C Tinkler

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

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JUL 1 1 1983

MEMORANDUM FOR: Brian W. Sheron, Chief, Reactor Systems Branch, DSI

FROM: Walter R. Butler, Chief, Containment Systems Branch, DSI

SUBJECT: CSB EVALUATION OF WESTINGHOUSE APWR PRIMARY SIDE SAFEGUARDS SYSTEMS MODULE

Enclosed is the CSB input to the preliminary evaluation of the Westinghouse APWR design. This evaluation has been prepared after having reviewed the applicable portion of the Primary Side Safeguards System (PSSS) Module.

We note that the PSSS Module only deals tangentially with containment issues. The sole significant interface identified is the containment spray system which is part of the integrated safeguards system. Regarding the spray system, Westinghouse has provided descriptive material but has not provided quantitative information to demonstrate the system's capability to perform its functional objectives insofar as the heat removal function is concerned. Since the containment spray system is only part of the containment heat removal system, which also includes fan coolers, and since these items are expected to be discussed in detail in the containment systems module, we conclude that our review of these items should be deferred to our review of that module.

We are providing, nevertheless, the enclosed descriptive material related to the APWR spray system.

Walter R. Butler

Walter R. Butler, Chief
Containment Systems Branch
Division of Systems Integration

Enclosure: As stated

cc: R. Mattson
R. W. Houston
W. Lyon

Contact: C. Tinkler, CSB X-27605

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6.2.2 Containment Heat Removal Systems

The containment heat removal systems for the Westinghouse APWR design will consist of the containment fan cooler system and the containment spray system.

The function of the containment heat removal systems is to reduce the containment atmosphere pressure and temperature following a break in either the primary or secondary system piping inside containment. This objective is accomplished by heat transfer to the containment spray water and to the cooling water of the fan cooler system.

The applicant has indicated that the fan cooler system will be discussed in the Containment Systems Module. Thus, we will review this system in conjunction with the evaluation of the appropriate module.

The containment spray system will consist of two redundant and independent trains. The system will be safety grade (Quality Group B and seismic Category I) and all components will be located outside of the containment. Each train of the containment spray system consists of two low head pumps, one additive tank and associated valves, piping and instrumentation. Each spray train draws from a separate refueling water storage tank (RWST). Inside the containment, spray water is discharged through 12 spray headers (three per pump) which are configured as 12 concentric half-rings.

The containment spray system is automatically initiated on a high containment pressure signal. During the injection mode of operation, the low head pumps draw from the refueling water storage tanks located outside containment. The low head pumps would be automatically shut off upon reaching a low water level set-

point in the RWST. Spray injection, based on pump capabilities and RWST level setpoints, would last for 30 minutes. Although each RWST holds 250,000 gallons, spray injection would be terminated after approximately 150,000 gallons had been drawn, in order to limit the flooding and water damage within containment.

The applicant has proposed that at the end of the spray injection period, the low head pumps be realigned for safety injection recirculation. If the operator determines that additional spray operation is required, then one or more low head pumps may be realigned to draw water from the emergency water storage tank and discharge to the spray headers. The emergency water storage tank is a large source of water located inside containment which serves both high pressure and low pressure pumping systems. In principle, the emergency water storage tank is a large volume(250,000 gallons) containment sump which is initially filled.

The applicant has not provided, at this time, information to demonstrate the ability of the containment spray system to meet its functional objectives with regard to containment atmosphere heat removal. The applicant has also not provided justification that NPSH or containment sump requirements have been met. The staff will report on these matters after the pertinent material is submitted.

There are several differences between the containment spray system proposed for the Westinghouse APWR design and spray systems installed in conventional PWR containments, which are outlined below:

1. The containment spray system shares the same pumps utilized for low pressure safety injection; i.e., long-term core cooling. However, rather than the conventional two pump arrangement, the APWR design proposes four pumps.

2. Because the same low head pumps are shared between the CSS and the ECCS the spray line penetrating containment has two outboard motor-operated valves rather than one, as is customary. The use of two motor-operated valves is to ensure isolation of the spray headers when the low head pump is in the core cooling mode. While this increases the reliability of isolation, the reliability of the containment spray function is diminished.

3. Automatic containment spray operation is assured for 30 minutes rather than the minimum required time of 2 hours. This matter will be discussed later in the AEB evaluation of containment spray fission product control.

UNION OF CONCERNED SCIENTISTS 1346 Connecticut Avenue, N.W. • S. 1101 • Washington, DC 20036 • (202) 296-5600

1 May 1984

FREEDOM OF INFORMATION ACT REQUEST

FOIA-84-335
rec'd 05/03/84

Mr. J.M. Felton, Director
Division of Rules and Records
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Freedom of Information Act Request (Sholly Number 84-27).

Dear Mr. Felton:

Pursuant to the Freedom of Information Act, please make available at the Commission's Washington, D.C., Public Document Room documents in the following categories:

A. All documents related to Westinghouse Electric Corporation's RESAR-SP/90 (the so-called "Advanced Pressurized Water Reactor" or APWR); this request specifically includes, but is not limited to, Westinghouse's application for a Preliminary Design Approval for RESAR-SP/90, any probabilistic risk assessment of the RESAR-SP/90 design or any portion thereof, any NRC Staff or NRC Staff contractor memoranda or reports concerning the RESAR-SP/90 design, and copies of the Form 189 for any NRC contracts for any evaluations, reviews, or critiques of the RESAR-SP/90 design.

B. All comments on any draft of NUREG-1070 written by members of the NRC Staff or NRC Staff contractors.

C. All documents containing estimates prepared by the NRC Staff of the frequency of severe core damage based on analysis of "precursor" events (for events from 1969 to the present).

D. All documents containing accident consequence and/or radiation dose calculations based on source terms specified in any of the volumes in BMI-2104 (Battelle Columbus Laboratories analyses of source terms for specific accident sequences in the Surry, Peach Bottom, Zion, Sequoyah, and Grand Gulf reactors), including accident consequence code computer output and an identification of the date of the analyses and the person(s) performing the analyses.

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E. Sandia National Laboratories, "ASEP Plant Survey and Initial Plant Grouping Letter Report", 22 December 1983, all volumes as well as any updates to this report in whatever form.

If there are any questions regarding these requests, please call me at (202) 296-5600. Your cooperation in responding to this FOIA request is appreciated. In the event that a full response if not feasible within 10 working days, a partial response to the request (consisting of documents then available) is encouraged.

Sincerely,

Steven C. Sholly

Steven C. Sholly
Technical Research Associate