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# SAFETY OF INTERSTATE NATURAL GAS PIPELINES

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## HEARINGS BEFORE THE COMMITTEE ON COMMERCE UNITED STATES SENATE EIGHTY-NINTH CONGRESS

SECOND SESSION

ON

### S. 1553

A BILL TO AMEND THE NATURAL GAS ACT TO AUTHORIZE  
THE FEDERAL POWER COMMISSION TO PRESCRIBE  
SAFETY REQUIREMENTS FOR NATURAL GAS  
COMPANIES

AUGUST 29 AND 31, 1966

WASHINGTON, D.C.

Serial 89-83

Printed for the use of the Committee on Commerce



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# SAFETY OF INTERSTATE NATURAL GAS PIPELINES

MONDAY, AUGUST 29, 1966

U.S. SENATE,  
COMMITTEE ON COMMERCE,  
Washington, D.C.

The committee met at 10 a.m., in room 5110, New Senate Office Building, the Honorable A. S. Mike Monroney presiding.

Senator MONRONEY. The Committee on Commerce will come to order.

This morning's hearing is on S. 1553, a bill to amend the Natural Gas Act to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies. The bill was introduced by request by Senator Magnuson and represents one of the legislative recommendations of the Federal Power Commission.

(The bill follows:)

[S. 1553, 89th Cong., 1st sess.]

A BILL To amend the Natural Gas Act to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That section 7 of the Natural Gas Act, as amended (15 U.S.C. 717f), is amended by adding at the end thereof the following new subsection:

“(i) The Commission is authorized to prescribe such standards, rules, regulations, restrictions, conditions, or orders with respect to the construction, extension, operation, and maintenance of pipeline transportation facilities of natural gas companies as, in its opinion, are necessary for the promotion of safety.”

Senator MONRONEY. These hearings will be held this morning and again on Wednesday morning, August 31. The hearings will then be resumed at a date to be announced.

Legislation of this nature has a long history in the Congress. Then-Congressman John Heselton, introduced one version of this bill, H.R. 88, in the 82d Congress in 1951. In 1954 hearings were held in the House of Representatives on the Heselton bill, which by then was H.R. 134. At that time, the industry was working on a safety code which would not be ready until the end of the year. Mr. Heselton said, “I am not interested in having the bill enacted until that action is completed.” I might add at this point that the industry is now in the process of revising their code.

In September 1963 the Report on the Movement of Dangerous Cargoes, an interagency study coordinated by Under Secretary of Commerce for Transportation, stated:

The Federal Power Commission should be given specific statutory authority and responsibility for the safety regulation of gas pipelines operating in interstate or foreign commerce.

Staff counsel assigned to this hearing: Donald W. Brodie.

On April 19, 1966, the Federal Power Commission made a report to this committee on the "Safety of Interstate Natural Gas Pipelines." This report covers a period of 15½ years and details the 64 deaths, 222 personal injuries, and 2,294 failures during that period.

This report is subject to many interpretations and most of them will be presented at these hearings. One interpretation stresses the fact that 17 persons were killed in an explosion in Louisiana in 1965. Clearly, the lines can be a hazard unless properly constructed according to specifications agreed to in various codes. The other interpretation was suggested by then-Chairman-of-the-Federal-Power-Commission Joseph Swidler, who said:

The self-interest of the pipeline companies, as well as their obligation to the public, has made safety in operation a matter of importance for them. The industry's safety record to date is a good one.

One matter should be stressed, and I wish to quote the FCC's report:

Most gas accidents occur at or near the point of consumption in the homes or business establishments of gas users \* \* \*. In most instances the gas involved in fires and explosions has passed through the customer's meter and is beyond the areas of responsibility of the local gas distribution company. Gas hazards of this nature are entirely matters of concern for State and local units of government and are not the subject of this report.

I hasten to add that these hazards are not the subject of this bill nor of these hearings. We are concerned only with interstate pipelines.

The first witness is Federal Power Commission Chairman, Lee White.

Will you come forward, Chairman White. We are happy to have you appear before us. You may read the entire statement, if you wish, or summarize it, and we will print the whole statement in the record, whichever is your desire.

**STATEMENT OF HON. LEE C. WHITE, CHAIRMAN, FEDERAL POWER COMMISSION, WASHINGTON, D.C.; ACCOMPANIED BY CARL BAGGE, COMMISSIONER, FPC; RICHARD A. SOLOMON, GENERAL COUNSEL, FPC; DAVID J. BARDIN, ASSISTANT GENERAL COUNSEL, FPC; FRANK F. WATTERS, CHIEF, BUREAU OF NATURAL GAS, FPC; AND LOUIS W. MENDONSA, DEPUTY CHIEF, BUREAU OF NATURAL GAS, FEDERAL POWER COMMISSION, WASHINGTON, D.C.**

Mr. WHITE. Because of the somewhat technical character of the statement, Mr. Chairman, we have present from the Commission's staff four people that I would like, if there is no objection, to join us here at the table to respond to any questions that you may have.

Senator MONRONEY. I will be happy to have them join you at the table. Would they come forward, and would you introduce them for the purpose of the record?

Mr. SOLOMON. My name is Richard A. Solomon, General Counsel of the Federal Power Commission.

Mr. BARDIN. I am David J. Bardin, Assistant General Counsel.

Mr. WATTERS. Frank F. Watters, Chief of the Bureau of Natural Gas, Federal Power Commission.

Mr. MENDONSA. Louis W. Mendonsa, Deputy Chief, Bureau of Natural Gas.

Senator MONRONEY. You may proceed, Mr. White.

Mr. WHITE. Thank you. Mr. Chairman, we are pleased to be here today to testify in favor of S. 1553, the natural gas safety bill introduced by Chairman Magnuson at the request of the Federal Power Commission. S. 1553 would assign to the Commission the responsibility for prescribing standards, rules, conditions, and orders necessary for the promotion of safety with respect to the design, construction, operation, and maintenance of pipeline transportation facilities of natural gas companies under our jurisdiction. The existing sanctions of sections 20 and 21 of the Natural Gas Act would apply to the enforcement of these safety requirements.

The Senate Commerce Committee is rendering a valuable public service in studying this important problem area through these hearings and through reports it has secured on this subject. The committee has published the Report on the Safety of Interstate Natural Gas Pipelines<sup>1</sup> which the Commission prepared at Chairman Magnuson's direction.

The report reflects detailed results of our survey of the 63 major interstate natural gas pipeline companies—the most comprehensive survey of natural gas pipeline accidents and failures ever made in this country. This report contains valuable data on the causes of pipeline failures and has formed the basis for a Summary of Safety Practices, prepared by the Independent Natural Gas Association of America (INGAA).

The Federal Power Commission believes that there is a need for legislation authorizing a comprehensive Federal safety code which would set mandatory, minimum safety standards for interstate natural gas pipelines. Our present statute permits us to investigate pipeline accidents, to gather and analyze statistics on the causes of pipeline accidents, and to report our findings to Congress and to the public, but our authority to prevent or lessen the possibility of pipeline failures is limited to imposing safety conditions in certificates of public convenience and necessity issued for new pipeline construction.

Commissioner O'Connor has asked me to state that, although he does not oppose safety legislation per se, he is not convinced that further legislation, going beyond our existing certificate responsibilities, is now justified. Commissioner O'Connor's views are set out in our response of August 25, 1966, to Chairman Magnuson's inquiry of July 1, 1966, regarding the exercise of the Commission's present responsibilities. We request that the response be included in the record.

Senator MONRONEY. The letter of August 25, 1966, will be included in the record at this point.

Mr. WHITE. Commissioner O'Connor has also indicated his willingness to come before this committee at any time or to submit further views in writing to explain any questions that might arise in your

<sup>1</sup> Safety of Interstate Natural Gas Pipelines, a report prepared for the use of the Senate Committee on Commerce, U.S. Senate, at the request of Hon. Warren G. Magnuson, Chairman, by the Federal Power Commission, April 19, 1966. We filed a supplement to the safety report with this committee on May 19, 1966. This supplement reflected additional data on 288 failures from four of the major pipeline companies. The additional data did not affect the conclusions in the report.

mind or the mind of any other member of the committee about his position.

(The letter follows:)

FEDERAL POWER COMMISSION,  
Washington, D.C., August 25, 1966.

Hon. WARREN G. MAGNUSON,  
Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: Thank you for your letter of July 1, 1966, which notes this Commission's recent adoption of a general certificate condition respecting safe operating pressures on natural gas pipelines, and requests our comments on how such requirements will be enforced, on whether the Commission has adequate staff for such enforcement, and on the extent to which the Commission might adopt additional certificate conditions to accomplish more of the goals of S. 1553 (89th Congress). We appreciate the opportunity to discuss these matters.

The general certificate condition is prescribed by our Order No. 324, issued June 30, 1966 (31 F.R. 9347), a copy of which is attached. The rule prescribed by Order No. 342 requires that a specific statement as to maximum safe operating pressure be included as an integral part of all future certificate applications. We believe our staff is adequate to review certificate applications for compliance with this requirement as part of its review of certificate applications for compliance with all of the Commission's rules. The rule also requires adherence to maximum safe pressure in operating the certificated facilities. Apart from a possible spotcheck in the course of staff visits to the pipeline dispatcher's office, we do not now contemplate field inspections or other elaborate enforcement programs. We are not now persuaded that it will be necessary to undertake any substantial new program to police the condition as long as the pipeline companies are clearly informed of the conditions with which they are legally required to comply. We have observed that the companies themselves are quite sensitive to safety considerations.

It should be noted that non-compliance with any condition would be a violation of the law for which there would be several sanctions. Under Section 20(a) the Commission may sue in a district court to enjoin acts which constitute or will constitute violations of the Natural Gas Act. Under Section 21(b) wilful and knowing violations of any certificate condition are subject to a fine of \$500 for each day the violation continues. Lastly, the regulations under the Natural Gas Act provide that certificates are only effective so long as all the certificate conditions are fulfilled (18 CFR 157.20(e)). In practice, the very existence of these sanctions generally results in compliance through self-policing.

The Commission believes that we should fully employ our existing certificate authority to impose safety conditions wherever they are in the public interest. We have imposed such conditions in individual cases and will fully explore every possible avenue for additional regulations in this field. We shall be happy to report to you any new proposals which our studies may develop.

Employment of certificate conditions, however, is no substitute for the more comprehensive approach which S. 1553 would authorize. S. 1553 would allow the Commission to prescribe minimum safety standards for operation and, if need be, replacement of existing pipe in the ground even if there were no new construction for which a certificate need be sought. Pipe already in the ground owned by Class A and B interstate pipeline companies under our jurisdiction exceeds 150,000 miles. Unless the company proposes to loop existing pipelines, in which case it might well be possible to attach some safety conditions applicable to the entire looped facility, the absence of comprehensive legislation along the lines of S. 1553 denies the Commission authority to achieve safety protections for the public. Moreover, while the Commission is entirely confident that the concept of public convenience and necessity codified in the Natural Gas Act is broad enough to authorize certificate conditions such as those respecting safe operating pressures in new construction, questions have been raised as to the Commission's statutory authority to impose such requirements. Enactment of S. 1553 would entirely dispose of any such doubts.

Although Commissioner O'Connor does not oppose safety legislation per se, he does not believe that further legislation is now needed. Rather, he recommends that full use first be made of existing powers to impose safety conditions

in pipeline certificates and that any possible future legislation be based upon experience gained from utilizing these powers. He notes further that the limits of these existing powers are untested despite the Commission's increasing awareness of its responsibilities. Considering the particular bill, S. 1553, Commissioner O'Connor feels it would place the federal government in the improper position of being a safety endorser; would infringe on authority properly within the police powers of the states; and might confer rights of participation in certificate proceedings upon persons, not presently parties, whose participation could hinder the orderly processing of such matters. In considering federal safety legislation, Commissioner O'Connor believes it is significant that the natural gas pipelines have for many years had the lowest casualty record of any branch of the interstate transportation industry.

Sincerely,

LEE C. WHITE,  
*Chairman.*

FEDERAL POWER COMMISSION

(Before Commissioners: LEE C. WHITE, *Chairman*; L. J. O'CONNOR, Jr., CHARLES R. ROSS, DAVID S. BLACK, and CARL E. BAGGE)

Docket No. R-290

OPERATION OF NATURAL GAS PIPELINE FACILITIES AT PRESSURES IN EXCESS OF DESIGN PRESSURES SPECIFIED IN CERTIFICATE APPLICATIONS—GENERAL CONDITIONS APPLICABLE TO CERTIFICATES ISSUED TO PIPELINE COMPANIES

ORDER NO. 324

*Prescribing a General Certificate Condition Respecting Safe Operating Pressures*

(18 CFR 157.14 and 157.20)

(Issued June 30, 1966)

This order amends two sections of the regulations under the Natural Gas Act to inform the Commission of the maximum pressure at which a certificate applicant believes it may operate the proposed facilities safely and without undue risk of failure, and unmistakably to prohibit operation of certificate facilities at pressures exceeding applicant's own maximum, unless a different maximum pressure is prescribed by the Commission in the final certificate order.

The first amendment, to § 157.14 (a) (9) requires that applications for a certificate of public convenience and necessity under section 7 of the Natural Gas Act state in Exhibit G-II the maximum operating pressure of each facility to be certificated by the Commission as determined by the provisions set out in the most recent edition of the American Standard Code for Pressure Piping, Gas Transmission and Distribution Piping Systems, ASA B31.8, or such other standard as the company may propose. A full explanation is required if the company's standard is less stringent than ASA B31.8.

The second amendment, to § 157.20, General Conditions Applicable to Certificates, prohibits operation of the facilities at pressures exceeding the maximum operating pressure as set forth by applicant itself in Exhibit G-II. The Commission, of course, may by special condition prescribe a lower maximum pressure than applicant proposes. The rule also states that it does not authorize operation of facilities in violation of any state regulations which call for a lower maximum pressure.

In response to our Notice of Proposed Rulemaking issued November 2, 1965 (30 F.R. 14110, Nov. 9, 1965), we received comments and suggestions from or on behalf of nineteen natural gas companies and the Independent Natural Gas Association of America.<sup>1a</sup>

<sup>1a</sup> Algonquin Gas Transmission Co., Colorado Interstate Gas Co., Columbia Gas System Service Corp., Consolidated Gas Supply Corp., El Paso Natural Gas Co., Kansas-Nebraska Natural Gas Co., Inc., Lake Shore Pipe Line Co., Lone Star Gas Co., Michigan Gas Storage Co., Natural Gas Pipeline Co. of America, Northern Natural Gas Co., Panhandle Eastern Pipe Line Co., and Trunkline Gas Co., Pacific Gas Transmission Co., Southern Natural Gas Co., Texas Eastern Transmission Corp., Texas Gas Transmission Corp., Transwestern Pipeline Co., United Gas Pipe Line Co., Washington Gas Light Co.

Most of them pointed out that as originally proposed the new condition would restrict a company to operating at the pressure listed in Exhibits G, G-I, and G-II; that such pressure merely indicates the anticipated operating pressure in the particular circumstances illustrated by the exhibit; that in many cases such pressure may be below the maximum safe operating pressure for which the line was designed and tested.

The Commission agrees that our original proposal would be unnecessarily restrictive in some cases if we based it on the operating pressure now included in Exhibits G, G-I and G-II to the certificate application. We therefore require a specific indication from the applicant of the maximum safe operating pressure for the facilities to be certificated. This amendment was suggested in substance by seven of the respondents.<sup>2</sup>

Our regulation will automatically prohibit operation of the certificated facilities at any pressure higher than that proposed by applicant itself, unless our certificate order prescribes a different condition. As a matter of general policy, we announce that any applicant proposing a maximum operating pressure which offers a lesser measure of safety than the relevant standard of the ASA B31.8 would bear a heavy burden to justify issuance of an unconditional certificate of public convenience and necessity. The rule here promulgated does not, however, compel a pipeline company to use the ASA B31.8 code as its standard and the commission would not object to use of more stringent standards by the applicant. In the absence of a federal safety code governing interstate natural gas pipeline companies we have chosen ASA B31.8 as a guide, without preempting the states from adopting more stringent codes.

This is not the first time we have used the ASA B31.8 code as a frame of reference. We have recently issued a rule requiring the annual filing of system flow diagrams by the larger natural gas pipeline companies. These diagrams must show the maximum operating pressure allowable under the Code for (1) the discharge side of compressor stations and (2) other critical points on the company's system (18 CFR 260.8). The system flow diagrams are submitted for systems already in operation to show their peak day and average day capability. The data which we are requiring in this order will be supplied with applications to the Commission for new facilities and will set pressure limits for those facilities for the company's subsequent operations.

*The Commission finds—*

(1) The amendments herein adopted are necessary and appropriate for the purposes of the administration of the Natural Gas Act.

(2) In view of the reasons given above for the use of Exhibit G-II, it is unnecessary to comply with the notice provision of the Administrative Procedure Act with respect to the amendment to § 157.14(a) (9) here adopted.

*The Commission*, acting pursuant to the authority granted by the Natural Gas Act, as amended, particularly sections 7, 16, and 20 thereof (52 Stat. 825, 830, 832, 56 Stat. 84, 15 U.S.C. 717f, 717o, 717s),

*Orders—*

(A) Part 157 of Chapter I of Title 18 of the Code of Federal Regulations is amended as follows:

(1) Section 157.14(a) (9) is amended by adding a new subdivision (vi) as follows:

“§ 157.14 Exhibits.

“(a) *To be attached \* \* \**

\* \* \* \* \*

“(9) *Exhibit G-II—Flow diagram data.*

\* \* \* \* \*

“(vi) The maximum allowable operating pressure of each proposed facility for which a certificate is requested, as permitted under the latest edition of the American Standard Code for Pressure Piping, Gas Transmission and Distribution Systems, ASA B31.8, or as otherwise proposed by the applicant. If a standard other than that of the ASA B31.8 code is used, explain the nature of such standard; whether it is more stringent than ASA B31.8, and, if not, the

<sup>2</sup> Algonquin, Colorado Interstate, Consolidated, El Paso, Kansas-Nebraska, United Gas Pipeline, and Washington Gas Light.

justification for its use; and designate by an appropriate symbol or legend. As a matter of general policy, the Commission will not normally grant a certificate authorizing operation of facilities at any pressure higher than the maximum permitted by ASA B31.8 and the burden will be on the applicant to justify any such deviation."

(2) Section 157.20 is amended by adding a new paragraph to read as follows:

"§ 157.20 General conditions \* \* \*.

\* \* \* \* \*  
 "(g) In the interest of safety and reliability of service, facilities authorized by the certificate shall not be operated at pressures exceeding the maximum operating pressure set forth in Exhibit G-II to the application as it may be amended prior to issuance of the certificate. In the event the applicant thereafter wishes to change such maximum operating pressure it shall file an appropriate petition for amendment of the certificate. Such petition shall include the reasons for the proposed change. Nothing contained herein authorizes a natural gas company to operate any facility at a pressure above the maximum prescribed by state law, if such law requires a lower pressure than authorized hereby."

(Secs. 7, 16, 20, 52 Stat. 825, 830, 832; 56 Stat. 84; 15 U.S.C. 717f, 717o, 717s.)

(B) The amendments ordered herein shall be effective as to all applications filed on or after August 1, 1966.

(C) The Secretary shall cause prompt publication of this order to be made in the Federal Register.

By the Commission:

JOSEPH H. GUTRIDE,  
*Secretary.*

[SEAL]

Mr. WHITE. High-pressure interstate pipelines form the backbone of the natural gas industry, the Nation's sixth largest industry in terms of investment. These pipelines provide the indispensable link between the gas producing regions of our country and its major consumption centers, often hundreds of miles away. The number of miles of interstate gas transmission pipelines has approximately tripled since the end of World War II. There are now over 150,000 miles of high pressure natural gas transmission pipelines in the United States operated by companies under the jurisdiction of the FPC and an additional 50,000 miles of nonjurisdictional transmission pipelines. Total gas-carrying capacity has increased even more through the use of larger diameter pipe and higher operating pressures.

The jurisdictional, interstate pipeline companies are subject to the provisions of the Natural Gas Act of 1938, as amended, including certificate regulation of new construction under section 7 of the act, rate regulation of wholesale rates under sections 4 and 5, and accounting regulation of the corporate books under sections 8 and 9.

HAZARDS ASSOCIATED WITH NATURAL GAS PIPELINES

Natural gas is transported through large diameter pipelines up to 42 inches in diameter, at high pressures, up to 1,300 pounds per square inch (which is about 90 times atmospheric pressure). Because of these high pressures, any failure of a pipe may cause large amounts of gas to be released to the atmosphere in a relatively short period of time. Any gas which escapes from the pipe and mixes with air may ignite and explode. The extent of the area affected will be controlled by the size of rupture, the size of the line, the pressure, the amount of time it takes to shut down the line and the amount of gas left in the

valved-off section. When gas burns, it reaches temperatures up to 2,500° Fahrenheit. The mixture of gas and air is so flammable that the actual cause of ignition can be the smallest spark or flame. Usually the precise cause is unknown. For example, it is suspected, but not established, that a pilot light in an appliance in a nearby house ignited the natural gas explosion at Natchitoches, La., which killed 17 people in March 1965.

In the 15½-year period from 1950 to the middle of 1965, companies under FPC jurisdiction reported 1,268 major operational pipeline failures or accidents.<sup>2a</sup>

The companies also reported 143 failures in compressor and metering facilities and 1,171 failures in testing of pipelines. These failures caused 64 fatalities and 225 injuries, the majority of which were serious. Three-quarters of the fatalities and a majority of the injuries occurred from the fire or explosion caused by the gas and air mixture igniting.

Senator MONRONEY. How many of these fatalities were caused by any single explosion?

Mr. WHITE. The largest number of fatalities created by any single instance was 17 killed in an explosion in Louisiana in March 1965.

Senator MONRONEY. Were there any other explosions or accidents that caused multiple deaths?

Mr. WHITE. Yes, sir. There were.

Senator MONRONEY. Do you have a table showing all of these that you can put in the record?

Mr. WHITE. Yes, sir. It is incorporated into the report, Safety of Interstate Natural Gas Pipelines, which the committee issued on April 19, 1966.

Senator MONRONEY. Proceed.

Mr. WHITE. I think your suggestion that it be incorporated at this point in the transcript of this hearing would be quite helpful.

(The material follows:)

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<sup>2a</sup> The definition of "major failure" as used in the safety survey was "an unanticipated release of pressure resulting in impairment of the affected facilities' ability to render normal service or personal injury or substantial damage to property." Such major failures were to be reported even though the affected facilities were bypassed so that no customer's service was interrupted or curtailed.

Multiple casualties: Deaths or injuries occurring from pipeline failures reported in the Federal Power Commission safety survey<sup>1</sup>

Date	State	Casualties			Facility that failed	Cause of failure and circumstances
		Total	Dead	Injured		
Aug. 20, 1950	Nebraska	3	2	3	Unreported	Unknown—fire and explosion.
Nov. 20, 1950	Virginia	5	3	2	30-inch pipe	Gouge in pipe—failure during testing.
Dec. 4, 1950	Mississippi	8	5	3	26-inch pipe	Inadequate support and defective weld—fire.
Feb. 9, 1951	Pennsylvania	6	2	4	16-inch pipe	Circumferential crack in wrinkle bend—fire and explosion.
July 17, 1951	Mississippi	2	2	0	24-inch valve	Operator error; compressor valve opened under unsafe condition.
Feb. 15, 1952	Louisiana	8	8	0	Butterfly valve	Leak in packing gland—fire.
Feb. 20, 1953	Texas	3	3	0	Compressor	Overstress or defective casting.
Apr. 17, 1953	do	3	3	0	16-inch pipe	Coupling failure.
Jan. 27, 1954	West Virginia	5	2	3	do	Wrinkle bend—explosion.
May 15, 1954	Texas	7	1	6	do	Fatigue and internal corrosion—fire.
June 23, 1954	do	3	3	0	20-inch pipe	Defective longitudinal weld—fire.
Mar. 9, 1955	Indiana	5	5	0	22-inch pipe	Defective fitting and welding—fire.
Dec. 22, 1955	Louisiana	12	1	11	16-inch valve	Employee error or malfunctioning of controls during repair.
Nov. 12, 1956	Oklahoma	2	1	1	20-inch pipe	Field weld and coupling—failure during testing.
Nov. 25, 1956	Colorado	8	1	7	do	Coupling failure.
Jan. 16, 1957	Kansas	19	4	15	1-inch bolts holding valve cap	Fatigue or impact—fire.
Feb. 17, 1958	Idaho	3	2	1	Meter	Manufacturing defect.
July 17, 1958	Louisiana	4	4	0	8-inch pipe	Road grader—fire.
Sept. 16, 1958	North Carolina	2	2	0	1/2-inch pipe nipple	Truck hit meter station.
Dec. 21, 1958	Alabama	9	9	0	Reducer	Explosive mixture created during tie-in—explosion.
Dec. 24, 1958	New Mexico	3	3	0	24-inch pipe	Internal corrosion—fire.
Jan. 14, 1959	Kentucky	2	2	0	Tube in gas heater	Improper design of heater controls.
Mar. 12, 1959	Wyoming	2	2	0	None	Gas accumulated in meter station—fire.
Sept. 25, 1959	Pennsylvania	2	2	0	Bonnet of 6-inch tap	Pressure applied to valve when lubricated.
Dec. 13, 1960	Texas	4	1	3	16-inch pipe	Soil corrosion—explosion
Feb. 11, 1960	Iowa	3	3	0	None	Valve opened by mistake—fire and explosion.
July 15, 1960	Texas	2	2	0	12-inch pipe	Road grader—fire
Sept. 7, 1960	Iowa	2	1	1	26-inch pipe	Bulldozer
Oct. 6, 1960	Florida	9	9	0	8-inch pipe	Backhoe—fire.
Jan. 4, 1961	Kansas	7	1	6	3-inch flexible fuel hose (temporary connection for testing)	Exterior force damaged hose—fire.
June 1, 1961	New Mexico	3	3	0	16-inch pipe	Defective longitudinal weld—fire.
June 18, 1961	Mississippi	11	11	0	36-inch pipe	Mill produced hard spot.

See footnote at end of table.

Multiple casualties: Deaths or injuries occurring from pipeline failures reported in the Federal Power Commission safety survey<sup>1</sup>—Con.

Date	State	Casualties			Facility that failed	Cause of failure and circumstances
		Total	Dead	Injured		
Sept. 10, 1961	Kentucky	20	---	20	30-inch pipe	Aerobic corrosion—fire.
Apr. 22, 1962	Kansas	2	---	2	Head gasket on compressor cylinder	Gasket not designed correctly—fire.
Mar. 12, 1963	Oklahoma	18	1	17	Compressor	Suction valve accidentally opened during testing—fire and explosion.
May 16, 1963	Louisiana	6	3	3	12-inch pipe	Trenching plow—fire.
Oct. 4, 1963	Kansas	2	2	---	24-inch pipe	Unknown—pipe blew out of coupling being sleeved.
Mar. 16, 1964	Kentucky	2	1	1	---	Secondary stress and/or stress corrosion—fire.
May 13, 1964	Kansas	3	1	2	Meter	Improper manipulation of valves—fire.
Aug. 31, 1964	---do---	6	2	4	None	Escaping gas ignited—fire.
Mar. 4, 1965	Louisiana	20	17	3	24-inch pipe	Stress corrosion under disbonded coating—explosion and fire.
Oct. 19, 1964	Nebraska	2	1	1	Valve covers	Improper assembly—fire.
June 28, 1965	Delaware	3	---	3	Compressor Meters	Workman shut off relief valve.

<sup>1</sup> This table does not include a maintenance operation accident which occurred on Jan. 10, 1966, after the survey period, and resulted in 7 deaths.

## SUMMARY TABLE OF CASUALTIES

*Casualties, by type of failure, by years, 1950-65*

Year	Casualties from line failure during operation				Casualties from operating failures of other facilities				Casualties during line test				Total casualties			
	Employee		Nonemployee		Employee		Nonemployee		Employee		Nonemployee		Employee		Nonemployee	
	Death	Injury	Death	Injury	Death	Injury	Death	Injury	Death	Injury	Death	Injury	Death	Injury	Death	Injury
1950	4	2		2		3							4	7		2
1951		2		6		2				2			1	4		6
1952			2	2		9								9		2
1953				3		3								3		3
1954	3	7		2									3	7		2
1955	5	2	1			13							5	15		1
1956	2	8								1			3	9		4
1957				3		4						1	3	4		4
1958	1	7	1	2		10	2						3	17	3	2
1959				2		2							2	4		1
1960				15		3								3		15
1961				34		7							1	7		34
1962				2		1								2		2
1963	2	2	3	3		18							4	20		3
1964	2	8	1	3		2				1			4	11		4
1965		1	17	3						3				1		6
Total	19	39	27	81		15	93	2	4	1	3		35	135	29	87

Senator MONRONEY. You may proceed.

Mr. WHITE. The accidental explosion of natural gas has the potential of causing many deaths. The greatest number of deaths caused by failure of an interstate transmission pipeline is 17. The worst natural gas explosion disaster in this Nation's history resulted from a leak in an intrastate distribution line (not a transmission line) and claimed 294 lives in New London, Tex., on March 18, 1937. The worst disaster since enactment of the Natural Gas Act occurred in Cleveland, Ohio, on October 29, 1944, when a liquid natural gas storage tank failed and the escaping gas ignited, killing 134 people.

Most high pressure interstate transmission lines are not located in highly populated areas and consequently failures on these lines have not taken as large a toll as those in distribution lines in populated areas. Thus, less than 5 percent of failures on transmission lines caused death or injury. Of the failures reported in our safety survey which occurred in compressor stations, metering stations, and similar facilities, however, where there is a greater likelihood that people will be present, almost one-fourth of the failures caused either death or injury.

As the built-up areas of our cities and towns expand, the problem of population density near interstate transmission pipelines increases, since much of this pipe was laid years ago to specifications designed for unpopulated areas. For example, one company in its 1964 annual report to the Commission reported 2 pipeline ruptures. The first one occurred in April 1964 on a 30-inch line in Tennessee. Seventy-eight million cubic feet of gas escaped and ignited. The resulting fire destroyed 15 acres of timberland in an unpopulated area. No lives were lost. Eleven months later, however, another rupture on a smaller sized pipe released one-fifth as much gas and burned a smaller area. But the smaller failure occurred at Natchitoches, La.; 17 people happened to be in the houses in the immediate area. All were killed. The temperature reached 2,500° F. and the explosion destroyed five houses. The heat melted cars and even rocks. When the pipe was laid, the area involved had been classified by the company as a "class 1" location, defined to include "wastelands, deserts, rugged mountains, grazing and farmland" with a relatively low density of houses intended for human occupancy within a quarter of a mile on either side of the pipeline route. Under the design guidelines employed by the industry (the ASA Code, which I shall later describe), class 1 locations call for the lowest safety margin for operating pressure. By the time of the accident a number of houses had been built near the pipeline. However, the line was operating at the maximum pressure allowed for class 1 design classifications.

Another example of the size and intensity of the potential hazard of an explosion after a line failure involved a 30-inch-diameter line in New Mexico which ruptured on March 28 of this year. One-quarter of a mile of pipeline split open, but in an unpopulated area and, consequently, no one was killed or injured. The explosion was so large, however, that it heavily damaged railroad tracks, putting the main line of the Santa Fe Railroad out of service, and did serious damage to electric transmission lines. Both the electric lines and the railroad tracks were about 140 feet from the point of the failure.

Just as population density has a bearing on the potential dangers associated with pipeline accidents so does the diameter of the pipe

which fails. The Commission's safety survey revealed a casualty rate of 6.2 per 1,000 miles of pipe for pipe of 30 inches or more in diameter but less than 1 where the pipe was 20 inches in diameter or less. The casualty rate which increases with the pipe diameter suggests that if failures occur on large-diameter, high-pressure pipe, any damage from blast and fire is much more serious. Since the pipeline industry is installing an increasing amount of large-diameter pipe it is obvious that there must be an increasing awareness of safety considerations.

My purpose here today is not to criticize the industry for its past safety record for, by and large, the record is good. Obviously, there are no companies that are casual or disinterested about safety in the handling of a product which inherently presents safety problems and where the potential for death and destruction is so great. But the public's interest is so great in this field of safety in terms of the risk to human life that no company or the industry collectively should alone bear the burden of establishing the standards that should apply to designing, constructing, maintaining and operating interstate pipelines. Is it in the public interest to place a company in the position of having to choose between the extra cost in time and money necessary to meet a potential safety problem, on the one hand, and the inherent risks of not meeting minimum safety standards on the other? One of the basic elements of any assumption of safety responsibilities by government is that it is unfair to expect a private company, which after all is in business to render a service and make a profit, to serve as the sole or final judge of what safety precautions and measures it will adopt.

Although there were but 64 deaths in the entire 15½-year period of our survey of jurisdictional interstate pipelines, I do not believe the need for mandatory and more stringent safety standards can be measured by the number of persons killed or maimed alone. The natural gas transmission industry is interstate by its very nature and every State in the Union except Alaska and Hawaii receive gas transported in interstate commerce. In many places, and increasingly so, pipelines traverse lands subject to multiple uses, occupy common rights-of-way with other utilities and come near to areas of expanding population density. Larger and higher pressure pipe is being used. The natural gas transmission industry is a public service industry closely associated with the health, safety, and comfort of our people. However, in many places pipeline design, construction, operation, and maintenance is subject to no public scrutiny. Many States have no safety regulation and others have only inadequate or outmoded provisions. Although the industry itself generally follows a safety code, it is not mandatory and there are no sanctions should a company exercise its option not to follow it.

In short, the public does not have an adequate voice in the establishment of minimum safety criteria. The FPC supports this legislation not because we believe the establishment of Federal minimum safety standards will somehow miraculously remove the potential danger of pipeline mishaps, but rather, because we believe the best talent of the industry, the State commissions and the Federal Government should be brought together under Government aegis to reduce to the barest minimum public safety hazards. The public ought not to have to wait for an accident of disastrous proportions before minimum safety legislation is enacted.

## HOW THESE HAZARDS ARE OVERCOME: STUDY OF THE CAUSES OF FAILURES

Pipeline companies recognize the great dangers inherent in the handling of natural gas and take many steps to minimize these hazards. The costs of these measures are allowed by the FPC in the cost of service and passed on to the pipeline company's customers. The technology of the pipeline industry is constantly developing better pipe and devising more efficient ways to protect it from failure. Interstate pipeline companies are taking advantage of this improved technology and we expect that they will continue to improve their facilities. Their starting point, and that of any regulatory safety efforts, must be a grasp of the kinds of events which cause pipeline failures.

The causes of pipeline failures can broadly be classified in three groups: (1) Those caused by weaknesses or processes in the pipe itself, accounting for about 53 percent of the known causes of the total operational pipeline failures reported in our safety survey—

Senator MONRONEY. You go back and forth between failures and what might be included as disasters or accidents. What is the difference in terminology?

Mr. WHITE. A failure, Senator, is when there has actually been some incident that the companies have reported in which the pipe has either exploded or burst and gas has escaped as distinguished from accidents which resulted in some harm or injury.

Senator MONRONEY. In other words, when you use "failures" it does not necessarily mean there were injuries; is that correct?

Mr. WHITE. Yes, sir; that is correct, not necessarily an accident in the sense that there was either injury or—

Senator MONRONEY. Loss of gas or loss of service.

Mr. WHITE. Loss of gas; that is correct.

Senator MONRONEY. In your statement, do all of the references to failures mean nonserious interruptions of service, noninjurious to personnel.

Mr. WHITE. They include both those that resulted in injury and death and those that did not.

The second basic cause of pipeline failures are those caused by external impacts arising from human error or carelessness, the most common being bulldozers that plow into pipe which is buried. These account for about 35 percent of the known causes of the total failures; and (3) those caused by external damage from the effects of the elements or vandalism, which accounted for 7 percent.<sup>3</sup> Failures can be and sometimes are caused by combinations of causes.

Senator MONRONEY. Would you tell us about the failures arising from the weakness of the pipe itself?

Mr. WHITE. Yes, sir. I can do that very easily.

Senator MONRONEY. I think it is important to know what we are going to regulate and what the failures are.

Mr. WHITE. Yes, sir. Let me, if I may, continue talking about the failures arising from weakness in the pipe itself.

## FAILURES ARISING FROM WEAKNESSES IN THE PIPE ITSELF

The most common causes of major failures caused by weaknesses in the pipe itself are—

<sup>3</sup> In 5 percent of the failures reported the cause was unknown.

- (a) weakening and then failure due to corrosion,
- (b) stresses in the pipe,
- (c) defects in the metal of the pipe,
- (d) improper welding,
- (e) improper handling, and
- (f) a combination of some of the above factors.

Defects in the pipe and the welds can frequently be detected by pressure testing or radiographic inspection before the pipe is put into operation, and it is noteworthy that our safety survey revealed almost as many failures detected by precautionary testing (1,171) as occurred in operation of the pipelines (1,268).

Apart from testing, unsafe pipe may sometimes be indicated by evidence such as loss of gas or less efficient performance. These conditions often signal the presence of widespread corrosion which is a source of weakness in the pipe. For example, in a case before the Commission a few years ago a pipeline company official explained the need to replace one of its lines as follows:

There is no way which we can predict (where) will be the place that this line is going to blow up \* \* \* not when it is going to blow up; but we can predict what \* \* \* is going to happen when it blows up.

He testified that the line was inspected and that the company recorded 242 leaks, repairing only 15 of the worst leaks.<sup>4</sup> Such widespread leaking of the pipeline itself may indicate corrosion has eaten away the walls of the pipe to the point that they are dangerously thin. I might add that the company in question is now completing an entire replacement of this particular pipe which is on its main line.

Failures of the pipe itself arise from a weakening over a period of time. While steel does not change its chemical composition with age alone, it corrodes easily and most soil provides a corrosive environment for steel. One company reported that a pipe which ruptured in Kentucky last year had corroded to the extent where the pipe wall in the vicinity of the failure was reduced to 25 to 40 percent of its original thickness, this thinning resulting from the corrosive effect.

Whenever steel pipe is exposed to damp soil, the electrostatic differential between the steel and soil causes flow of ionized metal to the soil. The destructiveness of the corrosive action of a soil environment on steel pipe is illustrated by the fact that a current flowing between the steel pipe and the soil would remove as ions 20 pounds of metal from the pipeline per ampere year. Cathodic protection can effectively prevent such corrosion at unprotected areas or defects in the coating by impressing an offsetting electric charge through the soil from an outside source to prevent corrosive ion flows off the pipeline. However, cathodic protection is economically feasible only for pipeline which is well coated.

That is, simply by virtue of the electrical differential between the pipe and the soil, there is a flow of electricity and with it the movement of ions which bring with them some of the actual metal that is part of the pipe. This can be offset by both putting on a counter electrical charge to shrink the potential difference and by a coating to the pipe from the soil so that there will be no place for the soil to come in contact with the pipe.

<sup>4</sup> 30 FPC 77 at 121. Such leaks are far more common than the major failures reported resulting in an unanticipated release of pressure.

Senator MONRONEY. Wrapping the pipe with a sort of a tar paper of some kind?

Mr. WHITE. That is one of the devices that is used; yes, sir.

Senator MONRONEY. And the use of the cathodic protection from outside to arrest this, is that rather common or rather infrequent practice?

Mr. MENDONSA. That is quite common.

Senator MONRONEY. They are doing it now for protection of their investment in the lines, I presume?

Mr. MENDONSA. Yes, sir. There are different techniques used by different companies. Some wait until they have evidence that the line is failing and then put cathodic protection on.

Senator MONRONEY. If they do it when the line is new and in good condition it will remain that way, will it not?

Mr. WHITE. The probability is that it will, yes.

I think you put the finger on one of the principal underlying elements. Safety is not only altruistic in the sense that it prevents the loss of life and destruction but it is also pretty good business. Frankly, this has been one of the stronger factors, we believe, in the excellent safety record which many of the companies subject to our jurisdiction have achieved over the years.

#### INCREASING AGE OF PIPE POSES PROBLEMS

The increasing age of much of the Nation's pipe raises serious safety questions. Not that age in itself causes deterioration of the pipe, but because older pipe was not protected as well as newer pipe from the effects of corrosion and other slowly developing causes of failures. The passage of time has taken its toll on the reliability of this pipe and the frequency rate per mile of failures on older pipe is much higher than that on newer pipe. There were more failures per mile that occurred during the survey period, 1950 to 1965, on pipe laid before 1932 than on pipe laid thereafter, although the actual mileage of pipe in the ground before 1932 was far less than the average mileage of pipe in the ground from 1932 to 1965.<sup>5</sup> Significantly, a major portion of the 1,171 testing failures reported to the Commission occurred not during testing new pipe but in retesting older pipe which had been in the ground for some years.

Senator MONRONEY. These testing failures, I am trying to get a measure of what they are. This is the overall breakdown of the line, is that correct?

Mr. WHITE. Yes, that is correct, Senator.

Senator MONRONEY. These were being tested by the company owners themselves?

Mr. WHITE. Yes, sir.

Senator MONRONEY. For their own self-regulation?

Mr. WHITE. Yes, sir. And in this process, they have reported to the Commission the failures that came about.

Senator MONRONEY. You may proceed, Mr. White.

Mr. WHITE. Coating put on a pipe to insulate it and make cathodic protection feasible can deteriorate and disintegrate years ahead of the

<sup>5</sup> Although exact records are not available for transmission pipeline mileage for 1931, we estimate the number of miles of transmission pipe in the ground by the end of 1931 at approximately 54,000. In 1950 the transmission pipeline mileage had doubled to 109,000. By the end of 1964 it has almost doubled again to 204,730. American Gas Association Historical Statistics of the Gas Industry, tables 47, 48, 49.

normal useful life expectancy of the steel pipe itself. When this happens, areas on the pipe become exposed to the corrosive action of the soil. Much of the older pipe in the ground today is not cathodically protected and consequently is highly susceptible to corrosion.

#### TECHNOLOGICAL IMPROVEMENTS

The development and refinement of good coating and cathodic protection for new pipe has been a great technological advance in the protection against corrosion. Technological improvements for new pipe do not, however, necessarily make the pipe already in the ground better. Quite often the benefits of such improvements can be realized only by removing the old pipe and replacing it with a better pipe, and, in fact, the industry does replace a certain amount of pipe each year. Even though the remaining mileage of old pipe decreases each year, however, the number of failures occurring per year on the older pipe does not decrease proportionately.

A development coming under closer study is the potential corrosive effect on gas pipelines of high-voltage direct-current electric transmission lines which use the ground for a return. Considering the plans for greater use of high-voltage direct-current transmission lines in this country, this matter assumes increasing importance.

Senator MONRONEY. Would you develop that? It is not quite clear.

Mr. WHITE. For example, there is a d.c. extra high voltage transmission line on the west coast now under construction—to the extent that such extra high voltage direct current lines use the ground as a return, it increases the electrical potential difference between the ground and the pipe near it.

This would speed up the corrosive effect we discussed, before; the ions and actual pieces of steel are taken away from the pipe, thereby leaving it thinner, and, of course, more subject to explosion.

Senator MONRONEY. The very existence of these high tension lines charge the soil, which withdraws certain elements from the pipe?

Mr. WHITE. That is right. There are still available these safety devices of the cathodic countercharge, so to speak, plus the coating.

The point we make here in the statement is that this increasingly high voltage presents a problem that we believe requires very serious attention.

The d.c. line on the west coast, if I recall correctly, is not a ground return, but there may be others that will use this technique, and, of course, the ground return is a more economical method of transmitting power along long distances.

But with these other technological benefits comes problems that we believe ought to be faced right now and action taken to minimize their harmful effects.

Senator MONRONEY. Thank you very much.

Mr. WHITE. Other improvements in pipeline technology include the development of better field welding techniques to reduce the defect in the girth weld which connects two sections of pipe together, and the development of radiographic inspection of these welds. Radiographic inspection by a trained operator can spot defects in the weld invisible to the naked eye and to other methods of testing. These defects can then be corrected before the pipe is placed in service. The use of welding instead of coupling as the method of joining pipe is also reducing the rate of failures in these connections.

Our safety survey also showed a number of failures at wrinkle bends. These are wrinkles in the steel pipe which result from one of the methods of bending line pipe in the field. Although this practice is no longer in use there is still pipe in the ground subject to this type of stress.

#### INFORMATION GAPS

There are still serious gaps in the available information as to corrosion and other causes of pipeline failures. The companies reporting 1,268 pipeline operational failures in our safety survey could not ascertain the cause of failure in 5 percent of the cases and in many more cases the companies used their best judgment but still were unable to define the cause positively and precisely. In many cases, where the failure was believed to involve a combination of factors the relative role of each remains uncertain. Continuing industry research seeks a better understanding of factors which may contribute to progressive weakening of pipe. The Natchitoches explosion, for example, has stimulated intensified research on the phenomenon of stress corrosion.

As a result of that incident the research committee of the American Gas Association authorized a research project to study this effect.

#### FAILURES CAUSED BY MECHANICAL IMPACTS AND THE ELEMENTS

The Commission's safety survey indicated that approximately 33 percent of all operational line failures were caused by rupture of the pipeline by bulldozers, tractors, road graders, plows, and other earth-moving equipment. An additional 8 percent were caused by forces of nature such as a flood, hurricane, landslide, lightning, washout, vandalism, and external explosions. Ruptures caused by external impacts can and should be materially reduced. Deeper buried pipe, more accurate maps, closer pipeline inspection, and better surface markers indicating the underground location of the pipe may be a partial answer.

We don't delude ourselves. This is a tough job and people who are in the construction business frequently are unable to get the word through to the man who is sitting on the bulldozer. This is a principal cause for the failures. We certainly believe, however, that a considerable improvement in that particular field can be accomplished.

Perhaps pipeline companies should be required to go further to publicize the location of their lines to contractors and others who dig on their rights-of-way. Some companies now make detailed maps available in public places, although the practice is not universally followed. Pipeline companies, in general, have programs directed toward preventing such failures, but rupture by earthmoving equipment remains a large cause of pipeline failure.

The companies themselves are primarily responsible for reducing the hazards associated with the transmission of natural gas. Although most pipeline companies report research programs of their own, we do not know their exact extent. Starting next year, however, more complete information on such research expenditures will be included in the annual reports of the pipeline companies. All companies have safety programs, including patrolling of the pipeline and other inspection procedures. However, our safety survey showed there are considerable variances between the safety programs of different companies.

Because the resources of individual companies are limited the natural gas pipeline industry has acted collectively in the field of pipeline safety. Trade associations of the industry sponsor research projects that individual companies could not otherwise afford. One major contribution of the industry has been the development of a code for use by the pipeline companies. This is the American Standard Code for Pressure Piping, Gas Transmission and Distribution Systems, and known as ASA B31.8 or the ASA Code.

The ASA code was designed as a guide to the pipeline industry and is widely used as such. It was not intended as a legislative prescription of mandatory, minimum safety standards. However, a number of State agencies have made it the basis for official safety requirements.

The ASA code is the product of an informed and knowledgeable group of some 70 experts drawn largely from the industry. However, the Deputy Chief of the FPC's Bureau of Natural Gas, Mr. Mendonsa, who is at the table, is one of the five members of this committee representing governmental agencies. The other four are drawn from the Michigan Public Service Commission, the National Energy Board of Canada, the National Association of Railroad and Utilities Commissioners, and the U.S. Bureau of Mines. The standards established in the code are valuable guides, and the FPC uses the code in its review of pipeline construction certificate applications. We would expect that the code would be useful as a starting point for the safety regulations the Commission would prescribe if we were given the authority proposed in S. 1553. Quite obviously the Commission would, if given responsibility for interstate pipeline safety, look to the technical experts who have spent their careers in this area for advice and guidance.

The ASA code was developed and is revised from time to time under the principle of consensus among the members of the code committee.<sup>6</sup>

Each revision of the ASA code has set progressively higher and more stringent safety goals. In such an evolutionary situation, however, where technology and safety consciousness press for constant improvement, the ASA method of adopting safety standards only by near unanimity of those with substantial interests at stake may result in adoption of a lower, rather than a higher common denominator of safety or may delay needed changes. For example, when the ASA B31.8 code was undergoing a major revision in 1954, the chairman of the code committee stated that adoption of the code was delayed because it had to be revised three times to accommodate the pipe manufacturers even though a majority of the code committee had agreed on the standards.<sup>7</sup>

Senator LAUSCHE. Under what authority was the ASA code group created?

Mr. WHITE. It is a completely private organization, Senator. It has no legislative charter or mandate, that I am aware of. It is made up of technical experts, people who are the best that this country has

<sup>6</sup> "An American standard can be initiated and approved only if a consensus exists of all groups who are substantially concerned with the scope and provisions of the standard. \* \* \*

A consensus does not necessarily mean unanimous acceptance. Votes are weighed rather than counted. A weighty objection of one important organization may outweigh all other affirmative votes." American Standards Association, *How American Standards Are Made*, p. 7.

<sup>7</sup> Hearings on H.R. 134, 83d Cong., before the House Interstate and Foreign Commerce Committee, June 10, 1954, testimony of Mr. Frederick A. Hough, transcript, p. 28.

produced. But it has no Government foundation nor does it operate under any Government aegis.

Senator LAUSCHE. The Deputy Chief of the Federal Power Commission's Bureau of Natural Gas is one of the members; is that correct?

Mr. WHITE. He is one of five governmental members. There are approximately 70 members in the total. So he is one of the 70 to 75.

I am holding in my hand a copy of the code that is issued by this group.

Senator LAUSCHE. The five which you identified in your paper are representatives of Government?

Mr. WHITE. Well, in a sense, Senator, some of the members of the code committee are governmental employees, but not all. The reason for singling these five out of the total of 70 was to indicate that there is some governmental participation in the work of this voluntary group.

Senator LAUSCHE. What was the catalytic agent of this group? Who originated the thought? Where was its source?

Mr. WHITE. There is an interesting story on that. If I might, I would like to ask Mr. Mendonsa, who is the FPC representative with that code group, to give you a little historical background.

Senator LAUSCHE. If you would.

Mr. MENDONSA. You are asking about section 8? This specific code committee, rather than the ASA itself?

The catalyst, I believe, was the fact that Representative Heselton introduced a bill in Congress proposing that the Federal Power Commission be granted safety authority over interstate pipes. The industry felt that they were competent to do an effective job, so they got together through their trade associations, the American Gas Association and others, and set up a committee, contacted the American Standards Association and the American Society of Mechanical Engineers to serve as sponsors for the effort, and then proceeded to hammer out a very effective code in the context they were seeking.

It was their hope that, in coming out with a code, it would make it evident that it was unnecessary to pass legislation.

Senator LAUSCHE. ASA is made up of how many members?

Mr. WHITE. This particular code committee, Senator—as Mr. Mendonsa suggests has approximately 70 members. Point 8 in its designation indicates that it is the eighth section. There are seven other sections that devote themselves to other mechanical engineering problems. Of the 70, 5 are either governmental or representative of governmental activities of one character or another.

Senator LAUSCHE. Thank you.

Senator MONRONEY. You may proceed.

Mr. WHITE. The difficulty of amending the ASA Code promptly to incorporate the most current accepted technological practices is illustrated by attempts to require inspection of welds done in the field which join sections of pipe. While the code recommends weld inspections, it does not specify that any certain sample be used, nor does it even require radiographic inspection, which is commonly accepted as the best and surest method. In fact, several States and a "model" code being developed by a subgroup of the Committee on Gas of the National Association of Railroad and Utilities Commissioners already call for inspection of all welds in certain higher risk areas. Also,

many companies report that they radiographically inspect all welds in certain population areas and a smaller percent in less populated areas.

What this really demonstrates, Senator, is our feeling that there is a known testing device. Many companies use it. Some States require it, but it is not required as a minimum by all companies under the existing situation.

A particularly significant limitation on the ASA Code is that even though its requirements are upgraded from time to time the revised requirements do not apply to pipe already in the ground. That is, the code has no retroactive applicability.<sup>8</sup>

Thus, even though the ASA Code prohibited wrinkle bends in high pressure pipelines constructed since 1955, it does not call for any program to remove or replace bends in older pipelines.

Senator MONRONEY. Would you, for the record, tell us what the "wrinkle bends" are?

Mr. WHITE. As mentioned earlier, the practice had been to bend pipe as they were installed in the ground, to make corners or turns so that wrinkles developed on the inside radius and the pipe was stretched out of round. This introduced stress at the particular points where there are such bends, and there is more likelihood to have a weakness and failure where such stresses operate.

Senator MONRONEY. Thank you.

Mr. WHITE. That practice is no longer followed by the industry. But the point here is that, even though it was no longer followed by the industry, the pipe that was laid under that practice is not required to be tested especially or to be replaced either by the ASA Code, or by State laws, except in perhaps one or two States which made some requirements retroactively.

Similarly, the code doesn't require a change in operating pressures as expanding population might call into play the greater safety factors of the ASA standards for new construction. The reason the code is not retroactive would appear to be simply economic, since if a more stringent standard of safety is required for a new pipe, presumably the same reasons for its adoption would apply to pipe already in the ground.

#### STATE REGULATION

Although companies individually and the industry collectively have made considerable safety efforts, 28 States have found it necessary to adopt safety regulations for gas pipelines operating in their borders. Twenty-seven of these States use the ASA Code as the basis for their regulations. At least one of these States, New York, went a long way toward making its safety standards retroactive when it adopted them in 1952. It required all pipelines operating in the State to certify that the existing facilities complied with the code or to otherwise verify their safety. The Rhode Island Code applies to pipe, old or new, which is subjected to 100 pounds pressure or more.<sup>9</sup>

<sup>8</sup> American Standard Code for Pressure Piping, Gas Transmission and Distribution Systems ASA B21.8 (1963), par. 804.6: "It is not intended that this code be applied retroactively to existing installations insofar as design, fabrication, installation, established operating pressure, and testing are concerned. It is intended that the provisions of this code shall be applicable to the operation, maintenance, and uprating of existing installations."

<sup>9</sup> At least 2 States, Vermont and Washington, adopted their present safety requirements before the construction of the first gas pipeline in the State. Some State statutes forbid application of safety requirements to previously installed pipe.

Only California has explicitly recast wording of the ASA Code to convert the voluntary provisions to make them mandatory requirements. Twenty-one of the twenty-seven States which use the industry ASA Code as the basis of their codes have either added independent safety standards or strengthened some provisions in the industry code. For example, eight States prohibit the construction of high pressure pipelines within specified distances of buildings for human habitation or use.<sup>10</sup>

However, since the ASA Code is silent on this matter, there are no restrictions in the other 41 States with natural gas service.

Senator LAUSCHE. Is it your opinion that that situation is one that ought to be dealt with in order to provide reasonable protection to the general public and workers?

Mr. WHITE. I would say that, if this authority is ever given to the Commission, we would expect to conduct studies and ask for the expert advice of those who have made a career of this. I would not want to say today that I know intuitively that we would demand that all of that pipe be replaced, or that special precautions be taken. This is indicated as illustrative of the type of problem which this Commission would focus on, if it were given the authority through this bill.

Senator MONRONEY. Only California has explicitly recast wording of the ASA Code to convert the voluntary provisions to make them mandatory? Do you mean all the other 26 States do not require the code to be observed? They ignore the code?

Mr. WHITE. The ASA Code normally is adopted by the State commission or becomes the legislative enactment. But some provisions of the ASA Code are not cast in mandatory terms. So, to the extent that the ASA Code suggests, or recommends, or advises, that is exactly what the State commission's regulations or the legislation does. It does not require certain actions to be taken.

Senator MONRONEY. In other words, if the code did provide for certain gage pipe or certain practices, for instance, no more wrinkle bends, and, although the State adopted the code, they still would not enforce it? Is that correct? They would have no desire to enforce it? It would be purely a voluntary matter between the pipelines?

Mr. WHITE. No, sir. If the code itself says that a certain practice shall be done, and the State commission or the legislation adopts that code as its own safety code, then, indeed, the companies would have to.

If, as is frequently the case, the ASA Code says that attention should be given to this, or it may be done, or consideration ought to be focused on this particular facet, but does not require it, then the State code itself does not require it, with the exception of the State of California, which has converted these voluntary provisions of the ASA Code to be mandatory.

Senator MONRONEY. But there are, two sides of the code—one, those things that suggest good business and safety practices, but not mandatory, and those sections of the code that have mandatory provisions? Is that right?

Mr. WHITE. That is correct.

<sup>10</sup> Connecticut, Kansas, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Washington.

Senator MONRONEY. Then the statement that, of the 27 States, all but 1 require voluntary acceptance would be only on those things which were voluntary in the first place in the code for use?

Mr. WHITE. Yes, sir.

Senator MONRONEY. It does not mean that the States cannot enforce the mandatory provisions of the code?

Mr. WHITE. You are absolutely correct.

Senator MONRONEY. So there is, in effect, enforcement by the 27 States on the mandatory provisions of the safety code?

Mr. WHITE. To the extent that they are mandatory, absolutely. And as also pointed out, 20 of the States have added certain features of their own.

Senator MONRONEY. They have gone beyond that?

Mr. WHITE. They have gone beyond the ASA Code.

Senator MONRONEY. Would that be in the parts that maybe had been recommended but left voluntary?

Mr. WHITE. Yes, sir. Some do fall in that category.

Senator MONRONEY. Some of the States have gone beyond that?

Mr. WHITE. Yes, sir. Incorporated in the report on our safety survey which the committee published, there is a table which summarizes what each of the States has done in that regard, where they have adopted safety codes. It is on page 125 in the report.

Senator MONRONEY. The people in your department have the best eyesight of any branch of Government. I can't read this.

Mr. WHITE. Let me say on that, when I read this over the weekend, I came back this morning and said I couldn't read it. They told me this was the committee print, and they handed me one that they thought I would be able to read. If you would like, I will submit this to you.

Senator MONRONEY. It will be a little more meaningful.

You might summarize this, give us a list of the States that have gone beyond the code and the degree to which they have.

Mr. WHITE. I think it might be useful just to tick these States off. These are the States which have adopted the ASA Code, or some other code. There are 28 of those. There are approximately 20 that have gone beyond the ASA Code.

I will list those States according to the table on page 125 of the committee print, which reproduced the survey made by the Federal Power Commission.

This information contained in the table was as of approximately the end of 1965. There have been, perhaps, some changes we don't know about. We do know that the States of Ohio and Wyoming have adopted the ASA Code since this was published.

Let me list those States which have adopted the code and added some provisions of their own to change it and make it stronger: California, Connecticut, Illinois, Iowa, Indiana, Kansas, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, and the State of Washington. Wisconsin has independent safety provisions.

Senator MONRONEY. It would be a good idea to have this table which you have just read from published in the record, and in bigger type.

[Laughter.]

(The table follows:)

State safety codes

State	State has—		State has added provisions not in ASA B31-8 on—											State has made more stringent ASA B31-8 provisions on—								
	Some code	ASA B31-8	Date	Employee safety practices	Properties of odorants	Coating	Cathodic protection	Pipe handling	Accident reports	Certificate of compliance	Automatic valves	Welds: Quality inspection	Bends	Proximity to buildings	Railroad and road crossings	Location classes	Inspection and testing	Purging	Pressure	Location of compressor	Cover	
Alabama.....	(1)																					
Alaska.....	(1)																					
Arizona.....	(1)																					
Arkansas.....	(1)																					
California.....	(1)	Yes	1964	X	X	(2)	(2)	(2)	(2)	(2)	(2)	X	X	X	X	X	X	X	X	X	X	X
Colorado.....	(1)	Yes	1962	X	X	(2)	X	X	X	X <sup>3</sup>	X	X	X	X	X	X	X	X	X	X	X	X
Connecticut.....	(1)	Yes																				
Delaware.....	(1)																					
District of Columbia.....	(1)																					
Florida.....	(1)	Yes	1939		(3)																	
Georgia.....	(1)																					
Hawaii.....	(1)																					
Idaho.....	(1)																					
Illinois.....	(1)																					
Indiana.....	(1)	Yes	1950		(3)																	
Iowa.....	(1)	Yes	1937																			
Kansas.....	(1)	Yes	1961																			
Kentucky.....	(1)	Yes	1961							X												
Louisiana.....	(1)	Yes	1959																	(4)		
Maine.....	(1)																					
Maryland.....	(1)	Yes	1955																			
Massachusetts.....	(1)	Yes	1964		X					X										X		
Michigan.....	(1)	Yes	1963							X												
Minnesota.....	(1)	Yes	1956																	(10)		X



Mr. WHITE. Although many States have made considerable and valuable contributions to pipeline safety standards, there are still large gaps in the public safety requirements.

Senator MONRONEY. In going through congested areas, there is the matter of practicality in laying lines and the need for servicing of these lines. It is a common practice to avoid the congested areas; is it not, and to feed the supply into the supply point from the city gate rather than midtown areas?

Mr. WHITE. It is the standard practice of these interstate pipe companies to seek the least expensive routes, as they should, and these normally turn out to be the least populated.

Senator MONRONEY. The universal practice would be to try to avoid the congested areas and not go through a city?

Mr. WHITE. Both from the point of view of cheaper rights-of-way and also for safety purposes. What has happened too frequently is that an area that today is sparsely populated, a nice farmland, for example, 10 years from now will be a subdivision. The 17 people killed in the Louisiana explosion last March were on a line in what is known as a class 1 location; namely, one with little or no population. But without the knowledge of the company, or if known to them they didn't appreciate the fact, houses had been built near enough to the pipe so that when it ruptured this gas accumulated in the atmosphere, mixed with the air and was ignited and there was a tremendous fire and explosion which took 17 lives. These are the problems that we are facing as we move forward.

Although many States have made considerable and valuable contributions to pipe safety standards, there are still large gaps in the public safety requirements. Even now 21 States, representing approximately 55 percent of the transmission pipeline mileage have adopted no safety regulations at all, and 5 of the States with safety regulations do not apply them to interstate lines.<sup>11</sup>

Most of the States with some safety regulation have not made their requirements retroactive. Approximately 90 percent of the present pipeline mileage was designed, fabricated, and constructed before the State in which it is located had adopted safety regulations.

Eight States (Florida, Indiana, Michigan, Nevada, New York, Oregon, Rhode Island, Washington), which have substantially adopted the ASA Code as their safety codes, do not provide for automatic updating of their safety regulations as the code itself is revised and improved. Thus, their safety standards may fall behind the latest practices of the industry.

While States have been adopting safety regulations the gas pipeline industry has been growing at an increasing pace so that today there are more miles of pipeline in States which still do not prescribe safety standards than the pipeline mileage in the entire country when the first State safety code was adopted.

This growth experience underscores the need for a concerted interstate and Federal effort to design realistic safety standards for an expanding industry and a dynamic technology.

The Federal Power Commission, while supporting Federal legislation, also supports State safety regulation. Six years ago the FPC

<sup>11</sup> Indiana, Maryland, New Mexico, Oregon, West Virginia.

suggested to the Council on State Governments that it consider gas pipeline safety in its suggested State legislation program.<sup>12</sup>

The Commission the next year drafted a model bill for adoption by States, which was substantially adopted by the Council<sup>13</sup> to give safety authority to the State regulatory authority.

We do not believe that the enactment of S. 1553 as proposed should or will disrupt State safety regulation.<sup>14</sup>

If there is any doubt whatsoever about this we would have no objection to the bill being amended to declare that States may impose additional safety standards. We propose minimum standards, not preemption of this field.

Senator MONRONEY. But you do advocate dual standards, one for the States and one for the Federal Government?

Mr. WHITE. No, sir; I don't think I would characterize them as dual standards.

Senator MONRONEY. Dual regulations?

Mr. WHITE. Dual regulations. We would suggest that where there are Federal standards and State standards in effect, that the most stringent apply; that is, a company would comply with both standards, the more lenient being included in the more stringent. We certainly would not suggest that any State would be discouraged from enacting its own code.

As I have tried to suggest, we have attempted to promote State regulation and will continue to do so.

Senator MONRONEY. You mentioned that some of the States that have adopted the code have adopted it only as applied to intrastate movement of gas.

Mr. WHITE. Yes, sir; that is correct.

Senator MONRONEY. They would be strictly under State law and subject to the States only.

Mr. WHITE. In those States where they have elected to make their own code applicable only to intrastate lines, interstate lines are not covered by that State or by the Federal Government because we have no Federal safety code at the present.

Senator MONRONEY. It would be possible to have the two standards?

Mr. WHITE. We certainly believe so.

Senator LAUSCHE. Mr. Chairman, may I ask a question?

Senator MONRONEY. Senator Lausche.

Senator LAUSCHE. I don't understand how you will solve this problem. Do you contemplate giving concurrent jurisdiction to the Federal Government and to the State, and that either may act; or do you contemplate in certain instances giving exclusive jurisdiction to the Federal Government and in others exclusive jurisdiction to the States?

Mr. WHITE. I would say, Senator, where the States have not acted, then the Federal safety code contemplated by this legislation would be the only code that would be applicable.

<sup>12</sup> Council of State Governments, Committee of State Officials on Suggested State Legislation (1962), pp. 71-73.

<sup>13</sup> Council of State Governments, Suggested State Legislation (1963), pp. 207-209.

<sup>14</sup> Supreme Court cases uniformly uphold the power of States to act in the field of safety even if such regulation has some effect on interstate commerce. *Kelly v. Washington*, 302 U.S. 1 (1937), *Southern Pacific v. Arizona*, 325 U.S. 761 (1945), *Nelson v. Pennsylvania*, 350 U.S. 497 (1946), *Hurton Portland Cement Co. v. Detroit*, 362 U.S. 440 (1960).

Senator LAUSCHE. What if the State has acted and the Federal Government has acted? Which of the two will have jurisdiction, or will they both have it?

Mr. WHITE. They will both have jurisdiction.

Senator LAUSCHE. How will you resolve the matter as to which of the two shall act?

Mr. WHITE. Our view of that is that the most stringent requirement govern the particular company.

Senator LAUSCHE. You do know what I am talking about when I speak of exclusive jurisdiction and concurrent jurisdiction?

Mr. WHITE. Yes, sir. My present thought is that concurrent jurisdiction comparable to that in the Federal coal mine safety legislation would be most appropriate, and that we would expect if a State had some standards that were lower than the Federal Government, the company would be required to meet the Federal standards. If, on the other hand, the State standards were higher, more stringent, we would expect the company to meet the State's more stringent requirements.

Senator LAUSCHE. Do you have any fear that that may present conflict as between the States and the Federal Government?

Mr. WHITE. It is conceivable that there would be. Realistically I don't think so, Senator. I think that we would be looking to the same group of experts for technical advice and guidance. I don't think that this presents unmanageable problems. We have a good working relationship with almost all of the State regulatory bodies.

Senator DOMINICK. Would the Senator yield?

Senator LAUSCHE. Yes.

Senator DOMINICK. I was interested in your answer, saying that you would have concurrent jurisdiction similar to the Coal Mine Safety Act. Where in the world do you have any State jurisdiction in the Coal Mine Safety Act?

Mr. WHITE. Senator, I just happen to recall that in the State of Kentucky there is a code that applies to all the coal mines in that State. In some few instances I think their requirements are more stringent than that specified in the Federal code.

Senator DOMINICK. That was prior to the passage of this year's law.

Mr. WHITE. It may well be that the extension to the small mines, legislation this year may have changed it, and my information may be a little outdated. My recollection goes back about 5 or 6 years ago, when the question was before the Congress and I had occasion to work on it. We knew that the Federal standards were regarded as a minimum and that there was concurrent jurisdiction with the States.

Senator DOMINICK. Taking these situations again, let's suppose that you put up a standard and that a State puts up a standard, and both you and the State feel that the standard that is being imposed by the particular agency is better for safety than the other one. I would presume that you would say that in all cases the Federal law would supersede the State, wouldn't you?

Mr. WHITE. That is a tough one, Senator. I don't know. I would expect, because of our good working relationships with the State commissions and the fact that we would probably all be relying on basically the same group of expert technicians, that we would be able to reach accord.

If it should prove to be the Federal Government saying this is the best way to do it and the State saying this is the best way to do it, I would presume that we would be in a fairly sharp contest that may even require judicial determination.

Senator DOMINICK. One more question. I don't want to interrupt your testimony too much.

Presumably the model safety code which was prepared for the States to adopt meets with your approval. Or does it?

Mr. WHITE. It is a little hard to be flat about it, Senator. I certainly believe that every State ought to be encouraged to adopt a code. As to whether we could today endorse and stand behind every single provision of that code, I can't say.

I think that, as I have suggested, it is a long step in the right direction.

Senator DOMINICK. Wasn't it prepared in consultation with the FPC?

Mr. WHITE. A staff member of the FPC is one of the committee of staff experts of the Committee on Gas of NARUC who developed the "model" code. The Federal Power Commission itself did not endorse or adopt it.

I don't intend by these qualifications to suggest that we think it is grossly defective or that this won't do the trick. It is clearly a very major contribution.

We would encourage all States to consider this code and to take a look at it and adopt those provisions that are applicable to their own States.

Senator DOMINICK. Even if they did, you do not feel that this would be sufficient?

Mr. WHITE. If all States had adopted it today, Senator? I think our view might be a little different. I don't know. I would say that would depend upon an analysis of each of the States' codes. Certainly where we stand today, with approximately 55 percent of the mileage not covered by any standard, I think we don't have any question about our position, which is that this should be adopted.

Senator DOMINICK. Thank you very much.

Senator MONRONEY. You may proceed.

Mr. WHITE. We are aware of only one serious conflict between a gas pipeline and a supposed safety regulation. In that case, the pipeline company successfully resisted zoning efforts by a New Jersey local government body to forbid construction of an interstate gas pipeline through a residential zone. (*Transcontinental Gas Pipeline Corp. v. Borough of Milltown*, 93 F. Supp. 287 [U.S.D. Ct., D.N.J. 1950].)

The town offered no proof that the line would endanger the health, safety, or welfare of residents of the town, whereas the pipeline company's expert asserted the safety of the plan. The court struck down the zoning ordinance as an undue burden on interstate commerce. At that time the State of New Jersey had no safety code, although one has subsequently been enacted.

Recently, some State commission personnel appear to have recognized that efforts of individual States to formulate amendments to the ASA Code, to make it suitable for use by a regulatory agency, are not enough.

A small group of staff experts<sup>15</sup> of the Committee on Gas of the National Association of Railroad and Utilities Commissioners has drafted a "model" State safety code based on the ASA Code. This is the one Senator Dominick just referred to.

Development of such a "model" code itself recognizes the Federal scope of this problem. This code, which has not yet been adopted by any State, could go a long way toward increased safety requirements for natural gas pipelines, much farther indeed, than either the ASA Code or any State has gone.

The "model" code would in all probability, be a great improvement over the ASA Code, but would not necessarily make all the changes in the ASA Code which would prove to be essential by a responsible public agency.

The executive committee of NARUC this summer passed a resolution calling for widespread distribution of this "model" code for study by State commissions and the industry. In our view, this is a real step forward for which NARUC should be commended.

The several States should be encouraged to give it their most serious consideration. However, the code should be regarded as supplementing a Federal program, not supplanting it.

The executive committee of NARUC this summer also passed a resolution opposing S. 1553 as presently drafted.<sup>16</sup>

If this opposition is based on the fear of preemption of State safety codes, we would have no objection to the bill being amended to make this point clear, as I have already indicated.

Senator LAUSCHE. Is it your belief that that is the sole reason that NARUC is opposing S. 1553, that they fear that it will preempt this field?

Mr. WHITE. It is very difficult, Senator, for me to express the motivation of NARUC. We work with them very carefully and successfully. Commissioner Bagge, of the Federal Power Commission has met with them at their Milwaukee meeting. I think there is a very strong common interest in promoting safety.

You will have before the committee, following the FPC presentation, a representative of NARUC. I am sure that he will be able to respond.

Senator LAUSCHE. You say if this opposition is based on the fear, then you express no objection to that specific language being included in the bill to eliminate the fear?

Mr. WHITE. Absolutely.

Senator MONRONEY. You say "Several States should be encouraged to give it their most serious consideration. However, the code should be regarded as supplementing a Federal program, not supplanting it."

Then you move forward to say that actually you are not trying to preempt the field. I don't know where that dividing line is. Who will have the last word? You specify certain restrictions in the State code and different restrictions in the Federal code. You will have

<sup>15</sup> This group included staff personnel of the State utility commissions of California, Kentucky, Illinois, New Jersey, New York, North Carolina, Wisconsin, Louisiana, Oregon, and Kansas plus the Chief of the Federal Power Commission's Bureau of Natural Gas.

<sup>16</sup> In 1954 Mr. Austin Robers, then general solicitor of the National Association of Railroad and Utilities Commissioners testified in favor of the natural gas safety bill, H.R. 134 (83d Cong.) and presented a resolution of the Executive Committee of NARUC favoring passage of the bill. Hearings on H.R. 134 (83d Cong.), supra, p. 42.

confusion compounded on what standards the pipe company should meet, would you not?

Mr. WHITE. In those States where—assuming we have the Federal code, in the State which has both a Federal code and a State code, it would be my view that the most stringent requirement be the one that would prevail.

Senator MONRONEY. How can you tell which is the most stringent requirement? You will have engineers disagreeing on that over a period of time, won't you?

Mr. WHITE. If, for example, the requirement of the Federal code is that every pipe had to be buried at least 2 feet below the earth's surface and the State said it had to be buried 3 feet below the earth's surface, we would expect the 3-foot standard to prevail.

Senator MONRONEY. What if the State said 6 feet below?

Mr. WHITE. I would say that, too, would be the State's prerogative.

Senator MONRONEY. Or 20 feet?

Mr. WHITE. That is the State's prerogative; yes, sir.

Senator MONRONEY. They would get no gas service. [Laughter.]

Mr. WHITE. Except to the point if it became a burden on interstate commerce, I would expect the courts to strike it down.

Senator MONRONEY. You can't always expect a State to know what kind of regulations to pass, and yet there are code limits which are very important in order to have uniformity.

Mr. WHITE. These are the things on which we would expect to focus most of our attention, these characteristics of the pipe, which would be the same whether located in one State or an adjoining State. If the States themselves wish to have more stringent requirements, we would certainly expect the companies to abide by that, except to the point that there would be an undue burden on interstate commerce, as the *New Jersey* case that I referred to stated. There the Court held that even though the town may have been well motivated by trying to keep the pipeline out, that that particular provision of the city zoning ordinance was unconstitutional as an undue burden on interstate commerce.

I can appreciate the points that you and Senator Dominick raise, Mr. Chairman, about the potential conflict. I really am quite confident in our ability to work with the State groups and indeed with the industry itself. But there might well come occasions where a judicial interpretation would be necessary if the Federal code were enacted.

Senator LAUSCHE. Are you taking the position of willing to write in the bill language excluding the preempted objective because you want to get the bill passed and want to remove the opposition that has been interposed against it?

I ask you that question because it would seem to me that in the interests of clarity and simplicity of approach you ought to invest the power in one agency or the other, exclusively; that is, giving concurrent power is a sort of hodgepodge.

Mr. WHITE. I would say, Senator, obviously, we would like as much support for any legislative proposal the Commission would make as we can secure. It was never the intention of the framers of this bill, as far as I know, to make this exclusively a Federal jurisdiction. I think it was always in the minds of the framers and the proposers that this be concurrent, for the reason that there may be States who,

by virtue of their own interests and by virtue of what their regulatory agencies tell the legislature, want to make their own requirements a little safer, a little more stringent.

Senator LAUSCHE. It seems to me that there are three courses that you can follow. You can give exclusive jurisdiction to the Federal Government in the interstate matters; you can give concurrent jurisdiction to both as a second course. The third course probably would be to say that if and when the State doesn't regulate the Federal aspect of the lines running through that State, then the Federal Government will step in.

Under this third proposal there would be a clear demarkation of who may act. The State may act and shall act when it decides to adopt a code covering interstate transportation by pipeline. But if it doesn't adopt the code, then the Federal Government will.

May I hear your observation on that analysis?

Mr. WHITE. I don't think we have focused on that very sharply. I would say, speaking personally now, except to the point where a State would be induced to adopt a code only to avoid Federal jurisdiction, where it was clearly so minimal as to be a fraud, that your proposal is certainly worthy of consideration. It has some appeal to it if this is a particular problem.

Senator LAUSCHE. Thank you.

Senator MONRONEY. You may proceed.

Mr. WHITE. Should there be Federal safety standards? Those concerned with pipeline safety generally agree on the need for standards to guide the practices of the industry. As already indicated, some States presently regulate pipeline safety, although there is no uniformity or consistency of practice.

The issue presented by S. 1553 is whether a legally enforceable code should be prescribed at the national level for interstate natural gas pipelines.

We believe we share with State commissions and industry the common goal of providing the American public the most efficient and reliable use of natural gas consonant with the safest possible operation of natural gas facilities. In our view, Federal safety standards for the interstate natural gas pipelines are one of the important means for attaining these objectives.

Most of the credit for improvements in the quality of pipe and in protective practices properly belong to the industry. However, this does not mean that mandatory minimum safety standards which make use of such modern techniques should not be established.

Technology is improving in all fields of industrial endeavor, but the public's interest requires a governmental involvement in insuring that we take all reasonable steps to reduce the danger from an unsafe segment of gas pipeline just as we do with an unsafe airplane, an unsafe train, an unsafe oil pipeline, or even an unsafe coal mine.

The Federal Power Commission has supported legislation almost identical with S. 1553 since 1950, when Congressman Heselton introduced H.R. 9933 in the 81st Congress, and it has been a part of our own legislative program every year since 1953.

Due to the rapid expansion of the pipeline industry in the intervening period, the need is even greater today for a concerted Federal effort to design realistic safety standards.

In 1963, the interagency "Report on the Movement of Dangerous Cargoes" coordinated by the Office of the Under Secretary of Commerce for Transportation and approved by the 22 participating Government agencies recommended that—

The Federal Power Commission should be given specific statutory authority and responsibility for the safety regulation of gas pipelines operating in interstate or foreign commerce.

Only last year Congress enacted Public Law 89-95, Senator Monroney's bill, adopting the parallel recommendation of that report as to oil pipelines. There the oil pipeline industry recognized the need for and wholeheartedly supported Federal safety regulation of oil pipelines.

Senator LAUSCHE. Does Public Law 89-95 deal with safety matters?

Mr. WHITE. Yes, sir.

Senator LAUSCHE. In the laying of the lines, and how they shall be constructed?

Mr. WHITE. Yes, sir, relating to oil pipelines.

In his message to Congress on Transportation and traffic safety on March 2, 1966, President Johnson recommended that a Department of Transportation be established and that it be assigned the responsibility to "Improve safety in every means of transportation." (House Doc. No. 399 (89th Cong.), vol. 112, Congressional Record 4434, 4436.)

The message recommended that the safety and accident investigation functions of the ICC and the CAB be transferred to the new Department, but did not allude to safety regulation of interstate natural gas pipelines. Should the new Department ultimately be established, it may be that it would make sense to consider consolidating this authority at that time.

Senator MONRONEY. Do you mean you would feel it could possibly come to rest in the Department of Transportation, rather than in the Federal Power Commission?

Mr. WHITE. That would certainly be a question Congress would want to explore, Senator. There are some aspects of our own certifying authority where it might be advantageous to have the responsibility focused in the Federal Power Commission. But I can tell you rather candidly that this is an awesome responsibility.

I believe that there is some benefit in centralizing all of these functions in the body of experts within the Government, and I think the Congress ought to give very careful consideration to that.

Senator MONRONEY. In other words, you feel that your primary function is economic regulations and matters of that type.

Mr. WHITE. It is, although we have inevitably moved into the safety area because you can't really separate the two. I know that there are those who question whether the Commission's authority extends beyond economic regulations to safety regulations. We have so construed it. Our General Counsel is satisfied that this construction would withstand any judicial challenge.

But here I think we are talking about not what is legal but what is wise and desirable. I expect that it is something Congress would want to focus on.

Senator MONRONEY. You may proceed.

Mr. WHITE. S. 1553 contemplates regulation by minimum standards. It would not discourage the efforts of the natural gas pipeline industry or the individual States in the field of safety. Research by the industry will continue to play a primary role in the development of new materials, designs and protective techniques. By our support for S. 1553 we volunteer to undertake broadened responsibilities. The FPC is deeply concerned about assuring the safe operation of pipelines and we now seek to promote safe design and practices by our review of applications for new pipelines. The Commission has also recently established a general condition in certificates requiring that the authorized facility shall be operated at a safe pressure.<sup>17</sup> We are now completing action on a permanent rule for detailed reports of accidents or failures.<sup>18</sup> The data obtained from such reports will provide the pipeline companies, the ASA Code Committee, and the Commission with comprehensive information as to the causes of pipeline failures in order to develop better safety standards.

One vital element which S. 1553 would add to our responsibilities is the authority to prescribe minimum standards for pipe already in the ground. We believe that under such responsibilities the Federal Power Commission can make a positive contribution by providing a public forum for the views of State regulatory agencies, members of the public, Federal agencies, and the industry, as a means to develop a mandatory, national minimum safety standard for interstate pipelines.

Senator DOMINICK. I am not quite clear on this. In view of your statement on the minimum standards which you would then prescribe for pipes already in the ground. Would this then indicate to you that any company that didn't meet these minimum standards would have to replace their pipe?

Mr. WHITE. Senator, the Natural Gas Act itself has within it provisions for enforcing both the Natural Gas Act and the orders and regulations of the FPC. I would think, if it ever came to that sort of a situation, that we would have the right to use whatever enforcement sanctions are in the act.

Senator DOMINICK. You would then be in this position: You would prescribe minimum standards, presumably you would then have to have reports from every company as to each section of their pipe as to whether they might meet these standards or not, and if they didn't you would require them to be replaced?

Mr. WHITE. I couldn't say replace. I would presume that the answer might well be—

Senator DOMINICK. Or fix them.

Mr. WHITE. You could operate at reduced pressure. The pressure, as it is increased, obviously puts a greater stress on the pipe itself. There might be many alternative ways of coming to the same result which would be a safe operation.

In all frankness, our relationship with the industry and their own desire to do right, makes me very optimistic about this type of regulation.

<sup>17</sup> Order No. 324, issued June 30, 1966 (31 F.R. 9347, July 8, 1966).

<sup>18</sup> Dockets Nos. R-283 and R-291.

Senator DOMINICK. Do I gather from this that there are now no standards as to what type of pipe is used for the transportation of gas?

Mr. WHITE. There are no Federal standards, minimum or mandatory.

Senator DOMINICK. Are there not standards established by an industry code?

Mr. WHITE. Yes, sir.

Senator DOMINICK. Or by technological requirements when they buy?

Mr. WHITE. Yes, sir. Before you came, we spent a considerable amount of time, Senator, on the way the code is put together. We certainly indicated that this was considerably better than no code at all. We focused on the fact that this is basically a voluntary procedure. And also we went so far as to say that generally the companies follow it.

But because what we are dealing with has so much potential for death, destruction, and injury, in our view at the Commission it is imperative that there be national minimum standards that are mandatory, not optional or voluntary.

Senator DOMINICK. What you are saying is that although the companies generally follow a code which you think may be adequate, nevertheless because it is not mandatory you think we should have legislation?

Mr. WHITE. Our position should be clear, Senator. I don't think we have ever really said that we believe that the ASA Code is adequate. We have on the Commission staff, sitting at the right end of the table, Mr. Mendonsa, who is the Deputy Chief of the Bureau of Natural Gas and who serves on the ASA Code Committee. We do have an opportunity to know how that code committee operates. Our feeling is that it makes tremendous progress, but not adequate for what we regard as today's needs.

Senator DOMINICK. You referred several times to the long lines or the interstate pipelines, and say S. 1553 applies only to the interstate pipelines. By this do you mean that you have no intention whatsoever of covering in those parts of the gas production and transmission systems that are exempted by the FPC legislation in section 1(b) where it shall not apply to facilities used for the production and gathering of natural gas?

Mr. WHITE. I had assumed that what we are talking about is the interstate transmission lines.

Senator DOMINICK. I think you should be rather clear on it. You have about as much mileage on the low intrastate gas gathering systems as you have in the long lines. It would be of interest to know whether it applies to the interstate and long lines and whether it would pick up the gathering lines.

Mr. WHITE. So far as I am aware we have focused exclusively on the interstate lines where our jurisdiction runs.

Senator DOMINICK. And your testimony this morning applies to the interstate lines?

Mr. WHITE. Yes, sir.

Senator DOMINICK. You would construe it to mean that this is the area in which you figure regulation would be best suited on a national basis?

Mr. WHITE. Yes; although I would certainly urge as we have in the States themselves focusing on this. I think a number of States have very recently been examining the model code submitted by this group and the ASA code, in their own interests. All of them, too, are devoted to safety and to protecting life and property as we are.

Senator DOMINICK. So all the planning, discussion, and understanding would therefore be interstate rather than the necessary line for the gathering to make possible the interstate line transmission?

Mr. WHITE. Let me ask my colleagues if they have a different view. Yes, that is correct.

Senator DOMINICK. You say it is unanimous within the area because a lot of people never operate beyond the State but are very much concerned over the regulations they might have to meet in the gathering system if it were Federal.

Mr. WHITE. I would assume that even the gathering operations that went interstate would be included. Our whole jurisdiction is founded on the interstate movement. This is what we have reference to.

Senator DOMINICK. And only to interstate?

Mr. WHITE. Yes, sir.

Senator DOMINICK. And only the long lines?

Mr. WHITE. Only the interstate long lines; yes, sir.

(The following material was subsequently submitted:)

FEDERAL POWER COMMISSION,  
Washington, D.C., October 11, 1966.

HON. WARREN G. MAGNUSON,  
Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This amplifies a point developed by Senator Dominick during my testimony August 29, 1966, on S. 1553, the Natural Gas Safety Bill, before the Senate Committee on Commerce. We then agreed that S. 1553 does not apply to any lines which engage only in intrastate commerce and I also attempted to make clear that S. 1553 would not assign to the Commission safety jurisdiction over gathering pipelines even when they operate in interstate commerce. A fuller explanation of this aspect of the Commission's proposed authority under S. 1553 may, however, be useful in the Committee's consideration of the bill.

S. 1553 would not give the FPC authority to set safety standards for gathering lines, even if they operate in interstate commerce because the Commission does not now have jurisdiction over such lines and nothing in S. 1553 would operate to change or affect their exemption. S. 1553 would cover only the kinds of facilities for which the Commission issues certificates of public convenience and necessity.

S. 1553 would amend the Natural Gas Act by adding a new subsection 7(i), but it would preserve intact the existing exemptions of subsection 1(b) for both local distribution facilities and for production or gathering; these exemptions would apply to safety regulations under S. 1553.

In *Colorado Interstate Gas Co. v. F.P.C.*, 324 U.S. 581, at 602-603, the Court indicated that the "production or gathering" exemption in subsection 1(b) applies to the "physical activities, facilities, and properties used in the production and gathering of natural gas." The Court reaffirmed this interpretation of the exemption in *Phillips Petroleum Co. v. Wisconsin, et al.*, 347 U.S. 672 (1954), even though it established the duty of the Commission to regulate the sale of natural gas by producers and gatherers. The concept of "gathering" under the Natural Gas Act has a well-established meaning in conformity with industry usage. "Gathering" ends at the point of the final commingling of gas lines at a central point for delivery into a single transmission line. *Barnes Transportation Com-*

pany, Inc., 18 FPC 369 (1957). This definition was approved in *Ben Bolt Gathering Company v. F.P.C.*, 323 F. 2d 610 (CA 5, 1963).

The bill itself would not silently amend subsection 1(b). To the contrary, S. 1553 provides that "The Commission is authorized to prescribe . . . standards . . . for construction . . . of pipeline *transportation* facilities of natural gas companies . . ." (emphasis supplied). The Natural Gas Act clearly distinguishes the "transportation" function from the "distribution" and "gathering" functions. S. 1553 itself therefore would limit the Commission's safety jurisdiction to pipeline transportation facilities, as distinguished from distribution or gathering facilities.

Sincerely,

LEE C. WHITE, *Chairman.*

Senator LAUSCHE. You stated:

The Commission has also recently established a general condition in certificates requiring that the authorized facility shall be operated at a safe pressure.

What are your present powers in adopting regulations or imposing conditions upon gas companies in the laying and maintenance of their lines?

Mr. WHITE. We, Senator, are bound by the Natural Gas Act to pass upon applications for authority for laying interstate pipe to carry natural gas in interstate commerce. If we find that the public convenience and necessity requires the issuance of that type of certificate, we grant it.

We have construed public convenience and necessity to incorporate within it some element of safe operation, too.

Senator LAUSCHE. If you were able to regulate the pressure, do you consider that to be the limit of your power, or can you go beyond that and regulate the thickness of the pipe, the manner in which the turns should be made and the manner in which welds or connections should be achieved.

Mr. WHITE. With respect to new pipe, pipe to be laid in the future, for which applications are sought, we construe that authority to include these elements that you have spoken of.

Senator LAUSCHE. Under present law you have full authority to control all of these matters about which we have been speaking, except that you do not feel that you have the authority to do it retroactively?

Mr. WHITE. I understand the question, but I don't think it is quite that clear. We have certainly maintained that position. Our General Counsel is absolutely certain that this would withstand any judicial review. But we feel we would be much better off and that we could have a much more aggressive program not only with respect to the existing pipe but with respect to future pipe if this legislation were enacted.

Senator LAUSCHE. Under existing law are any of these weaknesses which you mentioned in providing safety for the public beyond the remedy of the Commission through the adoption of adequate regulation?

Mr. WHITE. Yes, sir.

Senator LAUSCHE. Which ones are they?

Mr. WHITE. For example, one that we referred to earlier was the business of pipe that is bent when it is placed in the ground. This is not done any longer.

Senator LAUSCHE. If you have the power to tell them what pressure they may put on the pipe, why don't you have the power to tell them

whether they shall bend the pipe or whether they shall do the turning through some other device?

Mr. WHITE. I will refer that question to our General Counsel. That is really a place where one is on one side of the line and one on the other, as we view it.

Mr. SOLOMON. Senator Lausche, I think we have considerable authority in this field when we are certifying somebody to put in new facilities. This considerable authority however is authority to make individual conditions upon individual certificates, such reasonable terms and conditions as the public convenience and necessity may require.

Within this case-by-case structure the Commission has, in our opinion, considerable authority to act.

However, how far this conditioning authority goes, for example, to whether—in addition to specifying that pipe must be operated at particular pressures—whether we can go beyond that and say that they must have a general inspection of their pipe system, must walk the pipe, say, at least once a year, or once a month, or must have other types of inspection, is far from clear. And, of course, all of this authority relates only to what is going to be done and does not relate back to what has been done.

Senator LAUSCHE. Thank you.

Senator MONRONEY. You may proceed.

Mr. WHITE. One vital element which S. 1553 would add to our responsibilities is the authority to prescribe minimum standards for pipe already in the ground. We believe that under such responsibilities the Federal Power Commission can make a positive contribution by providing a forum for the views of the State regulatory agencies, members of the public, Federal agencies, and the industry, as a means to develop a mandatory, national minimum safety standard for interstate pipes. An especially significant byproduct of such legislation is likely to be better State regulation of intrastate lines, since it will allow the States to concentrate on unique local conditions affecting safety. S. 1553 applies only to interstate pipelines, but development and updating of a Federal safety code will in all probability stimulate Federal-State cooperation. We will, of course, draw upon the experience of the States; we also will provide all States with a guide for their own exclusive regulation of nonjurisdictional transmission lines. This aspect of S. 1553 may prove especially fruitful for those State commissions who have a chronic manpower shortage.

Senator Dominick. May I interrupt?

Senator LAUSCHE (presiding). Yes.

Senator DOMINICK. I don't like to keep harping on this. Under the previous procedure in the mining field, the Bureau of Mines was doing an educational job to try to show the various States the safety procedures that should be used. States, by virtue of this had about 292 mining inspectors. We passed a bill this year in which the Federal Government took over jurisdiction of all of this. And we eliminated those 292 inspectors as far as any authority was concerned and replaced them with 40 inspectors from the Federal Government which were all qualified by virtue of the Bureau of Mines testimony.

Let me ask you this: Am I correct or incorrect in feeling that the Federal Power Commission at this point is conferring and advising

the various companies and the States on safety procedures and technology of the structure of the pipe itself?

Mr. WHITE. Certainly with respect to new pipelines to be laid, Senator, as has been suggested, we have construed the public convenience and necessity to include within it safety. Our staff has discussed with applicants for authority to install this new pipe.

Senator DOMINICK. Is this generally acceptable to the companies and to the States, in other words this discussion and educational work that you are doing?

Mr. WHITE. As far as I know, I have not heard of any company which has turned back an application on that ground. Let me ask Mr. Watters.

Mr. WATTERS. No, there have been none that have been turned back to my knowledge. We have informally had some resistance, I might say.

Senator DOMINICK. Suppose we pass this bill, what are the increases going to mean, as far as the Federal Power Commission is concerned, with respect to inspectors, with respect to the necessary investigatory procedures that you all have to go through to see that the companies are complying with the requirements?

Mr. WHITE. Our present thinking is that if this bill is enacted we could so effectively use the general conditions and general standards by which companies would operate, that it would take a minimum of personnel. We do not, for example, at the moment contemplate putting on 200 or 400 inspectors, or any other such number. Unlike the coal mining industry in this country, we are dealing here with a comparatively small number of pipeline companies. Inherent in their nature is that there has to be some large organizational structure. These are large companies. They are sophisticated companies. And we feel that our needs for inspection and to check up on them would be minimal, perhaps some sort of spot-checking arrangement. We have considerable confidence in the pipeline industry.

Senator DOMINICK. For the purpose of the record I want to say that I was not talking about the Coal Mining Safety Act, I was talking about the Metallic Mine Safety Act on this occasion.

What you are saying then is that once having established the procedures, that you are then more or less going to rely on the company and their reports?

Mr. WHITE. That is our present thinking. We would obviously want to follow this through and see how things develop if this legislation is enacted and responsibility comes to the Commission. We would expect it to be regarded as a very serious responsibility. In fact there are some aspects of it that are very heavy indeed on a man's mind as he weighs the consequences of an instrumentality which is just inherently dangerous.

I certainly subscribe to the idea that this industry is one which I would expect would comply with every requirement.

I don't know if that responds to your question, Senator.

Senator DOMINICK. It helps.

Senator LAUSCHE. Continue please.

Mr. WHITE. Some pipeline companies earnestly oppose the enactment of S. 1553 and their objections deserve serious consideration.

Basically there seems to be a fear that the FPC would prescribe regulations under the bill which would require the unwarranted expenditure of funds or injure them competitively. We are sensitive to this concern, although we believe it to be overstated, and will work with the industry in an effort to keep expenditures at the minimum consistent with adequate standards of safety. We cannot conceive of any regulations which would put one company at a competitive disadvantage with any other company. Our regulations would not be directed at any particular company but rather would establish minimum standards equally applicable to all. Moreover, while a number of pipeline companies are subject to State regulations, it does not appear that this has hindered their operations. In any event, the costs of compliance with Federal safety regulations would not come out of company profits but would be borne by customers paying the pipeline companies' rates.

Senator DOMINICK. May I interrupt again?

Senator LAUSCHE. Yes.

Senator DOMINICK. This is the first time I have seen this mentioned. I just wonder how you are going to analyze this.

Supposing, for example, that your minimum standards require that new pipe be placed into the ground, replacing existing pipe. This is a good deal of expenditure probably on the part of the company. Would this then be reflected in their rate structure?

Mr. WHITE. Certainly if it were done by virtue of the State regulations or Federal regulations. I don't know how it could fail to be included in the rate structure.

Senator DOMINICK. So the net effect of this bill, then, could be an increase in rates to the consumers.

Mr. WHITE. It could indeed have some possible increase in rates to the consumer. Our feeling is that if it comes to that—and I am not sure that it would—if it does, as interested as this Commission is in lowering costs to the consumers, I think all of us are willing to pay for safety if it is a reasonable determination that has been made by responsible people.

Many pipeline companies today feel a strong responsibility for safety and as a matter of course and without financial difficulty replace older pipe which has become unsafe with newer and better pipe installed and operated under today's standards. As Chairman Magnuson of this committee has pointed out, the Commission recently approved an application by El Paso Natural Gas Co. to replace with a stronger one a line which the company considered hazardous due to the large increase in population around Flagstaff, Ariz.<sup>19</sup> This action is a credit to the company, particularly since Arizona has no State safety code whatever. Similarly, last fall the Commission approved the construction by Tennessee Gas Transmission Co. of 17 miles of pipe to parallel the Natchitoches, La., to Portland, Tenn., portion of its line. The company had, for safety purposes, reduced the maximum operating pressure on that line following the Natchitoches explosion.

Some companies may also fear that continued public acceptance of natural gas might be impaired by greater publicity to accidents or

<sup>19</sup> 112 Congressional Record 18954 (daily ed.), order of Aug. 3, 1966, in docket No. CP 66-326.

failures or by greater public attention to natural gas pipeline safety measures. The natural gas industry is in active competition with other fuels, both for use in the home and in industry, and public acceptance is understandably a vital competitive asset. I am convinced, however, that if such fears exist they are not justified. I believe that public acceptance will be enhanced by the knowledge that natural gas pipelines comply with standards set by the Federal Government. This is true of the public acceptance of airplanes and railroads and I am sure it will also be true in the case of Federal safety standards for automobiles and cruise ships which this Congress is now considering. The Commission, in its turn, is mindful of its responsibility to encourage the orderly and progressive expansion and development of the natural gas industry.

Pipeline companies under mandatory Federal safety standards would have the full freedom to solve diverse operating problems, just as they now do in States, where the safety standards in the code are mandatory requirements. It would undoubtedly cost some money for pipeline companies to bring their existing pipelines up to the design and fabrication standards of the most recent revision of the industry ASA Code. This is a step which the ASA Code does not require. Although the timetable the Commission might require for such compliance would have to be established, I would expect the Commission to give serious consideration to the practical problems involving the upgrading of older pipelines to reach appropriate safety levels.

We are not under any illusion that the Federal Power Commission could write a good safety code overnight or unaided. Before we would adopt any safety standards we would, of course, ask all segments of the industry, the State commissions and the public to contribute their views. We would follow all the procedural safeguards designed to protect the interests of the industry and the public. We would naturally expect to maintain regular consultation with industry experts, Government laboratories, the ICC, the State commissions, and others vitally interested in our safety orders. In the two rule-making proceedings I have already mentioned, the Commission received comments from the industry, an engineering firm, and State regulatory agencies. In fact, we held a conference with representatives of the industry and we modified our original proposals in response to the comments we received. We believe these rules are better as a result of this give and take and contemplate employing similar procedures if S. 1553 is enacted.

#### EFFECT OF FEDERAL SAFETY REGULATIONS ON INDUSTRY TECHNOLOGY

It has been suggested that Federal prescription of minimum safety standards would stultify and discourage improvement in materials and procedures and freeze technological development. I do not believe this contention has any merit. Under the proposed legislation, responsibility for research and development would remain with the industry and other interested parties, although we would hope that FPC and public interest would stir the industry to even greater achievements. Furthermore, the experience of many other industries under Federal safety laws and the experience of natural gas pipelines themselves under State laws do not support this contention. I have

seen no evidence that Federal safety regulations for airplanes, ships, railroads, or motor carriers, have in any way hindered the development of these industries. There are, in addition, Federal safety regulations for such diverse industries as mining, food, the private atomic energy industry and pharmaceuticals, and the Congress is considering legislation providing for safety standards for autos and cruise ships. If there are particular safety standards which the Federal Power Commission would favor but which the industry might object to, we would certainly discuss the merits of those standards, but a blanket condemnation of federally enforced safety standards as a detriment to the industry is certainly unwarranted.

#### CONCLUSION

In 28 years of administering the Natural Gas Act the FPC has developed a satisfactory working relationship with the industry. The Commission has not attempted to supersede management initiative or to take over the day-to-day affairs of the companies. Rather by regulatory reviews and guidance, with a relatively small staff and the assistance of public intervenors, we have utilized the imagination, initiative, competence, and coverage of those who operate the pipelines to achieve public interest results. I am confident that Federal safety regulation would, similarly, draw upon the professional expertise of the industry's engineers and become a means to heighten management's own sense of responsibility.

Federal safety standards would have a beneficial effect on the acceptance given to interstate natural gas pipelines by local communities through which a natural gas company intends to build a pipeline, backed up by the congressional grant of eminent domain authority. I am sure that any such community would feel more secure if it knew that the pipeline had to meet minimum safety standards set by a Federal agency.

The industry is now in the difficult dual role of judge and jury of its own safety practices. However, where the lives of people are concerned and where the possible destruction from a pipeline accident depends so greatly on the adequacy of safety standards, it is only reasonable that the public should have the last word in setting reasonable minimum safety standards. Safety regulation would be as awesome a responsibility for the FPC as it is for the industry. However, should the Congress decide that Federal regulation is necessary the Commission, which is already entrusted with broad responsibilities over interstate gas pipelines, will be prepared to discharge that responsibility.

I wish to express our appreciation for the opportunity to appear here today. The Federal Power Commission strongly urges that you act favorably on S. 1553. Thank you.

Commissioner Bagge, of the FPC, has taken a very deep and personal interest in safety. He is here and would be delighted to answer any questions that the committee may have. And I am sure that is true of our other experts here as well.

Senator LAUSCHE. Senator Dominick?

Senator DOMINICK. Your casualty figures in this field were set forth, I think, on page 5. At least as far as the last 15½ years are concerned.

Mr. WHITE. Yes, sir.

Senator DOMINICK. There were 64 fatalities and 225 injuries. Do I gather from your testimony that although there have been more accidents in the bathtub than there have been from this, that you feel that the potential problem is such that you need standards?

Mr. WHITE. Yes. I think you have captured it right there, Senator, in one sentence.

Senator DOMINICK. I didn't quite understand the last sentence on page 9 of your statement. I gather that what you are saying is that the principle or philosophy of the Government is that the Government should take over safety responsibilities because you can't expect the private companies to do it; is that correct?

Mr. WHITE. No. What I am suggesting, Senator, is that safety costs money. A company is, after all, in business to provide a service and to make a profit, as it should be in our economic system. It is a very difficult spot to be in. I have never been a pipeline company executive, but I can visualize a situation where the safety engineers tell me I should take one course of action, and the economists tell me that is a very expensive business and there must be some way to trim on it. I would not want to be in that kind of a spot where the potential hazards are so great.

We have not had many accidents, as you have pointed out. We have not had many deaths, for sure. But it strikes me that when we are talking about the type of damage or explosion that could occur, that there should be some governmental or public voice influencing that decision being made by a company executive. That is what I intended to say.

Senator DOMINICK. In this particular case, in a regulated industry where at least the rates charged to the consumers are controlled by the FPC, expenditures that are made in their system on behalf of safety are reflected in their rate base, which is then charged to the public; is that correct?

Mr. WHITE. Absolutely. Yet as we say, there is strong pressure to hold down rates. There is competition from electricity and other types of fuel. Businessmen really look to hold down expenses, and properly so. I don't know that we have ever rejected any application for an item to be included in the rate base for safety reasons on the grounds that it was improper. I don't think we ever would.

Senator DOMINICK. Do you have any estimate, or has the Commission been in a position to form any estimate, of what the effect of passage of this legislation would be with respect to rates to consumers?

Mr. WHITE. No, sir. We have a little study going on what we expect might be the cost of implementing any regulations. But it is extremely speculative. We honestly today don't know what the regulations would be.

I think it might be fruitful for us to submit to the committee whatever studies we do have on this matter. I would have to indicate that we know, at least we sense, that there will be some increased costs. But you can appreciate how difficult it is to be very confident in your predictions in this kind of an area.

Senator DOMINICK. One more question. You say that these mandatory standards that you would put in would be applicable to all pipe-

lines. Is there a difference in technology, desirable or required, because of the terrain which the line crosses? In other words, in our own Rocky Mountain area, we are liable to be faced with different situations than you would be in crossing the swamps of Louisiana.

Mr. WHITE. Your question is a very valid one. I don't think that the commission contemplates uniform standards in the sense that they would apply universally across the country regardless of terrain, population density, and other factors.

What we are talking about really is a minimum standard that would be adapted to the particular needs of the geographical area, taking into account topography and every other consideration. This is one reason, in response to an earlier question, that I indicated that I thought that State participation in this made some sense because they are better able to take their situation into account.

Senator DOMINICK. Your thought is that this still wouldn't effect the competitive relationship between the companies because, where you did have different standards, presumably they would be applicable to all companies operating in that geographical area; is that correct?

Mr. WHITE. Yes; that's correct. I can't conceive of one set of standards applying to company X and a different set to company Y who serve the same markets or pass through the same area.

Senator DOMINICK. The obvious difficulty that I can see with that is that a company goes through the southern part of the United States to Los Angeles, and another company picks up the gasfields in Wyoming or Colorado and puts them across the mountains, by the time you get to Los Angeles you have a different price structure.

Mr. WHITE. Indeed it may have to go that way. That is just the luck of the "lie" so to speak. I don't think we could be expected in our society to say that you would require the southern line, to take your illustration, to be built to artificially strict standards only to give them a competitive equality.

Senator DOMINICK. I just raised that because I can see this is a problem, as one of the things that they will bring up.

Mr. WHITE. For all I know it may be cheaper as far as construction costs go to send gas from the Rocky Mountains, Senator.

Senator LAUSCHE. It strikes me that the principal issue before us is the aspect of your bill that would give the Commission the power to issue orders operating retroactively. I want to question you on that subject solely for the purpose of getting information into the record.

You state that there are now over 150,000 miles of high pressure natural gas transmission pipelines, operated by companies under the jurisdiction of your Commission; is that correct?

Mr. WHITE. Yes, sir.

Senator LAUSCHE. And that there are 50,000 additional miles that do not come within your jurisdiction.

Mr. WHITE. Yes, sir; that is correct.

Senator LAUSCHE. When was the first pipe laid in the 150,000 category, subject to your jurisdiction?

Mr. WHITE. I assume this is pipe which has been in the ground for an awful long time, perhaps as long ago as the 1890's or 1900's.

Mr. WATERS. The lines that have been laid, of course, long before the jurisdiction of the Federal Power Commission was assigned authority over natural gas under the Natural Gas Act.

Senator LAUSCHE. When did you get jurisdiction?

Mr. WHITE. 1938.

Senator LAUSCHE. Do you have any records here showing what the mileage of the pipelines was in 1938 that came within your jurisdiction?

Mr. WATERS. I believe we do, Senator.

Senator LAUSCHE. I then assume that you have records showing what the expansion of the lines was since 1938, annually?

Mr. WATERS. Yes, sir; that's correct, we do.

Senator LAUSCHE. I would want placed in the record the mileage that was under jurisdiction in 1938, and how it expanded each year thereafter.

Mr. WHITE. That will be very easily supplied, Senator.

Senator LAUSCHE. Do you know whether any of the pipe has been removed, that is, replaced, since 1938?

Mr. WHITE. Oh, yes.

Senator LAUSCHE. In large line quantities?

Mr. WHITE. The answer to that is "Yes." Some pipe has been replaced. I think it would be a comparatively easy matter to give you the figures on that because all of those pipelines that were replaced had to be with the approval and the certification of the FPC. So our records will bring you that information rather readily.

Senator LAUSCHE. I believe that that statistic also ought to be placed in the record.

Mr. WHITE. We will so do, Senator.

(The following material was subsequently submitted:)

FEDERAL POWER COMMISSION,  
Washington, D.C., October 20, 1966.

HON. WARREN G. MAGNUSON,  
Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: During my testimony on S. 1553 August 29, 1966, Senator Lausche asked me to supply for the record a list showing the expansion of pipeline mileage under FPC jurisdiction since 1938 (transcript page 103). The table below shows such mileage as of the end of each year since 1942 when the FPC was assigned its present certificate jurisdiction and when it began collecting such statistics. From 1938 to February 7, 1942, the Commission's jurisdiction over new pipeline construction was limited to competitive service proposals and only four certificates were issued, totaling 124.5 miles of pipe.

Year:	Installed mileage	Year—Continued	Installed mileage
1942 -----	57, 418	1954 -----	105, 639
1943 -----	( <sup>1</sup> )	1955 -----	110, 101
1944 -----	60, 947	1956 -----	115, 272
1945 -----	61, 132	1957 -----	118, 688
1946 -----	62, 307	1958 -----	121, 119
1947 -----	70, 413	1959 -----	128, 281
1948 -----	73, 041	1960 -----	135, 549
1949 -----	79, 867	1961 -----	139, 276
1950 -----	85, 981	1962 -----	142, 589
1951 -----	98, 984	1963 -----	145, 786
1952 -----	105, 350	1964 -----	149, 770
1953 -----	109, 870	1965 -----	154, 378

<sup>1</sup> Not available.

The 1954 decrease in jurisdictional mileage from the prior years reflects the exempting effect of the Hinshaw amendment of March 27, 1954, to the Natural Gas Act. Mileage figures from 1957 to 1965 are those of jurisdictional Class A and B companies, which account for more than 99 percent of the sales by all

interstate natural gas pipeline companies under rates subject to Commission jurisdiction.

Senator Lausche also requested that I submit for the record the amount of pipe under FPC jurisdiction replaced since 1938 (transcript pages 103-104). The Commission does not have completely accurate data on such pipe but we estimate the pipe replaced since 1942, the first year the FPC had its present jurisdiction over pipelines, as approximately 10,028 miles.

The 10,028 miles of replacements represents the difference between total miles authorized by the FPC to be constructed and the actual increase in mileage under Federal Power Commission jurisdiction.

Between 1942 and 1965 the Commission authorized the construction of 106,988 miles of new pipeline (after excluding 13,495 miles of authorized construction subsequently exempted by the Hinshaw amendment). During that period, total pipeline mileage under FPC jurisdiction increased by only 96,960 miles. The difference, of 10,028 miles, we estimate to be the new construction which replaced older pipe. This replacement mileage amounts to about 10 percent of total construction for the period.

Our estimate of 10,028 miles is not precise and may understate replacement as some pipe has been replaced under section 2.55 of the Commission's rules which provide for replacement without certificate if pipe of the same size and capacity is installed. On the other hand, some pipe had been authorized but was not in operation as of the end of 1965. To obtain precise figures, the Commission would have to survey the companies involved.

Sincerely,

CARL E. BAGGE

(For Lee C. White, Chairman).

Senator LAUSCHE. Also submit for the record whatever studies you have made, and the conclusions reached about the potential cost of this program in the event it is put into effect, giving you jurisdiction to issue retroactive orders.

Mr. WHITE. I am sure it is extremely tentative, but we will submit whatever we do have, Senator.

(The following material was subsequently submitted:)

FEDERAL POWER COMMISSION,  
Washington, D.C., January 19, 1967.

HON. WARREN G. MAGNUSON,  
Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: During my testimony on S. 1553 on August 29, 1966, I indicated I would provide whatever information we could on the cost of an interstate pipeline safety program in the event it included authority to issue retroactive orders applicable to pipe in the ground. As I stated then, any such evaluation is difficult and must be extremely tentative because the specific standards which the Federal government might promulgate have not been established nor has any survey been made of the degree to which pipe in the ground owned by the various pipeline companies conforms to any particular standard. Nonetheless, our staff is developing some estimates which might be of general guidance to the committee. This has proven to be a most difficult and time-consuming assignment, and the studies are not yet completed. We shall, of course, submit them to you at the earliest possible date.

Sincerely,

LEE C. WHITE, *Chairman.*

Mr. WHITE. Commissioner Bagge asked if he might have a few words.

Senator LAUSCHE. Go ahead.

Mr. BAGGE. I would like to supplement the chairman's response pertaining to the question of self-regulation; that is, how will such self-regulation continue if safety regulations are promulgated by the Commission.

One of the economic factors operating in this field is that prescription of a code by a regulatory agency tends to enforce by itself con-

formity with that code because of the problem with respect to third parties—public injury.

Having had some experience as a lawyer for a regulated industry, I know this operates as a realistic factor. That is an additional reason why we don't think that we will be faced with a very strong problem of policing these codes.

The second point I would like to make, in response to your question, Mr. Chairman, was to be more specific about what kind of amendment we would propose. Speaking only for myself, I would think, since the matter was brought up generally, that the inclusion of the term "minimum" in the bill as it is presently drafted would make it abundantly clear as the simplest kind of revision which could be made that this is an area which could be regulated by both the Federal Government as well as the States.

Senator LAUSCHE. Anything further?

Mr. BAGGE. No.

Mr. WHITE. No, Mr. Chairman.

Senator LAUSCHE. Senator Dominick is not here. He commiserated over the fact that the States had 74 inspectors in the coal mines and the Federal Government took it over, and those 74 jobs will be lost. They will not be lost. There will be more than 74 jobs. There will be multiple times more by the time the bureaus and the agencies get through operating.

I just wrote down this note. There was an undeviating practice, tantamount nearly to a law, resulting in an expansion of the number of employees in the governmental agencies and bureaus, whether they are needed or not needed.

When we get through operating, through the evolution of our agencies, having within themselves an elan which states you must put on more and more workers, there will be many more on the Federal payroll than would have been on the State payroll.

Thank you, gentlemen.

Mr. WHITE. Thank you, Mr. Chairman.

Senator LAUSCHE. Mr. Francis?

**STATEMENT OF J. DAVID FRANCIS, CHAIRMAN, COMMITTEE ON GAS, NATIONAL ASSOCIATION OF RAILROAD & UTILITIES COMMISSIONERS; ACCOMPANIED BY E. C. O'REAR II, DIRECTOR OF ENGINEERING, KENTUCKY PUBLIC SERVICE COMMISSION; NORMAN A. MORK, CHIEF, GAS BUREAU, NEW YORK PUBLIC SERVICE COMMISSION; KENT A. BROWN, COUNSEL, NYPS, AND CHAIRMAN OF SUBCOMMITTEE OF STAFF EXPERTS, COMMITTEE ON GAS, NATIONAL ASSOCIATION OF RAILROAD & UTILITIES COMMISSIONERS; AND EVERETTE KREEGER, ASSISTANT GENERAL COUNSEL, NATIONAL ASSOCIATION OF RAILROAD & UTILITIES COMMISSIONERS**

Mr. FRANCIS. I have four gentlemen with me that I would like to have accompany me to the witness table.

Senator LAUSCHE. All right.

Mr. FRANCIS. Mr. Chairman, my name is J. David Francis. I am a member of the Kentucky Public Service Commission and chairman of

the Committee on Gas of the National Association of Railroad & Utilities Commissioners—and I will refer to them as “NARUC”—and appear here today at the invitation of your chairman in the latter capacity.

I would like to introduce the gentlemen with me at the witness table. On my extreme left is Mr. E. C. O’Rear, who is chief of the Department of Engineering of the Kentucky Public Service Commission.

On my immediate left is Mr. Norman Mork, chief of the Gas Bureau of the New York Public Service Commission.

At my immediate right is Mr. Kent Brown, who is the counsel for the New York Public Service Commission.

All three of these gentlemen are members of the Committee of Gas Experts of the Committee of Gas of NARUC.

On the extreme right is Mr. Everette Kreeger, who is the assistant counsel of NARUC.

The membership of that NARUC comprises each of the State utility rate and service regulatory commissions of this country. Included, of course, are all such authorities which exercise regulatory supervision over gas corporations and their facilities within each State.

Under authority of the Executive Committee of the NARUC, I appear here today to urge deferral of action by this committee looking toward the enactment of S. 1553 or any modification or counterpart thereof. I shall briefly state my reasons therefor but, preliminarily and by way of background, beg leave to advise of the activities of the NARUC’s Committee on Gas in the important and vital domain of safety of natural gas transmission facilities.

#### RECENT ACTIVITIES IN THE FIELD

Prompted in large measure by the tragic Natchitoches, La., gas pipeline explosion in March of last year and the pendency of the instant measure (S. 1553) before your honorable committee, the NARUC Committee on Gas, at my instigation and request immediately launched a survey of the State regulatory commissions in order to ascertain the nature, scope, and effectiveness of State safety requirements respecting gas pipeline facilities, both intrastate and interstate. The results of that survey, entailing responses by 51 of the 52 regulatory commissions involved, are reflected in a report filed with this committee under date of August 26, 1965, and appear in the report of the proceedings of the 77th Annual Convention of the NARUC, appended to the report of the committee on gas, at page 292.

Thereafter, our committee launched a supplementary study among the States, pertaining to accidents or substantial pipeline failures and State commission inspection procedures. While the latter survey was in progress, our committee was requested by your chairman to distribute a questionnaire concerning ASA Code B31.8 among those States which had substantially adopted that code, to collect the responses and forward them to your committee. We duly complied with that request and submitted the responses on May 6, 1966.

Simultaneously, as you are well aware, your committee had requested the Federal Power Commission to report on the extent of this safety problem; that is, the accident record, the extent of injury or damage

resulting from ruptures in pipeline facilities, the vintage of the lines and other available information respecting causes of such accidents.

Senator LAUSCHE. Then they have supplied statistical information in a measure dealing with the request that I made a moment ago?

Mr. FRANCIS. It is contained in that report of the Federal Power Commission, under date of April 19, 1966, yes, sir; presented to your committee by the Federal Power Commission.

Senator LAUSCHE. In those reports, the vintage of the lines are there?

Mr. FRANCIS. I think that is in there; yes.

Senator LAUSCHE. Proceed.

Mr. FRANCIS. In addition, observing that: "Should S. 1553 be enacted, the responsibility for the inspection and policing of gas pipeline safety standards would remain with the States," your chairman asked the FPC to evaluate present State inspection and policing procedures. The FPC's response to that request was submitted to your committee on March 25, 1966, and published under date of April 19, 1966. This is the document I referred to a moment ago.

In substance, it reflects considerable depreciation of the scope and effectiveness of the ASA Code and of State or State commission safety regulation in this area. Of course, as you might suspect, we do not concur with the FPC in the extent and degree of its depreciation or criticism of the industry code or of State safety practices, though we readily concede the need for improvement in both.

Having, as a result of our own preliminary surveys, convinced ourselves of this need for improvement—prior to promulgation of the FPC's report to this committee—our committee on gas charged its subcommittee of staff experts with the task of evolving and composing a suggested code or compilation of model rules pertaining to safety of gas transmission facilities for the consideration of each State regulatory agency charged with such functions. The committee of staff experts, comprising some of the most knowledgeable and experienced engineers on the staff of such State public utility commissions as New York, California, Wisconsin, Kentucky, and others, reflecting the experience of years in the administration of effective gas transmission safety codes long in effect in such States, immediately assumed and promptly discharged its assignment. Having before it the existing safety rules of every State commission and a list of suggested changes in the ASA B-31.8—1963 Code compiled by the staff of the Federal Power Commission, and working with that code, our staff committee went through the latter, section by section, and evolved proposed changes therein. A copy of the staff committee's proposals is appended to this statement. I shall not here dwell on the technical aspects of those proposals. The design thereof is twofold:

First, to convert the "voluntary" or "advisory" industry code into mandatory rule or regulation form; and secondly, to strengthen its specification of standards for allowable operating pressures, testing procedures, operation, and maintenance, prevention of corrosion, the improvement of older installations, et cetera.

The appended product of our staff's effort was submitted to our committee at a meeting in Milwaukee, Wis., last month, approved by the committee and, in turn, submitted by me to the executive committee

of the NARUC, seeking its authorization to distribute the proposed supplementary modifications of the ASA Code to all State commissions with the following recommendations:

- (1) That each State adopt as a minimum the ASA B31.8 Code; and
- (2) Simultaneously or supplementarily, that each State consider effecting the proposed modifications evolved by our staff.

The executive committee of NARUC on July 21, 1966, extended such authorization and approved both recommendations. A copy of its resolution so doing is also appended to this statement.

Immediately thereafter, communications were addressed by me to the chairman of every State commission in the country and similar communications were addressed by the chairman of our committee of staff experts, Mr. Brown, to the supervisory staff personnel of each such commission. Both communications urged serious and prompt consideration by each such State regulatory agency of the recommendations which the executive committee of our association has approved.

The responses so far received have been most heartening. Based thereupon, I can assure this committee that the reflection contained in the FPC's report to this committee of March 25, 1966, respecting the extent and effectiveness of State regulation of the safety of gas transmission facilities is already out of date and is no longer accurate. For example, two additional States, Wyoming and your State, the State of Ohio, have already adopted the ASA Code as State rule or regulation. Many others are in the process of doing so. Many which had already done so have resolved to adopt or adapt many of the supplemental modifications of that code which our staff committee evolved. In addition, those modifications are, I am informed, receiving careful consideration and analysis by the ASA Code Committee itself, the American Gas Association, the Independent Natural Gas Association of America and other interested industry, engineering and research groups and agencies.

#### NARUC'S POSITION WITH RESPECT TO S. 1553

As the appended resolution adopted by the executive committee of NARUC on July 21, 1966, indicates, it is opposed to the adoption of S. 1553 as it presently pends before you. I shall advise of the reasons therefor briefly.

In its 1965 annual report to Congress, the FPC noted that in its 1964 report it had observed, respecting the then-pending counterpart of S. 1553, that: "\* \* \* high pressure interstate pipelines 'necessarily present elements of hazard and, in the absence of adequate and uniform State laws, every practicable step should be taken by the Federal Government to protect the public from inherent dangers,' and legislation is warranted even though 'the pipelines in general are doing a good job in safety' " (1965 FPC report, p. 5).

Of course, high pressure gas transmission lines present elements of hazard. They always will—Federal legislation or no Federal legislation, State promulgated safety standards or no such standards. Accidents are bound to happen. Only the potential thereof may be minimized. Far and away the greatest cause of gas pipeline ruptures, for instance, is punctures by plows, bulldozers, excavating shovels,

road graders, and the like. In all likelihood, this will continue to be the case simply because many who ride bulldozers, et cetera, are oblivious even in the face of all kinds of warning signs. Such, or any single such event, provides no reasonable basis for hysteria, scapegoat publicity orgies or Federal agency empire building.

The next observation by the Federal Power Commission above quoted, respecting the inadequacy of State laws and rules pertaining to gas transmission pipeline safety, was, we concede in all candor, accurate to a degree. While many States have done an excellent job in this respect, others, regretfully, have not. But, as I have already indicated, this state of affairs may be and is being rectified in and by those States wherein improvement is called for. What we seek is an adequate opportunity to demonstrate that, in this instance, at least, no foundation for a Federal empire may be found in the ashes of State remissness.

The FPC's next-quoted criticism, respecting the lack of uniformity among extant state laws and rules on the subject, is not, in any event, a valid critique.

Chairman White touched on this in his statement. I think we would be in agreement that at least complete uniformity is not practical, engineeringly feasible, nor sensible. Variance—I think Senator Dominick asked a question on this—variance in such matters as terrain, soil conditions, density of population, concentration of structures, et cetera, from State to State—or from area to area within a State—must be productive of variations in any prescription of gas transmission facility safety standards.

It is with respect to the FPC's conclusion that every practicable step should be taken by the Federal Government "to protect the public from inherent dangers" of this nature, however, that NARUC takes principal exception. Until it is demonstrated that the States have not, cannot or will not discharge their responsibilities to their own people in this regard, we feel strongly that there is no occasion for Federal intrusion. Obviously, the pipeline companies themselves have a vital concern in the safety of their installations. Even the FPC concedes that they are "doing a good job" in this respect. With the added supervision, inspection and policing provided or to be provided by respectable State safety codes, we feel that there will be no need for the enactment of S. 1553 or any counterpart thereof. If we are to continue to "inspect and police" gas pipeline transmission facilities, we would prefer to do so under our own rules and regulations geared to the problems of each of our own domains.

It is for this reason that we urge your committee to defer consideration of its approval of the measure pending before you for a reasonable period of time, say, 1 year, and permit us to report to you our progress—or lack of progression improving the image of State commission regulation in this field, perhaps at the next session of the Congress. We feel confident, at this juncture, that we will then be in a position to advise of impressive improvement in this respect.

In any event—and this is something that Chairman White touched on in his testimony on page 26—in any event, and quite apart therefrom, assuming that now or ultimately there is deemed to be a sufficient impetus for the enactment of the measure before you, minimally we urge upon you the necessity for its amendment specifically and pre-

cisely to preserve unto the States the authority which both your chairman and the principal proponent of the measure, the Federal Power Commission, have professed to wish to retain, that is, State authority to impose regulations additional to or more rigorous than any "minimum" standards which the FPC might promulgate under and pursuant to this measure or some counterpart thereof. As it presently pends before you, there is no reflection of this expressed design or intent. It would be a simple matter to state it. We respectfully request that this be done before any further consideration is given to the measure by your honorable committee.

On behalf of the National Association of Railroad & Utilities Commissioners, its executive committee, and its committee on gas, I thank you for your courtesy, your consideration of our views and the opportunity to appear before you today to express them.

(The resolution referred to and proposed supplement follow:)

#### RESOLUTION

Whereas, There is pending in Congress S. 1553, H.R. 5872, regarding safety regulations affecting interstate pipelines; and

Whereas, The Committee of Staff Experts of the Committee on Gas of NARUC has carefully studied the pending bills, the necessity therefor, the present status of safety regulations promulgated and now being enforced by the various states, the fact that there is now in existence a Sectional Committee B31 of the American Standards Association which is constantly and continuously studying the matter of pipeline safety and that such committee has promulgated a code which is available for use either as written or as amended or supplemented by the various states; and

Whereas, The Committee of Staff Experts has prepared a proposed supplement to the ASA B31.8 Code to be sent to the various states: Now, therefore, be it

#### *Resolved—*

1. That the Executive Committee of NARUC is greatly interested in safety regulation but is opposed to the adoption of S. 1553, H.R. 5872 as presently drafted.

2. That the Executive Committee authorize the Committee on Gas to distribute the proposed supplement to all state commissions with the recommendation that each state adopt as a minimum the ASA B31.8 Code and consider effecting the proposed modifications contained in the recommended supplement insofar as they might be applicable to each individual state.

3. That the Executive Committee authorizes the Gas Committee to distribute copies of the proposed supplement to ASA, INGAA, AGA, and any other appropriate industry organizations and solicit their views.

Submitted by NARUC Committee on Gas.

J. DAVID FRANCIS, *Chairman.*

Adopted July 21, 1966, Milwaukee.

#### STAFF SUBCOMMITTEE OF NARUC GAS COMMITTEE PROPOSED SUPPLEMENTARY MODIFICATIONS OF "ASA B31.8-1963-GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS" WITH RESPECT TO TRANSMISSION FACILITIES INTENDED TO BE OPERATED AT 100 P.S.I. OR MORE

At this time, changes are not being proposed with respect to facilities intended to be operated at less than 100 psi. This pressure segregation is based upon an existing distinction in 841.43 and 841.44 of ASA B31.8-1963.

AUGUST 1966.

#### PROPOSED CHANGES IN ASA B31.8-1963

1. 804.6—Delete entire paragraph and substitute:

"(a) Every gas corporation transmitting gas by any pipeline intended to be subjected to pressures in excess of 100 psig shall:

"(1) within 90 days from the date of service of this order file with the Public Service Commission a statement verified by an officer, setting forth the respects

in which such pipeline and its appurtenances conform or do not conform, as the case may be, to the standards, requirements and safeguards enumerated in this Code. Such statement shall be based upon records of the gas corporation, including records of tests, specifications or other available data, and upon current investigations and surveys, not requiring excavation or interruption of service.

"(2) In each instance where any gas corporation required by paragraph (1) to file a verified statement claims that it is not possible or practicable to obtain the necessary data to prepare the same, a verified statement setting forth such claim shall nevertheless be filed within the period required by paragraph (1), and the basis for such claim shall be set forth in such verified statement.

"(3) In each instance in which the verified statement required to be filed by this section states that any portion of such pipeline or its appurtenances does not conform to the standards, requirements and safeguards enumerated in these rules or that it is not possible or practicable to obtain the necessary data to prepare such a statement, the verified statement shall state whether or not in the opinion of the officer verifying the same, such portion of pipeline and its appurtenances is in safe operating condition.

"(b) In each instance where it is stated that such pipeline or its appurtenances or any portion thereof is in safe operating condition, the basis for such statement shall be set forth including the operating conditions under which the opinion is expressed, and such verified statement may be accompanied by an application of the gas corporation to the Public Service Commission for an exemption from the application of the rules herein enumerated."

2. 821.3—Delete first sentence and substitute "Each utility shall establish and qualify a welding procedure for sound and ductile welds."

3. 826.1—On lines 5 and 6, change "be advisable" to "be required."

4. 827.1—On lines 5 and 6, delete "may" and change "be advisable" to "is required."

5. 828.1—In the title, insert, on line 2 after "at", "Both Less Than 100 psi and". On line 4, change "should" to "shall".

6. 828.2—In the title, on lines 2 and 3, delete "20% or More of the Specified Minimum Yield Strength" and substitute "100 psi or More".

7. 828.2(a)—On line 1, change "should" to "shall". Delete from "or" on line 2 to "company" on line 3.

8. 828.2(b)—Delete lines 4 and 5, change ";" at the end of line 3 to "." and substitute the following for the deleted material:

"The following minimum percentage of welds selected by the operating company on a random basis from each day's construction shall be examined over the entire circumference of the pipe except for minor relocations and minor reconstruction:

"10% of welds in Class 1 locations;

"15% of welds in Class 2 locations;

"40% of welds in Class 3 locations;

"100% of welds in Class 4 locations;

"100% of welds in major or navigable river crossings, major highway crossings, railroad crossings and all tie-in sections."

9. 829.9(d)—Change "It is recommended that all such areas" to "All such areas shall".

10. 831.11(b)—In last sentence, change "may" to "shall".

11. 841.011(a)—Change "12" to "5".

12. 841.011(b)—Change "20" to "10".

13. 841.012—On line 5, change "20" to "10" and, on line 6, change "12" to "5".

14. 841.013—In line 2, insert "legally" after "areas". In lines 3 through 6, delete from ", at" to "and". Delete last sentence. Thus changed, the paragraph reads

"Class 3 Locations: Class 3 locations include areas legally subdivided for residential or commercial purposes where a Class 4 classification is not called for."

15. 841.014—Delete entire paragraph and substitute the following:

"Class 4 Locations: Class 4 locations include each city and incorporated village and the adjacent areas in which there is a substantially equivalent population density or in which a significant increase in population density can reasonably be expected."

16. 841.016—On line 7, change "should" to "shall" and delete second paragraph.

17. Change omitted.

18. 841.16 (b)—Delete entire paragraph and substitute

"Whenever conditions permit, gas pipelines within Class 4 locations shall be laid with a cover of not less than 36 inches above the top of the pipe."

19. 841.16 (c)—Delete entire paragraph.

20. 841.16 (d)—Re-number to 841.16 (c).

21. 841.16 (e)—Re-number to 841.16 (d) and, on lines 3 and 4 change "or bridged" to "bridged or designed to withstand any such anticipated external loads".

22. 841.16 (f)—Re-number to 841.16 (e) and delete all but the first sentence.

23. 841.161—On lines 2 and 3 change "There should be at least 2 inches clearance wherever possible" to "Whenever conditions permit, there shall be at least 12 inches clearance" and, on line 5, delete "not used in conjunction with the pipeline or main".

24. 841.173—Delete entire title and paragraph and substitute:

"Corrosion control (a) Every gas corporation shall make a proper investigation to determine whether any gas pipeline to be operated requires corrosion protection and if so required, a recognized method or combination of methods shall be followed including coating with protective material, the application of cathodic current and the installation of galvanic anodes and electrical insulation by sections.

"(b) Whenever any gas corporation finds upon such investigation that corrosion protection of gas pipelines is not needed, such corporation shall submit to the Public Service Commission a report setting forth good and sufficient reasons why such protection is not required, such report to include the results of soil tests and other supporting data.

"(c) Whenever pipe coating is applied, the following additional precautions shall be taken:

"(1) Tests and inspections shall be made before backfill to insure that the coating is adequate and satisfactory.

"(2) During backfill, precautions shall be taken to insure that the coating is not damaged.

"(3) On completion of the backfill, proper tests shall be made to ascertain that the coating is adequate and satisfactory.

"(d) In addition to the foregoing, every gas corporation shall make periodic inspections and tests of any gas pipeline at reasonable intervals to determine whether or not the pipe metal is adequately protected against corrosion."

25. 841.21—On line 4, change "Preferably the" to "The" and, on line 6, change "should" to "shall".

26. 841.222—On line 4, change "should" to "shall" and delete "either" and, on line 5, change "or" to "and".

27. 841.241 (a)—On line 6, change "recommended" to "required".

28. 841.241 (c)—On line 1, change "should" to "shall".

29. 841.271—On line 2, change "should" to "shall".

30. 841.273 (a)—On line 1, change "should" to "shall".

31. 841.273 (b)—On line 2, change "should" to "shall".

32. 841.283—One line 1, change "should" to "may".

33. 841.284—On line 6, change "suggested" to "required".

34. 841.285 (a) and 841.285 (b)—Delete from "the" on line 2 of 841.285 (a) through "feasible", on line 5 of 841.285 (b). One line 5 of 841.285 (b), change "should" to "shall". Combine remaining material under 841.285 (a). As thus changed, 841.285 (a) reads

"When a pipeline or main full of air is placed in service, a slug of inert gas shall be introduced to prevent the formation of an explosive mixture at the interface between gas and air. Other suitable precautions may be taken in the case of either pipelines operated at pressures under 100 p.s.i.g. or pipelines having a diameter four inches or less. Nitrogen or carbon dioxide can be used for this purpose."

35. 841.285 (c)—Re-number as 841.285 (b). On line 4, delete "air", and, on line 5, insert "a slug of" after "with".

36. 841.285 (d)—Re-number as 841.285 (c). At the very end of the last sentence, add "and appropriate precautions shall be taken".

37. 841.31—At the very end, add "However, welds on tie-in sections of pipe shall be inspected and tested as required in 828.2."

38. 841.412(a)—On line 2, delete “either” and change “gas” to “water”. On line 3 change “1.1” to “1.25”. Delete from “or” on line 3 through “pressure” on line 5.

39. 841.412(b)—On line 2, delete “either”, insert “or water” after “air” and change “1.25” to “1.50”. Delete from “or” on line 3 through “pressure” on line 4.

40. 841.412(c)—On line 3, change “1.4” to “1.50”.

41. 841.412(d)—Change table, as follows:

“TABLE 841.412(a).—*Test requirements for pipelines and mains to operate at hoop stresses of 30 percent or more of the specified minimum yield strength of the pipe*”

“Location class (1)	Permissible test fluid (2)	Prescribed test pressure minimum (3)
1.....	Water.....	1.25Xmaximum operating pressure.
	Air.....	Do.
2.....	Water.....	1.50Xmaximum operating pressure.
	Air.....	Do.
3.....	Water.....	Do.
4.....	do.....	Do.

“NOTE.—If an operating company decides that the maximum operating pressure will be less than the design pressure a corresponding reduction in prescribed test pressure may be made as indicated in col. 3. However, if this reduced test pressure is used the maximum operating pressure cannot later be raised to the design pressure without retesting the line. See 845.22 and 845.23.”

42. Add as 841.412(e)—“Test pressure shall be maintained until the pressure has stabilized in all portions of the test sections. In no event shall the duration of the test be less than 24 hours following such stabilization except that, in the case of a short length of pipeline, main or piping which has not been backfilled prior to the test where, throughout its entire length, its entire circumference can be readily examined visually for the detection of leakage, the duration of the test shall be not less than 4 hours following such stabilization.”

43. Add as 841.412(f)—“Where water is utilized as the test medium, adequate provisions shall be made for disposal of the water and steps shall be taken to guard against contamination of local water supply.”

44. 841.413(c)—On line 1, change “1.1” to “1.50”. Delete from “and” on line 2 through “apply” on line 4.

45. 841.416—Delete in entirety.

46. 841.42—Change as shown below (underscored matter indicates italics):

“Tests required to prove strength for pipelines and mains to operate at less than 30% of the specified minimum yield strength of the pipe, but in excess of 100 p.s.i. Steel piping that is to operate at stresses less than 30% of the specified minimum yield strength<sup>1</sup> shall be tested in accordance with Table 841.412(d), except that gas or air may be used as the test medium within the maximum limits set in Table 841.421.

“TABLE 851.421.—*Maximum hoop stress permissible during test, percent of specified minimum yield strength*”

“Location class	1	2	3	4
Test medium:				
Air.....	<sup>1</sup> 75	75	50	40
Gas.....	<sup>1</sup> 30	30	30	30 <sup>2</sup>

<sup>1</sup> Material added at this point.

47. 846.21(d)—Delete last sentence and substitute “Automatic valves shall not be installed on any gas pipeline except where the particular circumstances are such as to show that such valves will contribute to safer operation.”

<sup>1</sup> Material deleted at this point.

48. 850.4—On line 2, change “should” to “shall”.

49. Add as 850.5—

*“850.5 Changes in Population Density*

“850.1 Where observed increases in population density in the vicinity of existing steel pipelines operating at hoop stress levels in excess of 40 per cent of minimum yield indicate a probable change in location class since the original installation or where detailed population index surveys or other studies indicate that the construction type for such existing pipelines is not commensurate with the existing location class, a study shall be initiated to determine the following:

“(a) The design, construction and testing procedures followed in the original construction and a comparison of such procedures with the applicable provisions of this Code.

“(b) The actual physical condition of the pipeline to the extent that this can be ascertained from available records.

“(c) Operating and maintenance history of the pipeline.

“(d) The maximum actual operating pressure and operating hoop stress level in the section of the pipeline directly affected by the location class change.

“(e) The actual area affected by the observed population density increase and physical barriers or other factors which may limit the further expansion of the more densely populated area.

“850.52 If the results of the study described in 850.51 indicate that further verification of the established operating pressure is necessary, the section directly affected by the location class change shall be retested in the same manner as a new pipeline would be if it were to be installed in accordance with this Code in the same location. If the section directly involved is retested as provided herein, no change need be made in the operating pressure levels. If the section directly involved cannot be taken out of service for the purpose of a retest, then the maximum actual operating pressure shall be reduced sufficiently to limit the hoop stress level to the maximum values permitted under this Code for new pipelines in the same location.

“850.53 No change is required in the operating pressure levels of existing pipelines after the completion of the study described in 850.51 if the section of the pipeline affected by the location class change is in satisfactory physical condition and if:

“(a) The section directly affected was tested on some previous occasion at pressures equal to or higher than the minimum pressures specified for new pipelines having the same maximum allowable operating pressure in the new location class; or

“(b) The maximum actual operating pressure (taking pressure drop into account) in the section directly affected is such that the resulting hoop stress level is equal to or less than that permitted for new pipelines in the same location.

“850.54 Whenever any planned repairs or planned replacements of sections of pipe are scheduled in areas where the location class has changed, the design construction and testing procedures shall be those specified for the new pipelines in the same location class.”

50. Add as 850.6

“850.6 Periodic Studies. Periodic studies, the nature and extent of which shall first be submitted to the Commission for its approval, shall be conducted with respect to all facilities intended to operate at 100 psi or more at intervals of not more than 10 years, and any requisite modifications to effect compliance with the specifications for new lines in the location class involved shall be made.”

51. 851.1—On lines 2 and 10, change “should” to “shall”.

52. 851.2—On lines 2 and 6, change “should” to “shall”.

53. 851.3—On lines 4 and 8, change “should” to “shall”.

54. 851.4—On lines 1 and 6, change “should” to “shall”.

55. 851.5—On lines 1, 3 and 6, change “should” to “shall”.

56. 861—Delete entire paragraph and substitute:

“861 ODORIZATION.

“861.1 Any gas distributed to customers through gas mains or gas services, used for domestic purposes in compressor plants or transmitted through Class 3 or Class 4 locations shall have a distinctive odor of sufficient intensity so that the presence of the gas may be detected down to a concentration in air of not over  $\frac{1}{2}$  the lower limit of combustibility. Whenever necessary to maintain

this level of intensity, a suitable odorant shall be added in accordance with the specifications in 861.2, 861.3 and 861.4.

"861.2 Odorants in the concentrations used shall be :

"Harmless to humans

"Noncorrosive to steel, iron, brass, copper and leather

"Not soluble in water to an extent greater than 2.5 parts

"by weight of odorant to 100 parts by weight of water.

"861.3 Odorizing equipment shall be designed to maintain a reasonably uniform level of odor in the gas.

"861.4 Each utility shall make periodic checks to determine that a proper level of odorization is maintained."

57. Add as 870-

"870 REPORTS AND RECORDS.

"871 REPORTS OF ACCIDENTS

"871.1 Accidents occurring on gas pipelines causing injury or death to any person or persons or damage to property shall be reported to the Public Service Commission within three days by the respective gas corporation. Each report shall give an exact and detailed description of the accident and its cause, supplemented by a sketch if such makes the explanation clearer, together with a statement of the extent of injuries to persons and damage to property and equipment and the action taken to prevent similar accidents in the future. The corporation shall also file a supplemental report where the accident results in the death of any person occurring subsequent to the first report and within 10 days of the accident.

"871.2 Every such corporation shall file with this Commission, on or before the 10th day of each month, a summary report covering the accidents that occurred during the preceding month. If no accident occurred within the month, such a report shall, nevertheless, be filed.

"871.3 In addition to the written reports hereinbefore required, immediate notice by telephone or telegraph shall be transmitted to the Public Service Commission giving notice of the place and general nature of each accident resulting in death or any injury requiring hospitalization.

"871.4 Every gas corporation operating a gas pipeline in this State shall file, with this commission and all municipalities within which such gas pipelines are located, the names, addresses, and telephone numbers of responsible officials of such gas corporations who may be contacted in the event of an emergency. In the event of any changes, immediate notification thereof shall be given to this commission and such municipalities.

"871.5 Each report here directed to be filed shall be signed by a duly authorized officer of such corporation.

"872 REPORTS OF INTERRUPTIONS TO SERVICE.

"872.1 Interruptions to the service furnished by any gas pipeline or the failure of any major equipment thereof shall be reported to the Public Service Commission. This requirement shall not apply to interruptions to service made by gas corporations in accordance with the provisions of contracts between such corporations and their customers.

"872.2 The reports shall be filed with the commission weekly, not later than Wednesday of the week following that for which the report is rendered. If no interruption of service occurred within the week, such a report shall, nevertheless, be filed.

"872.3 Each report shall give the following information: the week for which the report is rendered; the date or dates on which the interruptions occurred; the times when each interruption began and ended; the duration of each interruption; the territory affected by each interruption and the approximate number of ultimate consumers affected thereby; and the cause or causes of each interruption in reasonable detail. The report must be signed by a duly authorized officer of the corporation.

"873 REPORTS OF PROPOSED CONSTRUCTION.

"873.1 At least 30 days prior to the construction or major reconstruction of any gas pipeline intended to be subjected to pressure in excess of 100 psig, a report shall be filed with the Public Service Commission setting forth the specifications for such pipeline.

"873.2 Every gas corporation shall, on the 15th day of each month, submit a report to the Public Service Commission setting forth the progress of such construction or major reconstruction as of the end of the preceding month.

"873.3 Before any gas pipeline intended to be subjected to pressures in excess of 100 psig is placed in operation, a report shall be filed with the Public Service Commission certifying the maximum pressure to which the line is intended to be subjected and also certifying that the pipeline has been constructed and tested in accordance with the requirements of the rules herein prescribed, which report shall include the results of all tests made pursuant thereto. No gas pipeline shall be operated at pressures in excess of the pressure for which it was certified to the Public Service Commission.

"874 RECORDS. The responsibility for the maintenance of necessary records to establish that compliance with this Code has been accomplished rests with the utility. Such records shall be available for inspection at all times by the commission or the commission's staff."

Senator LAUSCHE. Thank you very much.

I have no questions of you, Mr. Francis. I appreciate the compactness of your statement, and the clear outline of the views of NARUC.

The staff adviser states that in 1954 NARUC favored this bill. Are you familiar with that fact?

Mr. FRANCIS. Yes, sir. I am just advised about it. I am not thoroughly familiar with it. I know at one time NARUC's position was in favor of the bill, and I believe some of the States, particularly the State of New York, for instance, at that time favored the bill. However, on my right is the chairman of our committee of staff experts who is the counsel for the New York commission.

Senator LAUSCHE. I would like to hear from the counsel of the New York commission.

Mr. BROWN. Thank you, Senator. It is true that in 1953 or 1954 NARUC went on record for the then-pending counterpart of this measure. That was in the early days of the infusion of large-scale pipeline installations from the South into the Northeast. There were obvious potentials for trouble.

Our own State of New York had just 1 year previously had occasion to adopt and impose a very effective State safety code for all pipelines installed in that State.

Massachusetts followed rapidly on our heels as did Wisconsin and a few others. There were, however, throughout the country, very few and limited examples of this exercise of authority by the States. It was, therefore, felt at the time that this being an interstate installation of large proportions that something should be done immediately, rather than leaving the installation and maintenance of such matters in the industry hands solely. That was the reason for the inspiration for the original measure.

Since then things have developed considerably. The States have exercised authority. The ASA code has been under constant analysis and change. It has become an effective guideline for the industry. It has been enhanced and improved upon by many States.

We feel that there is today, therefore, little reason for intrusion into the field by the Federal Government in view of this development, and it is for that reason that the NARUC position has, if you please, sir, changed.

Senator LAUSCHE. Mr. Brown, were you associated with this subject, or with NARUC, in 1954 and 1953?

Mr. BROWN. I was not, sir.

Senator LAUSCHE. When was the initial code of ASA drafted?

Mr. FRANCIS. May I refer that question to Mr. Mork.

Mr. MORK. In the 1930's.

Senator LAUSCHE. Sir?

Mr. MORK. In the 1930's. It has been revised.

Senator LAUSCHE. When was the last revision made of the ASA Code?

Mr. FRANCIS. In 1963, sir, I understand.

Mr. MORK. The 1963 code has been amended May 10, 1965. This volume came out in 1963, and they issued addendums to it.

Senator LAUSCHE. In 1954 NARUC felt that the States weren't adequately active in adopting codes that would protect the general public against the dangers of pipelines defectively laid or deteriorating and, therefore, recommended that Federal legislation be passed; is that correct, Mr. Brown?

Mr. BROWN. Not exactly, sir. The States had had little experience at that juncture, except for the few that I named, and it was for that reason that they were taken up as a Federal prerogative potentially. Since then that has changed markedly. We have had a world of experience in the field, as is illustrated by the activities of such States as my own.

Senator LAUSCHE. Mr. Francis, if most of the States in the future do not proceed to take action with respect to this problem, would you favor at a later date the adoption of a code of this type, of this provision contained in S. 1553?

Mr. FRANCIS. If Your Honor please, I would prefer not to answer that question at this time. But rather, I would like to suggest to the committee that it defer action on this matter. We are working on this matter. Say, a year from now, let's take a new look at it. I believe that we will by that time show a great deal of improvement in this field.

As I indicated, just within the last month two States have adopted the ASA Code. We are advised, by correspondence, by several of the State commissions that they have set hearings and are undertaking a study of the suggestions and recommendations of our committee of staff experts on modifications to the ASA Code. I believe within a relatively short period of time that we will be in a position to show remarkable improvement in this field.

Senator LAUSCHE. What was the cause of the Louisiana explosion?

Mr. FRANCIS. I am sorry, sir, I can't answer that question directly. NARUC did not itself make an investigation, not as to cause. But I have talked to Chairman Hunt, of the Louisiana Public Service Commission, who was the chairman of the committee appointed by the Governor to investigate that explosion. I can't give you the cause for it.

The Federal Power Commission, I am sure, investigated it and made an extensive report on it. But NARUC, of course, not as an organization, doesn't have the facilities to investigate and report on this matter.

Senator LAUSCHE. It is my understanding that the Louisiana Legislature failed to adopt a pipeline safety statute. Are you familiar with that?

Mr. FRANCIS. Yes, sir; I am. Actually, this is the main thing I called Chairman Hunt about, because I anticipated this being questioned.

I talked to Chairman Hunt of the Louisiana Public Service Commission, who, as I indicated, was also the chairman of the Governor's commission to investigate the matter. This came up at the last session of the Louisiana Legislature. At that time the Louisiana Legislature had a terribly crowded session, mainly with problems of reapportionment. They felt at that time that the matter had not been given sufficient study and Chairman Hunt gave me as his opinion, and authorized me to say here today, that it is his opinion that at the next session of the Louisiana Legislature they will grant to the public service commission the authority to regulate for safety purposes interstate and intrastate pipelines.

Senator LAUSCHE. Do you know whether Louisiana has a limitation on the number of days that it sits in regular session?

Mr. FRANCIS. I believe it has, sir. I couldn't say that as a definite thing, of course.

Senator LAUSCHE. Mr. Francis, word has come from Senator Morton's office that he regrets very much that he was not able to be here to hear what you had to say. He was in Chicago and transportation problems made it impossible to be here.

Mr. FRANCIS. I appreciate that very much, sir, and I hope you will have an opportunity to convey to him my kindest regards.

Senator LAUSCHE. The hearings will resume next Wednesday morning at 10 o'clock in this room. We stand in adjournment at this time.

(Whereupon, at 12:40 p.m., the committee was recessed, to reconvene at 10 a.m., Wednesday, August 31, 1966, in room 5110, New Senate Office Building.)

## SAFETY OF INTERSTATE NATURAL GAS PIPELINES

WEDNESDAY, AUGUST 31, 1966

U.S. SENATE,  
COMMITTEE ON COMMERCE,  
Washington, D.C.

The committee met at 10:10 a.m. in room 5110, New Senate Office Building, the Honorable Vance Hartke presiding.

Senator HARTKE. Good morning.

This morning's hearing is the second day on S. 1553, a bill to amend the Natural Gas Act to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies.

On Monday, the committee heard from the Federal Power Commission, which favored the bill, and the National Association of Railroad and Utilities Commissioners, which opposed the bill.

These hearings will resume after the Labor Day recess, but the exact date of those hearings will be announced later.

The first witness this morning is George Taylor, from the AFL-CIO. Good morning, sir.

**STATEMENT OF GEORGE H. R. TAYLOR, ECONOMIST WITH THE RESEARCH DEPARTMENT OF THE AFL-CIO AND SECRETARY OF THE AFL-CIO STAFF SUBCOMMITTEE ON ATOMIC ENERGY AND NATURAL RESOURCES; ACCOMPANIED BY JAMES DOHERTY, LEGISLATIVE REPRESENTATIVE WITH THE DEPARTMENT OF LEGISLATION**

Mr. TAYLOR. Mr. Chairman, for the record, my name is George H. R. Taylor. I am an economist with the research department of the AFL-CIO. In addition, I am secretary of the AFL-CIO Staff Subcommittee on Atomic Energy and Natural Resources.

I am accompanied this morning by Mr. James Doherty, who is a legislative representative with the department of legislation, AFL-CIO.

Mr. Biemiller regrets that although he had planned to testify this morning, he was unavoidably detained so I am reading his statement for the record if I may.

We appreciate this opportunity to express our support for the general objectives of S. 1553, a bill amending the Natural Gas Act to empower the Federal Power Commission to prescribe safety requirements for interstate pipelines. We have a suggestion for improving the bill, but we are in basic agreement with the objectives of S. 1553.

The AFL-CIO 1965 convention in a resolution declared:

We will oppose any legislation designed to remove interstate natural gas pipelines from Federal Power Commission regulation under the Natural Gas Act to the detriment of all consumers \* \* \*.

We endorse legislation to establish a federal regulatory program, with adequate enforcement provisions, to protect safety of workers on pipeline facilities of regulated natural gas companies.

We are seriously concerned about the safety of thousands of workers engaged in construction, operation, and maintenance on both transmission and distribution pipelines carrying natural gas. All of these workers should have the strongest possible safeguards against the occupational hazards connected with the natural gas pipeline industry.

We are also deeply concerned about the safety of the general public, the people who are served by interstate gas pipelines. The tragedy which claimed 17 lives in Natchitoches, La., in 1965 plainly demonstrates that not only workers but anyone in the vicinity can be killed or injured. The casualty record between January 1, 1950, and June 30, 1965, shows 64 deaths and 225 injured by reason of pipeline failures; 34 of those 64 deaths were pipeline employees, but 29 were not. Clearly you have a safety problem here which affects the safety of the general public as well as the safety of pipeline workers.

Already the interstate gas pipeline companies own and operate a huge network of more than 150,000 miles of pipeline. At the end of 1965, the Federal Power Commission had pending, applications from the regulated pipeline companies to spend in excess of \$2 billion on more than 15,000 miles of new pipeline, together with compressor capacity to keep the gas moving. There appear to be few signs of slackening of growth in the near future.

Safety in the construction operation, and maintenance of the existing and new pipeline facilities is already a serious problem and will become more serious as time goes on.

There will be more, not fewer, transmission failures under the existing situation. More and more pipeline will be laid where more and more people live, work, and travel. Each year more miles of pipeline will deteriorate from age; corrosion; failure in welds; inadequate design for high-pressure systems; accidental punctures by farm, road-building, or construction equipment. The maximum credible single accident possibility involving a pipeline failure, already high, will become even higher.

The case for Federal regulation over the interstate gas pipelines to insure the utmost possible safety of workers and the general public is admirably set forth in the committee print, "Safety of Interstate Natural Gas Pipelines," derived from a study undertaken by the Federal Power Commission at the request of the chairman of this committee.

We believe there is ample justification for "a Federal regulatory program, with adequate enforcement provisions," to assure greater safety efforts from the interstate gas pipeline industry.

The safety code for materials, equipment, design, construction, operation, and maintenance of pipeline systems, written for the American Standards Association by a committee of the American Society

of Mechanical Engineers, incorporates by reference a number of standards and specifications which other engineering groups, such as the American Society for Testing & Materials and the American Petroleum Institute have drawn up.

The last major change in the American Standards Association pipeline standard was in 1955, with partial revisions made in 1958 and 1963. The ASA code is not always specific regarding design specifications, and although its standards on materials and equipment are more definite, it still leaves room for deviations. Regarding operation and maintenance, it states that many variations among systems make it undesirable to establish an adequate national code "in all cases without being burdensome and impractical in some."

It is important to remember that this code is entirely voluntary. It will be enforced only if it is incorporated into the standards and regulations of some governmental agency. It is not enforced internally by the industry itself.

Furthermore, the FPC study reveals many lacks and weaknesses in the ASA pipeline code, which sets only minimum requirements. Unfortunately, the ASA moves very slowly in inaugurating new standards or revising existing standards.

The State regulatory pattern, as shown by FPC study, is, except in a few instances, either nonexistent or weak and blindly derivative from the ASA pipeline standard.

Of the 26 States with some sort of safety code for pipelines within their jurisdiction, 25 operate under the ASA code with or without some modification. A number of States by law can only regulate intrastate lines, thus leaving out of reach the mileage of an interstate pipeline as it passes through their territory.

Only 58 percent of both intrastate and interstate pipeline mileage is under State regulation. In 1964 according to the FPC study, there were 85,310 miles of pipeline in States with safety codes, and 119,420 miles in States with no regulation. Nearly 3,500 miles of the 5,100 miles of total new pipelines placed in operation in 1964 were in States with no regulation.

Of the 10 States with the most pipeline mileage within their borders, 6—Texas, Louisiana, Ohio, Oklahoma, Mississippi, and Illinois—account for 42.9 percent or 86,000 miles of the Nation's overall total of 204,730 miles of gas pipeline. None of these six States has any safety regulations of these gas transmission systems—either intrastate or interstate.

Clearly there is an immediate need for strong Federal regulations of safety in the interstate gas pipeline industry. It is apparent that the industry as a whole will not do the job and that the States are not doing it.

The report of the Federal Power Commission contained in the committee print states that—

The pipeline industry is interstate by its very nature, but at present time no federal body prescribes uniform minimum standards for pipeline design, construction, testing and maintenance.

We believe, therefore, that the Congress should enact S. 1553 without delay. However, while S. 1553 would remedy the situation I have described, it would not in its present form be fully effective. Without

proper provision and machinery for enforcement, it would be impossible to achieve meaningful gains in protecting workers and the general public against the growing hazards of this growing industry. We believe that S. 1553 should not only set safety standards and regulations, but see that they are properly administered and enforced.

We therefore urge this committee to amend S. 1553 by authorizing the Commission not only to prescribe but to enforce the standards, regulations, and conditions it would establish under this legislation.

With this change, the AFL-CIO strongly supports S. 1553 as a long needed and desirable step to improve worker and public safety. It is our understanding that sections 20 and 21 of the Natural Gas Act contain the necessary punitive teeth for willful violation of the act, and would apply to this bill which will become section 7(i) of the Natural Gas Act.

On behalf of the AFL-CIO, I wish to thank you for this opportunity to appear to set forth our position in support of the goals of S. 1553.

Senator HARTKE. Thank you, Mr. Taylor.

Are you familiar with the safety regulations of oil pipelines? This is a law which was passed last year. You may recall that there was no mention of pipelines in the ICC regulations until 1960 when there was an exclusion provision written into the law which then was corrected last year by including safety regulations of oil pipelines under Federal standards with a bill which was reported out of this committee. You are not familiar with that?

Mr. TAYLOR. Only generally. I have not gotten into it, sir.

Senator HARTKE. Chairman White has stated the following about this bill:

Apart from a possible spotcheck in the course of staff visits to the pipeline dispatcher's office, we do not now contemplate field inspections or other elaborate enforcement programs. We are not now persuaded that it will be necessary to undertake any substantial new program to police the condition as long as the pipeline companies are clearly informed of the conditions with which they are legally required to comply.

Do you concur?

Mr. TAYLOR. With all due respect to Chairman White, I do not.

Senator HARTKE. You do not?

Mr. TAYLOR. No; I don't know how far enforcement procedures should go. I think they should be made as reasonable as possible. I think every effort should be made to obtain the understanding and cooperation of the States and the pipeline industry itself.

On the other hand, unless you do have some method of ascertaining that the standards and designs are carried into effect in pipeline construction, operation, and maintenance, you don't know whether this is being done until something happens.

Senator HARTKE. Chairman White also stated he believes both the FPC and the States should have jurisdiction to set standards. Do you concur in this or do you think it should be exclusive jurisdiction? In other words should this bill preempt the field?

Mr. TAYLOR. I don't pretend to be a constitutional lawyer. I would gather that if the Congress decided to invoke the commerce clause and use it in connection with the pipeline companies already under Federal Power Commission regulation by means of the Natural Gas Act, that it

could, if it so chose, establish regulation over the interstate operation of the natural gas pipelines.

I wouldn't say that it should necessarily preempt the field in terms of intrastate lines. It poses a very nice constitutional question here which would depend on the nature of the situation and whether the States would finally come to life and do something about the pipelines beginning and terminating within their own borders.

Senator HARTKE. I point this out for the reason that in passage of the safety regulations of oil pipelines, a different approach was taken by those who were in charge of the operation of these facilities.

The testimony under the safety regulations by the Interstate Commerce Commission of interstate pipelines was, in effect, that what they preferred at that time was a centralized authority to avoid the multiplicity of regulations from state agencies, and it was necessary that regulations be promulgated and enforced by an agency whose members are thoroughly familiar with the petroleum pipeline industry. And only a central authority can provide the uniformity of regulation necessary in an interstate operation.

Would you agree with that?

Mr. TAYLOR. I would agree with that. I would think if I may present an analogy here, yesterday the Joint Committee was hearing a bill which would establish national standards set by the Federal Government on a recordkeeping system for workers exposed to occupational radiation. They don't intend in this bill to actually go out and inspect. They are going to do it with the cooperation of the States. The standards will be uniform and national, and they will be set by the Atomic Energy Commission. But by means of some incentive payments, grants to the States, the States, if they meet certain Federal criteria, will have the money to establish and to maintain the recordkeeping system and to send in duplicate copies of the records on occupational radiation to a central agency which will then use it in determination of safe levels, epidemiological studies and the like.

It might be possible to provide a program like that in the establishment of the standards and the cooperation of the States in enforcing them on intrastate lines. This is a suggestion.

Senator HARTKE. In your opinion would this bill preempt the field and place the preemptive authority for regulation in the Federal Government, or does it provide for merely general guidelines, and would the State regulations still be operative?

Mr. TAYLOR. The full responsibility would be placed on the Federal Government to establish uniform standards. As far as the enforcement of them is concerned, and the cooperation of the States, this can be worked out in a number of ways. But the enforcement authority should be squarely Federal interstate gas pipelines.

Senator HARTKE. With regard to the workers, does the AFL-CIO have any specific recommendations for a code which would insure the safety of the workers?

Mr. TAYLOR. For the record, Mr. Chairman, the Oil, Chemical, and Atomic Workers, and the Operating Engineers, are preparing statements to this effect, based on their own internal local problems in terms of safety. They will either be offered when the hearings reconvene, or they will be offered for the record. I am sure there will be some sug-

gestions along that line out of their own experience. At least that is my understanding of it.

Senator HARTKE. Senator Morton?

Senator MORTON. I have no questions.

Senator HARTKE. Thank you, sir.

Mr. TAYLOR. Thank you, sir.

Senator HARTKE. Mr. Martin T. Bennett. Good morning, sir.

**STATEMENT OF MARTIN TOSCAN BENNETT, CONSULTING  
ENGINEER, WASHINGTON, D.C.**

Mr. BENNETT. Good morning, Mr. Chairman.

My name is Martin Toscan Bennett. I am a consulting engineer with offices here in Washington.

I have had some 40 years of experience in the public utility field, principally involving the gas industry.

I am appearing here today not on behalf of any public body or any client. I am appearing here as a result of my own personal experience, because I think I have something that—I hope I have something to contribute.

My experience with pipelines on a large scale started with the building of the pipelines across Manhattan, and the remainder of New York City, which was started in 1949 by the five companies operating in New York.

I have since assisted and advised the Connecticut and Massachusetts Commissions on the adoption of safety regulations for pipelines in accordance with new statutes passed in those States.

The Connecticut regulations vary somewhat from others in that they were also given authority, or, in fact, assigned a responsibility for drafting and prescribing safety regulations to protect workmen, as well as the public.

I am going to limit my remarks, as Chairman Magnuson requested in his letter to me, to a summary of points which I think are additive to what has already been said by Chairman White of the Federal Power Commission, and others. I take no issue with anything in Chairman White's statement. I support S. 1553 as being a move in the right direction and suggest one possible amendment that would also give the Federal Power Commission authority to order removal or replacement of pipelines, when they are believed to be unsafe or known to be unsafe.

I think the principal point that I want to make is that, with the growth of our megalopolises, and a number of them are in the North American Continent, and with the extending of urban characteristics of living into suburban and rural areas, the pipelines are finding themselves overwhelmed with people moving in on them. This is producing a condition that was not, I believe, contemplated at the time pipelines were built.

This, in my opinion, requires flexibility and ability to amend regulations such as those set forth in the B31.8 code.

I do not criticize the code, as such, but a code must live, must grow, must be viable. It cannot be something that is once drafted and then lasts forever. In my opinion, a central organization, like the Federal Power Commission, can move much more rapidly than a committee

of some 70 people that have to arrive at some sort of consensus before an amendment can be made.

Not only do we have increasing need for strengthening regulations in certain areas, but we also have technological improvements coming forward very rapidly. We now are faced with problems involving plastic pipe, not mentioned in the code, and high-strength steels. These things produce their own problems. Yet, in the interest of progress, we have to take into account the availability of new materials, so that the codes can be supplemented or revised to meet these changed conditions.

Another point that is in my prepared statement is that we are realizing some new hazards, such as those resulting from ground subsidence. These are not new to gas companies operating in coal mining areas, where subsidence has been going on for years. However, we have found that subsidence is becoming increasingly important. And, yet, the B-31.8 code, as of this time, anyway, is quite vague and not very specific in requirements to meet the dangers of ground settlement.

How serious this can be is indicated in a recent article in the Reader's Digest on the city of Mexico, which is experiencing subsidence not the result of coal mining but the result of removing water from water-bearing strata underneath the city, which has allowed a gradual settlement of the whole city.

Scranton, Pa., and some of the other areas in eastern Pennsylvania, where the anthracite mines have been taking out large volumes of coal over the years, have suffered some terrific subsidence.

I also want to mention—and this is my concluding point—that I believe some form of sanction is necessary. I have assumed that the Federal Power Commission has some authority to enforce its regulations. It cannot just sit back and accept what anyone does. I do not think that policing is going to be a very important function of the Commission, if it is given this authority.

Thank you, Mr. Chairman.

Senator HARTKE. Senator Morton?

Senator MORTON. I have no questions.

Senator HARTKE. I suppose, sir, that the heart of this goes back to the testimony which was presented again by Mr. J. David Francis, who is chairman of the NARUC Committee on Gas. In his objections to this legislation, he points out certain things. Admitting that there are certain elements of hazard, he says that—

The greatest cause of pipeline ruptures is punctures by plows, bulldozers, shovels, road graders, and the like, and that, in all likelihood, even if you have regulation of the type proposed here, this would continue and therefore would be of no effect.

Would you care to comment on that?

Mr. BENNETT. Yes; I would.

I don't exactly agree with that statement. I believe the report that the Federal Power Commission made to this committee shows that there were many other causes besides those. Aside from that, the action of other persons moving in on pipe rights-of-way is a hazard. That is something that can only be overcome in two ways; (1) by perhaps burying the pipe deeper than has been the practice in the past, and then (2) adequate patrolling by the pipeline owners or oper-

ators. There is no question that that is a hazard and that that has been the cause of many failures in the past.

Senator HARTKE. He also said: "While many States have done an excellent job, regrettably, others have not."

He said: "This is being rectified by these States."

Do you see such improvement in the local regulations as indicated by Mr. Francis?

Mr. BENNETT. He mentioned some cases where additional States have recently incorporated safety regulations, but, again, the States are depending upon this committee, some 70 members to come forth with recommendations for those changes.

In some cases, in effect, the State commissions are delegating the authority to control safety regulations to this committee which is composed largely of industry people. And I don't mean just the gas industry but people who are involved with pipelines—the gas industry, the construction industry, and the steel and appliance manufacturers.

Senator HARTKE. He also points out the fact that—

In some cases, uniformity is neither practicable, engineeringly feasible, nor sensible.

Would you care to comment upon this approach?

Mr. BENNETT. Yes, sir. I think uniformity is not an end in itself. One of the problems that we have had in the past in attempting to secure safe construction has been that the uniform provisions of the B-31 code did not apply to such places as New York. And that is the craveness of my statement here, that we have to keep flexible, keep the administration and the revision of such regulations flexible in order to meet the changing conditions, and they are not necessarily uniform. There is no New York metropolitan area in many parts of the United States.

Senator HARTKE. "There should be no Federal intrusion." Can you comment upon that statement?

Mr. BENNETT. I do not consider that this bill is a Federal intrusion on the States. I think the States still should, in the interests of safety for their own people, review these regulations that the Federal Power Commission will prescribe, if this act is passed.

And if they find that they are inadequate, they should augment them locally to meet their local conditions.

I must, however, add to that statement one caveat. Sometimes things are done in the interest of safety which subsequent experience turns out to show invoke their own hazards. For example, the use of so-called cathodic protection of gas mains and underground pipes. As a result of the action of cathodic protection, a layer of hydrogen is deposited upon the steel in the pipeline. If that hydrogen penetrates the steel, it causes an embrittlement, and that can, in turn, result in a weakening of the pipeline.

My authority for that is the research that has been done by Batelle Memorial Institute under the aegis of the American Gas Association.

Senator HARTKE. The question of brittle pipe, is that the same thing or is this a situation which develops brittle pipe?

Mr. BENNETT. This is a situation which develops brittlement in the steel. It is called hydrogen embrittlement.

Senator HARTKE. Is that a situation which develops after the line is in place or is there also a situation where you can have pipe which is basically brittle in the first instance?

Mr. BENNETT. Both are possible. Cast iron is brittle. The example I was giving was to demonstrate or illustrate that sometimes a precaution taken to protect the pipe can itself result in a hazard.

Senator HARTKE. Is that process still being used today?

Mr. BENNETT. Yes, and it is necessary today. But now they are aware of the problem, measures are being taken and research is being done on methods of abatement.

Senator HARTKE. In such a situation, you say measures are being taken. Do you mean in the reduction of the use of that type of pipe, or is there a new type of pipe that is available?

Mr. BENNETT. Yes. Better protective coatings will help, new steels that will not absorb hydrogen will help. Keeping the steel in a zone in the soil where it is not subject to extremely low temperatures also helps.

Senator HARTKE. Let's take that one case where the brittleness is caused after the pipe is in place. How much additional cost would be involved for the pipelines, if they followed that procedure that you recommended; that is, the placing of the pipe at sufficient depth to avoid changes in temperature? And what other processes would be necessary?

Mr. BENNETT. Again I can't answer that with anything very specific or definite because in the South you don't need so much protection from cold weather as you do in the North. We hope, at least I hope, as a result of the research that is now being done by the steel people, that there will be developed steels of high strength that will not become brittle when they get cold, or at least will withstand very cold temperatures before they get brittle.

I mentioned depth, and you properly picked me up on that. You can bury pipe too deeply, in my opinion, to be safe. You can bury pipe so deeply that it is not easily accessible to repair crews the minute a sign of leakage appears and you are in trouble again. So this thing is not absolute. It is a relative matter.

Senator HARTKE. Let's come back to this matter of the pipe itself. Have the steel companies produced a type of steel which would be sufficiently thin, and therefore safe in that ground, and still not develop brittleness? Do you know whether they have developed such a steel?

Mr. BENNETT. Yes.

Senator HARTKE. In other words, is it available now?

Mr. BENNETT. There are steels available that do not develop brittleness under ordinary conditions of exposure.

Senator HARTKE. Do you know what the economics of this are? In other words, if you used this type of steel, would it be relatively greater in cost, could it economically be put into place? Or is it such a high cost that it would be prohibitive for use in pipelines?

Mr. BENNETT. We don't know that the brittleness is in itself a result of—we don't know exactly what causes the embrittlements. We know it can be determined by laboratory tests at varying temperatures. As of now, I think there is probably very little pipe being installed that produces a hazard from brittleness.

Senator HARTKE. In New York you say you reviewed the design and construction of that system in the early 1950's. You also state that the

code which was in effect then, 1947, was far from adequate for New York City conditions.

Did your installation at that time exceed the standards and specifications and requirements of the 1947 code?

Mr. BENNETT. Yes, sir; by several times. We were very much more conservative in our design than the code required. However, we did use parts of the code as a point of departure or point of reference. We referred to certain specifications which are a part of the code.

Senator HARTKE. Was your installation at that time equal to or in excess of the requirements of the code, the present code which is effective, B-31.8?

Mr. BENNETT. Which was effective in 1963?

Senator HARTKE. Yes. You could not have complied with the 1963 code. I am asking you if you would take the code of 1963, would your installation in New York have been sufficient to qualify to meet that code, was it greater in its effectiveness, or less?

Mr. BENNETT. Subject to the frailties of my memory, I believe that the pipeline system in Metropolitan New York far exceeds the requirements, the minimum requirements of the 1963 code in all respects.

Senator HARTKE. Have you had any experience with State regulatory agencies in regard to their personnel, their facilities and funds available for inspection and enforcement of safety regulations?

Mr. BENNETT. Yes, sir. As a consultant and as an employee of State commissions, I have worked for a dozen of them. I was with the Wisconsin Commission for 11 years, and the New York Commission for nearly 5 years. I have been consultant to a number of other State commissions. All of this work has brought me in contact with the commission staffs. As a matter of fact, I have been employed in proceedings before other commissions in which I had contact with commission staff. So I think probably I am as well acquainted as most people.

Senator HARTKE. In your experience in this field, do you feel that they have the personnel, that they have the facilities and the necessary funds to properly and adequately enforce State regulations of the nature which would assure safety to the public in regard to these pipelines?

Mr. BENNETT. By "enforce" do you mean inspect and follow up on regulations?

Senator HARTKE. The basic purpose, if there is any need for legislation as far as safety is concerned, is to provide safety for the public generally and for those people who work upon these lines. What I am trying to find out is whether or not the contention which was made by Mr. Francis is right or wrong; that is, that the States really are capable of doing this by themselves. Do they have the personnel, the facilities, and the necessary funds on hand to provide in those cases where they do have regulations, the type of regulation which would insure safety?

Mr. BENNETT. Some States don't have any. Take small States like Delaware and Rhode Island, both of which commissions I have worked for, incidentally—

Senator HARTKE. And both of which have pipelines in their States; is that right?

Mr. BENNETT. Yes. But to my knowledge, at least at the time I worked with them, they had no one who was qualified to review gas specifications—pipeline specifications.

Senator HARTKE. Senator Morton?

Senator MORTON. In Delaware and Rhode Island, have you any evidence to show that the same standards weren't carried out by the operating companies that were carried out in States that did have adequate inspections?

Mr. BENNETT. No, sir; I do not.

Senator HARTKE. On Monday Mr. Francis submitted committee revisions of the American Standard Association Safety Code B-31.8, referred to, adopted in 1963, which he declared would substantially meet the need for pipeline safety. Have you reviewed these revisions as recommended by Mr. Francis and by the association?

Mr. BENNETT. Only very hastily to try to determine what the basic purpose was of the revisions. I got them Friday. I have been out of town most of the time since then.

Senator HARTKE. Have you gone over them sufficiently so that you can form an opinion as to whether or not they would be of substantial help?

Mr. BENNETT. As of now they would. In the absence of any Federal regulation, they would be very helpful, in my opinion. However, substituting "shall" for "may," does not meet all of the limitations of relying on the B-31 code, in my opinion. I refer back to what I said earlier about the length of time it takes to revise the B-31.

Senator HARTKE. In your statement you mentioned the advisability of the Federal Power Commission's requiring inspection, repair or replacement of existing unsafe pipe. I want to know if you would be more specific as to just exactly what these requirements would involve in the light of your experience with the pipeline safety over the last few years.

Mr. BENNETT. I do not feel that it would be necessary for the Federal Power Commission to have personnel in the field continually inspecting pipeline. That is a responsibility which lies with the pipeline companies themselves.

As Commissioner Bagge of the Federal Power Commission stated in answer to a question at the Monday meeting, the fact that a pipeline company is violating a regulation, particularly a regulation of another body, is in itself making that pipeline company extremely vulnerable in the case of a lawsuit for damages. That would be a tremendous incentive for a pipeline company to follow all of these regulations unless the pipeline company thought the regulations produced an unsafe condition, and that is conceivable, as I mentioned before.

Then, of course, it should have an appeal or should have a means of appeal for amendment or modification of the regulation as it applies to that pipeline.

Senator HARTKE. Do you have any personal information as to whether all companies really do oppose Federal standards of safety through the Federal Power Commission?

Mr. BENNETT. Is the question whether all companies oppose?

Senator HARTKE. Yes.

Mr. BENNETT. My observation was, until Monday, that many of the companies were heartily in favor of Federal regulation because they operate in many jurisdictions and had a feeling that if they are federally regulated, they will get less—find less conflict in the regulations as they go from one jurisdiction to another.

Senator HARTKE. In other words, this was the argument that I brought out earlier that was made by the oil companies when they asked for regulations on the bill that was passed last year.

Mr. BENNETT. Yes, exactly. And there have been articles in the industry press that to me meant just exactly the same thing as the oil companies did.

Senator HARTKE. Of course one element that is involved, Mr. Bennett, in all of these situations, is that you are dealing with an industry which is competitive with other industries. If you put in safety requirements of the type of which you are talking, and the type which are envisioned by this legislation, would it put them in a disadvantageous position competitively with other operations which are not in the field of gas, for example?

Would the added cost, in other words, be of such a tremendous importance that it would create a noncompetitive factor?

Mr. BENNETT. In my opinion, based on observations in just about every State in the Union, the only company that would really suffer would be an irresponsible one. I can't name one, but there may be some. If they are irresponsible, then they certainly would utilize or pinch every penny in order to remain competitive.

I have seen in the past—and I am talking of some years ago—second-hand locomotive boiler tubing welded together and used for gas pipelines, with no protection to amount to anything.

Senator HARTKE. Do you know of any of that in place at the present time?

Mr. BENNETT. I imagine that—that was some years ago—I imagine that is gone by now, sir.

Senator HARTKE. You mentioned this issue of subsidence. Would the use of thicker steel better resist the forces caused by land subsidence?

Mr. BENNETT. I am sorry, I didn't get that.

Senator HARTKE. You mentioned subsidence. If you use thicker steel, would this be a greater protection? Could you put in a steel which would be thick enough to resist this type of pressure?

Mr. BENNETT. It depends on the location, sir. But the answer is probably not. There are locations where increasing the thickness of the steel would not be adequate under present requirements.

Senator HARTKE. How would you meet this problem?

Mr. BENNETT. They meet it in the industry where they have subsidence, and they know it is taking place, by actually removing the overburden on the pipe, the backfill, the material on top of the pipe. Some companies leave the pipe exposed in the trench and patrol it while they are anticipating this subsidence. The gas companies are in contact with the coal mine operators so that the coal mine operators let them know they are removing pillars and the subsidence may take place.

There are cases, and one is mentioned in my prepared statement, where the subsidence was not anticipated and a 30-inch high pressure

steel pipeline ruptured. That was operated at two-thirds of the normal pressure. Even that increased heaviness of the steel did not ameliorate the problem.

Senator HARTKE. At the same time, if you had proper regulation, it should have taken that into account, is that what you are saying?

Mr. BENNETT. No. What I said was that the code did not adequately take it into account.

Senator HARTKE. I understand. If you had proper regulation and you could go ahead and take these into consideration, that variety of circumstances, you could make it safe.

Mr. BENNETT. That is right. You could do it much more quickly rather than trying to amend the code. It is like trying to amend the Constitution of the United States. It is a long procedure.

Senator HARTKE. Many cities have found that is true too in their building code.

Mr. BENNETT. Unfortunately that is correct, I know.

Senator HARTKE. In regard to the code itself, was there a major revision in 1955?

Mr. BENNETT. Yes. I would say that probably was the biggest revolution.

Senator HARTKE. The 1947 code was the preliminary code. The 1955 revision was one of greater magnitude and one really which was most effective; is that true?

Mr. BENNETT. Except I would have to take exception to the statement, the 1947 code was preliminary. It was at the time considered a good code by many people in the industry.

Senator HARTKE. The truth of it is that the 1955 code basically was an outgrowth as a result of hearings on a similar bill to this one, which was conducted in the House; isn't that true?

Mr. BENNETT. You are asking me what went on in people's minds.

Senator HARTKE. Let me state it and save you the the trouble. In 1954 there was a similar bill in the House of Representatives and hearings were held, and after that the 1955 code revision came forward. I really was just laying the groundwork anyway so it doesn't make any difference.

What I want to ask you is this: How much pipe, in your judgment, is now in the ground which was laid prior to 1955, percentage-wise?

Mr. BENNETT. I couldn't tell you.

Senator HARTKE. Do you know mileage-wise?

Mr. BENNETT. I couldn't hazard a guess. I am sure the Federal Power Commission people could tell you as far as the interstate pipeline is concerned.

Senator HARTKE. Staff informs me this was asked for Monday. I think this is very important information and I am glad it was asked for.

Mr. BENNETT. May I add one point, sir. You mentioned that there was legislation that may have brought about this revision of the code. I think there was also a feeling in the industry that if something wasn't done to strengthen that code, that they would be faced with a variety of stringent regulations. You recall at that time Connecticut, Massachusetts, I believe New Jersey, New York, and Washington, and possibly some others, had adopted regulations which in part went beyond the code.

Senator HARTKE. On page 4 you stated that, "The code leaves much to the designer's interpretation and in many cases innovation."

Do you frankly believe that it is possible to cover all the details in the written code?

Mr. BENNETT. It is not possible to cover all the details and every contingency, and that is one reason why you have to keep the code or regulation flexible and easily amendable. You are continually running into new experiences which indicate the necessity for either an inspection provision for that condition at that particular location or it signals an inadequacy your code and regulations.

Senator HARTKE. You also say that policing will not be an important FPC function under the bill as authorized. Do you mean that it is not an important function because of the way the bill is written, or do you feel it should not be an important function?

Mr. BENNETT. I don't think it needs to be an important function. I am using the word "policing"—

Senator HARTKE. I understand, in a regulatory sense.

Mr. BENNETT. Yes. And also looking for violations.

Senator HARTKE. Do you have any information whatsoever as to any pipe which is presently in place which you would consider inferior in accordance with present standards and present regulations?

Mr. BENNETT. As of this minute I could not answer that affirmatively. I have found in the past cases of pipelines that were in my opinion not safe. I know in one case the pipeline has been replaced.

Senator HARTKE. In your opinion is there at the present time, in place, steel pipelines which are not safe? There have been some allegations, some conversation to the effect that some inferior steel was used due to the fact that after World War II there was a shortage of high quality steel. Do you know of any which was in place at that time?

Mr. BENNETT. There was at the end of the war the "little inch" and the "big inch" pipelines originally built as oil pipelines. They were subsequently used as gas pipelines. As a result of troubles the company hydrostatically tested every foot of that main that it could. It put water in and pumped it to a high pressure to produce failures so that they would find out the weak spots and know they were weak, and that pipe was replaced. I do not now think it is unsafe but at that time it was unsafe had they operated it at the pressures they are now using it.

Senator HARTKE. Do you know whether they have replaced the entire line or just the portions which were considered unsafe?

Mr. BENNETT. The portions which failed were replaced. Other portions have subsequently been replaced. The "little inch" line is now in oil service again, not in gas service.

Senator HARTKE. You have spoken of the danger of high voltage lines as a new problem. Is this going to be a serious problem?

Mr. BENNETT. I don't know. What I stated was that the Federal Power Commission is peculiarly well situated to promptly appraise the problem. I do know that some tests have been made, for example, by Pacific coast gas companies, pipeline companies, on these test lines that the Department of Interior is building, high-voltage lines. I do not know whether the high voltage will produce a hazard or not. It is something which should be looked into. It is a worry to some people.

Senator HARTKE. Thank you.

Senator Morton?

Senator MORTON. As I understand it, we are dealing with transmission pipelines and not with local distribution pipelines in this matter that is before the committee, and your testimony has been directed primarily to that aspect.

Mr. BENNETT. Yes, sir.

Senator MORTON. Thank you, Mr. Bennett.

Mr. BENNETT. Thank you.

(Full text of prepared statement follows:)

**PREPARED TEXT OF MARTIN TOSCAN BENNETT, CONSULTING  
ENGINEER, WASHINGTON, D.C.**

Mr. Chairman and members of the committee, my name is Martin Toscan Bennett. I am a consulting engineer with over 40 years' experience in public utilities and extractive industries covering most of the United States and some foreign countries. I am a registered professional engineer licensed by five States and the District of Columbia.

While I have worked for a dozen State commissions and many other public bodies, I represent no one here; any opinions I express are my own. I am appearing at the invitation of Chairman Magnuson.

In 1949 the city of New York employed me to review and oversee the design and construction of the high-pressure natural gas pipeline system completed late in 1950 by the five distributing companies in the city. At that time available standard specifications were not adequate for a system such as the New York line, but we used whatever standards were considered suitable.

The American Standards Association Code for Pressure Piping, designated B-31.1 (effective 1947) and the forerunner of the presently effective B-31.8 Code for Gas Transmission and Distribution Piping Systems, was far from adequate for New York City conditions.

Many special precautions were necessary because of the extreme congestion of underground structures and the high population density along the pipeline routes.

Following the New York experience I drafted proposed safety standards and rules for construction and operation of high-pressure gas pipelines for the Massachusetts and Connecticut commissions and since have advised both bodies on pipeline safety matters.

The rules finally adopted supplemented the current industry codes. Those issued in November 1951 by the Massachusetts commission were among the first comprehensive rules adopted by any State regulating pipeline safety. The Connecticut commission first issued its safety rules in February 1952.

I have also investigated a number of accidents which involved natural gas and have advised clients as to the safety of proposed high-pressure transmission facilities.

I favor the basic premise of S. 1553, a bill to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies. It is very similar to the Heselton (H.R. 88) and Salton-

stall (S. 1699) bills introduced in the 82d Congress in January 1951 which did not become laws.

S. 1553, like the earlier bills, would centralize responsibility for promulgating and enforcing safety rules in lieu of relying on voluntary compliance with industry safety codes or local ordinances.

While industry codes are necessary as guides, relying on the natural gas pipeline industry to develop and apply its own codes on a voluntary basis or through varied local governmental sanctions seems to me both cumbersome and uncertain in result.

A code requiring the assent of many individuals requires compromises which take time to work out. Enforcement, if any, comes still later.

In contrast, conferring authority on the FPC to prescribe and administer safety regulations would insure conformity to practices it finds required for the public safety.

In my opinion, an administrative body is better able to act quickly in adapting safety standards to technological improvements and current experience than a committee of 69 members having regular full-time duties other than code revision and administration.

On the 1963 code committee were 35 gas company representatives, 17 pipe and accessory manufacturers' representatives, 12 consultants and contractors, 3 regulatory commission staff members, 1 professor, and 1 whose affiliation is not stated.

While industry brains and research must provide the technological improvements and advances in the first instance, I believe that an FPC staff group devoted to updating and advising the Commission continuously would be the most effective vehicle for formulating and administering consistent safety rules for pipelines.

Voluntary adherence to codes and safety practices has resulted in a generally good safety record for the natural gas pipeline industry. However, the general pipeline industry standard for safety is revised only every few years. Moreover, the current standards were not known or generally applied when much of the pipe was laid in the early days of transmission line expansion.

It was not until the 1955 version of the code that detailed treatment was given to varying standards to meet the variations in such local conditions as population density. This was a problem faced by public authorities in the Northeast when pipeline safety became their responsibility over 15 years ago.

The FPC's April report to this committee indicates that most of the failures reported by interstate pipeline companies in response to the Commission's 1965 survey occurred on lines installed prior to adoption of the 1955 revision of the ASA code. That revision greatly enlarged and strengthened the prior code's standards, but the improvements called for are almost entirely for prospective construction. For example, it set forth for the first time four types of construction and four classes of locations which, in effect, determine the minimum standards to be applied in design, installation, and testing. These standards superseded earlier classifications comprising two broad divisions that give little effect to location characteristics.

The new location classes are defined according to the general geographical area and population density. Types of construction are defined by particular conditions surrounding the installation within designated locations.

The 1963 code is more than twice as long as the code in effect prior to 1955. The 1963 revision further increased the safety factors built into certain of the minimum requirements. Further revision is under consideration at this time.

Periodic improvements in the standard code do not mitigate the principal drawback of its application. It leaves much to the designer's interpretation and, in many cases, innovation.

Situations not considered "usual" are not specifically covered and frequently are not subject to mandatory review by any qualified body, no matter how problems are resolved. For example, the ASA code does not yet contain standards for plastic pipe although the gas industry has made increasing use of various types and sizes. Since 1954, about 2,000 miles of plastic pipe has been installed by gas companies. Yet earlier this year tentative specifications were still pending approval before the American Society for Testing Materials, the Plastics Pipe Institute, and the American Gas Association.

Given legislative authority to oversee safety, the FPC would be required to take into account all matters affecting the safe construction and operation of interstate pipelines which the industry is not obligated to do even where the code is adopted under local safety rules.

The code's limitations are indicated by its own language:

804.4. The requirements of Section 8 are adequate for safety under conditions normally encountered in the gas industry. Requirements for abnormal or unusual conditions are not specifically provided for, nor are all details of engineering and construction prescribed. It is intended that all work performed within the scope of this section shall meet or exceed the safety standards expressed or implied here.

\* \* \* \* \*

804.6. It is not intended that this code be applied retroactively to existing installations insofar as design, fabrication, installation, established operating pressure, and testing are concerned. It is intended, however, that the provisions of this Code shall be applicable to the operation, maintenance, and uprating of existing installations.

One important area where the code is virtually silent concerns the minimum support required to guard against failure from earth movements. This phenomenon is much more common than is indicated by the attention given it in generally available design and installation standards.

Of this problem, the code merely states:

840.1. General Provisions. The design requirements of this code are intended to be adequate for public safety under all conditions usually encountered in the gas industry. However, special conditions that may cause additional stress in any part of a line or its appurtenances shall be provided for, using good engineering practice. Examples of such special conditions include: long self-supported spans, unstable ground, mechanical or sonic vibrations, weight of special attachments, and thermal forces other than seasonal.

Incidentally, the Oil Transportation Piping Code, B-31.4, is somewhat more concerned with the need for support.

The gas companies operating pipelines subject to ground subsidence from mining have been keenly aware of the problem. The hazard can be appreciated when one views the destruction from subsidence wrought in the anthracite coal mining areas, but subsidence has also resulted from withdrawing oil and water from underground porous strata.

In one case in 1953, a 30-inch diameter interstate gasline was broken by subsidence. It was carrying a pressure of only 600 pounds per square inch although its design pressure was reported to be 935 pounds per square inch. Even with this factor of safety, the line failed. In many cases, subsidence can continue for years.

Other examples appear in the FPC's report to this committee where causes of failure are reported variously as subsidence, landslide, wash-out, settlement of land, movement in quicksand, land movement, ground settlement, ground stresses, et cetera.

The FPC could assure inspection and testing procedures in such critical areas to detect and correct dangerous conditions before accidents occur.

Another area deserving attention in which the FPC is particularly well qualified is the effect on pipelines of extra high voltage, high capacity electric transmission lines.

The American Electric Power System plans to install 1,050 miles of 765,000-volt lines extending from central Indiana across parts of five States to southern Virginia—an area laced with pipelines. Test sections have been built for a 750,000-volt direct-current system for the Pacific Northwest-Southwest intertie.

Possible induced voltages and electrolytic action resulting from proximity and orientation of such electric lines and underground gas lines might negate the effectiveness of existing protection or require special protection. Insulating joints and cathodic protection might be inadequate and require substantial modification in the vicinity of such large capacity lines.

Again, the FPC is in a better position than the industry to make a timely and adequate appraisal of the overall safety problems and to prescribe remedial measures.

In other respects, no code can be geared to new developments as rapidly as they occur. The machinery for securing modification of a code for new materials or design features involves slow, ponderous procedures.

Under the FPC's administration of safety, I believe that modifications could be handled more expeditiously because of the specific staff devoted to this responsibility.

A particularly important feature of S. 1553, as I understand it, is that it would give the FPC authority to prescribe safety standards for the operation of existing lines. I believe that new construction is now subject to whatever safety standards the FPC may impose under its certificating authority, but I question whether it has authority over existing lines.

The code does not prescribe safe operating practices except in rather vague general recommendations and compliance is largely a matter of discretion. In fact, the code states:

850.1 Because of many variables, it is not possible to prescribe in a national code a set of operating and maintenance procedures that will be adequate from the standpoint of public safety in all cases without being burdensome and impractical in some.

Where pipelines were built originally in sparsely populated areas, subsequent development could change the location designation under the code, but no revisions in subsequent operations are called for under present requirements, and the FPC apparently lacks authority to require such revisions.

It follows that the early installations may be substandard by current safety standards. The FPC would be in a position to establish policy for reevaluating, and if necessary, prescribing lower pressure limits for lines where the risks to the public have escalated.

Similarly, the FPC could prescribe testing and inspection procedures where necessary to insure safe operation of existing lines, particularly where they were installed when code requirements were less stringent than currently or were not observed.

Although we cannot be sure what accidents are preventable by periodic inspection and testing, an FPC-directed, systemic industry-wide program for doing so would increase the margin of safety for the older lines.

To clarify and strengthen the FPC's authority, I suggest adding the word "replacement" after the word "extension" in line 8 of S. 1553. This would be to give the FPC authority to require the elimination of unsafe facilities.

In summary, I favor passage of S. 1553 because I believe that FPC regulation of safety standards and practices for interstate natural gas pipelines would be more efficient, effective, and complete in achieving adequate protection of the public than the present situation involving only voluntary compliance with a published code or varied forms of local regulation.

Senator HARTKE. Mr. Federic A. Lang, Good Hope Road, Landenberg, Pa., representing the Southeastern Pennsylvania Landowners' Association. My understanding is that Fred T. Cadmus III, West Chester, Pa., representing the Chester County Commissioners, Pennsylvania, will appear with him. Is that correct?

**STATEMENT OF FREDERIC A. LANG, GOOD HOPE ROAD, LANDENBERG, PA., REPRESENTING THE SOUTHEASTERN PENNSYLVANIA LANDOWNERS' ASSOCIATION; ACCOMPANIED BY FRED T. CADMUS III, WEST CHESTER, PA., REPRESENTING THE CHESTER COUNTY, PA., COMMISSIONERS; AND LOUIS F. WALDMANN, GLENMORE, PA., REPRESENTING CHESTER COUNTY CONSERVATION COMMITTEE**

Mr. LANG. Yes, sir, and Mr. Waldmann.

Senator HARTKE. You want to appear as a trio?

Mr. LANG. Yes, sir.

Mr. Chairman, I am Frederic A. Lang, Good Hope Road, Landenberg, Pa. I am a registered engineer and have worked for 26 years in mechanical engineering design and consultation. The technology that we are discussing here today is familiar to me in my daily work. I am a member of the American Society of Mechanical Engineers and the National Society of Professional Engineers.

Mr. Edward W. James is not here today because he desires to testify when the hearings resume after today. Mr. Fred T. Cadmus will enter a resolution by our county commissioners and have brief remarks.

Mr. Louis F. Waldmann is here this morning and will make a statement.

The Southeastern Pennsylvania Landowners Association, for whom I speak, has submitted to your committee this morning our written

statement that provides you with our viewpoint and a proposed Public Interest Pipeline Safety Regulation. I have a few remarks which are a clarification of our position on pipeline safety. I wish to give you those remarks now.

The association for whom I speak believes that legislation on pipeline safety will benefit the public only if it incorporates some of the truths that have become available to us over the past 3 years.

Already placed in our backyards is part of the world's largest pipeline. Colonial Pipeline Co. does not have a right-of-way across my property, and probably cannot get a legal right-of-way. The 30-inch pipeline was installed behind my home in 1963. I am asking the courts to order Colonial to remove the pipeline.

On my neighbor's property, however, Colonial has purchased a right-of-way. The right-of-way agreement says that Colonial's pipeline may be used for transportation of natural gas, other gases, and liquids, at a pressure not exceeding 1,130 pounds per square inch. At a natural gas pressure of 1,130 pounds per square inch the steel of the pipe in my backyard would be stressed to over 60,000 pounds per square inch, or 16 percent higher than the yield strength of that steel.

Extra thin wall pipe is only one of the technical problems along Colonial's 2,500-mile pipeline system.

This sample [indicating] of Colonial's pipe from my backyard may help you understand certain pipeline dangers of which I will speak. This piece of pipe is 30-inch diameter. It is 0.281 inch thick—barely one-quarter inch. It is A.P.I. 51X52 steel. Colonial and its industry code, B31.8, contend that this pipe is safe for natural gas at a pressure of 706 pounds per square inch. Such a pressure is equivalent to the rupture forces we would have if we hung a 10-ton dump truck from the ceiling of this room with this piece of pipe as a ring in the hoisting cable. Yes, I think the pipe might raise the 10-ton dump truck over our heads here, but our lives would be jeopardized.

Mr. Chairman, I did not come here to discuss Colonial Pipeline but I must remind you that we did appear here on June 3, 1965, when you considered ICC jurisdiction over gasoline pipeline safety. Our statement at that time included a recommendation that your legislation contain specifications on pipeline acceptance limits rather than merely grant jurisdiction to ICC. However, the bill passed without acceptance limits.

ICC took jurisdiction in July 1965. We then produced evidence for ICC that Colonial Pipeline Co. violates known safety rules. Yet ICC says that they can do nothing now to protect us because they have yet to develop regulations.

We believe that our statement of June 3, 1965, will help you now and we ask that this copy of our statement be added to our new statement.

Senator HARTKE. We will include it in this place in the record.  
(The statement follows:)

#### STATEMENT OF FREDERIC A. LANG

##### INTRODUCTION: VIEWPOINT FROM PENNSYLVANIA

Gentlemen, we are Pennsylvanians living in Chester County. We thank you for the opportunity to appear at this hearing on behalf of the Southeastern Pennsylvania Landowner's Association. This citizens' group was formed in our area

to investigate and to gain improvement in the safety of the world's largest gasoline pipeline which was constructed recently through our State. The forty members of our Association, of whom more than a dozen are registered professional engineers, have carried on this safety activity for over two years and will continue indefinitely until pipeline safety is assumed by appropriate legislation. Chester County is a beautiful countryside on the outskirts of Philadelphia and Wilmington, Delaware, with a fast increasing population of over a quarter million. One of the problems in our county development is the large number of petroleum pipelines crisscrossing the County. Our citizens have a strong interest in good government and have capable County Commissioners and legislators who are now striving to solve some of the problems introduced by these pipelines through legislation. Our Landowner's Association has asked me to make this statement to you as you consider S. 1021.

#### NEED FOR CONGRESSIONAL ATTENTION

We feel that Congressional cognizance of the pipeline safety problem is needed at this time. Today, as in most segments of our economy, the size and technical complexity of pipelines is rapidly increasing. But in the blanket name of progress, this expansion is occurring with little supervision by government, either local or federal. There is little concern for the welfare of the individual citizen who has neither the time, the money, nor the technical background to assure for himself the kind of safety environment he wishes to choose for his own home, in the face of the well-organized and well-financed petroleum industry.

We would like to bring to your attention some of the facts concerning the Colonial Pipeline in Pennsylvania, as a case history of the safety practices by the industry. As we will show, the safety considerations for pipelines are complex and detailed, and in the past have not been promulgated nor practiced by that industry with the public welfare in mind. No governmental agency, at the Federal, state, or local level, known to us today, regulates the construction or operation of crude or product petroleum pipelines, in the United States. The matter is urgent. We fully expect major gains in safety to come from your careful consideration of this important national problem.

#### OUR POSITION IN SUMMARY

We believe that pipelines are essential in our economy, and we are in favor of their use. However, because of their importance, we feel that they should be safely designed, constructed, and operated. We submit that the complexity of the problems requires a detailed investigation by competent engineers serving public as well as industry interests, before regulations are adopted. The group for which I speak therefore opposes S. 1021 in its present form because it would result in Federal preemption in the field of pipeline safety without detailed technical provisions necessary for an effective safety code, and without the necessary police power to require approval of the design, construction, and operation of pipelines, including the authority to stop unsafe operation pending compliance.

#### NATURE OF THE PIPELINE PROBLEM

##### *Pipelines are dangerous vessels*

Petroleum pipelines are potentially dangerous vessels because they contain highly flammable gases or liquids under the pressure necessary to move them through the pipeline. For example, the pipeline that concerns our Association in Chester County will transport high octane gasoline at pressures as high as 700 pounds per square inch, according to its owners. Both gas and liquid can be pumped safely through pipelines when adequate consideration is given to many engineering matters including steel quality, steel thickness, stress, fabrication, welding, and inspection methods. But when the internal pressure, for whatever reason, stresses the pipe beyond its limit, a rupture will occur spewing the contents into the vicinity. For this reason, the regulations that most states have for pressure vessels do not differentiate between gas and liquids.

On March 4, 1965, at Natchitoches, Louisiana, the pressure was 500 psi according to the owners, when the pipe could no longer hold the pressure. It split open, the contents ignited and killed 17 people. It was the second explosion of this line in the same parish within nine years. When Linda Keilholz and

her father were killed near Jefferson City, Missouri, on January 21, 1965, it was the pressure of the liquid propane in a Phillips 66 pipeline that exceeded the strength of the steel pipe. That same day at Beaumont, Texas, Charles Carson and Bonds Martin died when the pipeline that Gulf Oil uses for ethylene could no longer hold the pressure. Two weeks earlier the same Phillips line had ripped open in Kansas because the pipe could no longer hold the pressure.

In discussions of pipeline safety, it is often stated that there are over 200,000 miles of liquid pipelines operating without undue failures. This statement is misleading in two respects. First, 95% of these lines are 16 inches in diameter or less and have wall thicknesses that keep the stress level conservative. Second, lack of information on failures is not due to an absence of failures, but rather to an active and not surprising effort on the part of the pipeline industry to suppress such information.

Today, the petroleum products pipeline being built dwarf their predecessors of only a few years ago. Not only are they larger in size, but they are operating closer to their strength limits, and they carry a more hazardous load. The danger to lives and property from pipelines of this size is not hard to visualize, even where the lines are well-constructed. Gasoline floats on water and its vapors hug the ground. Both will travel for miles down streams and valleys, retaining at all times their explosive and incendiary powers. In Spartanburg, South Carolina, recently a boy died by burning 1½ miles from a gasoline leak. The petroleum had been carried down a stream where the fumes were ignited by a cigarette, causing his death and much property damage.

#### *Pipelines expose the public—not the owner and user*

One of the differences between pipeline and other transportation means is that the pipelines expose the general public to the hazard, not the owner or user or their employees. When a truck, train, or ship are involved with employees of the owner aboard, safety is an economic concern and provisions are promulgated and executed with this in mind. The pipeline hazard exposes few employees, if any, and little capital investment. At Natchitoches, when the pipeline explosion killed 17 persons, including the Reverend Van Meter, his wife, his three daughters, and his mother-in-law, Tennessee Gas announced, within hours after the catastrophe, that it would have the damaged pipe replaced and the line back in operation the next day. Economics dictated this rapid return to service without any study of whether the same or a similar source of failure still existed. Furthermore, the economic liability to survivors of Reverend Van Meter's family was small—there were no survivors.

#### *Voluntary industry codes versus safety statutes*

The use of codes in engineering and public works has a two-fold purpose. First, certain codes permit an organization of material specifications, construction methods, and testing procedures for use in bids and contracts to ensure the adequate economic accomplishment of a project, second, other codes are used to ensure materials and methods that will guard public safety. These safety codes must have three specific attributes:

- (1) Adequate technical provisions based on fundamental engineering and agreed to by a majority of competent engineers, including those representing the public;
- (2) Mandatory status provided by law;
- (3) Adequate policing by an agency representing the public whom the code purports to protect.

Any code not having these attributes is not a safety code and cannot be used to judge the adequacy of the safety of a project affecting the public. Several codes have been related to pipeline construction and operation in Pennsylvania. Only the pressure vessel code when made mandatory by State laws is a safety code. The other codes are all agreements within the pipeline industry and show considerable inconsistencies among themselves. These can only be considered economic codes.

#### *Economic or industry codes*

- API, 1104: Welding code.
- API, 1105: Pipeline construction code.
- ASA, B31.4: Oil transportation piping.
- ASA, B31.8: Gas transmission and distribution piping system.
- ASA, B31.3: Petroleum refinery piping.

*Safety code*

Unfired Pressure Vessel Code (Pennsylvania State Law).

Although Colonial depended on its industry codes when the safety of its lines in Pennsylvania was challenged, three government bodies ordered more stringent requirements for the safety of the public. Judge Thomas A. Riley, in a Chester County court required 100% radiographic inspection of field welds instead of Colonial's customary 10%. The Delaware River Basin Commission, a four-state agency with representation from the President of the United States, required two stream crossings to be dug up and the pipe replaced with thicker pipe. Finally, the Pennsylvania Public Utility Commission ordered that ten defective welds be repaired that had been accepted by Colonial's inspectors, and that pressure readings, pipe wall thickness measurements, and corrosion samples be submitted periodically as a condition of operation.

## A CASE HISTORY OF VOLUNTARY INDUSTRY CODES IN USE

*Original assumptions on pipelines safety*

The Colonial Pipeline Company's recent construction of a 1600 mile products pipeline from Houston to New York is an excellent example of the weakness of voluntary industry codes in use. A study of Colonial's practices has provided us with valuable knowledge on the type of regulations that we feel are needed to protect the public.

Like most people, the landowners in Chester County assumed in 1963 that this huge gasoline pipeline to be built beside their homes was already subject to safety regulation by an appropriate authority, just as the local building codes regulate how our homes and factories are constructed. Many of us had observed the jurisdiction and regulation of the Pennsylvania Department of Labor and Industry over the steel thickness and welding quality for private propane tanks and all high pressure vessels.

No one believed that Colonial and all other pipelines were almost totally free of any imposed safety restrictions other than those dictated by economic considerations. As we learned more about the line we became alarmed; the size, the flow of 22,000 gallons per minute of gasoline, the brittle high tensile steel, the thin wall—thinner than water lines of the same capacity. We determined to find the authority that permitted such hazardous specifications.

*Searching for government jurisdiction*

We began by asking Colonial to what authority it has submitted its pipeline design and construction procedure for approval. The reply—none. Our Township Supervisors were powerless. The County Commissioners had no ordinances regulating pipelines. The Pennsylvania Department of Labor and Industry said it had seen no drawings and was not sure whether it had jurisdiction. Although the Pennsylvania Public Utilities Commission had issued a certificate of convenience to Colonial of Pennsylvania, the Commission was not certain it had jurisdiction over interstate pipelines at all, and strongly asserted that Colonial was capable of setting its own safety standards. Both the Interstate Commerce Commission and the Federal Power Commission denied jurisdiction over the safety of even interstate lines.

By this time, construction had reached nearby Maryland, and we had the opportunity to observe the girth welding, which is done in the field, the inspection procedures, and the laying of the pipe. At this point we became truly disturbed at the low quality of all procedures. With no agency willing to take jurisdiction over the safety of the line, we were advised by counsel to take the matter to County Court. A test case arose upon an injunction sought by Colonial to restrain one of our members from halting the construction across his property. Judge Thomas A. Riley of the Chester County Court heard testimony on the safety matter and in a landmark decision ordered 100% radiographic weld inspection across this property instead of the usual 10% being used by Colonial.

About the same time a complaint was filed with the Pennsylvania Public Utility Commission by three of the group, requesting a hearing on the safety matter and questioning Colonial's right to exercise eminent domain. The Commission held thirteen days of hearings in which Colonial and the landowners both presented expert testimony on factors governing line safety, including radiographic films of a sampling of girth welds. After four and a half months of deliberation, the Commission ordered Colonial to comply with several safety provisions as a condition of operating the line.

*Pipeline specifications and codes*

The Colonial line was buried in December of 1963, although some of the changes required by the Delaware River Basin Commission and the Pennsylvania Public Utility Commission were not completed until the end of 1964. The line is now operating at partial capacity, if at all, since two pumping stations originally planned are not in service.

The line in Pennsylvania is 30' in diameter with a wall thickness just over a quarter inch. It is made of high tensile 5LX52 steel. The pipe is buried about 30 inches deep. In the Public Utility Commission hearings Colonial stated the steel could be safely stressed to 72% of yield (permanent deformation), which would occur at an internal pressure of 706 psi. No extra wall thickness was allowed for additional stresses due to corrosion, bending, thermal movement, local weaknesses in the steel, and construction accidents, like dents and buckles.

Colonial claimed compliance with the following industry codes: Oil Transmission Piping Code (B31.4), Pipeline Construction Code (API 1105), and Welding Code (API 1104). Its witnesses testified that they depended on external visual inspection plus radiographic inspection of only 10% of the field welding to eliminate all defects not allowed in their code. They further stated that they consider their final hydrostatic check (line plugged and pressurized with water) to be a conclusive test of the soundness of the line including all the welds.

*Deficiencies in specifications and methods used*

Since mid-1963, an investigation of the specifications and methods being used by Colonial has been in progress by engineers concerned with public safety. In addition, consulting engineers have been retained specializing in metallurgy, welding, radiographic inspection, pressure vessel design, and pipeline pressure surges. Expert testimony was presented during sixteen (16) days of hearings before three government bodies, producing a record of some 2,800 pages. The matter is not closed and the investigation continues.

Deficiencies in Colonial's specifications and codes brought out in the hearings include:

(1) Colonial did not calculate stresses due to surges in Pennsylvania until the Public Utility Commission hearings, after the pipe was in the ground, and then incorrectly.

(2) Purchasing 5LX steel without transition temperature specification (embrittlement temperature) is not safe practice.

(3) Stresses as high as 72% yield are not safe practice for pipelines in this service.

(4) It is not safe to ignore stress allowances for corrosion, bending, thermal movement, steel defects, and dents or buckles.

(5) A line of this size and service should be buried deeper than 30 inches.

(6) Welding quality is considerably below the minimum allowed by Colonial's own industry code API 1104.

The facts collected on the welding of Colonial's pipeline in Pennsylvania illustrate the failure of voluntary industry codes. An independent company was engaged to obtain radiographic films of the weld quality on a sample of girth welds, using industry-approved gamma sources and techniques. From a sample of forty-one (41) welds, completed and accepted by Colonial's inspectors, ten (10) were found rejectable under API 1104. In its November 9, 1964 Order, the Pennsylvania Public Utility Commission confirmed this finding, also using films of the same welds offered by Colonial.

Evidence admitted in the hearings also showed that a poorer quality film had been used for radiographic inspection prior to Judge Riley's Order, that many films were destroyed in violation of the code, that the radiographic technicians were actually judging weld quality since they only referred to Colonial's inspector what they considered rejectable, that long sections of the line received no radiographic inspection at all.

The Pennsylvania courts have yet to rule on what to do when a 1% sample (41) of the 4000 welds in Pennsylvania prove to be 25% defective (10 rejects) under the codes used by Colonial itself. Pennsylvania's share of defects in the world's largest gasoline pipeline may be as many as 1000 welds.

*Urgency and need for detailed specifications and policing*

The chaotic situation in codes, standards, jurisdictions, and the difficulties in policing illustrate the urgent need for development of entirely new guidelines

and jurisdictions that can effectively provide safety of pipelines. The magnitude of disasters to date gives more than ample justification for urgent pursuit of an adequate law. The saving of only one life will justify the effort. Let us remember that accidents don't happen—each accident is caused by some human failure or oversight.

#### CONCLUSIONS AND RECOMMENDATIONS

##### *Postpone final action on S. 1021*

Final action on S. 1021 should be delayed pending an investigation of the detailed requirements and necessary police power to provide effective pipeline safety. If Congress should preempt the field of pipeline safety over which the states have taken limited jurisdiction, a vacuum would exist for some time until such information could be developed and regulations put into effect.

##### *Evaluate Federal versus State jurisdiction*

Evaluation should be made of the degree of jurisdiction properly left with the states in the matter of pipeline safety. Local problems, particularly with respect to planning and the desires of local citizens are sometimes better and more efficiently served at the local than at the Federal level.

##### *Constitute an advisory committee*

An Advisory Committee should be constituted to make a thorough review of all applicable industry standards and existing statutes, and to submit for Congressional consideration recommendations to resolve the conflicting interests of the public and the industry. Such a Committee should be composed of balanced public and industry representation, in addition to that of the Federal and State governments.

We must conclude from our investigation of the Colonial Pipeline in Pennsylvania that although Colonial may have intended to construct a safe line, its intent was thwarted by lax codes, substandard workmanship, and inadequate inspection. We see here a parallel in the recent *Thresher* tragedy. As Admiral Rickover testified in that investigation, deviations from the codes and "degradation of specifications" in the welding led to piping weakness and ultimate failure. One of your esteemed members, Senator Pastore, summed up the testimony on the *Thresher* in these words: "The lesson is obvious. There is no substitute for proper attention to quality of material and workmanship in the first instance. The initial extra costs which may be involved will eliminate much greater additional cost later on, but much more importantly, it could mean the saving of the lives of the men who man our submarines."

Let us follow the lead of those who made the thorough investigation of the *Thresher* disaster and determine, before more pipeline tragedies strike, the proper road to pipeline safety.

Senator HARTKE. I don't want to go too far astray and review all the hearings that were held by this committee on legislation which has been passed.

Mr. LANG. We agree.

Today, we request that you approve legislation containing iron-clad provisions that will result in safe pipelines in the Nation and beside our homes. We object to any legislation that allows the pipeline owners to be the final arbiter of how good or bad will be pipeline design, construction, and operation. We object to legislation that provides no policing and no penalties for violation or regulations.

"Accidents don't happen—they are caused." This is accepted and understood in the engineering profession. Accidents are caused by carelessness. An engineer who fails to investigate thoroughly the design, construction, and operation details of a potentially lethal pipeline and to provide suitable margins for safety is a careless man and a cause of accidents.

The engineering know-how exists today to provide safe pipelines. None of us who live beside pipelines can agree with the industry statements that they cannot incur a 5 percent or 10 percent higher operating cost to provide better steels, thicker steels, and better welding.

Such expenditures are necessary, we believe, and surely will save the lives of one, ten, or a thousand persons each year.

We commend the FPC for compiling a report to you that contains crystal-clear justification for good pipeline safety regulations. There should be no argument about the need. The controversy between the industry and the public is more concerned with the quality of the regulations and the means of enforcement. To assist you in deciding this controversy, we are providing a detailed set of regulations and suggesting a means for enforcement.

But first let us compare the pipeline industry standards being proposed by others to the pressure vessel laws of the States. Pressure vessels for natural gas and nearly all other gases and liquids are controlled rigorously by State laws based on the ASME Pressure Vessel Code. I own a 3-foot diameter by 20-foot long propane gas tank that was manufactured under the strict requirements of the Pennsylvania pressure vessel rules and Pennsylvania inspectors. Essentially all propane tanks are safe vessels because of such State regulations. I have never heard of a rupture of a permanently installed propane tank anywhere in the United States of America.

Now I will compare the quality of Pennsylvania pressure vessels with the quality of Pennsylvania pipelines. My State has adopted the pipeline industry standard B-31.8 with a very minor change concerning odorization of the gas. To the best of my knowledge, this State regulation has not increased the safety of pipelines one iota anywhere. Pennsylvania has had 33 gas pipeline ruptures since 1950, according to the FPC report to your committee. Because Pennsylvania has no policing of the industry standard B-31.8, nothing is accomplished. Even if it were enforced, we still would not have safe pipelines.

If Pennsylvania adopted the proposed revision of B-31.8 or the standard proposed by the National Association of Railway and Utility Commissioners, we would still not have safe pipelines because of the mile-wide loopholes in these standards. A 30-inch-diameter high-pressure gasoline pipeline forceably placed in my backyard is said to comply with a pipeline industry code, yet all the welding and all the steel is in violation of the safety provisions of the Pennsylvania pressure vessel regulations.

We urge you to pass legislation that will make pipelines as safe as pressure vessels. Certainly the lethal contents and the steel and the welding do not know whether they are being regulated under one name or the other. The margin of safety should be the same for pressure vessels and pipelines.

The public interest pipeline safety regulations we are submitting and recommending have been under study for more than 3 years by a group of qualified professional engineers with broad experience in the subject. This is the group I represent. Nationally known consultants have studied the pipeline safety problem and made their recommendations to us. Our proposal is in close agreement with the reputable findings reported in current technical literature, including the pipeline industry literature.

This public interest regulation differs greatly from the industry written standards. Our regulation closes the door to carelessness. It de-

tails safe acceptance limits for the steel quality, stresses, welding, and inspection. It eliminates the loopholes in B-31.8 which exist as flagrant violation of safe practice. It provides for policing. However, it leaves to the judgment of Congress the penalties for violations of the regulations.

This proposed regulation is attached to our formal statement and will be available to you as part of the record of these hearings. At this time I wish to mention briefly several items in these regulations.

The regulation requires that the steel have certain chemical and physical properties. The carbon content shall not exceed one-fourth percent. The elongation in a tension test shall exceed 20 percent. The Charpy V-notch test shall not show less than 15 foot-pound energy absorption at the lowest ambient air temperature on record for the locality where the material will be used. These are some of the absolute minimum requirements necessary to prevent catastrophic pipeline failures.

Most steels have a temperature below which they are brittle and above which they are ductile. A significant portion of the steel in existing pipelines is brittle at its operating temperature. The present-day use of such steel by the pipeline industry is a dangerous practice but an economical proposition. It should cost little more to buy steel that is not brittle at its operating temperature.

The use of brittle steel involves hazards like transporting gas in cast iron pipe. The industry is quite aware of this problem and fears that the public will demand nonbrittle steel for all pipelines. The brittle problem may be avoided easily by using aluminum or silicon kilned steels, by small amounts of alloying metals, by avoiding cold expansion of the steel, and by other minor changes in manufacturing technique.

The refinery piping code B-31.3 written by the oil industry for its own use outlaws the use of API 5LX pipeline quality steel within the refinery because it too frequently fails by brittle fracture. You should not permit API 5LX steels to be used in pipelines beside our homes.

The public interest pipeline safety regulations require that the girth welding quality be controlled to satisfactory acceptance limits, thereby eliminating weld defects of excessive size as stress risers in the steel. Rupture of a pipeline starts at the point of maximum stress which often is at a weld defect. The defects must be found and eliminated. Radiography of welding as proposed here is the best way of finding the defects. The removal of such defects is mandatory. The industry standard does not require removal of such defects.

The public interest regulations do not allow results of hydrostatic pressurization of a pipeline to be used to bypass welding and steel quality control. To do so would violate a basic principle of engineering. The fact that a drunken driver navigates a car in heavy traffic today is no proof that he can navigate safely tomorrow at even half that speed.

The pipeline industry wishes to use hydrostatic tests as a crutch to fall back on when it is guilty of violating true safety principles. We shall never allow this. We have never allowed static testing to prove the quality of bridges, buildings, railroads, airplanes, or elevators.

Bridges are designed properly and inspected. They are used with confidence without a test.

These regulations present a mandatory formula for calculation of maximum allowable pressure in pipelines. The formula considers steel strength, pipe diameter, and wall thickness. It assumes that steel quality and welding quality have been maintained and that corrosion has not occurred. It assumes that all construction is carefully performed and checked by inspectors working for the regulatory agency.

The formula provides a safe margin between the tensile strength of steel and stress caused by internal pressure so that light and heavy abuse of the pipe during earth settlement, truck crossings, and backhoe digging does not always result in rupture. The formula provides a cushion of strength that makes the pipeline safe in spite of certain unknowns that always exist. This is mandatory engineering practice almost everywhere except under the pipeline industry's standards.

There are other engineering requirements in these regulations that are essential. We will not take your time to describe these now but we ask that they not be omitted as a result of your legislation.

I hope your committee will have testimony from the pipeline industry concerning the need of legislation on gas pipeline safety. When the industry spokesmen appear they should be asked to discuss some of the salient features of the regulation that I have presented to you. The industry should be asked these questions:

1. Is some of the pipeline steel already installed brittle at its operating temperature and subject to brittle type of failure?
2. Where is the physical laboratory test data prove the quality of the steel already installed?
3. Does the quality of girth welds already installed at least equal the minimums set forth in the industry standard API 1104?
4. Where are the radiographs on existing welding that may prove the weld quality on lines already installed?
5. How would the citizens be safe if regulations do not apply to the pipelines already in the ground?
6. If the existing B-31.8 is a safety standard as claimed by the industry, why do NARUC, the courts, and the Commission continually feel it is necessary to upgrade the industry standard?
7. Why do we see people such as Mr. Jack Vickery of Colonial Pipeline and the rest of the oil industry ask the Senate Committee on Commerce to provide Federal regulations over oil pipelines, yet another segment of the oil industry now seeks to avoid Federal regulation?
8. Why does the industry pressure on ASME prevent me from seeing minutes of the B-31.8 committee meetings? Are these secret meetings?
9. If our highway speed laws are not obeyed without policemen, how can we expect pipeline companies to always be honest without inspectors representing the public?
10. How can the industry say that their materials and workmanship are adequate in view of the large numbers of failures that are found the first time the pipeline is pressurized prior to startup?
11. Does the low cost of damages resulting from pipeline explosions make the economics favorable to dangerously thin pipe?

12. Does casual inspection of welding during new construction permit the contractors to bid lower on contracts?

13. Why did Colonial Pipeline Co. put patches or "pumpkins" over defective welds on my property?

14. Is the \$4.72 per foot that was the installation contract cost of a 30-inch pipeline in my backyard sufficient to insure safe workmanship?

15. How many poorly trained welding inspectors determine the public safety on the construction jobs underway today?

16. How many persons must die in pipeline explosions before the industry will agree that they cannot police itself?

I see some Colonial Pipeline representatives in the audience. They will probably tell you that we have been turned down everywhere in our seeking for safety. I would like to answer that in this brief sentence:

Far from vindication, Colonial has received a series of precedent making adverse rulings already, and the final record is not yet closed anywhere. Judge Riley in Chester County court required Colonial to radiograph 100 percent of the girth welds on one complainant's property rather than 15 percent. The Delaware River Basin Commission, which took limited authority over pipeline safety at a few stream crossings, ordered Colonial to dig up pipe about one-quarter inch thick at two stream crossings and to replace it with double the thickness. The Pennsylvania PUC found that 10 welds (out of 41 sampled) were faulty at the time radiographed by Colonial and our association and were of doubtful safeness at the time of burial. PUC also conditioned Colonial's operation on 18 safety requirements not planned by Colonial. A suit filed July 27 in Federal district court in Philadelphia against Colonial has not been heard.

This morning I visited Colonial's only Pennsylvania pumping station at 7 a.m. and found only the small pump was operating, which is about 25 percent of their installed capacity. So I would contend that the pipeline is not in full operation, and even if it was, that would not prove the safety.

Never again will life be as simple as in the horse-and-buggy days. But in spite of the hazards of our complex space age technology, we need not sacrifice lives when the know-how exists for and the economics permit safety along our very valuable pipeline systems. Congressional action is urgently needed to keep unseen trouble out of the earth over which we work, play, and sleep.

I thank you.

(The regulations referred to follow:)

**PUBLIC INTEREST PIPELINE SAFETY REGULATIONS TO BE ADMINISTERED BY FEDERAL POWER COMMISSION**

**1. OBJECTIVE**

The objective of these safety regulations is to provide safety for the public from the hazard of pipelines under the jurisdiction of the Federal Power Commission.

**2. APPLICATION TO NEW PIPELINES**

All pipelines for the transportation of natural gas constructed after the effective date shall be subject to these regulations. No new pipelines under FPC jurisdiction shall be laid within 500 feet of a place of human habitation unless FPC issues and enforces special requirements and grants a permit for each specific instance.

## 3. APPLICATION TO EXISTING PIPELINES

All pipelines for the transportation of natural gas constructed before the adoption of these regulations shall be subject to the following provisions of these regulations, from the effective date:

- (a) Reporting of failures;
- (b) Pressure monitoring;
- (c) Annual inspections;
- (d) Reporting of operating conditions.

Whenever a failure anywhere in a company's pipeline system shall cause property damage in excess of \$1,000, personal injury, or death, or whenever a formal complaint is entered, based on factual evidence of conditions (except earth cover) not permitted by these regulations for new pipelines, proceedings shall be initiated by FPC to determine the cause of damage, if any, or the actual conditions existing. Proceedings shall include opportunity for all interested persons to be heard. If the proceedings reveal conditions (except earth cover) not allowed by these regulations for new pipelines, then the continued operation of such pipeline shall be conditioned by an FPC order on changes to be made under FPC inspectors to provide compliance with these regulations.

## 4. SAMPLING PROCEDURES

In the event that investigation determines the steel or the weld quality to be in question anywhere in a company's pipeline system, procedures consistent with MIL-ST-105D, 29 April 1963, "Sampling Procedures and Tables for Inspection by Attributes," shall be used to select samples over a distance of at least 500 feet upstream and downstream from the locality in question for radiographic or metallurgical inspection. Acceptability of welding and steel in the sample shall be judged by the appropriate provisions of these regulations. An acceptable quality level (AQL) of 1.0%, and normal single sampling methods shall be used.

## 5. ALLOWABLE OPERATING PRESSURE

The maximum operating pressure for any section of the pipeline shall be taken as the sum of:

- (a) Maximum steady-state compressor discharge pressure for that section of the pipeline.
- (b) Pressure equivalent to the static head from compressor discharge to the lowest point in the line.
- (c) An allowance for surges, at 20% of compressor discharge pressure if not calculated, but in no case less than 10% of compressor discharge pressure.

The maximum allowable pressure shall be calculated by the formula:

$$\text{Maximum allowable pressure} = \frac{ts}{2D}$$

where  $s$  = ultimate tensile strength of steel (pounds per square inch)

$D$  = inside pipe diameter (inches)

$t$  = pipe wall thickness (inches)

## 6. REQUIRED QUALITY CONTROL OF STEEL AND WELDING

(a) Steel used for subject pipelines shall be a low carbon or alloy type. Other materials may not be used without specific FPC approval. The sampling method described earlier shall be used to determine that the carbon content of the steel does not exceed 0.25% and that elongation in a tension test exceeds 20%. Charpy V-notch tests for steel having less than 70,000 psi tensile strength shall show not less than 15 ft-lb energy absorption at the lowest ambient air temperature on record for the locality where the material will be used, and steels having more than 70,000 psi tensile strength shall show a foot-pound energy absorption not less than the tensile strength divided by 5,000 for the same temperatures. All longitudinal welds shall be 100% radiographically inspected and shall conform to weld quality specified in Section VIII.<sup>1</sup> Records of all tests made shall be retained until FPC approves their destruction.

<sup>1</sup> Section VIII as used in these regulations refers solely to Section VIII of the ASME Unflared Pressure Vessel Code, 1965 ed.

(b) All welding shall be made in conformance with the practices permitted by Section VIII. Use of friable back-up rings shall be an acceptable alternative to back-welding.

(c) All welding performed during construction and maintenance shall be 100% radiographed and inspected in accordance with the limitations set forth by Section VIII. All welding not meeting these requirements shall be rejected until repaired in accordance with provisions of Section VIII.

(d) Welding performed during fabrication of the pipe and during joining of the pipe lengths, and at all other times, shall be performed in a manner to keep the steel immediately adjacent to the weld within the quality limits prescribed in Provision 6a. Evidence of such quality shall be provided by samples taken and tested at the direction of the FPC inspector.

(e) No field welding of any kind shall be performed on pipe sections except at a girth weld which encircles the pipe unless the stress level is reduced permanently to 50% of the amount allowed by the formula in Section 5.

#### 7. OTHER REQUIRED SAFETY PROCEDURES

(a) All pipelines 12 inches in diameter and larger shall be bedded on at least 6 inches of sand or equivalent material wherever the soil contains rocks that might result in localized support of the pipe. Before bedding, the pipe shall be inspected for dents and buckles, and all visible defects shall be corrected by removing that section of pipe.

(b) All portions of the pipeline shall be protected by exterior coatings such that the resistance to ground is within the limits stated under Section 9—Annual Inspections. At the time of bedding, this protective coating shall be inspected by an FPC inspector for cracks, crushing, or holidays, and such defects repaired before the pipe is placed in the ditch.

(c) All portions of the pipeline shall have cathodic protection at all times as evidenced by a potential of no less than  $-0.85$  volts between the metal surface of the pipe and a  $\text{Cu/CuSO}_4$  reference half-cell buried within 2 feet of the pipe at a level within 1 foot of the bottom of the pipe. Such measurements shall be made at intervals of  $1\frac{1}{4}$  mile, and any values less than the required potential of  $-0.85$  volts shall be corrected by uncovering the pipe and repairing the coating.

(d) All pipelines to be placed in the earth shall have a minimum cover of 5 feet below the finished grade.

(e) Hydrostatic pressurization to find pinhole leaks may be used at the option of the construction company or owner, provided the pressures used never exceed a value which will stress the pipe steel to its yield point, and provided the temperature of the steel is not below  $40^\circ\text{F}$ . during the pressurization. The results of hydrostatic pressurization shall never be accepted as conclusive evidence that the pipeline is safe at that pressure, at the allowable operating pressure or at any pressure above 15 psi.

(f) Interior gaging of the completed construction shall be carried out in the presence of an FPC inspector and must show that the difference between the maximum and minimum diameter of any section shall not exceed 2% of the pipe diameter.

(g) Pressure monitoring shall be provided by an FPC-prescribed frangible disc device, attached by a pipe connection and shut-off valve to the pipeline at a point more than 50 feet and less than 1,000 feet downstream from each compressor. The frangible disc, the valve, and the joining pipe shall have a cross sectional area greater than 50% of the pipeline cross sectional area to which it is connected. The failure pressure rating of the frangible disc shall be not more than 25% above the maximum allowable pressure as defined above. The only shut-off valve between the pipeline and the frangible disc shall be maintained in an open position at all times by an FPC seal. When this seal is broken, FPC shall be notified of the reasons within 24 hours, and a new seal will be installed by an FPC inspector. The frangible disc discharge shall be piped into a flare tower with continuous ignition, having a capacity equal to the pipeline throughout. Safety fencing shall be placed at least 800 feet outside and completely around the flare tower. Until proved otherwise, failure of the frangible disc shall be used by FPC as evidence that design methods and safety devices are ineffective for maintaining pressures within a safe range. In such cases, FPC shall require further safeguards which may include permanent reduction of the allowable operating pressure for the pipeline.

## 8. CERTIFICATIONS AND RECORDS

(a) FPC requires that all engineering designs and specifications be submitted for FPC approval prior to letting of contracts and commencing the construction. No construction shall be undertaken until FPC issues a construction permit. At least 10 days' prior notice shall be given of all construction and its schedule to FPC to allow for arrival of FPC field inspectors.

(b) A registered professional engineer, approved by FPC and duly registered in each state through which the pipeline will pass, shall be retained by the construction company to observe and inspect construction, and to submit an official report to the FPC certifying the following particulars:

- (1) A comparison of design with "as built" drawings and specifications;
- (2) Pipe source, specifications, test results and installed location;
- (3) Quality on all girth welds, a listing of repairs, and a listing of all welds rejected;
- (4) Thickness of earth cover of the line;
- (5) Bedding conditions, pipe conditions, and protective coating integrity at time of placing earth cover;
- (6) Hydrostatic pressurization conditions and results, if such are used;
- (7) Size gaging test conditions, defects indicated by such test, and disposition of the defects;
- (8) Installation and calibration of all pressure monitoring and other instrumentation required by these regulations.

(c) An inspector from the staff of FPC shall be assigned to each construction crew or spread, to determine that all regulations are complied with. He shall have the authority and responsibility to oversee all construction methods, inspection procedures, radiographic quality, and weld quality. He shall further have the authority to halt the construction, upon obtaining and holding evidence that any of these regulations are being violated.

(d) A certificate of approval shall be issued by FPC before any portion of a pipeline can be put into operation, based on a satisfactory certification by staff inspectors and registered engineers.

(e) Operating and construction records shall be taken and maintained with the following information:

- (1) Mainline pressure into and out of each pumping station as shown by 24-hour recorder charts;
- (2) Flow rate in the system as shown by 24-hour recorder charts at or near each station discharge point;
- (3) Girth welding radiographic films as specified in these regulations;
- (4) Steel quality records as specified in these regulations.

Such records shall be retained indefinitely for access by FPC inspectors or until FPC approves the destruction of specific records.

(f) All failures of the pipeline of any kind shall be reported by telephone to FPC within 24 hours after the occurrence, stating the nature of the failure, the resulting damage, the assignment of cause, and the steps proposed to repair the failure and reduce the possibility of a similar failure in the future. A detailed written report shall follow within 4 days. If a failure results in personal injury, death, or damage exceeding \$1,000, the pipeline shall be taken out of service until an FPC permit is obtained for renewed operation. FPC shall review the failure circumstances and proposed action and issue a permit for repair and operation only when it is satisfied that the public safety will be served. Such reviews shall take top priority on the Commission's agenda.

## 9. ANNUAL INSPECTION

During annual inspections, FPC inspectors shall examine all records to see that the pipeline has been operated in a safe manner. FPC inspectors shall observe tests that determine whether corrosion is occurring between the pipe and its environment. These tests must indicate that a potential difference of at least  $-0.85$  volts is being maintained between the metal surface of the pipe and a Cu/Cu SO<sub>4</sub> reference cell placed in the bottom of the ditch containing the pipe and within 1 foot of the pipe. These reference cells shall be placed at intervals along the pipe not to exceed  $\frac{1}{4}$  mile. Measurements shall be made annually at each reference cell. All conditions indicating failure of coatings or ineffectiveness of cathodic protection shown by this test shall be eliminated within 30 days and a new test made to show compliance with safe conditions.

## 10. GENERAL REQUIREMENTS

(a) FPC inspectors shall have full access to offices and premises at all times for the purpose of examining work in progress and for examining past and present records. No records mentioned here shall be destroyed without specific written approval from FPC.

(b) The design and construction of unattended compressor stations, tank farms, terminals, and branch connections shall be within strict application of the requirements of the current edition of the ASME Boiler and Pressure Vessel Code, Section VIII for Unfired Pressure Vessels.

(c) At all times the burden of proof that this safety regulation has been complied with shall remain with the pipeline owner. Any evidence that the regulation has not been carried out, or absence of such proof, shall be cause for FPC to order immediate shutdown of all pipeline operations of the system and all construction work therewith in question.

Senator HARTKE. We will proceed with Mr. Cadmus next, and have questions afterward.

**STATEMENT OF FRED T. CADMUS III, WEST CHESTER, PA., REPRESENTING THE CHESTER COUNTY, PA., COMMISSIONERS**

Mr. CADMUS. My name is Fred T. Cadmus III. I am an attorney with offices in West Chester, Pa. The Chester County commissioners have asked me to present the following resolution:

Whereas, within the period of the past ten years, during which time Chester County's population growth has been among the top four percentagewise on the Eastern seaboard, many problems have arisen as a consequence of this growth which have required participation and action on the part of our Board, in the interest of the welfare and safety of our citizens, and

Whereas one of these subjects of prime importance which, in our opinion, falls within the realm of our distinct responsibility and causes us deep concern, is the proper location and guaranteed safe construction, operation and maintenance of high pressure pipelines carrying flammable liquids or gases, and

Whereas it is our belief that Congress should not adopt the provisions as recommended by the INDUSTRIAL CODE as adequate to serve the public interests but that any legislation which is adopted give adequate consideration to the need of local Planning Commissions to have an opportunity to exercise a degree of control over the routes, extent and types of utility installations to avoid the sterilization of local areas, and

Whereas this Board has caused to be introduced in the Pennsylvania Legislature bills which would accomplish this result: Now, therefore, be it

*Resolved*, that we the members of the Board of Commissioners of Chester County, Pennsylvania, unanimously subscribe to the testimony of the South-eastern Pennsylvania Landowners Association being submitted, together with the conclusions and recommendations contained therein.

Adopted August 25, 1966.

I would like to add very briefly, I come here not as any legal expert in the utility field. I am a county seat lawyer engaged in a typical general practice, in a rural section, growing unfortunately largely suburban. But the last 3 years, being involved in pipeline matters, has convinced me, as you have already seen by a wealth of testimony, there is a serious problem here.

I have had a situation where a farmer, a client of mine, was plowing his field, and smelled gas coming up out of the line. There is no periodic inspection.

The important thing, I suggest respectfully, Mr. Chairman, for this committee to consider, is what are the alternatives to congressional action here. You might say "Go to your legislature." We tried that, and the remedial legislation we had asked died in committee.

The utility lobby at Harrisburg, our capital, was able to get the utilities excluded from even the eminent domain code, the remedial legislation we needed. The electric light companies have one statute for their eminent domain provisions, the petroleum companies another, natural gas companies another, and so on. The utilities are out of that code. Yet the highway department, school boards, municipals, and so forth have to live by it. So we have no hope in the Legislature of Pennsylvania.

The Public Utility Commission of Pennsylvania is, we respectfully urge, a blind alley. I am advised reliably that our Pennsylvania Public Utility Commission staff is inadequate to do the necessary policing, does not have the money for the personnel. Likewise, I think it important to state that a member of the technical staff of one State public utility commission has told me quite frankly that his concern is not with necessarily the new lines going in now, but he said, "I am seriously concerned with those lines that have been in 10, 15, 20 years or so." Some of them in our State have been in as many as 60 years and they are still in operation, and part of the application of Manufacturers Light & Heat Co., to the Federal Power Commission, states that it is expensive and difficult to repair those lines.

Unless a complaint is made, our public utility commission at Harrisburg does nothing. The only reports that are necessary so far as pipeline failures are those where personal injury or death results. Those unfortunately are privileged. For instance, a client of mine was electrocuted about a year ago today. A report was made by the utility, an electric company. That report is privileged. I can't even get that to prepare my case.

Next, can we look to the individual property owners? We property owners have fought, and I have been counsel to Mr. Lang and other engineers and neighbors of his in connection with the matters he has referred to. I may look at this with a slightly prejudiced eye. But if anybody in this room has ever tried to enlist expert witnesses to testify on pipelines, to try to get X-ray units, for instance, to come in, as we did—he will find it very difficult. Before the Colonial pipeline was buried in the ground we shot 41 of these welds, and 10 were found to be at least doubtful by the public utilities commission, and it is a tough thing to convince the Pennsylvania Utility Commission. But they ordered those dug up and looked over.

A supplementary order was entered because the lines were already filled and it would be an expense to dig them up. That matter is pending before the commission. Here we have proof positive that the industries aren't always doing what they say they are doing.

The landowners can't afford, as a practical matter, to fight this safety battle. The only group left is the industry itself.

Mr. Martin Bennett's statement here certainly covers the prospects as far as industry being permitted to police itself.

The answer is obvious. Unless Congress acts, unless your committee recommends this legislation, very, very similar to what we were here on a year ago when Mr. Vickery and the other representatives, the American petroleum industry representatives testified, "Senators, please approve this legislation, put us under ICC so we won't be plagued by conflicting regulations as we go from township to township,

State line to State line, county to county," and so forth, there will be no adequate remedy.

They wanted to get under the Federal umbrella. I am anxiously waiting to learn why the gas industry desires to take an entirely reverse viewpoint.

I thank you for your courtesy.

Senator HARTKE. Now we will proceed with Mr. Louis Waldmann.

Mr. WALDMANN. My name is Louis Waldmann, chairman of the Chester County Conservation Committee, located in Chester County, Pa.

Mr. Chairman, I would like to add briefly to the commentary of these other two gentlemen with regard to why such legislation on the Federal level, in my opinion, and in the opinion of our organization, should go forward and be passed.

I have a letter here which is addressed to a gentleman in Chester County, a Mr. Ford, in answer to a query that he sent to the Pennsylvania Public Utility Commission with regard to their jurisdiction on the pipeline presently contemplated by the Manufacturers Light & Heat Co.:

This is in reference to your letter of March 29, 1966, regarding Manufacturers Light and Heat Company acquiring a right-of-way access to your property for the installation of a gas transmission main. By the provisions of the public utility law, the Commission has no jurisdiction over the installation of facilities across private property for the transmission of natural gas; therefore, it is inappropriate for the Commission to offer any opinion of a legal nature upon considerations reserved exclusively to adjudication by the civil courts of law. In addition, Manufacturers Light and Heat Company is an interstate pipeline company, and as such, its operations are subject to supervision by the Federal Power Commission.

This, I think, is the crux of our problem. At least, it is in Pennsylvania. We have, as Mr. Cadmus stated, a public utility commission which I feel has a relatively disinterested view toward these problems. I don't think they are adequately staffed. I don't think that they have, frankly, the right spirit. They are put into a place of responsibility to the people of the State of Pennsylvania, and in my opinion, they have not adhered to this responsibility.

The sum and substance, frankly, of our public utility commission in the State of Pennsylvania is that it is a political plum job, and there is no definite basis or educational requirement, or things of this nature, in order to qualify to be placed in such a high position with such responsibility.

We have, as far as the Chester County Conservation Committee is concerned, over the last 2 years, been in conflict with several utilities. They all seem to have one thing in common, and that is, one—when you fight one company, per se, you really fight the industry. And as individuals we have had to take the burden of proof upon our shoulders to prove whether a system is adequate as far as its safety is concerned, is necessary, is going down the most advantageous right-of-way, or any of these other things. This is quite an expensive proposition, and in my opinion, none of us are in conflict with the idea of being witness to this type of operation. But I don't think that it really should fall on the shoulders of the individuals when we are supposed to have a public utility commission to protect the people in this type of situation.

It seems to us that, particularly with interstate lines—and most of these lines are interstate, certainly they are for the most part in Chester County—and incidentally, Chester County is in a peculiar position geographically because we lay between the great energy sources of the Southwest and the huge densely populated areas in the Northeast. So that consequently, Chester County, over a number of years, has become actually a corridor for electric transmission lines, for gas pipelines, product lines, and so on. So that I think particularly we have a problem which is extremely significant to those people who live in the community, and I think we have a right to know specifically what is being done at present under this code B 31.8. I think we also have the right to have some jurisdictional body who will hold hearings and, if necessary, subpoena and force these companies to testify as to what they are going to do. I think that they have to comply with commonsense with regard to county planning commissions, because certainly with the millions of dollars, perhaps billions of dollars, that are being spent throughout this country in planning, the utilities seem to have a position where they have worked themselves into a point of exclusion, whereby zoning requirements and things of this nature fall upon all of us and many industries, the utilities per se—gas, oil, electric, whatever they are—have a very favored position.

Our contention is that there is no recourse other than to have the Federal Power Commission have jurisdiction in this matter of safety regulations, because, just as in the ICC situation, with the product lines, it is unbelievable for me to quite understand why companies would not want to work under a uniform code.

Mr. Bennett mentioned uniformity from the standpoint that perhaps this wasn't a good thing in itself. I agree with the context in which he stated that. But I should think it would be to everyone's advantage to have a basic understanding of what is required of a pipeline, and to have the most pertinent and updated technological information furnished along with Federal Power Commission members and engineers, and so on, as well as company people. I think we are in a position where we are subjugated to the whims, really, of many engineering people who have a pecuniary interest in this situation which is certainly not in line with the protection of the people.

It seems very strange, and I will reiterate a little bit what Mr. Lang said, that gas or gasoline or propane, or what have you, don't really know what kind of tank it is in, or what kind of pipeline it is in, or what code it is running through. Certainly the Interstate Commerce Commission had great trepidation about ICC MC-330, and changed it to MC-331, and made revisions, updated the code and made certain technical changes in that code. ICC decided that the original code was not adequate for the pressure vessels which carry propane gas over the road. This wasn't found out until they had a holocaust in Berlin, N.Y., and several accidents previous to that. I think that we are in a situation here where it is like the State trying to determine whether to put a stoplight up at an intersection. Do we have to have five people killed before we put a stoplight up? Just where is that point where we really begin to take a good, hard look at this.

It certainly is our recommendation as an organization, and my own personally, that the Federal Power Commission take this safety situa-

tion under its cloak and cooperate with outside disinterested parties as well as the industry.

If I might, Senator, I would mention one thing. You were asking about older pipelines. Mr. Cadmus mentioned this. On page 8 of the application for the Manufacturers Light & Heat Co., docket CP66-347, they mentioned here:

Nearly all of these lines are screw-joint pipe with an average age in excess of sixty years. These pipelines are deteriorated to such an extent that it is impossible to increase the pressure sufficiently to transport the additional volumes of gas required for the Eastern market. Maintenance and repairs of lines is difficult and expensive. Leaks occur frequently at the screw-joints and it is necessary to strip the earth back a considerable distance from the joints to separate the lines and effect repairs, because the lines are laid tightly together in a single ditch along with another pipeline owned by the Southern Pipeline Company.

I mentioned this only because you brought this question up earlier this morning.

Senator HARTKE. Whose statement is that?

Mr. WALDMANN. This is the statement made in this application to the Federal Power Commission by the Manufacturers Light & Heat Co. of Pittsburgh, Pa.

Senator HARTKE. That is the statement of Manufacturers?

Mr. WALDMANN. That is correct, sir. It is signed by Mr. H. R. Weitzel, who is a senior vice president of Manufacturers Light & Heat Co.

Senator HARTKE. Senator Morton?

Senator MORTON. First, gentlemen, I think we ought to put this back into perspective. This report as I understand it, is a result of a request from the Committee on Commerce to the Federal Power Commission, and we have their report on safety of interstate natural gas pipelines. That I think is the subject of this hearing. The report covers only interstate transmission of gas. It excludes both local distribution and intrastate transmission. Therefore we should get back in perspective on what we are talking about, not some bill we passed last year, or the question of hazardous substances because we passed another bill out of this committee yesterday to deal with that.

Mr. Lang, you enlarged upon your statement to some degree because of your personal experience with the Colonial pipeline that passes through your own property. That is the pipeline that passes through your property?

Mr. LANG. That is correct.

Senator MORTON. And this sample that you have given us is from that pipeline?

Mr. LANG. That is correct.

Senator MORTON. Does any gas go through that pipeline?

Mr. LANG. No; but it may tomorrow. I have no control over it.

Senator MORTON. But so far it hasn't?

Mr. LANG. I don't know of any that has gone through.

Senator MORTON. Isn't it a fact that that pipeline is used for the transmission of oil and gasoline?

Mr. LANG. It may be. It is entirely under the control of the company. I know of no regulations anywhere that would control their use of that line.

Senator MORTON. But you also have no knowledge that any gas has ever gone through that pipeline?

Mr. LANG. That is correct.

Senator MORTON. In paragraph 3 of your statement—and I must say I think you get into some emotional overtones here—you talk about a thousand persons each year whose lives will be saved by an increase in expenditures of 5 to 10 percent. Do you have any evidence that there have been anything like a thousand fatalities in any year as a result of interstate transmission of gas? This is what we are talking about.

Mr. LANG. I have no evidence, but I also have no evidence that the lines being installed today may not rupture tomorrow.

Senator MORTON. We have evidence of a lot of accidents happening today that are causing more than a thousand fatalities per year and I think probably the Congress should deal more with those matters. We have enough to do with what is happening to us today without worrying too much about a potential figure which I think is very much exaggerated and is the result, as I say, of a rather emotional statement.

Mr. LANG. May I comment?

Senator MORTON. Yes, sir.

Mr. LANG. I feel that it is far less costly and far easier, using existing know-how, to save the people that will be killed by gas pipeline explosions, than it is to save some of the other people that you refer to.

Senator MORTON. I agree, there is little difference in value between one person we save and another. I agree. If we are so wise in the Congress that we could pass legislation to avoid having anyone killed in an accident, it would be a great thing for us to do. I hope we can someday reach that end. But I am not quite as optimistic as you seem to be. I frankly think, in connection with the other two gentlemen who have spoken here, that you have used this committee as a forum for a personal animosity toward the Pennsylvania Utility Commission as much as anything else. I don't know a single member of that commission, but I dare say that they are in their way doing their job and that they are dedicated citizens. I don't think that any member of that commission wants to stimulate accidents. They have many responsibilities on that commission. All of us have human frailties. I don't know how many members make up the commission, but I think that since we are considering a very restricted subject here, I don't think that this is the appropriate forum for you gentlemen to voice your personal animosities against a State commission. This is not our responsibility.

If you think the Federal Government ought to do everything, fine. That is your opinion and you are entitled to it. I disagree. In my State we have had a problem with coal mine safety. For years we have had a coal mine safety law whereby the Federal Government inspected large mines to avoid disaster. It has recently been expanded to cover small mines which have been controlled by the States. The facts are that the fatalities and the injuries in the large mines controlled by the Federal Government, under their inspection and their supervision, have far exceeded the fatalities and the accidents in the

small mines which have been supervised by the States. And your own Governor, not your present Governor but your Governor of some years ago, in 1951 or 1952, sent his representatives here to strongly oppose the downgrading of the Pennsylvania mine inspection law which is a good one. And the Governor of West Virginia and others did the same. They felt they were doing a better job than the Federal Government could do.

Just because we are at the national level doesn't mean necessarily that we can prevent all accidents.

I don't know whether a law passed in Frankfort, Ky., for the design of a lawnmower or the specification of a pipeline would be inferior to what we might do here. I don't know whether my grandson will get his foot caught in this lawnmower because we pass a law here or because one is passed in Frankfort. I believe that the best government is that closest to the people and I don't know that we are going to accomplish so much by being so all knowing here that we can say there is not going to be an accident in 1976 because a pipeline might blow up somewhere. It is going to happen regardless of any law we pass here or any law that is passed in the States, I am afraid.

That is all that I have, Mr. Chairman. I think that we ought to confine this hearing to the terms of reference that we as members of this subcommittee have, and not just go all over the lot.

If there is something to be done by the Federal Government in this area, I want to be the first to do it. But let's find out what it is, and let's not get off the subject into a vilification of a State commission, be it Pennsylvania, be it Nebraska, be it any other State.

Mr. CADMUS. I would like to comment very briefly, Senator, No. 1, by nothing I stated did I intend to impugn the integrity of any members or collectively the Public Utilities Commission of Pennsylvania. My statement and my reference was, sir, solely to the fact that it is not doing anything, except when complaints are made, as far as going out to see that anything is done concerning safety, they are not doing anything in this area, and I still stand on that statement.

Secondly, it is relevant, I submit, for this committee to consider our experiences in the Colonial matter. I don't come here to use your committee or misuse it as a sounding board for any animosity or any feelings in the Colonial dispute, except, this may help, the easement voluntarily negotiated by certain other property owners where Colonial Pipeline permits the use of gas. So I think it is highly relevant that the committee consider this instance.

Also, in addition to having the right to put gas into this line with additional action of the Pennsylvania Public Utilities Commission, you have in mind that whether it is a molecule of gas pressure pushing against a square inch of pipe, or whether it is liquid, gasoline, petroleum, whatever it may be, you have the same problem of pressure, except for service and certain other technical matters, and that the same steel, Senator Morton, is used for gas pipelines, the same thickness and so forth, and substantially the same pressures, as in the Colonial matter, so I feel that all Mr. Lang has stated is highly relevant. Thank you, sir.

Senator HARTKE. Mr. Lang, you talked about brittle pipe, and you made some comment about this. Do you have any cost estimates of

what would be involved if they were to use the type of pipe to which you referred?

Mr. LANG. I believe that, if the pipeline industry would specify that the steel they will order and use will pass the brittle fracture requirement, they can then obtain that steel, because of the tremendous quantity involved, at almost the same price they now get the steel they are using.

Maybe the cost would be 5 percent, 10 percent higher. For a short period, if there were only one company ordering a relatively small quantity of this better steel, the premium might be 20 percent. As soon as the industry accepted the new specification and the steel companies produced it, the cost should be no more.

Senator HARTKE. There are new specifications being put out for revisions of B-31.8 code.

Mr. LANG. I understand that is so, but I am not allowed to see them.

Senator HARTKE. You have not seen them?

Mr. LANG. No, sir. I am told in the trade industry magazines, that they have made certain minor changes. These changes are so small as to be of no consequence in providing more safety.

Senator HARTKE. Is Mr. Bennett still here?

Mr. BENNETT. Yes, sir.

Senator HARTKE. I thought you said you saw them.

Mr. BENNETT. I beg your pardon?

Senator HARTKE. I thought you said and testified that you saw these revisions.

Mr. BENNETT. No. The revisions I saw were those proposed by NARUC. I didn't testify about the revisions to B-318, 1963 edition. Those, I know, were in preparation. I have not seen them.

Senator HARTKE. Let me come back to you, Mr. Lang.

Have you seen the revisions which Mr. Francis referred to in his testimony?

Mr. LANG. I have seen those, read them, and studied them.

Senator HARTKE. Would you comment on those?

Mr. LANG. Those revisions are ones that the industry should find very acceptable because they do nothing to change the cost of the pipeline or the procedures that are currently under use.

The major change proposed by Mr. Francis is to go through the standard in a few places, or some of the places, and change the word, "should" to "shall." But, even with the change in words, the loopholes still exist.

For instance, the standard does not control the steel that is used in the pipeline. There are wide-open gaps. It does not even say you have to weld the joint between the pipes. You can use chewing gum. It doesn't say that you have to inspect the weld in any way. It says, if, in the opinion of the company, it is deemed that inspection is desirable, then it should be done.

So I see nothing that will be improved by the adoption of the proposal of Mr. Francis and the other commissions.

Senator HARTKE. In your statement you said that, "hydrostatic pressurization"—this is in the safety procedures you have—"to find pinholes may be used at the option of the construction company or the owner."

Do you mean the homeowner?

Mr. LANG. No; the pipeline owner. It may be used if they choose to use it. We see nothing damaging about using it, but we do not believe that it will prove the safety of the pipeline.

Let me add to that. In the manufacture of pressure vessels, companies, such as Downington Iron Works, Allied Steel, and many others, have manufactured tanks for years and never had one fail by hydrostatic test. They believe that hydrostatic test is of no real significance in their business.

How do they do it? By controlling the quality of the steelplate that they take into their shop, from which they are going to fabricate the tank. They do it by controlling the qualification of the welders that will do the welding. They control it by doing a very good inspection job, including radiographic films of the welds. Because of these procedures and these materials, and these skills, they are able to produce a tank that need never be submitted to a hydrostatic test, because it would prove nothing.

Senator HARTKE. You also stated that the pipes should be buried at least 5 feet. Mr. Bennett stated that he thought you could bury a pipe too deeply. Would you care to comment on that?

Mr. LANG. Yes, sir. Probably pipe above ground would be safer than any. If it were out where we could see it, we would probably not so likely run into it with a backhoer or a post-hole digger, or we would be less likely to have it damaged by a subsidence of the earth.

However, we are reluctant to propose that all pipelines be above earth, because this would do far more to ruin the beauty of our countryside.

I think there is a limit to how much we can set on top of the earth. Therefore, for certain esthetic reasons we need to bury our pipelines. If we would put them 5 feet deep, we will avoid some of the abuse they now receive from backhoes and other earth-moving equipment.

Senator HARTKE. Do you believe that the Federal Power Commission should have exclusive jurisdiction and preempt the entire field of regulation over the States?

Mr. LANG. I do.

Senator HARTKE. In other words, to the extent that no State would be allowed to have any additional regulation which was more stringent than that required by the Federal legislation; is that right?

Mr. LANG. I can't imagine a situation wherein, if the Federal Power Commission has true safety regulations, that any State would want to have additional regulations. Certainly the States do not have the technical staff at present, and probably will not see fit to equip themselves with a staff, where they can make a better judgment than the Federal Power Commission.

Senator HARTKE. Mr. Bennett also said that one of the weaknesses of the present regulation was that revision was time consuming and, I think his statement was, is more difficult than amending the Constitution.

Your testimony is that there should be exact specifications. With the development of new technology and new methods, do you feel that exact specifications would be harmful or helpful in the overall operation of providing for safety of pipelines?

Mr. LANG. The type of exact specifications to which I refer would be helpful. They would be in the same class as the specifications now used by the States for control of pressure vessel design and operation. Those regulations permit the company, if it has a better idea on how to do the job safely, or if new material comes along, to submit a proposal to the proper technical specialist and have it approved. The regulations are not inflexible. They can be varied and kept up to date.

We have had no trouble keeping nuclear regulations up to date, although nuclear energy is relatively new and changing.

Senator HARTKE. One concern expressed here on Monday by the Federal Power Commission was the growth of population in formerly rural areas, where they had pipelines constructed according to standards for a rural area. I understand there are four different categories.

What is your view of this policy?

Mr. LANG. My view is that there should be only one class of construction in the United States, as long as the piping is off of the property of the company. In New Jersey, right now, some natural gas is stored in underground piping, which are really bottles, by a gas company, and they do this on a sizable piece of property of their own. They keep their people away from it. On ground or territory over which the public may live, walk, or drive, there should be only one classification. This is true in the pressure vessel laws. There is not one bit of difference in a boiler established in this building where 1,000 people may work, or a boiler installed in a hotel where 2 people work or live.

Senator HARTKE. I have no further questions.

These hearings will now be recessed and be resumed on a date to be announced by the chairman of this committee.

The hearings are recessed subject to the call of the Chair.

(Whereupon, at 12:12 p.m., the hearings in the above-entitled matter were closed.)

(The following material was subsequently received:)

COLONIAL PIPELINE Co.,  
Atlanta, Ga., September 19, 1966.

HON. WARREN G. MAGNUSON,  
Chairman, Senate Committee on Commerce,  
5202 New Senate Office Building,  
Washington, D.C.

DEAR CHAIRMAN MAGNUSON: I attended a hearing before your Committee on August 31, 1966, on S. 1553, a bill to authorize the Federal Power Commission to prescribe safety regulations for gas pipe lines. The purpose of this letter is to refute certain incorrect or misleading statements made before the Committee on that day by Mr. Frederic Lang and his attorney, Mr. Fred T. Cadmus, and to clarify Colonial's position as a transporter of petroleum products rather than gas.

Colonial owns and operates a petroleum products pipeline system consisting of approximately 2900 miles of trunk and lateral lines, extending from Houston, Texas, to the New York Harbor area. This pipeline company now transports about 750,000 barrels per day of gasoline, kerosene, home heating oils, aviation gasoline, and diesel fuels from five input points on the Gulf Coast to 164 delivery terminals in the South and East. The system is being expanded and by the end of this year the throughput capacity of the Colonial system will be increased to 960,000 barrels per day.

Colonial is engaged solely in the business of transporting liquid petroleum products as a common carrier in interstate commerce, and is fully regulated by

the Interstate Commerce Commission. Colonial is not and never has been engaged in the gas business in any respect, does not fall under the Natural Gas Act, is not regulated by the Federal Power Commission, and would not be covered by S. 1553. As a matter of fact, last year Colonial supported Public Law 89-95 which returned safety authority over interstate liquid petroleum pipelines to the I.C.C., and I submitted testimony before this committee in support of the bill.

The petroleum pipeline business is vastly different from the gas transmission business, and we take no position whatsoever as to the merits of S. 1553. The fact that Colonial supported the petroleum pipeline safety bill should in no way be construed as support for or opposition to S. 1553. The gas industry people are extremely safety conscious and should know what is best for their industry insofar as safety regulations are concerned.

Although Mr. Lang and Mr. Cadmus knew full that Colonial Pipeline Company was not engaged in the gas business and that the hearings before the Pennsylvania Public Utilities Commission did not involve gas, they misused this Committee to denounce the Pennsylvania Commission for issuing orders upholding the safety of Colonial's system. The Pennsylvania Commission has not yet ruled on all of the many complaints filed by Lang against Colonial, and it would be improper for me to discuss the case while it is still pending. However, I was very surprised to hear Mr. Lang and Mr. Cadmus speak critically of the Pennsylvania Commission after that body had listened so patiently to their irresponsible complaints and engineering theories for 15 days of hearings, during which time 2453 pages of testimony was taken and 191 exhibits submitted. The Pennsylvania Public Utilities Commission is a competent, fair, public-minded regulatory body that has leaned over backwards in an attempt to satisfy itself and everyone concerned that Colonial's pipeline system is absolutely safe in every respect. The soundness of their decisions is proved by the fact that Colonial has been in operation across the Commonwealth of Pennsylvania for more than two years, during which time over 125 million barrels (or over 5 billion gallons) of petroleum products were transported without having a single personal injury, either to an employee or a member of the public.

We do not believe it is necessary to refute point by point the many incorrect or misleading statements made by Mr. Lang and Mr. Cadmus, but for the sake of this record, categorically deny all implications that Colonial's pipeline system is not safe or that the industry codes and standards under which it was built are inadequate.

It is respectfully requested that this letter be made a part of the hearing record in S. 1553.

I am supplying copies of this letter for transmittal to each member of the Committee.

Very truly yours,

JACK VICKREY,  
*Vice President and General Counsel.*

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#### STATEMENT OF S. LOGAN KERR, CONSULTING ENGINEER

I am S. Logan Kerr of Flourtown, Montgomery County, Pennsylvania. I am a Professional Engineer registered in eleven states, the District of Columbia, a Chartered Engineer in the United Kingdom, and have a "Certificate of Qualification" from the National Council of State Boards of Engineering Examiners.

The technology that we are discussing today is familiar to me in my work as a Consulting Engineer over many years. My affiliation with Engineering and Technical Societies are: Fellow of the American Society of Mechanical Engineers (ASME) and of the American Society of Civil Engineers (ASCE), Honorary Member of the American Water Works Association (AWWA), Member of other technical organizations in the U.S.A., Canada and the United Kingdom.

My familiarity with the development of Codes and Standards comes from service on a number of such committees covering AWWA Standards for steel and cast iron water and gas pipe, American Standard Codes for Pressure Piping, ASME Power Test Codes and International Test Codes for Hydraulic Turbines, Governors and storage pumps and for pipe.

In this field of petroleum pipe lines, carrying flammable and sometimes explosive liquids or gases, my concern is for the public health, safety, and interest.

I feel it my professional duty as an independent consulting engineer to present that aspect before this Committee, and am doing so at my own expense and not as a representative of any organization.

These remarks apply equally to gas lines or liquid lines as basic engineering designs of pipelines follow the same laws irrespective of the materials of construction or the materials transported.

The formulas for calculating pipe wall thickness for containing internal pressures are the same, the forces required to create and sustain flow depend upon the same relations, the surge pressures caused by changes in flow are determined by the same well-proven theory. The differences are of degree only and depend upon the physical characteristics of the fluids or gases flowing in the pipe line, the pipe itself and the conditions surrounding the structure.

These physical laws apply whether transporting petroleum, crude or refined, water, sewage, chemicals or gasses. Why should special exceptions be made for petroleum liquids or gases as compared to the safe practices followed with water, sewage or industrial wastes?

Should not the designs of high pressure petroleum pipe lines carrying explosive or flammable materials be fare more conservative than for lines carrying water under far less pressure?

Why should petroleum pipe lines be less safe than any other type of pipe line?

For many years oil and gas pipe lines were of small size and ran for limited distances. The pipe was usually of mild steel, with relatively thick walls, pressures were not excessively high, and there was an ample margin of safety when originally installed.

Few lines traversed heavily populated areas. Techniques were simple and accidents rare. When failures did occur they were often due to corrosion leaks or in threaded joints rather than complete ruptures of the pipe itself. If failure did occur due to internal pressures, the remedy was to "beef it up". Casualties were infrequent and almost entirely suffered by employees rather than the general public.

Several developments have changed the situation greatly:

First, the population of our country has grown greatly and "open spaces" are disappearing rapidly.

Second, cross country pipe lines have become common due to the tremendous increase in the use of petroleum products by the automobile, by home and industrial heating and many others.

Third, the technical advances in steels that makes possible the large diameter, thin wall pipe so common today—yield strengths nearly doubled from the common grades formerly used in "line pipe."

Fourth, field welding has replaced the threaded pipe joints.

Fifth, economic pressures to meet these new conditions call for lines of the largest diameters with the thinnest walls and highest stresses, reaching to nearly three-quarters of the yield strength as compared with values of one-third to one-half of those originally used.

Sixth, aging and corrosion of lines laid 10 to 20 years or more ago.

Seventh, a petroleum pipe line industry grown to enormous proportions where the "speed", "miles laid per day", "lowest cost per mile", have stretched their personnel so thin that detailed line design has often been left to the field construction staff and not done in the engineering departments.

And where does the "Public Health, Safety, and Interest" enter the picture??

To what extent has this been a factor as far as the "pipe liners" are concerned?

Have limits been placed on allowable stresses and on accurate definitions of the internal pressures that cause them?

Have the pipe lines been provided with sufficient earth cover to protect them from external damage?

Have welding techniques and pipe fabricating methods resulted in a uniformly acceptable pipe line in place?

Have construction practices produced the final structure in a safe condition?

Has the toll of corrosion, both internal and external, been held to safe degrees?

Have corroded and leaking lines been replaced?

Have structural changes in the pipe metal, with time and soil conditions, been considered and provided for?

Have residential and industrial areas been by-passed to protect the residents and workers?

Have reduced stress limitations been placed on pipe lines traversing populous areas?

Have stream and river crossings been designed to provide extra protection against pipe line failures?

Has the pollution of public water supplies been guarded against?

In short, just where is "Public Health, Safety, and Interest" considered in all this?

The petroleum pipe line industry reply usually states that they are governed by the "Codes", hence there is no need of questioning their practices, and criticism of this policy is most unwelcome!

If such is the case, how effective are the "Codes" in protecting this "Public Health, Safety, and Interest"?

The two existing "Codes" applicable to petroleum pipe lines outside of the refineries are sections of American Standard Code for Pressure Piping, B31.4 (1959) for "Oil Transportation Piping", and B31.8 (1963) for "Gas Transmission and Distribution Piping Systems". Within the refinery areas B31.3 (1962) "Petroleum Refinery Piping" applies.

Auxiliary Codes and Standards for Welding, Railroad and Highway Crossings and Materials of Construction are referred to and usually considered as parts of the three "Codes" mentioned.

What is the source of these "Codes" and to what extent do they provide for the "Public Health, Safety, and Interest"?

The American Society of Mechanical Engineers developed and maintains the "Boiler Code" and its companion the "Code for Unfired Pressure Vessels". Both of these activities have had commendable records in protecting the public. They have been written into the laws of most states. The manufacture and use of such equipment is subject to rigid requirements, permits certificates and official seals.

However, "Boilers" and "Pressure Vessels" must be connected to something by piping. The next step, logically, was to prepare a Code for Steam Piping, but this grew to include many other applications of piping systems and affected many industries. Project B31 was set up in 1926 as an activity of the American Standards Association, with the American Society of Mechanical Engineers as the "sole administrative sponsor".

The first "Code" produced by B31 Committee was issued in 1935 as an "American Tentative Standard Code for Pressure Piping". Supplements, additions and revisions came out from time to time. The broadening scope of the project resulted in forming a number of subcommittees to prepare separate sections of the Code applying to the various interests involved. These gave rise to the number following the decimal point in the Code designations.

How has this activity functioned? Have the purposes and objectives been attained? To quote from the "Introductions" of both B31.4-1959 and B31.8-1963:

"The Code for Pressure Piping sets forth engineering requirements deemed necessary for *safe design and construction* of piping systems. While *safety is the basic consideration of this Code*, this factor alone will not necessarily govern the final specifications for any pressure piping system." (Emphasis added).

To quote further from PM200 of the American Standards Association, January 1966, "Current Projects":

#### "B31 Code for Pressure Piping

"*Scope.*—Design, manufacture, fabrication, test, installation and operation of pressure piping systems.

"*Sponsor.*—American Society of Mechanical Engineers."

Our question now is how far have these Codes gone in achieving these commendable objectives and have all six of the items of Scope been covered in existing Codes? To answer this the procedures of producing Codes and securing their official approval must be studied. Such an inquiry included in this statement will be limited to existing Codes related to cross country type pipe lines for petroleum liquids and gases, B31.4-1959 and B31.8-1963.

Since Codes and Standards designated as "American Standards" are produced under the auspices of the American Standards Association (ASA), a study of their Rules and Procedures should disclose the means whereby a "safe design and construction" is achieved.

The initial phases for developing B31 Codes have been no different from those of hundreds of other Codes and Standards under ASA. The need has been demonstrated, the sponsor designated, a scope prepared, and a "Sectional Committee" authorized.

The actual preparation, review and approval steps, however, deserve close attention to discover just where the "Public Health, Safety and Interest" is considered and protected. Again this analysis applies only to the two Codes for Petroleum Pipelines in their existing form and not at the moment to any revisions or modifications of them in preparation. These will be dealt with further on.

The Rules of Procedure for the American Standards Association state that the personnel of a "Sectional Committee" (such as B31) shall be organized by the Sponsor in cooperation with the American Standards Association. It further states that member organizations will be selected from those "who have a substantial interest in the project together with a number of representatives which each shall have, with due regard being given to the relative importance of the interest of each organization in the project and the proper balance between producer, consumer and general interest groups". With respect to subcommittees, these members are supposed to "function as individuals rather than as official representatives of organizations, although a reasonable balance of interests is desirable".

The Sponsor, therefore, subject to the approval of the American Standards Association, selects the personnel of the Sectional Committee. This committee apparently selects the personnel of the subcommittees, and the approval of neither the sponsor nor of the American Standards Association seems to be required although a "reasonable balance of interests is desirable". This implies that the balance should be of the same character as for the Sectional Committee, namely the producer, the consumer and general interest groups.

Referring to the personnel of B31.4 Subcommittee which prepared the Standard issued in 1959, there were sixteen representatives of pipe line companies, six representatives from producers of pipe, and six representatives from manufacturing organizations supplying equipment other than pipe. There were two representatives of the American Petroleum Institute, there were no consultants and there were no representatives of either general interest or public interest.

The Subcommittee personnel on B31.8 is also made up predominately of pipe liners or suppliers to pipe line companies. Two contractors are included but they in turn could be defined as suppliers since they secure their construction contracts from the pipe line companies. There is, however, an important difference, namely that a research institute and an engineering school are represented and a state Public Service Commission member is included as well as a representative from a governing body of Public Interest in Canada.

As the subcommittee proceeds in its work and secures a "consensus" their draft document is submitted to the main committee (Sectional Committee) where certain definite procedures are required. This draft is circulated to that committee and "in some cases to a selected list of organizations and individuals not on the Committee". A further provision for the Sectional Committees, after it has secured agreement on the draft Standard, is that "the draft Standard is published for criticism in one or more trade or technical journals, or circulated to industrial and technical groups". This matter is optional and not mandatory and presumably was not followed in the case of B31.4-1959.

"When complete unanimity is reached or when the proposed Standard is so substantially supported that it may properly be considered that a consensus has been reached (in the Sectional Committee), a report giving a detailed record of the vote is made to the Sponsor."

In another section of the Rules it points out that ASA is responsible for determining whether a "consensus" has been reached on a national basis and an approval of 83 $\frac{1}{3}$  percent of the Standards Board of six members is required for such approval.

It rests, however, with the Sponsor to make the recommendations in regard to the technical qualifications of a proposed Standard and ASA emphasizes this important responsibility.

Has the "Public Health, Safety and Interest" been protected in the subcommittee where an implied balance of interest is supposed to exist, or does it rest with the Sectional Committee who may wish to act only on whether or not there has been a "consensus", or does it rest elsewhere?

It would appear that the responsibility of the Sponsor is clearly set forth—to examine critically the technical aspects of a proposed Code or Standard and not merely give automatic approval to the document because "the Committee and the Subcommittee knows what they are doing and why should we question it?"

The question still remains as to what part of the so-called "consensus" gives consideration to the "Public Health, Safety, and Interest". The answers received from this question indicate that the subcommittee is purely technical and deals with technical matters only, that the Sectional Committee ordinarily does not delve into technical matters and furthermore has on B31 an "Advisory Group" on whom they rely for comments related to the "Public Health, Safety and Interest". It should be noted, however, that the "Advisory Group" has no vote so the effect of their voice is not counted in as a part of "consensus". The ASA Standards Board is concerned only as to whether a "National Consensus" has been obtained, relying upon the Sponsor for the technical aspects of Codes. Some of these so-called "technical aspects" have a direct bearing on the "Public Health, Safety, and Interest".

The two "Codes" referred to have many desirable features, B31.8 on gas lines does have stress limitations with respect to environmental conditions. B31.4 on liquid lines lacks this provision. Neither of the "Codes" in their presently published form contain sufficient provisions to cover the essential aspects of a "safe Code"—they are good as far as they go—but do not go far enough!

And what is being done about going the rest of the distance? From a report on B31 Sectional Committee contained in the Magazine of Standards, January 1965, the statement is made:

"In the future \* \* \* B31 activities will involve increased attention to the Committee's primary responsibility of creating documents that will safeguard the public interest."

B31.8 is also under similar revision. The present status of these changes are not known nor is information forthcoming as to how much protection is being given in them to the "Public Health, Safety and Interest".

The availability of draft reports as suggested in the "Rules and Procedures" apparently extends only to B31.4, B31.8 members and B31 Sectional Committee members and not to public bodies or organizations as such or to interested individuals or even to members of the Sponsoring Society.

Requests for copies of the draft Code from interested individuals not on the committee have been met with refusal on the basis that this is still "a committee function and the text will not be available until the approvals of the Sponsor and of the American Standards Association have been received and the Code published".

How is anyone who has a definite professional interest in this matter able to present his views to the B31 Subcommittees, to the Sectional Committee, to the Sponsor, or to the American Standards Association if he is unable to secure a copy of the document he is commenting upon?

To what extent are Public Bodies or Professional Organizations being consulted and their views incorporated in the "Codes"? This is not known.

The Industry has urged that B31.4 and B31.8 Codes be accepted by local and state regulatory bodies and also by Federal Agencies as being ample to provide "for safe design and construction of piping systems".

Many pipe line companies treat these Codes as "minimum requirements" and are prudent and conservative in their designs. A few are prone to design and operate lines at pressures beyond such minimums or to omit detailed pressure analyses. In some instances lower standards of construction have been permitted.

It is for these few that "rules", "codes" and "regulations" must be spelled out in unmistakable language so that compliance is not left to poor judgment or even deliberate misinterpretation.

If the responsibility for safety of gas transmission mains is to be assigned to the Federal Power Commission just as similar responsibility was assigned for oil transportation piping to the Interstate Commerce Commission, to what extent can these Codes (B31.4 and B31.8) in their present or future forms be considered as conclusive and endorsed as safe Industry Standards?

It seems to me that public agencies have a dual role, first of all to protect the "Public Health, Safety and Interest", and second to see that unreasonable requirements are not imposed on the petroleum pipe line industry. The allocation of responsibility for safety to Federal Agencies should not preclude protests by citizens or public bodies against intrusion through public or private properties or against insufficient design or improper construction where such areas are traversed.

It is desirable for this Committee of the Senate to be apprised of the procedures followed in the preparation and approval of such Codes when assigning to Federal Agencies the responsibility for safety. Hearings before this Committee focuses attention on these most important aspects of the problem.

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,  
Washington, D.C., October 17, 1966.

HON. WARREN G. MAGNUSON,  
Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This is in reply to your request of September 2, 1966, for the views of the Bureau with respect to S. 1553, "To amend the Natural Gas Act to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies."

We concur with the views expressed by Chairman Lee D. White, of the Federal Power Commission, when he testified before your Committee on this bill.

While legislation along the lines of S. 1553 would be consistent with the Administration's objectives, the Executive Branch will give further consideration to the need for any changes or improvements that should be made in the bill, with a view to submitting further recommendations on it to the 90th Congress.

Sincerely yours,

WILFRED H. ROMMEL,  
Assistant Director for Legislative Reference.

COMPTROLLER GENERAL OF THE UNITED STATES,  
Washington, D.C., March 26, 1965.

HON. WARREN G. MAGNUSON,  
Chairman, Committee on Commerce,  
U.S. Senate.

DEAR MR. CHAIRMAN: By letter dated March 18, 1965, you requested our comments on S. 1553. The stated purpose of the measure is to amend the Natural Gas Act to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies.

We have no special information that would assist the Committee in its consideration of this measure and therefore offer no comments with regard thereto.

Sincerely yours,

JOSEPH CAMPBELL,  
Comptroller General of the United States.

FEDERAL POWER COMMISSION,  
Washington, D.C., February 24, 1965.

HON. HUBERT H. HUMPHREY,  
President, U.S. Senate,  
Washington, D.C.

DEAR MR. PRESIDENT: I transmit herewith for the consideration of the appropriate committee twenty copies of a draft bill to amend section 7 of the Natural Gas Act by adding a new subsection authorizing the Commission to prescribe safety standards for the construction and operation of interstate natural gas pipelines. Similar bills were before the 87th Congress (S. 1600; H.R. 6960).

During the past fifteen years the natural gas industry has built thousands of miles of large diameter pipeline. Much of this mileage operates under pressures of 800 pounds or more per square inch, is in populated areas, and could constitute a threat to public safety unless constructed and maintained in accordance with high standards of safety.

The present proposal does not suggest that the industry is not adequately discharging its obligation to protect the public against the dangers inherent in the operation of natural gas pipelines. Indeed, the self-interest of the pipeline companies, as well as their obligation to the public, has made safety in operation a matter of importance for them. The industry's safety record to date is a good one. Unfortunately, however, because of the diversity of state action or inaction, there are no uniform standards. A number of states have adopted rules or regulations applying the code of the American Standards Association, some with modifications, but the majority of the states have not provided for any comprehensive safety regulation of the high-pressure pipelines.

The Natural Gas Act is silent on the matter of conferring safety Jurisdiction on the Commission, in contrast to the regulatory statutes governing a number of other regulated industries, such as civil aviation, rail and motor carriage, and atomic energy. These statutes, like the Natural Gas Act, authorize agency certification or licensing of operations, but also deal specifically with safety considerations. With the enormous growth of the interstate network of pipelines since adoption of the Natural Gas Act in 1938, and in the absence of adequate and uniform state laws, every practicable step should now be taken by the Federal Government to protect the public from the inherent dangers associated with high-pressure pipelines.

Under the proposed authorization, the Commission would be in a position to prescribe a uniform, mandatory safety code for the interstate pipelines. In this regard, the setting of standards is the primary and immediate object of the legislation. The legislation and the contemplated regulations do not propose to displace or alter the primary obligation devolving upon each operator to provide for the protection of the public. Furthermore, the Commission is not seeking inspection and policing authority, a task which would involve considerable additional personnel and money. It is the Commission's belief that the pipeline companies have acted responsibly in matters of safety, and that the use of simple reporting requirements should produce an adequate check on compliance with the Federal standards which would be adopted.

For the foregoing reasons, the Commission urges enactment of the draft bill. Commissioner O'Connor has asked me to note his opposition to the proposed legislation on the grounds that it is not needed and, if enacted, might do harm to the voluntary industrial safety program. In his view, the interstate gas transmission companies have achieved a splendid safety record without governmental direction by continuing, voluntary research in the safety field. He believes that governmental entry into the field would not only tend to reduce the incentive for voluntary industry research but would put the Commission in the role of a safety endorser—a role he feels it cannot realistically fulfill without federal inspection and enforcement.

Respectfully,

JOSEPH C. SWIDLER, *Chairman.*

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U.S. DEPARTMENT OF JUSTICE,  
OFFICE OF THE DEPUTY ATTORNEY GENERAL,  
*Washington, D.C., April 26, 1965.*

HON. WARREN G. MAGNUSON,  
*Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.*

DEAR SENATOR: This is in response to your request for the views of the Department of Justice on S. 1553, a bill "To amend the Natural Gas Act to authorize the Federal Power Commission to prescribe safety requirements for natural gas companies."

This bill has been examined, but since its subject matter does not directly affect the activities of the Department of Justice we would prefer not to offer any comment concerning it.

Sincerely,

RAMSEY CLARK,  
*Deputy Attorney General.*

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