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December 9, 1983
OSC 83-21

MR DARRELL G EISENHUT
DIVISION OF LICENSING
UNITED STATES NUCLEAR REGULATORY COMMISSION
WASHINGTON D C 20555

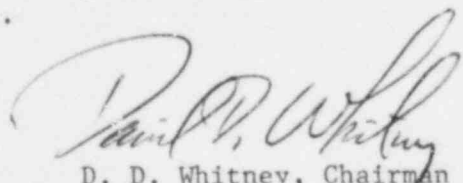
Subject: B&W Owners Group Plan and Schedule for Addressing the Safety
Evaluation of "Abnormal Transient Operating Guidelines"

- Reference: 1) Eisenhut, D.G., "Safety Evaluation of "Abnormal Transient Operating Guidelines" (C-neric Letter 83-31)" letter from D.G. Eisenhut to All Operating Reactor Licensees, Applicants for an Operating License and Holders of Construction Permits for Babcock & Wilcox Pressurized Water Reactors, September 19, 1983.
- 2) Eisenhut, D.G., "Safety Evaluation of "Abnormal Transient Operating Guidelines" letter from D.G. Eisenhut to D.D. Whitney, September 19, 1983.
- 3) Whitney, D.D., "Supplement to ONS-3 Final ATOG," letter from D.D. Whitney to D.G. Eisenhut, July 2, 1983.

Reference 1 transmitted the Safety Evaluation Report (SER) on the Oconee Nuclear Station Unit 3, Abnormal Transient Operating Guidelines (ATOG) to the B&W Owners Group as an enclosure. Reference 2, and enclosure to Reference 1, required a submittal of the B&W Owners Group plan and schedule within 90 days for addressing the items identified in the SER which need further work to the NRC.

In Enclosure 1 of Reference 2 you identified four items upon which "the acceptance of ATOG as a basis is contingent". Items 1 and 2, pertaining to ATWS and interruption of natural circulation guidance, were transmitted to the NRC July 2, 1983 in Reference 3. Our proposed comprehensive plan and schedule for addressing the SER, is provided herein as Attachment 1 which addresses the third item. This completes our obligations prerequisite to closure of NUREG-0737, Item I.C.1. Subsequent submittal of the Technical Basis Document will provide for closure of the remaining non-IST (Integrated Systems Test) open items with the SER. Future changes to procedures derived from the plant-specific ATOG's and the Technical Basis Document will be implemented per the requirements of 10 CFR 50.59. The remaining item, item 4, is the NRC's agreement with the B&W Owners Group proposed plan and schedule (Attachment 1). The NRC's prompt action will allow the Operator Support Committee to proceed with the proposed plan and schedule.

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D. D. Whitney, Chairman
Operator Support Committee
B&W Owners Group

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1.0 INTRODUCTION AND PURPOSE

This document contains the B&W Owners Group (B&WOG) detailed plan and schedule for addressing the items identified in the Safety Evaluation Report (SER) written for the Oconee Nuclear Station Unit 3 (ONS-3) Abnormal Transient Operating Guidelines (ATOG). The plan and schedule are contained in Section 2.0 and information that supports the plan and schedule is provided in Section 3.0.

The B&WOG intends to address as many of the ATOG SER issues as practicable in a document entitled, "Babcock & Wilcox Owners Group Technical Bases Document for Operating Procedures," currently being developed by the B&WOG. This Technical Bases Document will be a condensed, generic application of the technical bases developed in the ATOG program. The primary objective of developing this document is to establish a technical bases format that provides an efficient vehicle for document maintenance and for periodic updates to address new issues and operational methods. The overall plan for the Technical Bases Document program is to develop a document that consolidates the ATOG technical bases, the supplemental material provided for the Oconee Nuclear Station Unit 3 final ATOG in response to NRC questions, and the current information developed from other B&WOG programs. The intent is that this document will then be revised as needed to include the applicable results of the analyses performed in response to the ATOG SER, and the applicable results of programs pursued in response to new issues, thus maintaining the document current.

The open issues identified by the ATOG SER requiring further analyses demand more detailed planning. The Integral System Test (IST) program is being pursued by the B&WOG, the NRC and EPRI as outlined in "Contract Between The Babcock & Wilcox Company and Electric Power Research Institute and The U.S. Nuclear Regulatory Commission" NRC-04-83-168, RP2399-1 effective June 6, 1983 to investigate the B&W Nuclear Steam Supply System's

response to various transients. Part of the output from this program is data that will be used to benchmark computer codes (RELAP5) against various phenomena. Therefore, in scheduling the performance of the analyses required by the ATOG SER, the schedule for the IST program is considered. If the phenomena being analyzed for the ATOG SER is being investigated by the IST program, then the performance of the analysis is scheduled after the IST data becomes available.

The remainder of the issues are categorized as plant specific. These are identified in the plan and schedule and will be addressed on a plant specific basis.

2.0 PLAN AND SCHEDULE

The enclosed plan and schedule divides each major area identified in Section 4.0 of the ATOG SER into individual issues. Column 1 lists the major SER areas. Column 2 identifies the individual SER issues within a major area. Column 3 lists the response category that has been assigned to each issue. The response categories are:

- OGTBD - Will be addressed in the B&W Owners Group Technical Bases Document for Operating Procedures.
- A - An analysis or engineering evaluation will be performed to address the issue and the results will then be incorporated into the Technical Bases Document by the issuance of a formal revision or supplement.
- A (IST) - An analysis or engineering evaluation will be performed once the relevant data taken from the Integral System Test Program has been used to benchmark RELAP5.
- PS - The issue is plant specific and therefore will be addressed on a plant specific basis.
- E - The B&W Owners Group takes exception to the issue for the reasons noted.

The respective paragraph within Section 3.0 of this document, which provides further information regarding how each issue will be addressed is identified in the next column. The schedule for addressing each issue is provided in the last section of the plan and schedule.

ATOG SER
PLAN AND SCHEDULE

Page 1 of 5

(SER FINDINGS SECTION NUMBER)	MAJOR AREA TITLE	ISSUE WITHIN MAJOR AREA	(SER TEXT SECTION NUMBER)	RESPONSE CATEGORY (SEE NOTE 1)	SUPPORTING INFORMATION (PARAGRAPH NUMBER)	SEE NOTE 2				SCHEDULE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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NOTE 2: A more detailed schedule for the development of the Owners Group Technical Bases Document is provided in Figure 1.

ATOG SER
PLAN AND SCHEDULE

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						1984				1985				1986				1987			
						1ST QTR	2ND QTR	3RD QTR	4TH QTR	1ST QTR	2ND QTR	3RD QTR	4TH QTR	1ST QTR	2ND QTR	3RD QTR	4TH QTR	1ST QTR	2ND QTR	3RD QTR	4TH QTR
4.2.4 Plant Cooldown	Plant Cooldown	Cyclic Boiler- Condenser Phenomena (3.13)	(1ST)	OGTBD/A	3.10	OTIS 0---0 TESTS OTIS DATA 0-----0				MIST TESTS 0-----0 MIST DATA 0-----0											
						0-----0				0-----0								0-----0			
						0-----0				0-----0								0-----0			
						0-----0				0-----0											
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ATOG SER
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						1984				1985				1986				1987							
						1ST QTR	2ND QTR	3RD QTR	4TH QTR	1ST QTR	2ND QTR	3RD QTR	4TH QTR	1ST QTR	2ND QTR	3RD QTR	4TH QTR	1ST QTR	2ND QTR	3RD QTR	4TH QTR				
						OTIS 0---0 TESTS				MIST TESTS 0-----0															
						OTIS DATA 0-----0								MIST DATA 0-----0											
4.2.5	Extended Coverage of Entry Conditions	(3.2.2, 3.11)		PS/OGTBD	3.17	0-----0																			
4.2.6	Loss of AC Power	(3.3.2, 3.12, 3.13)		OGTBD/PS	3.18	0-----0																			
4.2.7	ATWS	(3.3.2, 3.12)		OGTBD	3.19	0-----0																			
4.2.8	PTS	(3.4.2, 3.9.4.2)		OGTBD/PS	3.20	0-----0																			
4.2.9	Post ICC with Core Damage	(3.7.2, 3.8.2)		OGTBD	3.21	0-----0																			
4.2.10	RCP Operation																								
	RCP Trip Criteria (3.3.2, 3.5.2, 3.6.2, 3.7.2, 3.8.2, 3.9.6, 3.13)			OGTBD	3.22	0-----0																			
	RCP Restart Criteria (3.3.2, 3.5.2, 3.7.2)			OGTBD	3.22	0-----0																			
	Actions if RCP not Tripped (3.9.6, 3.5.2)			OGTBD	3.22	0-----0																			
	Actions After Restart if Conditions not Maintained (3.9.6, 3.7.2)			OGTBD	3.22	0-----0																			

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PLAN AND SCHEDULE

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						1984				1985				1986				1987				1ST QTR	2ND QTR	3RD QTR	4TH QTR
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						OTIS 0-----0 TESTS OTIS DATA 0-----0				MIST TESTS 0-----0 MIST DATA 0-----0															
		RCP Restart With Voids (3.5.1, 3.8.2, 3.13)		OGTBD/A/ A(IST)	3.23	0-----0												0-----0							
		Validity of Pump Bumps (3.5.1, 3.8.2)		A(IST)	3.23													0-----0							
4.2.11	Instrumentation			PS	3.24																				
		RCS Inventory Measurement (3.8.2)																							
4.2.12	Statement Clarification			OGTBD	3.25	0-----0																			
4.2.13	EFW to Isolated SG			OGTBD	3.25	0-----0																			
4.2.14	TBV			PS	3.26																				
4.2.15	Statement Clarification			OGTBD	3.25	0-----0																			
4.2.16	Use of PORV			OGTBD	3.25	0-----0																			
4.2.17	ATOG Inconsistencies			OGTBD	3.25	0-----0																			
4.2.18	SG Inventory Control Inconsistencies			OGTBD	3.25	0-----0																			

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						OTIS 0---0 TESTS				MIST TESTS 0-----0											
						OTIS DATA 0-----0				MIST DATA 0-----0											
4.2.19	Containment Parameters			PS	3.27																
4.2.20	HPI Performance			A(1ST)	3.11				0-----0												
4.2.21	Special ICC Precautions			OGTBD/PS	3.15	0-----0															
4.2.22	Reactor Building Temperature Monitoring			PS	3.28																
4.2.23	Capability/ Operation of Condenser			PS	3.29																
4.2.24	RCP Seals			PS	3.30																
4.2.25	Term Clarification			OGTBD	3.25	0-----0															
4.2.26	Time Frame Quantification			OGTBD	3.25	0-----0															
4.2.27	Post LOCA Time Frame Justification			OGTBD	3.25	0-----0															
4.2.28	ICC Indication Clarification			OGTBD	3.25	0-----0															
4.2.29	Provide Figures			OGTBD	3.25	0-----0															

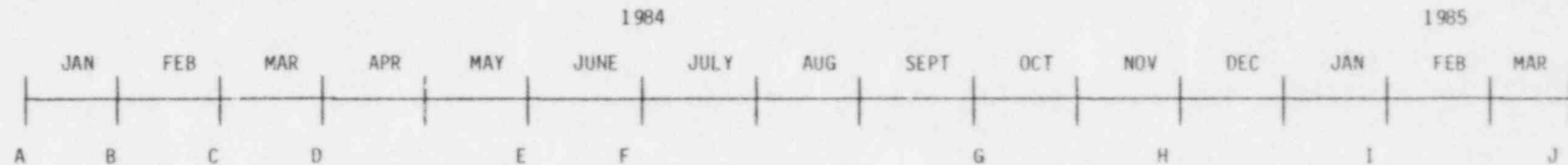
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B&W OWNERS GROUP TECHNICAL BASES DOCUMENT

DETAILED ESTIMATED SCHEDULE

FIGURE 1



MILESTONES

- A - Steam Generator Tube Rupture Chapter of OGTBD submitted for Utility review. (Includes MSGTR Program Output)
- B - Plant Cooldown Chapter of OGTBD submitted for Utility review.
- C - B&W Owners Group Meeting to discuss comments on Steam Generator Tube Rupture Chapter.
- D - B&W Owners Group Meeting to discuss comments on Plant Cooldown Chapter.
- E - Draft OGTBD ready for B&W inhouse review.
- F - Draft OGTBD submitted for Utility review.
- G - B&W Owners Group Meeting to discuss comments on OGTBD.
- H - Comments resolved by B&W, OGTBD submitted for Utility review.
- I - B&W Owners Group Meeting to discuss comments on OGTBD.
- J - Final OGTBD submitted to NRC.

3.0 SUPPORTING INFORMATION

The paragraphs in this section correspond to the paragraph numbers identified in column four of the ATOG SER Plan and Schedule. These paragraphs provide additional information as to how the ATOG SER issue will be addressed.

- 3.1 The potential overfill of a steam generator resulting in water in the steam lines and the associated concerns will be addressed in the Technical Bases Document. The capability to fill the steam lines will be addressed on a plant specific basis.
- 3.2 Analyses have been performed under the current B&W Owners Group Plant Cooldown Program and the resulting alternate methods for controlling RCS pressure will be provided in the Technical Bases Document. The use and availability of various depressurization methods will be addressed on a plant specific basis.
- 3.3 The Technical Bases Document will provide extended guidance for multiple tube ruptures in one steam generator and single and multiple tube ruptures in both steam generators.
- 3.4 Guidelines will be developed for alternate SG inventory control methods when steaming of the affected steam generator(s) is no longer practical. Two alternate methods involving steam generator drains and filling of the steam lines will be covered by the Technical Bases Document. A third proposed method, involving intentional saturation and voiding of an affected loop to minimize or terminate the leak flow, will be analyzed using RELAP5. Related phenomena will be observed during the MIST facility testing. Therefore, this analysis will be performed following reduction of the MIST data, currently scheduled for 1987.

- 3.5 The Technical Bases Document will provide guidance for loss of sump recirculation flow.
- 3.6 The concern of a Small Break LOCA with a concurrent loss of HPI will be analyzed after the MIST data is available and RELAP5 has been benchmarked.
- 3.7 The availability and accuracy of measurements for hydrogen concentration and radiation levels within containment are plant specific, therefore actions based on these parameters will also be determined on a plant specific basis. The availability and capabilities of hydrogen mitigation systems (recombiners, dilution, etc.) are also plant specific and will be handled accordingly. The generic Technical Bases Document will provide important factors to be considered by each utility in establishing plant specific procedures.
- 3.8 Guidelines for prevention, recognition, and mitigation of RCS voids (loop and RV head) will be provided in the Technical Bases Document. Guidelines for prevention will discuss methods of inducing idle loop and RV head cooling during natural circulation. Guidelines for recognition will include the use of RCS inventory measurements. Guidelines for mitigation will include the use of high point vents and RCP bumps. Also, the MIST facility will investigate RCS voids. Therefore, confirmatory analyses will be performed after the MIST data is available.
- 3.9 The plant response to depressurization using the PORV will be addressed in the Technical Bases Document backed by analyses performed for the B&W Owners Group Plant Cooldown Program.

3.10 Analysis will be performed using RELAP5 to demonstrate predicted RCS response during cyclic boiler-condenser operation following a small break LOCA and to confirm the description in the Technical Bases Document. This analysis will be an extension of existing analysis that covers the loss of natural circulation during the initial transition to the boiler-condenser mode of core cooling. Related phenomena will be observed during the OTIS and MIST facility testing. Therefore, this analysis will be performed following reduction of the OTIS data, currently scheduled for mid-1985, with a confirmatory analysis performed following the reduction of the MIST data, currently scheduled for 1987.

3.11 An extended analysis will be performed with RELAP5 to demonstrate predicted RCS response during the transition to HPI cooling (feed and bleed). Specifically, the analysis will be directed at determining the following:

- a) predicting the RCS temperature and pressure response during the transition and subsequent cooldown until a stable cooldown trend is obtained (at both high and low decay heat levels and considering the effects of delayed and/or degraded HPI actuation),
- b) the impact of a simultaneous tube rupture, and
- c) the anticipated flow splits in the cold leg to assess the potential for large tube to shell differential temperatures during extended HPI cooling.

Related phenomena will be observed during the OTIS facility testing. Therefore, this analysis will be performed following reduction of the OTIS data, currently scheduled for mid-1985.

Flow splits in the cold legs are being investigated in both the OTIS and the MIST test facilities. OTIS will look at the raised loop response whereas MIST will look at the lowered loop response. Therefore, HPI flow splits will be investigated twice; once after OTIS data is available and once after the MIST data is available. If the HPI flow splits indicate that an appreciable amount of cold HPI fluid gets to the SG, then the tube to shell differential temperatures resulting from the split will be analyzed.

- 3.12 The Technical Bases Document is intended to be used by the procedure writer and is written at a high functional level. The Technical Bases Document is not intended to be used by the operator as a training manual. As such, the Technical Bases Document will not contain a discussion of the analyses performed for the guidelines.
- 3.13 HPI cooling with an inoperative PORV will be addressed in the Technical Bases Document.
- 3.14 Results from the current Owners Group Plant Cooldown Program regarding solid plant cooldown will be incorporated in the Technical Bases Document.
- 3.15 The Technical Bases Document will be written at a high functional level such that these types of concerns should be eliminated in the Technical Bases Document. Internal loops without exits, transfers into inappropriate or incorrect paths and interfacing with non-emergency procedures will be carefully guarded against in the development of Plant-Specific Procedures.

- 3.16 The Technical Bases Document will provide guidance on when DHRS operation may be started with a saturated RCS including the appropriate precautions regarding DH pump suction head requirements.
- 3.17 The Technical Bases Document will contain material that is applicable to conditions other than reactor trip and power operations to the same level as ATOG covered. The coverage of any condition which jeopardizes, or potentially jeopardizes, an identified barrier to release of radioactive material involves a much broader scope and therefore must include plant specific procedures. Definition of the appropriate coverage in other plant procedures, interfacing information and discussions on the rationale for locating this material in other procedures will be provided by the individual plants.
- 3.18 The Technical Bases Document will discuss the NSS response to a loss of AC power. Specifics on impact on instrumentation displays and actions to be taken will be covered by plant specific procedures.
- 3.19 Guidance to control an ATWS was provided in a supplement to the ONS-3 Final ATOG dated July 2, 1983. This guidance will also be provided in the Technical Bases Document. The intent is that the Technical Bases Document will be updated as necessary as additional ATWS considerations are identified by the NRC and the results of current B&W Owners Group ATWS programs become available.
- 3.20 Pressurized Thermal Shock guidance will be provided in the Technical Bases Document including guidance for the case where the pressure-temperature limits have been exceeded. The intent is that the resolution of USI A-49 will be followed and revisions made to the Technical Bases Document as necessary. Specifics for operator guidance during a PTS transient will be covered by plant-specific procedures.

- 3.21 The impact of core damage on SGTR control methods (i.e., potential for higher coolant activity) will be covered in the Technical Bases Document. Other aspects of dealing with degraded cores will be covered by following the IDCOR program with the intent of modifying or adding to the Technical Bases Document or plant-specific procedures, as appropriate.
- 3.22 The Technical Bases Document will provide guidance on RCP trip, RCP restart, RCP operation after a restart if proper plant conditions are not maintained and for the case where RCPs are not tripped as required. Items pertinent to RCP operation will be factored into each specified area.
- 3.23 The effects of restarting reactor coolant pumps with loop and/or head voids will be analyzed to determine:
- a) expected RCS pressure and temperature response and appropriate guidelines for pressurizer level and subcooling prior to restart,
 - b) effect of RCP restart while saturated in restoring primary to secondary heat transfer including Core Flood Tank behavior, and
 - c) thermal stresses associated with RCP restart with a voided head.
- Guidelines for RCP restart will be provided in the Technical Bases Document. The validity of RCP bumps is being investigated by the MIST facility. Therefore, an analysis using RELAP5 will be performed after the reduction of the MIST data, currently scheduled for 1987.
- 3.24 As RCS inventory instrumentation becomes operational, guidance will be provided on a plant specific basis.

- 3.25 The Technical Bases Document may not contain the specific references of these concerns, but the preparation of the TBD will consider concerns of this type to preclude their recurrence.
- 3.26 Guidance for determining if the TBVs are available and alternate instructions for the case where the TBVs are not available is plant specific and therefore will be addressed on a plant-specific basis.
- 3.27 The use of containment parameters will be covered on a plant-specific basis (Reference Paragraph 3.5).
- 3.28 The justification and use of reactor building temperature will be addressed on a plant-specific basis (Reference Paragraph 3.5).
- 3.29 The capability and operation of the condenser during a Loss of Offsite Power will be addressed on a plant-specific basis.
- 3.30 RCP operating limits and precautions are plant specific, therefore, required actions and justification will be addressed on a plant-specific basis.