UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Licensee: Duke Power Company
422 South Church Street
Charlotte NC 28242

Docket Nos.: 50-269, 50-270, 50-287 License Nos.: DPR-38, DPR-47, DPR-55

Facility Name: Oconee Nuclear Station

Inspection Conducted: April 25 - May 5, 1988

Inspection Team Leader: L. Lawyer 5/24/88
Date Signed

Inspection Team Members: M. Archer
M. DeGraff
P. Kellogg
G. Bryan
P. Skinner

Approved By: C. A. Julian 6/7/88
C. A. Julian, Chief Date Signed
Operations Branch
Division of Reactor Safety

SUMMARY

Scope: This special, announced inspection was conducted in the area of review of the adequacy of Emergency Operation Procedures.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

* R. Bugert, Manager Operations Training
* M. Carter, Design Engineer
* D. Deatherage, Operating Engineer
* C. Harlin, Compliance Engineer
* R. Ledford, QA Surveillance Supervisor
* R. Lingle, Operations Engineer
* R. Morgan, Production Engineer
* F. Owens, Shift Supervisor
* M. Patrick, Operations Engineer
* P. Stovall, Lead Simulator Instructor
* R. Swiegart, Superintendent Operations
* M. Tuckman, Station Manager

Other licensee employees contacted included engineers, technicians, operators and office personnel.

NRR Attendees

* W. Regan, Chief, Human Factors Assessment Branch
* H. Pastis, Project Manager

NRC Resident Inspectors

* P. Skinner, Senior Resident Inspector
* L. Wert, Resident Inspector

* Attended exit interview on May 5, 1988.

2. Exit Interview

The inspection scope and findings were summarized on May 5, 1988, with those persons indicated in paragraph 1. The NRC described the areas inspected and discussed in detail the inspection findings listed below. Although proprietary material was reviewed during this inspection, no proprietary material is contained in this report. Those items on which dissenting comments were received from the licensee are identified by a marginal asterisk in the detailed discussion which follows.

Note: A list of abbreviations used in this report is contained in Appendix E.

Item Number	Status	Description/Reference Paragraph
IFI 269,270,287/88-11-01	Open	Resolution of QA review effectiveness (paragraph 4)
IFI 269,270,287/88-11-02	Open	Resolution of OP references in the EP (paragraph 5)
IFI 269,270,287/88-11-03	Open	Correction of labeling discrepancies between EOPs and panel indication as outlined in Appendix D (paragraph 6)
IFI 269,270,287/88-11-04	Open	Correction of technical discrepancies contained in the EOPs as outlined in Appendix B (paragraph 6)
IFI 269,270,287/88-11-05	Open	Correction of human factors discrepancies contained in EOPs as outlined in Appendix C (paragraph 6)
IFI 269,270,287/88-11-06	Open	Review Natural Circulation Cooldown with vents open (paragraph 6)
IFI 269,270,287/88-11-07	Open	Review simulator effectiveness in training on EOPs (paragraph 7)
IFI 269,270,287/88-11-08	Open	Review writer's guide training to increase operator awareness of terms (paragraph 8)

3. Background Information

Following the TMI accident, the Office of Nuclear Reactor Regulation developed the "TMI Action Plan" (NUREG-0660 and NUREG-0737) which required licensees of operating reactors to reanalyze transients and accidents and to upgrade Emergency Operating Procedures (EOPs) (Item I.C.1). The plan also required the NRC staff to develop a long-term plan that integrated and expanded efforts in the writing, reviewing, and monitoring of plant procedures (Item I.C.9). NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures," represents the NRC staff's long-term program for upgrading EOPs, and describes the use of a "Procedures Generation Package" to prepare EOPs. The licensees formed four vendor type owner groups corresponding to the four major reactor types in the United States; Westinghouse, General Electric, Babcock & Wilcox, and Combustion Engineering. Working with the vendor company and the NRC, these owner groups developed Generic Technical Guidelines (GTGs) which are generic procedures that set forth the desired accident mitigation

strategy. These GTGs were to be used by the licensee in developing their PGPs. Submittal of the PGP was made a requirement by Confirmatory Order dated July 6, 1984. Generic Letter 82-33, "Supplement 1 to NUREG-0737 - Requirement for Emergency Response Capability," requires each licensee to submit to the NRC a PGP which includes:

a. Plant-specific technical guidelines with justification for differences from the GTG

b. A writer's guide

c. A description of the program to be used for the validation of EOPs

d. A description of the training program for the upgraded EOPs.

From this PGP, plant specific EOPs were to have been developed that would provide the operator with directions to mitigate the consequences of a broad range of accidents and multiple equipment failures.

Due to various circumstances, there were long delays in achieving NRC approval of many of the PGPs. Nevertheless, the licensees have all implemented their EOPs. To determine the success of the implementation, a series of NRC inspections are being performed to examine the final product of the program; the EOPs. The objective is to perform table top reviews, simulator exercises where possible, and in-plant walk-throughs of the EOPs with licensed operators to verify their adequacy. The EOPs are considered to be adequate for use if they can be understood and performed successfully by the operators and they incorporate the accident mitigation strategy developed by the appropriate vendor specific owner groups.

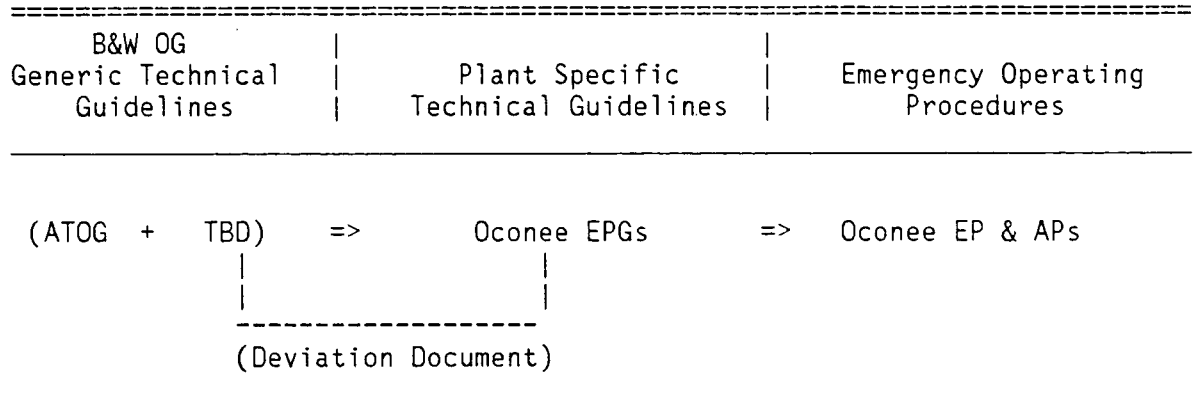
This inspection report represents findings, observations, and conclusions regarding the adequacy of the EOPs. It did not, as a matter of intent, review whether the EOPs thus prepared conformed to the NRC staff's long-term program for upgrading EOPs and whether those EOPs had been properly prepared using a PGP.

The success level of licensees in following the PGP submitted to NRC is a regulatory issue that will be dealt with on a case-by-case basis. Although some licensees' EOPs strayed far from their PGP, that issue is of secondary importance to this inspection effort. The purpose of this inspection is to verify adequacy of the EOPs for continued safe operation of the facility.

4. EOP/GTG Comparison

The NRC reviewed the relationship between the Oconee EOPs and the plant specific EPGs. The approved Oconee ATOG and the B&W owners' group TBD are generic technical guidelines that form the basis for the Oconee plant specific technical guidelines detailed in the EPG document (Figure 1). An "EPG - TBD Deviations Document" (2/12/88) details specific deviations between the EPG document and the TBD.

Figure 1
Development of the Oconee EOPs



The EPG document serves as the plant specific technical guideline from which Oconee EOPs and their changes are developed. The Oconee emergency procedure (EP/1/A/1800/01) very closely parallels the EPG document, but, as appropriate, provides greater operational detail. The licensee uses plant specific APs to supplement the EP. The Oconee EP and APs together compose the licensee's emergency operating procedures.

The NRC reviewed emergencies and other significant events covered by the Oconee EP and APs. Taken together the EP and AP procedures cover the broad range of emergencies and other significant events listed in RG 1.33, section 6. At Oconee the EP and AP procedures together constitute the EOPs.

A Quality Assurance department individual was interviewed and selected records were reviewed to verify that QA had been properly involved in the initial preparation of the EP and APs. QA audit NP-87-14(ON) was conducted on operations activities from 8/24/87 to 9/18/87. This audit encompassed the EP and APs. There were no deficiencies noted by that QA audit.

A review of the EP and APs was conducted by QA during the procedure preparation phase. While the purpose of this review was to verify adherence to the writer's guide, findings produced by this review were minimal and many failures to conform to the writer's guide were missed (see Appendix C). Three specific examples of this were AP/1/A/1700/7, Loss of Low Pressure Injection System, AP/1/A/1700/22, Loss of Instrument Air, and AP/1/A/1700/23, Loss Of 1KI (NNI). The QA review of these had listed only a small fraction of the writer's guide deficiencies such as unapproved abbreviations, incorrect spelling and capitalizations which were identified in a spot check by the NRC. A licensee representative

committed to review the effectiveness of this QA review and take appropriate corrective action. Resolution of this issue will be identified as IFI 50-269, 270, 287/88-11-01.

No violations or deviations were noted in this area.

5. Independent technical adequacy review of the EOPs.

* The NRC determined by review of the procedures listed in Appendix A that generally the vendor recommended step sequence was followed except where deviations were documented in the EPG-TBD Deviations Document. Review of the EOPs established that the ATOG guidance was contained within the EOPs whenever applicable. The general priority of treatment and order of steps was maintained in the procedures. However, in order to reduce the bulk of the EOP, on occasion the operator was referred to an entire operating procedure, of which only a small portion was applicable (e.g., Appendix C, item 1a, 1c1, 1c2, 1d, etc.). The licensee should review the OP references to determine if the applicable portions of the OPs could be included as steps within the EP or as a separate enclosure. Resolution of this issue will be identified as IFI 50-269,270,287/88-11-02

Placekeeping deficiencies were identified during simulator and control room walk-throughs of the EOPs and are documented in Appendix C. These include:

* a. Portions of the EP and APs were removed from their binders to hand to other operations personnel. This caused several delays in the completion of procedures. An additional copy of the APs should be provided in the control room or other steps should be taken to avoid the need for doing this.

b. Many operators inappropriately made use of random objects (fingers, pencils, and a stapler) as placekeeping aids. However, one SRO employed an appropriate solution to this problem. He used yellow stick-ups to mark WHEN statements to remind himself of future actions. This placekeeping technique worked successfully and should be encouraged.

The inspectors verified that entry conditions to the procedures were generally clear. The scenarios postulated during the procedure walk-throughs resulted in multiple transfers and instances of simultaneous use of the EOPs; no significant errors were identified.

Cautions and notes were generally clear and properly placed within the EOPs. The priority of accident mitigation appeared to be maintained in the Oconee EOPs.

The degree of adherence to the B&W guidance available in the ATOG and the TBD was found to be appropriate. The licensee has identified major deviations as required between the ATOG/TBD and the EPG in the Emergency Procedure Guidelines Technical Basis Document Deviations Document. The

inspectors were unable to confirm that safety significant deviations were reported to the NRC due to time constraints.

ONS unique operator action parameter values were established in the ONS setpoint document and were used in the EOPs except for the infrequent occasions noted in the appendices.

Control room drawings were inspected to verify that management controls were effective and that plant changes were reflected in interim and final drawings in a timely manner. The inspectors found that the number of outstanding NSMs requiring drawing changes did not appear to be excessive, and the number appeared to be decreasing.

There were no violations or deviations noted in this area.

6. Review of the EOPs by In-Plant and Control Room Walk-throughs

In-plant and control room walk-throughs of the emergency and abnormal procedures listed in Appendix A were conducted. Generally, the nomenclature appears to be consistent between the instrumentation and control labeling on the control board and the procedures. Those few discrepancies noted are enumerated in Appendix D. The licensee committed to review these and make changes as appropriate. Resolution of this issue is identified as IFI 50-269,270,287/88-11-03.

Indicators, annunciators and controls referenced in the EOPs were found to be available to the operators. There is one set of emergency and abnormal procedures maintained in the control room at all times for each unit. These procedures were verified to be of the latest revision and free of any handwritten changes.

While the result of these walk-throughs was generally positive, a few discrepancies in the areas of technical adequacy, writer's guide adherence and human factors were noted. Technical discrepancies are identified in Appendix B, while writer's guide and human factors discrepancies are noted in Appendix C. The licensee has committed to correct the discrepancies identified in the aforementioned appendices except where specifically excepted by marginal asterisk. Appendix B discrepancies will be identified as IFI 50-269,270,287/88-11-04, and Appendix C discrepancies will be identified as IFI 50-269,270,287/88-11-05.

In response to Generic Letter 81-21, the licensee committed to perform a natural circulation cooldown without forming a void in the reactor vessel head. The licensee's method of accomplishing this is to open the reactor vessel head vent prior to initiating the cooldown. While this will help to prevent void formation this will also open the reactor coolant system to the reactor building. This could result in excessive contamination of the reactor building and possibly limit access for some time.

It should be noted that at the time Generic Letter 81-21 was issued, procedures for natural circulation cooldown with upper head voids were not generally available. The NRC staff's technical position on upper head voiding has changed accordingly. Controlled voiding into the reactor vessel upper head is now an acceptable strategy provided that it can be done using all safety grade equipment with NRC approved procedures and licensed operators trained in the use of these procedures. The licensee committed to review the use of head vents in light of this position and request a change to allow cooldown with the head vents closed. Resolution of this issue will be identified as IFI 50-269,270,287/88-11-06.

Due to time constraints many of the aspects of the validation and verification program that were applied to the development of the EP and APs were not inspected in depth. Some deficiencies are identified in connection with the licensee's ongoing evaluation of EOPs in paragraph 8.

There were no violations or deviations noted in this area.

7. Simulator Observations

The NRC observed two different crews performing the following six scenarios on the Oconee simulator:

a. Loss of Electrical Power
b. Overcooling
c. Loss of HPI and RCP Seal Failure
d. Loss of all Feedwater
e. Steam Line Break with SG Tube Rupture
f. Small Break LOCA

The procedures provided operators with sufficient guidance to fulfill their responsibilities and required actions during the emergencies, both individually and as a team.

The procedures did not cause the operators to physically interfere with each other while performing the EP and APs. However, the operator concurrently performing APs and OPs was loaded with tasks.

The procedures did not duplicate operator actions unless required (e.g., for independent verification).

When a transition from one EOP to another EOP or other procedure was required, precautions were taken to ensure that all necessary steps, prerequisites, initial conditions, etc. were met. Operators were found to be knowledgeable about where to enter and exit the procedures. However, there were a number of problems related to placekeeping in the procedures (see Appendix C, Writer's Guide and Human Factors discrepancies).

Activities that should occur outside the control room were initiated by the operators and proper confirmation of their completion was given. These actions were inspected during in-plant walk-throughs of the procedures.

The EOP lesson plans cover both the technical basis behind the procedures and their structure and format. The training scenarios provide sufficient coverage of the EOPs (with the exceptions noted below), including multiple malfunctions. In addition, operators were trained on significant revisions of the EOPs prior to their implementation.

The training simulations should duplicate actual plant operations whenever possible. The extent of simulation should be such that the operator is required to take the same action on the simulator to conduct an evolution as on the reference plant using the same procedure. Three deficiencies in this aspect of EOP training program were noted:

a. Operators are encouraged in training not to check the placekeeping check-off spaces in the EP, while they are expected to do so in an actual emergency.

* b. The PORV operating switch (1RC-66) in the simulator is not a spring return to auto switch as it is in the plant. Because of this, the simulator does not accurately simulate plant procedures involving opening the PORV.

c. The simulator cannot model the use of the diesel air compressor as an emergency supply of instrument air.

Simulator training in EOP usage should model the reference plant as nearly as possible. The licensee should review EP and AP simulator training and retraining, and assure that discrepancies such as these are eliminated. Resolution of this item will be identified as IFI 50-269,270,287/88-11-07.

No violations or deviations were noted in this area.

8. Ongoing Evaluation of the EOPs

Administrative controls were reviewed to determine if the licensee has an acceptable program in place for a continuing evaluation of the EOPs. These were OMP 4-2, The Validation Process; APM Section 4.2, Administrative Instructions for Permanent Station Procedures; and procedure MNSA-103, Workplace Procedure for Technical Review and Verification of Nuclear Station Emergency Procedure and Guidelines. While these procedures were used to verify the EP, only selected APs received full V&V. Since the NRC did not consider the number of discrepancies listed in Appendices B, C, and D to be indicative of a serious V&V problem, no corrective action is proposed for existing EOP revisions. However, the licensee has committed to apply V&V to future revisions of the EOP.

There were no violations or deviations noted in this area.

9. EOP User Interviews

Ten interviews were conducted by the NRC inspection team and it was determined that the current EOPs satisfy the needs of the operational personnel. The operators felt the EOPs were adequate and compatible with the level of knowledge of the typical operator, and the operations staff were confident that the EOPs would function effectively during an actual event. One discrepancy that was noted during these interviews was that confusion appeared to exist among the operators interviewed as to the true meanings of the terms "available","excessive", "go to", "refer to" and "complete". These inconsistencies indicate a need for further operator training in the terminology used in the EOPs and/or definitions contained in the Writer's Guide. The licensee should review this area and provide retraining as necessary. Resolution of this issue will be identified as IFI 50-269,270,287/88-11-08.

There were no violations or deviations noted in this area.

APPENDIX A

PROCEDURES REVIEWED

NUMBER	TITLE	
EP/1/A/1800/01	EMERGENCY OPERATING PROCEDURE	04/08/88
AP/1/A/1700/01	LOAD REJECTION	04/08/88
AP/1/A/1700/02	EXCESSIVE RCS LEAKAGE	04/08/88
AP/1/A/1700/03	BORON DILUTION	04/08/88
AP/1/A/1700/05	EARTHQUAKE	04/08/88
AP/1/A/1700/06	NATURAL DISASTER	04/08/88
AP/1/A/1700/07	LOSS OF LOW PRESSURE INJECTION SYSTEM	#
AP/1/A/1700/08	LOSS OF CONTROL ROOM	04/07/88
AP/1/A/1700/09	SPENT FUEL DAMAGE	04/07/88
AP/1/A/1700/10	UNCONTROLLABLE FLOODING OF TURBINE BUILDING	04/08/88
AP/1/A/1700/11	LOSS OF POWER	01/29/88
AP/1/A/1700/12	LOOSE PARTS IN REACTOR COOLANT SYSTEM	04/07/88
AP/1/A/1700/13	LOSS OF CONDENSER CIRCULATING WATER INTAKE CANAL/DAM FAILURE	04/07/88
AP/1/A/1700/14	LOSS OF NORMAL MAKEUP OR LETDOWN	#
AP/1/A/1700/15	DROPPED CONTROL RODS	#
AP/1/A/1700/17	LOSS OF CONTAINMENT INTEGRITY	04/13/88
AP/1/A/1700/18	ABNORMAL RELEASE OF RADIOACTIVITY	04/22/88
AP/1/A/1700/19	LOSS OF MAIN FEEDWATER	02/29/88
AP/1/A/1700/20	LOSS OF COMPONENT COOLING	04/12/88
AP/1/A/1700/21	HIGH ACTIVITY IN RC SYSTEM	04/25/88
AP/1/A/1700/22	LOSS OF INSTRUMENT AIR	03/31/88
AP/1/A/1700/23	LOSS OF 1KI (NNI)	04/14/88
AP/1/A/1700/24	LOSS OF LPSW	#

PROCEDURES REFERRED TO BY EP OR APs THAT WERE REVIEWED (IN FULL OR IN PART)

CP/1&2/2002/05	POST ACCIDENT CAUSTIC INJ INTO LPI	03/14/88
OP/0/A/1102/22	RB HYDROGEN ANALYZER SYSTEM	10/03/85
OP/0/A/1102/23	OPERATION OF CONTAINMENT HYDROGEN RECOMBINER	03/01/87
OP/0/A/1102/25	SHUTDOWN FOLLOWING A FIRE	10/20/87
OP/0/A/1103/05	PRESSURIZER OPERATION	08/16/84
OP/0/A/1106/31	CONTROL OF SECONDARY CONTAMINATION	01/22/87
OP/0/A/1600/11	SSF EMERGENCY OPERATING PROCEDURES	12/10/87
OP/1/A/1102/04	OPERATION AT POWER	02/03/88
OP/1/A/1102/10	CONTROLLING PROCEDURE FOR UNIT SHUTDOWN	11/24/87
OP/1/A/1103/06	RCP OPERATION	04/13/87
OP/1/A/1104/04	LPI SYSTEM	10/21/87
OP/1/A/1106/01	TURBINE GENERATOR	01/18/88

Procedures are in the review process and have not yet been approved for use.

APPENDIX B

TECHNICAL COMMENTS

This appendix contains technical comments, observations and suggestions for EOP improvements made by the NRC. Unless specifically stated, these comments are not regulatory requirements. However, the licensee agreed in each case to evaluate the comment and take appropriate action. These items will be reviewed during a future NRC inspection as noted in paragraph 6.

1. EP/1/A/1800/01 Section 504, SG Tube Leak

   a. Step 9.1 has the operator open 1RC-159 and 1RC-160, but does not inform the operator that SKL Breaker 8 in the Cable Room must be closed to open these valves. The breaker is normally kept open during operation. A number of operators were not aware of this. The need to close the breaker should be noted in the EP or a warning label placed next to the valve switches on the control panel.

   b. Step 11.2 The order of the items is important, but they are not numbered as required by the writer's guide.

2. EP/1/A/1800/01 Section CP-603, HPI Cooling Cooldown

   a. step 5.0; In order to open either the high point vents or the reactor head vent the local breaker must be closed and then the "power on" button must be depressed on the main control board. This required action is not addressed in the procedure. The licensee should revise the procedure accordingly.

   b. step 26; A note should be included in the step to feed only the unaffected generator unless the affected steam generator is required for heat transfer.

* 3. AP/1/A/1700/03, Boron Dilution

   The licensee should consider revising the AP and supporting OP/1/A/1103/04 to recognize those AP cases and symptoms which are severe enough to warrant immediate boron injection without waiting for chemistry sample results. As written, the procedures currently follow a process of: AP entry to a particular case, chemistry sampling, exit to the OP, await sample results, determine desired concentration, compute, lineup, and then add boron.

   An example of a case that warrants immediate boron injection is AP case D. With the reactor critical at power and control rod insertion to a position to the left of the safety limit curve, the procedure

should add boron immediately. When rod position has been restored to at least the 6 hour LCO region, a final predetermined addition can be made in the normal manner.

The NRC concluded that immediate boration was applicable in other cases such as AP case A,B and C.

4. AP/1/A/1700/13, Loss of Condenser Circulating Water Intake Canal/Dam Failure.

   a. Pg. 3, step 5.4; This step waits until secondary heat removal systems are "exhausted" before sending personnel to the SSF. The procedure should be revised to man the SSF prior to exhaustion.

   b. Pg 7, step 4.4; The licensee should consider adding a note following 4.4 explaining that if all four CCW pumps were running, CCW 10-13 would be open. To reestablish pump flow, an NLO must close one discharge valve prior to start of that pump in step 4.5.

5. OP/1/A/1103/06, Reactor Coolant Pump Operation

   Enclosure 4.3, section 2.5; This section requires "start RCPs using enclosure 4.1." If enclosure 4.1 was used in strict conformance to this step, i.e. establish the seal injection prior to the start of the pump, the intent of this section would not be met. The intent is to start the pump without seal injection and gradually bring seal injection into operation.

Appendix C.

WRITER'S GUIDE AND HUMAN FACTORS DISCREPANCIES

This appendix contains comments, observations and suggestions for EOP improvements made by the NRC. Unless specifically stated, these comments are not regulatory requirements. However, the licensee agreed in each case to evaluate the comment and take appropriate action. These items will be reviewed during a future NRC inspection as noted in paragraph 6.

1. EP/1/A/1800/01, Emergency Operating Procedure

   a. Section 502, Loss of Heat Transfer; The reference to OP/O/A/1102/25, Shutdown Following a Fire, for operation of the atmospheric dump valves is inappropriate. The EP should specify which section of the enclosure to use or the specific steps should be put into the EP from the OP.

   b. Section 503, Excessive Heat Transfer; Step 2 refers to a SG level of greater then 92%. The EPG references a 95% setpoint for this condition. The licensee should resolve this conflict to reflect the actual plant value.

   c. Section 504, SG Tube Leak

      (1) Step 5.0 refers the operator to OP/1/A/1102/4, OPERATION AT POWER, but does not specify a step number. The only applicable step is 3.4. This should be referenced in the EP.

      (2) Step 6.1 refers the operator to OP/1/A/1102/10, CONTROLLING PROCEDURE FOR UNIT SHUTDOWN, but does not specify a step number. The only applicable step is 3.2 (Turbine Generator Shutdown). This step number should be referenced in the EP.

      (3) Steps 11.0 and 26 contain a list of valves to be closed to isolate the SG. There is no action statement to inform the operator that he should close the valves. This step should be rewritten to conform with the writer's guide.

      (4) Page 83. In the Unit Status Summary "using on SG with forced circulation" appears to be a typographical error.

   d. Section 507, Inadequate Core Cooling; In step 14 the intentions are to start a Reactor Coolant Pump. The caution and first bullet reference support systems and the operating procedure. The initial conditions of the operating procedure may be contradictory to the current plant condition at the time this step is being implemented and could be confusing to the operator. This step should be modified to clearly state which section of the OP would be applicable.

e. Section CP-601, Cooldown Following a Large LOCA

(1) Step 2.4.2; This step refers the operator to OP/0/A/1102/25, Shutdown Following a Fire, to provide direction on the use of the atmospheric dump valves. From a review of this procedure it appears that only one step in this OP is applicable to the operation of the atmospheric dump valves. The licensee should revise the EP to include the applicable information from the OP.

(2) Step 8.1; This step requires the operator to verify RB isolation but the step provides no guidance on which valves need to verified closed nor does the step address any specific valve line-ups. The licensee should provide additional guidance denoting valves which need to be verified.

(3) Step 8.1; This step is lacking in two other respects. Step 12 of the same procedure requires, when initiating make-up to the BWST, that the boron concentration be greater than T.S. values. Additionally, step 12 references OP/1/A/1104/04, Low Pressure Injection System for the correct make-up procedure given the current plant configuration. Step 8.1 contains neither the concentration requirement nor the reference. The licensee should revise step 8.1 to be consistent with other steps completing the same action.

(4) Step 9.0; Within this step there are two separate actions. The first action requires chemistry to sample the RB emergency sump for boron concentration. The second action (if necessary) requires operations to isolate possible sources of sump dilution. The licensee should revise the procedure to separately state these group responsibilities.

f. Section CP-602, SG Cooldown With Saturated RCS

(1) Step 17 includes a list of valves to close. One line lists the RCP seal return valves, the next states "(If RCPs NOT operating)," and the following line lists the Quench Tank Vents. This use of a conditional is unclear, and not in accordance with the Writer's Guide. This step should be rewritten to clarify the meaning of the conditional and conform to the writer's guide.

(2) Step 39; This step includes a list of "bullets" for alternative methods to be used to reduce RCS pressure. This list is intended to provide alternative actions to be taken in order of preference, not an indication that the operator should always perform all the actions (the

meaning of bullets is described in the writer's guide). This step should be rewritten to clarify the meaning of these bullets and to conform to the writer's guide.

g. Section CP-603, HPI Cooling Cooldown

(1) Step 2.0 requires that when subcooling margin is greater than 50 degrees F and CETCs are decreasing, RCS P/T be maintained in the proper region of enclosure 7.1. To be consistent with other steps referencing the same action the licensee should include a statement to throttle HPI.

(2) Step 16; Same comment as CP-601, step 9, above.

h. Section CP-604, Solid Plant Cooldown

(1) Step 4.0; To be consistent with other steps which reference maintaining RCS P/T within the proper region of enclosure 7.1, the licensee should include a statement to throttle HPI when subcooling margin is greater than 50 degrees F.

(2) Step 11; Under verify RB isolation the phrase "if RCPs are not operating" appears. It is unclear as to the applicability of this statement. The licensee should revise the procedure to clearly identify which valves need to be verified closed if the RCPs are not operating.

2. AP/1/A/1700/01, Load Rejection

* a. Step 3.0; Main steam relief valve position indication is not available in the control room. The procedure should be revised to indicate that confirmation of valve position is required from external observation.

b. Step 5.3; 396" is near the upper range limit of the instrument (400") and is too precise to be read from the installed meter. If this value is correct (see comment below) and the precision is required, the step should be revised to direct the operator to verify level from a computer point.

c. Step 5.3; Change 396" to be consistent with other documents. This step reacts to pressurizer solid conditions. Both EP/1/A/1800/01 (step 5.17.4) and the EPG Setpoint Document (pg.9) use 375" as the licensee's definition of pressurizer solid. 396" does not appear in the setpoint document.

3. AP/1/A/1700/02, Excessive RCS Leakage

   Step 5.6.1; This step refers to any subcooling margin " less than or equal to zero." To be consistent with other steps the reference to subcooling margin should be changed to " equals zero."

4. AP/1/A/1700/03, Boron Dilution

   Step 5.1 of Case A, B, C, & D; In this step, the reader is directed to "Refer to the Emergency Plan." Where appearing, this should be changed to "Refer to AP/0/B/1000/01, Classification of Emergencies." The decision to implement the EP plan is made from that procedure.

5. AP/1/A/1700/07, Loss of Low Pressure Injection

   a. Steps 5.2, 5.5 and 5.5.4 case B; All these steps address make-up to the RCS; however, they are not consistent with each other. The licensee should revise these steps such that make-up to the RCS is done the same way each time.

   b. Step 5.5.4.2; There is a typographical error. The licensee needs to change "fo" to "to".

6. AP/1/A/1700/08, Loss of Control Room

   Case A; In Step 4.8, an operator is sent to the Unit 1 and 2 WDP with directions to establish communications with the Auxiliary Shutdown Panel as soon as possible. Although there is a telephone at the WDP, no phone number is listed in the procedure, posted by the telephone or otherwise quickly available to allow the operator to establish this communication.

7. AP/1/A/1700/11, Loss of Power

   a. Step 6.1, THEN statement. Add a reference to OP/1/A/1104/12.

   b. Step 11.0. Add "Verify" to the last 4 bullets of the IF statement.

   c. Step 4.2; Position a copy of OP/0/A/1106/27 at the diesel air compressor. Currently, an in plant NLO tasked to start the compressor must go to the Control Room for a copy of the OP, then to the diesel compressor. On a loss of instrument air, time is too precious to accept the lost time involved in pulling a copy of the procedure from the control room before proceeding to the diesel.

   d. Step 5.3.1; Valve label plate is missing on 1CCW- 79 and should be replaced.

* e. Enclosure 6.2, step 1.0; This step involves high voltage hazards and should be done by experienced I&E personnel. At present there is no procedural requirement for I&E staffing on back shifts. The licensee should consider establishing a minimum I&E manning level in plant procedures.

f. Step 8.0; 1HP-26 is an infrequently operated valve. The procedure should be revised to include the physical location of the valve.

* g. Step 3.0; Provide a racking tool at or near the auxiliary service water switchgear.

h. Step 3.6; ASW 600V Load Center label plate is missing and should be replaced.

8. AP/1/A/1700/13, Loss of Condenser Circulating Water Intake Canal/Dam Failure

a. Case A & B, Step 2.0; The same parameter value should apply in both lake level bullets (now shown as ~775' and decreasing less than 775' respectively).

b. Case B, Step 4.1.1. Delete the last bullet. "Continue concurrently with ..." is redundant to "REFER TO."

c. Case B, Step 4.3; The procedure should be revised to direct the operator to obtain 1CCW-20 through 25 valve positions from the control room computer point readout or by local verification.

d. Case B, Step 4.6; The last bullet states security will energize the lock. Operators indicate that normal practice is to send a guard directly to the gate and that some problems have arisen when guards did not know where to go. Additional training and possible procedure changes should be considered.

e. Enclosure 6.1, Step 1.0; Install a chain on LPSW-139 or provide a nearby ladder. The nearest ladder is ~150' away through a dimly lighted area, an area which may be flooded if this procedure is operative.

f. Enclosure 6.1, Pg 12; After step 4.0, direct the reader back to pg. 9 to continue with step 5.6.2 of Case B.

9. AP/1/A/1700/23 - Loss of 1KI Bus (NNI)

Step 5.7 instructs an operator to proceed to the equipment room to bypass the 1KI inverter by changing switch positions. These switches are located above the KI panel so that a ladder would be required to safely operate these switches. A ladder should be staged in the room.

10. AP/1/A/1700/20, Loss of Component Cooling

    Step 4.4 requires that all heat exchangers be checked for temperature increase. The licensee should revise this step to include the maximum values to assist the operators in determining when a limit is being approached.

11. AP/1/A/1700/22, Loss of Instrument Air

    a. Section 2.0, symptoms; The statalarm location, (2SA-4 D-5) should be (2SA-4 C-5). Typographical error.

    b. Step 5.3.1; The second bullet requires the operator to remain in the area of 1CC-8. Radiation levels need further consideration. The present stationing of an operator in this area would be unacceptable under certain accident conditions. The licensee should revise the procedure to include a caution statement as to the presence of high radiation levels under certain accident conditions when manual operation of 1CC-8 is required.

    c. Step 5.5; The labels attached to 1FDW-315 and 1FDW-316 are color coded incorrectly, i.e. red versus black.

12. OP/1/A/1103/06, Reactor Coolant Pump Operation

    a. Step 2.7; Several sub steps reference seal leakage flow rates of 8.5 gpm or greater. The maximum flow rate that can be read on the instrumentation provided to the operators is read on a chart recorder that can only read a maximum of 6 gpm.

    b. Step 2.7.5; Where the term " seal return valve " is used, the actual valve designators should be used.

    c. Enclosure 4.1, step 2.1; A tolerance should be provided to the operator to provide practical adjustment of the flow to an RCP.

    d. Enclosure 4.1, step 2.4; Locations should be provided for 1HP-277 and gage 1PG-102. In addition, labels should be attached to the gage.

    e. Enclosure 4.3, section 2.2; This section requires the operator to slowly reestablish component cooling flow to all reactor coolant pump thermal barriers. This section should be clarified to provide details on how this action is to be accomplished.

APPENDIX D

NOMENCLATURE DISCREPANCIES IDENTIFIED
BY
NRC EOP INSPECTION TEAM

Procedure	Step/ Page	Procedure Nomenclature	Label on Equipment
EP/1/A/1800/01	3.0	SU Block Vlv	SU FDW Block Vlv
		SU Control Vlv	SU FDW Control Vlv
		MS to SSRH	MS to 2A1 & 2B2
		TD EFDWP Disch Vlv	To 2A/2B OTSG Blk
	6.1	1HP-25 (1B HPI BWST Suction)	1 HP-25
	6.1	1HP-27 (1B HP Injection)	1 HP-27
	7.3.1	Reference to SG	OTSG on Board
Section 504	3.3.1	'1B' HPI BWST Suction	No Name on Label
	3.3.3	'1B' HP Injection	No Name on Label
	8.1	Subcooling Margin	Saturation Margin
	11&26.0	Main FDW Control Vlv	Main FDW Control
		SU Control Vlv	Startup FDW Ctl
		MD EFDWP Disch Vlv	No Name on Label
		TD EFDWP Disch Vlv	TDEFDWP Disch to 1A(1B) OTS 6 Blk
	13.7.3	'1A' HPI Header Flow	Emerg HP Inj Flow
	19.2.1	"High"	HI
	19.2.2	"OFF"	Stop
	27.7.7	RBNS Isol	RB Normal Sump Isl
	28	SG Secondary Pressure	Main Steam Prss.
Section 505	1.1	HPI Header Flow	Emerg HP Inj Flow

	2.2	LPI Header Flow	DH Removal Flow
	2.3	LPSW Flow	LPSW to Decay Hx
	3.1	LPSW Flow	Reactor Bld, Vent
	4.0	RB Spray Flow	RBS Flow
Section 602	1	HPI Header Flow	Emerg HPI Inj Flow
	36	LPI Header Flow	DH Removal Flow
OP/0/A/1600/11	2.3	Diesel Engine Service Water Flow	Diesel Engine Service Pump Discharge Flow
	2.13	PORV Block Vlv	PORV Block
	2.13	Pzr Water Space Sample	Pzr Water Sample
	2.13	RC Pumps Seal Return	RCP Seal Return
	2.21	TH-103 (SSF ASW Suction Temperature)	No Label on Component
	2.21	SSF-CCW-285	No Descriptive Label
AP/1/A/1700/01	1/3.0	Turbine Master	Turbine Header Pressure
AP/1/A/1700/02	5.5	1RC-66 (PORV)	1RC-66 (PORV Pilot Valve)
AP/1/A/1700/03	4/5.6.1	1LPSW-7(RCP Coolers Supply)	Channel 6 Label Plate Missing
AP/1/A/1700/05	5.5	Red Phone Notification Procedure	No Procedure So Designated
AP/1/A/1700/11	4/2.0	... channel A & channel B ...	Bus 1 and Bus 2
	7/4.1	SL1 LEE STBY BUS 1 FDR	Transformer CT5 Bus No. 1
	7/4.1	SL2 LEE STBY BUS 2 FDR	Transformer CT5 Bus No. 2
	7/4.2	SK1 KEOWEE STBY BUS 1 FDR	Transformer CT4 STBY BUS No. 1

	7/4.2	SK2 KEOWEE STBY BUS 2 FDR	Transformer CT4 BUS No. 2
	8/5.2	SL1 LEE STBY BUS 1 FDR	Transformer CT5 STBY Bus 1.
	8/5.2	SL2 LEE STBY BUS 2 FDR	Transformer CT5 Bus 2.
	8/5.3	LEE BUS BKR Xfer SWs	CT5 Bus 1 Auto/ Manual; ... Bus 2 ....
	8/5.3	SL1	(w/o SL1)
	8/5.3	SL2	(w/o SL2)
	11/4.2	RCP Seal Injection Flow	Seal Inlet Header
	14/7.3	(HWPs ....)	Hotwell Pump
	14/7.4	CBP	Cond Booster Pump
	14/7.6	CSAE	STM to STM Air Eject A (or B or C)
	14/8.1.4	CC Total Flow	Comp Cool Header Flow
	29/3.6	SF Priming Pump	U1 & U2 Emerg. Cooling Water Priming Pump
AP/1/A/1700/13	1/2.0	Lake Level	Forebay Level (w 700' Correction)
	3/5.2	1LPSW-138 (TD EFDWP Cooling Bypass Valve)	1LPSW-138 & 184 to EFWP Pump Cooling Bypass
	3/5.3.1	ESWT	Storage Tank Level
	11/1.0	2CCW-70 (LPSW to Unit 3 .....)	2CCW-70 Service Water Return to Unit 3 .....
	11/1.0	2CCW-71 (LPSW Return to	2CCW-71 Service Water .....
	11/2.0	1LPSW-19 (1B RBCU Inlet)	1LPSW-19 1B RBCU & Aux Fan CLR Inlet

	11/2.0	2LPSW-19 (2B RBCU inlet)	2LPSW-19 2B RBCU & Aux Fan CLR Inlet
AP/1/A/1700/20	5.2	CC Surge Tank	Comp. Cool. Surge Tank Level
AP/1/A/1700/24	--	LPSW Pump Discharge	LPSW Serv H2O Hdr

Note:

1. Specific discrepancies between procedure and equipment nomenclature may occur more than once in the same procedure. To avoid repetition, they are only identified once.

2. This appendix lists identified nomenclature differences between procedures and installed equipment. Nomenclature requirements for the EP and APs are stated in the writer's guide; for OPs they are stated in APM section 4.2.3.4.

APPENDIX E

LIST OF ABBREVIATIONS

AP	Abnormal Procedure
ASW	Auxiliary Service Water
ATOG	Abnormal Transient Operating Guidelines
B&W	Babcock & Wilcox
BWST	Borated Water Storage Tank
CCW	Condenser Circulating Water
CETC	Core Exit Thermocouples
EOP	Emergency Operating Procedure
EP	Emergency Operating Procedure
EPG	Emergency Procedure Guidelines
GTG	Generic Technical Guidelines
HPI	High Pressure Injection
I&E	Instrument & Electrical
LCO	Limiting Condition of Operation
LOCA	Loss of Coolant Accident
NLO	Non-licensed Operator
NRC	Nuclear Regulatory Commission
NSM	Nuclear Station Modification
OG	Owners Group
ONS	Oconee Nuclear Station
OP	Operating Procedure
PGP	Procedure Generation Package
PORV	Power Operated Relief Valve
P/T	Pressure/Temperature
QA	Quality Assurance
RB	Reactor Building
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RG	Regulatory Guideline
SG	Steam Generator
SRO	Senior Reactor Operator
SS	Shift Supervisor
SSF	Safe Shutdown Facility
TBD	Technical Basis Document
TMI	Three Mile Island
V&V	Validation and Verification
WDP	Waste Disposal Panel