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TESTIMONY OF
J. DEXTER PEACH, DIRECTOR
ENERGY AND MINERALS DIVISION
ON LIQUEFIED ENERGY GASES SAFETY
BEFORE THE
COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION

Sen 06200

Mr. Chairman:

We are pleased to be here today as you consider S.411, the Administration's bill to amend the Natural Gas Pipeline Safety Act of 1968. I will be commenting, in part, on its provisions to improve the safety of liquefied energy gases ~~(LEG)~~ facilities. Our comments will relate to the siting and safety of both liquefied natural gas (LNG) and liquefied petroleum gas (LPG) facilities.

As you recall, we appeared before your committee in December to discuss the conclusions and recommendations from our report on "Liquefied Energy Gases Safety" (EMD-78-28) issued in July, 1978. In March we submitted to your committee our comments on S.411, and last week, a summary of actions taken by Congress and Federal agencies which deal with issues identified by our report.

My statement briefly summarizes the major conclusions of our report on LEG safety, discusses the provisions of S.411 that relate to LEG safety problems we identified, reviews the major actions taken by Federal agencies in response to our recommendations, and highlights important areas where we believe action is still needed.

SUMMARY OF MAJOR FINDINGS IN THE JULY, 1978 REPORT

Our July, 1978 report documented that many large LEG storage facilities are a serious hazard to the surrounding area. The facilities are built to the same standards as ordinary buildings, and tanks at three of the five sites we evaluated had earthquake safety margins less than 25 percent. It is virtually certain that the level of natural phenomena that LEG facilities are designed to withstand will be exceeded at a large number of facilities in the next 50 years, with the possibility that one or more of them will fail.

Tank failures might also be caused by acts of sabotage. We found that security procedures and physical barriers at LEG facilities are generally not adequate to deter even an untrained saboteur. Most of the storage tanks are highly vulnerable to sabotage which could lead to complete catastrophic failure of the tank walls.

National Fire Protection Association standards require that each large LEG tank, or group of tanks, be surrounded by a dike which can hold at least the volume of the largest tank. However, most of these dikes are only designed to contain LEG spilled from relatively slow leaks. They cannot contain the surge of liquid from a massive rupture or collapse of a tank wall or from the sudden appearance of a hole at the bottom of the wall. At five of six sites we examined, where the dikes were all built to NFPA safety criteria, more than 50 percent of the fluid could escape.

Our calculations assumed an immediate, total spill of a full tank, with the fluid moving toward the nearest dike wall. Such an LNG spill occurred in Cleveland in 1944. A similar, much larger LPG spill occurred in the country of Qatar in 1977.

If spilled in an urban area, LEG could spread across a city in sewers, subways, or other underground conduits, or if a massive burning cloud is blown along by a strong wind, a city could be faced with a very large number of ignitions and explosions across a wide area.

LEG trucking to and from storage facilities through densely populated areas also is very dangerous. These trucks move routinely through large cities and on elevated highways. The 40 cubic meters of LNG from one truck, vaporized and mixed with air in flammable proportions, are enough to fill 110 miles of a 6-foot diameter sewer line, or 15 miles of a 16-foot diameter subway system. LEG trucks are highly vulnerable to sabotage.

LPG railcars, which are also vulnerable to accidents and sabotage, travel through densely populated areas, even cities which prohibit LPG storage.

We found that double-hulled LNG ships are probably the least vulnerable part of the LNG transportation and storage system. LPG ships with single hulls are much more vulnerable both to collisions and to sabotage.

A major LNG accident could cause damage of such severity that injured parties could not be fully compensated under existing arrangements. Present corporate structures and legal

limits on liability offer nearly total protection to the corporations which reap the profits.

The mixture of Federal, state, local, and National Fire Protection Association codes for LNG and LPG reflect neither the relative dangers from the fuels nor much consistency among themselves. Most of the regulations are based on an uncritical acceptance of National Fire Protection Association standards. Many large LEG facilities have not been subjected to Federal regulation at all, partly because of a failure of cognizant agencies to fully assert their authority. The Federal Power Commission system for approving LNG projects was clearly inadequate to protect the public.

I will not take the time to summarize other conclusions which, though important, are not so relevant to this hearing.

SPECIFIC COMMENTS ON S.411

We find, Mr. Chairman, that S.411 addresses a number of safety concerns that we raised in our report. We approve of its provisions to strengthen and clarify the Department of Transportation's present authority in the safety regulation of natural gas pipeline transportation and to provide major new and comprehensive authority in the safety regulation of hazardous liquid pipeline transportation. The patterning of Title II after the Natural Gas Pipeline Safety Act, with the amendments in Title I, is a logical step in establishing a comprehensive and effective Federal pipeline safety program.

Although we are in basic agreement with S.411 as it relates to pipeline transportation, we recommend that the Committee add a new Title III which could be entitled the "Large Hazardous Commodities Storage Facility Safety Act of 1979". We believe that large storage facilities should be covered in a separate title because of the great risks to the public associated with having large quantities of hazardous materials in one place.

We believe that the Federal government should regulate every facility, in or affecting interstate or foreign commerce, which stores large quantities of hazardous commodities at one location, whether or not connected to pipelines. There are large facilities storing hazardous liquids which are not associated with pipelines. For instance, the Petrolane LPG import terminal in Los Angeles, which has a storage capacity of 600,000 barrels, is not connected to a pipeline. The LPG is transported from the terminal in trucks and railroad tank cars. The bulk storage of other hazardous commodities, such as chlorine, hydrogen cyanide, and vinyl chloride, would also not be covered by S.411 because these hazardous commodities are not transported by pipeline.

Our proposed Title III, in its definition of hazardous commodity, would extend the Secretary's regulatory authority to include large storage facilities in or affecting interstate

or foreign commerce for any liquid, solid, or compressed gas which is regulated under the Hazardous Materials Transportation Act of 1975. The Secretary would be required to regulate LNG, LPG, ethane, anhydrous ammonia, and chlorine, but would be given discretion to include other commodities in his regulations.

Title III should prohibit the siting of any new large hazardous commodity storage facility, or the expansion of an existing large storage facility, in or near a densely populated area. The Secretary of Transportation should also be authorized to require any existing, large hazardous commodity storage facility to incorporate any standards applicable to new facilities where he determines that former standards are not adequate.

Coverage should be limited to large storage facilities in order to exclude from regulation the use of small quantities by businesses and other consumers, such as residential and farm LPG users. Federal, state, and local storage facilities should be required by law to maintain the same safety standards as private facilities.

We have made detailed recommendations in our bill comments, but I would like to emphasize here the three provisions that we consider most important:

1. Remote siting for storage facilities should be required. The bill should prohibit the siting of any new, large hazardous commodity storage facility or the expansion, including additions to storage capacity or the expanded use, of an existing, large storage facility in or near

densely populated areas. The Secretary should prescribe the definition of 'near' and 'densely populated area'.

2. The Secretary should evaluate each existing, large hazardous commodity storage facility. The Secretary should be authorized to require such a facility to incorporate any design, construction, operations, or maintenance standards applicable to new facilities where he determines that former standards are not adequate.

3. The bill should require that the owners and operators of a large hazardous commodity storage facility, including affiliates, shall be strictly liable without regard to fault for damages, including cleanup costs, sustained by any person or entity, public or private, as a result of an explosion, fire, or discharge. If a facility is so dangerous that the owners are unwilling to assume this liability, then it is too dangerous for the public.

If the Committee does not adopt our suggested Title III, we believe the provisions should be incorporated into Titles I and II.

ACTIONS ALREADY TAKEN ON GAO RECOMMENDATIONS BY DOT AND FERC

Let me turn now to the impact our report has had on the Federal regulation of LEG. In addition to proposing the bill that the committee is now considering, the Administration has acted, through the responsible Federal agencies, on many of our recommendations. For example, FERC's assessments of proposed LNG terminals now include the trucking that would be associated with a terminal. DOT has taken action, or plans to take action, on many of our recommendations.

DOT's Notice of Proposed Rule Making on LNG facilities includes many requirements that reflect our analysis of the hazards. The proposed rules would establish a set of comprehensive Federal safety standards governing siting, design, and construction of new LNG facilities and--equally important--parts of existing facilities that are replaced, relocated, or significantly altered.

The new standards would require:

--Use of greater land area to protect nearby populations against the heat radiating from a fire at the facility site.

--Use of greater land area or an ignition system to protect surrounding populations against the hazards of a gas cloud traveling downwind from an LNG spill.

--More detailed geological investigation of a proposed site (based on Nuclear Regulatory Commission standards).

--Stronger design of storage tanks, dikes, and other critical components to guard against the effects of earthquakes, flooding, and high winds. Facilities would be prohibited in active seismic areas.

--Better design of impoundment systems (diked areas) to contain a major spill of LNG.

--More stringent storage tank design and testing to minimize the possibility of a catastrophic failure.

--New construction procedures, qualification of construction personnel, and testing control systems.

We take special note of the fact that the proposed rules would require that the impounding system have a configuration or design which, to the maximum extent possible, will prevent liquid from escaping impoundment under the worst predictable spill conditions. Imposed loading and surging flow characteristics must be based on a sudden total spill release of the full contents of an LNG tank.

Our study identified the possibility that LEG or LEG vapors could accumulate under a tank elevated on piles and thus cause an explosion that could rupture the tank bottom. A proposed rule would prohibit the construction of any storage tank with a capacity of more than 15,000 barrels with an underlying airspace where

vapors could accumulate. DOT also plans to address this safety concern in future rulemaking on LPG facilities. DOT has said it will be studying the matter further to determine more precisely the nature and extent of damage that might occur to existing elevated tanks.

While DOT reacted positively and constructively to many of our recommendations on LEG facilities, we are especially concerned about the DOT response to two major recommendations. The first would require that all new, large LEG storage facilities be built in remote areas, and would preclude the expansion of existing faciities in other than remote areas.

DOT's proposed rules merely set minimum distances between an LNG facility and certain other buildings or activities.

We believe remote siting is the primary factor in safety. Because of the inevitable uncertainties inherent in large-scale use of new technologies and the vulnerability of the facilities to natural phenomena and sabotage, the public can be best protected by placing these facilities away from densely populated areas. It is because of the potential hazards to densely populated areas that we have urged the inclusion of a remote siting requirement in S.411.

The other major recommendation would prohibit LEG truck and LPG railcar movements through densely populated areas and any areas that have features that increase the vulnerability to a major LEG spill, unless delivery is otherwise impossible.

In its substantive reply to our report, sent to the Senate Appropriations Committee, DOT cites 49 CFR Part 397.9(a) which prohibits truck movement of hazardous materials through densely populated areas, unless no other practicable highway route is available. They note that truck routes in such areas, and the use of vehicular tunnels in particular are usually regulated locally. They also point out that diverting materials to other modes of transportation may involve greater risks or exposures.

DOT has initiated research to develop criteria for use in conjunction with existing highway design, population, geographic, and other factors in the designation of routes for hazardous materials highway carriers. The result will form the basis for advising State and local governments on criteria for route designation, as well as for deciding whether Federal regulation is necessary.

We found that the interpretation of "practicable highway route" has been such that LEG trucks routinely roll through our large cities. The result is that the possibility of a catastrophe continues to exist unnecessarily. Local communities have no power to regulate truck routes on interstate highways passing through them.

DOT also does not believe that the prohibition of LPG railroad cars through densely populated areas is a practicable requirement.

Since the Secretary of Transportation has not acted to prohibit the movement of LEG by trucks and railcars through densely populated areas, the committee may also wish to address this issue in LEG legislation.

In summary, while DOT has agreed to take some steps to upgrade safety and security in some areas, action is not planned on a

number of other recomendations that we believe are necessary for adequate protection of the public.

This concludes my statement, but we will be happy to respond to any questions you or the committee may have.