
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|---|
| In the Matter of | ) | |
| Boston Edison Company, et al. | ) | Docket No. 50-471 |
| (Pilgrim Nuclear Generating Station, Unit 2) | ) | |

# APPLICANTS' DIRECT TESTIMONY ON ALTERNATIVE SITES

# APPLICANTS DIRECT TESTIMONY ON ALTERNATIVE SITES*

Panelists: William R. Griffin, Project Licensing Engineer,
Boston Edison Company

Peter J. Frascino, Manager, Facility Siting Group
United Engineers and Constructors, Inc.

* See: Intervenors' Commonwealth of Massachusetts, Contentions 4,12
Intervenor Daniel F. Ford, Contentions F, M

Q. Please state your name.

A. William R. Griffin.

Q: By whom are you employed?

A. Boston Edison Company.

Q: What position do you hold at Boston Edison?

A: Project Licensing Engineer.

Q: How long have you held this position?

A: Since February 1978.

Q: Will you describe your educational background?

A: I received a Bachelor of Civil Engineering Degree from Georgia Tech in 1970. I studied environmental engineering at Northeastern University and received an M.S. degree in 1974. I studied law at Suffolk University and was awarded a Juris Doctor degree in 1978.

Q: Will you state any professional certificates or licenses that you hold?

A: Since 1970 I have been registered as an Engineer-in-Training in the State of Georgia. Since 1978 I have been a member of the Bar of the Commonwealth of Massachusetts.

Q: With which professional organizations are you affiliated?

A: I am a member of the American Society of Civil Engineers, the Boston Society of Civil Engineers Section of the American Society of Civil Engineers, the Northeastern Section of the American Nuclear Society, and the American Association for the Advancement of Science.

Q. Would you briefly describe your professional work experience?

A. I was employed by the U.S. Environmental Protection Agency from 1970 to 1972 as an environmental engineer. I was employed by United Engineers and Constructors from 1972 to 1975 as an enviornmental engineer and as project coordinator. During the latter period I was a principal investigator on two alternate sites study projects which have been reviewed during this proceeding. From 1975 to 1977 I was employed by Anderson-Nichols as a project manager in the Environmental Sciences Division. I have been with Boston Edison since 1977. As Project Licensing Engineer for Pilgrim Station Unit 2, I manage preparation of environmental and safety-related material for submission to NRC Staff.

Q. Describe your involvement in siting study work since the 1974 Study.

A. While at UE&C I led a siting study effort for New York State Electric and Gas Corporation. Later I helped organize a larger siting study for the same utility which included nearly all of New York State. I also led a siting study review for Jacksonville Electric Authority which included much of northern Florida.

Q. What was your role with respect to the information on alternatives developed by UE&C for Boston Edison in 1973?

A. I acted as one of the principal investigators on this effort, which compared Pilgrim 2 with a hypothetical power plant at Edgar Station in Weymouth, Mass.

Q. What was your role with respect to the study entitled "Boston Edison Company Siting Study for Long Range Generating Capacity Expansion - 1975 - 2000" which has sometimes been referred to in this proceeding as the "1974 Study"?

A. I was a principal investigator, a member of a team of about six people

who worked full time for nearly a year on the effort. I developed much of the environmental data in the study through research in numerous libraries and government agency offices, and through surveys on and near sites. Along with the project team I assisted in analyzing data used in site comparisons, and I helped prepare the report.

Q. Would you describe the purpose and scope associated with the 1974 Study?

A. The subject matter of the study was directed to alternative sources and sites. The purpose of the study was to develop a comprehensive information base and perform an evaluation of the alternative sources and sites for Boston Edison for the time period 1975-2000. Ultimately, over 500 references were reviewed. The alternative sites portion of the study dealt with base load, intermediate and peaking power generating stations. Fuel types included oil, coal and nuclear. Boston Edison requested that our effort in the alternative sites portion of the study be directed primarily to environmental concerns. Thus the majority of the project team included environmental specialists.

Q. Please describe the activity associated with the alternative sites portion of the study.

A. The initial focus of the site search was to determine the geographic scope. Our ultimate objective was to identify a reasonable number of sites for fossil and nuclear stations. Thus we did not start with any hard and fast rules with regard to geographic scope. Rather, we adopted two guidelines as starting points, with the understanding that we would expand our search if an adequate number of sites could not be identified. Our initial guidelines were as follows:

1. Because Boston Edison has no service territory outside the Commonwealth of Massachusetts, the initial search should be

within the Commonwealth.

2. The site search should begin within the BECo Service territory and expand outward until a reasonable number of siting options had been identified.

Ultimately, these guidelines proved adequate for purposes of our study, and it was not necessary to enlarge upon them. Although some elements of the study covered the entire Commonwealth, an adequate number of sites for all fuel types were identified in the eastern half of Massachusetts.

In parallel with the site search effort, a number of topical studies were conducted, most of which addressed environmental subjects. For example, lengthy literature searches were undertaken on land use and land use planning, water supply and water sources planning, water quality, terrestrial ecology and other subjects. The information base developed in these topical studies was later used in the site identification and comparison phases.

While the site search began with the BECo service territory, which consisted of the City of Boston and approximately 39 surrounding municipalities, the scope of the site search was expanded beyond the BECo service area because of the dense population and limited land and water resources in that area. Most sites for base load power plants were ultimately identified outside the BECo service territory. The radial expansion was accomplished by increments based upon the location of major water bodies, including the principal river valleys as far west as the Blackstone and Nashua Rivers. During the course of the study, areas along the 1500 mile coastline of the Commonwealth were examined for offshore and onshore power plant sites.

Although we did not employ the term "resource area" per se, the study broke the Commonwealth into areas for which that term provides a good definition.

We came to some important general conclusions regarding these resource areas. The Merrimack River, with a flow averaging 5000-8000 cfs, is the only river in eastern Massachusetts which is probably capable of supplying a major base load power station without the need for creating a major new water impoundment. The second group of rivers are much smaller, having average flows of approximately ten percent of the Merrimack. None of these streams could supply water for evaporative cooling to a major base load power plant without the installation of a major water impoundment. The rivers in this category include the Concord, the Nashua, the Taunton and the Blackstone. Although the potential for constructing impoundments was examined, it was concluded that it would be difficult or impossible to develop on-stream reservoirs of the required size because of development along these streams. Thus it was determined that these smaller rivers were probably not suitable for base load stations, but might be capable of supporting smaller fossil stations such as those which produce intermediate and peaking power.

Coastal areas were also examined, and sites were initially identified in all coastal areas. For nuclear units it was concluded that the Massachusetts coast north of Boston was clearly less attractive than the coast south of Boston. This was primarily due to two factors. First, the population density north of Boston is generally higher. Second, the conformation of the coastline north of Gloucester, with wetlands as much as five miles wide and a National Wildlife Refuge spanning much of the coast, presented environmental conflicts.

With respect to Cape Cod, because of land use conflicts, the area was eliminated as a location for nuclear units. The best sites available were determined to be located on the coast between Boston and the Cape Cod Canal, and on the west coast of Buzzards Bay.

Thus, three resource areas emerged as most suitable for nuclear units. These included the Merrimack River and the two coastal areas mentioned above. In these resource areas approximately ten sites were found to be most suitable. Approximately a dozen sites were deferred from further consideration. These were not rejected as being unsuitable; rather, they were found suitable, but less attractive than the ten sites ultimately selected. The ten sites are described in the 1974 Study, the Supplement to the FES, and numerous documents supplied to the NRC Staff during the past year. The group includes: sites using open cycle cooling and closed cycle cooling; sites on fresh water and salt water; sites on water-front land as well as landlocked sites; and sites located northwest of Boston, southeast of Boston and south of Boston.

I believe this group of sites represents a reasonable number of environmentally and geographically diverse alternatives, and that each of these sites is potentially licensable. Other than Pilgrim Station, I do not feel there are any nuclear sites in eastern Massachusetts which are obviously superior to those in the group identified in the 1974 Study.

Q. What was yoru role with respect to the alternative sites information provided to NRC Staff during 1978?

A. I oversaw the processing of all technical and environmental material

prepared in response to questions from NRC Staff.

Q. Please describe the purpose and scope of your effort in 1978.

A. First, we evaluated the currency of the data base for each of the sites which the NRC Staff had selected for their analysis. This was done to ensure that the Staff would not be working with obsolete information. Where changes in the data base had occurred, we communicated these to the Staff. UE&C also examined each site in light of the siting and licensing criteria existing in 1978. This was done to determine whether evolution in siting and licensing criteria since 1974 would have rendered any of the sites unlicensable. The results of the analyses described above were transmitted to the NRC Staff. Most of the information was transmitted in the form of responses to questions raised by NRC Staff. Other information developed during our effort, although not specifically requested by NRC questions, was also forwarded to NRC when it was felt that such information would be relevant to their analysis. Based primarily upon published data, we also provided information on the major nuclear sites in southern New England so that these could also be evaluated by the Staff and ultimately be compared to the Rocky Point Site. In summary, our 1978 effort was intended to ensure that the Staff would be evaluating licensable sites on the basis of up to date data. Boston Edison did not attempt any comparison of sites in 1978. The NRC Staff conducted all such comparisons.

Q. Would you name and briefly describe the principal documents submitted by BECo to NRC Staff during their alternate sites effort in 1978?

A. The 1974 siting study entitled "Boston Edison Company Siting Study for long term Generating Capacity Expansion - 1975-2000" 1/ was submitted to the Staff by letter on January 26, 1978. This was a major

comprehensive study of alternative sites and alternative sources of power. The Staff reviewed this document and responded with questions in its letter of April 7, 1978. BECo prepared responses to NRC questions, and these were forwarded by letter of April 13, 1978.[2] NRC Staff decided that, although the 1974 Study had some deficiencies, it was substantial enough such that it could be the starting point for the Staff's alternate sites evaluation. The Staff began a detailed review of the 1974 Study, and one of the outputs of their review was a lengthy list of questions and information requests transmitted to BECo by letter of May 10, 1978. BECo provided responses to most of these questions by letter of May 30, 1978.[3] The documents described above contained the bulk of the information provided to NRC. However, further information was supplied as follows. By letter of August 2, 1978,[4] BECo submitted written opinions, prepared by legal counsel in states adjacent to Massachusetts, discussing the legal and institutional impediments which would be anticipated if there were an attempt to locate Pilgrim 2 outside Massachusetts. By letter of August 11, 1978,[5] BECo submitted information supplementary to that transmitted on May 30, 1978. By letter of August 18, 1978,[6] BECo submitted informational documents having the following titles: "Additional Environmental and Economic Information on the Seabrook, Millstone, Charlestown and Montague Sites", "Transmission Cost Study for Alternative Sites Evaluation", and "Realistic Appraisal of Schedule and Cost Impacts of Locating Pilgrim Unit 2 at Alternate Sites instead of Pilgrim Station." Finally, I should note, in response to interrogatories from the Attorney General of the Commonwealth of Massachusetts, BECo submitted on September 8, 1978 answers primarily dealing with the methodology used to prepare population density estimates during our

1978 effort.

References

1/ "Boston Edison Company Siting Study for Long Term Generating Capacity Expansion - 1975-2000," United Engineers and Constructors, February 1974.

2/ Untitled letter from R. M. Butler/BECo to W. H. Regan/NRC, April 3, 1978.

3/ "Alternative Sites - Responses to NRC Questions and Additional Information", letter from R. M. Butler/BECo to W. H. Regan/NRC, May 30, 1978.

4/ Untitled letter from R. M. Butler/BECo to W. H. Regan/NRC, August 2, 1978.

5/ Untitled letter from R. M. Butler/BECo to W. H. Regan/NRC, August 11, 1978.

6/ "NRC Review of Alternate Sites for Pilgrim 2: Submission of Additional Information", letter from R. M. Butler/BECo to W. H. Regan/NRC, August 18, 1978.

Q. Please state your name

A. Peter J. Frascino.

Q. What is the name and address of your employer?

A. United Engineers and Constructors, 100 Summer St., Boston, Mass.

Q. What position do you hold at UE&C?

A. I am Manager of the Facility Siting Group.

Q. How long have you been involved in electric power plant siting work at UE&C?

A. Since 1973.

Q. Will you describe your educational background?

A. I was awarded a BS in Environmental Engineering by Rensselaer Polytechnic Institute in 1972. I did graduate work in Environmental Engineering and was awarded a Master of Engineering Degree by RPI in 1973.

Q. Please describe your professional background.

A. I joined UE&C in 1973. Virtually all my work since that time has involved assessment of the environmental impact of energy facilities. I have coordinated and supervised siting studies for nuclear stations, coal fired stations, and coal plant solid waste disposal facilities. I have participated in the development of federal and state licensing documents for new generating stations and transmission facilities. As part of these activities, I have participated in the development of conceptual design of water and wastewater treatment systems, cooling systems, flue gas desulfurization systems and solid waste disposal systems. I have served as supervisor of environmental activities on several recent power plant siting studies. During the 1978 effort in support of Boston Edison, all UE&C technical specialists reported to me.