UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 21, 1988

Docket No. 50-601

APPLICANT: Westinghouse Electric Corporation

FACILITY: RESAR SP/90

SUBJECT: SUMMARY OF MEETING TO DISCUSS THE PRA FOR RESAR SP/90

On March 31, 1988, representatives of the NRC, Brookhaven National Laboratories (BNL), and Westinghouse met at the Westinghouse Energy Complex in Monroeville, Pennsylvania to discuss the probabilistic risk assessment (PRA) for the RESAR SP/90. Enclosure 1 is a list of attendees. Enclosure 2 is the agenda followed during the meeting.

The first part of the meeting concerned BNL's review of the analysis of core melt probability (commonly referred to as the "front end" portion of the PRA). The applicant made a brief presentation concerning the safety systems of RESAR SP/90, with particular emphasis on the integrated protection system (IPS). The participants then discussed the concerns raised in the staff's March 21, 1988 draft SER. The remainder of the meeting concerned review results of the consequence analysis of the PRA (or the "back end" portion of the PRA). The following is a summary of the staff's and BNL's concerns:

1. The PRA did not adequately address the potential for dependent failure of the engineered safety features actuation system (ESFAS) during an ATWS event. Westinghouse indicated its intent to include appropriate analysis in the revised PRA to be submitted during the final design approval (FDA) review.

2. During the development of the PRA, the design of the IPS was insufficiently complete to be appropriately modelled in the PRA. In lieu of this model, Westinghouse used typical estimates of the reliability of Westinghouse reactor trip breakers to represent the reliability of the IPS. Westinghouse indicated its intent to provide the detailed model of the IPS in the FDA PRA.

3. A recent study by BNL has shown that accumulators can be a large contributor to core melt frequency due to failure of the high pressure/low pressure interface, and subsequent LOCA release. The RESAR SP/90 design includes four accumulators and four core reflood tanks for which this concern is applicable. Westinghouse indicated the design of the core reflood tanks (small (4") discharge line with an orifice in each line) is such that such a break would be a small break LOCA. Westinghouse indicated its intent to address this concern at the FDA stage of design since the issue is new and has not undergone full review by the NRC or industry.

4. Enclosure 3 is a list of assumptions and success criteria for which insufficient supporting analysis was provided. Westinghouse agreed to provide this information as it evolved during the development of the facility design.

5. BNL noted that the RESAR SP/90 PRA did not address concerns with the direct heating (DH) effect and H_2 burning since the applicant utilized the MAAP containment failure analysis (which does not consider the DH effect).

6. BNL was concerned that certain input to the CRAC2 code appeared to have been entered incorrectly. Westinghouse agreed to review the matter.

The staff and BNL indicated that the NRC would need to determine which, if any, of the open issues would require resolution prior to issuance of the PDA, and which could be resolved during the FDA review.

Thomas J. Kenyon, Project Manager
Standardization and Non-Power
Reactor Project Directorate
Division of Reactor Projects III, IV,
V and Special Projects
Office of Nuclear Reactor Regulation

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Original Signed By:

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ENCLOSURE I

MEETING ATTENDANCE LIST
RESAR SP/90 PRA
MARCH 31, 1988

NAME	AFFILIATION
T. Vande Venne	Westinghouse
M.H. Shannon	W NTSD
S.S. Tsai	W NTSD
W.M. Schivley	W NTSD-Nuclear Safety
Tom Kenyon	NRC, NRR
David Sharp	W NTSD
Trevor Pratt	BNL
Tsong-Lun Chu	BNL
T.L. Schulz	W NTSD
S. Sancaletar	W NTSD
Bruce Cook	W NTSD

Enclosure 2

Proposed Agenda for March 31st Meeting
W/NRC/BNL Discussion on SP/90 PSS
(8:30 AM - Conclusion)

1. Introductions/Opening Remarks/Meeting Goals (W. M. Schivley)

2. Brief presentation of W SP/90 Safety Systems (T. van de Verne)
   (approx. 45 min.)

3. Presentation of SP/90 IPS System Design (Bruce Cook)
   (approx. 30 min.)

*4. Discussion on IPS Model

   - o What is a satisfactory model?
     Millstone PRA, WCAP-10271
   - o Potential dependant failure of ESFAS in an ATWS
   - o What systems may be available upon a total loss of vital AC?

*5. Interfacing Systems LOCA through accumulators and reflooding tanks

   - o BNL assessment for Calvert Cliffs - 5.34×10^{-6} per year

*6. Success criteria and assumptions used in SP/90 PSS

   - o Supporting analysis needed

7. Comparison of W MAAP and BNL STCP calculations

   - o Areas of agreement
   - o Areas of disagreement
     - Hydrogen generation and combustion
     - Fission product releases
     - Core-concrete interactions
     - Containment response

8. Direct Containment Heating

* - Items for discussion as requested by BNL/NRC

SP-90 PSS SUPPORTING ANALYSIS NEEDED

- ABILITY TO USE RHR TO INJECT IN A SMALL LOCA WITH HIGH-HEAD SAFETY INJECTION SYSTEM FAILURE
- VERIFY THAT LOW PRESSURE COMPONENT WILL NOT BE CHALLENGED IN AN INTERFACING SYSTEM LOCA IN THE RHR SUCTION LINE
- VERIFY THAT NO CORE DAMAGE WILL OCCUR IN THE FOLLOWING SCENARIO: REACTOR OPERATING AT 100% POWER WHEN A LOSS OF MAIN FEEDWATER OCCURS, AND FAILURE TO TRIP THE REACTOR AUTOMATICALLY OR MANUALLY, AND FAILURE OF TURBINE TRIP
- USE OF FAN COOLERS FOR LONG-TERM COOLING AFTER A SMALL OR LARGE LOCA (RHR HXs NOT AVAILABLE)
- EMERGENCY FEEDWATER SYSTEM SUCCESS CRITERIA IN AN ATWS - 2/4 PUMPS TO FOUR SGs
- ATWS PRESSURE RELIEF SUCCESS CRITERIA - 3/3 SAFETY VALVES AND 1/3 PORVs
- SUCCESS CRITERIA FOR LARGE LOCA - 2/3 ACCUMULATORS AND 5/8 CORE REFLOOD TANKS AND HHSI PUMPS
- SUCCESS CRITERIA FOR CONTAINMENT SPRAY - 1/4 OR 2/4
- NUMBER OF PORVs NEEDED FOR BLEED AND FEED