



**Commonwealth Edison**

Zion Generating Station  
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0040

May 4, 1990

Mr. A. Bert Davis  
Regional Administrator  
Region III  
U. S. Nuclear Regulatory Commission  
Glen Ellyn, IL 60137

Subject: Zion Station Units 1 and 2  
Response to Inspection Report  
50-295/90004 and 50-304/90004  
NRC Docket Nos. 50-295 and 50-304

Reference: April 4, 1990, letter from A. B. Davis to Cordell Reed

Dear Mr. Davis,

This letter provides the Commonwealth Edison response to the Emergency Operating Procedure Inspection Report provided in the reference. Attachment 1 contains the response to the four open items from the Inspection Report.

To fully address the concerns and weaknesses in the Inspection Report for which no response is required, Zion Station has analyzed and chosen to provide a response to those items as well. This response is contained in Attachment 2. The Inspection Report provided detailed comments on the Zion Station Emergency Operating Procedures in Appendix B. Attachment 3 to this letter addresses those comments. The Inspection Report also contained examples of human factors findings in Appendix C. Attachment 4 to this letter contains a response to those findings.

Commonwealth Edison welcomes the Staff's thorough observations concerning the Zion Station Emergency Operating Procedures. The Attachments to this letter describe the process that Zion will use to continue to enhance the Emergency Operating Procedures.

Please direct any questions concerning this matter to this office.

Very truly yours,

T. J. Kovach  
Nuclear Licensing Manager

RAC/rmd

cc: C. Patel - NRR  
Zion Resident Inspector  
Office of Nuclear Reactor Safety - IDNS

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ATTACHMENT 1

2. EMERGENCY OPERATING PROCEDURES

2.C.(1) DESKTOP REVIEW - OPEN ITEM 295/90004-01; 304/90004-01

The following items correspond to open items from section 2 of the Inspection Report. The response actions described below, and any EOP procedural changes associated with these items, will be completed by September 1, 1990, except as noted. Procedural changes associated with the Zion Administrative Procedure (ZAPs) will be completed by October 1, 1990.

CONCERN:

The Zion Critical Safety Function (CSF) status Tree F.0.1, "Subcriticality" contains a caution stating that if the reactor cavity fans are lost, the nuclear instrumentation may be unreliable and an assessment of reactor status should be performed before continuing with the procedure. No guidance is given on how the assessment should be performed. This status tree transitions to the ATWS procedure on an orange or red path and the timeliness of this transition is important. The licensee agreed to assess the need for including assessment criteria or delete the caution.

RESPONSE:

At this time, the intent of Zion Station is to remove the Caution from F-0.1. A review will be made to determine if the information within the Caution should be inserted within FR-S.1, located after action steps have been taken to mitigate the ATWS.

CONCERN:

Tripping the Reactor Coolant Pumps is a contingency action in the ERG for E-0, "Reactor Trip or Safety Injection" if containment spray is required. In the ERG, this is an immediate action step (which the operator is to commit to memory). This is not an immediate action step in the corresponding Zion EOP. The licensee stated that this action is identified on the EOP foldout page and would be performed if required. The inspector's concern was that the foldout page is not committed to memory and some delay in execution could occur. The licensee needs to reassess their position on this issue.

RESPONSE:

Zion station agrees that this action should be an action committed to memory. Tripping the RCPs when containment pressure has been greater than 23 psig, the Phase B actuation setpoint, will be included as an immediate action step of E-0.

ATTACHMENT 1 (Cont)

2.C.(1) DESKTOP REVIEW (Cont)

CONCERN:

EOP ES-0.1. "Reactor Trip Response" provides no plant specific means for restoring power to the service buses as required by the ERGs. The licensee agreed to assess this issue for an appropriate EOP change; however, the licensee was waiting for a response to the station blackout analysis which could impact this step.

RESPONSE:

This step will be rewritten to incorporate the appropriate actions for restoring power to service buses.

CONCERN:

Step 4 of the ERG for FR-3.1, "Response to Nuclear Power Generation/ATWS", initiates emergency boration and is an immediate action step. A substep of step 4 in the ERG requires that the pressurizer pressure be verified less than the PORV pressure setpoint. This assures adequate injection flow. The corresponding Zion EOP incorporated this substep as a high level step not designated as an immediate action. The inspector's concern was that an adequate boration rate must be established quickly and the pressurizer pressure can impact this rate. The licensee agreed to assess this issue.

RESPONSE:

Zion station agrees that this action should be an action committed to memory. Verifying that the Pressurizer (PZR) PORVs and block valves are open (if required, depending on PZR pressure) will be included as an immediate action step.

CONCERN:

In step 11.d of EOP E-1, "Loss of Reactor or Secondary Coolant" Zion stops all but one containment spray pump. The equivalent ERG step specifies stopping all pumps. The deviation document stated that the reason for this was that the Standard Review Plan required running the containment spray pumps for at least two hours. The licensee stated that this practice at Zion predated the implementation of the ERGs. The inspector's concern was that unnecessary operation of the spray pumps could result in instrumentation problems and unnecessary drawdown of the RWST. The licensee agreed to reassess this issue.

## ATTACHMENT 1 (Cont)

### 2.C.(1) DESKTOP REVIEW

#### RESPONSE:

The step to maintain containment spray operation for at least two hours after spray initiation was included in the Zion Emergency procedures prior to implementation of the Westinghouse Owners Group (WOG) ERGs. The Standard Review Plan and the WOG ERGs are in conflict regarding operation of the containment spray system. The Standard Review Plan states that the containment spray must operate for at least two hours; whereas the ERGs allow stopping containment spray when containment pressure has been reduced to less than the spray actuation setpoint. The basis for operating containment spray for at least two hours (after spray initiation) needs to be evaluated to determine if containment spray can be terminated when containment pressure is less than the spray actuation setpoint. This issue will be evaluated for the appropriate procedure changes. An initial evaluation will be completed by September 1, 1990. At that time, Commonwealth Edison will initiate a teleconference between NRC and the WOG to ensure concurrence. An implementation date will be determined during the teleconference.

#### CONCERN:

During the initial phase of core cooling, suction is taken from the RWST. When the RWST low level is reached, the suction source is switched to the containment sump in the recirculation mode. In two cases (loss of recirculation capability and LOCA outside of containment), the RWST is the only source of water for injection. Since the drawdown rate on the RWST may be considerably higher than the rate at which it can be refilled, makeup should be initiated as quickly as possible to maximize the length of time it is available as a suction source. The only Zion EOP explicitly directing the refill of the RWST is ECA-1.1, "loss of Emergency Coolant Recirculation". The other EOPs in the E-1 series (loss of reactor or secondary coolant), in most cases, contain steps directing the technical support center to assess the need to refill the RWST. However, in some cases these steps may not be reached due to transitions to other procedures. The licensee agreed to review this issue for potential procedure changes.

#### RESPONSE

From an initial review, it appears that the only procedure that may require a step to refill the RWST is ECA-1.2. All other transitions from E-0 that require an evaluation for refill of the RWST (ECA-3.1, E-2 and ECA-2.1) either have the appropriate step or return to E-1 in a timely manner. A review will be made to determine what procedures this step should be added to.

ATTACHMENT 1 (Cont)

2.C.(2) WALKDOWNS - OPEN ITEM 295/90004-02; 304/90004-02

CONCERN:

During the walkdown of in-plant tasks, there were some problems encountered by operators in locating valves in the vertical pipe chase (VPC). Valve locations in one procedure were found to be incorrect, providing line penetration levels instead of correct levels for valve access.

RESPONSE:

The procedure that was identified with incorrect valve locations, ECA-0.0, has been corrected under procedure change number 0-90-0098.

CONCERN:

During the walkdowns, it was also determined that effective methods were not in place for providing equipment operators with a written list of local tasks to be performed during implementation of the EOPs. Typically, Control Room operators reported that they would make a photocopy of pertinent pages to send with the equipment operator, or communicate each step over the phone or radio. This does not take into account situations where the copy machine may be unavailable, or communications may be poor as noted above.

RESPONSE:

Zion station intends to provide its operators with the best possible tools for implementation of the Emergency Operating Procedures. To aid local operators in the performance of their tasks, Zion will develop a file which contains controlled copies of the EOPs. The local operators will then have available those copies to use in the performance of required actions.

ATTACHMENT 1 (Cont)

CONCERN:

Equipment Labeling - The licensee has a labeling upgrade program in progress. This has apparently been pursued on a relatively low priority basis. The priority for labeling equipment that may need to be operated locally during casualty situations should be increased.

RESPONSE:

Zion has had an extensive labeling program in place since 1988. Most areas of the station have been re-labeled to standards described in Zion Administrative Procedure (ZAP) 10-52-6 "Painting, Valve Tagging and Labeling Procedure".

Tagging and labeling priorities since the inception of the labeling program have been associated with Zion's Detailed Control Room Design Review (DCRDR), valves and equipment described in the Fire Operating Procedures (FOPs), electric power distribution systems, and piping and mechanical components.

Zion has reviewed the inspectors concerns regarding labeling of equipment that may need to be operated locally during casualty situations. Labeling of this equipment will be upgraded. To implement this program, Zion will develop lists of EOP equipment required to be locally operated. This list will be prioritized by anticipated need. Equipment on this list will then be inspected for adequate labeling. Those deemed insufficient will have high visibility color coded tags installed. The prioritized lists of equipment will be developed by August 31, 1990. All upgraded labels will be installed by August 31, 1991.

CONCERN:

Lighting - The licensee needs to improve normal and emergency lighting for local operations. Some emphasis should be placed on emergency lighting in areas containing equipment that must be operated locally during the loss of all AC power (ECA-0.0, ECA-0.1, and ECA-0.2).

## ATTACHMENT 1 (Cont)

### RESPONSE:

Emergency battery packs were installed in the vertical pipe chase under two previous modifications. Surveys in the areas of the Containment Spray (CS), Safety Injection (SI), and Residual Heat Removal (RHR) pump rooms confirmed that there were no emergency lights. The Charging pump rooms each have two bulbs in them supplied from battery packs located outside the room. The Spent Fuel pit heat exchanger room has one bulb in it that is supplied from an emergency diesel driven bus.

These surveys indicate that additional personal lighting is still desirable because equipment placement obscures vision. Zion currently has over 100 battery emergency lights in the Aux. Building now. Adding more battery packs may create additional problems. As an example, the battery packs are only rated for 8 hours and there are some local operator actions in the EOPs that may exceed 8 hours. EOP operations in the above areas can be accomplished with more flexibility using long discharge duration handheld lighting, i.e. miner's hats, or 8 hour big beam flashlights. Such equipment presently exists on shift in the Fire Operating Procedure (FOP) cabinet. Local operators will be trained to use this cabinet, or one like it, to obtain their copies of procedures and needed emergency lighting.

As part of other corrective actions in this report, Zion will be developing a list of equipment requiring local operator actions. After this list of equipment is developed, a review will be completed for normal and emergency lighting in those areas noted in the inspectors concern. This review will be completed by June 1, 1991.

Where deficient conditions are found, solutions will be sought. If modifications to correct noted deficiencies are needed, they will be developed and implemented.

### CONCERN:

Communications - The licensee should evaluate the adequacy of communications between the control room and personnel performing actions in the field during casualty events. This includes not only verbal communications (telephone and radio) but the availability of written instructions to the local operators.

### RESPONSE

The availability of written instructions for local operators has been addressed in response to labeling concerns described earlier. To improve communication between personnel located at different locations within the plant, interim and long term measures have been established. Inoperable telephones in the vertical pipe chase will be repaired by September 1, 1990.

## ATTACHMENT 1 (Cont)

### INTERIM MEASURES:

Electrical and Instrument Maintenance Departments dispatched a team of maintenance personnel to troubleshoot the Sound Powered Phone system. Currently, all eight (8) channels are operational without crosstalk and with increased volume.

More efficient portable radios were ordered from Motorola to replace the radios used by Operating personnel. These radios will improve the transmitting and receiving of communication due to their capability of penetrating into areas not sufficiently reached by the radios currently used by Operating personnel. These radios have arrived at the site. Separate channels are being established for Security, Operating and the Fire Watch to prevent crosstalk between these departments.

### LONG TERM MEASURES:

System Electrical Engineering has been researching solutions to the interference problems for all CECO Nuclear facilities; and has concluded that a "Trunking Radio System" would eliminate interference problems and vastly improve radio communications. Motorola was contacted to design a trunking radio system for Commonwealth Edison nuclear generating stations. Presently, Motorola has furnished Edison with preliminary system design; and System Electrical Engineering has obtained radio frequency licenses for each nuclear generating station from the Federal Communications Commission. Motorola's preliminary estimate of equipment availability is for the 4th quarter 1991, and installation/implementation thereafter in 1992 or 1993.



3. TRAINING AND QUALIFICATION EFFECTIVENESS - OPEN ITEM 295/90004-03:  
304/90004-03

Training issues identified during this inspection are discussed in Paragraphs 2.c.(2), 2.c.(3), and 2.d.(3). These concerns are summarized below:

CONCERN:

Licensed Operator Training - The operators expressed a need for more training in the EOP basis documents and the contingency and function restoration procedures. Inspector observations during the simulator exercises confirmed this need for more training in procedure transitions and control room protocol.

RESPONSE

In 1989, approximately thirty-two hours of lecture time was devoted to EOP related training, but did not specifically focus on EOP basis training. The licensed operator EOP training for 1990 has been enhanced to increase the emphasis on the basis for EOPs. Starting with EOP training in December of 1989 and continuing in 1990, the simulator classroom training sessions have been devoted to EOP basis training. Consequently, Zion Station has allocated thirty hours of Licensed Operator Re-Training (LORT) classroom training for EOP basis training in 1990. Eighteen hours of this training have already been completed.

Simulator training scenarios have been enhanced during 1990, to include casualties of sufficient complexity to provide for ES, FR and ECA procedure entry and transitions.

Zion station has completed an informal verbal poll to obtain input from licensed personnel in the retraining classes regarding control room protocol. This data will be reviewed by a multi-disciplined management group, including the operations group, procedures group, and training in order to generate appropriate revisions to Zion Administrative Procedure (ZAP) 5-51-3A "Use of Procedures in Operating Department". This review will be completed by July 2, 1990. Simulator training will be structured to implement the guidance of the revised procedure.

ATTACHMENT 1 (Cont)

CONCERN:

Non-licensed operator training - During the walkdowns of local operations, a need was identified for more equipment operator training on the location of equipment that may need to be operated locally during a casualty event. Because the list of equipment is extensive, this training should also include the use of available resources for quickly locating equipment if its location is not immediately known to the operator.

RESPONSE

The station non-licensed operator training schedule will include walkdowns of local actions specified by the EOPs, beginning with ECA-0.0. This procedure has been identified as requiring the largest number of local operator actions. This training will be completed by December 31, 1990. This training will be followed by continuing training designed to maintain non-licensed operator proficiency with local operator actions specified by the EOPs, including the use of resources available to locate in-plant equipment.

ATTACHMENT 1 (Cont)

4. QUALITY VERIFICATION EFFECTIVENESS OPEN ITEM 295/90004-04; 304/90004-04

CONCERN:

The licensee's efforts in this area were considered to be weak. No independent in-depth technical audit of the EOPs had been conducted until February 1990. The limited scope of this audit precluded the identification of some concerns identified by the inspection team. Specifically, the audit did not cover field activities or training adequacy.

Where the audit did cover areas inspected by this inspection team, it did not identify similar concerns. Specifically, those concerns relating to E-0, E-1, and FR-S.1 (see paragraph 2.c.(1) and Appendix B). The audit did identify several concerns which were resolved.

RESPONSE

Although past audits of Zion Emergency Operating Procedures (EOPs) identified deficiencies, the technical aspects were not stressed. This point is attributable, at least in part, to the fact that the EOPs were under a major rewrite to the WOG Emergency Restoration Guideline Rev. 1A between January of 1988, and February 1989.

To establish better audit coverage, standard checklists were developed for all areas as part of the 1990, Nuclear Division audit program. The checklists covering EOPs should assure that significant elements of the program are examined. Furthermore, a source document is being developed that will identify and prioritize requirements to be audited and specify audit frequencies and depth of audits based on past results. Also, new requirements will be factored into the source document and consequently the audit program.

Although QA audits currently have a "performance based" emphasis, additional training has been scheduled for all Quality Program's personnel to further stress the performance based audit concept. The consultant being used in this effort is the same one that has developed the NRC's performance based training program.

ATTACHMENT 2

RESPONSE TO ADDITIONAL AREAS OF CONCERN

2.C.(3) SIMULATOR EXERCISES

CONCERN:

There appeared to be no strict protocol for the reading of steps, cautions and notes which was inconsistent with reported station policy requiring verbatim reading of all substeps, notes and cautions during the performance of the EOPs. This was not evident in many of the scenarios in that notes or cautions were not always read and at times substeps were not read. In addition, steps, notes or cautions were sometimes paraphrased vice being read verbatim. The station policy of repeat-backs was inconsistently applied, ranging from excellent to no feedback at all. At times, the procedure reader did not maintain eye contact with the operator directed to perform actions which lead to operators crossing paths to perform tasks not clearly assigned.

RESPONSE:

Zion Station has completed an informal verbal poll in order to obtain input from licensed personnel in the retraining classes regarding control room protocol. This data will be reviewed by a multi-disciplined management group, including the operations group, procedures group, and training in order to generate appropriate revisions to Zion Administrative Procedure (ZAP) 5-51-3A "Use of Procedures in Operating Department". This review will be completed by July 2, 1990. Simulator training will be structured to implement the guidance of the revised procedure.

CONCERN:

The transitions were generally correct, however, one crew had confusion on whether to transition to FR-H.1 "Loss of Heat Sink: when the capacity to feed the steam generators was lost with sufficient level only in a ruptured steam generator. Another instance was a transition to E-2 "Faulted Steam Generator Isolation," performance of steps in E-2, and then a transition back to E-0 "Reactor Trip or Safety injection: without completion of E-2 or using ES-0.0 "Rediagnosis".

RESPONSE:

Simulator training scenarios have been enhanced during 1990, to include casualties of sufficient complexity to provide for ES, FR and ECA procedure entry and transitions.

ATTACHMENT 2 (cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

CONCERN:

At the simulator, three copies of the EOPs were available for the crew's use. The facility must ensure that the same availability of EOPs is used during training as is available in the control room. At times during the simulator scenarios all the operators were reading the procedures and no one was monitoring plant parameters.

RESPONSE:

Zion will ensure the same availability of EOPs in both the control room and at the simulator. Regarding operators reading the procedures and not monitoring the control board while on the simulator, Zion's policy is that operators are responsible for monitoring the instrumentation and controls located within their area. All licensed and non-licensed supervisors and operators on shift must be aware of the plant status at all times. Training will continue to monitor crew performance in this area during simulator sessions.

CONCERN:

During a Steam Generator Rupture scenario, the accumulators were allowed to inject into the Reactor Coolant System. The cause of this appears to be the looping during the steps for securing the Safety Injection (SI) pumps. The ERGs only check for sufficient subcooling and not "pressure stable or increasing" as in the Zion EOPs.

RESPONSE:

According to the basis for the accumulator isolation step of LCA-3.1, the accumulators "should be isolated during RCS depressurization prior to reaching the accumulator nitrogen pressure in the RCS to prevent unnecessary discharge". The two substeps at the end of each step of the SI reduction steps were added based on the knowledge items described in the WOG Background of those steps, specifically, (1) to verify subcooling is maintained and (2) to wait for RCS pressure to stabilize before stopping another ECCS pump. An evaluation will be made to determine where these two substeps may be relocated within the procedure to preclude unnecessary discharge of the accumulators.

ATTACHMENT 2 (Cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

CONCERN:

During one scenario, the crew was concerned about the steam generators depressurizing. The cause was due to an operator continuing the cooldown of the plant. Some confusion was generated until the Shift Engineer diagnosed the problem.

RESPONSE:

Zion has reviewed this concern and has determined this to have been an isolated case involving only one individual. The procedure involved was reviewed and found to be adequate.

CONCERN:

Step 4c of E-3 "Steam Generator Tube Rupture" requires securing the Turbine Driven Auxiliary Feedwater Pump if either steam generator B or C is ruptured. This logic is not the desired action; this RNO should only apply if the steam supply from either A or D steam generator can not be closed.

RESPONSE

This step will be reworded to isolate steam to the Turbine Driven AFW pump only if the steam supply from either A or D steam generator can not be closed.

2.C.(4) VERIFICATION AND VALIDATION

CONCERN:

One strength identified in this area was the inclusion of all operating procedures in the validation program (a weakness found at many other facilities). At the same time, a weakness was identified in the validation program in that it did not emphasize the walkdown methodology for field activities. Most of the inspector concerns identified in Paragraph 2.c.(2) could have been identified by the licensee if the walkdown methodology had been used more extensively.

RESPONSE:

ZAP 5-51-5A, Procedure Validation is being revised to include a walkdown of local operator actions as a requirement. The criteria evaluated during walkdown validation will include required tools, equipment labels, adequate normal and emergency lighting, and communication with the control room.

## ATTACHMENT 2 (cont)

### RESPONSE TO ADDITIONAL AREAS OF CONCERN

#### CONCERN:

The Safety Evaluation for the Zion Procedures Generation Package was issued subsequent to this inspection (Chardu P. Patel, NRR to Thomas J. Kovach, CECO dated March 13, 1990). This Safety Evaluation noted some concerns with the verification and validation program. It appeared that at least some of these concerns had been addressed by the licensee; however, the licensee should carefully review these concerns to assure that they all have been addressed.

#### RESPONSE

All concerns relating to verification and validation that were presented in the Safety Evaluation for the Zion Procedures Generation Package will be reviewed and addressed by October 1, 1990.

#### 2.D HUMAN FACTORS REVIEW

The following responses correspond to item 2.d, Human Factors Review. Procedure changes to the EOPs that are associated with the following items will be made on an ongoing basis and will be fully completed by February 1, 1991. Responses to the items in Appendix C are contained in Attachment 4 of this response. The EOP Writer's Guide will be enhanced to reflect the concerns presented from these items. The procedure change to the Writer's Guide will be completed by October 1, 1990.

#### 2.D (1) GENERAL EOP COMMENTS

Cautions and Notes - Cautions should be used to alert operators to hazardous conditions that may cause injury or equipment damage, and should describe the consequence of the hazard. Notes should be used to present supplemental information to the operator. Neither cautions or notes should contain action statements. In many cases, however, Zion's EOPs contain cautions and notes that are actually recurrent or contingent action steps. For example, "If CST level is less than 0.5 feet, SW must be supplied to the AFW pumps..." Hazards or potential consequences of actions (or inactions) are presented infrequently. Cautions were also found that contained non-critical information which serves to dilute the importance given to them by the operators.

ATTACHMENT 2 (Cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

2.D.(1) GENERAL EOP COMMENTS

RESPONSE:

Zion Station agrees that required operator actions should not be contained within a Caution or Note. However, there are required operator actions that apply throughout an entire procedure, as is the case given as the example in the NRC report; "If CST level is less than 0.5 feet, SW must be supplied to the AFW pumps..." Since there is a step on the foldout pages that provides instruction to perform this action, this caution is not viewed as containing the required action, but as a reminder to perform the action, if the action must be performed prior to reading the step in the procedure. Recognizing that the example Caution could be interpreted as an action without specific instruction, all Cautions of this type in the EOPs will be revised to provide the consequences of the potential hazard; e.g. "Cavitation of the AFW pumps may occur when the CST level is less than 0.5 feet. AOP- 4.3 provides instructions for aligning SW to the AFW pumps."

All cautions and notes in the EOPs will be reviewed for content of information.

CONCERN:

Use of Logic Terms - Logic statements are used to describe a set of conditions that must be assessed by the operator or a sequence of actions that must be performed. Because decisions can be difficult to make during emergency situations, it is critical that logic statements be clearly, consistently and appropriately used. When action steps are contingent upon certain conditions, the step should begin with the description of the condition. In many cases, however, Zion procedures began the statement with the action term followed by the condition. For example, "Stop depressurization IF any of the following occur.." In most instances, this structure was used in cases where the action could only be performed if the conditional statement was met, (for example "Reset si, IF actuated"). Therefore, this practice did not pose a serious potential for causing actions to be performed inadvertently by the operators. It does, however, establish a poor precedent for structuring conditional statements that could result in misleading instructional steps. There were also some cases where conditional statements contained more than one condition which makes it difficult to determine whether the contingent action should be performed.

RESPONSE:

The EOPs will be revised so that the conditional logic terms precede the action. The Writer's Guide will be revised to delete allowing steps to contain logic terms preceding the action.



ATTACHMENT 2 (Cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

2.D.(1) GENERAL EOP COMMENTS

CONCERN:

Step Structure - Zion's EOPs follow the Westinghouse ERG format of providing high level steps followed by lower level substeps that describe the specific actions that must be performed to accomplish each high level step. In many cases, the generic guidelines provide substeps that must actually be performed prior to the specific action described in the high level step (i.e. verification of pump start criteria before actually starting the pump). In other cases, substeps describe actions which are not totally consistent with the high level step wording. In many cases, Zion has reworded steps to prevent possible confusion; however, there are still a number of steps that contain this flaw.

RESPONSE:

The high level steps of the EOPs will be reviewed to ensure that they are consistent with the actions described in the substeps.

ATTACHMENT 2 (Cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

2.D (1) General EOP Comments

CONCERN:

Equally Accessible Steps - In a number of cases, steps are identified in the procedures as equally acceptable steps. For example, "Start RCP B AND/OR D. In reality, however, many of these alternatives are preferable for a given set of conditions. Zion procedures need to reflect when a specific path is preferred and under what conditions.

RESPONSE:

The EOPs will be reviewed to determine where alternative actions can be designated with a specific priority.

CONCERN:

Place Keeping - Procedures should provide methods for the operators to keep track of the current step while performing designated activities. Although Zion's EOP notebooks have ribbons for marking pages when the operator must leave and re-enter a procedure, no means of tracking steps is provided. Aids such as check-off boxes should be provided to assist operators in tracking steps that have been performed or parameters that have been verified. Such aids are especially important in tracking performance of non-sequential steps. Zion's prescribed method of using "yellow stickers" is not viewed as an optimum placekeeping method.

RESPONSE

This issue will be evaluated to determine if a method of tracking steps and parameters can be implemented within the EOPs.

ATTACHMENT 2 (Cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

2.D.(2) REVIEW OF WRITER'S GUIDE

CONCERNS:

Section 4.3.4 Recurrent Steps - There is no direction provided as to how the operator should be reminded to perform concurrent steps.

Section 4.3.6 Non-Sequential Steps - Directions on how to write these steps is very vague.

Section 5.2 Operator Actions - For steps that require completion before going on, give specific language to be used.

Section 5.2.4 Use of Logic Terms - Writer's guide gives permission for conditional term to follow the required action for "simple" conditions. conditional terms should always precede the action.

Section 5.2.8 Component Identification - Does not require that abbreviations be from the list of standard abbreviations provided in table 3. This should be an all inclusive list, not "examples" of abbreviations.

Section 7.4 Vocabulary - Instead of providing a list of "frequently used" verbs, the list should identify and define all action words that are acceptable for use in the EOPs.

RESPONSE:

The concerns expressed above will be added as enhancements to the Writer's Guide by October 1, 1990.

CONCERNS:

Section 3.5 Procedure Access and identification - Need to clarify how procedures will be tabbed (i.e. number? title? color?)

Section 5.2.7 Placekeeping Aids - Provides no mechanism for placekeeping within a procedure, such as check-off boxes.

RESPONSE:

The concerns in the above two items will be reviewed to determine any actions or procedure changes that are required. Any action or procedure changes that are required will be implemented by October 1, 1990.

ATTACHMENT 2 (Cont)

RESPONSE TO ADDITIONAL AREAS OF CONCERN

CONCERN:

There were some inconsistencies reported in terms of control room protocol (i.e. reading steps and substeps verbatim and requirements for repeat-backs) which were also observed in the simulator exercises.

RESPONSE:

Zion station has completed an informal verbal poll in order to obtain input from licensed personnel in the retraining classes regarding control room protocol. This data will be reviewed by a multi-disciplined management group, including the operations group, procedures group, and training in order to generate appropriate revisions to Zion Administrative Procedure (ZAP) 5-51-3A "Use of Procedures in Operating Department". This review will be completed by July 2, 1990. Simulator training will be structured to implement the guidance of the revised procedure.

CONCERN:

Lack of training in use of the SPDS was mentioned as a training weakness.

RESPONSE:

Previous SPDS training has been provided primarily on the simulator. However, SPDS training has been included in the classroom portion of the Licensed Operator Retraining (LORT) program at Zion for 1990. This Retraining started April 2, 1990 and is scheduled for completion by May 4, 1990. The weekly quizzes associated with this LORT training does include questions on the SPDS lecture.

CONCERN:

Interviews were also conducted with equipment operators. It was determined that non-licensed operator training does not specifically address the A and B operator functions during execution of the EOPs. This area was also identified by the licensee as a weakness and is being addressed.

RESPONSE:

The multi-disciplined management group will assess development of an ongoing program for maintenance of non-licensed operator proficiency with EOPs including A and B operator functions specifically addressed by the EOPs.

ATTACHMENT 3

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE E-0

CONCERN:

Step 5 - Verifying MSIV bypass valve closure should be included as an immediate action step.

RESPONSE:

This is being incorporated as an immediate action step under procedure change number 0-90-0097.

CONCERN:

Determining the need to trip the RCPs should be an immediate action.

RESPONSE:

See response to open item 2.c.(1). Tripping the RCPs when containment pressure has been greater than 23 psig, the Phase B actuation setpoint, will be included as an immediate action step of E-0.

CONCERN:

Figure 1 - It should be made clear that Containment Pressure is or has been greater than 23 psig.

RES:

This is being incorporated under procedure change number 0-90-0097.

CONCERN:

The EOP Basis Identifier Sheet does not include the caution preceding step 20.

RESPONSE:

This is being corrected under procedure change 0-90-0097.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE ES-0.1

CONCERN:

Step 9 - The direction to open the MSIV bypass valves when they may have been closed in step 1 RNO may cause confusion. Also, step 9.b. does not address Tavg with no RCPs running.

RESPONSE:

These two items are being corrected under procedure change number 0-90-0168.

CONCERN:

Appendix A, Step 4.d - "Significant duration" should be defined

RESPONSE:

This step will be reworded to be performed "At The Shift Engineer's Direction". This change is being incorporated under procedure change number 0-90-0168.

PROCEDURE ES-0.2

CONCERN:

The sequence of steps 3, 4 and 6 should be reassessed. RCS boration may be started and stopped many times before the required boron concentration is obtained.

RESPONSE:

These steps will be reworded to resolve this problem in the next procedure change of ES-0.2.

CONCERN:

Step 16.b RNO should have a transition to ES-0.3 or ES-0.4.

RESPONSE:

This will be incorporated in the next procedure change to ES-0.2.

CONCERN:

Step 23.b RNO does not have a transition back to step 15.c.

RESPONSE:

We believe the concern is related to step 23.c RNO (Not step 23.b RNO). This transition will be evaluated to determine if a procedural change is required.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE ECA-0.0

CONCERN:

Step 4 - Contingency actions require use of an "R" key to obtain access to steam supply valves that must be locally operated. This requirement is not identified in the procedure.

RESPONSE:

This has been corrected under procedure change number 0-90-0098.

CONCERN:

Steps 4.b, 13.a - Contingency actions and Table 3 provide incorrect location information for a number of valves in the vertical pipe chase (VPC). The procedure provides the penetration level for the associated pipe instead of the access level for the valves themselves - (MOV-MS0006, MOV-FW0052, 53, 56, & 57).

RESPONSE:

This has been corrected under procedure change number 0-90-0098.

CONCERN:

A number of equipment tags on valves in VPC were difficult to locate or read (small metal tags, often facing away from line of sight).

RESPONSE:

See response to item 2.c.(2) associated with equipment labeling.

CONCERN:

Step 6 - Directs operator to set equipment switches in Pull-To-Lock. List of equipment is ordered such that the operator must walk back and forth several times. Should follow normal operator path down the control board from starting position at DGs.

RESPONSE:

This has been corrected under procedure change number 0-90-0098.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE ECA-0.0 (cont)

CONCERN:

Step 15 - Calls for checking CST level. Meter is labeled SEC WTR STOR TK LEVEL.

RESPONSE:

Validation of procedures allows terminology in operator preferred language. This will be reviewed to determine if a procedure change is required.

CONCERN:

Step 20.e - RNO action reference to containment spray/isolation phase B reset pushbuttons inconsistent with new panel labeling.

RESPONSE:

The labeling is consistent with the Unit 2 control board. The Unit 2 control board is being changed at this time in accordance with the Detailed Control Room Design Review (DCRDR) changes. The DCRDR labeling changes are already in place on Unit 1. The new labeling will be incorporated into the next procedure change of ECA-0.0.

CONCERN:

Step 25.c - This step calls for check of radiation monitors on back panel but does not provide monitor number (ORE-0005 and ORT-AR03).

RESPONSE:

This will be included in the next procedure change to ECA-0.0.

CONCERN:

Step 30.b. RNO - Directs the operator to locally close boric acid evaporator inlet isolation valves. Entry into this area requires a respirator. Since the evaporator has not been in service for several years, these valves could be taken out of service or aligned closed so that this step could be removed from the procedure.

RESPONSE:

Zion station agrees with this. The action of locally closing these valves will be removed from the procedure.



ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE ECA-0.0 (cont)

CONCERN:

Step 30.e - Directs the operator to throttle open a CC water HX discharge valve while maintaining greater than 80 psig on local gauge. Pressure gauge cannot be read at the valve locations. Also, this step should be identified as a local action.

RESPONSE:

This step has been identified as a local action under procedure change number 0-09-0098. A review will be made to determine if a procedure change is required to perform the action of maintaining pressure by using the local gauge.

CONCERN:

Step 30.e.2 - Should be identified as a local action.

RESPONSE:

We believe the concern is related to step 30.f.2 (not 30.e.2) which has been identified as a local action under procedure change number 0-90-0098.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE ES-1.3

CONCERN:

Steps 6.a RNO and 9.a RNO should define actions for the cases in which attempts to start RHR train B is or is not successful.

RESPONSE:

These steps will be reviewed to determine what enhancements should be added for the case where the affected inoperable RHR train is restored to operation.

CONCERN:

Appendix A is not referenced in the procedure.

RESPONSE:

Reference to this appendix will be added at the appropriate steps in the next procedure change.

CONCERN:

Step 13 - "If Required" should be defined.

RESPONSE:

The phrase "If required" will be deleted in the next procedure change. The requirement to align RHR spray is defined in substep 13.a, that is, if a containment spray pump is running, then RHR spray is required to be aligned.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE E-3

CONCERN:

Step 4.c RNO - This step should be reworded to clarify that MOV-MS0006 should be closed only if SG A and/or B is ruptured, a MD AFW is available, and the associated AFW pump steam supply valve cannot be closed.

RESPONSE:

This step will be reworded to isolate steam to the Turbine Driven AFW pump only if the steam supply from either A or D steam generator can not be closed

PROCEDURE ECA-3.1

CONCERN:

ERG note preceding EOP step 16 should be re-inserted. There are cases where it would be applicable to Zion (e.g. loss of bus 147 with charging pump 1A and 1B SI secured).

RESPONSE:

It appears that the intent of this note may be applicable for the one ESF bus that powers a charging pump and SI pump. This will be reviewed to determine if a similar note should be added.

CONCERN:

Steps 16 and 17 - The subcooling values based on the number of SI pumps running should be re-inserted. The SI pumps may be inoperable.

RESPONSE:

Based on the SI reduction sequence used at Zion, and the calculation used for determining subcooling values, the subcooling values required to stop the first charging pump, and align the second pump to normal charging, are the same whether 1 or 2 SI pumps are running. The subcooling values with no SI pumps running are larger; an evaluation will be made to determine what actions will be added to account for no SI pumps running.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE FR-S.1

CONCERN:

Step 6 - This should be an immediate action step.

RESPONSE:

See response to open item 2.c.(1). This step will be made an immediate action step.

PROCEDURE FR-S.2

CONCERN:

Step 1.b. RNO - If IR current is increasing, the operator should be in FR-S.1.

RESPONSE:

This statement will be changed to read "IF current is increasing, THEN go to FR-S.1".

PROCEDURE FR-C.1

CONCERN:

The second caution before step 1 in the ERGs was deleted in the Zion EOPs. The deviation documentation does not address this deletion.

RESPONSE:

The reference for the justification for leaving the RHR pumps running will be added to the deviation documentation. This deletion is consistent with the deletions from other EOPs associated with leaving the RHR pumps running. Leaving the RHR pumps running during implementation of the EOPs has been justified as an acceptable action in Verification Discrepancy Sheet E-0-11 for E-0, Rev. 0; dated 12-21-85.

ATTACHMENT 3 (Cont)

APPENDIX B

RESPONSE TO DETAILED COMMENTS ON THE ZION EOPs

PROCEDURE FR-1.1

CONCERN:

Step 5 RNO(2) - The rationale for stopping the charging pumps is acceptable; however, this should be addressed in the deviation documentation.

RESPONSE

The ERG Deviation Report for this step will be revised to include this rationale.

ATTACHMENT 4

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE ECA-0.0

CONCERN:

The caution about establishing cooling to the DGs prior to step 5 is worded as an action step. This caution should be reworded and include information regarding time limit to establish cooling.

RESPONSE:

This caution will be reworded to remove the implication of an action step and to include information regarding a time limit to establish DG cooling.

CONCERN:

Step 5.a.1 directs the operator to verify "Normal" DG voltage and frequency. As no normal range is indicated on gauges, "normal" band should be provided in procedure.

RESPONSE:

An operating band will be provided to define "normal" DG voltage and frequency. The proposed step has been reworded as follows:

Verify DG voltage and frequency - NORMAL	Adjust voltage and frequency as necessary.
- Voltage - 4160 VOLTS (3900 VOLTS TO 4200 VOLTS)	
- Frequency - 60 HZ (59.8 HZ to 60.2 HZ).	

CONCERN:

Step 13.a RNO should be reworded to indicate requirement for communication with Control Room to perform this task.

RESPONSE:

The requirement to be in communication with the Control Room will be incorporated into this step's RNO.

CONCERN:

Step 14.a. directs the operator to refer to ZED-3 to evaluate other non-essential DC loads. This should be pre-evaluated before event and include as appendix to procedure or elsewhere.

RESPONSE:

This issue will be evaluated to determine if a list of equipment loads can be included in ECA-0.0 instead of referring to ZED-3.

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE ECA-0.0

CONCERN:

Step 15.b RNO calls for arranging for offsite supply of water. Procedure for such arrangements should be pre-established and available in control room (perhaps include in AOP-4.3).

RESPONSE:

This issue will be reviewed to determine if such arrangements can be proceduralized.

CONCERN:

Step 16 directs the operator to "Initiate depressurization of intact SGs." Following step provide criteria to be met before depressurization is ready to begin.

RESPONSE:

The major action to be accomplished is to depressurize all SGs. The heading for this step will be changed to "**Depressurize Intact SGs**". The criteria to be met before SG depressurization can begin is also the criteria to stop the SG depressurization. This criteria has been added from validation of the procedure since this step may be returned to with the SG depressurization already in progress or completed.

CONCERN:

Step 24.b RNO should specify the valves that may need to be realigned to clear alarm or make reference to step 21 RNO.

RESPONSE:

The valves referenced in step 21 RNO will be added to the RNO of step 24.b.

CONCERN:

Step 25.c. directs operator to check level in spent fuel pit - Greater than 610 feet. Since low alarm set point is 614'4" this action would only be necessary if an alarm were present.

RESPONSE:

This step will be reworded to check the SPENT FUEL PIT LEVEL LOW annunciator LIT before requiring a visual check of the spent fuel pit level.

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE ECA-0.0

CONCERN:

Step 26 ends with the initiating logic condition.

RESPONSE:

This will be reworded. The proposed wording is "Stop Any SG Depressurization in Progress".

CONCERN:

Step 27 directs operator to energize 480V ESF Bus(es). Reference to procedure (SOI-63) or appendix should be provided.

RESPONSE:

The steps associated with energizing the 480V ESF bus(es) will be incorporated into step 27.

CONCERN:

Step 30.f directs the operator to "operate additional CC water pumps as necessary" followed by step directing him not to exceed 2 pumps per Hx. This information should be provided prior to direction to operate pumps.

RESPONSE:

Step 30.f will be reworded. Step 30.f is an action heading for two substeps where "operating additional CC pumps" is to be performed by doing steps 30.f.1) and 30.f.2) A proposed change to the heading is "Align additional CC water pumps as necessary by performing the following".

CONCERN:

Appendix A, Steps 4 and 5.b should refer operator to Table 1.

RESPONSE:

This has been incorporated under procedure change number O-90-0098.



ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE E-3

CONCERN:

Step 2.a.2 RNO directs to stop all RCPs within 5 minutes. Should indicate "within 5 minutes of losing component cooling."

RESPONSE:

This will be incorporated in the next procedure change.

CONCERN:

Step 8.a - Re-order substeps to prevent possible confusion due to negative in first statement.

RESPONSE:

This step will be reworded with the substeps of step 8.a re-ordered. The proposed rewording is:

- |   |  |
|---|--|
| a. Check all SGs.   | a. Verify all faulted SGs isolated unless needed for RCS cooldown.   |
| - SG pressure - GREATER THAN 100 psig                           | - Steamlines   |
| - SG pressure - <u>NOT</u> DECREASING IN AN UNCONTROLLED MANNER | - Feedlines  |
|   | <u>IF</u> any faulted SG <u>NOT</u> isolated <u>AND NOT</u> needed for RCS cooldown, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION. |

CONCERN:

Step 8.a RNO - Clarify the condition to which the IF NOT applies. If (SGs) NOT isolated or IF (SGs) NOT needed for cooldown.

RESPONSE:

See response directly above for proposed rewording.

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE E-3

CONCERN:

Step 14.c Use of AND/OR in listing alternatives for dumping steam makes it difficult to determine preferred action. This statement needs clarification as to the preferred method.

RESPONSE:

As is described in the Writer's Guide, the preferred order is delineated by the numbering: "1) To condenser" is preferred first, however, if the condenser is not available, or is not providing for sufficient cooldown rate, the operator can use "2)...the SG atmospheric relief valves" alone or in conjunction with dumping steam to the condenser. Recognizing that the preference of (1 AND 2) over (1 OR 2) is not established by the numbering, all EOP steps that use this wording will be reviewed to determine if a note to establish the terms of priority can be added.

CONCERN:

Step 14.c RNO directs operator to either use faulted SG for dumping steam OR go to ECA-3.1. Clarification should be provided as to conditions for choosing either alternative.

RESPONSE:

The issue of using a faulted SG for cooldown versus transferring to ECA-3.1 to use a ruptured SG, requires an evaluation to be quickly performed. This evaluation must "weigh the concerns of reactor vessel thermal stresses, increased discharge to containment, and stresses on the SG tubes against increased radiological releases from the ruptured SG and the potential for SG overflow on an event specific basis"<sup>1</sup>. This issue will be reviewed to determine if any additional information regarding the criteria to be used for selecting the cooldown method, can be added to the procedure.

CONCERN:

Caution preceding Step 15 should indicate consequence of not completing cooldown rather than simply directing operator to perform the action.

RESPONSE:

This caution will be revised to include information regarding why the cooldown must be completed prior to implementing step 15.

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<sup>1</sup> WOG Background; E-3 step 14, PLANT SPECIFIC INFORMATION  
0401W

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE E-3

CONCERN:

Step 18.a - Using AND/OR to connect two alternative actions makes it difficult to determine preferred path.

RESPONSE:

As is described in the Writer's Guide, the preferred order is delineated by the numbering: "1) Maximum normal spray" is preferred first, however, if normal spray is not available, or is not providing for sufficient depressurization rate, the operator can use "2) One PZR PORV" alone or in conjunction with using normal spray. Recognizing that the preference of (1 AND 2) over (1 OR 2) is not established by the numbering, all EOP steps that use this wording will be reviewed to determine if a note to establish the terms of priority can be added.

CONCERN:

Step 22 directs operator to stop ECCS pumps, however substep clarified to "stop all but one charging pump". Confusion could be prevented by rewording upper level step such as "Stop the following ECCS pumps..."

RESPONSE:

Step 22 will be reworded to say "Stop The Following ECCS Pumps And Place In Standby".

CONCERN:

Caution preceding step 31 refers to uncertainties of instrumentation, connotating unreliability. Better wording would refer to differences in precision or calibration of instruments.

RESPONSE:

This caution will be reworded so as not to imply unreliability in using the SG and RCS pressure instruments. The proposed wording change is "Due to the accuracy of the SG and RCS pressure instruments,...".

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE E-3

CONCERN:

Step 37.c directs operator to start one or two RCPs at discretion of Shift Supervisor. Based on reported differences in operator philosophies on prioritization, either additional guidance is needed in the procedure, or training in consistent station philosophy.

RESPONSE:

Appendix A has a note that establishes the priority for starting RCPs. This note will be reworded to clarify which RCP has priority to be started first.

PROCEDURE ECA-3.3

CONCERN:

Step 4.b - Additional guidance needed on preference of starting RCP. Use of AND/OR does not define preferred path.

RESPONSE:

The priority is to start at least one RCP which provides pressurizer spray; step 4.b will be reworded to Start RCP B or D.

CONCERN:

Step 6.c - Conditional clause in a logic statement is presented after the contingent action is stated.

RESPONSE:

The RNO of step 6.c will be reworded. The proposed rewording is: "IF PORV can NOT be closed, THEN close the associated PORV block valve."

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE ECA-3.3

CONCERN:

Step 8.a needs to clarify if level greater than 4% is required in all SGs or at least one SG to satisfy expected response.

RESPONSE:

We believe the concern is related to step 9.a (not step 8.a). The major action heading is "Check Intact SG Levels". It is implied that all SG levels are checked. If only one SG narrow range level greater than 4% was required to satisfy the expected response, step 9.a would say:

- Narrow range level - GREATER THAN 4%  
(26% FOR ADVERSE CONTAINMENT) IN AT  
LEAST ONE SG

CONCERN:

Step 11 should be reworded to indicate "Stop the following ECCS pumps..."

RESPONSE:

Step 11 will be reworded to say "Stop The Following ECCS Pumps And Place in Standby".

CONCERN:

Step 19.b should be reworded to clarify awkward sentence structure.

RESPONSE:

This will be reviewed for rewording.

CONCERN:

Caution preceding step 28 should be reworded as per comment.

RESPONSE:

This caution will be reworded so as not to imply unreliability in using the SG and RCS pressure instruments. The proposed wording change is "Due to the accuracy of the SG and RCS pressure instruments,..."

ATTACHMENT 4 (Cont)

APPENDIX C

RESPONSE TO EXAMPLES OF HUMAN FACTORS FINDINGS

PROCEDURE ECA-3.3

CONCERN:

Step 31 provides three alternative methods for depressurization, with no guidance for preferred method or conditions that would lead to selecting a particular method.

RESPONSE:

This issue will be reviewed to determine if criteria for selection can be included into the procedure.

CONCERN:

Note preceding step 10 in Appendix H allows operator to delete step "if desired". Guidance should be provided regarding conditions that would warrant performance or deletion of step.

RESPONSE:

Appendix H will be reviewed to determine if criteria for starting a second RHR pump can be included.

PROCEDURE ES-1.1

CONCERN:

Step 4 directs operator to 'stop all charging pumps but one centrifugal'. Step should be reworded to remove exception (but one) from end of sentence.

RESPONSE

This step will be reworded. The proposed rewording is: "Stop All But One Centrifugal Charging Pump".

CONCERN:

Appendix A, Step 12 needs to be reworded to direct operator to return to procedural step from which was entered.

RESPONSE:

This step will be reworded to return to the step in ES-1.1 that the Appendix was entered from.

FINAL