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NUCLEAR REGULATORY COMMISSION
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Docket 70-1151
License SNM-1107

MEMORANDUM FOR: Robert C. Pierson, Chief
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and Safeguards, NMSS

THRU: Charles W. Emeigh, Section Leader
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FROM: Thomas H. Cox, Senior Project Manager
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SUBJECT: SUMMARY OF MEETING WITH WESTINGHOUSE ELECTRIC CORPORATION TO DISCUSS CRITICALITY SAFETY ANALYTICAL APPROACH

On January 21, 1994, Nuclear Regulatory Commission staff met with Westinghouse Electric Corporation (WEC) staff at NRC offices in Rockville, Maryland, to receive and discuss a presentation from WEC on criticality safety analysis to be submitted in the license renewal process. Enclosure 1 lists attendees at the meeting.

WEC reported that they have two contractors working in the criticality safety area, the Westinghouse Savannah River Co. in Aiken, South Carolina, and the Process Safety Institute, in Knoxville, Tennessee. With the help of these contractors, WEC has developed an approach to safety analysis that they believe should be acceptable to the NRC for both criticality safety analyses and the broader, integrated safety analysis covering the entire plant operations. Their stated purpose in calling for the meeting was to explain the approach to the NRC and to obtain concurrence from the staff in that approach.

The elements of the WEC analysis method were presented in a handout, Enclosure 2. The elements for a "baseline" criticality safety analysis would be accomplished in the order presented:

1. Develop a precise process description for each system, including a description of the system boundary conditions that define interconnections and dependencies on other related systems.

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2. Develop a narrative description of normal process operating conditions, normal process control ranges, and potential upset conditions of safety significance.

3. Develop a detailed description of process equipment design, including controls, and supporting service requirements. Drawings and specifications would be included.

4. Develop a complete documentation "Data Pack" consisting of an identification of all documents used in the Hazardous Operations (HAZOP) analysis, photographs of relevant system equipment, and all other documents collected for review.

5. Develop a listing of all initiating events, associated bounding assumptions, and safety limits for provided controls.

6. Develop a HAZOP analysis using the data collected in steps 1 through 5 above. The product HAZOP table and report will be included in the documented Criticality Safety Evaluation. Additional hazard analysis techniques, specifically event and fault trees, and common mode failure analyses, will be used to assure the completeness and accuracy of the HAZOP report.

WEC stated that all conclusions and recommendations from the analysis would be documented and tracked to closure. They planned to use this analytical approach and product in licensing submittals for the current renewal process.

The NRC staff and WEC staff discussed WEC's plans to implement the proposed approach, which includes teams of qualified specialists organized to examine specific processes and parts of processes. Regarding the availability of detailed, accurate documents on the plant design basis, WEC noted that they have had a formal configuration control program in place for about a year, and are confident of its quality. However, all design bases documents have not yet been established and incorporated into the configuration control program.

The NRC staff noted at the end of the meeting that the WEC approach presented was consistent with our current positions evolved from developing both a revised 10 CFR Part 70 and a format and content document for preparing an integrated safety analysis document.

ORIGINAL SIGNED BY

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Division of Fuel Cycle Safety
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Enclosures:
1. List of Attendees
2. WEC handout, "Criticality Safety Evaluation"

cc: Mr. Charles Sanders,
Westinghouse, NFD

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WESTINGHOUSE MEETING
January 21, 1994
OWFN ROOM 3B-13

ATTENDEES	ORGANIZATION
Robert Pierson	NRC
Keith McDaniel	NRC
Robert Wilson	NRC
Thomas Cox	NRC
Don Goldbach	Westinghouse
Charles Sanders	Westinghouse
Wilbur Goodwin	Westinghouse

Enclosure 1

CRITICALITY SAFETY EVALUATION

TABLE OF CONTENTS

SECTION 1.0

GUIDELINES FOR PREPARING A PROCESS DESCRIPTION IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables from the development of a process description are: a precise narrative definition of "normal operation" as it relates to the defined system; a schematic representation of the system; a narrative outline of the system transfer interconnections with text references that detail normal operating boundaries (i.e. composition, concentrations, flows, sampling); references to all relevant drawings and procedures; photographs, diagrams, tables and charts depicting the system and crucial subsystem equipment. These items are prepared for review by the Criticality Safety Evaluation (CSE) Team.

SECTION 2.0

GUIDELINES FOR PROCESS THEORY SECTION IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables for the Process Theory are a narrative description of the normal process operating conditions, including the ranges of control conditions experienced. Further descriptions of upset conditions which have the potential for exceeding criticality safety are identified and discussed with references documenting the sources of the theory.

SECTION 3.0

GUIDELINES FOR PREPARING PROCESS DESIGN AND EQUIPMENT DOCUMENTATION IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables from the development of a process design and equipment description are: the dimensions, construction materials and design configuration of lines and vessels of the defined system (what the system includes); a precise narrative definition of subsystem equipment controls and features as related to the defined system; and a tabulation of relevant reference drawings. These items are prepared for review by the Criticality Safety Evaluation (CSE) Team.

SECTION 4.0

GUIDELINES FOR PREPARING DRAWINGS AND OPERATING PROCEDURES DOCUMENTATION IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables from the collection of system documents (i.e. drawings and procedures) are: the final reference listing of documents used to perform the formal HAZOP analysis and their relevance to the evaluation process; and photographs of the system/subsystem equipment that had relevance to and were used during the HAZOP analysis process. All other relevant documents collected for review and information are retained as part of the Data Pack for the system's Criticality Safety Evaluation.

SECTION 5.0

GUIDELINES FOR PREPARING SAFETY ANALYSIS DOCUMENTATION IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables from a Safety Analysis are: a listing of Initiating Events (IE's) and their associated Defense Elements. The Defense Elements are composed of bounding assumptions and criticality safety limits as applied to the nine parameters affecting K-eff; a summary of Defense Elements listed by IE's as necessary to examine normal operations for Common Mode Failure (CMF); a summary of Defense Elements to ensure SNM-1170; a summary of Defense Elements to ensure K-eff < 0.90; a summary of Defense Elements to ensure K-eff < 0.95; and, a summary of residual Defense Elements near delayed critical (i.e., K-eff $= 1.000$).

SECTION 6.0

GUIDELINES FOR PROCESS HAZARDS ANALYSIS IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables from a Hazards and Operability Analysis are: a HAZOP Table and a HAZOP Report. The Table and Report are prepared by the Team Leader and Scribe, who have been trained in HAZOP Analysis methodology.

The HAZOP Table provides the substantive results of the P&ID analysis using the JBF Associates, Inc. LEADER software. Essential elements of the Table include: a listing of each upset and deviation disclosed in the analysis, the significant causes of each such upset or deviation, the consequences of each such upset or deviation, and the controls in place to prevent each cause and/or mitigate each consequence. Those controls that have been imposed as License Conditions must be specifically identified. The Table is embodied in Section 6.0 of the system's Criticality Safety Evaluation.

The HAZOP Report provides the detailed results of the analysis in a narrative format. Essential elements of the Report include: a table of contents, an executive summary, a table of recommended actions from both the P&ID and procedure reviews, the HAZOP team members, the HAZOP analysis methodology, the scope of the analysis, a process description, and a discussion of the hazards of the process. The Report is retained as part of the Data Pack for the system's Criticality Safety Evaluation.

SECTION 7.0

GUIDELINES FOR LICENSE COMPLIANCE VERIFICATION IN THE CONTEXT OF A BASELINE CRITICALITY SAFETY EVALUATION

The deliverables from a License Compliance Verification are: a listing of License Conditions (taken from Sections 2, 3, and 4 of SNM-1107), a statement that the License Conditions were reviewed during the HAZOP Analysis of the system, and were attested to be (or not to be) in-place and operational; and, a compilation of License Safety Demonstrations for the subject system. The listing and statement are prepared by the cognizant individual who extracted the relevant information from the License; and, are provided in the form of a Section 7.0; "LICENSE COMPLIANCE", for the system's Criticality Safety Evaluation. The compilation of Safety Demonstrations is included in the Criticality Safety Evaluation Data Pack for the system.