APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-482/88-13 Operating License: NPF-42

Docket: 50-482

Licensee: Wolf Creek Nuclear Operating Corporation (WCNOC)
P.O. Box 411
Burlington, Kansas 66839

Facility Name: Wolf Creek Generating Station (WCGS)

Inspection At: WCGS, Burlington, Kansas

Inspection Conducted: March 14 through April 6, 1988

Inspectors: Dwight D. Chamberlain for
R. S. Love, Team Leader 5-10-88
Date

Teams Members: B. Bartlett
B. Glickstein
J. Hopkins
J. Lennartz
C. Liang

Approved: Dwight D. Chamberlain
D. D. Chamberlain, Chief, Project Section A, Division of Reactor Projects 5-10-88
Date

Inspection Summary

Inspection Conducted March 14 through April 6, 1988 (Report 50-482/88-13)

Areas Inspected: Special announced safety inspection to verify that the emergency operating procedures are technically correct; that their specified actions can be meaningfully accomplished using existing equipment, controls, and instrumentation; and that the available procedures have the usability necessary to provide the operator with an effective operating tool. The inspection was conducted in accordance with Temporary Instruction (TI) 2515/92.

Results: During the special Emergency Operating Procedure (EOP) team inspection, two violations (failure to have adequate procedures, paragraph 2.B(3) and failure to assure that conditions adverse to quality are promptly identified and corrected, paragraph 2.D(3)) were identified.

DETAILS

1. Persons Contacted

Wolf Creek Nuclear Operating Corporation (WCNOC)

*B. D. Withers, President and Chief Executive Officer
*R. M. Grant, Vice President (VP), Quality
J. A. Bailey, VP, Engineering and Technical Services
*F. T. Rhodes, VP, Operations
*G. D. Boyer, Plant Manager
*C. M. Estes, Operations Manager
*O. L. Maynard, Manager, Licensing
*B. McKinney, Manager, Technical Support
W. M. Lindsay, Manager, Quality Evaluations
*M. G. Williams, Manager, Plant Support
R. D. Flannigan, Supervisor, Compliance Engineering
*J. A. Zell, Manager, Training
*D. G. Moseby, Lead Shift Supervisor
*C. J. Hoch, Quality Assurance (QA) Technologist
*R. W. Holloway, Manager, Maintenance and Modifications
*R. H. Belote, Manager, Nuclear Safety Engineering
*C. E. Parry, Manager, QA
K. R. Petersen, Supervisor, Licensing
*G. J. Pendergrass, Licensing Engineer
*A. A. Freitag, Manager, Nuclear Plant Engineering
*E. Taylor, Simulator Training Coordinator
*S. Armstrong, License Instructor
J. Zelm, Simulator Instructor
D. Neufeld, Shift Supervisor
B. Erbe, Supervising Operator
O. Korbelik, Shift Supervisor
R. Schmidt, Supervising Operator
D. Dees, Senior Reactor Operator
L. Parmenter, Reactor Operator
J. Kuras, Reactor Operator
M. Mitchell, Reactor Operator
S. Willet, Reactor Operator
R. Evenson, Reactor Operator
M. Piteo, Reactor Operator
D. Berry, Senior Nuclear Station Operator
S. Madden, Nuclear Station Operator
D. Dodson, Nuclear Station Operator
P. Hopkins, Senior Nuclear Station Operator
B. Romine, Junior Nuclear Station Operator
G. Smith, Licensed Requalification Training Coordinator
*J. D. Stamm, Lead Project Engineer
*M. L. Johnson, Nuclear Coordinator

NRC

*R. D. Martin, Regional Administrator, Region IV
*L. J. Callan, Director, Division of Reactor Projects, Region IV
*W. H. Regan, Chief, Human Factors Branch, NRR
*G. C. Wright, Chief, Operations Branch, DRS, Region III
*M. E. Skow, Resident Inspector, Wolf Creek

Other licensee personnel were contacted during the inspection.

*Denotes those personnel in attendance at the exit interview on April 6, 1988.

2. Emergency Operating Procedures (TI 2515/92)

a. Background

Emergency Operating Procedures (EMGs) have undergone significant changes as a result of the 1979 accident at the Three Mile Island facility. The new EOPs are required to be symptom-oriented rather than event-oriented. For the purpose of this report the term EOP or EMG is used interchangeably to indicate emergency operating procedures.

The purpose of this inspection was to verify that the Wolf Creek EMGs are technically accurate, that their specified actions can be accomplished using existing equipment, controls and instrumentation, and that the available procedures have the usability necessary to provide the operator with an effective operating tool.

This was accomplished by performing: A desk-top review of 25 EMGs, 6 critical safety function status trees, 19 function restoration procedures, and 3 off-normal procedures; system walkdowns of 5 EOPs, 2 restoration procedures, and 2 off-normal procedures; carrying out 3 scenarios on the plant specific simulator that exercised 13 procedures and the 6 status trees; and a human factors review of the procedures, plant operations, and an interview of 11 licensed and nonlicensed personnel that utilized the above referenced procedures and status trees. For a detailed list of the procedures reviewed, see Appendix C.

This inspection report only provides examples of observations noted during the inspection of WCGS EMGs. The minor observations were provided to the licensee at detailed debriefings in which the inspection team's observations and concerns were discussed.

b. Desk-Top Review

The desk-top review was accomplished by comparing the procedures identified in Appendix C with the Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERGs), and the Plant-Specific Setpoint

Document. When deviations between these documents were identified, the inspectors verified that the deviations were documented on a plant-specific deviation form and when required, that a safety analysis report has been prepared in accordance with 10 CFR 50.59.

Inspection Results

Generic technical guidelines were prepared for all of the ERGs. These generic guidelines provide a complete and documented analytical basis for each of the procedures. The generic technical guidelines have been verified by the WOG. The generic plant used in the development program was a SNUPPS type, 4 loop, 1150 MWe plant. Consequently, plant specific differences between WCGS and the generic plant were minimal. Therefore, the WOG verification also applies to the WCGS Technical Guildelines since only plant specific data had been inserted and no substantial changes had been made to the basic guidelines. No instances were identified where these changes were not properly identified on a deviation form as required by WCGS Procedure ADM 02-022, Revision 5, "Writers Guide for Emergency Operating Procedures."

The WCGS Validation Checklist (ADM 02-022, Attachment 2) was used to document the validation review. The validation reviews were performed by an operating crew utilizing the team training concept. One or more of the following methods were used in the validation program: (1) desk-top review; (2) control room/plant walkdowns; and (3) performance/walkthru of the EOPs on the plant specific simulator. No instances were identified where the EOPs were not properly validated.

In general, the WCGS EMGs were found to be acceptable; however, when plant specific information was placed in the procedures, numerous typographical errors and several omissions were made and not corrected. This is indicative of a less than adequate review of the procedures by line management and quality overview groups (e.g., operating crews, training department personnel, and the QA/Quality Control organization). The following examples are provided:

(1) In Procedure OFN-013, two subcooling curves were not provided. When this was brought to the attention of the onshift operating crew, immediate action was taken to replace the blank pages with the proper subcooling curves. In that these standard curves are found in several of the EMGs available to the operators, the lack of these curves in one procedure was not considered safety significant.

(2) Approximately five controlled copies of the EMGs did not have multi-colored status trees. Revision 1 of the EMGs revised the core exit thermocouple temperatures from 700°F to 900°F. This change was incorporated on the multi-colored status trees but was missed on the five copies of the EMGs with single color

status trees. Immediate action was taken to replace the incorrect status trees. In that the control room, auxiliary shutdown panel, simulator, and training department copies of the EMGs all had multi-colored status trees with the proper temperature (900°F), the failure to have the correct temperature on the status trees in the five referenced copies was not considered safety significant.

(3) Temporary procedure change forms are posted in front of WCGS Procedures EMG E-0 and EMG ES-31; however, these changes were not posted or identified in the body of the procedure at the appropriate step(s). In both cases, CAUTIONS were added to the procedures by the procedure change forms. During the implementation of Procedure EMG E-0 at the simulator, it was observed that the supervising operator (SO) missed the CAUTION (two places) that was added by the temporary procedure change. When this deficiency was brought to the attention of the operations manager, he took immediate action to ensure that temporary procedure changes were posted/identified in the body of the EMGs in the control room and at the auxiliary shutdown panel. During a review of Procedure ADM 07-100, Revision 33, "Preparation, Review, Approval, and Distribution of WCGS Procedures," it was noted that this procedure did not require temporary procedure changes be posted or identified in the body of any procedures, including EMGs. The licensee was informed that failure to assure that activities affecting quality are prescribed by adequate procedures and accomplished in accordance with the procedures, is a violation of Criterion V of 10 CFR Part 50, Appendix B (482/8813-01).

(4) Appendix A of Procedure OFN 00-017 had instrument prefix letters listed as HZ when they should have been ZL (22 examples). Even though the instrument prefixes were wrong, the operators were able to find the correct instrument, therefore, this item is not considered safety significant.

c. Plant Walkdowns

(1) The EOP procedures reviewed thru the performance of plant walkdowns are identified in Appendix C.

(2) Plant walkdowns of selected EOPs were performed during this inspection. Three walkdown teams were utilized. Each team consisted of two NRC personnel and one licensee operator. The operators were either a licensed reactor operator or a senior nuclear station operator (SNO). The walkdowns were performed to verify that the EOP specified actions could be meaningfully accomplished using existing equipment, controls, and instrumentation.

(3) The results of the walkdown are broken down into six areas. The areas and their results are listed below:

(a) Procedures Steps Which Could Not Be Performed Due To A Lack Of Information Or Unaccessable Equipment

- The reference tables used to calculate the amount of boric acid required to be added to the reactor coolant system to ensure an adequate shutdown margin, were not available at the auxiliary shutdown panel (ASP).
- Procedure EMG CS-02 requires that in certain situations Valve AL HV-32 should be manually opened. However, AL HV-32 was located in a fireproof box with access only via destructive disassembly of the box.

(b) Operator Knowledge Is Relied Upon To Perform Certain Procedure Steps

- The instrument air header pressure indicator is not labeled.
- There were no local instructions for startup of the turbine driven auxiliary feedwater pump.
- Valve BG HV-8105 was not labeled.
- The boron injection tank inlet and outlet valve numbers were not given in some procedures.

(c) Uncontrolled Operator Aids

- On Control Room Panel RP-068, there were penciled in descriptions of the function of certain handswitches.

(d) The Guidance To The Operator Is Unclear In Some Procedures

- The valve position of Solenoid Valves SJ HV-129 and -130 can not be field verified. The procedures should be changed to have an operator close the manual valves if doubt exists as to whether a solenoid valve is open or closed.
- The abbreviation PORV is used interchangeably to mean either steam generator power operated relief valve or pressurizer power operated relief valve. These valves should be clearly identified in the procedures.
- Some procedures did not specify which reactor coolant system temperature indicator should be utilized (e.g., THot or TCold).

- EMG C-11, step 19, response not obtained (RNO) column was unclear as to what power should be restored to.

(e) Errors In Procedures

- OFN 00-017, step 3a, annunciator 64c should read 63c.
- OFN 00-017 references Terminal Box AB05 this should read TV-AB05.
- The label on some breakers did not exactly match the procedure.

(f) Equipment Accessibility

- Some procedures reference valves that are inside containment while discussing local operator action. Local operator action inside containment during some accident scenarios would be inappropriate.
- The north and south electrical penetration rooms would have to be entered for some local operator actions. The Updated Final Safety Analysis Report gives projected dose rates (post accident) so high as to make this inappropriate.

Following the procedure walkdowns, the findings were discussed in detail with the licensee. Some of the major procedure deficiencies identified were being corrected by the licensee during the period of the EOP inspection at plant site. The inspection team understands that the licensee will incorporate the applicable findings from the EOP inspection.

For the first concern stated in Item (f) above, the licensee stated that the operator could close the isolation valve outside the containment for each system to achieve containment isolation without entering the containment. It is recommended that these alternate operator actions be included in the procedure for operator's guidance under conditions that the containment is unaccessable. For the second concern stated in Item (f) above, the licensee stated that the operator could vent the accumulators from the control room. It is recommended that the method of venting accumulators be included in the EOP for operator's guidance under the conditions that the electrical penetration rooms are unaccessable.

d. Simulator Scenarios

Four scenarios were conducted on the WCGS plant specific simulator. These scenarios were conducted in two 4-hour sessions utilizing relief crew licensed operators. The simulator crew consisted of a SO, RO, and a balance of plant (BOP) operator. This crew size meets

WCGS Technical Specification requirements. An extra licensed operator was utilized to monitor the critical safety function status trees. During actual plant operations, the extra operator would be provided from the relief crew or a licensed operator that was "on-crew to maintain his qualification in accordance with 10 CFR 55.53." The EMGs utilized in the performance of these scenarios are identified in Appendix C.

In general, the specified actions detailed in the EMGs were technically correct, could be accomplished using the existing equipment, controls and instrumentation, and the procedures provide the operator with an effective operating tool. The procedures led the operators through the transition points without much confusion.

However, there were three instances where the EMGs had incorrect transition points due to typographical errors. The three instances are identified as follows:

(1) In Procedure OFN 00-017, Attachment C, step 8e in the RNO column transitions the operator back to step 7a when in fact there is no step 7a. The correct transition should have been back to step 8a. In that a repeat of step 7 would be conservative, this transition error is not considered safety significant.

(2) In Procedure EMG FR-I3, step 11 in the action/expected response (A/ER) column transitions the operator to step 21 when in fact the correct transition is to step 22. In that a transition to step 21 would be conservative, this transition error is not considered safety significant.

(3) In Procedure EMG C-33, step 7c in the RNO column transitions the operator to step 18e when in fact there is no step 18e in this procedure. From a review of the EMG and the WOG ERG, the NRC inspection team could not verify the correct "transition-to-step." Step 7c in the A/ER column directs the operator to "check RVLIS - AVAILABLE." RVLIS (reactor vessel level indication system) is plant specific and is not addressed in the WOG ERG.

A simulator scenario was developed to Exercise EMG C-33 to determine what action the operator would take when he/she discovered there was no step 18e in the procedure. When EMG C-33 was exercised on the simulator and the SO was directed to transition to step 18e, he hesitated a moment and then continued with step 19. After the scenario was terminated, the transition from step 7c to step 19 was discussed. At that time, it was noted that a 7e was lightly penciled in next to the 18e in the step 7c RNO column. The licensee later confirmed that the correct "transition-to-step" was 7e. Additional licensed operators were questioned as to what actions they would take when they discovered there was no step 18e (The operators were

questioned before the licensee corrected the transition error by issuing a temporary procedure change.). Approximately one-half of the operators questioned would have transitioned to step 19 and the other half would have continued with step 7d, when they discovered there was no step 18e.

During a review of WCGS Procedure ADM 02-022, Revision 5, "Writers Guide For Emergency Operating Procedures," paragraph 2.8, provides for a mechanism by which EMG improvements, concerns, or suggestions are put into the system for evaluation. Even though the transition error had been identified in the simulator copy of EMG C-33, the licensee could not provide any evidence that the error was entered into their system for evaluation and correction. As stated above, prompt corrective action was taken after the transition error had been identified by the NRC EOP inspection team.

The safety significance of this transition error was evaluated by the inspection team. It was determined that with an incorrect transition to step 19, steps 7e through 18 of EMG C-33 would not have been performed and the procedure would have failed to perform its intended purpose. Without operator actions outside of the procedure, the transition error could have resulted in a radioactive release to the atmosphere from the primary to secondary tube rupture through the PORVs and/or safety valves.

The licensee was informed that failure to establish measures to assure that conditions adverse to quality are promptly identified and corrected is a violation of Criterion XVI of 10 CFR 50, Appendix B (482/8813-02).

3. Human Factors Review (TI 2515/92)

The human factors review was conducted using plant walkdowns, desk-top reviews, simulator scenarios, and interviews. The following documents the human factors findings in each of these areas.

a. Local Control Station Walkdowns

The human factors issues identified in the local control stations included:

(1) Incorrect reference in the EMG of the local system procedure to be used. In C-0, Step 5.2 RNO, the operator is referenced to Procedure SYS NB-203. During the walkdowns an operator indicated that this reference should be SYS NB-202 and SYS NB-201.

(2) In general, labeling of local control station instrumentation was good. The majority of instruments were clearly and

appropriately labeled. Some instrumentation had inadequate or no labeling. Examples of this concern include the following: In C-0, Step 23a RNO, the label for Spent Fuel Pool Demineralizer Outlet Drain Connection EC-V149 can not be seen from the floor because EC-V149 is located approximately 25 feet in the air. No location information is provided in the procedure. Also, in OFN-13, step 11a RNO, Breakers NG01 BDR3 and NG01 BFD1 are not labeled at the control center.

(3) During a walkdown of EMG C-0, it was noted that emergency lighting (local battery operated lights) was not available in all plant areas. In cooperation with the EOP inspection team, the licensee's operations department conducted a survey of all areas that would be entered during a loss of all AC power (EMG C-0). The areas surveyed were: north and south mechanical penetration rooms; area 5 steam enclosure; diesel generator rooms; 4160 volt switchgear rooms; and auxiliary building in the vicinity of large/small purge valves.

The survey concluded:

- Both the diesel generator rooms and the NB01/NB02 switchgear rooms have adequate lighting needed for tasks accomplished there.

- Both north and south mechanical penetration rooms have adequate lighting on 2000-foot elevation but the mezzanine areas would be dark. It should also be noted that mezzanine solenoid valves, by and large, have no way of being manually isolated so that a flashlight would be sufficient here.

- The purge valves have no emergency lighting in their vicinity.

- Area 5 in the vicinity of B and C MSIV's would be well lit, but Area 5, lower level near the feedwater isolation valves and blowdown valves has no lighting. In addition, one of the lights in the vicinity of B and C main steam isolation valves needs to be reaimed, it currently points to the ceiling.

Actions scheduled to be taken by the licensee:

- EER's will be written to install more emergency lighting in Area 5 by MFIV's, 2047 level by purge valves, mezzanine areas of north and south mechanical penetration rooms, and the auxiliary feedwater pump room.

- Operations is looking into purchasing, for the interim, some battery powered lights which an operator can wear.

These would be stored in the emergency locker and would be put on inventory sheets for the lockers.

- A work request will be written to paint outside purge valve position indicators with a glow-type paint as the portable light an operator would wear would not reach high enough to illuminate the position indicators.

Pending the verification of the emergency lighting discussed above, this item is open (482/8813-03).

(4) It was also noted in Area 5, 2000-foot level, that there is a potential for the operator to need communications with the control room while starting or stopping a pump. This area contains approximately five rooms, joined by one hallway. The paging system unit, located in the hallway, is provided in this area. Headsets can be used in the room, if the operator brings them.

b. Desk-Top Reviews and Scenarios

The human factors issues identified during the desk-top reviews and scenarios include:

(1) Inconsistent level of detail, for example in some steps, valve numbers were given, in others they were not. (Example E-3, BIT inlet isolation and outlet isolation valve numbers were not included, in ES-07, step 7, they were included.)

(2) Information which can not be used by the operator is included in the procedures. Example: containment pressure was given in both psig and psia. The operator can only read pressure in psig.

(3) Several concerns relating to the procedure format and wording were identified. These include:

(a) Logic statements needed to clarify the intent of the step. In ES-03, step 6d there were three valves (BG HIS 8105, 8106, and 8146) listed then the word "-or-", and then a fourth valve (BG HIS 8147) which may be opened. Structured this way, the step may be interpreted to mean open the first three valves or just the last valve. The real intent is to open the first two valves (8105 and 8106) AND either one of the last two valves (8146 or 8147). The logic term "AND" needs to be inserted. This was a generic problem throughout the procedures.

(b) There is a concern with unclear or misleading wording of steps. Example: FR Z-1, step 3 Note: "Step 3c.2 should not be performed until RWST level is less than 12 percent."

This note wording may mislead the operator into thinking that he must wait for RWST level to be less than 12 percent before continuing in the procedure.

C-0, step 16c.2 RNO- use of the word "continue" usually implies remaining in the same step. The transition is actually to another step. The words "Go To" would reduce any confusion.

(c) A concern was noted regarding information which is not a required action being incorporated into a step. The information may be better suited as a note. (ES-03, step 14a, the operator is to check VCT makeup control system. The bulletted information in step a "BG FK-110 Set at 8.575=2000 ppm," is not a required action).

(4) Another human factors issue was with the availability and suitability of displays and controls.

(a) Several instrumentation inconsistencies were found. Instrumentation which was called out in the procedure was not correctly identified. (E-1, step 4 - SG blowdown and Sample Valve RE-2 should be SJ-2. ES-3?, step 13b, pg 12 should be pg-22).

(b) The use of the word "at" in some cases may be too constraining when a parameter, such as pressure, must be maintained. A range, rather than a precise value would be more appropriate. (For example, in ES-05, step 4b, the operator is to maintain RCS pressure at 1920 psig. Since it would be difficult for the operator to maintain pressure at a specific value, a range would be more appropriate. This occurs throughout the procedures and has been discussed with the licensee.

(5) Placekeeping practices were found to be good. Operators used boot laces attached to the procedures as well as paper and pencil to keep their place.

(6) In observing operator actions during walkthough and simulator scenarios, no problems were found in this area. There were no unnecessary duplications of operator actions, staffing levels were adequate, and the roles and responsibilities of the crew were clearly defined. A team approach was noted. Procedures in the control room were readily available and adequate space was provided to use them.

c. Interviews

A total of 11 persons were interviewed:

- 2 shift supervisors
- 2 SOs
- 4 reactor operators (ROs)
- 2 SNOs
- 1 licensed requalification training coordinator

Results of the interviews are listed below:

(1) There is a need for additional spacing in some steps in order to be able to read and follow it more clearly. (Examples are in step 31 RNO and C-31, step 12a RNO).

(2) Another concern stated was in regards to the use of negatives in the action/expected response column which may be confusing. Example, "Check if all SGs not faulted." All interviewees stated that this was confusing and is usually taken care of with practice and training. One operator pointed out that although training usually helps, during the last simulator exercise he participated in, he still got tripped up. One supervising operator commented that this was additional stress that is not needed during an emergency.

One suggested recommendation for these steps is to word them positively.

(3) Three out of eight control room operators stated that the noise level in the control room was high when involved in a control room ventilation isolation signal. It was pointed out; however, that this issue was being addressed and an engineering evaluation request has been made.

(4) Regarding roles and responsibilities, all persons interviewed clearly understood their tasks and responsibilities during the use of emergency procedures.

(5) Training on the EOPs was conducted using classroom lectures, required reading and simulator exercises. The operators obtained 1 week of requalification training every 6 weeks. During the course of a year, all emergency procedures were covered.

Most operators felt that training was very good in preparing them to use emergency procedures. Two operators felt that more training was needed on understanding the background and reasons for actions that are taken. These operators felt that is was too easy to get into a cookbook mode of using the procedures. In general, all operators felt good about the procedures and were confident that they could be used and would work during an emergency.

In summary, the human factors review found the WCGS EOPs to be adequate.

4. Open Items

Open Items are matters which have been discussed with the licensee which will be reviewed further by the inspector, and which involves some action on the part of the NRC or licensee or both. The open item disclosed during this inspection is discussed in paragraph 3.a(3) of this report.

5. Exit Interview (30703)

The inspectors met with licensee representatives (denoted in paragraph 1) on April 6, 1988. The inspectors summarized the purpose, scope, and findings of the inspection and the likely information content of the report. The licensee acknowledged this information and did not identify any proprietary information.

APPENDIX C

This appendix contains a list of all emergency procedures utilized during this inspection.

Emergency Operating Procedures

#EMG E-0, Revision 1, "Safety Injection"
EMG ES-01, Revision 1, "Rediagnosis"
EMG ES-02, Revision 1, "Reactor Trip Response"
EMG ES-03, Revision 1, "SI Termination"
EMG ES-04, Revision 1, "Natural Circulation Cooldown"
EMG ES-05, Revision 1, "Natural Circulation Cooldown With Steam Void In Vessel (Without RVLIS)"
EMG ES-06, Revision 1, "Natural Circulation Cooldown With Steam Void In Vessel (With RVLIS)"
#EMG E-1, Revision 1, "Loss Of Reactor or Secondary Coolant"
EMG ES-11, Revision 1, "Post LOCA Cooldown and Depressurization"
EMG ES-12, Revision 1, "Transfer To Cold Leg Recirculation"
EMG ES-13, Revision 1, "Transfer To Hot Leg Recirculation"
#EMG E-2, Revision 1, "Faulted Steam Generator Isolation"
#EMG E-3, Revision 1, "Steam Generator Tube Rupture"
EMG ES-31, Revision 1, "Post-SGTR Cooldown Using Backfill"
EMG ES-32, Revision 1, "Post-SGTR Cooldown Using Blowdown"
EMG ES-33, Revision 1, "Post SGTR Cooldown Using Steam Dump"
*#EMG C-0, Revision 1, "Loss Of All AC Power"
EMG CS-01, Revision 1, "Loss Of All AC Power Recovery Without SI Required"
*#EMG CS-02, Revision 1, "Loss Of All AC Power Recovery With SI Required"
#EMG C-11, Revision 1, "Loss Of Emergency Coolant Recirculation"
EMG C-12, Revision 1, "LOCA Outside Containment"
#EMG C-21, Revision 1, "Uncontrolled Depressurization Of All Steam Generators"
*#EMG C-31, Revision 1, "SGTR With Loss Of Reactor Coolant-Subcooled Recovery Desired"
#EMG C-32, Revision 1, "SGTR With Loss Of Reactor Coolant-Saturated Recovery Desired"
#EMG C-33, Revision 1, "SGTR Without Pressurizer Pressure Control"

Critical Safety Function Status Trees

EMG F-0, Revision 1, "Critical Safety Function Status Trees (CSFST)"

The CSFST are: Subcriticality, core cooling, heat sink, integrity, containment, and inventory

Function Restoration Procedures

#EMG FR-S1, Revision 1, "Response To Nuclear Power Generation/ATWT"

EMG FR-S2, Revision 1, "Response To Loss Of Core Shutdown"
EMG FR-C1, Revision 1, "Response To Inadequate Core Cooling"
EMG FR-C2, Revision 1, "Response To Degraded Core Cooling"
EMG FR-C3, Revision 1, "Response To Saturated Core Conditions"
*#EMG FR-H1, Revision 1, "Response To Loss Of Secondary Heat Sink"
EMG FR-H2, Revision 1, "Response To Steam Generator Over Pressure"
EMG FR-H3, Revision 1, "Response To Steam Generator High Level"
EMG FR-H4, Revision 1, "Response To Loss Of Normal Steam Release Capabilities"
EMG FR-H5, Revision 1, "Response To Steam Generator Low Level"
EMG FR-P1, Revision 1, "Response To Imminent Pressured Thermal Shock Conditions"
EMG FR-P2, Revision 1, "Response To Anticipated Pressurized Thermal Shock Condition"
*#EMG FR-Z1, Revision 1, "Response To High Containment Pressure"
EMG FR-Z2, Revision 1, "Response To High Containment Sump Level"
EMG FR-Z3, Revision 1, "Response To High Containment Radiation Level"
EMG FR-I1, Revision 1, "Response To High Pressurizer Level"
EMG FR-I2, Revision 1, "Response To Low Pressurizer Level"
EMG FR-I3, Revision 1, "Response To Voids In Reactor Vessel"

Off-Normal Procedures

*OFN 00-013, Revision 7, "Control Room Not Habitable"
OFN 00-014, Revision 4, "Hot Standby To Cold Shutdown From Outside The Control Room"
*OFN 00-017, Revision 6, "Control Room Evacuation"

*-Walkdowns of these procedures were performed as noted in Paragraph 2.C.

#-Simulator scenarios of these procedures were performed as noted in Paragraph 2.D.