RS-002, "PROCESSING APPLICATIONS FOR EARLY SITE PERMITS"

ATTACHMENT 2

2.2.1 - 2.2.2 IDENTIFICATION OF POTENTIAL HAZARDS IN SITE VICINITY

REVIEW RESPONSIBILITIES

Primary - Probabilistic Safety Assessment Branch (SPSB)

Secondary -None

I. AREAS OF REVIEW

For an early site permit (ESP) application, the site and its vicinity are reviewed for relative location and separation distance with respect to industrial, military, and transportation facilities and routes. Such facilities and routes include air, ground, and water traffic, pipelines, and fixed manufacturing, processing, and storage facilities. They also include any existing nearby nuclear power plants. The review focuses on potential external hazards or hazardous materials that are present or which may reasonably be expected to be present during the projected lifetime of a nuclear power plant or plants of specified type (or falling within a plant parameter envelope [PPE]) that might be constructed on the proposed site . The purpose of this review is to establish the information concerning the presence and magnitude of potential external hazards so that the reviews and evaluations described in Sections 2.2.3 and 3.5.1.6 of this review standard can be performed.

II. ACCEPTANCE CRITERIA

The regulations in 10 CFR 52.24 require that an ESP application meet the applicable standards and requirements of the Atomic Energy Act and the Commission regulations. With respect to site hazards, 10 CFR 100.20 requires that site acceptance be based on, among other considerations, the use characteristics of the site environs. In accordance with 10 CFR 52.17, the application is required to contain information needed for evaluating these factors. Non-seismic siting criteria are provided in 10 CFR 100.21. Guidelines for specific information requirements are described in Chapter 2, Sections 2.2.1 and 2.2.2 of Regulatory Guide (RG) 1.70.

The information submitted by the applicant is adequate and meets the 10 CFR 52.17, 10 CFR 100.20, and 10 CFR 100.21 requirements and RG 1.70 guidelines if it satisfies the following criteria:

1. Data in the site safety assessment adequately describe the locations and distances of industrial, military, and transportation facilities in the vicinity of a nuclear power plant or plants of specified type (or falling within a PPE) that might be constructed on the proposed site, and are in agreement with data obtained from other sources, when available.

2. Descriptions of the nature and extent of activities conducted at the site and nearby facilities, including the products and materials likely to be processed, stored, used, or transported, are adequate to permit identification of possible hazards in subsection III of this section.

3. Sufficient statistical data with respect to hazardous materials are provided to establish a basis for evaluating the potential hazard to a nuclear power plant or plants of specified type (or falling within a PPE) that might be constructed on the proposed site.

III. REVIEW PROCEDURES

Selection and emphasis of various aspects of the areas covered by this review standard section will be made by the reviewer on each case. The judgment of the areas to be given attention during the review is to be based on an inspection of the material presented, the similarity of the material to that recently reviewed for other sites, and whether items of special safety significance are involved. The following procedures are followed:

1. The reviewer should be especially alert, in the ESP review, for any potentially hazardous activities in close proximity to the site, since the variety of activities having damage potential at ranges under about 1 kilometer can be very extensive. All identified facilities and activities within 8 kilometers (5 miles) of the plant site should be reviewed. Facilities and activities at greater distances should be considered if they otherwise have the potential for affecting safety-related features of a nuclear power plant or plants of specified type (or falling within a PPE) that might be constructed on the proposed site. For sites with existing plants, most hazards will already have been identified. Emphasis should be placed on any new information. For such sites, any existing analyses pertaining to potential accidents involving hazardous materials or activities on or in the vicinity of the site will be reviewed to ensure that results are appropriate in light of any new data or experience which is available at the time of review.[1] Facilities that are likely to either produce or consume hazardous materials should be investigated as possible sources of traffic of hazardous materials past the site.

2. Information should be obtained from sources other than the safety assessment wherever available, and should be used to check the accuracy and completeness of the information submitted in the safety assessment. This independent information may be obtained from sources such as U.S. Geological Survey (USGS) maps and aerial photos, published documents, contacts with State and Federal agencies, and from other ESP or nuclear plant applications (especially if they are located in the same general area or on the same waterway). Information should also be obtained during the site visit and subsequent discussions with local officials. (See Section 2.1.1 of this review standard for further guidance with regard to site visits.) To the extent that definitive information is available, future potential hazards over a time period that includes the proposed life of a nuclear power plant or plants of specified type (or falling within a PPE) that might be constructed on the proposed site (plus the term of the ESP) should be reviewed.

3. The specific information relating to types of potentially hazardous material, including distance, quantity, and frequency of shipment, is reviewed to eliminate as many of the potential accident situations as possible by inspection, based on past review experience. For sites with existing plants, nearby industrial, military, and transportation facilities and transportation routes will be reviewed for any changes or additions which may affect the safe operation of a nuclear power plant or plants of specified type (or falling within a

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[1] Potential impacts of nearby existing nuclear facilities on a reactor or reactors that might be constructed on the proposed site should also be addressed.

PPE) that might be constructed on the proposed site. If these changes alter the data or assumptions used in previous hazards evaluations or demonstrate the need for new ones, appropriate evaluations will be performed.

Although detailed plant design information may not be available for the ESP review, the following specific references may provide useful guidance in the review of potential releases of hazardous materials. For pipeline hazards, Reference 6 may be used as an example of an acceptable risk assessment. For cryogenic fuels, Reference 8 may be used, and for tank barge risks, Reference 7. For aviation, guidance from Section 3.5.1.6 of this review standard may be used. References 9 and 10 also provide useful information. Safe separation distances for explosives are identified in References 1 and 2, and for toxic chemicals, Reference 3 should be consulted.

The distance from nearby railroad lines is checked to determine if a nuclear power plant or plants of specified type (or falling within a PPE) that might be constructed on the proposed site is within the range of a "rocketing" tank car which, from Reference 4, is taken to be 350 meters with the range for smaller pieces extending to 500 meters.

If a nuclear power plant or plants to be sited involves bulk storage of hazardous materials, e.g. liquid or compressed hydrogen or oxygen, the associated hazards will have to be addressed once this design information is identified (at the combined license stage if not available at the ESP stage). References 13 and 14 may be used for guidance to assess hazards associated with the storage and use of these materials.

The reviewer should determine whether bulk storage of propane exists on site. Propane may be used for incineration of low-level radioactive waste (dry combustible waste or contaminated oil). Reference 14 contains appropriate review guidance to assess the risk associated with the storage and use of propane.

4. Potential accidents which cannot be eliminated from consideration as design basis events because the consequences of the accidents, if they should occur, could be serious enough to affect safety-related features of a nuclear power plant or plants of specified type (or falling within a PPE) that might be constructed on the proposed site, are identified. Potential accidents so identified will have to be addressed at the combined license stage if sufficient design detail information is not available at the ESP stage.

IV. EVALUATION FINDINGS

The reviewer verifies that the information submitted by the applicant is in accordance with 10 CFR 52.17 requirements and within RG 1.70 guidelines such that compliance with 10 CFR Part 100 can be evaluated. The information is sufficiently complete and adequate if it can support conclusions of the following type, to be used in the staff's ESP safety evaluation report:

As set forth above, the applicant has provided information in the safety assessment on potential site hazards in accordance with the requirements of 10 CFR 52.17 and with the guidance of Regulatory Guide 1.70, such that compliance with 10 CFR 100.20 and 100.21 can be evaluated. The nature and extent of activities involving potentially hazardous materials which are conducted at nearby industrial, military, and transportation facilities have been evaluated to

identify any potential hazards from such activities which might pose undue risk to the type of facility proposed for the site [or falling within the applicant's PPE]. Therefore, based on evaluation of information contained in the safety assessment, as well as information independently obtained by the staff, the staff concludes that all potentially hazardous activities on and in the vicinity of the site have been identified. The hazards associated with these activities have been reviewed and are discussed in Sections _____ and _____ of this SER.

If the activities are identified as being potentially hazardous, the evaluations are performed using applicable review guidance. For example, in most cases aircraft hazards may be evaluated at the ESP stage using Sections 2.2.3 and 3.5.1.6 of this review standard. In the event the identified hazards (including aircraft hazards) cannot be addressed at the ESP stage due to the unavailability of plant design information, they will be evaluated at the combined license stage.

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this section of this review standard.

This section will be used by the staff when performing safety evaluations of ESP applications submitted by applicants pursuant to 10 CFR Part 52. Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides and NUREG.

VI. REFERENCES

1. Department of the Army Technical Manual TM5-1300, "Structures to Resist the Effects of Accidental Explosions," June 1969.

2. Regulatory Guide 1.91, "Evaluation of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plant Sites."

3. Regulatory Guide 1.78, Rev. 1, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release.", December, 2001.

4. National Transportation Safety Board Railroad Accident Report, "Southern Railway Company, Train 154, Derailment with Fire and Explosion, Laurel, Mississippi, January 25, 1969," October 6, 1969.

5. Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants."

6. NUREG-0014 Safety Evaluation Report, Hartsville Nuclear Plants A1, A2, B1, and B2, April 1976, Docket STN 50-518.

7. Safety Evaluation of the Beaver Valley Power Station, Unit No. 2, November 9, 1976 and supplements. Docket 50-412.

8. Safety Evaluation Report, Hope Creek Generating Station, Units 1 and 2, Supplement No. 5, March 1976, Docket 50-354 and 50-355.

9. NUREG/CR-2859, “Evaluation of Aircraft Crash Hazard Analyses for Nuclear Power Plants,” June 1982.

10. DOE-STD-3014-96, “Accident Analysis for Aircraft Crash into Hazardous Facilities,” October 1996.

11. 10 CFR Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

12. 10 CFR Part 100, “Reactor Site Criteria."

13. NRC Staff Safety Evaluation Report (July 1987) contained in Electric Power Research Institute (EPRI) Report NP-5283-SR-A, "Guidelines for Permanent BWR Hydrogen Water Chemistry Installation - 1987 Revision."

14. Safety Evaluation Relating to the Operation of a Mobile Volume Reduction System, August 13, 1986, Commonwealth Edison Company, Dresden Station, Unit Nos. 2 and 3, Docket Nos. 50-237 and 50-249.