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U.S. Nuclear Regulatory Commission
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Subject: **Indian Point 3 Nuclear Power Plant**
Docket No. 50-286
Station Blackout Rule
Response to Safety Evaluation Recommendations

Reference: 1. NRC letter, N. F. Conicella to R. E. Beedle, dated December 23, 1991, Safety Evaluation of the Indian Point 3 Response to the Station Blackout Rule (TAC No. M68557).

Dear Sir:

The Authority's responses to the recommendations included in the NRC safety evaluation (Reference 1) for the station blackout rule are attached, as required by 10 CFR 50.63(c)(4).

The Authority disagrees with the NRC consultant's position that the coping time analyses (and therefore the Emergency AC power classification) should be based on the ability to achieve a plant cold shutdown status. The Authority can find no regulatory basis for the consultant's position. The Authority requests that the NRC staff reconsider the basis for the coping time analyses conducted by their consultant.

If you have any questions, please contact Mr. P. Kokolakis.

Very truly yours,

Ralph E. Beedle
Executive Vice President
Nuclear Generation

cc: See next page

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Attachment

cc: U.S. Nuclear Regulatory Commission
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RESPONSE TO STATION BLACKOUT SAFETY EVALUATION RECOMMENDATIONS

Introduction

This attachment responds to the NRC safety evaluation (SE) recommendations (NRC letter, N. F. Conicella to R. E. Beedle, dated 12-23-91) concerning station blackout. The dates given for completion of actions are based on Engineering department resources and coordination with ongoing work efforts. This attachment also presents the Authority's rationale for disagreeing with the staff's consultant that coping time analyses should be based on the ability to achieve a plant status of cold shutdown.

Responses to Individual Safety Evaluation Recommendations

NRC Recommendation:

> Station Blackout Duration and Required Coping Time Analyses (from cover letter, N. Conicella (NRC) to R. Beedle (NYPA), dated December 23, 1991)
>
> The NRC staff has concluded that your response and proposed method of complying with the SBO rule is acceptable with the following exception: The staff has determined the minimum required coping duration for the Indian Point Nuclear Generating Unit No. 3 to be eight hours, not four hours as your response stated. The difference is due to your coping analysis calculating the electrical loads required to achieve and maintain a safe shutdown condition for an extended period of time as the loads required to achieve and maintain the hot shutdown condition. However, the staff requires that coping time analyses consider all loads required to achieve the cold shutdown condition.

NYPA Response:

The staff's conclusion on coping time analyses, based on the consultant's technical evaluation report (TER), would change the Indian Point 3 coping time from four hours to eight hours, by changing the emergency ac (EAC) classification from a group "A" to a group "D." The consultant concludes that this change results in the need for two emergency diesel generators (EDG) to achieve cold shutdown, instead of one EDG being required for hot shutdown. Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.155 (Regulatory Position 3.1 and Table 3) defines the number of EAC power sources required to operate AC-powered decay heat removal systems by stating "this number is based on all the ac loads required to remove decay heat (including ac-powered decay heat removal systems) to achieve and maintain **safe shutdown** at all units at the site with offsite power unavailable" (emphasis added). Title 10 of the Code of Federal Regulations, section 50.2, defines safe shutdown as follows: "Safe shutdown (non-design basis accident (non-DBA)) for station blackout means bringing the plant to those shutdown conditions specified in plant technical specifications as **Hot Standby or Hot Shutdown**, as appropriate (plants have the option of maintaining the RCS at normal operating temperatures or at reduced temperatures" (emphasis added). Based on the guidance of RG 1.155, IP3 is an EAC group "A" plant (one of three EDGs needed for **safe shutdown**), with a required coping duration of four hours.

Finding no regulatory basis in 10 CFR 50.63 or RG 1.155 for the TER position that coping

time analyses need to consider cold shutdown, the Authority reexamined the guidance of NUMARC 87-00. NUMARC 87-00 describes how to determine the number of necessary EAC power standby power supplies as follows: "The number of EAC standby power supplies required for station blackout is based on the AC loads needed at each unit to remove decay heat (including the heat generated by AC-powered decay heat removal systems) in order to achieve and maintain **safe shutdown** with offsite power unavailable" (emphasis added). NUMARC 87-00, Appendix A, reiterates the 10 CFR 50.63 definition of safe shutdown as hot standby or hot shutdown.

During a May 14, 1991 telephone conference call (referenced on page one of the staff's station blackout SE for IP3), a staff consultant informed the Authority that NUMARC 87-00, Supplemental Question and Answer 3.4, requires the EAC determination to consider cold shutdown loads, because the answer states, in part, "... the shutdown loads powered must be capable of maintaining the plant in a safe shutdown condition for an **extended period**..." (emphasis added).

The staff's consultant considering the word "extended" from Question 3.4 to mean cold shutdown is contrary to what the NUMARC staff intended this question and answer to mean, and contrary to the industry's understanding of its meaning. Additionally, Question and Answer 3.5 states that safe shutdown means the design basis safe shutdown condition (which the NRC staff acknowledged in the SBO SE transmittal letter dated December 23, 1991 as hot shutdown for IP3).

In conclusion, the Authority can find no regulatory basis for the TER position of cold shutdown. The Authority requests that the NRC staff reconsider the position on cold shutdown put forth by the consultant's TER.

Please note that the Authority disagrees with some of the recommendations listed in the NRC SE (and repeated below) based on our disagreement over the issue of cold shutdown.

NRC Recommendation:

2.3.3 Compressed Air

The licensee should verify the habitability of the areas from which the AFW flow control valves and the PORVs are operated during the first hour after the onset of an SBO event.

NYPA Response:

There is no habitability concern, because the areas mentioned are large, open areas that are not normally provided with any forced ventilation. The heatup calculation for the AFW pump room showed a temperature of 128°F after four hours, without natural circulation. The Authority expects that AFW flow will be established within one-half hour of the onset of an SBO, and the temperature rise up to that time is not expected to make habitability a concern. For the Main Steam atmospheric dump valves, the only operator action anticipated is to line up the backup nitrogen bottles. Once this is done, the Main Steam

atmospheric dump valves will operate automatically (because they receive power by way of the station batteries). Habitability is not a concern for the short duration required to line up the backup nitrogen bottles.

NRC Recommendation:

2.3.4 Effects of Loss of Ventilation

The licensee should reassess the areas containing the SBO equipment which do not have HVAC after one hour to estimate temperature rise for these areas consistent with an SBO duration of eight hours.

NYPA Response:

In accordance with the Authority's previously stated conclusion that coping analyses do not need to consider the cold shutdown condition, the Authority classifies IP3 as a four hour coping duration plant. For this reason, the Authority does not intend to reassess the temperature rise in areas with SBO equipment for an eight hour SBO duration.

NRC Recommendation:

2.3.4.1 AFW Pump Room

The licensee should reassess the temperature rise in the AFW pump room for an eight-hour SBO event using a conservative initial temperature as allowed by the TS or provide administrative controls to ensure that the temperature of 90°F. in the AFW pump room will not be exceeded under any circumstances during normal plant operation.

NYPA Response:

In accordance with the Authority's previously stated conclusion that coping analyses do not need to consider the cold shutdown condition, the Authority classifies IP3 as a four hour coping duration plant. For this reason, the Authority does not intend to reassess the temperature rise in the AFW pump room for an eight hour SBO duration.

Neither NUMARC 87-00 nor NRC Regulatory Guide 1.155 specify acceptable initial room temperatures. NUMARC 87-00 does state as an initial assumption that the plant is operating with systems in their normal condition. The Authority will re-perform the temperature rise calculation using a more conservative initial temperature. The Authority recently (for most of the time period between February, 1990, and November, 1991) recorded the temperature in the AFW pump area. The Authority will review the recorded data, and use the data to determine a more conservative initial temperature. The calculation will be done by October 30, 1992.

NRC Recommendation:

2.3.4.2 Control Room

The licensee should establish procedures to open the control room cabinet doors within 30 minutes of an SBO event in accordance with the guidance described in NUMARC 87-00 and to ensure that the room temperature of 78°F. used as the initial temperature in the analysis will not be exceeded during normal power operation.

NYPA Response:

The Authority is evaluating the guidance of NUMARC 87-00 (including Appendix I, Question/Answer 46 and Appendix J, Question/Answer 2.7) to determine which control room cabinet doors need to be opened. The Authority will monitor temperatures inside control room cabinets to determine the temperature differential between the inside of the cabinets and the control room temperature. Based on review of the collected data, the Authority will review the previously performed control room heatup calculation to determine the effect of any temperature differentials. The review based on collected data will be performed by December 30, 1992. For control room cabinet doors that need to be opened, the procedure changes and required training will be completed by June 30, 1993. Please note that the Appendix R diesel generator will be operating one hour after the start of the SBO event, and control room ventilation will be restored at that time.

Neither NUMARC 87-00 nor NRC Regulatory Guide 1.155 specify acceptable initial room temperatures. However, NUMARC 87-00 assumes that the control room is initially at 78°F. The Authority assumed an initial control room temperature of 78°F, in accordance with the guidance provided by NUMARC 87-00. NUMARC 87-00 does not state that the initially assumed temperature should be administratively controlled, thus making it in effect a maximum temperature. However, a preliminary evaluation indicates that if 90°F were substituted into the original heatup calculation in place of 78°F, the resulting control room temperature (at one hour after an SBO event) would not exceed 120°F.

NRC Recommendation:

2.3.5 Containment Isolation

The licensee should identify the CIVs which cannot be excluded based on the five criteria given in RG 1.155 and document the detailed justification for the exclusion of each of these valves. Additionally, the licensee should ensure these valves are included in the appropriate procedures to ensure containment integrity will be maintained during an SBO event.

NYPA Response:

The following containment isolation valves cannot be excluded based on any of the criteria listed in RG 1.155. Included with the list of valves is the rationale for accepting the valves as providing the required containment integrity. All of the valves listed below can be

operated independent of the EDGs and also have some means of valve position indication that is independent of the Emergency AC system.

1. CB-3, CB-4: 80 foot air lock inner and outer door equalizing valves

   These valves have instrument bus powered indication available on panel SL.

2. CB-7, CB-8: 95 foot air lock inner and outer door equalizing valves

   These valves have instrument bus powered indication available on panel SL. (Please note that in the Authority's letter dated August 19, 1991, these valves were mistakenly listed as CB-5 and CB-6. Valves CB-5 and 6 are check valves, and CB-7 and 8 are the air lock door equalizing valves.)

3. MOV-885A and 885B: RHR suction from containment sump

   These valves have a DC powered "Valve Off Normal" alarm.

4. MOV-888A and 888B: RHR supply to high head pumps

   These valves have a DC powered "Valve Off Normal" alarm.

5. 869A and 869B: containment spray line valves

   These valves are manually operated locally, and have visible indication of closure.

6. MOV-850A, 850C, and 851A: SI pump discharge valves

   Valves 850A and 850C have DC powered indication available in the control room. Valve 851A has a DC powered "Valve Off Normal" alarm.

7. MOV-1835A and 1835B: BIT discharge valves

   These valves are manually operated locally, and have visible indication of closure.

8. MOV-743 and 1870: RHR miniflow valves

   These valves have a DC powered independent system that indicates a valve "Off Normal" position.

9. MOV-744: RHR discharge valve

   This valve has a DC powered independent system that indicates a valve "Off Normal" position.

10. MOV-222: RCP seal return valve

    This valve is manually operated locally, and has visible indication of closure.

There is no separate IP3 procedure for establishing containment integrity during a station blackout. However, procedure SOP-CB-11 ("Non-Automatic Containment Isolation") provides instructions for closing all of the valves listed (except for the air lock door valves), if this becomes necessary. The air lock door equalizing valves could not be excluded from consideration by the criteria given in RG 1.155 because they are not locked shut. However, the air lock door equalizing valves are interlocked with their respective air lock doors, so that when the handwheel to open the door is turned, the equalizing valve also begins to open. Because the doors are mechanically interlocked so that only the inner or outer door can be open at any one time, only one of the equalizing valves will be open at any one time.

NRC Recommendation:

2.5 Proposed Modification

The licensee should update the temperature rise calculations for the required eight-hour coping duration and reassess the calculated values to identify dominant areas of concern which may result in additional modifications. The licensee should include all analyses and related information in supporting documentation that is to be maintained by the licensee for possible staff review.

NYPA Response:

In accordance with the Authority's previously stated conclusion that coping analyses do not need to consider the cold shutdown condition, the Authority classifies IP3 as a four hour coping duration plant. For this reason, the Authority does not intend to reassess the temperature rise in the AFW pump room for an eight hour SBO duration. The Authority has not identified a need for any plant modifications to comply with the station blackout rule.

NRC Recommendation:

2.6 Quality Assurance and Technical Specifications

The licensee should verify that the SBO equipment is covered by an appropriate QA program consistent with the guidance of RG 1.155. Confirmation that such a program exists should be documented as part of the package supporting the SBO Rule response.

NYPA Response:

The Authority is using existing equipment to cope with a station blackout. Most of the equipment used is QA Category I, and therefore covered by the Authority's QA program. The Authority will classify all non-safety-related equipment essential for response to an SBO as (at least) Category M. Category M equipment is non-safety-related equipment to which portions of the QA program must be applied. Application of QA program

requirements may be modified so that only selected criteria or selected portions of criteria are applied to Category M equipment. The Authority will review the application of the QA program to the Category M equipment, to ensure that the intent of RG 1.155, Appendix A, is met. The equipment classification and review of the QA program application will be completed by March 30, 1993.

For a true station blackout (that is, offsite power and EDGs unavailable and power being supplied by the Appendix R diesel) the service water pumps supplied power according to procedure SOP-EL-14 would be QA Category I. However, the IP3 procedure for a loss of all AC power (ECA-0.0) allows starting a backup service water pump if power is restored to a 480V AC bus (from offsite power or an EDG). Backup service water pump 38 is QA Category M, while backup service water pumps 37 and 39 are Non-category I. This scenario (using a backup service water pump) would not be a station blackout, because either offsite power or an EDG would be available.

NRC Recommendation:

2.7 EDG Reliability Program

The licensee should confirm and include in the documentation supporting the SBO submittals that is to be maintained by the licensee that a program meeting the guidance of RG 1.155, Position 1.2, is in place or will be implemented.

NYPA Response:

While the Authority has not committed to RG 1.155, and is awaiting NUMARC and NRC agreement on resolving the EDG reliability issue, the Authority's IP3 EDG reliability program follows the guidance of RG 1.155. Listed below are the specific guidelines of RG 1.155 for an EDG reliability program, and the manner in which the Authority follows each guideline.

1. Individual EDG reliability target levels consistent with the plant category and coping duration.

   The following description of reliability targets is meant to clarify the Authority's letter dated August 19, 1991, regarding unit versus individual target reliabilities. The Authority maintains, as described in procedure PFM-57, an IP3 unit EDG target reliability of 0.975, for the purpose of determining diesel failure "exceedence trigger values." When performing EDG reliability evaluations, the EDG reliability goals for station blackout are considered to be met if the NUMARC trigger values are not exceeded. The total reliability (start reliability times load reliability) for each EDG is tracked to monitor individual performance. An EDG that has experienced four or more failures in the last 25 demands is defined as a problem EDG. Following completion of corrective actions (including those required by trigger value exceedence), restored performance of the problem EDG should be demonstrated by conducting seven consecutive failure free start and load-run tests.

2. Surveillance testing and reliability monitoring programs designed to track EDG performance and to support maintenance activities.

   Data collected during diesel surveillance testing is used as input for the diesel reliability monitoring program, to ensure that the EDG reliability targets are met. Periodic recording of many parameters (such as service water flow) during diesel surveillance testing is used to help identify the need for preventive maintenance.

3. A maintenance program that ensures that the target EDG reliability is being achieved and that provides a capability for failure analysis and root-cause investigations.

   The performance of preventive maintenance (as well as any necessary corrective maintenance), together with the diesel testing and monitoring programs, ensures that the target reliability is being achieved. If a countable diesel failure is recorded, the IP3 diesel reliability program (PFM-57) requires that a root-cause analysis be performed.

4. An information and data collection system that services the elements of the reliability program and that monitors achieved EDG reliability levels against target values.

   As previously stated, the information and data collection and trending done in conjunction with diesel testing helps to ensure that the EDG target reliability is achieved.

5. Identified responsibilities for the major program elements and a management oversight program for reviewing reliability levels being achieved and ensuring that the program is functioning properly.

   The procedures governing the IP3 diesel reliability program specify who is responsible for the individual portions of the program, and require informing plant management if a countable diesel failure is recorded. However, these procedures will be updated (by September 30, 1992) to account for recent changes in the organizational structure at IP3.