

**CERTIFIED BY:**  
Thomas Kress - 6/24/99

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PDR  
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**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
SEVERE ACCIDENT MANAGEMENT SUBCOMMITTEE MEETING MINUTES  
WOG MODIFICATIONS TO CDAG/PASS REGULATORY REQUIREMENTS  
APRIL 30, 1999  
ROCKVILLE, MARYLAND**

**INTRODUCTION:**

The ACRS Subcommittee on Severe Accident Management held a meeting on April 30, 1999 with representatives of the NRC staff, and the Westinghouse Owners Group (WOG). The purpose of this meeting was for the Subcommittee to discuss the WOG's proposed revisions to the Core Damage Assessment Guidelines (CDAG) and Post Accident Sampling System (PASS) requirements for Westinghouse Electric Company nuclear power plants. The entire meeting was open to the public. Mr. P. Boehnert was the cognizant ACRS staff engineer and Designated Federal Official (DFO) for this meeting. There were no written comments or requests for time to make oral statements received from members of the public. The meeting was convened by the Subcommittee Chairman at 8:30 am, April 30, 1999, and adjourned at 11:50 AM that day.

**ATTENDEES**

**ACRS Members/Staff:**

T. Kress, Chairman	M. Fontana, Member
M. Bonaca, Member	R. Seale, Member
P. Boehnert, DFO	

**NRC Staff:**

J. O' Brien  
R. Palla

**Westinghouse Owners Group**

L. Liberatori, (Con. Edison)  
R. Bryan, (TVA)  
W. Harrison, (South Texas Project)

There were approximately 5-10 other members of the public in attendance during this meeting. A listing of those attendees who registered is available in the ACRS office files. Public participation during this meeting was limited to the presentations by the above named industry representatives.

The presentation slides and handouts used during the meeting are attached to the Office Copy of these Minutes. The presentations to the Subcommittee are summarized below.

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## CHAIRMAN'S COMMENTS

T. Kress, Subcommittee Chairman, convened the meeting. He discussed the history of the CDA/PASS requirements, noting that the WOG has proposed significant revisions to these requirements. The lead plant for this effort is Wolf Creek. Dr. Kress indicated that the full Committee is scheduled to discuss this matter during its May Meeting and that formal comments summarizing the Committee's review are expected.

## GENERAL OVERVIEW

L. Liberatori provided general comments regarding proposed revisions to the CDA guidelines and PASS requirements. He noted the initial intended uses of CDA and PASS, post-TMI accident. The WOG's proposed revisions will be more cost-effective, timely, and result in no reliance on the use of the PASS.

## CORE DAMAGE ASSESSMENT GUIDELINES

### WOG Presentation

Details of the revised Core Damage Assessment Guidelines (CDAGs) were discussed by Mr. R. Bryan (TVA). He described the CDA assessment methods, past and present, and the bases for the revised CDAGs. The revised CDAGs are based on use of in-plant instrumentation (core exit T/Cs, containment high radiation monitors, and containment hydrogen monitors), with qualitative validation of CDA estimates obtained from supporting instrumentation. The WOG believes that the revised CDAGs provides more accurate and timely information, with the level of accuracy estimated to be +/- 50% for the amount of core damage seen.

In response to questions from Dr. Kress, the WOG said that the MAAP code is used to provide the estimates of fission product release rates. The WOG also said that PASS sample lines are not expected to become plugged unless or until core-concrete interactions occur. PASS sampling capability will be retained, post-CDA/PASS modifications.

### NRR Presentation

R. Palla provided a presentation on the results of NRR's review of the WOG's revised CDAGs. He discussed the (regulatory) background, review scope, preliminary review findings, residual issues and conclusions. NRR supports the use of the revised CDAGs, as they are an improvement over the current methodology; further, availability of CDA could improve emergency plan decision making.

In response to Dr. Kress, NRR noted that for the post-TMI requirements the commitments of individual licensees became regulatory requirements. Because of this, there are no uniform requirements, particularly for the PASS. Dr. Bonaca noted that PASS was really designed for providing independent sampling of the containment sump and RCS - long-term post-severe accident. In response to Dr. Fontana, Mr. Palla indicated that the CDA is not directly relied on for emergency planning actions. In response to Dr. Seale, Mr. Palla said that the staff did review the CDAG methodology used to account for the fission product chemical interactions seen.

### POST ACCIDENT SAMPLING SYSTEM MODIFICATIONS

#### WOG Presentation

Details of the proposed PASS modifications were provided by Mr. W. Harrison (South Texas Project). In summary the WOG proposes the following modifications:

1. Eliminating most of the PASS sampling and accuracy requirements except for:
  - RCS boron within 8 hrs of obtaining a safe stable state.
  - Containment hydrogen within 30 minutes of core damage.
  - Containment sump pH only if all three of the following exist:
    - brackish water plant,
    - no passive pH control,
    - a single barrier only between containment and heat sink.
2. Retaining the capability to obtain PASS samples for long-term cleanup/recovery planning.
3. Relying primarily on core exit temperatures and containment high range radiation monitoring as primary CDAG indicators with containment hydrogen, reactor vessel level, neutron monitoring, and hot leg RTD temperature as secondary, confirmatory information.

The WOG will ensure PASS capability via requirements stipulated in plant UFSARs.

Dr. Seale expressed concern that some form of accuracy requirements are needed in order to ensure the integrity of the information obtained from PASS. Dr. Kress said any plant should be subject to sampling of the containment sump water via the PASS if it lacks Ph control measures. Messrs. Bonaca and Seale suggested that the staff should consider an audit of licensees QA procedures with regard to the modified PASS.

### NRR Presentation

Mr. J. O'Brien discussed the background, NRR Review Team Members, and preliminary positions with regard to NRR's review of the WOG's proposed modifications to the PASS. For the specific requested modifications, NRR found most to be acceptable, a few acceptable with conditions, and three (deletion of measurement of radionuclides in the RCS, containment atmosphere, and containment sump) still under evaluation.

In response to Dr. Kress, NRR said that all Westinghouse plants control the Ph of the sump water. Dr. Kress cited Dr. Powers expressed concern with the possibility of boron plate out. The staff responded that they had investigated this matter and by employing a "back-of-the-envelope"-type calculation ruled this problem out, given the large quantity of boron available. Dr. Kress suggested that the staff consider the use of in-containment gamma monitors that are "tuned" to the gamma emission spectrum for the elements of cesium and krypton. This would provide a good estimate of the full source term on a timely basis.

Mr. O'Brien noted two open issues: (1) clarification of PASS capabilities, subsequent to approval of the modifications, and how these capabilities will be controlled, and (2) evaluation of the impact of losing the capability for radionuclide sampling, pursuant to the issue noted above.

### SUBCOMMITTEE CAUCUS

The Subcommittee agreed that this matter should be brought to the full Committee for review during its May Meeting. Dr. Kress instructed the WOG and NRC regarding the content of its presentations before the ACRS.

### FOLLOW-UP ACTIONS

Dr. Kress asked that Westinghouse provide information on the following during its ACRS presentation: (1) is there a regulatory basis for maintaining any of the PASS capability, and, (2) does the capability for detecting the gamma spectrum for the cesium and krypton isotopes currently exist in Westinghouse plants?

### BACKGROUND MATERIAL PROVIDED TO THE SUBCOMMITTEE PRIOR TO THIS MEETING

1. Memorandum, dated April 12, 1999 from P. Boehnert ACRS to T. Kress, Chairman, Severe Accident Phenomena Subcommittee transmitting:

- Westinghouse Electric Corporation Topical Report: "Westinghouse Owners Group Core Damage Assessment Guidance", WCAP-14696, dated July, 1996
  - Westinghouse Electric Corporation Topical Report: "Westinghouse Owners Group Post Accident Sampling System Requirements: A Technical Basis" (Proprietary), WCAP-14986 - P, Revision 1, dated August, 1998
2. Memorandum to Severe Accident Phenomena Subcommittee, from P. Boehnert, dated April 20, 1999, transmitting:
- NRC Transmittal: "Background and NRR Staff Preliminary Evaluation of WCAP-14696, Westinghouse Owners Group Core Damage Assessment Guidance, dated April 19, 1999 (Preliminary Evaluation)
  - NRC Transmittal: "Background and NRR Staff Preliminary Evaluation of WCAP-14986-P, Westinghouse Owners Group Post Accident Sampling System Requirements, A Technical Basis, dated April 21, 1999



**NOTE:** Additional details of this meeting can be obtained from a transcript of this meeting available in the NRC Public Document Room, 2120 L Street, Washington, D.C. 20006, (202) 634-3274, or can be purchased from Ann Riley & Associates, LTD., 1025 Connecticut Ave., N.W. Suite 1014, , Washington, D.C. 20036, (202) 842-0034.