be it further

*Resolved*, That the Committee inform the Secretary of Defense that the congressional support he seeks for the XM–1 program can best be assured by his responsiveness to the following guidelines:

(1) The XM–1 program should proceed into Full Scale Engineering Development with a single contractor as quickly as possible, but in no event later than November 17, 1976;

(2) In making the selection between alternative proposals, the Source Selection Authority should select that proposal which offers the best possibility of achieving the primary objective of the XM–1 program, even if that selection is in conflict with the terms of the addendum to the Memorandum of Understanding with the FRG;

(3) If one of the standardization proposals is selected as best meeting the primary program objective, Full Scale Engineering Development should serve as a basis for comparative testing of the basic XM–1 turret and the dual-capable turret. The final decision as to which turret should be incorporated in the initial production of the XM–1 should be based solely on the actual results of testing during Full Scale Engineering Development;

(4) The commitment to agree with the FRG on a specific 120mm gun configuration by January 15, 1976, was not justified to the Committee on the basis of known military requirements. Therefore, the Committee cannot support or fund any such commitment until:

(a) Alternative 120mm gun systems have been comprehensively tested and evaluated by the Army, and;

(b) One of those alternative 120mm gun systems has clearly demonstrated superior combat effectiveness over the present 105mm gun and its future improved ammunition;

(5) The testing and evaluation of alternative 120mm gun systems should be conducted as a parallel program, separate and apart from the funding of the XM–1 program; and should commence only after congressional approval of a reprograming action, or through the normal authorization and appropriation process;

(6) The Committee believes that the Army can choose now, on the basis of hard test data, between the diesel and turbine engine, and that it should do so without regard to which engine is compatible with the addendum to the Memorandum of Understanding;

(7) The Committee believes that the source selection process should be restructured to provide independent input from the user elements of the Army. As a minimum, this should involve full access to actual test reports by the commands represented on the ASARC to assure that the Source Selection Authority has the benefit of independent systems evaluations.

# APPENDIX III

## REBUTTAL TO THE SUMMARY OF FINDINGS OF THE TWO-MEMBER XM-1 TANK PANEL OF THE HOUSE COMMITTEE ON ARMED SERVICES

25 September 1976

FINDINGS #1 and #2, WHICH SUPPORT THE NEED FOR EARLY DEPLOYMENT OF A NEW ARMY TANK AND NOTE THAT THE XM-1 PROGRAM MEETS THE ARMY'S REQUIREMENTS WITHIN COST, SCHEDULE, AND RISK GOALS, ARE NOT CHALLENGED.

FINDING #3:

"THE DECISION TO DELAY THE XM-1 PROGRAM ... WILL RESULT IN A DELAY IN THE PROGRAM WHICH COULD BE AS MUCH AS TWO YEARS."

Fact: Gen Baer, in response to a question, testified that 'If the program were stopped until a 120mm gun could be incorporated in the first production tank, a delay of two years would then result. This is, of course, not what is planned.

Relevant material from the Two-Member Tank Panel Hearings follows:

Mr. Stratton: Didn't you indicate that it might even be two years?

Gen Baer: If we delay at this point in time to go the full route to include the application of the 120mm in the first production tanks? Yes sir, I believe we did indicate it could be as much as two years. (Underlining added)

Gen Baer: ... as I believe we've made clear throughout, we see the 120mm gun application being somewhere down the line, perhaps as much as four to five years, if we depend on the US production capability.

"THE PROJECT MANAGER, THE MOST AUTHORITATIVE WITNESS ON THE SUBJECT, INDICATED THAT IN ADDITION TO THE ALREADY ANNOUNCED DELAY OF FOUR MONTHS, AN ADDITIONAL SIX MONTHS WAS AN OPTIMISTIC ESTIMATE." (Underlining added)

Fact: Gen Baer gave the following testimony during the Tank Panel Hearing:

Mr. Stratton: You said yesterday that there would be at least six months delay in addition to the four months.

Gen Baer: I said there could be as much as a six month delay. (Underlining added)

"THE DECISION TO DELAY THE XM-1 PROGRAM TO ALLOW STANDARDIZATION WITH THE FEDERAL REPUBLIC OF GERMANY ..."

Fact: The following statements were made before the HASC:

Mr. Hoffmann: Thus, we have embarked on a course of action to select our optimized set of tank components to achieve additional combat capability and growth potential and at the same time enhance standardization of the XM-1 and the FRG Leopard 2.

Mr. Clements: As the time for final source selection approached, it became apparent that we could obtain a better tank for our forces by substituting selected components into alternative configurations ...

FINDING #4:

"THE CHANGE IN THE PROGRAM MOVES THE XM-1 FROM A PROGRAM OF LOW TECHNICAL RISK TO ONE OF UNKNOWN TECHNICAL RISK."

Fact: Technical risk remains unchanged as no final configuration has been selected. With regard to the impact of the Addendum to the Memorandum of Understanding, special provisions are made to assure that no new item is introduced until it is fully verified as sound:

Quote from Addendum to MOU: "During the period leading up to the certification for production of the turbine power package and the 120mm gun, both countries will be able to proceed with the development and test and, if necessary, first-lot production of their current design Leopard 2 and XM-1 respectively, except as agreed above.

(Note: Exception refers to "low-risk" items such as gunner's telescope, track, hybrid turret, metric fasteners and FLIR.)

(1) With regard to risk involved in the hybrid turret, it was stated during the Tank Panel hearing:

Gen Baer: It is our preliminary assessment that the delays associated with the hybrid turret are very minimal. I am talking about a month or two months, something along that line.

(2) With regard to risk in the 120mm gun:

Mr. Augustine: The nature of the agreement, however, provides that until the German 120, or whatever gun is selected, is fully tested and meets the specific conditions that the U.S. places upon it, it, of course, would not be installed in our tank and we would continue to install the British 105 gun. So, if there is risk,

It would not be risk on our tank. We would just not install the 120 until the risk was removed, and that is in keeping with our understanding with the FRG.

(3) With regard to risk in the turbine engine:

Mr. Miller: ... I am just saying, as an engineer who's been in this business for 25 years, ten years in the gas turbine business, that I wouldn't get any more gray hair about doing that, and I mean it.

FINDING #5:

"... THE INCREASED COSTS THAT WILL RESULT FROM THE DELAY IN THE PROGRAM WOULD BE BETWEEN $800M AND $943M. NO ACCEPTABLE CHALLENGE TO THESE COST ESTIMATES WAS RECEIVED."

Fact: The cost of the decision to delay the program (per se) is approximately $14M. Any further impact will be determined on or before Nov. 17, when a final configuration and source is selected. Addressing cost increases said to be associated with individual components:

-- With regard to the turbine: (Statement by Secretary of Defense Donald Rumsfeld) "... both the turbine engiher and diesel engine have been under consideration for the XM-1 program from the beginning and both are still under consideration. The only revision with respect to the power package is that the Army has now asked both contractors to price out their tanks with the turbine design as well as the diesel so that the full range of options may be evaluated.

-- With regard to the hybrid turret: (Tank Panel Hearings)

Mr. Parker: In terms of the data on the impact on the unit cost, the indication so far as the standardization items, if I might --

Mr. Stratton: Don't bother to read it. Just tell me what you got. We are in a hurry here and I want to get an answer and a straight answer and a simple answer to these questions.

Mr. Parker: We have an indication that, as I recall, on the order of $3,000 unit cost impact as a result of the change in the turret so far as turret structure is concerned. I believe that --"

Mr. Augustine: ... The cost of retrofitting a 120 gun into that turret is modest, on the order of -- our original estimates, I believe, were like $23,000 a tank for the gun system. Now, if one doesn't design the turret in the hybrid fashion, and later decides that he wants the 120 gun, then the entire turret has to be replaced and the cost of that runs in the hundreds of thousands of dollars. That is very expensive.

-- With regard to the gun/ammunition: (HASC Hearing: Mr. Hoffmann's opening statement)
"Hence, the decision to incorporate the 120mm gun in the near-term does not necessarily represent a basic new increase in cost either, but rather represents a moving forward of the point in time at which the additional funds needed to support the mounting of a 120mm gun must be committed. On the other hand, this earlier commitment minimizes the costs which otherwise might have been required for retrofit--not only of a gun but of a turret as well--should the threat so demand."

FINDING #6:

"THE PROJECT MANAGER STATED THAT THE HYBRID TURRET WITH THE 105MM GUN WILL RESULT IN A DEGRADATION OF COMBAT CAPABILITY OF ABOUT 5 TO 8 PERCENT AND POSSIBLY AS MUCH AS 10 PERCENT (GOING IMMEDIATELY TO THE 120MM GUN WOULD MEAN ACCEPTING A DELAY ESTIMATED AT AS MUCH AS TWO YEARS)."

Fact: During the Tank Panel Hearing it was stated:

General DePuy: On the other hand, you know, if the judgment is urging to go to a 120mm but that you are going to put the 105 only on the first production, then having a hybrid turret is the only sensible way to go.

So the decision is not the turret. The decision is the gun. If you are going to go to 120 reasonably soon, the hybrid turret is probably the way to go.

Gen Baer: ... And that it does have some degradation. It could be somewhere between 5 to 8 percent perhaps overall. But that again, I wouldn't want to stand here today and say that is an absolutely accurate number, because I would have to go back and look at some of the records on that.

(The two-year delay was addressed in Finding #3. The 120mm for initial production tanks is not planned, nor was it ever planned.)

FINDING #7:

"THE SECRETARY OF DEFENSE WROTE TO THE COMMITTEE THAT 'ANY ADDITIONAL PROGRAM COST WOULD BE RELATED TO ENHANCED CAPABILITY.' THE DEPUTY SECRETARY OF DEFENSE AND THE SECRETARY OF THE ARMY, IN TESTIMONY ON AUGUST 10, PORTRAYED IMPROVED COMBAT CAPABILITY AS A GOAL SOUGHT AT THE TIME OF THE DECISION TO DELAY THE PROGRAM. THESE STATEMENTS ARE NOT BORNE OUT BY THE FACTS."

Fact: Statements before the HASC:

General Baer: Mr. Chairman, I did not say that the 120 is not an improvement. It does provide growth potential capabilities which exceed that of the 105 millimeter gun. The turbine engine provides certain capabilities the diesel engine will never be able to achieve, but whether it is cost-effective or not in the current time frame is the issue the Army has to deal with, and that is exactly what we were dealing with.

Gen Kerwin: If you took the turbine and its growth potential you would say then you are increasing the combat ability out at some point in time. If you placed on it the 120mm gun, whether it was rifled or smoothbore, and you consider the possibility of the threat in the long term, then the 120mm could handle that. Yes, you would be increasing the combat ability of that tank.

(Note that the definition of combat "capability" should consider overall tank effectiveness and not just the capability of individual items of hardware.)

Tank Panel Hearings:

Mr. Augustine: Perhaps the definition should also include the importance that we have logistical interchangeability with our allies; that we have tactical interchangeability with our allies.

FINDING #8:

"THE REQUIREMENT OF THE MOU FOR A TURBINE ENGINE APPEARS TO HAVE BEEN LARGELY DICTATED AS THE ONLY QUID PRO QUO FOR THE UNITED STATES ON STANDARDIZATION SINCE THE FRG WAS TOTALLY COMMITTED TO THE 120MM GUN."

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Fact: During the Tank Panel hearing it was stated:

Mr. Augustine: Now the question is, should the U.S. adopt the German diesel engine, and the Germans adopt the U.S. 105 gun? The argument would be that many countries think the 105 gun isn't adequate; that the tripartite gun agreement said the way of the future is the 120, although it wasn't mandatory in the near-term. The way of the long-term future, and perhaps the short-term future, in engines was certainly the turbine and not the diesel. So the only kind of agreement that made sense was to standardize on the U.S. turbine, which the Germans, frankly to my surprise, were willing to do; and for us to standardize on the German gun, or on a 120 gun.

General Baer: Mr. Chairman, first of all let me say that it's not something that has only arisen in relation to the standardization issue that we are looking at now. In 1964 and 1965, when we were working with the Germans on the MBT-70, the turbine was considered as one of the power pack alternatives. Even after it was rejected as the primary power pack, it was continued in development as an alternative, as a parallel program.

So there has been considerable interest. The primary promise of the turbine is that it represents a new technology. It permits a much lighter weight vehicle in that it has less weight and less bulk than a diesel engine. The potential for greater reliability and durability is also there.

Other HASC hearing exchange:

General Baer: I think the desire to achieve some standardization within the NATO tank fleet has been of long standing. It was certainly a driving factor in the MBT-70 program of fifteen or sixteen years ago. In the specific case here we were trying to bring this about more through a data exchange as a follow-on to the termination of the MBT-70-XM-803 program. We continued to monitor their testing and they continued to monitor ours. We exchanged data on some of the new ideas we were looking at for our new tank systems, so we are working toward standardization but not in a specific component sense.

Mr. Hillis: Can you point to any standardization in the present XM-1 tank that grew out of this data exchange?

General Baer: Yes, sir. In some of the elements of the fire control system we have similar approaches. Laser range finders and night vision work was done in the MBT-70 program. Elements of the suspension system, the power pack, and much of the technology that we have in our new transmission is a follow-on to some of the work that had been done as part of the MBT-70 exploratory work.

FINDING #9:

"THE FRG SMOOTHBORE GUN HAS PROBLEMS SIMILAR TO THOSE ENCOUNTERED IN THE SHERIDAN TANK IN THE PAST WITH COMBUSTIBLE-CASE AMMUNITION."

Fact: The combustible case ammunition used in the Sheridan armored reconnaissance vehicle (and also in the newest M60A2 tank) is performing in a fully satisfactory manner, with the problems encountered early in the program having been satisfactorily resolved. Further, no combustible case ammunition will be used in the XM-1 until it has fully met all U.S. specifications. Should it fail to do so, production will continue with the current 105mm gun and rounds.

Addendum to MOU:

"The US will initiate production of the 120mm gun and ammunition at such time as it meets the requirement of being ready for production and is certified as such by the developing nation including all specified US requirements ..."

"ADDITIONALLY, THE PANEL LEARNED THAT THE 120MM GUNS OF THE BRITISH, FRENCH AND GERMAN ARMIES DO NOT USE INTERCHANGEABLE AMMUNITION."

Fact: Message from US Mission to NATO re German-French agreement reached subsequent to US/FRG addendum on tank standardization:

"The FRG and the French Republic both regard the 120mm smoothbore gun as the optimum solution in the present state of the art for future battle tank armament. Both countries agree that, in the interest of standardization, interchangeability of the ammunition for the Improved AMX-30 and the Leopard 2 is absolutely essential." (The agreement goes on to provide for this interchangeability.)

(The UK has not yet agreed to standardize ammunition; however, it is to be noted that the UK posesses only about 15% of the total number of tanks owned by the three countries in question: (UK/FRG/France).

"... NO DATA IS AVAILABLE WHICH CLEARLY ESTABLISHES A 120MM GUN CAN SIGNIFICANTLY SURPASS THE POTENTIAL RESULTS OF THE 105MM AMMUNITION."

Fact: Given the same level of technology, the 120mm can penetrate substantially greater armor thickness and more advanced armor, at a given range, than can the 105mm system. That the body of technical knowledge in the world supports this view is suggested by the following:

| World's tank developing nations | Gun selected for new tank |
|---|---|
| USSR | 115 and 122 |
| UK | 120 |
| FRG | 120 |
| France | 120 |
| (US) | (105 initial, 120 eventual) |

US/UK/FRG Tripartite working group report states:

"The trials results indicate that of the three calibers tested 120mm provides the best basis for future development of advanced tank weapon systems."

FINDING #10:

"THE DECISION TO DELAY THE XM-1 WAS MADE EXCLUSIVELY BY THE SECRETARY OF DEFENSE."

Fact: The decision to delay the Xm-1 program was made by the Secretary of Defense based upon the unanimous recommendation of the Deputy Secretary of Defense, the Director of Defense Research and Engineering, the Assistant Secretary of Defense for Installations and Logistics, the Assistant Secretary of Defense (Comptroller), the Director of Plans, Analysis and Evaluation, and the General Counsel of the Department of Defense.

Although the Army's preferred alternative had been to continue the program without delay, the following considerations apply:

HASC Hearing:

Mr. Hoffmann: We did not regard this either as a radical program change or as a violent swerving derail from the course we had set on. Our objectives have been the same in DoD and the Army throughout the program, and the hope is that by applying a little foresight now, taking advantage of some of the leverage we have in competition, that we will come out with a tank that is more combat-capable with more growth potential, out of all proportion to either the delay or the increased cost that we would incur by so doing.

SASC Hearing:

Mr. Augustine: So, we have a plan that, if followed, we believe will by the 17th of November have us on the path toward getting the tank the Army has much need of, and that is the man thing I would like to leave with the Committee.

HASC Hearing:

Mr. Augustine: I think we can stand here today, and say the standardized tank is a fine tank.

FINDING #11:

"THE DECISION TO DELAY THE PROGRAM RESULTED FROM THE SECRETARY OF DEFENSE'S INSISTENCE ON STANDARDIZATION WITH THE FRG."

Fact: Statement before HASC: (Concerning the reason for delay rather than making an award on the original schedule).

Mr. Hoffmann: At the time originally scheduled for contractor selection, two alternatives were available to introduce the design modifications needed to achieve those goals in a prompt manner: (1) Selecting a winner and negotiating with a single contractor, thereby producing a situation in which we would be unlikely to maintain minimum cost and schedule impact and which violates our basic management tenet of promoting competition. (2) Delaying source selection and asking for appropriate modification to both the existing proposals, thus capitalizing on the existing competition. The latter alternative appeared most reasonable ...

Note that during the Tank Panel Hearing it was stated;

Mr. Stratton: You mean to say you are going to award the contract and start to put in all kinds of change orders which is what got us into trouble on the TFX and on the C-5.

FINDING #12:

"THESE REVISED PROCEDURES PREVENTED THE REVIEW BY THE ARMY SYSTEMS ACQUISITION REVIEW COUNCIL (ASARC) AND A DEFENSE SYSTEMS ACQUISITION REVIEW COUNCIL (DSARC)."

Fact: The views of the appropriate panels were heard and a decision was made. With regard to the DSARC having an opportunity to review the program: Statement by Secretary of Defense to HASC: "On July 20, 1976 the recommendation of Secretary Hoffmann and the Army, as presented to Deputy Secretary Clements and the members of the Defense Systems Acquisition Review Council (DSARC), was ..."

With regard to the ASARC having an opportunity to present views: (The Vice Chief of Staff, as Chairman of the ASARC, has decision-making authority to resolve differing views within the ASARC and speaks for the ASARC.)

From the Tank Panel Hearing:

Mr. Stratton: ... Did you make any strong attempt to defend the Army's point of view?

General Kerwin: Well, I believe I did, as the Chairman of the ASARC, sir.

From Statement by Secretary of Defense to HASC:

"In considering the differing views, I concurred with the unanimous recommendation of Deputy Secretary Clements and the members of the DSARC."

FINDING #13:

"THE SECRETARY OF DEFENSE NEVER APPROVED AN ESTABLISHED DSARC POSITION ON THE XM-1 PROGRAM AS REQUIRED BY DEFENSE DEPARTMENT REGULATIONS."

Fact: (From "Statement by Secretary of Defense" provided to HASC)

"In considering the differing views, I concurred with the unanimous recommendation of Deputy Secretary Clements and the members of the DSARC."

FINDING #14:

"NO EFFORT WAS MADE PRIOR TO JULY 22 TO CONSULT WITH THE CONGRESS ON THE CHANGE IN THE XM-1 PROGRAM"

Fact: Consultation with Congress prior to July 22 was difficult due to the ongoing competition. Specifically, Public Law 91-441 Sec. 507(a) states: "No information concerning the identity or location of the person, company, or corporation to whom any contract has been awarded by the Department of Defense shall be given to any individual, including any Member of Congress, in advance of a public announcement by the Secretary of Defense of the identity of the person, company, or corporation to whom such contract has been awarded."

"IN THE OPINION OF THE PANEL, THE ACTIONS OF THE DEPARTMENT OF DEFENSE IN HANDLING CHANGES IN THE XM-1 PROGRAM REPRESENT A VERY GRAVE DISREGARDING OF THE ROLE OF CONGRESS IN ESTABLISHING DEFENSE POLICY."

Fact: The Department of Defense recognizedand appreciated the role of Congress in restructuring the program, and the need for the approval of Congress to implement the Addendum to the MOU was acknowledged in the MOU itself as follows:

"All actions contemplated by and agreed to in this Addendum by the US and FRG will be implemented within the existing laws and regulations of the two countries. The Ministry of Defense and the Department of Defense agree to seek from their respective Parliament and Congress the support needed to assure continuation of the Leopard 2 and XM-1 programs including the provisions indicated herein."

Also, Mr. Hoffmann, on 10 August, testified that:

Mr. Hoffmann: In the first place, as I indicated in my statement, the agreement in terms reserves all Congressional prerogatives with respect to extent, and indicates the agreement is subject to such action as may have to be taken or made by the Congress or may be required that the Congress will take subsequent to the ending of the treaty. So, I think to that extent that we have not exceeded what our prerogative might be if this would seem to be elevated to the dignity of the treaty."