May 8, 1997

MEMORANDUM TO: PD IV-1 File

FROM: /S/
Tom Alexion
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

SUBJECT: REVIEW OF PROCEDURES FOR EXTENDED STANDBY DIESEL GENERATOR, ESSENTIAL COOLING WATER AND ESSENTIAL CHILLED WATER ALLOWED OUTAGE TIMES, SOUTH TEXAS PROJECT, UNITS 1 AND 2

During my site visit in December 1996, I initiated a review of the implementing procedures for the October 31, 1996, license amendment that allowed extension of the standby diesel generator, essential cooling water and essential chilled water allowed outage times (AOTs). Due to the number of procedures (3 inches) and the number of questions that I had for the licensee that required followup (and also due to the holidays, other priority work, etc.), I didn't complete the review until about February 1997.

As a result of this review (attached), it is concluded that the licensee is ready to implement the extended AOTs consistent with the October 31, 1996, license amendment. It is noted that there are three possible very minor discrepancies (depending on interpretation) in Sections I.A.6, I.A.8, and III.(1), however, their safety significance is minimal.

Docket Nos. 50-498 and 50-499

Attachment: As stated

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REVIEW OF IMPLEMENTING PROCEDURES FOR EXTENDED SDG, ECW AND ECHW AOTs

Selected implementing procedures were reviewed related to the October 31, 1996, license amendment and safety evaluation that allowed extension of the standby diesel generator (SDG) allowed outage time (AOT) to 14 days, extension of the essential cooling water (ECW) loop and the essential chilled water (ECHW) loop AOT to 7 days, and added to Administrative Controls a description of the Configuration Risk Management Program (CRMP) used to assess changes in core damage probability resulting from applicable plant configurations.

Specifically, the review focused on the procedures that were revised as a result of this license amendment/safety evaluation. The procedures reviewed include those that cover the 13 compensatory actions to be taken prior to and during the extended AOT (for both planned and unplanned extended AOT entry), the 4 mitigating actions that would be taken if an accident occurs during the extended AOT, and the new technical specification (TS) on the CRMP.

The following procedures were reviewed:

Plant Operating Procedure OPOP01-ZO-0006, Revision 0, "SDG, ECW or ECHW Extended AOT"

Plant Surveillance Procedure OPSP03-EA-0002, Revision 3, "ESF Power Availability"

Plant Surveillance Procedure OPSP03-ZQ-0028, Revision 28, "Operator Logs"

Plant General Procedure OPGP03-ZA-0090, Revision 18, "Work Process Program"

Plant Operating Procedure OPOP04-ZO-0002, Revision 10, "Severe Weather Guidelines"

Plant Operating Procedure OPOP02-HC-0003, Revision 5, "Supplementary Containment Purge"

Plant Operating Procedure OPOP04-AE-0001, Revision 9, "Loss of Any 13.8 kV or 4.16 kV Bus"

Plant Operating Procedure OPOP09-AN-02M3, Revision 7, "Annunciator Lampbox 2M03 Response Instructions"

Plant Operating Procedure OPOP09-AN-02M4, Revision 6, "Annunciator Lampbox 2M04 Response Instructions"

Plant Operating Procedure OPOP05-EO-EC00, Revision 6, "Loss of All AC Power"

Plant General Procedure OPGP03-ZA-0091, Revision 0, "Configuration Risk Management Program"

ATTACHMENT

Schedular's Guide, Revision 2

As a result of this review, it is concluded that the procedures addressed compliance with all the compensatory actions, mitigating actions and the new technical specification discussed above. It is further concluded that the licensee is ready to implement the extended AOTs should the need arise.

An outline of the review conducted is attached.

REVIEW OF IMPLEMENTING PROCEDURES FOR EXTENDED SDG, ECW AND ECHW AOTs

I. Review of all compensatory actions prior to and during the AOT.

A. Planned Entry

1. The licensee states that it will verify at least once per shift that the emergency power transformer breaker alignment is correct and that power is available from the transformer (SE page 4).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 6.2, says to go to Procedure OPSP03-EA-0002 (ESF Power Availability). 0002, step 1.2, says use data sheets 1 and 8. Breaker alignment is verified in 0002, data sheet 1 (left hand side) and power availability is verified in 0002, data sheet 8 (page 2 of 6), Emer Bus 1L (2L)). Verification that the above is done once per shift is covered in OPSP03-ZQ-0028 (Operator Logs), page 33 of 34 (day shift) and page 34 of 34 (night shift).

2. Transmission and Distribution personnel will be involved in this planning process to ensure all work to be performed is preplanned and no risk significant work is scheduled in the switchyard during the AOT (SE page 4).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.5.2, says that all maintenance activities in the switchyard will be prohibited unless scheduled per the Work Process Program, OPGP03-ZA-0090. 0090, step 4.3.3.5, ensures that maintenance activities in the switchyard which could directly cause a loss of offsite power event are not scheduled during the extended AOT, and, in addition, any work activities on the North or South Bus distribution systems and the Emergency transformer including their associated power circuits will be coordinated and promulgated using the scheduling process (i.e., the schedular's guide). 0090, step 4.3.4, shows that the authorized work schedule is to be reviewed and approved by various station managers.

The schedular's guide, page 8, section 2.4.8, says that planners, schedulars, and work window coordinators will meet to provide preliminary and adjusted interactive schedule inputs for risk profile generation prior to the initiation of planned maintenance activities (risk profile guidance is contained in Addendum 6 of the guide).

The above discussion appears to satisfy this commitment.

3. The licensee also stated that "current plant procedures will prevent voluntary entry into this LCO during expected adverse weather conditions." The weather conditions included are hurricane, tornado, and flood watches and warnings (SE page 4).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.1, verifies that the station is not under hurricane, tornado or flood watches or warnings. Step 5.1 also references OPOP04-ZO-0002 (Severe Weather Guidelines). 0002 provides guidelines to follow in the event of

a tornado watch/warning, hurricane watch/warning, or flooding.

4. This includes a commitment that prior to commencement of maintenance under the proposed AOTs, containment integrity will be verified to ensure containment isolation penetrations are in their proper alignments and the reactor containment building supplemental purge valves will be verified to be operable and in their proper alignment (SE page 15).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.12 ensures containment integrity and references OPSP03-SI-0016 (Containment Integrity Checklist). Step 5.13 verifies that the containment purge valves are operable and references OPSP03-XC-0002 (Containment Inspection).

5. Additionally, containment purges that may be required during the AOTs will be strictly controlled (SE page 15).

Procedure OPOP02-HC-0003 (Supplementary Containment Purge), page 4 of 26, step 4.7, says that if an extended AOT is entered for ECW, ECHW, or SDGs, then containment purges shall be limited to those necessary to satisfy Technical Specifications.

6. The requirements for two (2) of the onsite power sources specified in Specification 3.8.1.1.b and the two (2) supporting ECW loops specified in Specification 3.7.4 are operable (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.9, says to perform OPSP03-EA-0002 (ESF Power Availability), data sheets 1, 2, 3, and 8 (also see note on page 3 of 21). These data sheets cover TS 3.8.1.1.b, the LCO for 3 operable SDGs.

The Action for TS 3.7.4 only addresses the required actions if 2 ECW loops are operable (1 ECW loop inoperable). TS 3.7.4 does not address the condition if less that 2 ECW loops are operable. Therefore, if less than 2 ECW loops are operable, TS 3.0.3 requires a plant shutdown, and no other procedure is required to cover this condition. (For an unplanned event, the licensee's procedures specifically check for 2 operable ECW loops. The licensee indicated they will consider modifying their procedure 0006 to check for 2 operable ECW loops for a planned entry, but the licensee agrees that such modification is not necessary).

7. The circuits required by Specification 3.8.1.1.a are operable (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.9, says to perform OPSP03-EA-0002 (ESF Power Availability), data sheets 1, 2, 3, and 8 (also see note on page 3 of 21). These data sheets cover TS 3.8.1.1.a, the LCO for 2 physically independent operable offsite circuits.

8. The equipment specified by Action 3.8.1.1.d is operable (SE page 21) (these are the cross-train components and the TDAFW pump).

Procedure 0POP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.8.1, ensures the work schedule contains no planned maintenance on cross-train components. 0006, step 5.8.3, ensures the work schedule contains no planned maintenance on the TDAFW pump. Although it's obvious that since the extended AOT is planned, this equipment would need to be operable in order to produce a risk-informed work schedule, and although it's also obvious that there would be no point in ensuring no planned maintenance is scheduled on inoperable equipment, the procedure could be clarified to ensure the equipment is operable prior to ensuring that the work schedule contains no planned maintenance on the equipment. The licensee indicated they will modify the procedure to clarify this. (Also it is noted that if this equipment is inoperable, the action statement in TS 3.8.1.1.d requires restoration in 24 hours (or go to hot standby), and there would be no extended AOT).

Procedure 0POP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.11 verifies that the TDAFW pump is operable.

9. The circuit between the 138 kV offsite transmission network, via the emergency transformer, and the onsite Class 1E Distribution System shall be functional and available (SE page 21).

Procedure 0POP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.9, has a note above it that says that step 5.9 verifies ESF power availability prior to entering into the extended AOT, and then it quotes the commitment in 9. above. Step 5.9 says to perform 0PSP03-EA-0002 (ESF Power Availability) data sheets 1, 2, 3, and 8 (also see response to 1. above). In addition, step 5.5.3 says that the 138 kV Blessing to STP and the Lane City to Bay City lines shall be in service during the planned extended AOT. Collectively, steps 5.5.3 and 5.9 appear to satisfy this commitment.

10. The technical support center diesel generator and the positive displacement pump are functional and available (SE page 21).

Procedure 0POP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.10 ensures that the TSC diesel generator and the positive displacement charging pump are functional and available.

11. Planned maintenance on the equipment specified in Action 3.8.1.1.d is suspended (SE page 21) (these are the cross-train components and the TDAFW pump).

Procedure 0POP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.8.1 ensures that there is no planned maintenance on the cross-train components, and step 5.8.3 ensures that there is no planned maintenance on the TDAFW pump.

12. Maintenance activities in the switchyard which could directly cause a loss of offsite power event will be prohibited unless required to ensure the continued reliability and availability of the offsite power sources (SE page 21).

Procedure 0POP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.8.2

ensures the work schedule contains no planned maintenance activities in the switchyard which could directly cause a loss of offsite power event unless required to ensure the continued reliability and availability of the offsite power sources.

13. Procedures are in place to ensure that, immediately before and during entry into the subject actions, the status of all associated systems and trains are reviewed for their impact on safety, taking into consideration the conditions expected as a result of modifying the AOTs...Administrative procedures require maintenance planners and schedular reviewers to meet at the beginning of each schedular week, to provide preliminary and adjusted interactive schedule inputs for risk profile generation prior to the initiation of planned maintenance activities. The procedure is to ensure minimal temporary CDF impact due to schedular planning (SE page 22).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 5.8 says to review various items in the approved work schedule to ensure that no planned maintenance is scheduled for various items. Work schedules are authorized and approved per OPGP03-ZA-0090 (Work Process Program). 0090, step 4.3.4, says that the authorized work schedule is to be reviewed and approved by various station managers. Steps 4.3.4.1 and 4.3.4.2 ensure that the risk profile is approved with an acceptable level of risk. The authorized work schedule is prepared using the schedular's guide.

The schedular's guide, page 8, section 2.4.8, says that planners, schedulars, and work window coordinators will meet to provide preliminary and adjusted interactive schedule inputs for risk profile generation prior to the initiation of planned maintenance activities (risk profile guidance is contained in Addendum 6 of the guide). Section 2.3.1.3 of the schedular's guide show that the schedular process is done weekly, with week N being the current week. The final schedule is issued no later than Thursday night of week N-2.

The above discussion appears to satisfy this commitment.

B. Unplanned Entry

1. The licensee states that it will verify at least once per shift that the emergency power transformer breaker alignment is correct and that power is available from the transformer (SE page 4).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.2.

2. Transmission and Distribution personnel will be involved in this planning process to ensure all work to be performed is preplanned and no risk significant work is scheduled in the switchyard during the AOT (SE page 4).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.3.2, says that all maintenance activities in the switchyard will be

prohibited unless scheduled per the Work Process Program, OPGP03-ZA-0090. 0090, step 4.3.3.5, ensures that maintenance activities in the switchyard which could directly cause a loss of offsite power event are not scheduled during the extended AOT, and, in addition, any work activities on the North or South Bus distribution systems and the Emergency transformer including their associated power circuits will be coordinated and promulgated using the scheduling process (i.e., the schedular's guide). 0090, step 4.3.4, shows that the authorized work schedule is to be reviewed and approved by various station managers.

The schedular's guide, page 8, section 2.4.8, says that planners, schedulars, and work window coordinators will meet to provide preliminary and adjusted interactive schedule inputs for risk profile generation prior to the initiation of planned maintenance activities (risk profile guidance is contained in Addendum 6 of the guide).

The above discussion appears to satisfy this commitment.

3. The licensee also stated that "current plant procedures will prevent voluntary entry into this LCO during expected adverse weather conditions." The weather conditions included are hurricane, tornado, and flood watches and warnings (SE page 4).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.1.

4. This includes a commitment that prior to commencement of maintenance under the proposed AOTs, containment integrity will be verified to ensure containment isolation penetrations are in their proper alignments and the reactor containment building supplemental purge valves will be verified to be operable and in their proper alignment (SE page 15).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), steps 7.5.8 and 7.5.9.

5. Additionally, containment purges that may be required during the AOTs will be strictly controlled (SE page 15).

Procedure OPOP02-HC-0003 (Supplementary Containment Purge), step 4.7.

6. The requirements for two (2) of the onsite power sources specified in Specification 3.8.1.1.b and the two (2) supporting ECW loops specified in Specification 3.7.4 are operable (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), steps 7.5.2.2 and 7.5.2.4.

7. The circuits required by Specification 3.8.1.1.a are operable (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.2.1.

8. The equipment specified by Action 3.8.1.1.d is operable (SE page 21) (these are the cross-train components and the TDAFW pump).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.2.3.

9. The circuit between the 138 kV offsite transmission network, via the emergency transformer, and the onsite Class 1E Distribution System shall be functional and available (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), steps 7.2 and 7.5.3.3.

10. The technical support center diesel generator and the positive displacement pump are functional and available (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.6.

11. Planned maintenance on the equipment specified in Action 3.8.1.1.d is suspended (SE page 21) (these are the cross-train components and the TDAFW pump).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), steps 7.5.7.1 and 7.5.2.5.

12. Maintenance activities in the switchyard which could directly cause a loss of offsite power event will be prohibited unless required to ensure the continued reliability and availability of the offsite power sources (SE page 21).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.7.2.

13. Procedures are in place to ensure that, immediately before and during entry into the subject actions, the status of all associated systems and trains are reviewed for their impact on safety, taking into consideration the conditions expected as a result of modifying the AOTs...Administrative procedures require maintenance planners and schedular reviewers to meet at the beginning of each schedular week, to provide preliminary and adjusted interactive schedule inputs for risk profile generation prior to the initiation of planned maintenance activities. The procedure is to ensure minimal temporary CDF impact due to schedular planning (SE page 22).

Procedure OPOP01-ZO-0006 (SDG, ECW or ECHW Extended AOT), step 7.5.7 (Section 7 is for unplanned entry) says to review various items in the approved work schedule to ensure that no planned maintenance is scheduled for various items. OPGP03-ZA-0091, CRMP, step 6.2 says to calculate the weekly projected cumulative risk for the unplanned event. Work schedules are authorized and approved per OPGP03-ZA-0090 (Work Process Program). 0090, step 4.3.4, says that the authorized work schedule is to be reviewed and approved by various station managers. Steps 4.3.4.1 and 4.3.4.2 ensure that the risk profile is approved with an acceptable level of risk (and step 4.3.4.3 ensures that risk profile is adjusted until acceptable). The authorized work schedule is prepared using the schedular's guide.

The schedular's guide, page 8, section 2.4.8, says that planners, schedulars, and work window coordinators will meet to provide

preliminary and adjusted interactive schedule inputs for risk profile generation prior to the initiation of planned maintenance activities (risk profile guidance is contained in Addendum 6 of the guide). Section 2.3.1.3 of the schedular's guide show that the schedular process is done weekly, with week N being the current week. The final schedule is issued no later than Thursday night of week N-2. The guide also says that emergent work may cause rescheduling of previously planned activities, that the outage work control group will provide direction in the rescheduling effort, and that unresolved restraints are rescheduled.

The above discussion appears to satisfy this commitment.

II. Review of selected mitigating actions if accident occurs during AOT (those procedures that needed revision).

A. SE Section 4.3.g - FHB Filtration System

Summary: The C Train doesn't power any heaters. However, procedures are available to energize the Train B heaters from the C SDG.

OPOP04-AE-0001 (Loss of Any 13.8 kV or 4.16 kV Bus) and Addendums 9 (Response to Loss of Train A and Train B 4.16 kV ESF Buses), 10 (Local Operator Actions in Response to a Loss of Train A and Train B 4.16 kV ESF Buses), and 15 (ESF Emergency Bus Cross-Connection Restrictions) appear to contain provisions for cross-connecting the C Train ESF SDG to the A Train or B Train ESF Bus, to energize one set of FHB Emergency Ventilation System Heaters.

B. SE Section 4.4.c - Hydrogen Control

Summary: Backup power to the recombiners is supplied by safety Trains B and C. The hydrogen recombiners would not be needed for at least 11 days following a postulated DBA. This would allow the licensee considerable time....or to complete the necessary procedural steps needed to realign the hydrogen recombiners to an operable SDG before hydrogen recombiner operation was required.

OPOP04-AE-0001 (Loss of Any 13.8 kV or 4.16 kV Bus) and Addendums 11 (Response to Loss of Train B and Train C 4.16 kV ESF Buses), 12 (Local Operator Actions in Response to a Loss of Train B and Train C 4.16 kV ESF Buses), and 15 (ESF Emergency Bus Cross-Connection Restrictions) appear to contain provisions for cross-connecting the A Train ESF SDG to the B Train or C Train ESF Bus, to energize a hydrogen recombiner.

C. SE Section 4.3.f- CCW

Summary: Unless one of the remaining operable electrical train is Train C, one of the (non-essential) headers would not isolate in the event of an ESF signal (assuming only one SDG is available), and accident loads may not receive the design CCW flow. However, operator actions can be taken to manually close the affected MOV. [note: that elsewhere in the SE it states that even without operator actions to restore design CCW flow, the results are acceptable.]

OPOP09-AN-02M3 (Annunciator Lampbox 2M03 Response Instructions) has actions for an operator in response to high flow (page 22) or low pressure (page 39) to ensure the non-essential headers are isolated by closing certain valves. High flow or low pressure would result if there is only one operable SDG because with the loss of the other 2 CCW pumps, the one running CCW pump speed would increase to try to pick up the flow/load the other 2 pumps were carrying (the 3 CCW flow paths come to a common header). This procedure is for the A train CCW response instructions. OPOP09-AN-02M4 is the procedure for the B or C train CCW response instructions.

D. SE Section 4.4.b - Containment Isolation

Summary: Automatic isolation of the containment radiation monitoring line is supplied by safety Trains A and B. Automatic isolation of the RCP seal return lines is supplied by safety trains B and C. In both these cases, however, the lines are small and EOPs contain instructions to manually isolate the valves using local, manually operated valves in the event of a loss of all AC power.

OPOP05-EO-ECOO (Loss of All AC Power), step 21 has actions to manually close the containment atmosphere radiation monitor isolation valves. Also, step 3c has an action to dispatch an operator to close the RCP seal return OCIV (this action was already in the procedure).

III. Technical Specification 6.8.3.k - CRMP (new TS)

"A program to asses changes in core damage frequency and cumulative core damage probability resulting from applicable plant configurations. The program should include the following: (1) training of personnel, (2) procedures for identifying plant configurations, the generation of risk profiles and the evaluation of risk against established thresholds, and (3) provisions for evaluating changes in risk resulting from unplanned maintenance activities."

(1) Training of personnel - The licensee provided training to selected personnel (i.e., operations, work control, licensing, senior management). This was completed on 11/26/96, per condition no. 96-13894-6. In addition, the licensee opened condition no. 96-14570 to maintain this training. However, procedure OPGP03-ZA-0091 (Configuration Risk Management Program) doesn't mention training. It was recommended that this procedure be revised to mention training (the licensee agreed to this).

(2) Procedures for identifying plant configurations, the generation of risk profiles and the evaluation of risk against established thresholds - OPGP03-ZA-0091 (Configuration Risk Management Program), step 5.1 says that various planners and schedulars will meet to provide schedule inputs for risk profile generation prior to initiation of planned maintenance activities per OPGP03-ZA-0090, Work Process Program. CRMP step 5.3 indicates that a planned exceedance of the work schedule's non-significant threshold shall be approved by the plant manager.

(3) Provisions for evaluating changes in risk resulting from unplanned maintenance activities - OPGP03-ZA-0091 (Configuration Risk Management Program), step 6.2 says to use RAsCal to calculate the weekly projected cumulative risk for the unplanned event. Steps 6.3 through 6.4 contain contingencies for exceedance of various risk thresholds. It is also noted that procedure OPOP01-ZO-0006 (SDG, ECW, or Essential Chilled Water Extended Allowed Outage Time) has many provisions for checking the risk profile should various equipment become inoperable after a planned entry, or for an unplanned entry (i.e., steps 6.3, 6.4, 6.5, 7.5, 7.6, 7.7).