Docket File

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 19, 1995

APPLICANT: Westinghouse Electric Corporation

FACILITY: AP600

SUBJECT: SUMMARY OF AUGUST 24, 1995, SENIOR MANAGEMENT MEETING (SMM) TO DISCUSS THE REVIEW OF THE AP600

On August 24, 1995, representatives of the Nuclear Regulatory Commission (NRC) and the Westinghouse Electric Corporation (Westinghouse) met to discuss the review of the AP600 design. Attachment 1 is a list of attendees. Attachment 2 is a copy of the slides presented by Westinghouse. Attachment 3 is a copy of the slides presented by the NRC.

Mr. Russell opened the meeting stating that Westinghouse and the staff needed to develop a detailed milestone schedule for all areas of the review. The schedule would consider both Westinghouse and staff resources required to obtain issue closure; supplemental draft safety evaluation report (DSER) issuance, final safety evaluation report issuance, final design approval, and design certification rulemaking. The schedule should identify controlling path work and responsible individuals. Mr. Russell stated that the staff plans to send a revised schedule to the Commission in a SECY paper by mid-October. The staff and Westinghouse will have to interact closely to accomplish this task. Mr. Russell also committed to provide feedback on the sufficiency of Westinghouse submittals to the staff within 60 days of receipt. If the Westinghouse submittal is of sufficient quality, the staff will then complete its review within four months of the submittal receipt.

The specific technical issue discussions affecting the AP600 review are summarized below:

Supplemental DSER Content and Milestones

Westinghouse is focused on obtaining a supplemental DSER from the staff which addresses the commitments made in the original DSER. Namely;

- the acceptability of the testing program
- the quality of the AP600 analysis codes, and
- the acceptability of the analysis codes for evaluating the AP600 design

The analysis codes to be included in the DSER supplement are:

1. LOFTRAN - used to analyze transient response of the AP600 design to specified perturbations of process parameters. Assessment of LOFTTR2 for steam generator tube rupture analysis would be considered part of the LOFTRAN evaluation.

2. NOTRUMP - used to analyze small break LOCA's in the reactor coolant system.

DF03

3. WCOBRA/TRAC - used to perform large break LOCA and Long Term Cooling analysis.

(4) WGOTHIC - used to determine containment responses for the various DBA analyses.

The staff will work with Westinghouse to schedule resources and review information necessary to issue the supplemental DSER. However, the staff stated that Westinghouse must answer high priority requests for additional information (RAI) before the staff will be in the position to make a meaningful evaluation of the testing program and codes. Westinghouse proposed that a date be set for the issuance of the DSER supplement which could be issued with open items identified. The staff stated that it would be preferable to produce a supplement that identifies issues that are confirmatory in nature.

TESTING:

The staff and Westinghouse both agreed that the testing program was not critical path for issuance of a supplemental DSER. Completion of the Oregon State University (OSU) Test Analysis Report (by the end of September) and response to prioritized testing RAI's (by the end of November) are the two major milestones for this effort. The staff does not anticipate any schedular or resource restrictions which would preclude completion of a supplemental evaluation of the testing program before the code validation and verification effort is complete.

NOTRUMP/LOFTRAN:

The staff issued RAIs on the NOTRUMP and LOFTRAN codes in the spring of 1995. The staff requires responses to these RAIs to continue with its evaluation of these codes. Westinghouse is still working on a schedule to respond to these RAI's. Westinghouse plans to prioritize those RAI responses which are necessary for the supplemental DSER during the week of August 28, 1995. The staff is committed to provide feedback to Westinghouse on the sufficiency of new Westinghouse submittals within 60 days of when they are received.

WCOBRA/TRAC:

The staff expects to receive the OSU Long Term Cooling Preliminary V&V report the week of August 28, 1995. Westinghouse has also promised responses to key technical issues and RAIs issued on this code (except long term cooling) by November 30, 1995.

WGOTHIC:

Issues including scaling remain unresolved. Westinghouse now plans to use a revised DBA evaluation model which will be based on a conservative bounding analysis of the AP600 containment. Westinghouse will provide a schedule for deliverables by mid-September, 1995.

Action: The staff and Westinghouse will work together to develop: (1) the information necessary for completing the review for the supplemental DSER; (2) complete milestone and deliverable schedules by mid-September.

In-Vessel Retention

Westinghouse noted that they met with the staff on August 17, 1995, where Westinghouse presented the conceptual design for the reactor vessel insulation. Both Westinghouse and the staff found the August 17, meeting productive; however, Westinghouse indicated in the SMM that the effort to demonstrate in-vessel retention of molten corium via external reactor vessel cooling (ERVC) may not be warranted if the staff is going to require assessment of ex-vessel severe accident phenomena (e.g. core-concrete and fuel-coolant interactions). Westinghouse also stated that some limited ex-vessel work has been done in the PRA decomposition event trees; however, a deterministic analysis of melt progression/vessel breech has not been performed.

The staff stated that it is not possible to predict the outcome of the IVR review before the review has started, especially for this novel approach to severe accident mitigation. The staff believes that there could be hot spots and uncertainties in the heat transfer coefficient both within the molten debris pool and from the lower reactor vessel head to the surrounding water. Therefore, some level of ex-vessel phenomena should be examined.

The staff also suggested that Westinghouse should perform a structural evaluation of the reactor cavity's ability to withstand an ex-vessel steam explosion as was done for the evolutionary ALWR designs. Westinghouse indicated that this has not been done. The staff has suspended its review of the ERVC/IVR pending a response from Westinghouse whether they intend to pursue ERVC/IVR for the AP600 design.

Action W: Westinghouse to determine if work will continue on demonstrating in-vessel retention via external reactor vessel cooling.

Design Basis Accident (DBA) and Long-Term Severe-Accident Radiological Consequences

Westinghouse presented several options regarding possible improvements to existing plant features and/or additional plant features which could be incorporated into the AP600 design to reduce containment pressure and radioactive aerosols following an accident. The two primary options discussed were the use of existing fan coolers and the installation of an externally supplied containment spray header. Westinghouse emphasized using the fan coolers. The staff will need additional information before it can bring this issue to closure, including issues such as survivability of equipment, post-accident support systems operation, aerosol loading, and containment isolation concerns. In particular, the Westinghouse assessment and comparisons were performed under accident conditions up through the early in-vessel release phase, and the staff would also like to see how these alternatives compare under more severe accident conditions such as late in-vessel and ex-vessel.

Action N: The NRC will provide requests for additional information concerning alternatives and analysis results provided by Westinghouse.

Passive Autocatalytic Recombiner System (PARS)

This issue involved the level of detail needed to certify a design basis accident hydrogen control system that uses PARs. Westinghouse felt that the level of detail currently docketed was consistent with the staff's feasibility review of PARs contained in a letter to the Electric Power Research Institute dated October 3, 1994. The staff indicated that the purpose of that review was to provide feedback on the conceptual feasibility of such a design and, as indicated in the letter, the specific design would be reviewed in accordance with Section 6.2.5 of the NRC standard review plan. The staff stated that the information submitted thus far is insufficient to complete that review. Westinghouse indicated that they would have to decide whether to submit additional information in support of their design specific application of PARs or pursue other options which may be available to them.

During a breakout session on this issue, the staff and Westinghouse reached agreement that, should Westinghouse choose to provide supporting data on the PARs, it would need to be of a quality commensurate with its intended usage. This does not mean that it was gathered in conformance with, 10 CFR Part 50, Appendix B, QA requirements. However, an actual application of PARs by the COL applicant would need to be fully QA qualified.

Action W: Westinghouse will determine what course of action they will pursue in demonstrating post DBA hydrogen control.

Passive System Thermal-Hydraulic Performance

Westinghouse expressed their concern with the conditions the staff placed on the bounding methodology process for demonstrating passive system reliability. Westinghouse was particularly concerned with performing a thermal-hydraulics uncertainty sensitivity study on the focused PRA. Westinghouse stated that they may not meet the large release goal (10^{-6}) with all of the conservatisms that have been applied. The staff will need to see the results before determining the significance of not meeting this goal.

The staff had a breakout meeting in which the implementation of the staff's requirements were discussed. The staff plans to conduct several meetings with Westinghouse during the next month to determine how Westinghouse will satisfy the specific staff concerns outlined in the August 14, 1995, letter to Westinghouse on thermal-hydraulic uncertainty.

Action: Westinghouse and the staff will meet to conduct a detailed review of the process used to determine the four bounding worst case sequences. A subsequent meeting will explore methods of demonstrating adequacy of the MAAP4 code in predicting important thermal-hydraulic phenomena.

DSER Open Item Status

Based on an August 17, 1995, meeting between the staff and Westinghouse, a consensus was reached on the status of most open items including the basis for differences, where applicable. The open item status data base has been revised accordingly and the tracking system has been restored to a functional management tool.

Conclusions

The NRC and Westinghouse management agreed that a comprehensive realistic schedule for completing the AP600 design certification was essential to allocate the necessary resources through the duration of the project. Significant interaction between the staff and Westinghouse will be required during the next several weeks to identify the information needs, work efforts, and schedules for both Westinghouse and the NRC for the remaining outstanding tasks. To ensure that this information is available to support a Commission paper in mid-October, Mr. Russell recommended that the next SMM be held near the end of September or first week in October.

Original signed by
William C. Huffman, Project Manager
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Office of Nuclear Reactor Regulation

Docket No. 52-003

Attachments:
As stated

cc: See next page

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JMoore, 0-15 B18	WDean	ACRS (11)

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DATE	09/15/95		09/ /95		09/19/95	

DOCUMENT NAME: A:AUG-24.SMM

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AP600 SENIOR MANAGEMENT MEETING
ATTENDEES
AUGUST 24, 1995

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Bob Vijuk	Westinghouse
Eugene Piplica	Westinghouse
John Butler	Westinghouse
Jim Scobel	Westinghouse
Brian McIntyre	Westinghouse
Earl Novendstern	Westinghouse
Terry Schultz	Westinghouse
Debra Ohkawa	Westinghouse
Cindy Haag	Westinghouse
Andrea Sterdis	Westinghouse
Jim Gresham	Westinghouse
Bill Russell	NRC
Ashok Thadani	NRC
Gary Holahan	NRC
Dennis Crutchfield	NRC
Ted Quay	NRC
Mike Franovich	NRC
Tom Kenyon	NRC
Diane Jackson	NRC
Ralph Caruso	NRC
Tom Boyce	NRC
Mike Snodderly	NRC
Ed Butcher	NRC
Nick Saltos	NRC
Ralph Architzel	NRC
Bill Huffman	NRC
Ed Throm	NRC
Sheri Peterson	NRC
Tim Collins	NRC
Gene Hsii	NRC
Stephen Dinsmore	NRC
Goutam Bagchi	NRC
Don McPherson	NRC
Gus Lanis	NRC
John Monninger	NRC
Jack Kudrick	NRC
Kaz Campe	NRC
Dino Scaletti	NRC
Barry Zalcman	NRC
Rich Emch	NRC
Ralph Landry	NRC
Sterling Franks	DOE
Charles Thompson	DOE
Ed Rodwell	EPRI
R. McDonald	ARC
Charles Brinkman	ABB-CE
John Trotter	Polestar Applied Technology

Attachment 1

HANDOUTS

PRESENTED BY WESTINGHOUSE

AT THE AUGUST 24, 1995,

SENIOR MANAGEMENT MEETING

Attachment 2

WESTINGHOUSE/NRC AP600 SENIOR MANAGEMENT MEETING

AUGUST 24, 1995

I.	Introduction	NRC/W
II.	Actions from Last Meeting	
	• Codes and Testing	W/NRC
	• Schedules	W/NRC
	• Status and Content of Supplemental DSER	W/NRC
III.	Discussion of Selected Technical Issues	
	• In-Vessel Retention	W/NRC
	• DBA/Severe Accident Radiological Release	W/NRC
	• Passive Hydrogen Control	W/NRC
	• Thermal - Hydraulic Uncertainty	W/NRC
IV.	DSER Open Item Status	W/NRC
V.	Discussion / Conclusion	ALL

Codes and Testing

Earl Novendstern
Manager
Advanced Plant Safety Analysis

Presentation at AP600 Senior Management Meeting
Rockville, MD
August 24, 1995

Codes and Testing

Reports

- Scaling
- Test Description
- Test Data
- Test Results
- Verification and Validation (V&V)

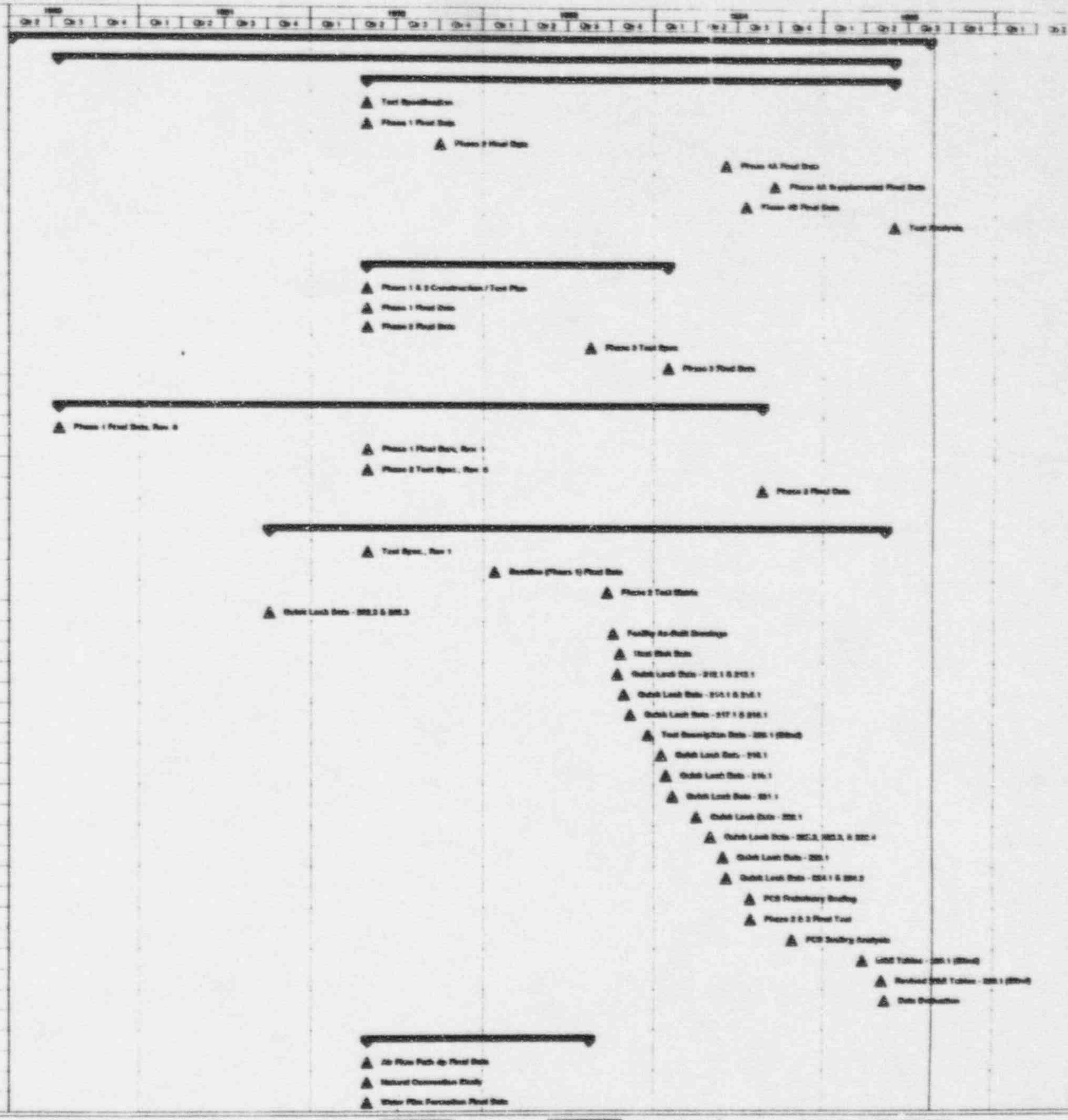
Report Schedule

- Completed
- Remaining

DSER Content & Schedule

AP600 Codes and Testing Input to Supplemental DSER

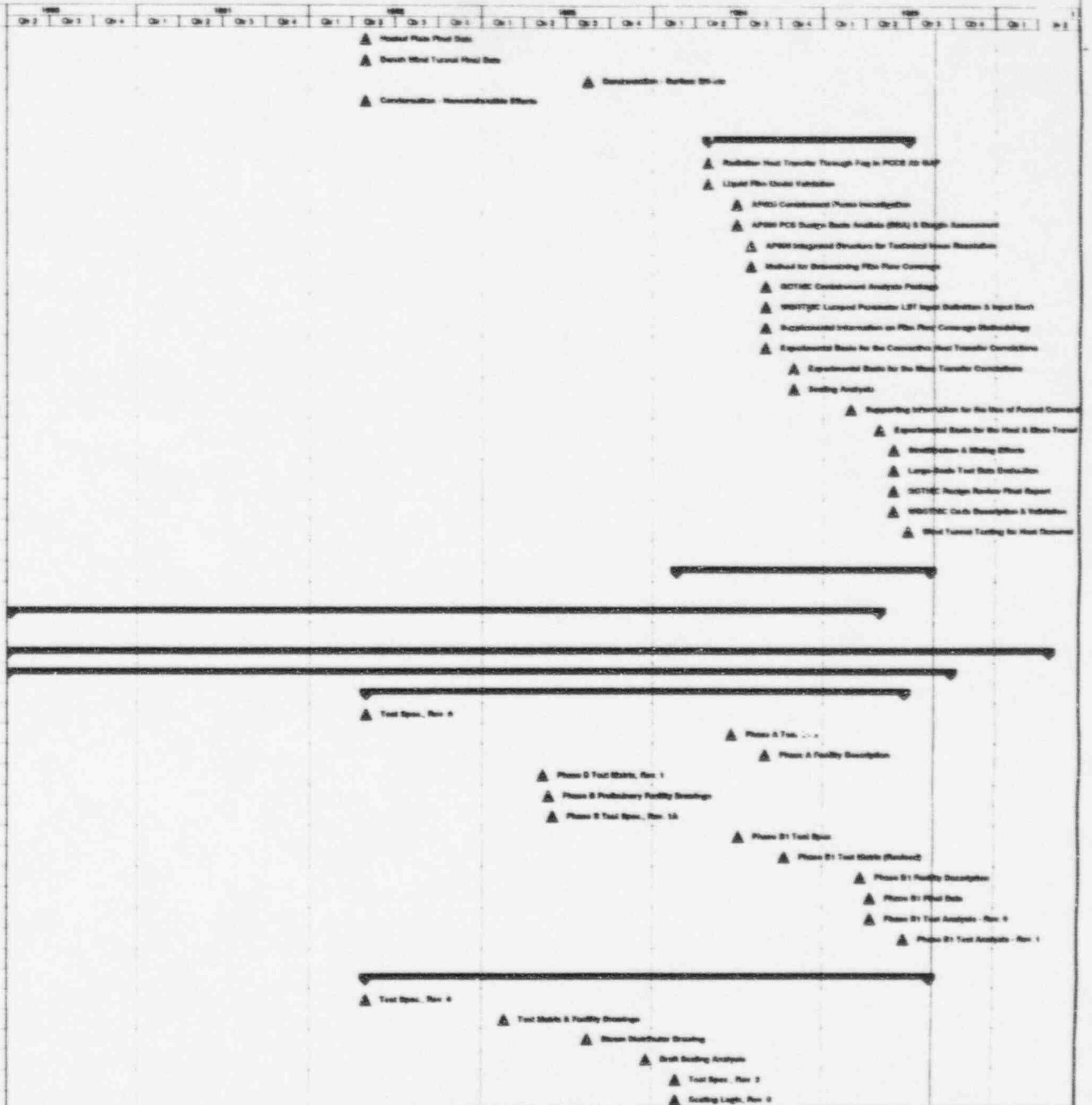
ID	Task Name
1	**CONTAINMENT**
2	**Test & Test Analysis Reports**
3	**Wind Tunnel**
4	Test Specification
5	Phase 1 Final Data
6	Phase 2 Final Data
7	Phase 4A Final Data
8	Phase 4A Supplemental Final Data
9	Phase 4B Final Data
10	Test Analysis
11	
12	**Water Distribution**
13	Phase 1 & 2 Construction / Test Plan
14	Phase 1 Final Data
15	Phase 2 Final Data
16	Phase 3 Test Spec.
17	Phase 3 Final Data
18	
19	**Small Scale Integral**
20	Phase 1 Final Data, Rev. 0
21	Phase 1 Final Data, Rev. 1
22	Phase 2 Test Spec., Rev. 0
23	Phase 2 Final Data
24	
25	**Large Scale Integral**
26	Test Spec., Rev 1
27	Baseline (Phase 1) Final Data
28	Phase 2 Test Matrix
29	Quick Look Data - 202.3 & 203.3
30	Facility As-Built Drawings
31	Heat Sink Data
32	Quick Look Data - 212.1 & 213.1
33	Quick Look Data - 214.1 & 215.1
34	Quick Look Data - 217.1 & 218.1
35	Test Description Data - 220.1 (Blind)
36	Quick Look Data - 216.1
37	Quick Look Data - 219.1
38	Quick Look Data - 221.1
39	Quick Look Data - 222.1
40	Quick Look Data - 222.2, 222.3, & 222.4
41	Quick Look Data - 223.1
42	Quick Look Data - 224.1 & 224.2
43	PCS Preliminary Scaling
44	Phase 2 & 3 Final Test
45	PCS Scaling Analysis
46	M&E Tables - 220.1 (Blind)
47	Revised M&E Tables - 220.1 (Blind)
48	Data Evaluation
49	
50	**Feasibility**
51	Air Flow Path dp Final Data
52	Natural Convection Study
53	Water Film Formation Final Data



Task — Progress — Milestone — Summary — Rolled Up Task — Rolled Up Milestone — Rolled Up Progress

AP600 Codes and Testing Input to Supplemental DSER

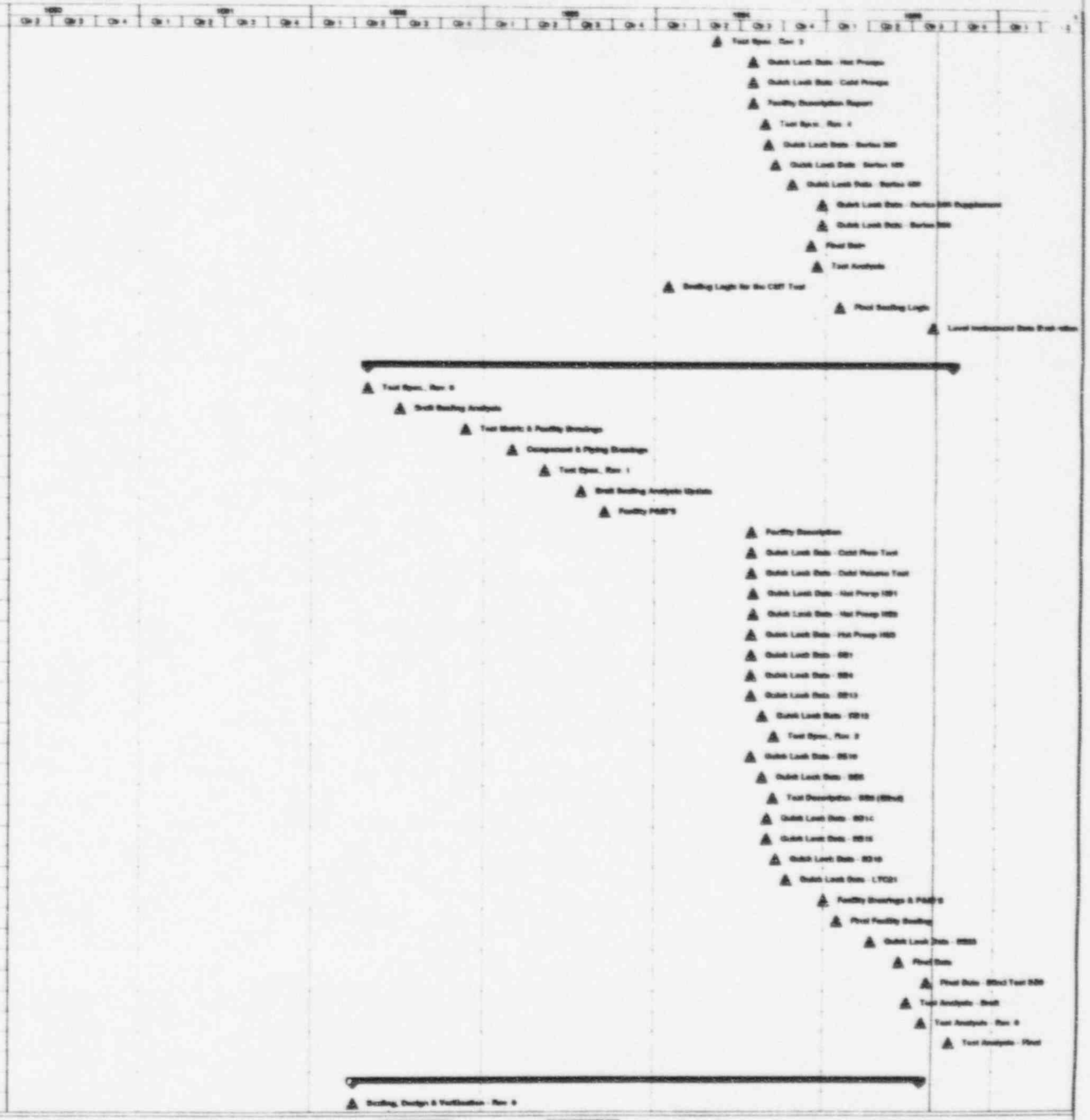
Task Name
Heated Plate Final Data
Bench Wind Tunnel Final Data
Condensation - Surface Effects
Condensation - Noncondensible Effects
V&V Reports
Radiation Heat Transfer Through Fog in PCCS Air GAP
Liquid Film Model Validation
AP600 Containment Plume Investigation
AP600 PCS Design Basis Analisis (DBA) & Margin Assessment
AP600 Integrated Structure for Technical Issue Resolution
Method for Determining Film Flow Coverage
GOTHIC Containment Analysis Package
WGOTHIC Lumped Parameter LST Input Definition & Input Deck
Supplemental Information on Film Flow Coverage Methodology
Experimental Basis for the Convective Heat Transfer Correlations
Experimental Basis for the Mass Transfer Correlations
Scaling Analysis
Supporting information for the Use of Forced Convection in PCS Annulus
Experimental Basis for the Heat & Mass Transfer Correlations
Stratification & Mixing Effects
Large-Scale Test Data Evaluation
GOTHIC Design Review Final Report
WGOTHIC Code Description & Validation
Wind Tunnel Testing for Heat Removal
Number of Meetings = 37
Audits, Inspections & Site Visits = 11
REACTOR SYSTEM
Test & Test Analysis Reports
ADS
Test Spec., Rev. 0
Phase A Test Data
Phase A Facility Description
Phase B Test Matrix, Rev. 1
Phase B Preliminary Facility Drawings
Phase B Test Spec., Rev. 1A
Phase B1 Test Spec.
Phase B1 Test Matrix (Revised)
Phase B1 Facility Description
Phase B1 Final Data
Phase B1 Test Analysis - Rev. 0
Phase B1 Test Analysis - Rev. 1
CMT
Test Spec., Rev. 0
Test Matrix & Facility Drawings
Steam Distributor Drawing
Draft Scaling Analysis
Test Spec., Rev. 2
Scaling Logic, Rev. 0



Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress

AP600 Codes and Testing Input to Supplemental DSER

ID	Task Name
134	Test Spec., Rev. 3
135	Quick Look Data - Hot Preops
136	Quick Look Data - Cold Preops
137	Facility Description Report
138	Test Spec., Rev. 4
139	Quick Look Data - Series 300
140	Quick Look Data - Series 100
141	Quick Look Data - Series 400
142	Quick Look Data - Series 300 Supplement
143	Quick Look Data - Series 500
144	Final Data
145	Test Analysis
146	Scaling Logic for the CMT Test
147	Final Scaling Logic
148	Level Instrument Data Evaluation
149	
150	**OSU**
151	Test Spec., Rev. 0
152	Draft Scaling Analysis
153	Test Matrix & Facility Drawings
154	Component & Piping Drawings
155	Test Spec., Rev. 1
156	Draft Scaling Analysis Update
157	Facility P&ID'S
158	Facility Description
159	Quick Look Data - Cold Flow Test
160	Quick Look Data - Cold Volume Test
161	Quick Look Data - Hot Preop HS1
162	Quick Look Data - Hot Preop HS2
163	Quick Look Data - Hot Preop HS3
164	Quick Look Data - SB1
165	Quick Look Data - SB4
166	Quick Look Data - SB13
167	Quick Look Data - SB12
168	Test Spec., Rev. 2
169	Quick Look Data - SB10
170	Quick Look Data - SB5
171	Test Description - SB9 (Blind)
172	Quick Look Data - SB14
173	Quick Look Data - SB15
174	Quick Look Data - SB19
175	Quick Look Data - LTC21
176	Facility Drawings & P&ID'S
177	Final Facility Scaling
178	Quick Look Data - SB23
179	Final Data
180	Final Data - Blind Test SB9
181	Test Analysis - Draft
182	Test Analysis - Rev. 0
183	Test Analysis - Final
184	
185	**SPES-2**
186	Scaling, Design & Verification - Rev. 0

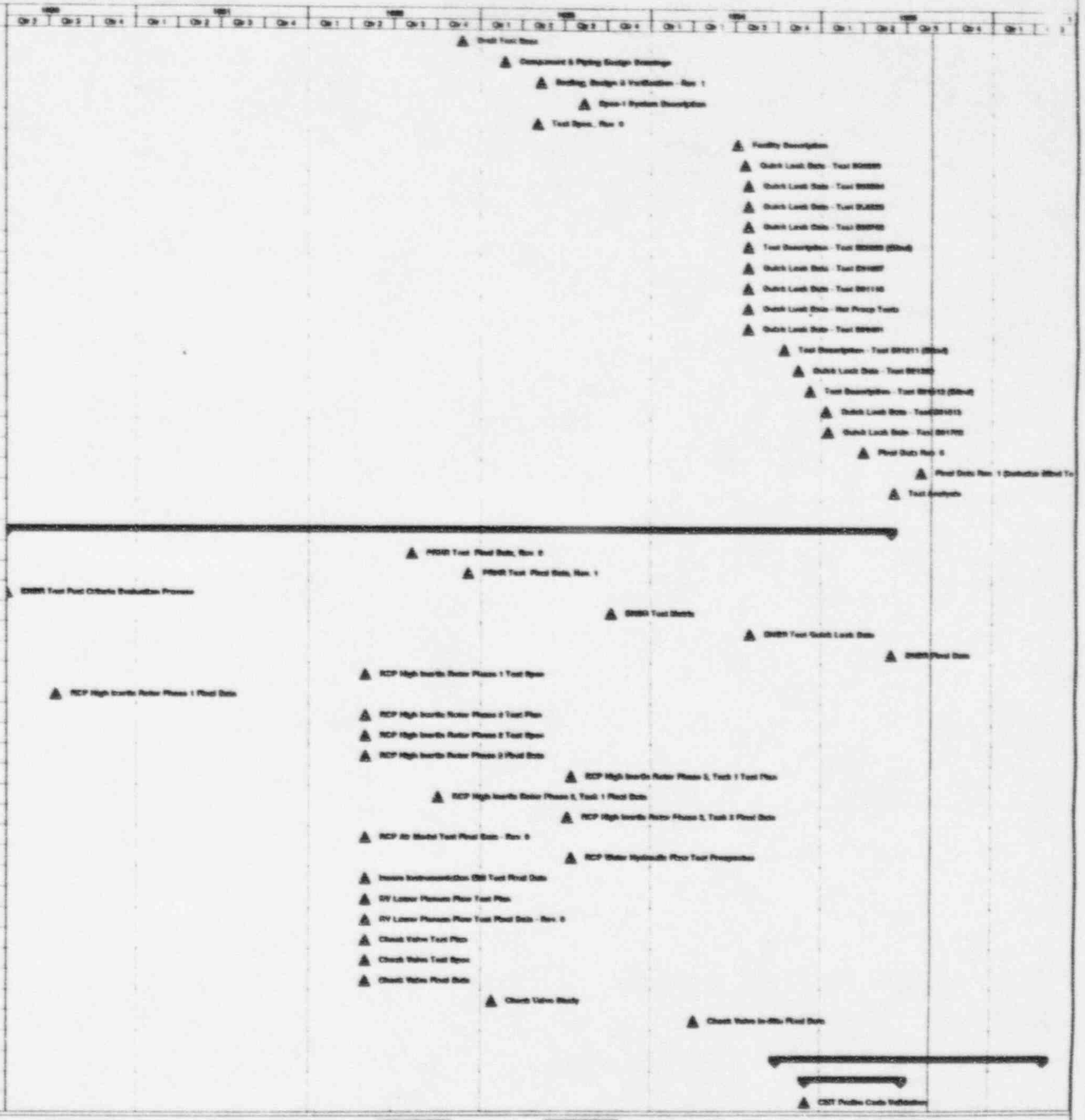


Project:
Date:

Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress

AP600 Codes and Testing Input to Supplemental DSER

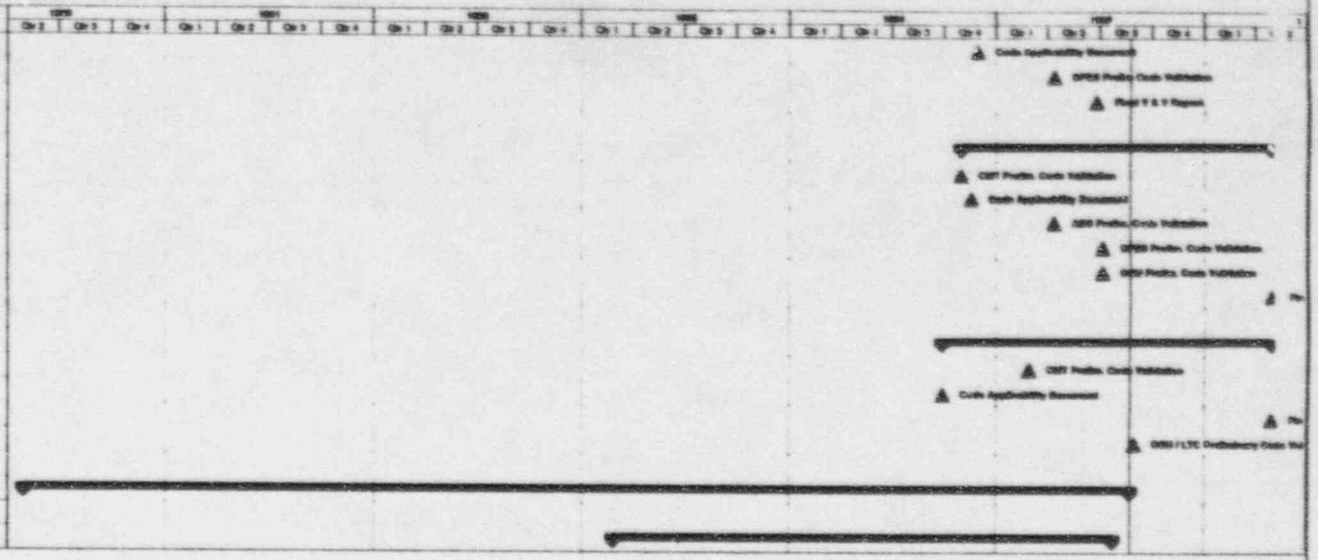
ID	Task Name
[illegible]	Draft Test Spec.
[illegible]	Component & Piping Design Drawings
[illegible]	Scaling, Design & Verification - Rev. 1
[illegible]	Spes-1 System Description
[illegible]	Test Spec., Rev. 0
[illegible]	Facility Description
[illegible]	Quick Look Data - Test S00303
[illegible]	Quick Look Data - Test S00504
[illegible]	Quick Look Data - Test S00605
[illegible]	Quick Look Data - Test S00706
[illegible]	Test Description - Test S00908 (Blind)
[illegible]	Quick Look Data - Test S01007
[illegible]	Quick Look Data - Test S01110
[illegible]	Quick Look Data - Hot Preop Tests
[illegible]	Quick Look Data - Test S00401
[illegible]	Test Description - Test S01211 (Blind)
[illegible]	Quick Look Data - Test S01309
[illegible]	Test Description - Test S01512 (Blind)
[illegible]	Quick Look Data - Test S01613
[illegible]	Quick Look Data - Test S01703
[illegible]	Final Data Rev. 0
[illegible]	Final Data Rev. 1 (Includes Blind Tests)
[illegible]	Test Analysis
[illegible]	
[illegible]	**Other**
[illegible]	PRHR Test Final Data, Rev. 0
[illegible]	PRHR Test Final Data, Rev. 1
[illegible]	DNBR Test Fuel Criteria Evaluation Process
[illegible]	DNBR Test Matrix
[illegible]	DNBR Test Quick Look Data
[illegible]	DNBR Final Data
[illegible]	RCP High Inertia Rotor Phase 1 Test Spec
[illegible]	RCP High Inertia Rotor Phase 1 Final Data
[illegible]	RCP High Inertia Rotor Phase 2 Test Plan
[illegible]	RCP High Inertia Rotor Phase 2 Test Spec
[illegible]	RCP High Inertia Rotor Phase 2 Final Data
[illegible]	RCP High Inertia Rotor Phase 3, Task 1 Test Plan
[illegible]	RCP High Inertia Rotor Phase 3, Task 1 Final Data
[illegible]	RCP High Inertia Rotor Phase 3, Task 2 Final Data
[illegible]	RCP Air Model Test Final Data - Rev. 0
[illegible]	RCP Water Hydraulic Flow Test Prospectus
[illegible]	Incore Instrumentation EMI Test Final Data
[illegible]	RV Lower Plenum Flow Test Plan
[illegible]	RV Lower Plenum Flow Test Final Data - Rev. 0
[illegible]	Check Valve Test Plan
[illegible]	Check Valve Test Spec
[illegible]	Check Valve Final Data
[illegible]	Check Valve Study
[illegible]	Check Valve In-Situ Final Data
[illegible]	
[illegible]	**V&V Reports**
[illegible]	**LOFTRAN**
[illegible]	CMT Prelim Code Validation



Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress

AP600 Codes and Testing Input to Supplemental DSER

Task Name
Code Applicability Document
SPES Prelim Code Validation
Final V & V Report
NOTRUMP
CMT Prelim. Code Validation
Code Applicability Document
ADS Prelim. Code Validation
SPES Prelim. Code Validation
OSU Prelim. Code Validation
Final V & V Report
WC/T
CMT Prelim. Code Validation
Code Applicability Document
Final V & V Report
OSU / LTC Preliminary Code Validation
Number of Meetings = 48
Audits, Inspections & Site Visits = 13



Task · Progress · Milestone · Summary · Rolled Up Task · Rolled Up Milestone · Rolled Up Progress

Supplemental DSER Input

All but two reports complete

- 193 submitted
    - Two Remain for Supplemental DSER
    - W COBRA/TRAC LTC Preliminary V&V next week
    - OSU Final TAR - 9/30/95
        - (Two preliminary versions submitted to start review early of this item)
- Two scheduled after Supplemental DSER
    - W COBRA/TRAC and NOTRUMP Final V&V next year
        - (Preliminary V&V reports used for DSER)

95 Meetings

24 Audits, Inspections & Site Visits

RAIs

- Existing test and test analysis RAIs to be completed
    - High Priority - 9/30/95
    - Remaining - 11/30/95
- Resolution of code/modeling RAIs in 1996
    - Prioritize
    - Develop schedule

Supplemental DSER Content and Schedule

Focusing on fixed date and content will minimize use of NRC & W resources

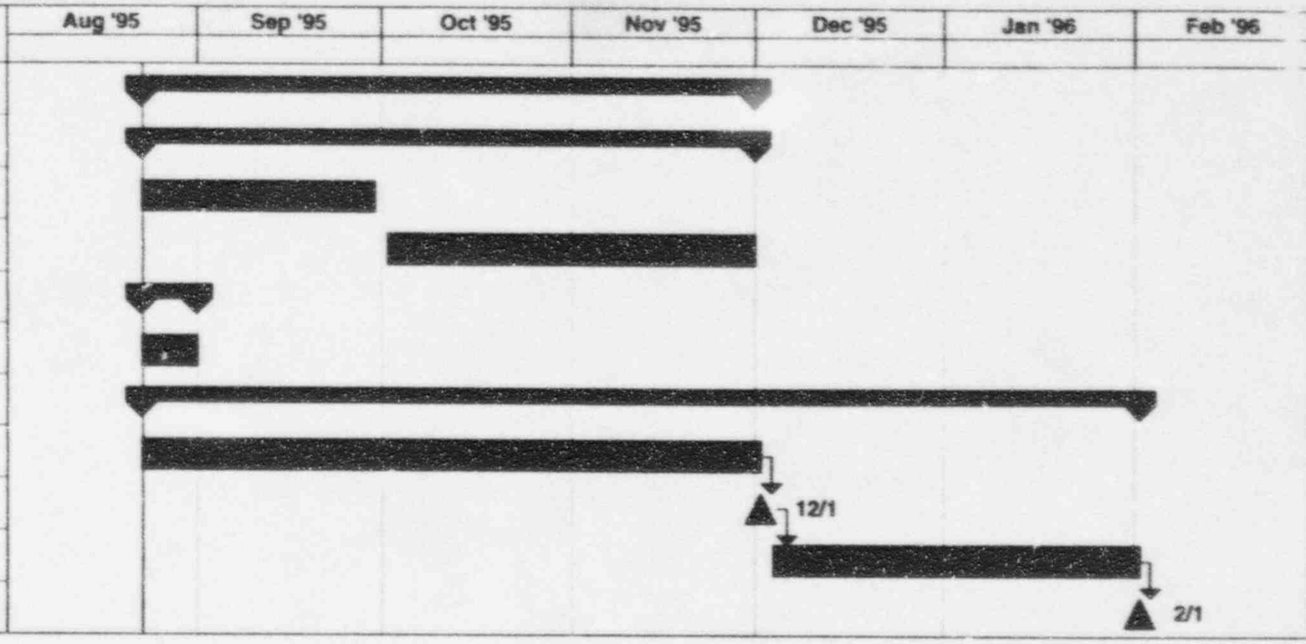
- Similar to DSER

Westinghouse proposes:

- Supplemental DSER content
  - Adequacy and applicability of testing
  - Adequacy of codes
    - Subject to resolution of open items

Westinghouse Proposed Supplemental DSER Schedule

ID	Task Name
1	**Westinghouse**
2	**Testing**
3	Test RAIs (Hi Priority)
4	Test RAIs (Lo Priority)
5	**Codes**
6	WC/T OSU LTC Validation
7	**NRC**
8	Writing /Interaction
9	Issue to PM
10	Internal Approvals
11	Issue to Westinghouse



Project:
Date: 8/23/95

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

AP600 In-Vessel Retention of Core Debris

Presented by
James H. Scobel
W Risk Assessment Services

W/NRC Senior Management Meeting
August 24, 1995

SECY-95-172

- "[IVR] Strategy appears to offer significant potential for mitigating severe accidents by preventing ex-vessel severe accident phenomena such as core-concrete interaction, high-pressure melt ejection, containment liner melt-though, and ex-vessel steam explosions."
- Establishes 5 staff technical issues that need to be resolved for endorsement of IVR

IVR Issues from SECY-95-172

1) *Applicability and scaling of experimental data to AP600*
   - DOE/ID-10460 IVR ROAAM Testing and Analysis
   - peer review of IVR ROAAM Testing and Analysis
   - ARSAP program technical support (Theofanous)

2) *Impact of reactor vessel insulation on water ingression and steam venting*
   - functional specifications for "IVR-friendly" reactor vessel insulation
   - feasible conceptual design of insulation

3) *Uncertainties in heat transfer coefficient both within the molten debris pool and from the reactor vessel lower head to the surrounding water*
   - DOE/ID-10460 IVR ROAAM Testing and Analysis
   - peer review of IVR ROAAM Testing and Analysis
   - ARSAP program technical support (Theofanous)

IVR Issues from SECY-95-172 (continued)

4) *Reactor vessel material properties and strength at elevated temperatures*
   - DOE/ID-10460 IVR ROAAM Testing and Analysis
   - peer review of IVR ROAAM Testing and Analysis
   - ARSAP program technical support (Theofanous)

5) *Potential for the strategy to increase the loadings from any ex-vessel steam explosion in the event that IVR fails.*
   - successful resolution of issues 1 through 4 minimizes need to address ex-vessel phenomena

IVR Issue Resolution Status

- July 1994, IVR Decomposition Event Tree Analysis (PRA rev. 1)
- November 1994, DOE/ID-10460, In-Vessel Coolability and Retention of a Core Melt Draft Report Issued for Peer Review
- April 1995, meeting to discuss NRC questions on DET
  - Agreed next step to develop feasible "IVR-Friendly" Reflective Insulation Conceptual Design

IVR Issue Resolution Status (continued)

- July 1995, DOE IVR Final Report Issued
  - Presents extensive two-year effort of testing and analysis employing ROAAM methodology
  - Concludes that failure into flooded cavity is "physically unreasonable"
  - Includes comments from 17 member peer review team and authors' responses
  - Two appendices to be released (approximately end of August)
    1. ULPU CHF Tests with prototypical vessel steel and paint
    2. Peer review acceptance for authors response

- August 1995, meeting with NRC staff to present insulation conceptual design
  - Constructive meeting with good NRC comments and feedback on conceptual design

Concerns Regarding Regulatory Review of IVR

- Need staff guidance on level of comfort needed to endorse IVR to support Westinghouse decision on whether to continue with IVR strategy or pursue more traditional means of severe accident mitigation.

- Allows credit for the key benefit of pursuing IVR and the extensive effort that has been put forth by DOE-ARSAP and Westinghouse

- Failure to credit IVR will require an additional effort for both Westinghouse and NRC staff to unnecessarily investigate ex-vessel phenomena

AP600 Senior Management Meeting

Presentation to the NRC
August 24, 1995

Containment Performance Post-LOCA

Jim Gresham
Containment & Radiological Analysis
Westinghouse Electric Corp.

Staff Concerns

- Containment pressure may remain elevated for an extended period of time, resulting in higher releases of radioactive material.

- The passive approach to particulate removal from the containment atmosphere is relatively slow (0.5 hr^{-1}) compared with active spray systems. This results in a higher air concentration of activity available for leakage to the environment.

- Westinghouse was requested to evaluate the capability of active, non-safety systems to reduce the release of activity to the environment in the event of a postulated core damage accident.

Potential Mitigation Actions - Discussed August 15, 1995

- Provide additional PCS water to the outside of the containment shell to enhance heat removal - This was evaluated and found to be of little benefit.
- Use of the non-safety normal RHR system was evaluated and rejected because it adds a potential release pathway.
- Operation of the non-safety containment fan coolers
- Addition of non-safety containment spray capability using water from the fire protection system

Operation of Fan Coolers

Assumptions

- One fan cooler in operation within two hours
- 31,000 cfm air flow
- Chilled water and CCW are assumed available to support cooling
- Particulate removal efficiency is 10 - 20% for the cooling coils (based on preliminary evaluation)

Impact

- Long term containment pressure drops from 9 psig to 6 psig
- Site boundary doses from particulates are reduced by about 8%
- LPZ doses from particulates are reduced by about 20%

The effects would be increased for two fan coolers in operation.

Spray System Added to Upper Containment

- Total flow rate of 334 gpm (22 nozzles)
- Single ring header located above the polar crane
- Sprayed volume is annular region (28% of containment volume)
- Aerosol removal coefficient in the sprayed region is 2.5 hr^{-1} (using SRP model)
- Maximum spray duration that can be tolerated is about six hours

Impact of Spraying Upper Containment

- Heat removal by the sprays decreases the containment pressure while sprays are operating
- After spray flow is terminated, containment pressure will rise and equilibrate at the pressure supported by PCS operation
- Reduction in SB dose from particulates is 15% (6 hours of spray)
- Reduction in LPZ dose from particulates is 27% (6 hours of spray)
- Delayed actuation of sprays would reduce the impact on doses
- Early actuation could deplete sprays before a major release of activity to the containment occurs

Spray System Added to Penetration Area

- Total flow rate of 258 gpm (17 nozzles)
- Sprayed volume is about 32% of compartment volume
- Assumption is made that the containment leakage path is only through the penetration area
- Impact of spray on containment pressure is minimal
- Reduction in doses is lower than for the case in which the upper compartment is sprayed

Conclusions

Use of fan coolers provides sufficient active, non-safety related accident mitigation capabilities.

- The fan coolers have a long-term impact on containment pressure
- Both fan coolers and sprays have a similar level of impact on doses
- Operation of the fan coolers is not sensitive to concerns of timing of core releases
- Operation of the fan coolers does not cause dilution or flood-up concerns

AP600 DESIGN CERTIFICATION PROGRAM
SENIOR MANAGEMENT MEETING

AP600

PASSIVE HYDROGEN CONTROL

AUGUST 24, 1995

BRIAN A. McINTYRE

WESTINGHOUSE ELECTRIC CORPORATION

AP600 DESIGN CERTIFICATION PROGRAM
PAR TECHNICAL BACKGROUND

AP600

- CATALYTIC HYDROGEN RECOMBINERS HAVE BEEN DEVELOPED OVER THE PAST TEN YEARS THAT HAVE AN ADEQUATE CAPACITY TO PROVIDE COMBUSTIBLE GAS CONTROL FOLLOWING A SEVERE ACCIDENT IN A NUCLEAR POWER PLANT

- PROTOTYPE TESTS PERFORMED IN GERMANY BY NIS ENGINEERING COMPANY AT THE REQUEST OF RWE-ENERGIE (1989 - 1991)

- TEST RESULTS PROVIDED BY THE ALWR PROGRAM TO THE NRC - APRIL 9, 1993

  - "... TO PRESENT THE TECHNICAL BASES FOR AND OBTAIN GENERIC ACCEPTANCE AND QUALIFICATION OF THE PASSIVE AUTOCATALYTIC RECOMBINER AS A COMBUSTIBLE GAS CONTROL SYSTEM ..."

    - ACCEPTANCE OF THE APPROACH

    - ACCEPTANCE OF THE TEST DATA AS SUFFICIENT FOR USE BY ALWR DESIGNERS AS A BASIS FOR THE DESIGN OF PLANT SPECIFIC COMBUSTIBLE GAS CONTROL SYSTEMS

    - DATA IS GENERIC IN THAT IT REPRESENTS A CLASS OF AUTOCATALYTIC RECOMBINERS BASED ON THE SAME PHYSICAL PRINCIPLES AND SIMILAR CONFIGURATION AS THE NIS PAR USED AS THE BASIS FOR THE STUDY - (OTHER PAR DESIGNS DISCUSSED IN REPORT)

AP600 DESIGN CERTIFICATION PROGRAM
NRC REVIEW

AP600

- NRC LETTER - OCTOBER 3, 1994
  - EVALUATION AGAINST SRP 6.2.5 FOR DBA
  - AREAS TO BE ADDRESSED FOR A DESIGN SPECIFIC APPLICATION IDENTIFIED
    - PARAMETRIC STUDIES TO VARIATIONS IN RELEASE RATE
    - DETONATION AND GEOMETRY
    - ADDITIONAL POISONS
    - SHIELDING AGAINST SPRAY
    - DESIGN SPECIFIC SURVEILLANCE PROGRAM

AP600 DESIGN CERTIFICATION PROGRAM
NRC REVIEW

AP600

- CONCLUSION

  - "... BASED ON THE INFORMATION IN EPRI's REPORT, THAT PARs ARE ACCEPTABLE DEVICES FOR THE CONTROL OF COMBUSTIBLE GASES WITHIN ALWR's FOR THE COMPLETE SPECTRUM OF DBA CONDITIONS. APPLICANTS FOR FDA/DC USING PARs FOR THIS PURPOSE WILL BE EXPECTED TO ADDRESS THE REQUIREMENTS OF SECTION 6.2.5 "COMBUSTIBLE GAS CONTROL IN CONTAINMENT," OF THE STANDARD REVIEW PLAN"

  - "APPLICANTS FOR FDA/DC WILL BE EXPECTED TO PROVIDE ADDITIONAL INFORMATION TO SUPPLEMENT THE CURRENT UNDERSTANDING OF PARs BEHAVIOR DURING SEVERE ACCIDENT CONDITIONS"

  - "APPLICANTS FOR FDA/DC WILL BE EXPECTED TO PROVIDE ADDITIONAL INFORMATION ON THE POTENTIAL IMPACT OF CATALYST POISONS ON THE PARs AS WELL AS THE POTENTIAL IMPACT OF COKE DEPOSITION ..."

  - "... DESIGN SPECIFIC SURVEILLANCE PROGRAM MUST BE INCLUDED..."

AP600 DESIGN CERTIFICATION PROGRAM
AP600 APPLICATION OF PARs

AP600

- PARs REPLACE ELECTRIC HYDROGEN RECOMBINERS FOR HYDROGEN CONTROL FOLLOWING DESIGN BASIS LOCA (NOT SEVERE ACCIDENT)

- NONSAFETY RELATED IGNITERS USED FOR SEVERE ACCIDENT

AP600 DESIGN CERTIFICATION PROGRAM
PAR IMPLEMENTATION

AP600

- EPRI PAR REPORT PROVIDES THE TECHNICAL BASIS USED FOR THE AP600 PAR IMPLEMENTATION
  - FUNCTIONAL REQUIREMENTS
  - TEST RESULTS AVAILABLE TO NRC THROUGH EPRI TO CONFIRM FEASIBILITY OF PAR PERFORMANCE AS DESCRIBED IN EPRI PAR REPORT
- COL APPLICANT IS RESPONSIBLE FOR PROCUREMENT OF A PAR THE MEETS THE AP600 DESIGN CERTIFICATION FUNCTIONAL SPECIFICATION
  - SAME AS FOR OTHER EQUIPMENT
  - APPENDIX B TESTING
    - PERFORMANCE AGAINST DESIGN ASSUMPTIONS
    - ENVIRONMENTAL QUALIFICATION

OVERVIEW OF PASSIVE SYSTEM RELIABILITY AND THERMAL/HYDRAULIC UNCERTAINTY

AUGUST 24, 1995

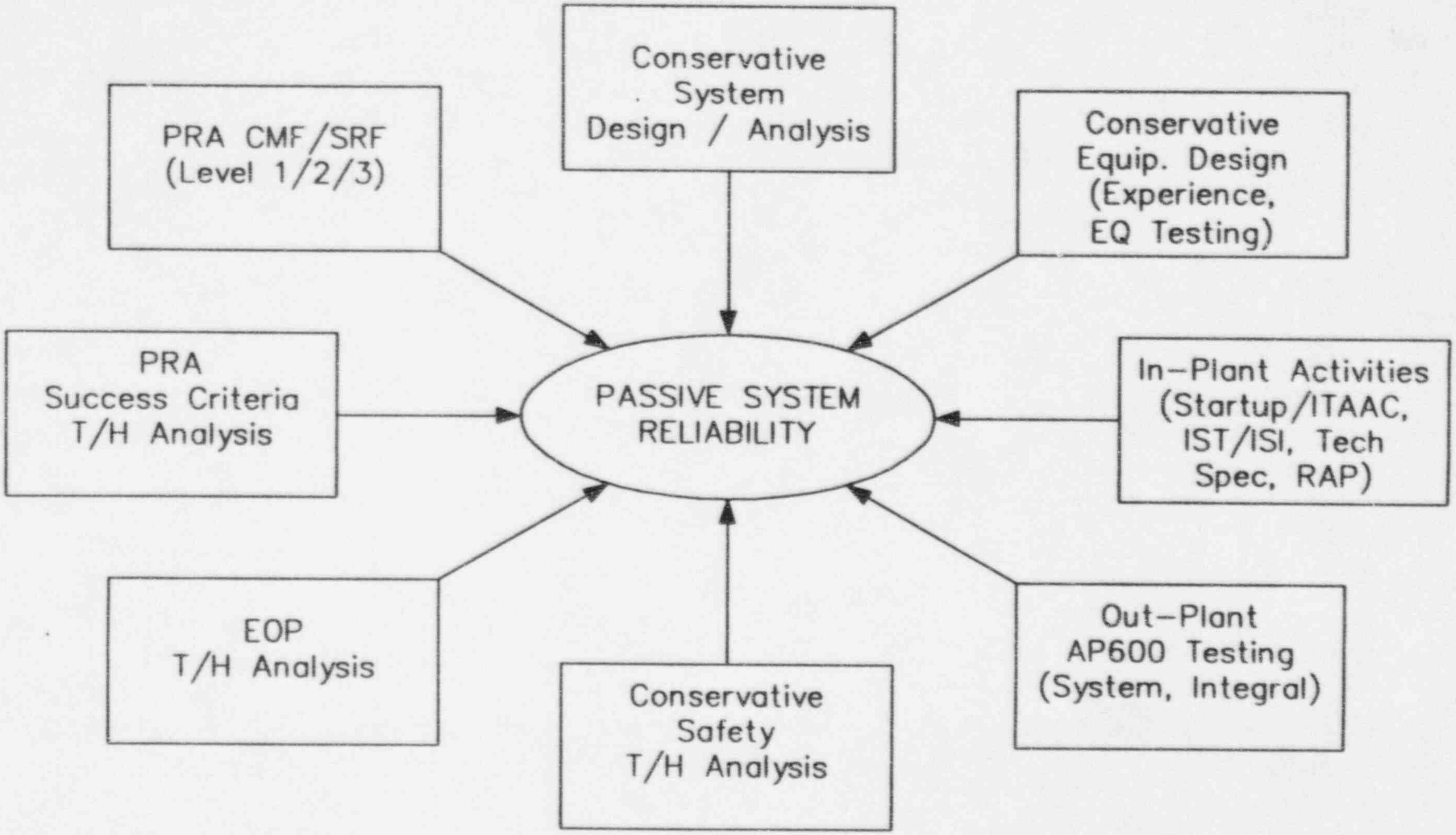
PASSIVE SYSTEM RELIABILITY OVERVIEW

AP600

- **Overview of Passive System Reliability**
  - Broad discussions occured early in West / NRC interaction
  - Agreed that normal licensing process addresses most issues
    - One exception is T/H uncertainity in PRA success criteria analysis
    - After 11/94 all efforts have focused on T/H uncertainity

- **Aspects Addressed by Licensing Process**
  - Conservative system design and analysis
  - Conservative component design (experience, qualification testing)
  - In-plant activities (startup tests, ITAAC, IST/ISI, Tech Spec, RAP)
  - Out-plant AP600 testing (system and integral)
  - Conservative safety T/H analysis
  - EOP T/H analysis
  - PRA success criteria T/H analysis
  - PRA CMF / SRF (level 1/2/3)

PASSIVE SYSTEM RELIABILITY OVERVIEW



Thermal/Hydraulic Uncertainty Evaluation
Mission Statement

To provide a higher level of comfort that AP600 success criteria have been defined "robustly," so that PRA results are not significantly impacted by:

- T/H uncertainty in the behavior of the passive systems
- MAAP4's simplified models

Summary of T/H Uncertainty Program

June 14, 1994	NRC introduces passive system reliability as related to PRA success criteria
Aug. 1, 1994	Westinghouse presents approach that concentrates on developing robust PRA success criteria
Sept. 15, 1994	Status meeting
Nov. 15, 1994	Status meeting; NRC presents concerns on T/H uncertainty; Westinghouse believes these concerns are addressed by planned activities
Feb. 1995	Westinghouse submits Rev. 2 PRA. Chapter 6 and Appendix A provide detailed documentation of PRA success criteria
March 17, 1995	NRC issues comments on Appendix A
March 30, 1995	Westinghouse proposes to reorganize Appendix A information to address NRC comments; provides examples. NRC presents that W approach has not fully addressed their T/H concerns.

Summary of T/H Uncertainty Program (cont.)

April 20, 1995	W/NRC work through and agree upon a plan to resolve T/H uncertainty issues.
May - June, 1995	Westinghouse submits draft deliverables to NRC for review. NRC comments show we are diverging on the process and expectations of the program.
June 29, 1995	W/NRC senior management meeting. Identify single point contacts at both W and NRC. Both parties agree to reexamine what is the mission and expected outcome of the T/H uncert. program.
July 27, 1995	Westinghouse provides details and preliminary results of the T/H evaluation (April 20 plan). Process modified to address NRC concerns outlined in comments on draft deliverables.
Aug. 14, 1995	NRC issues 7/27/95 meeting summary and includes list of 6 additional staff concerns that need to be addressed as part of T/H uncertainty evaluation.

AP600 PRA Success Criteria Analyses

- Analyses using MAAP4 were performed to identify the minimum hardware configurations as the AP600 PRA success criteria
  - Peak core temperatures are well below 2200°F in the success analyses

- PRA success sequences were grouped into "Baseline" MAAP4 cases defined with:
  - Worst break size for a given initiating event
  - Worst break location for a given initiating event
  - Worst ADS assumption in the success criterion
  - Worst number of CMT and accumulators
  - Worst containment conditions for IRWST gravity injection (failure of containment isolation)

AP600 PRA Success Criteria Analyses (continued)

- The Baseline MAAP4 cases are the b·:unding cases for a large number of PRA success sequences
  - Many less-limiting sequences are "represented" by a Baseline case
- The AP600 PRA success criteria have been developed in a more systematic, rigorous manner than typical PRA success criteria

Hardware Failure Assumptions for T/H Uncertainty Assessment

- The T/H uncertainty and MAAP4 benchmarking concerns will be addressed with NOTRUMP / MAAP4 comparisons

- Before defining cases for NOTRUMP / MAAP4 comparison, make minor changes to the hardware failures assumed for specific success criteria to:

  - Avoid long-term core uncovery
  - Provide more margin to PCT limit of 2200°F

- The PRA sensitivity to these hardware failures is insignificant; therefore, the less restrictive hardware failure assumptions are used to define accident sequences for further examination

Selection of Cases for MAAP4 / NOTRUMP Comparison

- The four cases (accident sequences) were selected based on:
  - They are the most limiting
  - They are the only ones with core uncovery
  - They have over 1000°F margin to the PCT limit
  - They cover a range of
    - break sizes
    - break locations
    - hardware assumptions

Summary of Closure Plan for T/H Uncertainty

- T/H uncertainty issues are to be addressed with bounding DBA-like NOTRUMP analyses, still meeting a PCT limit of 2200°F
  - Hardware availability based on PRA sequences
  - Other analysis assumptions based on Appendix K

- System response predicted by MAAP4 will be compared to NOTRUMP prediction to provide level of comfort about MAAP4's predictions for other cases

- The process for bringing the T/H uncertainty issue to closure is based on:
  - Further study of a limited number of cases
  - Providing a higher level of comfort, not an absolute guarantee

Westinghouse Concerns

Concerns Westinghouse has with the NRC 8/14/95 letter:

1. MAAP4 validation rather than benchmarking

   - NRC asking W to compare MAAP4 against experimental data

2. NRC concern of whether "use of Appendix K inputs and models is sufficient to bound the T/H uncertainties for all AP600 PRA sequences."

   - Need further clarification of NRC concerns.

3. Conflicting statements on NRC acceptance of W approach as discussed at July 27 meeting.

   - "the staff considers that the approach described and laid out by Westinghouse to be acceptable provided that Westinghouse can address the following specific staff concerns."

   - Westinghouse needs to "explain why success of the associated sequence ensures that all other PRA sequences would be expected to succeed if analyzed using the same DBA-like analyses"

Westinghouse Concerns (cont.)

4. NRC stating the focused PRA sensitivity study must include the effects of T/H uncertainty while continuing to satisfy the criteria of 1E-4/yr core damage frequency and 1E-6/yr large release frequency.

5. NRC needs to identify who is the single point of contact on the T/H uncertainty issue.

Westinghouse Electric Corporation

AP600

AP600 Senior Management Meeting

Open Item Tracking System

John Butler

August 24, 1995
Rockville, PA

Open Item Resolution

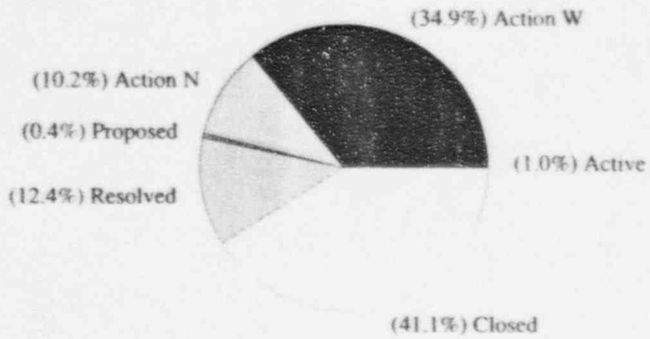
AP600

Activities of note since last Senior Management Meeting

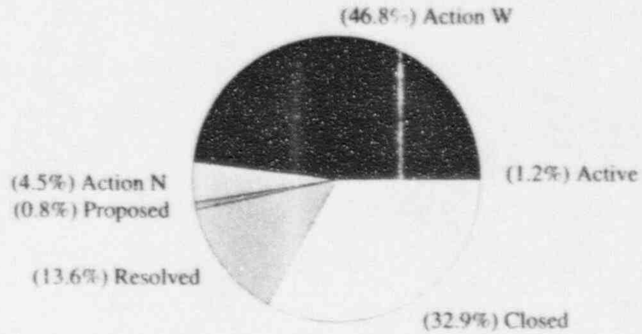
- **August 17, 1995 meeting with individual branches to discuss status of open items**
- **Meeting resulted in a marked improvement in common reflection of open item statuses**
- **Database updates are being provided more frequently to NRC staff via Internet**

Open Item Status - All Chapters

DSER Items (OI, COL, Conf.)



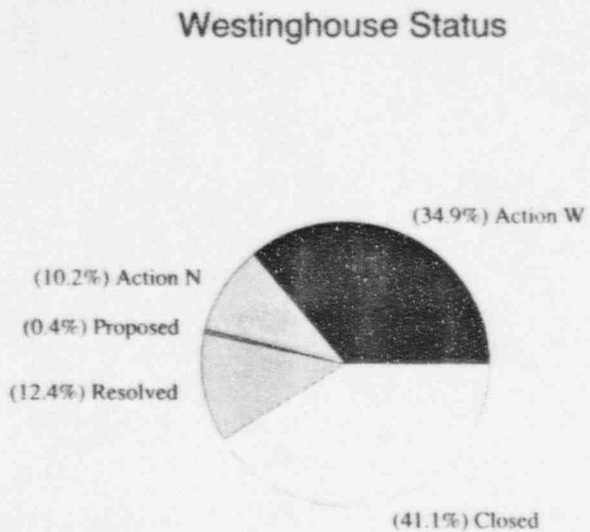
Follow-on Items (RAI, Mtg., Telecon)

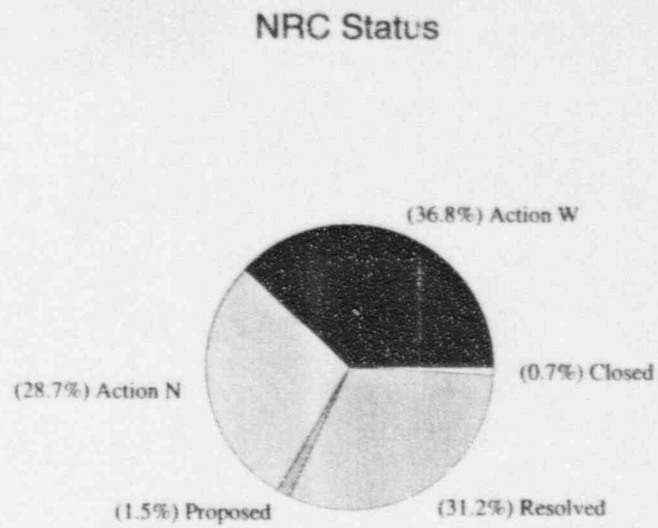


	Inactive	Progress	Active	Action W	Action N	Proposed	Resolved	Closed	Total
DSER Items									
DSER-OI	0	0	14	442	136	6	118	432	1148
DSER-Confirmatory	0	0	0	9	1	0	38	15	63
DSER-COL	0	0	0	29	4	0	14	118	165
Subtotal	**0**	**0**	**14**	**480**	**141**	**6**	**170**	**565**	**1376**
Follow-on Items									
RAI-OI	0	0	1	218	3	0	5	63	2[illegible]0
Meeting-OI	1	0	10	223	40	8	124	248	654
Telecon-OI	0	0	0	2	0	0	0	1	3
Subtotal	**1**	**0**	**11**	**443**	**43**	**8**	**129**	**312**	**947**
Total	**1**	**0**	**25**	**923**	**184**	**14**	**299**	**877**	**2323**

Westinghouse Status as of August 23, 1995

DSER Open Item Status - Westinghouse/NRC Status





	Inactive	Progress	Active	Action W	Action N	Proposed	Resolved	Closed	Total
West. Status									
DSER-OI	0	0	14	442	136	6	118	432	1148
DSER-Confirmatory	0	0	0	9	1	0	38	15	63
DSER-COL	0	0	0	29	4	0	14	118	165
Subtotal	**0**	**0**	**14**	**480**	**141**	**6**	**170**	**565**	**1376**
NRC Status									
DSER-OI	0	0	15	462	329	14	318	10	1148
DSER-Confirmatory	0	0	0	14	3	0	46	0	63
DSER-COL	0	0	0	31	63	6	65	0	165
Subtotal	**0**	**0**	**15**	**507**	**395**	**20**	**429**	**10**	**1376**

Westinghouse Status as of August 23, 1995

HANDOUTS

PRESENTED BY THE NRC

AT THE AUGUST 24, 1995,

SENIOR MANAGEMENT MEETING

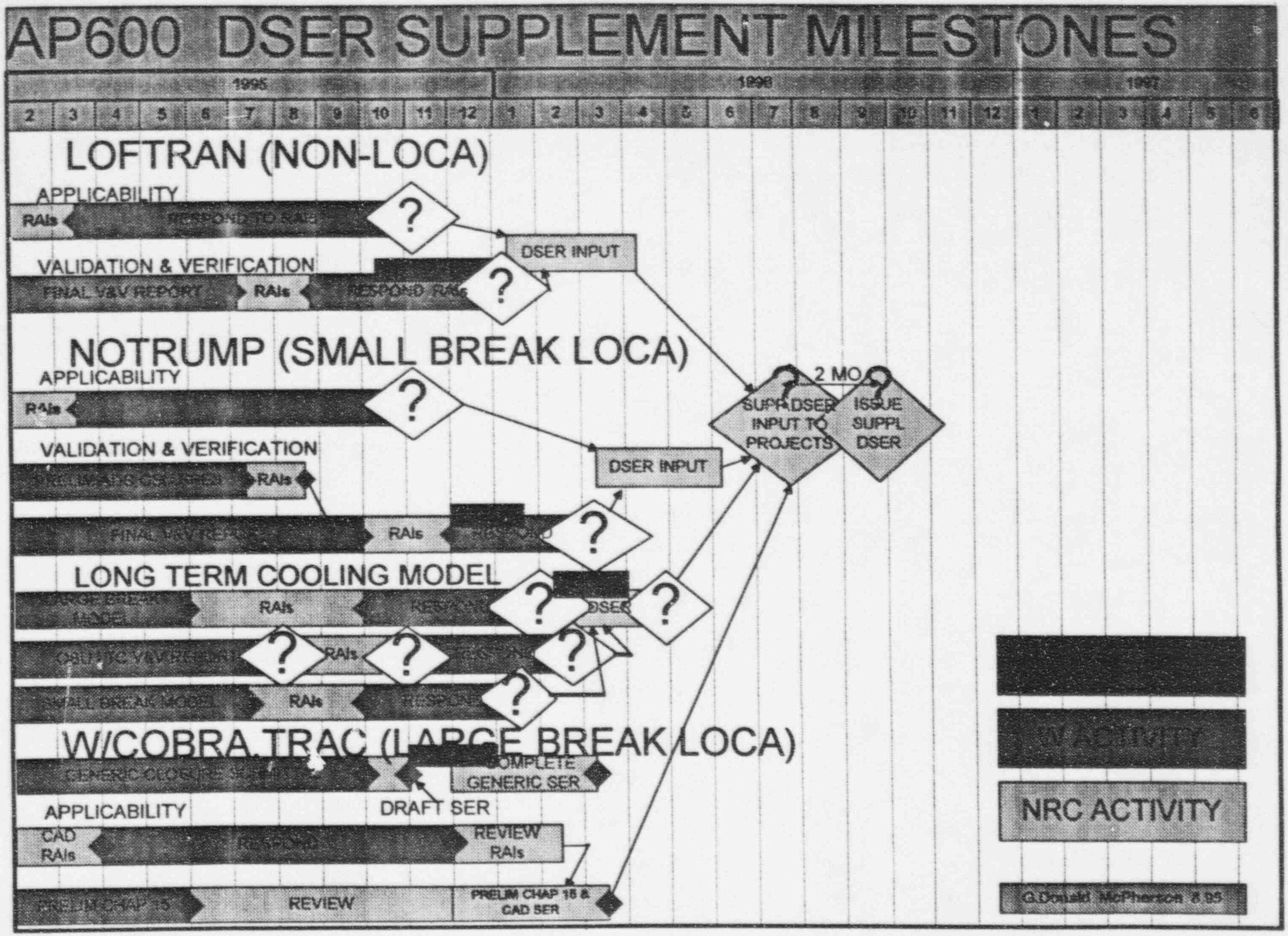
Attachment 3

NRC STAFF PRESENTATION MATERIAL

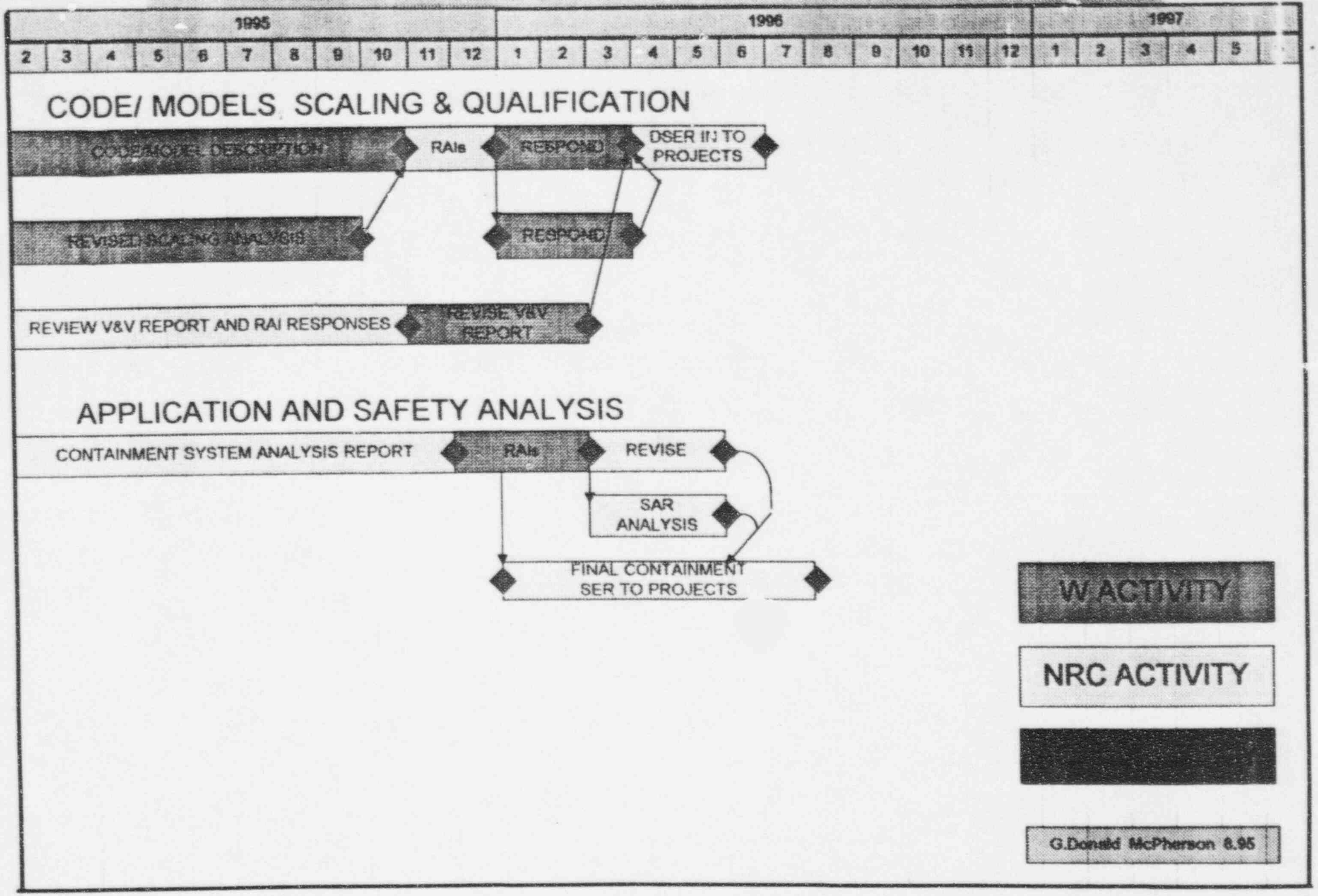
NRC / WESTINGHOUSE

SENIOR MANAGEMENT MEETING

AUGUST 24, 1995


AP600 DSER SUPPLEMENT MILESTONES
1995
1996
1997
2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6
LOFTRAN (NON-LOCA)
APPLICABILITY
RAIs
RESPOND TO RAIs
?
DSER INPUT
VALIDATION & VERIFICATION
FINAL V&V REPORT
RAIs
RESPOND RAIs
?
NOTRUMP (SMALL BREAK LOCA)
APPLICABILITY
RAIs
?
VALIDATION & VERIFICATION
RAIs
DSER INPUT
FINAL V&V REPORT
RAIs
?
LONG TERM COOLING MODEL
LARGE BREAK MODEL
RAIs
?
DSER
?
RAIs
?
?
SMALL BREAK MODEL
RAIs
?
2 MO
SUPP DSER INPUT TO PROJECTS
ISSUE SUPPL DSER
W/COBRA TRAC (LARGE BREAK LOCA)
COMPLETE GENERIC SER
DRAFT SER
APPLICABILITY
CAD RAIs
RESPOND
REVIEW RAIs
PRELIM CHAP 15
REVIEW
PRELIM CHAP 15 & CAD SER
W ACTIVITY
NRC ACTIVITY
G.Donald McPherson 8.95

NRC STAFF PROPOSAL FOR AP600 PCCS & W/GOTHIC REVIEW



PASSIVE SYSTEM T/H RELIABILITY

STAFF POSITION (8/14/95 MEETING SUMMARY):

1. W NEEDS TO DEMONSTRATE ADEQUACY OF MAAP4

2. W NEEDS TO DEFINE A SYSTEMATIC PROCESS TO JUSTIFY SELECTION OF BOUNDING SEQUENCES

3. W NEEDS TO DEMONSTRATE USE OF APPENDIX K INPUTS AND MODELS SUFFICIENT TO BOUND T/H UNCERTAINTIES

4. W NEEDS TO DEMONSTRATE THE RESULTS OF FOCUSED PRA WITH LOW MARGIN SEQUENCES SET TO FAILURE MEET COMMISSIONS SAFETY GOAL GUIDELINES FOR CDF AND LRF

5. W NEEDS TO DESCRIBE SYSTEMATIC PROGRAMS TO IDENTIFY AND ACCOUNT FOR POTENTIAL PASSIVE SYSTEM FAILURE MECHANISM

EXTERNAL REACTOR VESSEL COOLING

STATUS:

DOE REPORT ON ERVC RECEIVED AUGUST 7, 1995
- ADDITIONAL TESTING RESULTS
- PEER REVIEW COMMENTS AND RESOLUTION

MEETING WITH WESTINGHOUSE ON INSULATION DESIGN AUGUST 15, 1995
- POSITIVE MEETING
- SUMMARIZED MAJOR DESIGN REQUIREMENTS
  - INSULATION/IN-VESSEL RETENTION
  - SHIELDING
  - VENTILATION
  - ACCESS REQUIREMENTS
- DISCUSSED CONCEPTUAL DESIGN
- RESULTING ISSUES
  - DEFINITION OF PRESSURE LOAD AND DESIGN
  - CLOGGING OF FLOW PATH WITH DEBRIS

DISCUSSION:

WESTINGHOUSE RELUCTANCE TO INCORPORATE DOE REPORT
- LEVEL OF CREDIT TO BE GIVEN TO ERVC
- AMOUNT OF ADDITIONAL EX-VESSEL SEVERE ACCIDENT WORK REQUIRED
- STAFF AND CONTRACTOR (SNL) REVIEW ON HOLD

CONTAINMENT PRESSURE AND TEMPERATURE

STATUS:

MEETING WITH WESTINGHOUSE AUGUST 15, 1995 TO DISCUSS DESIGN OPTIONS
- WGOTHIC CODE FOR DESIGN BASIS LOCA PRESSURE AND TEMPERATURE
- 4 DESIGN OPTIONS
    - ADDITIONAL PCCS FLOW AT 24 HOURS
    - CONTAINMENT FAN COOLERS
    - CONTAINMENT SPRAYS
    - NORMAL RHR WITH FAN COOLERS

DISCUSSION:

STAFF INITIALLY BELIEVED THAT WESTINGHOUSE PROVIDED GOOD ASSESSMENT

FURTHER ASSESSMENT INDICATES NO CLEAR BASIS FOR COMPARISON OF OPTIONS
- INITIATION TIMING
- LENGTH OF OPERATION
- SPRAY FLOOD-UP LEVELS
- NEED FOR ASSESSMENT IN SEVERE ACCIDENT ENVIRONMENT
- DEGRADATION OF PCCS DUE TO NON-CONDENSIBLE GAS GENERATION

FAN COOLER WEAKNESSES
- EQUIPMENT SURVIVABILITY
- AEROSOL CLOGGING OF HEAT EXCHANGERS
- SUPPORT SYSTEMS
    - AC POWER
    - COMPONENT COOLING WATER AND CHILLED WATER

Level of Detail Needed For Certification of PAR Design

In accordance with the Standard Review Plan, the staff is to review the qualification testing of the PAR in order to establish its functional capability

Information submitted thus far by Westinghouse is insufficient to accomplish this review

Westinghouse has told the staff that this is an issue to be resolved by the staff and EPRI and not the staff and Westinghouse

Level of Detail Needed For Certification of PAR Design

The staff disagrees with Westinghouse's position for the following reasons:

- Westinghouse is responsible for the data to assess the analytical tools used for safety analyses

  It appears Westinghouse has incorrectly incorporated the PAR's performance data into its containment hydrogen concentration analysis

- Westinghouse is responsible for resolving any differences between its AP600 test program and the PAR test program conducted by the NIS company of Germany

  PAR qualification testing was performed under the quality assurance rules of the NIS company

Level of Detail Needed For Certification of PAR Design

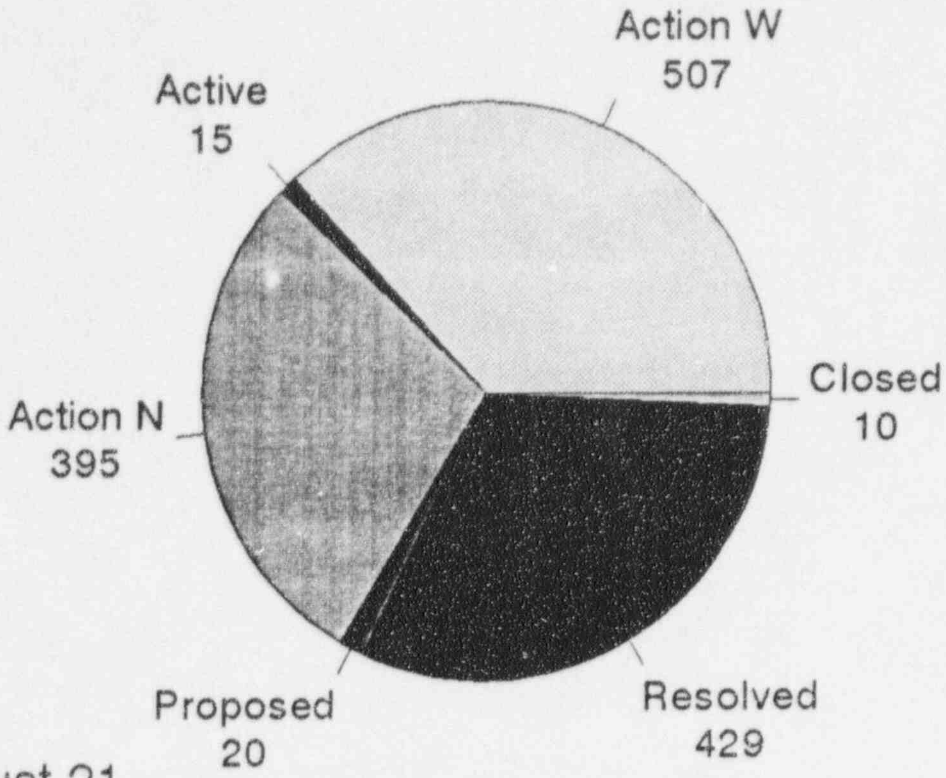
10 CFR 52.47 (b)(2) states that certification of a standard design which utilizes passive means to accomplish its safety functions will be granted only if:

- The performance of each safety feature of the design has been demonstrated through either analysis, appropriate test programs, experience, or a combination thereof;

- Sufficient data exist on the safety features of the design to assess the analytical tools used for safety analyses

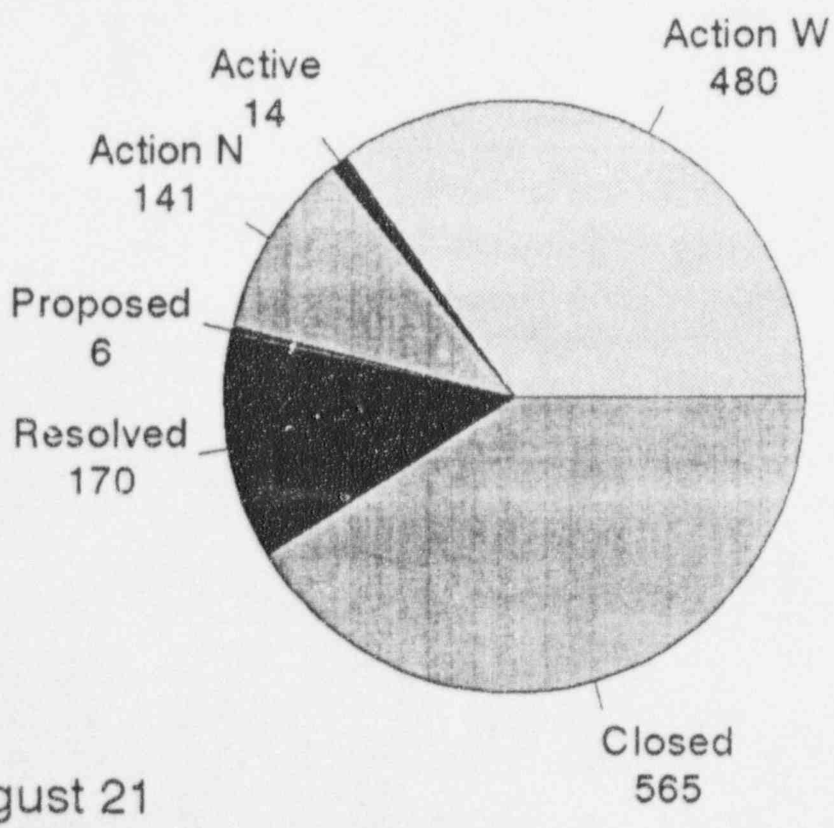
10 CFR 52.47 (b)(2) further states that information normally contained in certain procurement specifications be completed and available for audit if such information is necessary for the Commission to make its safety determination

NRC DSER Open Item Status



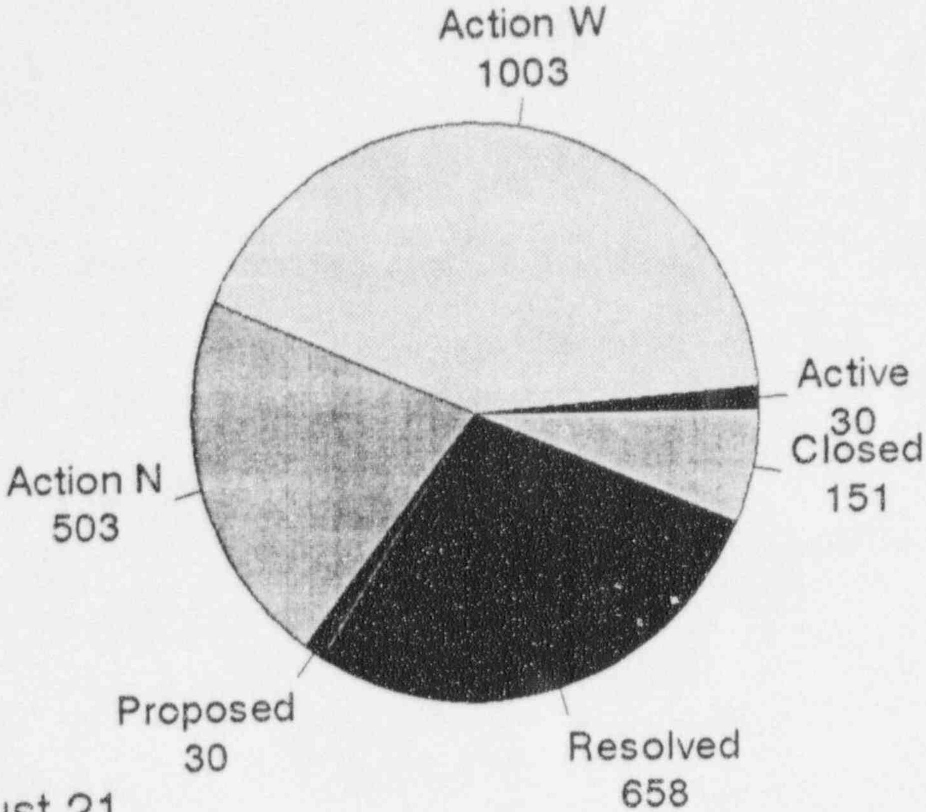
August 21

Westinghouse DSER Open Item Status



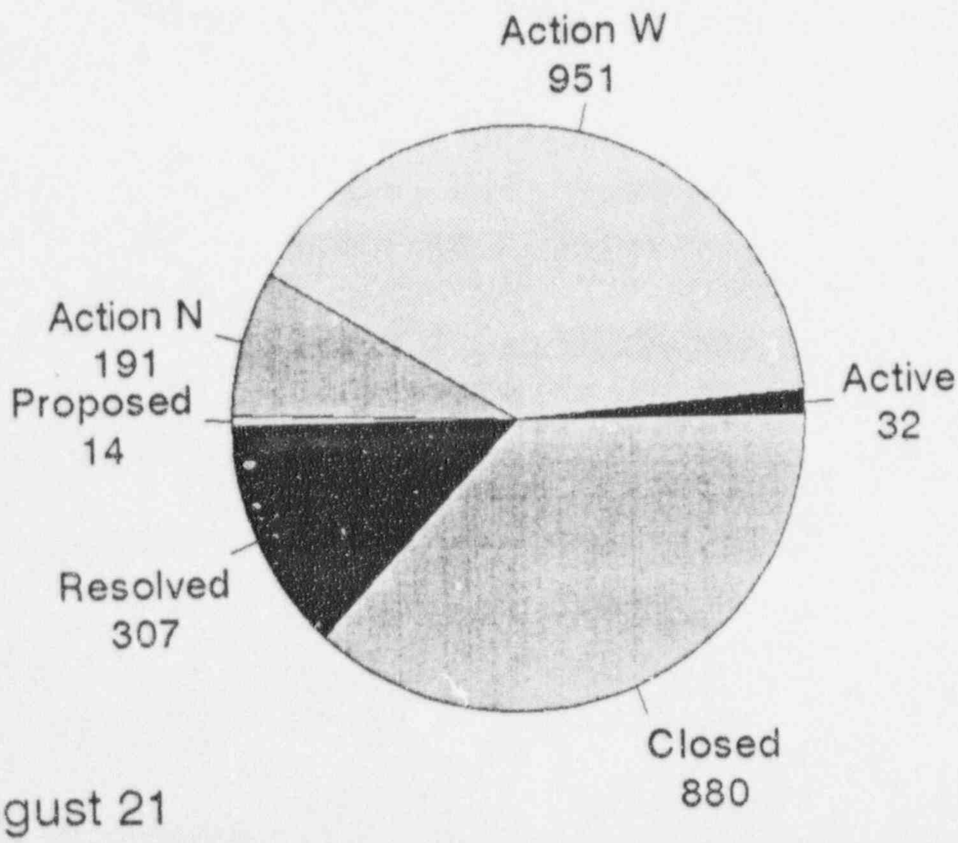
August 21

NRC Open Item Status



August 21

Westinghouse Open Item Status



August 21