

UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the Matter of

Carolina Power and Light Company
H. B. Robinson Steam Electric
Generating Plant Unit 2

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Docket No. 50-261
Licensee No. DPR-23
EA 87-124

ORDER IMPOSING CIVIL MONETARY PENALTY

I

Carolina Power and Light Company (CP&L/licensee) is the holder of Operating License No. DPR-23 (license) issued by the Nuclear Regulatory Commission (NRC/Commission) on July 31, 1970. The license authorizes the licensee to operate the H. B. Robinson Steam Electric Generating Plant, Unit 2, in accordance with the conditions specified therein.

II

A Safety System Functional Inspection (SSFI) was conducted on March 9 - April 15, 1987, with a followup inspection conducted May 26 - 29, 1987, at the H B. Robinson Steam Electric Generating Plant, Hartsville, South Carolina. The results of this inspection indicated that the licensee had not conducted its activities in full compliance with NRC requirements. A written Notice of Violation and Proposed Imposition of Civil Penalty (Notice) was served upon the licensee by letter dated November 13, 1987. The Notice states the nature of the violations, the provisions of the NRC's requirements that the licensee had violated, and the amount of the civil penalty proposed for Violation I set out in the Notice. The licensee responded to the Notice by letter dated December 17, 1987.

III

After consideration of the licensee's response and the statements of fact, explanations, and arguments for withdrawal of Violation I, reduction of severity level, and remission or mitigation of the proposed civil penalty contained therein, the Deputy Executive Director for Regional Operations has determined, as set forth in the Appendix to this Order, that Violation I occurred as stated in the Notice and that the penalty proposed for Violation I designated in the Notice should be imposed.

IV

In view of the foregoing and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205, IT IS HEREBY ORDERED THAT:

The licensee pay a civil penalty in the amount of Fifty Thousand Dollars (\$50,000) within 30 days of the date of this Order, by check, draft, or money order, payable to the Treasurer of the United States and mailed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555.

V

The licensee may request a hearing within 30 days of the date of this Order. A request for a hearing shall be clearly marked as a "Request for an Enforcement

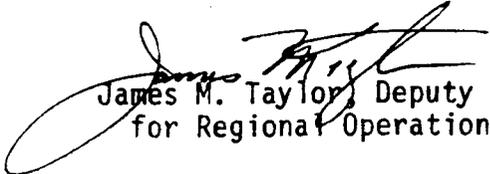
Hearing" and shall be addressed to the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D. C. 20555, with copies to the Assistant General Counsel for Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Regional Administrator, Region II, 101 Marietta Street, N.W., Atlanta, Georgia 30323, and a copy to the NRC Resident Inspector, H. B. Robinson Steam Electric Generating Plant.

If a hearing is requested, the Commission will issue an Order designating the time and place of the hearing. If the licensee fails to request a hearing within 30 days of the date of this Order, the provisions of this Order shall be effective without further proceedings. If payment has not been made by that time, the matter may be referred to the Attorney General for collection.

In the event the licensee requests a hearing as provided above, the issues to be considered at such hearing shall be:

- (a) whether the licensee was in violation of the Commission's requirements as set forth in Violation I of the Notice referenced in Section II above, and
- (b) whether, on the basis of such violation, this Order should be sustained.

FOR THE NUCLEAR REGULATORY COMMISSION


James M. Taylor, Deputy Executive Director
for Regional Operations

Dated at Rockville, Maryland
this 17th day of August 1988

APPENDIX

EVALUATION AND CONCLUSIONS

On November 13, 1987, a Notice of Violation and Proposed Imposition of Civil Penalty (Notice) was issued for violations identified during a Safety System Functional Inspection (SSFI) conducted March 9 - April 15, 1987, with a follow-up inspection conducted May 26 - 29, 1987. Carolina Power and Light Company (CP&L/licensee) responded to the Notice on December 17, 1987. In its response, the licensee denied the violations as stated in the Notice, adding that in no instance does the Notice raise any issues that individually or collectively could have jeopardized the capability of its operating staff to safely shut the plant down using established procedures. The licensee asserts its belief that it complied with the requirements of 10 CFR Part 50, Appendix R, although "some problems may have existed at the time of the SSFI," and that, if the NRC concludes that violations occurred, they merit no more than a Severity Level IV classification. This appendix addresses each of the detailed arguments raised by the licensee related to the Notice.

The intent of Appendix R was to prevent a repeat of the TVA Browns Ferry fire and to provide adequate separation of equipment and power supplies necessary to achieve safe shutdown. For plants where extensive modifications would be required to meet the separation criteria, Appendix R allowed the substitution of Dedicated/Alternate Shutdown. These methods permit the use of dedicated equipment and manual operator actions to:

1. achieve and maintain subcritical conditions in the reactor,
2. maintain reactor coolant inventory,
3. achieve and maintain hot standby,
4. achieve cold shutdown within 72 hours, and
5. maintain cold shutdown.

A Dedicated/Alternate Shutdown system was implemented at H. B. Robinson Steam Electric Generating Plant rather than the installation of extensive plant modifications. The licensee proposed to meet Appendix R by establishing adequate procedures, training, communications, and emergency lighting to assure safe shutdown capability with a fire in any zone. The licensee also stated that at least ten operators would be called in to direct the activities of maintenance personnel through the dedicated shutdown repair procedures.

After the initial development of the dedicated shutdown procedures and initial operator training by a consultant, the primary responsibility for Dedicated/Alternate Shutdown was relegated to the Operations Department. Interviews with Operations management and staff indicated that the licensee believed the chances of a severe fire and implementation of the dedicated shutdown procedures were extremely remote. Operations staff indicated that dedicated shutdown was considered a very low priority in comparison with other operations responsibilities and requirements.

Response to Violation IRestatement of Violation I (Civil Penalty)

10 CFR 50.48 requires, in part, that the licensee implement fire protection features to assure fire protection of safe shutdown capability in accordance with Section III.G of 10 CFR Part 50, Appendix R. The licensee elected to install a dedicated shutdown capability pursuant to Section III.G of Appendix R and was required to do so by March 24, 1986. Section III.L.3 of Appendix R requires the licensee to have procedures in effect to implement this shutdown capability.

Technical Specification 6.5.1.1.1.f requires that written procedures shall be established, implemented, and maintained for the Fire Protection Program.

Contrary to the above, the licensee failed to adequately establish, implement and maintain procedures to carry out the dedicated shutdown capability in the event of a fire in the control room. Specific examples of these failures include the following:

A. Failure to Establish Procedures

1. On March 24, 1987, plant operating procedures were not adequately established in that the procedure entry conditions were insufficient to ensure that Dedicated Shutdown Procedure (DSP)-001, Hot Shutdown Using the Dedicated/Alternate Shutdown System, was entered only when required. In particular, the lack of decision points may not preclude unwarranted deenergization of all AC power sources.

Summary of Licensee's Response

The licensee denies the alleged violation occurred. The licensee believes that DSP-001 did provide adequate guidance on the entry conditions in that the procedures stated "This procedure is used to safely bring the reactor plant to a hot shutdown condition subsequent to a severe fire. The procedure will only be used if the extent of the fire induced damage precludes the use of the Emergency Operating Procedures (EOPs) Network to safely control the plant."

The licensee states that the NRC had previously approved deenergization of major busses in the August 8, 1984 Safety Evaluation Report (SER). This action was approved as a basis to prevent spurious operations from impacting safe shutdown and from causing damage to other plant equipment. Additionally, the licensee stated that spurious operation of the emergency diesel generators and equipment running without loss of offsite power was identified in a 10 CFR Part 50, Appendix R, inspection conducted by Region II personnel in 1985. The Inspector Followup Items, detailed in NRC inspection report 85-07, identified two concerns. They were the spurious operation of the emergency diesel generators and equipment running without loss of off-site power. The licensee states that it resolved these concerns by determining that all AC power sources except for the Dedicated Shutdown (DS) diesel would be deenergized initially and that restoration occur as soon as possible following

stabilization of the plant in a hot shutdown condition and determination as to the extent of fire damage and completion of any needed repairs. The licensee asserts that the NRC staff previously accepted this methodology, which is now found to be deficient, and as such may constitute a backfit.

The licensee states that the dedicated shutdown procedures were developed using worst case fire conditions that could not be controlled using the emergency operating procedures. An event of this magnitude does not afford one time to diagnose equipment malfunctions during initial stages when outside the emergency operating procedure network or from remote operating stations.

With the above statements in mind, the licensee states they were in compliance with the requirements of 10 CFR Part 50, Appendix R, and denies that any violation of regulations occurred.

NRC Evaluation

The licensee's emergency operating procedures (EOPs) are not designed for use outside of the main control room. At the time of the SSFI inspection, the licensee had in place two separate procedures designed to allow the safe shutdown of the reactor from outside the main control room. Abnormal Operating Procedure (AOP) -004, Control Room Inaccessibility, which was in place prior to the dedicated shutdown procedures, was intended to allow for a controlled boration shutdown when the control room is inaccessible due to smoke or toxic gas. The other procedure, DSP-001, Hot Shutdown Using the Dedicated/Alternate Shutdown System, was intended to allow a safe shutdown from outside the control room when severe fire conditions have resulted in a loss of power to both trains of the normal systems and instrumentation used to perform a reactor shutdown, or when the fire results in the unintended and uncontrolled spurious operation of systems and equipment. DSP-001 is the more severe of the two procedures in that it requires the intentional deenergization of all normal and emergency onsite and offsite power supplies. Additionally, once DSP-001 was entered, there are no additional decision points or related symptoms provided prior to the deenergization of the AC power to the redundant trains of the normal safety shutdown systems and instruments.

During the inspection, the inspectors interviewed operations personnel during a simulated walkthrough and posed the hypothetical situation that there was a very smoky fire in the main control panel (current transformer fire). The Operations supervisor in setting up the walkthroughs expected under the simulated conditions (no loss of voltage or ESF equipment, or spurious equipment actuations) that the Senior Reactor Operator (SRO) would elect to enter AOP-004 and perform a routine shutdown from outside the main control room. However, in the walkthrough the SRO elected first to have the operators don respirators and attempt the shutdown using the EOPs from within the main control room which was supposedly on fire. Given a simulated increase in heat level and smoke, the SRO then decided to enter DSP-001, not the expected response. This highlights

inadequacies in the licensee's procedures and training with regard to the use of the Dedicated Shutdown and Abnormal Operating Procedures.

DSP-001 is considered inadequate as it permits entry into the procedure and resulting deenergization without adequate consideration of the circumstances associated with the fire event. In particular, it fails to interface with AOP-004 with the resulting uncertainty as to which procedure is to be applied.

The NRC staff agrees that approval of the deenergization of AC power sources in the alternative/dedicated shutdown procedures was given in the SER and in inspection reports. The NRC in the SER noted the multiple and complex manual actions required by this approach and noted that compliance with Appendix R would be subject to future inspections. Deenergization of AC power sources is an appropriate response to a worst case fire at the Robinson facility. In the case of a less severe fire, a situation not before evaluated by the NRC staff at the Robinson facility and for which deenergization of AC power sources had not been specifically approved, the NRC staff expects that appropriate procedures including guidance for these less severe fires would be provided to preclude the unwarranted deenergization of the AC power sources. In this case, the procedures were insufficient to provide the necessary guidance. In addition, operator training was proven not to be sufficient to ensure a consistent response.

NRC Conclusion

The safety significant concern is that the lack of well-defined entry conditions and interfaces among EOP's, AOP's, and DSP's. This violation when combined with inadequate operator training and the associated stresses under actual fire situations, could result in confusion of the operators and the unwarranted initiation of DSP-001 and subsequent deenergization of the normal emergency power sources. For the above reasons, the NRC staff concludes that this example of the violation occurred as stated.

2. On March 24, 1987, the dedicated shutdown procedures did not provide directions for controlling the auxiliary feedwater (AFW) pump speed controller.

Summary of Licensee's Response

The licensee indicated that Operations personnel perform, on a monthly basis, Operations Surveillance Test (OST)-202 Steam Driven Auxiliary Feedwater System Component Test. This procedure requires operators to use the knurled knob on the Steam Driven AFW pump speed controller. The licensee considers the inclusion of specific instruction as to which direction to turn the knurled knob as unnecessary, claiming it is well within the scope of operators' knowledge. Additionally, the licensee states that steam generator level can be controlled solely by the use of the pump discharge valve. As such, they have deleted the requirement to adjust the pump speed controller from the emergency operating procedures but the dedicated shutdown procedures had not yet been revised.

NRC Evaluation

DSP-001, Step 5.1.3. requires operators to control the steam driven AFW pump by:

- (1) controlling steam generator level by throttling valve V2-14a, and
- (2) adjusting AFW pump speed using the knurled knob.

While operation of the knurled knob may be within an operator's knowledge, NRC discussions with operators during walkthroughs of DSP-001 indicated confusion over the use of this knob to control pump speed and how adjustments of this knob would interface with the efforts to control steam generator level through valve adjustments. In addition, this step is in conflict with the system description provided by the licensee which indicates that adjustment of this knob without first removing control air supply could result in physical damage to the controller.

The licensee's response indicates that this step had been removed from the emergency operating procedures but the dedicated shutdown procedures had not yet been revised. In actuality, this unnecessary and inadequate step had been removed from the emergency operating procedures in November 1984. This revision to the emergency operating procedures therefore took place several months before the dedicated shutdown procedures were even written, and the licensee's implication that the associated revision of the dedicated shutdown procedures was pending is inappropriate. It is clear that the dedicated shutdown procedures did not have the same management attention as the emergency operating procedures.

Further, if, as the licensee asserts, its operators knew how to operate the AFW pump properly, review or walkthroughs of the dedicated shutdown procedures should have alerted plant personnel to the fact that procedural inconsistencies existed. This is another indication of the lack of plant staff and management involvement in these procedures.

NRC Conclusion

The instructions contained in DSP-001 did not provide for adequate guidance for controlling the AFW pump speed controllers as evidenced by the confusion experienced during the NRC inspection.

For the above reasons, the NRC staff concludes this example of the violation occurred as stated.

3. On March 24, 1987, DSP-011 contained an incorrect cable routing diagram for the repair of the PORV control power.

Summary of Licensee's Response

The licensee does not argue the accuracy of the statement, but does deny that any violation of a regulatory requirement occurred. The licensee indicated that it recognized the need for a revised diagram

as a result of a change to the doorway into the auxiliary building prior to the SSFI inspection. The licensee states that the walls did have penetrations through which the cables could be run. Additionally, the licensee states that measures were in progress to revise the procedure to include an updated drawing depicting the corrected cable routing.

NRC Evaluation

The licensee's response indicated that it was aware of the need to revise the cable routing diagram due to construction changes to the walls of the auxiliary building. Operators did have a draft revision of the revised diagram at the time of the SSFI inspection. The actual change in the wall, however, was completed on January 2, 1986. This is not a timely incorporation of a design change into procedures. Although a draft revision was available and may be acceptable for a brief period while a procedure was being revised, the NRC finds it unacceptable to rely on a draft (unapproved) diagram for an extended period of time.

The licensee indicated that six to eight hours would lapse before repairs needed to be implemented and that the Emergency Response Organization would be available to compensate for the incorrect diagram. However, the PORV repairs may need to be completed much earlier to support Hot Standby operations as addressed in DSP-001/002. Additionally, the licensee's commitment for Dedicated/Alternate Shutdown did not include the Emergency Response Organization/Technical Support Center (ERO/TSC).

NRC Conclusion

For the above reasons, the NRC staff concludes that this example of the violation occurred as stated.

4. On May 26-29, 1987, DSP-007 did not provide (1) specific acceptance criteria for parameters related to control and verification, (2) charts and tables required for performing necessary calculations and evaluations, and (3) the locations for local valves and breakers which were required to be operated.

Summary of Licensee's Response

The licensee states that the magnitude of fire that would require the use of DSP-007 would also require the activation of the Emergency Response Organization (ERO). Activation of the ERO would provide additional resources and personnel to assist and make recommendations for the continued safety of the plant.

The licensee argues that DSP-007 does provide specific parameters related to a controlled cooldown and depressurization of the reactor coolant system. The licensee states these parameters, when followed, allow acceptable operating conditions and that no other acceptance criteria is required.

The licensee states that the charts and tables referred to in the violation were included as references in the procedures and are available for use as needed.

The licensee states that its practice has been to list component identification within procedures. However, since the location of plant equipment is located on plant drawings, location information is typically not included in procedures due to the availability of drawings.

NRC Evaluation

See NRC Evaluation under B.1.

NRC Conclusion

See NRC conclusion under B.1.

B. Failure to Implement Procedures

1. As evidenced during the walkdown of DSP-002 and DSP-007, on May 26-29, 1987, the licensee's employees failed to properly implement procedures to demonstrate dedicated shutdown capability. The personnel could not readily locate essential valves and breakers; locate necessary repair equipment such as cables and instruments; locate security keys and access required areas; locate or properly utilize required charts and tables associated with the procedures; and were unfamiliar with specific setpoints and requirements such as minimum boron concentrations or the steam generator level high band.

Summary of Licensee's Response

With respect to DSP-002, the licensee denies that any operators had difficulty during the walkthrough of this procedure.

The licensee states that DSP-007 is used to achieve cold shutdown and would not be implemented until six to eight hours after a fire. With that in mind, the licensee states that the operators in the walkthroughs were given the impression by the NRC that this procedure was to be accomplished without delay and without the assistance from any personnel or resources not in the procedure. Once again the licensee indicates that a fire of this magnitude would require the activation of the Emergency Response Operator (ERO) and the Technical Support Center (TSC). This would provide additional personnel and resources to support Operations personnel.

The licensee states that only one operator can recall having difficulty in locating a specific valve or breaker. The operator did admit he was unsure and then, using available resources, did identify the valve location. The licensee states that one operator having difficulty does not constitute a programmatic breakdown. Additionally, the licensee states it believes it unreasonable for the NRC to impose unrealistic time constraints during walkthrough scenarios.

The licensee states that it does not require operators to memorize the locations for post fire repair equipment. The repair equipment would not be required for six to eight hours following a fire, at which time additional personnel would be available to assist.

The licensee states that none of the operators who participated during the NRC walkthroughs of dedicated shutdown procedures could recall any concerns about gaining access to locked rooms. Additionally, the licensee stated that procedures addressing immediate actions designate the keys required and for those procedures where longer term actions are required, normal key control is used.

The licensee states that only one operator recalled a concern with not being able to utilize charts and tables. The operator thought that the information was included with the dedicated shutdown procedures when, in fact, it was not. When questioned by the NRC as to where the information could be located, he responded properly.

The licensee states that it does not require operators to memorize specific parameters and setpoints which are readily available in procedures and reference material. The licensee believes that memorization of this type of information increases the likelihood of personnel error. Instead the licensee places emphasis on having the procedure available to guide the operators.

NRC Evaluation

During the SSFI followup inspection, May 26-29, 1987, the licensee indicated that the additional Dedicated/Alternate Shutdown training commitments had been satisfied and that the revised procedures were in draft. In an attempt to verify the adequacy of the upgrade training and procedures, the inspectors walked several operators, including one Senior Reactor Operator (SRO) selected by the licensee, through selected procedures.

The procedures used were DSP-002 (formerly DSP-001), Hot Standby using the Dedicated/Alternate Shutdown System, DSP-006, Cold Shutdown using the Dedicated/Alternate Shutdown System, and DSP-007, RHR Pump Power Repair Procedure. DSP-001 is used under fire conditions to place the reactor in Hot Standby within approximately one hour and DSP-006 is used to achieve Cold Shutdown within 72 hours, if normal equipment is lost. Dedicated shutdown repair procedures 006 through 012 are used to provide temporary power supplies to cooldown equipment such as RHR and to restore vital instrumentation and controls.

The inspectors recognized that Cold Shutdown under DSP-006 and -007 was an extended process not requiring the timely response of DSP-002. Participants were advised that this was not a timed evaluation and were walked through individually versus the team concept used during the SSFI. The walkthroughs indicated that operators were still unfamiliar with the contents of DSP-006 and -007 and with the locations of essential valves and breakers. It should be noted that these deficiencies were identified after the licensee had completed

the upgrade training on Dedicated/Alternate Shutdown. The licensee's response indicates that only one operator could recall difficulty in locating one valve. The fact is that during walkthroughs of DSP-007 and -006, an SRO had significant difficulty in locating numerous valves. In several instances the individual led inspectors to the wrong rooms and pointed out valves which were subsequently determined to be the wrong valves. He became disoriented and confused and admitted to the inspectors he was unfamiliar with the procedures and had never walked them through.

The licensee maintains that six to eight hours would lapse before it would be necessary to implement repair procedures. To maintain Hot Standby and natural circulation, DSP-001 (now DSP-002) requires implementation of the PORV repair procedure as soon as possible if the PORVs are not operable, and also indicates that the RHR pump and instrumentation repair procedures should be implemented if necessary. If the extent of the fire damage was sufficient to require Cold Shutdown, the operators would proceed from DSP-001 to DSP-006 to perform a natural circulation cooldown. The prerequisites for DSP-006 require that the repair procedures to restore RHR system operability have been initiated. In addition, SROs indicated that, if they knew the fire damage was sufficient to require Cold Shutdown, they would initiate the start of these repairs as soon as the reactor was in Hot Standby or within one hour.

The licensee also implies that the NRC conclusions were based on the inability of one operator to recall the location of several valves. During the SSFI walkthroughs, the inspectors used an entire shift, including operators and supervisors, in performing DSP-001. These personnel demonstrated a number of inadequacies in knowledge of the procedures and location and operation of equipment. This was despite the fact that the licensee had conducted rehearsal drills when they learned of plans to perform the walkthroughs. During the followup inspection walkthroughs of DSP-002, several operators were used. For the walkthroughs of DSP-006 and DSP-007, the licensee provided a staff SRO. Since the performance of DSP-006 and DSP-007 does not require the time constraints as in DSP-001 and DSP-002, the inspectors preferred to walkthrough one individual at a time versus a team. Since the licensee indicated the upgrade training on Dedicated/Alternate Shutdown was completed, and with the difficulties experienced by the SRO in completing the procedures, the NRC inspectors did not consider the testing of additional personnel was essential to demonstrate the need for more training.

This decision was also influenced by the licensee, who was reluctant to provide additional personnel due to manpower requirements for startup preparations. It should also be noted that since this individual was a staff SRO, the potential exists that he may have been one of the ERO/TSC members the licensee was relying on to assist operators in locating valves and equipment and performing Cold Shutdown.

Considering a worst case fire, certain plant repairs would be necessary to implement natural circulation cooldown and to achieve Cold Shutdown per Dedicated Shutdown Procedures. These repairs can be divided into three areas as follows:

- (1) Required for initiation of cooldown:
 - Connection of steam generator PORV long-term nitrogen supply
- (2) Required for reactor coolant system depressurization:
 - Installation of temporary PORV control cables and lineup of backup nitrogen supply (if required)
- (3) Required for RHR entry conditions:
 - RHR pump motor cable replacement;
 - Portable self contained fan units; and
 - Installation of RHR flow control, flow indication, and temperature monitoring equipment.

The licensee's submittal dated May 1984 indicated that the earliest time to implement the repairs to support activity (1) would not be for six to eight hours. It appears, however, that repair of the PORVs may be necessary much sooner to support the maintenance of Hot Standby. This submittal also indicated that ten operators would be available to direct the activities of post fire repairs and to achieve Cold Shutdown. Prior to the SSFI inspection, the operators had not been trained in the directing of maintenance personnel in Cold Shutdown repairs including the location of repair materials, the routes and methodology necessary to deliver the equipment to the appropriate plant locations, or the specific locations for repair connections of cables and instruments. As a result, the commitment to have operators direct the repair activities could not have been reasonably exercised. In addition, the maintenance personnel, who operators indicated to inspectors were actually responsible, had not received in-plant training on the delivery of materials, routing of cables, or the physical repairs or temporary connections. The inspectors did request operators to gain access to the warehouse, to point out delivery routes and access, and to point out cable routing paths and repair locations, all of which demonstrated deficient operator knowledge levels. Of greater concern, however, is that the licensee had not: (1) actually designated which group was responsible, (2) trained the personnel in-plant, and (3) preplanned the actions to be taken to achieve repairs and Cold Shutdown. Once again, the licensee's response relies heavily on support from the ERO/TSC to accomplish these evolutions and to compensate for inadequate procedures, training, and preplanning.

During the followup inspection, walkthroughs of DSP-006 and DSP-001 revealed several other concerns involving locks and access. At one point during the walkthrough of DSP-006, the SRO attempted to enter a locked room in the HP decontamination area to look for valves. He

did not have a key to the door and was not sure who would. This locked door was to a closet in which were located the penetrations necessary for routing the PORV repair control cable. Also encountered during the walkthroughs of the dedicated shutdown procedures and local valve operations were rooms requiring full dress out and a pathway labeled as a high radiation area. In both cases, the operators did not appear to be sure what actions would be necessary during a severe fire, i.e., to dress out or not, to use the high radiation path or seek an alternate path. Hopefully, HP technicians would be available at this point, but training and preplanning could avoid delays and or unnecessary exposures and contamination.

In implementation of repair procedure DSP-007, the inspectors observed additional deficiencies in training and preplanning. The warehouse was not manned and Operations personnel appeared to differ in opinion as to how access would be gained. There was, in fact, a delay in gaining access to the building which housed the Dedicated/Alternate Shutdown materials. Once access was gained, the operators were requested to point out the routes that would be used to deliver the cable reels and instrument carts to the required locations in the plant. The operators appeared unsure of the correct routes, and in some cases led inspectors through normal corridors that would be difficult to access with a fork lift, particularly during the loss of normal lighting and AC power. The operators also indicated paths that passed through locked perimeter gates for which they did not have keys and were unsure who would. We realize that as time progressed support personnel would be available to provide access although this might not be in time to support PORV repairs to maintain Hot Standby under DSP-001/002. The primary concern here, once again, is that the licensee committed to provide operators to direct the Cold Shutdown repair efforts, but did not provide training or adequate preplanning to ensure effective implementation and prevent confusion.

DSP-006, requires operators to use Curve 3.4, Reactor Coolant System Pressure-Temperature Limitations for Cooldown, and steam tables to ensure adequate subcooling margin in performance of natural circulation cooldown. The operator and inspectors were at the local control station when the requirement to begin using curve 3.4 was reached. The operator could not locate the curve in DSP-006. He then pointed out a different curve in a different dedicated shutdown procedure. This curve could not be used to maintain RCS pressure-temperature limits. The operator then indicated that the curve and steam tables were probably in a procedure envelope attached to the wall of the valve room; however, they were not. The operator indicated that the station curve book would be the only place he could obtain the curve. There is a station curve book in the control room, which under the scenario was inaccessible, and in the Operations Superintendent's office outside of the plant proper. The only available option was the Operations Superintendent's office and the inspectors accompanied the operator to that location. Even when the book was located, the operator did not demonstrate an adequate ability to find and use the curve. Once again, the licensee indicates that six to eight hours would be available permitting the assistance of the ERO/TSC. Procedures,

however, should be complete and provide the operator with the necessary charts and tables, particularly when they are intended for use in emergency conditions and outside of the main control room. It should be noted that charts and drawings are attached to other dedicated shutdown procedures, including DSP-001/002. Under severe fire conditions and recovery, an operator should not be expected to have to exit the plant to retrieve necessary charts and tables.

DSP-006 requires operators to verify RCS boron concentration is adequate to achieve Cold Shutdown. Three different licensed operators were asked what this concentration would be. The inspectors were given widely varying answers on what value PPM this would be. Since the procedure did not specify a specific value, as indicated in the licensee's response, and the operators had not been adequately trained, an adequate cold shutdown boron concentration could not have been insured. DSP-006 also indicates that feeding each steam generator to the high band will ensure adequate secondary water inventory prior to steam pressure decreasing below the minimum required to operate the AFW pump. Once again, the operators provided three different interpretations as to what was meant by "high band." Since a specific value was not provided in the procedure, and operator training was inadequate, adequate secondary water level could not have been assured. It should be noted that specific values are provided for other parameters in other dedicated shutdown procedures. The licensee again seeks to compensate for those inadequacies by taking credit for the availability of six to eight hours of time and the ERO/TSC for assistance.

NRC Conclusion

- (1) The inspectors did not impose unrealistic constraints on operators in the walkthroughs of DSP-006 and DSP-007.
- (2) There were multiple valves which could not be readily located and more than one operator was involved in these failures.
- (3) The upgraded operator training between the SSFI and the followup inspection was inadequate and did not include in-plant walkthroughs of DSP-006 and DSP-007. The training, however, was represented by the licensee as being complete.
- (4) The violation was not based on the inability of one operator to perform Dedicated/Alternate Shutdown.
- (5) Given the procedure conditions that were in existence from July 31, 1985 until the SSFI, the licensee's response on the assistance from the ERO/TSC is not reasonable for some scenarios and was not the commitment under Appendix R and Dedicated/Alternate Shutdown.
- (6) Operators (or maintenance) personnel had not been trained to direct or accomplish cold shutdown repair procedures including the location of repair equipment, equipment delivery routes and methodology, and connection locations for temporary power and instrumentation.

- (7) Despite the licensee's commitment made 2 years ago to provide ten operators to direct cold shutdown repairs, plant personnel were confused as to whether Operations or Maintenance was responsible for this area.
- (8) Access areas required for Dedicated/Alternate Shutdown were inaccessible. The operators did not have keys and did not know where to look for them.
- (9) Charts and tables essential for use of DSP-006 to perform natural circulation cooldown were not provided in the procedure or in the dedicated shutdown areas of the plant and operators were not familiar with the use of these curves.
- (10) Minimum boron concentration and the high band of steam generator level were not defined in DSP-006 and operators indicated widely varying opinions on these values to inspectors.

The NRC staff maintains that the licensee failed to adequately implement procedures to demonstrate the ability to perform Dedicated/Alternate Shutdown. For the above reasons, the NRC staff concludes the examples of the violation set out in this area occurred as stated.

2. On March 24-25, 1987, the implementation of DSP-001 was not adequate in that the necessary communications could not be accomplished. The portable radio system, the only communication system available under this dedicated shutdown procedure, could not provide adequate communications essential to the dedicated shutdown evolutions and coordination.

Summary of Licensee's Response

The licensee states that it was aware that radio communications required during dedicated shutdown at the time of the SSFI were not up to previously demonstrated capability. The licensee states that the acceptability of the portable radio system was determined based on testing. These tests revealed a few areas in the auxiliary building where communications were weak, but by moving around communications were possible. The licensee states that it is true that the portable radio system is the only practical means of communications during the first one-half hour of the event. However, after that operators would be stationed at locations where a sound powered phone system is available and thus a second means of communications would be available.

NRC Evaluation

In a February 1984 submittal, the licensee indicated that Dedicated/Alternate Shutdown communications would be accomplished via a portable radio system and the intercom. They also committed in this submittal to upgrade the communications capability for operators at remote locations. In a supplemental submittal dated June 6, 1984, the licensee indicated that Dedicated/Alternate Shutdown communications would consist of a combination of sound powered phones and

portable radios. This submittal also indicated that the routine usage of the portable radio system at H. B. Robinson provided reasonable assurance that they would be adequate for post fire safe shutdown. The NRC subsequently questioned the adequacy of the communications system to support the complex manual operator actions with the expected noise levels during post fire safe shutdown. The licensee once again stated that the use of these radios provides reasonable assurance that they would be adequate for post fire safe shutdown. Their submittals did not address numerous inadequacies in the licensee's communications network for Dedicated/Alternate Shutdown, including:

- (1) The intercom system addressed in the first submittal would not be available under DSP-001/002 because the power source is intentionally deenergized.
- (2) The sound powered phone system provides communications between only three Dedicated/Alternate control stations in the plant and cannot support the complex and manual operator actions required initially to achieve hot standby.
- (3) The portable radio repeater system was not powered from a redundant or safety-related supply. Until December 1987, the power supply was from MCC-5, a power source that would not be available with a fire in a specific zone and which also had an incorrect reenergization sequence procedure in DSP-001.
- (4) The portable radio system, until after the SSFI, did not have an installed repeater to enable transmission capability between plant areas.

During testing in 1985, the licensee became aware of the deficiencies in the ability of the portable radio system. The licensee indicated to inspectors that it was determined at that time that effective radio communications could be assured only between three specific locations in the plant. This information was not provided to the NRC although it related to the ability to support post fire safe shutdown. Additionally, this information was never incorporated into training on the Dedicated/Alternate Shutdown scheme. During the SSFI walk-throughs of DSP-001, the operators were observed having extreme difficulty communicating between the dedicated shutdown locations and the SRO who was directing the evolutions. The operators ran from area to area, climbed ladders and shouted in an effort to communicate.

It was also identified by the NRC that the direction provided for restoration of Motor Control Center (MCC) 5 following intentional deenergization of all onsite and offsite power, in accordance with Dedicated Shutdown Procedure (DSP-001), was incorrect and would not have resulted in restoration of power to MCC 5. The response at the time of the inspection was that MCC 5 was not necessary for Dedicated/Alternate Shutdown, but as reflected in the licensee's December 17, 1987 letter, MCC 5 was the only power supply for the portable radio system repeater.

NRC Conclusion

This lack of adequate communications constitutes a major impediment to safe shutdown capability considering the complexity and nonroutine nature of the evolutions, the necessity to complete certain actions before initiating others, and the commitment to have the SRO direct and control the effort from a central location. The licensee's response acknowledges that inadequate radio communications would exist during the first half hour of Dedicated/Alternate Shutdown, but places emphasis on the availability after that of the sound powered phone system. The manual operator actions taken during the first half hour are multiple and complex and must be coordinated. The NRC maintains its position in that the communications provided for Dedicated/Alternate Shutdown were inadequate. Based on the above reasons, the NRC staff concludes this example of the violation occurred as stated.

II. ARGUMENTS FOR MITIGATION OF CIVIL PENALTYSummary of Licensee's Response

The licensee states there are extenuating circumstances that justify mitigating the proposed civil penalty. First, the licensee states that 100 % reduction of the civil penalty is justified because of the plant's prior good performance in the fire protection area, as evidenced by the SALP Category 2 ratings in the two most recent SALP reports and the lack of any violations involving fire protection. Second, the licensee states that the NRC mischaracterized the licensee's corrective actions, which are asserted to be sufficiently prompt and effective, and satisfied its commitment to retrain the operators prior to power operation.

The licensee states that the facts described in the reply to the examples of the violation demonstrate that the specific issues do not involve a Severity Level III violation but are more appropriately characterized as a Severity Level IV violation. The licensee asserts that the NRC has not raised any issues which individually or collectively could have jeopardized the capability to safely shut down the plant. The licensee asserts that the ability to safely shut down the plant was recognized by Region II management in the enforcement conference held on June 26, 1987 and at the SALP board meeting held on October 13, 1987.

The licensee states that the situation at Robinson when compared to other recently issued fire protection enforcement actions taken (Susquehanna, Vermont Yankee, and Salem) demonstrates that the alleged violations at Robinson are simply not as safety-significant as the other three cases which involved redundant train separation violations. The licensee states that the Robinson violations are more comparable to the Severity Level IV violations given to St. Lucie in an NOV issued on May 22, 1985 which involved violations regarding emergency operating procedures for alternate shutdown.

The licensee argues for not imposing a civil penalty based on the lack of clarity in and the evolving nature of the NRC's fire protection requirements. The licensee states that the draft procedures were accepted by the NRC audit team in 1985 and the NRC had not provided guidance in Generic Letter 86-10 concerning such procedures.

NRC Evaluation

The licensee claims that additional reduction in the proposed civil penalty is justified based on the plant's good performance in the area of fire protection. The NRC originally proposed only partial mitigation when it issued this Notice. The NRC notes that the SSFI inspection was an in-depth inspection of the implementation of the procedures to safely shut down the facility in the event of a fire and thus focused on a different area than the inspections which formed the basis of the SALP report. The ratings given in SALP and the findings during routine inspections focus generally on the licensee's overall fire protection activities (i.e., maintenance of fire barriers and fire protection systems, establishment and implementation of fire watches where necessary, and the maintenance of good housekeeping practices). Therefore, the NRC concludes that only partial mitigation based on the plant's prior good performance in the general area of fire protection is appropriate.

With respect to the licensee's claim that it completed adequate corrective actions to retrain the operators prior to power operation, the NRC, prior to its follow-up inspection in May 1987, had contacted plant personnel to assure that the NRC inspection was not performed prior to the completion of the plant's re-training program. Based on assurances that the necessary re-training had taken place, the NRC conducted its follow-up inspection. While this inspection was performed prior to the plant resuming operation, there was no indication from plant personnel before or during the followup inspection that any additional training activities were planned by plant personnel. As discussed above, the training levels observed by NRC inspections at this time were inadequate. Therefore, the NRC considers that the follow-up inspection was conducted at an appropriate time and at that time the licensee's corrective actions had not been adequate to assure that operators could complete the actions necessary to accomplish dedicated shutdown in the event of a fire. Therefore, escalation of the base civil penalty is considered appropriate based on the licensee's inadequate corrective actions.

The NRC disagrees with the licensee's statement that in the SALP board meeting and the enforcement conference with the licensee, Region II management recognized the capability to safely shut down the plant. Rather, Region II had emphasized during these meetings the significance of deficient procedures, the lack of adequate operator training, the lack of adequate communications. These deficiencies when viewed collectively lead the NRC to conclude that, without further evaluation, the plant would not likely have been able to adequately conduct safe shutdown evolutions in the event of a fire. NRC walk-throughs of these procedures with plant operators, who would have been called upon to perform duties during an actual fire, demonstrated that these responsible personnel would not likely have been able to promptly accomplish the complex multiple actions required for safe shutdown.

The licensee asserts that the situation at Robinson is not as severe as those for which other enforcement actions have been taken. The licensee has compared the procedural, training, and communications deficiencies at Robinson with the failure to provide adequate separation of redundant trains at the other facilities. The NRC views the deficiencies at Robinson to be equally as significant as the physical hardware problems encountered at the other plants. The inability of plant personnel to perform the necessary steps to assure the safe shutdown of the plant in the event of a fire is considered to be as safety significant as the failure to provide adequate physical separation for one train of systems necessary to achieve and maintain hot shutdown. Both of these situations involve the potential inability of the plant to achieve and maintain hot shutdown conditions in the event of a fire. Therefore, the NRC concludes that the Severity Level III classification for the Robinson violations is appropriate and is consistent with the enforcement actions taken for other fire protection violations.

The licensee argues that the lack of clarity and the evolving nature of the fire protection requirements are facts for which the NRC should consider to not impose the civil penalty. The NRC does not consider the requirements for placing procedures in effect to implement the alternative and dedicated shutdown capability, specified in 10 CFR Part 50, Appendix R, Section III.L, as lacking clarity or having an evolving nature. Implicit in the requirement to establish these procedures was the understanding that the procedures would be adequate and that personnel would be trained in the use of the procedures. The procedures themselves had numerous deficiencies. In addition, although the licensee had done some training of personnel, this training was inadequate to enable the personnel to complete the necessary actions called out by the procedures when the procedures were demonstrated in the presence of NRC inspectors. The difficulties encountered by the plant personnel demonstrated the inadequacies in the training, procedures, and communications to cope with a fire in certain plant areas.

The review of the draft procedures in 1985 had no bearing on the deficiencies identified in the implementation of the procedures found in the March - May, 1987 inspections. The NRC noted in the inspection report in 1985 that the procedures were only in draft form and that the actual training had yet to be done. The NRC recognizes that a lack of specific procedural guidance can sometimes be compensated by the use of personnel training which would instruct personnel in the proper performance of the procedure. However, in the case at Robinson, even if the procedures had been adequate, the failure to provide proper training caused a condition in which it was questionable whether the procedures could be satisfactorily accomplished.

III. NRC CONCLUSIONS

The Staff emphasizes that the examples of the violation taken as a whole, including inadequate training, communications, and procedures, raises a safety concern and warrants the severity level of the violation. It is clear that licensee management, particularly at the program implementation level, was not sensitive to the importance of 10 CFR Part 50, Appendix R, requirements and the necessity to assure continued safe shutdown capability. From these violations it is clear that the review of fire protection procedures and the training on these procedures did not receive adequate plant staff or licensee management attention.

The results of the SSFI indicated, and continues to indicate, that the initial training, procedures, and communications were inadequate to reasonably assure safe shutdown capability and have been inadequate since implementation in July 1985. Additionally, from the implementation date until the SSFI was conducted, there had been no upgrades to operator or maintenance training, no requalification training, no revisions to the dedicated shutdown procedures, and no substantial improvements to radio communications.

There were many technical and human factors deficiencies observed in the dedicated shutdown procedures, which at the time of the inspection had been implemented for nearly two years. Incorrect or inadequate direction in any emergency procedures can contribute to operator stress and personnel error, particularly under the stress and environmental working conditions experienced during a fire. When considered with the other existing deficiencies in operator training and communications, it remains unlikely that the licensee could have effectively carried out safe shutdown of the plant under postulated fire conditions.

Of concern to the NRC is that even after numerous deficiencies were identified during the first week of the SSFI, the operations effort at upgrading training and procedures appeared minimal and was more directed toward correcting items identified by the inspectors than truly upgrading the Dedicated/Alternate Shutdown capability. Only two operations staff members were assigned to complete both training and procedures upgrade. The training staff was not utilized during this effort and operator training was primarily conducted in the classroom environment and not actually in the plant. During the followup inspection, the operations staff indicated to the inspectors that training had been completed. However, during subsequent walkthroughs with operators using the revised dedicated shutdown procedures, there continued to be deficiencies noted which indicated that in-plant walkthroughs were not included in the training. During the followup inspection, plant management committed to provide 16 hours of additional training including eight hours of in-plant walkthroughs of all dedicated shutdown procedures.

The licensee's response to the Notice of Violation and Proposed Imposition of Civil Penalty emphasizes the inspection findings in NRC Inspection Report 85-07 and the role of the Emergency Response Organization (ERO) in supporting dedicated shutdown. However, Inspection Report 85-07 was considered a pre-audit and inconclusive in that the licensee's dedicated shutdown procedures were in draft form and operations and maintenance training had not been conducted. The Inspector Follow-up Items that were referenced, in some cases, may have been violations if the procedures had been approved and the program implemented. The licensee was also informed that final inspection of the procedures could not be completed until the procedures were approved. Heavy reliance on the ERO to achieve dedicated shutdown is also cause for concern. While the engineers and personnel in the Technical Support Center (TSC) are intended to assist operators in the mitigation and recovery from accidents, it was never intended that the ERC would be utilized to compensate for inadequate Dedicated/Alternate Shutdown procedures, training, and communications.

The NRC staff has concluded for the reasons stated above that the violation occurred as stated in the Notice of Violation and Proposed Imposition of Civil Penalty. A sufficient basis for mitigation of the proposed \$ 50,000 civil penalty has not been provided by the licensee. Accordingly, a civil penalty in the amount of Fifty Thousand Dollars (\$50,000) should be imposed.

VIOLATION II

Enclosure 2

Restatement of Violation II (Non-Civil Penalty)

10 CFR Part 50, Appendix R, Section III.J, requires, in part, that emergency lighting units with at least an eight-hour battery supply shall be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

Contrary to the above, on March 24-25, 1987, emergency lighting units were not provided in several areas needed for operation of safe shutdown equipment. These areas included the dedicated shutdown diesel enclosure and local operating panel, and the auxiliary feedwater (AFW) local control area. Subsequent reviews by the licensee noted additional dedicated shutdown areas where emergency lighting was nonexistent, inadequate, or improperly directed and also noted a large number of emergency lights and battery packs out for maintenance.

Summary of Licensee's Response

The licensee denies the violation as pertaining to the lack of emergency lighting provided in the dedicated shutdown diesel enclosure and local operating panel, and the AFW local control area. The licensee concurs with the NRC in its evaluation of the violation for nonexistent, inadequate or improperly directed lighting for the additional dedicated shutdown areas.

NRC Evaluation

The licensee in its response states that the dedicated shutdown diesel is remotely started and operated from the 4 kV switchgear room. This method of operation was previously approved in the August 8, 1984, Safety Evaluation Report. While attempting to perform a surveillance test during the SSFI, the operators were unable to start the dedicated shutdown diesel. Upon the failure to start, operators were dispatched to the dedicated shutdown diesel enclosure and local operating panel. Subsequent investigation revealed that the previous surveillance test had left the remote/local switch in the local position.

While the NRC agrees that the dedicated shutdown diesel may be operated remotely, without adequate assurance that maintenance or surveillance activities will not defeat the remote starting capability, the diesel may, in some cases, need to be started using the local operating panel. As was evident during the SSFI, operator action at the local operating panel was necessary to start the diesel. In addition, protracted run times may require adjustments and the monitoring of the diesel parameters. Thus, because operator actions in the diesel enclosure may be needed for the safe operation of the diesel, emergency lighting is necessary.

With regard to the emergency lighting in the auxiliary feedwater local control area, the licensee claims that action in this area is not necessary and therefore emergency lighting is not required. At the time of the NRC inspection, DSP-001, Step 5.1. specified operator actions at the local control panel. The NRC inspection revealed that appropriate emergency lighting had not been provided in this area. It was for this lack of emergency lighting in an area where the licensee's procedures required operator actions for which this example of a violation was cited. While later evaluations showed that operator actions in this area were not necessary, this has no bearing on the fact that, during the NRC inspection, operator actions had been specified in procedures in an area which did not have the appropriate emergency lighting.

As a result of the NRC inspection, the licensee identified other areas with deficient emergency lighting in areas called for in procedures.

The deficiencies in the emergency lighting could have been identified during a blackout evaluation in 1985. This evaluation resulted in a June 16, 1985, submittal to the NRC requesting exemption from Section III.J of Appendix R requirements for two specific areas identified as deficient in the licensee's evaluation. However, these were not the same areas identified in the post-SSFI evaluation as inadequate.

NRC Conclusion

For the above reason, the NRC staff concludes that the violation for failure to provide emergency lighting units in required areas, including the dedicated shutdown diesel enclosure, and the local operating panel, as well as the auxiliary feedwater pump local control area, as well as others, occurred as stated.

Carolina Power and Light Company

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