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STATEMENT OF
J. DEXTER PEACH, DIRECTOR
ENERGY AND MINERALS DIVISION
SUBCOMMITTEE ON FOSSIL AND SYNTHETIC FUELS
HOUSE COMMITTEE ON ENERGY AND COMMERCE

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to be here today to discuss our views on natural gas supplies and on Federal policy concerning the use of natural gas. As you know, the social and economic well being of the Nation is currently dependent on a continuing and adequate supply of natural gas. Federal natural gas legislation over the past decade has clearly shown Congress' intent to protect high priority gas users and to ensure the efficient use of this premium fuel over the long term.

Over the past several years, we have done considerable work on natural gas supplies, policies and programs. Our reports have covered such topics as natural gas production potential from conventional and unconventional sources; natural gas imports from Canada, Mexico, and Algeria; natural gas reserve estimating procedures, coal gasification, natural gas pricing, and planning for natural gas shortages. My testimony today is based on this work (see Attachment I) and current reviews now nearing completion which I will discuss later in my statement. My statement today will provide our views on natural gas

supplies, Federal policy, and expectations for future supply levels.

In general, the gap between domestic natural gas production and consumption is expected to grow through the remainder of the century. Consequently, our natural gas supply slate is expected to show a shift from traditional dependence on conventional lower-48 well production to a variety of other domestic supply sources, such as the unconventional gas resources, Alaskan supplies, and natural gas imports.

BACKGROUND

Before discussing our expectations for future natural gas supplies, some background information is pertinent. Currently, natural gas accounts for more than 30 percent of the energy we produce, and about 27 percent of the energy we consume. This fuel is consumed in over half the residences and commercial establishments of the Nation, and natural gas provides nearly 40 percent of the fuel consumed by industry and agriculture.

Unfortunately, natural gas supplies available for these customers were not consistently dependable during the 1970's. In 1971, interstate pipelines were, for the first time, unable to satisfy total demand. Subsequently, the colder than normal winter of 1976-1977 became a focusing event for natural gas issues. At the height of this shortage, which occurred during the first week of February 1977, service to residential customers was threatened in some areas, and an estimated 1.2 million workers were idled by natural gas shortages. Because

of continuing supply uncertainties, the possibility of a reoccurrence has not been eliminated.

FEDERAL NATURAL GAS POLICY AND PROGRAMS

Federal regulation of the natural gas industry has undergone significant changes since passage of the Natural Gas Act of 1938. We reviewed the development of Federal policies and regulation in our March 16, 1981 report entitled "Natural Gas Plan Needed to Provide Greater Protection for High Priority and Critical Uses." Our report describes the Federal policy directions of the 1970's which first aimed at restricting natural gas consumption and market growth, and contrasted this policy with DOE's efforts since 1978 to encourage natural gas consumption. DOE's efforts to encourage consumption are a departure from the policies set forth in the National Energy Act of 1978, the body of legislation which established the current framework for Federal natural gas policy. Two of the five laws which comprise the National Energy Act deserve specific mention at this point.

The National Gas Policy Act of 1978 was designed to remedy the supply distortion caused by the two market system; it provided incentives for increasing exploration and drilling, and it also provided for safeguarding high priority users. The Act prescribes a schedule for deregulating natural gas prices by 1985. Gradual price increases are permitted as drilling and exploration incentives, but these increases are also designed to soften the inflationary impact of higher gas prices and to protect residential and small commercial

consumers from rapid increases in their gas bills.

The Powerplant and Industrial Fuel Use Act of 1978 extended the Federal policy started in 1974 to expand the use of coal by large industries in place of natural gas or oil. Under this Act, existing powerplants can be ordered to convert from natural gas or oil to coal, and new electric powerplants and major fuel burning installations are prohibited from using natural gas or oil as a primary energy source. In addition, existing utility powerplants are not permitted to use natural gas as a primary energy source after January 1, 1990. However, temporary and permanent exemptions from these provisions can be obtained in a wide variety of circumstances. For example, utilities have been provided special public interest exemptions to use natural gas if oil could be displaced. This temporary program is due to expire this summer.

OUTLOOK FOR FUTURE NATURAL GAS SUPPLIES

In a December 1979 report 1/, we analyzed the future trends in United States petroleum and natural gas production in light of the physical factors affecting that production. We concluded that the aggregate trend in total domestic natural gas production is for a steady decline in the late 1980s. Production may then begin to stabilize at slightly less than 17 Tcf a year through the end of the century because

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1/"Analysis of Current Trends in U.S. Petroleum and Natural Gas Production, EMD-80-24, Dec. 7, 1979.

of the introduction of natural gas from Prudhoe Bay and the frontier OCS. We also concluded that although lower-48 production will continue to dominate overall U.S. production, its share of such production will continue to decline. Furthermore, the average rate of reserve additions in this area will not be sufficient to stabilize lower-48 production until after the end of the century.

Some recent increases in exploratory and development drilling for natural gas have been reported and are supported by work we recently completed at the request of the former Chairman, Subcommittee on Intergovernmental Relations, Senate Committee on Governmental Affairs. We expect to issue a report on this review shortly. Our review showed that drilling for oil and gas wells have increased sharply since the NGPA of 1978 was enacted, and that natural gas reserve additions in 1979 were the highest since 1970. However, the news is not all good. Total proved gas reserves continue to decline. We continue to consume gas faster than we are finding it. We recognize that it is too soon for the act to have had much effect on reserves because proving reserves typically requires from 2 to 5 years. While we would hope that this increase in drilling would signal a reverse in the historical trend and prove our projections to be wrong, the evidence is too fragile and the time too early to cause us to change our outlook at this time.

Moving past this basic starting point concerning conventional natural gas supplies, the supply estimates for future years become even more speculative and can differ

significantly among reporting sources. These differences are due to various expectations for natural gas supplies obtainable from the unconventional natural gas deposits, imported natural gas from Alaska and Mexico, liquified natural gas (LNG) imports, and synthetic gas. Each of these estimates must be examined carefully in terms of assumptions made and expected achievements.

In a September 1980 report 1/, we estimated the potential of oil and natural gas resources available to the United States from Alaska, Canada, and Mexico through the year 2000. This work was further supplemented by other GAO reports to provide a basis for assessing overall natural gas supply trends.

Our bottom line is that import dependence will remain with us through the end of the century and the United States will have to work harder to conserve and to increase our domestic production of energy, including natural gas, as much as possible until our long range energy projections of renewable and inexhaustible energy sources are obtained. Should domestic supplies increase due to research and development advances in unconventional gas production, gas imports could be reduced, or OPEC oil could be displaced.

I would now like to expand briefly on our findings in these gas supply areas.

1/"Oil and Natural Gas From Alaska, Canada, and Mexico--Only Limited Help for U.S., EMD-80-72, Sept. 11, 1980.

Alaska

Alaska's resources look promising and increased production could help offset the anticipated decline in lower-48 production. But, the time required to develop our Alaskan natural gas resources will constrain this contribution even if exploration efforts and transportation systems are expedited. While an estimated 26 Tcf of recoverable natural gas reserves is contained in the Prudhoe Bay area, a transportation system needs to be completed. The Alaskan Highway Pipeline, which may bring this gas to market, is not likely to be completed before late 1985. It is important to note that this project's financing is uncertain at this time, which could further delay its completion. Due to the exploration and transportation constraints, we have estimated that Alaska's natural gas production at about 0.3 Tcf a year in 1985 and about 1.4 Tcf in 1990 if the pipeline is completed by 1985. To exceed this amount of production in 1990 and thereafter, another major gas transportation system will be needed, and new natural gas fields and reserves will have to be discovered and developed.

Unconventional sources

The unconventional gas sources include Devonian shales, tight sands, coal beds and geopressured zones. Gas from the eastern Devonian shales and western tight sands are considered as chief potential contributors to unconventional gas production in the mid-term. Both economic and technical uncertainties must be overcome to realize the potential production from these areas. Low well production rates have been the principal deterrent

to increased industry activity in shale areas. This condition has favored investments in conventional gas exploration where wells have recovered investment costs in less than half the time required for shale gas wells. For tight sands areas, further development of fracturing techniques are needed to improve the resistance to gas flow which is 5 to 2,000 times greater than typical gas producing formations. The varying shapes of these deposits have also made exploration of these deposits much more difficult than typical gas deposits. The 1980 production from Devonian shale and tight sands total about 1 Tcf. Some estimates have been made assuming successful results from further research and development, but the figures are very speculative.

Further interest in coal bed methane is necessary for development, and substantial uncertainties must be resolved before geopressured methane's production potential is identified. The natural gas industry has expressed little interest in coal bed methane; its attention has been focused on conventional gas resources. The coal industry's primary concern has been venting methane from coal beds as a safety precaution rather than recovery. In addition, there are unresolved legal questions about gas producer and coal company ownership rights to coal bed methane. Geopressured methane's potential is uncertain because production of this resource has not been demonstrated, the costs of production are speculative, and the costs and risks associated with production are potentially high. We believe the uncertainties make this resource too speculative to depend on as a

contributor at this time.

Canada and Mexico

Imports from our neighboring countries also supplement our domestic supplies. However, both Canada and Mexico have declared policies to meet their domestic energy needs first, and then export surplus production. These countries have made clear their intent to obtain the highest possible prices and our nation's natural gas import bill from them was about $4.4 billion during 1980. The future of Canadian imports is limited due to expected increases in Canadian consumption. Depending upon Canadian consumption and energy policy, exports to the U.S. could either be greater or lesser than current export levels by the mid-1980s.

Mexican imports are, and will continue to be, limited by the size of the existing pipeline through 1985. We assume that Mexican supplies will increase further with completion of another pipeline to accomodate natural gas from the Reforma fields via the city of Monterey near the U.S. border. Based on these factors, we estimate imports from both Canada and Mexico will increase from 0.9 Tcf in 1978 and range from 1.1 to 2.1 Tcf in 1985, and from 0.5 Tcf to 2.8 Tcf in 1990.

LNG and synthetic gas

We expect little supply from the two other potential sources, liquefied natural gas (LNG) imports from OPEC countries, and synthetic gas from coal or other energy sources. LNG imports are limited by the current natural gas supply levels, the lengthy and complex regulatory review given LNG projects,

and various transportation and market differences with potential LNG importers. Our discussions with gas industry officials indicate that few proposals to import LNG will be made this decade. The Office of Technology Assessment has estimated that only about 0.6 Tcf of additional LNG could be imported above current levels from OPEC by about 1990. Increased LNG imports from OPEC countries is also of concern because such supplies would essentially trade dependence on imported OPEC oil for dependence on imported OPEC natural gas.

We also cannot anticipate significant contributions from new conversion technologies due to technical uncertainties, market complexities, production costs, environmental questions, and continuing fluctuations in conventional supplies. Due to the large number of uncertainties, any projection of synthetic production in the 1990s is subject to considerable variation.

NATURAL GAS USE ISSUES

Legislation has been introduced in this Congressional session which would further change Federal natural gas policy by encouraging industrial natural gas consumption. We have not formally analyzed these proposals and have no specific position on them. But, we do want to discuss how our current work relates to the issues under consideration. These issues are particularly important at this time, because the temporary program for oil displacement was recently extended at least 90 days from May 31, 1981. In addition, the Administration has proposed no funding for continuing Fuel Use Act activities

starting in fiscal year 1982. We have recently completed work in both areas although our report on Fuel Use Act activities has not yet been published.

In our March 1981 report, 1/ we concluded that the direction of the Nation's natural gas policy is clouded by the gas for oil program. Although the program was to be temporary, it has been extended 4 times, and DOE has previously indicated the program could be extended up to 5 years. The purpose of the program is to hold down oil imports by allowing electric utilities and other industries to consume a temporary excess of natural gas supplies. Although attractive from the standpoint of reduced oil dependency, we believe it could also signal a departure from previous policy and erode the credibility of Federal programs designed to phase out the inefficient use of natural gas as boiler fuel. If interpreted that way, existing and potential users of natural gas are likely to pay little attention to the nation's longer term fuel use goals in making their capital investment and fuel use decisions.

We recommended that the Secretary of Energy take the lead and work with the Chairman of the Federal Energy Regulatory Commission to develop a plan to provide greater assurance that natural gas supplies will be available for high priority and critical uses in the mid- and long-terms, until substitutes are developed or the transition to alternates is feasible. We recommended that DOE and the Commission should

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1/Natural Gas Plan Needed to Provide Greater Protection for High Priority and Critical Uses, EMD-81-27, March 23, 1981.

solicit the cooperation of and work closely with the States to achieve the plan's objectives. Also, the Secretary and the Chairman should clearly communicate that the gas-for-oil program is temporary and should not be interpreted as a departure from overall Federal efforts to encourage the efficient use of natural gas.

Our review of Fuel Use Act activities was requested by the former Chairman and now Ranking Minority Member of the Senate Committee on Energy and Natural Resources. We will provide the Subcommittee with a copy of our report on this subject when it is released.

Our tentative conclusions are that

--utilities are making efforts to voluntarily convert existing boilers, and their efforts are outpacing the regulatory enforcement actions (Attachment III provides a list of conversions which utilities are attempting to make, and which could save the equivalent of about 230,000 barrels of oil per day);

--the electric utility industry projects that 97 percent of the generating capacity to be added between 1980 and 1989 will use energy sources other than oil or natural gas;

--purchasers of large industrial boilers show a preference for coal or other alternatives to oil or natural gas although the data is inconclusive because of the depressed sales of large industrial boilers;

--utilities generally expect to apply for exemptions from the prohibition on natural gas use which starts in 1990. The ultimate impact of this off-gas provision on utility construction costs and fuel use will depend largely on how DOE handles the exemption requests.

CONCLUSIONS

In summary, Mr. Chairman, our work to date shows that we need to maintain continuing concern for natural gas supplies and gas use. Natural gas policies based on caution and constraint are appropriate, despite the optimistic views of some that we have nothing to worry about.

This concludes my prepared statement, Mr. Chairman. We will be pleased to answer any questions.

ATTACHMENT I

SELECTED GAO REPORTS ON NATURAL GAS POLICY ISSUES

Natural Gas Plan Needed To Provide Greater Protection for High-Priority and Critical Uses, EMD-81-27, March 23, 1981.

Implications of the U.S.-Algerian Liquefied Natural Gas Price Dispute and LNG Imports, EMD-81-34, Dec. 16, 1980.

Oil and Natural Gas From Alaska, Canada, and Mexico--Only Limited Help for U.S., EMD-80-72, Sept. 11, 1980.

Natural Gas Incremental Pricing: A Complex Program With Uncertain Results and Impacts, EMD-80-96, Sept. 4, 1980.

Help for Declining Natural Gas Production Seen in the Unconventional Sources of Natural Gas, EMD-80-8, Jan. 10, 1980.

Analysis of Current Trends in U.S. Petroleum and Natural Gas Production, EMD-80-24, Dec. 7, 1979.

Policy Needed to Guide Natural Gas Regulation on Federal Lands, EMD-78-86, June 15, 1979.

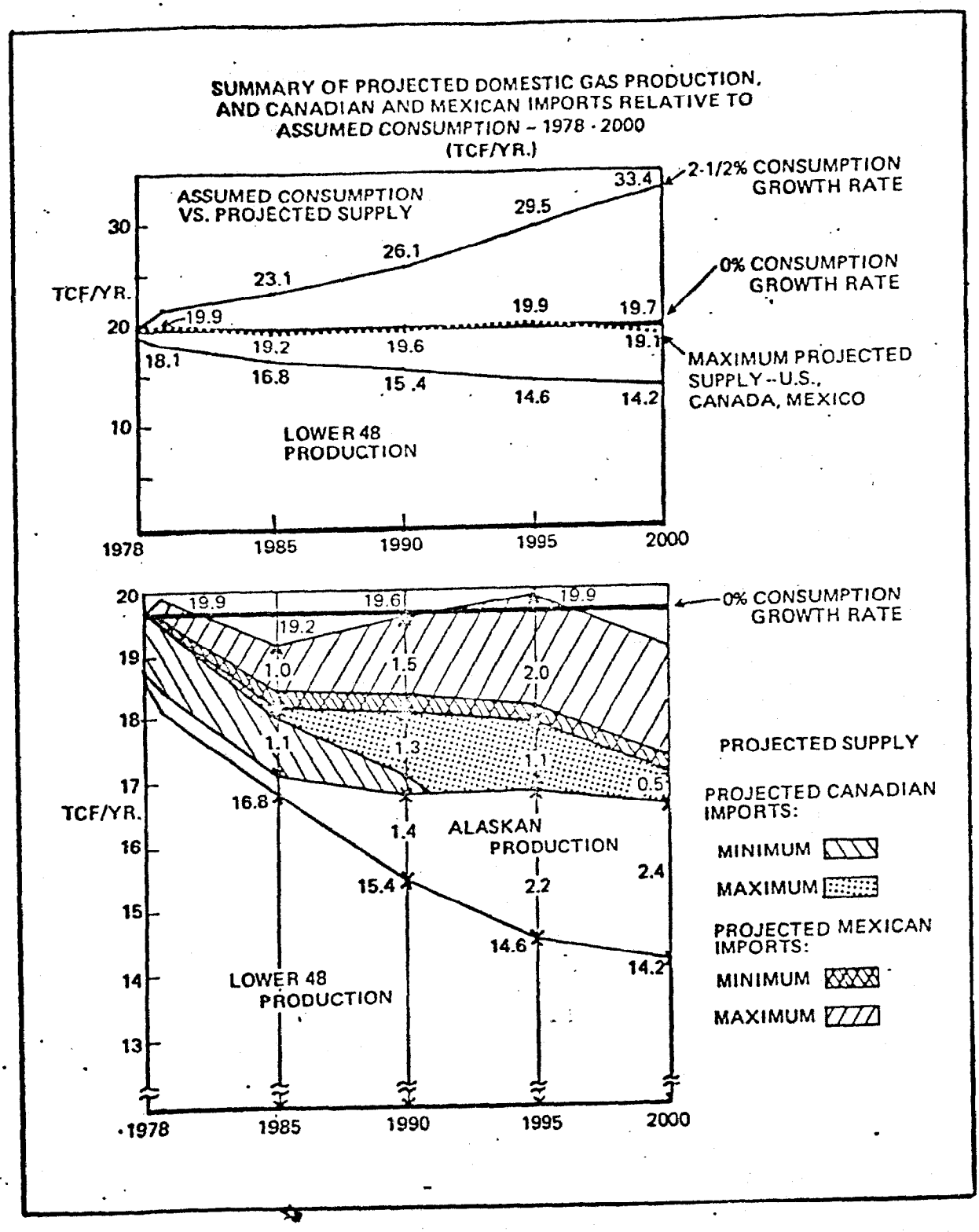
Natural Gas Reserve Estimates: A Good Federal Program Emerging, But Problems and Duplications Persist, EMD-78-68, June 15, 1979.

Information on the U.S. Importation of Liquefied Natural Gas, EMD-79-48, March 22, 1979.

Emergency Natural Gas Purchases: Action Needed to Correct Program Abuses and Consumer Inequities, EMD-78-10, Jan 6, 1978.

Status and Obstacles to Commercialization of Coal Liquification and Gasification, RED-76-81, May 5, 1976.

Implications of Deregulating the Price of Natural Gas, OSP-76-11, Jan. 14, 1976.



Source: Oil and Natural Gas from Alaska, Canada, and Mexico--Only Limited Help for U.S., EMD-80-72, September 11, 1980.

then taper off to about 0.5 Tcf by 2000 as Canadian consumpt.. rises. Our assumption is based on the following:

--Since 1975 Canada has increased its official estimate of natural gas reserves annually, and is expected to continue to increase it in the future.

--The NEB has historically been very conservative in its estimates, and is not very likely to recognize as large reserves as industry contends exist.

--Political support for energy conservation within Canada appears to be growing, including support for saving hydrocarbon reserves for future Canadian use. This will probably also limit exports of Canadian natural gas in the future.

With regard to price, the Canadians have demonstrated a strong inclination for charging what the market will bear, and all indications are that they will continue to.

Physical production of Mexican natural gas will not be as much a constraint on deliveries to the United States as politics and transportation facilities. Mexico will produce increasing quantities of associated natural gas beyond its needs as it increases oil production. This should result in more exports of natural gas to the United States.

Mexico has begun exporting 300 million cubic feet a day (about 0.1 Tcf per year) to the United States. The bilateral contract authorizing these exports requires construction of new pipeline facilities if any increased amounts of natural gas are negotiated. Originally a 42-inch pipeline with a capacity of about 0.7 Tcf a year was planned. Today, however, there is no evidence to indicate what size pipeline might be constructed or when.

Given the surplus natural gas that Mexico will produce during the rest of this century, and the strong attraction of the U. S. market, we have assumed that these imports will increase to about 0.7 Tcf a year, or about the pipeline capacity of the existing facilities, between now and 1985 at a minimum. As an upper parameter to our projections, we have assumed construction of the previously planned 42-inch-diameter pipeline by 1985, with an attendant rapid rise of imports to 2 Tcf a year. This is a reasonable upper parameter for the time period of our projection because that is the size and approximate capacity of the pipeline that Mexico has constructed to bring associated natural gas from the Reforma fields to the city of Monterey, near the U.S. border.

ATTACHMENT III

LIST OF POWERPLANTS WHICH UTILITIES ARE ATTEMPTING TO CONVERT

Company	Powerplant
New England Electric Power	Brayton Point 1/ Salem Harbor
Virginia Electric and Power	Chesterfield 1/ Portsmouth 1/ Possum Point Yorktown
Consolidated Edison	Ravenswood Arthur Kill
Public Service Electric and Gas	Burlington Bergen Hudson
Savannah Electric and Power	Effingham
Baltimore Gas and Electric	C.P. Crane Brandon Shores
Delmarva Power and Light	Edge Moor
St. Joseph Power and Light	Lake Road 1/
Holyoke Water Power (a subsidiary of Northeast Utilities Company)	Mt. Tom
Central Maine Power	Mason
Atlantic City Electric	Deepwater
Orange and Rockland Utilities, Inc.	Lovett
Public Service Company of New Hampshire	Schiller
Tampa Electric	F.J. Gannon

1/Coal burning commenced at these powerplants before October 1980. ERA issued a final ESECA prohibition order on Brayton Point during 1980.