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## Task II.A: Siting (Rev. 2)

The objective of this task was to provide an added contribution to safety through the development of siting criteria for new power plants and the reevaluation with regard to the new siting criteria of facilities either under construction or operating.

### ITEM II.A.1: SITING POLICY REFORMULATION

#### *DESCRIPTION*

In this TMI Action Plan item,<sup>1</sup> the staff was required to identify the principal criteria for evaluating proposed sites for nuclear power stations, recommend the adoption of these criteria in a Proposed Rule on Siting, and prepare an environmental assessment or environmental impact statement of the proposed revisions to meet NEPA requirements.

#### *PRIORITY DETERMINATION*

This issue was investigated by PNL but no risk or cost analyses were made.<sup>2</sup>

#### Frequency Estimate

Siting does not directly affect the frequency of radioactive releases. However, it should be noted that longer transmission lines will increase the frequency of load rejections and thus somewhat increase the probability of a release.

#### Consequence Estimate

WASH-1400<sup>3</sup> estimates of risk were used assuming a uniform population density of 340 people/square-mile, the average for U.S. sites. Multiplying frequency by consequences for each Release Category and then summing the products, the average risk was 70 man-rem/PWR-year and 150 man-rem/BWR-year. Thus, compared to an average site, the maximum difference remote siting could make would be 150 man-rem/Ry, which corresponded to locating a BWR in a completely deserted area. This average population density was comparable to the existing criteria in SRP<sup>4</sup> Section 2.1.3 which limited the surrounding population density to about 500 people/ square-mile.

#### Cost Estimate

Industry Cost: Remote siting involves a number of cost factors the most significant of which are: transmission line losses; lower plant availability due to longer transmission lines; cost of land for a major transmission line corridor and delays involved in acquiring the land; and recruiting and relocating personnel to staff the plant. The latter two factors, although widely recognized as significant, were difficult to quantify generically. However, assuming a 1% line loss (reasonable for a 100-mile line) and five additional load rejections per year, the first two factors totaled more than \$100M for a 1,000 MWe plant over 40 years.

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<sup>1</sup> NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," U.S. Nuclear Regulatory Commission, May 1980, (Rev. 1) August 1980.

<sup>2</sup> NUREG/CR-2800, "Guidelines for Nuclear Power Plant Safety Issue Prioritization Information Development," U.S. Nuclear Regulatory Commission, February 1983, (Supplement 1) May 1983, (Supplement 2) December 1983, (Supplement 3) September 1985, (Supplement 4) July 1986, (Supplement 5) July 1996.

<sup>3</sup> WASH-1400 (NUREG-75/014), "Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," U.S. Atomic Energy Commission, October 1975.

<sup>4</sup> NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, (1st Ed.) November 1975, (2nd Ed.) March 1980, (3rd Ed.) July 1981.

NRC Cost: NRC costs were insignificant in comparison to industry costs.

Total Cost: The total industry and NRC cost associated with the possible solution was \$100M.

### Value/Impact Assessment

Based on an estimated public risk reduction of 6,000 man-rem/reactor and a cost of \$100M/reactor for a possible solution, the value/impact score was given by:

$$S \leq \frac{6,000 \frac{\text{man-rem}}{\text{reactor}}}{100 \frac{\$M}{\text{reactor}}} \\ \leq 60 \frac{\text{man-rem}}{\$M}$$

### Other Considerations

The relatively low value/impact score must be combined with consideration of the net risk of 70 man-rem/PWR-year and 150 man-rem/BWR-year. Over a 40-year plant life, this corresponded to 3,000 to 6,000 man-rem which would normally place the issue automatically in the high priority category, regardless of value/impact score or cost-effectiveness. However, this was the maximum risk reduction and most future sites would provide less. Specific sites may have better access to the grid and thus may be more cost-effective. At the time of this evaluation, there were no new plants being proposed.

### CONCLUSION

Based on the above considerations and the need to address siting questions, this issue was given a medium priority ranking (see Appendix C). However, in 1984, the Commission decided to better define its safety objectives and better characterize radioactive source terms before proceeding with new siting regulations. As a result, it was decided that, before new siting efforts were undertaken, a new radioactive source term must be approved and the evaluation of the safety goal must be completed. Upon completion of these two tasks, the need for a revised siting rule was to be reassessed and, if necessary, a new generic safety issue was to be established to address siting rulemaking. Thus, this item was RESOLVED and no new requirements were established.<sup>5</sup>

## ITEM II.A.2: SITE EVALUATION OF EXISTING FACILITIES

### DESCRIPTION

In this TMI Action Plan item,<sup>6</sup> the staff was to "prepare an analysis for Commission decision of the NRC staff plans to reconsider, with regard to the revised siting policy, facilities either under construction or operating. The analysis would take, as a point of departure, the criteria expressed in the Proposed Rule on Siting (Item II.A.1) and would address a strategy for consideration of siting decisions of plants that have construction permits or operating licenses."

### CONCLUSION

At the time of this evaluation, the basic purpose behind the issue was being addressed in the larger context of the Safety Goal<sup>7</sup> which was being developed under TMI Action Plan<sup>8</sup> Item V.A.1. Consequently, all NRC staff efforts on this issue were terminated in mid-1981.

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<sup>5</sup> Memorandum for W. Dircks from H. Denton, "Generic Issue II.A.1, 'Siting Policy Reformulation,'" September 17, 1984. [8410090175]

<sup>6</sup> NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," U.S. Nuclear Regulatory Commission, May 1980, (Rev. 1) August 1980.

<sup>7</sup> NUREG-0880, "Safety Goals for Nuclear Power Plants: A Discussion Paper," U.S. Nuclear Regulatory Commission, February 1982, (Rev. 1) May 1983.

<sup>8</sup> NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," U.S. Nuclear Regulatory Commission, May 1980, (Rev. 1) August 1980.

