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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: T. R. QUAY

SUBJECT: ADVANCE COPY OF SECTION 2 OF WCAP-13856

Reference 1: Letter from Westinghouse to NRC, McIntyre to Quay, NSD-NRC-96-4843, "Advance Copy Of Section 3 of WCAP-13856, dated October 14, 1996.

Dear Mr. Quay:

Enclosed is an advanced copy of the revised Section 2, Focused PRA Sensitivity Study, of WCAP-13856, "AP600 Implementation of the Regulatory Treatment of NonSafety-Related Systems Process" (RTNSS). This section (stamped "draft") summarizes the Focused PRA Sensitivity Study performed to determine the significant nonsafety-related systems, structures, and components (SSCs) for the AP600.

The results and conclusions of this study remain the same as provided in Revision 0 of WCAP-13856. This advanced copy of a revision to Section 2 of WCAP-13856 is sufficient to allow the NRC to review the Focused PRA Sensitivity Study area of RTNSS. Reference 1 provided an advance copy of Section 3, Initiating Event Frequency Evaluation.

Please contact Cindy L. Haag on (412) 374-4277 if you have any questions concerning this transmittal.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/nja

Enclosures

cc: D. Jackson, NRC (1 copy enclosure)
N. Liparulo, Westinghouse (w/o enclosure)

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2.0 FOCUSED PRA SENSITIVITY STUDY

The purpose of the focused PRA sensitivity study is to determine if the safety-related systems, when challenged, can provide sufficient capability without reliance on nonsafety-related SSC mitigation functions to meet the NRC safety goal guideline for core damage frequency less than 1×10^{-4} events per reactor year and to meet a large release frequency of less than 1×10^{-6} events per reactor year. Nonsafety-related SSC mitigation functions that are relied upon in the focused PRA sensitivity study to meet the safety goals will be assigned reliability/unavailability missions as appropriate and will be subject to additional regulatory oversight.

The focused PRA sensitivity study is based on the AP600 baseline PRA. The baseline and focused PRAs include an evaluation of both internal and external events. The PRAs consider events that occur at-power, as well as during the spectrum of shutdown operations including plant cooldown, reduced reactor coolant system inventory (including midloop), refueling, and heatup. Seismic margins are used to evaluate seismic events.

For the focused PRA sensitivity study, the initiating event frequencies remain the same as in the baseline PRA. The mitigation functions of the nonsafety-related systems are removed from the baseline PRA, and then the focused PRA sensitivity study model is quantified. If the core damage frequency and large release frequency calculated in the focused PRA are acceptable and no mitigation credit is taken for nonsafety-related SSCs, then no additional regulatory oversight is necessary for the nonsafety-related SSCs, based on the results of the focused PRA sensitivity study.

The AP600 systems classified as nonsafety-related systems and are modeled in the baseline PRA, which are not credited for mitigation purposes in the focused PRA analysis are listed in Table 2.0-1. Table 2.0-1 also contains a list of the safety-related systems that are credited in this analysis.

2.1 Focused PRA Analysis

The focused PRA sensitivity study is performed using the same basic methodology as the baseline PRA. The baseline event trees and fault trees are used as a starting point for the focused PRA sensitivity study. Since the baseline event tree and fault tree models credit nonsafety-related SSCs, the event trees and fault trees must be modified for the focused PRA sensitivity study so that only safety-related functions are credited. The fault tree reduction, core damage frequency quantification, accident class quantification, and release frequency calculations are performed using the same methods as for the baseline PRA. The methodology for performing the focused PRA sensitivity study is described in Chapter 52 of the AP600 PRA report.

2.2 Results

The focused PRA core damage frequency and large release frequency with no credit for the nonsafety-related mitigation functions of the nonsafety-related SSCs are reported in Chapter 52 of the AP600 PRA report. An importance analysis of the focused PRA core damage frequency was performed to rank the initiating events. The results from this analysis and a comparison with the AP600 baseline initiating event importance ranking can also be found in Chapter 52 of the AP600 PRA report.

The focused PRA sensitivity study assumes no credit for the nonsafety-related mitigation functions of the nonsafety-related SSCs. The results from this focused PRA analysis show that the AP600 core damage frequency and large release frequency meet the specified safety goals with no credit for the nonsafety-related SSCs.

DRAFT

TABLE 2.0-1

NonSafety-Related Systems and Functions Removed From Baseline PRA Analysis

- Chemical and Volume Control System (CVS)
- Main and Startup Feedwater System (FWS)
- Condensate System (CDS)
- Normal Residual Heat Removal (RNS)
- Main AC Power System (ECS) (connection from grid and diesel)
- Non-Class 1E DC and UPS System (EDS)
- Diverse Actuation System (DAS)
- Plant Control System (PLS)
- Circulating Water System/Cooling Tower (CWS)
- Main Steam System (MSS)
- Turbine Building Closed Cooling Water
- Central Chilled Water System (VWS)
- Component Cooling Water System (CCS)
- Service Water System (SWS)
- Compressed and Instrument Air Systems (CAS)
- Hydrogen Ignitors

There are several nonsafety-related systems that are not included in this list. To address the systems that are not included in the list, the following rule is applied, "Any system that relies on nonsafety-related AC power for active equipment such as pumps, compressors, or fans is not credited in the analysis."

Safety-Related Systems and Functions Credited in the Focused PRA Sensitivity Study

- Passive Core Cooling System (PXS)
  - IRWST Injection/Containment Recirculation
  - Core Makeup Tank (CMT)
  - Accumulator
  - Passive Residual Heat Removal
  - Automatic Depressurization
- Passive Containment Cooling (PCS)
- Containment Isolation
- Class 1E DC and UPS System (IDS)
- Protection and Safety Monitoring System (PMS)
- Steam Generator Isolation