



**Commonwealth Edison**  
1400 Opus Place  
Downers Grove, Illinois 60515

August 2, 1994

Mr. William T. Russell, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Application for EMERGENCY Amendment to Facility Operating License:

Byron Station Units 1 and 2  
( NPF-37/66; NRC Docket Nos. 50-454/455)

"Remote Shutdown Instrumentation"

- References:
1. K. L. Graesser letter to W. T. Russell, dated July 29, 1994, requesting a Notice of Enforcement Discretion for TS 3.3.3.5
  2. J. A. Zwolinski letter to D. L. Farrar, dated August 1, 1994, granting a Notice of Enforcement Discretion for TS 3.3.3.5

Dear Mr. Russell:

Pursuant to 10 CFR 50.91(a)(5), Commonwealth Edison Company (ComEd) proposes to amend Appendix A, Technical Specifications of Facility Operating Licenses NPF-37 and NPF-66, and requests that the Nuclear Regulatory Commission (NRC) grant an EMERGENCY amendment to Technical Specification Section 3.3.3.5 "Remote Shutdown Instrumentation". Consistent with NRC guidance, a request for an NRR Notice of Enforcement Discretion (NOED), for the period until this amendment can be granted, was submitted and subsequently granted as documented in References 1 and 2.

Specifically, this emergency Technical Specification change addresses the Unit 1, Loop B, wide range hot leg resistance temperature detector (RTD). The subject RTD and associated indication has been declared inoperable as it's behavior has been erratic under certain containment cooling fan configurations. The proposed change will allow Byron Unit 1 to complete the current fuel cycle with less than the minimum number of operable channels currently required by TS Table 3.3.9, "Remote Shutdown Monitoring Instrumentation". To avoid placing Byron Unit 1 in an unnecessary shutdown condition, ComEd requested the NRC to exercise discretion not to enforce compliance with Technical Specification 3.3.3.5 on July 29, 1994. This request was granted on August 1, 1994 and is in effect until approval of this emergency technical specification change.

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This emergency change could not be avoided as ComEd took prudent and timely actions to address the RTD problems as they arose. Corrective maintenance was performed on the subject RTD and appeared to have eliminated the problem, however, the erratic indication reappeared at a later time. It should be noted that the RTD in question is operating within the allowable specifications at the present time, however, is considered unreliable due to its erratic behavior. Byron Station has elected to conservatively declare the channel inoperable.

A detailed description and justification of the proposed changes is presented in Attachment A. The revised Technical Specification page is contained in Attachment B.

This request for a Technical Specification Amendment has been reviewed and approved by the Onsite and Offsite Review Committees in accordance with ComEd procedures. ComEd has reviewed this proposed amendment in accordance with 10 CFR 50.92(c) and has determined that no significant hazards consideration exists as documented in Attachment C. An Environmental Assessment has also been completed and is contained in Attachment D.

Pursuant to 10 CFR 50.91(b)(1) a copy of this request has been forwarded to the designated State of Illinois Official.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

Please address any comments or questions regarding this matter to this office.



Respectfully,

*Joseph A. Bauer*

Joseph A. Bauer  
Nuclear Licensing Administrator

*Mary Jo Yack* 8-2-94  
Attachments

- cc: G. Dick, Byron Project Manager - NRR
- H. Peterson, Senior Resident Inspector - Byron
- B. Clayton, Branch Chief - Region III
- Office of Nuclear Facility Safety - IDNS

# ATTACHMENT A

## DESCRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGES TO APPENDIX A TECHNICAL SPECIFICATIONS OF FACILITY OPERATING LICENSES NPF-37 and NPF-66

### 1. Description of the Proposed Change

On July 29, 1994, Commonwealth Edison Company (ComEd) requested a Notice of Enforcement Discretion (NOED) for Technical Specification 3.3.3.5, "Remote Shutdown Instrumentation". The NOED was subsequently granted on August 1, 1994. This emergency Technical Specification amendment is being submitted as a followup action to the NOED conditions.

Commonwealth Edison Company, therefore, requests an emergency Technical Specification (TS) change to TS 3.3.3.5, "Remote Shutdown Instrumentation", for the 1B wide range (WR) Hot Leg resistance temperature detector (RTD). The proposed Technical Specification change will allow Byron Unit 1 to continue operation with less than the minimum number of operable channels required by TS Table 3.3.9, "Remote Shutdown Monitoring Instrumentation". Specifically, the Reactor Coolant Temperature wide range Hot Leg indication for loop B will have no channel operable as the subject RTD and associated indication has been declared inoperable. The RTD is currently operating within the allowable specifications but its indication has been erratic under certain containment cooling fan configurations. The wide range loop RTDs are a dual element RTD. One element provides indication to the control room with temperature indication displayed on a meter and a chart recorder; and temperature indication at the RSDP, thus both indications are considered inoperable. The second element in the RTD well, while not safety related, provides indication at the Fire Hazards Panel and is operable. To avoid placing Byron Unit 1 in an unnecessary shutdown condition, ComEd requested the NRC to exercise discretion not to enforce compliance with Technical Specification 3.3.3.5 on July 29, 1994. This request was granted on August 1, 1994 and is in effect until approval of this emergency technical specification change.

A footnote to address the change from the current requirements has been added to TS Table 3.3.9. This footnote specifies the applicable Unit, Cycle and timeframe the change is in effect. The change proposed in this amendment is applicable only to Unit 1. The Unit 2 license is affected due to the fact that the change occurs on a common page.

The proposed changes to the Technical Specification page is included in Attachment B of this submittal.

## **2. Description of Current Requirements:**

Technical Specification 3.3.3.5, "Remote Shutdown Instrumentation", requires that with the number of operable remote shutdown monitoring channels less than the minimum channels operable, restore the inoperable channel to the operable status within 7 days, or be in at least Hot Standby (Mode 3) within the next 6 hours and in Hot Shutdown (Mode 4) within the following 6 hours. Table 3.3.9, "Remote Shutdown Monitoring Instrumentation", requires that the one Reactor Coolant Temperature Wide Range Hot Leg channel, installed in each loop, for be operable.

## **3. Bases for the Current requirements:**

The Remote Shutdown System provides the Nuclear Station Operator (NSO) with sufficient instrumentation and controls to place and maintain the unit in a safe shutdown condition from a location other than the control room. The operability of the remote shutdown instrumentation ensures that sufficient information to shutdown and maintain Hot Standby conditions from outside of the control room is available. This capability is required in the event control room habitability is lost and is consistent with General Design Criterion 19 of 10 CFR Part 50. If the control room becomes inaccessible, the operators can establish control at the remote shutdown panel (RSDP), and place and maintain the unit in Mode 3. Upon completion of a unit shutdown following a trip, the unit is in Mode 3 and can be maintained safely in this condition for an extended period of time. In Mode 3, the Auxiliary Feedwater (AFW) System and the steam generator (SG) safety valves or the SG atmospheric dump valves can be used to remove core decay heat and meet all safety requirements. The wide range RTDs are available for the operators to monitor RCS loop temperature and verify the decay heat removal process.

## **4. Description of the Need for Amending the Technical Specifications:**

During the performance of Technical Specification monthly surveillance requirement (SR) 4.6.3.2 a of the Reactor Containment Fan Coolers (RCFCs) it was noted that the 1B Hot Leg RTD indication becomes erratic. This problem was first noted while performing the RCFC surveillance in April and again in May of 1994. The problem was reviewed by the System Engineer and the Instrument Maintenance Department (IMD). The RTD Amplifier card (NRA card) was removed and replaced with a qualified spare after the May occurrence. This action returned the indication of the 1B Hot Leg WR RTD to normal. The Instrument Maintenance department assumed the NRA card was bad and wrote a work request to repair the card. This action was reviewed and believed to be the root cause of the erratic indication of the 1B wide range RTD problem. No additional variations in RCFC operations were deemed necessary at that time.

The indication remained within the required allowable tolerances specified for operability for the next month. On performing the RCFC surveillance for June, the RTD started indicating erratically. The NSOs noted the problem, logged the deviation, and noted that the indication on the 1B RTD returned to normal within minutes after completion of the surveillance. The June event appeared to be a short spike and therefore the channel was not declared inoperable at that time.

During the July RCFC surveillance, conducted on July 25, the 1B wide range RTD again provided erratic indications. The 1B wide range RTD was declared inoperable at 0920 on the 25th and the seven day action requirement was entered. The System Engineer and IMD were informed of the problem and an investigation was initiated to determine the root cause of the problem.

The NFIA card was replaced again, and multiple combinations of RCFCs were utilized in an attempt to recreate the erratic indication. Some effect was seen on the RTD output. Although the deviations were minor and within allowable tolerances this indicates that a problem still exists that cannot be corrected from outside of the containment. Based on tests of the instrument loop and prior experience with narrow range RTD instrumentation, it is believed that the root cause of the problem is a cable splice located inside containment.

As previously stated, on Monday, July 25, 1994 at 0920 hours, Byron Unit 1 entered Technical Specification 3.3.3.5, Action Statement "a" due to having less than the minimum number of operable remote shutdown monitoring channels as required by Table 3.3.9, "Remote Shutdown Monitoring Instrumentation". Specifically, item 3.a, the Reactor Coolant Temperature hot leg wide range RTD indication, requires a minimum of one channel per loop to be operable. The 1B RTD, although currently operating within the allowable tolerances as required by Technical Specifications, is considered to be in a degraded condition. ComEd has conservatively declared the channel inoperable because there is reason to believe that it may not be available under certain containment cooling conditions.

The 7 day allowable outage time (AOT) for the subject RTD expired on Monday, August 1, 1994 at 0920 hours (CDT), at which time the action required by Technical Specifications would have been to place the unit in Hot Standby. Large changes in reactor power during this late period in the core fuel cycle or completely shutting the reactor down will induce Xenon and Delta I transients creating reactivity changes that can sometimes be difficult to stabilize. Startup from the shutdown condition also presents challenges. In order to minimize Xenon/Delta I transients, startup should begin with the core Xenon-free. The Xenon build-in distribution effects may also impact Quadrant Power Tilt Ratio.

In the event of an accident requiring the use of the wide range temperature indications in the control room, loop A, C, and D Hot Leg indications are available. Also each loop's cold leg RTD is operable with available indication in the control room. In an event requiring the operators to monitor subcooling, the preferred instrumentation for measuring RCS temperature is the Core Exit Thermocouples (CETCs), which are also operable.

To repair the 1B RTD faulty connection while the unit is at power would involve an ALARA concern due to a high radiation field in the location of the terminals' junction box. The junction box for the RTD lug connection is in containment, inside the missile barrier, in a radiation field of 4 to 7 REM/hr. To repair the RTD in a radiation field of this magnitude, with a three person crew, would require subjecting the staff at Byron to an addition 24 to 63 person-rem of exposure, making this option unacceptable. To conduct the same repair to the RTD with the unit shutdown for refueling places the crew in a 50 mrem/hr field. This would result in the crew receiving a maximum total dose of 450 millirem of exposure.

Entering a forced shutdown to perform this repair is undesirable since Byron Unit 1 is currently experiencing a Loss of Full Power Capability (LFPC) and is in coastdown operations. With the Unit in coastdown, the core is sensitive to reactivity effects seen with large changes in reactor power, control rod movement, or a RCS temperature change. The core responds to reactivity changes through Xenon/Delta I transients that can be difficult to stabilize. These core sensitivities are attributed to fuel depletion in the center region of the core with the core top and bottom regions relatively neutronically decoupled. Due to these considerations, Byron Unit 1 will be maintained at stable power conditions. No load following or other optional activities that would perturbate power level are planned throughout the end of the cycle.

Startup from a forced shutdown condition also presents challenges. In order to minimize Xenon/Delta I transients, startup should begin with the core Xenon-free. Even at the Xenon-free condition, a startup at this point in core life would experience Xenon build-in/Delta I effects from power increases, control rod movement, temperature changes and RCS dilution due to the separate behavior of the top and bottom core regions. The Xenon build-in distribution effects may also impact Quadrant Power Tilt Ratio.

This emergency technical specification change is requested to allow the 1B WR RTD to be inoperable until completion of the current fuel cycle and will remain in effect until entry into Mode 3 prior to returning to power operations. During the next refueling outage (B1R06), the Instrument Maintenance Department will replace the lug connections with butt connections at the terminals' junction box located inside containment. This work had been previously scheduled as work to be completed during the refueling outage to begin on September 9, 1994. The work will also be completed if the unit enters Hot Standby conditions due to some unforeseen event prior to the next scheduled refueling outage.

This emergency change could not be avoided as ComEd took prudent and timely actions to address the RTD problems as they arose. Corrective maintenance was performed on the subject RTD and appeared to have eliminated the problem, however, the erratic indication reappeared at a later time. It should be noted again that the RTD in question is operating within the allowable specifications at the present time, however, is considered unreliable due to its erratic behavior. Byron Station has elected to conservatively declare the channel inoperable.

## **5. Description of the Proposed Amendment:**

Technical Specification 3.3.3.5, "Remote Shutdown Instrumentation", requires that with the number of operable remote shutdown monitoring channels less than the minimum channels operable, restore the inoperable channel to the operable status within 7 days, or be in at least Hot Standby within the next 6 hours and in Hot Shutdown within the following 6 hours. Table 3.3.9, "Remote Shutdown Monitoring Instrumentation", requires that the one channel installed in each loop for Reactor Coolant Temperature wide range Hot Leg indication be operable.

The proposed change would add an asterick (\*) to the Table 3.3.9, part 3.a columns for "TOTAL NO. OF CHANNELS" and "MINIMUM CHANNELS OPERABLE". The proposed change is applicable only to Unit 1 and not Unit 2, but is denoted on a common page. The corresponding footnote reads:

"None required for Unit 1 loop B through the end of cycle 6 (i.e. prior to entry into Mode 3 for cycle 7) or until any unscheduled Unit 1 shutdown (entry into Mode 3 on the return to power operation) prior to the end of cycle 6".

As the footnote indicates, this TS change is intended to expire after repairs to the WR hot leg RTD are successfully completed during the scheduled refueling outage, B1R06, or prior to the entry into Mode 4 after any unscheduled Unit 1 shutdown.

## **6. Bases of the Proposed Amendment:**

With Byron Unit 1 in a normal at power configuration, the 1B wide range RTD for the Hot Leg responds as expected. The wide range loop RTDs are a dual element RTD. One element provides indication to the control room with temperature indication (TI) displayed on a meter and a chart recorder. The element also displays a temperature indication at the RSDP. The second element in the RTD well, while not safety related, provides indication at the Fire Hazards Panel. The Fire Hazards Panel is powered from a safety related bus.

In the event a control room evacuation is required, plant procedures direct operating personnel to use other available instrumentation if the primary indication is unavailable. For the 1B WR RTD indication, operations personnel are directed to monitor the backup indication available at the Fire Hazards Panel.

The operability of the remote shutdown instrumentation ensures that sufficient information is available to permit shutdown and maintenance of the facility from locations outside of the control room. This capability is required in the event control room habitability is lost. The operators can establish control at the remote shutdown panel and place and maintain the unit in Hot Standby.

Therefore, an emergency technical specification change is requested to allow the 1B WR RTD to be inoperable until completion of the current fuel cycle and to remain in effect until entry into Mode 3, upon return of the unit to power operation. The TS change will expire after repairs to the RTD are successfully completed during the scheduled refueling outage, B1R06, or prior to the entry into Mode 3 after any unscheduled Unit 1 shutdown .

#### **7. Impact of the Proposed Change:**

A review of the Significant Hazards Consideration was performed with respect to the provisions of 10CFR50.92. The proposed changes have no impact on the conclusions reached in the original Evaluation of Significant Hazards Consideration.

#### **8. Schedule Requirements:**

Commonwealth Edison requests that the review and approval of the proposed emergency Technical Specification amendment be completed as soon as possible, to support implementation of the request for enforcement discretion.