

April 13, 2001

U S Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

**PRAIRIE ISLAND NUCLEAR GENERATING PLANT**

Docket Nos. 50-282 License Nos. DPR-42  
50-306 DPR-60

**Request for Notice of Enforcement Discretion  
Prairie Island Technical Specification 3.7.B**

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On April 9, 2001, at 9:30 am CDT, the Prairie Island Nuclear Generating Plant (PINGP) D6 (Unit 2 Train B) emergency diesel generator was removed from service and a 7-day LCO (Limiting Condition of Operation Action Statement) was entered in order to conduct a 24-hour surveillance run. During the test, increasing crankcase pressure was noted on one of D6's diesel engines. At approximately 1:30 pm, PINGP personnel decided to stop the test and inspect the engine. At approximately 3:00 pm, D5 (Unit 2 Train A) emergency diesel generator was demonstrated operable per Technical Specification surveillance requirement 4.6.A.1.e.

Boroscopic investigation found that one of the cylinders in the affected D6 diesel engine showed evidence of piston ring blow-by. PINGP personnel assessed the blow-by as the apparent cause of the high crankcase pressure.

With this letter we are requesting a Notice of Enforcement Discretion to allow noncompliance with Technical Specification 3.7.B. In this case, the NOED is requested for a period not to exceed 3 days – effectively, an extension of the Allowed Outage Time for D6 of Technical Specification 3.7.B.1 from seven to ten days. The proposed NOED would expire at 9:30 am CDT on April 19, 2001.

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In this letter we make the following new Nuclear Regulatory Commission commitments:

- 1. Prior to implementation of a NOED, Prairie Island will maintain certain compensatory measures until the D6 emergency diesel generator operability is restored. These measures include:**
  - **A PRA evaluation has been completed to identify risk-critical equipment.**
  - **The identified risk-critical equipment has been added to the protected equipment list and no work will be conducted on this equipment beyond critical emergent maintenance.**
  - **No planned work will be conducted in the switchyard beyond critical emergent work necessary to ensure immediate-term reliability. Access to the switchyard will be maintained by the Unit 2 Shift Supervisor.**
  - **The switchyard, D5 room, Unit 2 emergency AC switchgear rooms, D1 and D2 rooms, and Unit 1 emergency 4 kV switchgear rooms will be posted to restrict access for the period of the NOED.**
  - **No non-essential testing or maintenance will be conducted on plant equipment that could result in a Unit 2 transient, power reduction, or trip (e.g., the Unit 2 Reactor Protection system, Feedwater Pumps, etc.)**
  - **If the Unit 2 configuration changes unexpectedly during the period of the NOED, the evaluation of risk-critical equipment will be revised and the protected equipment list updated accordingly.**
  - **The on-shift operating crews will be briefed on the importance of specific actions from the Risk Assessment. That is, should the plant Emergency Operating Procedures lead them to perform any of these actions, they will be aware of the importance of successful completion.**
  
- 2. Xcel Energy system dispatchers have been contacted. They have assured Prairie Island that:**
  - **Grid conditions are stable and are expected to remain so for the period of the NOED.**

Please contact Jeff Kivi (651-388-1121) if you have any questions related to this letter.



Joel P. Sorensen  
Site Vice President  
Prairie Island Nuclear Generating Plant

c: Regional Administrator - Region III, NRC  
Senior Resident Inspector, NRC  
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J E Silberg

Attachments:

1. REQUEST FOR ENFORCEMENT DISCRETION REVIEW ITEMS

NUCLEAR MANAGEMENT COMPANY, LLC  
ATTACHMENT 1  
APRIL 13, 2001

REQUEST FOR ENFORCEMENT DISCRETION REVIEW ITEMS

**1. The TS or other license conditions that will be violated.**

Technical Specification 3.7.B, which notes, in part:

3.7.B During STARTUP OPERATION or POWER OPERATION, any of the following conditions of inoperability may exist for the times specified, provided STARTUP OPERATION is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within the time specified, place the affected unit(s) in at least HOT SHUTDOWN within the next 6 hours and be in COLD SHUTDOWN within the following 30 hours.

1. One [of a unit's] diesel generators to be inoperable for 7 days provided (a) the OPERABILITY of the other diesel generator is demonstrated\* by performance of surveillance requirement 4.6.A.1.e within 24 hours\*\*, (b) all engineered safety features equipment associated with the operable diesel generator is OPERABLE, (c) the two required paths from the grid to the unit 4 kV safeguards distribution system are OPERABLE and (d) the OPERABILITY of the two required paths from the grid shall be verified OPERABLE within 1 hour and at least once per 8 hours thereafter.

\* The OPERABILITY of the other diesel generator need not be demonstrated if the diesel generator inoperability was due to preplanned preventative maintenance or testing

\*\* This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY

Prairie Island requests a one-time Notice of Enforcement Discretion (NOED) to allow exceeding the 7-day Allowed Outage Time (AOT) for the D6 (Unit 2 Train B) emergency diesel generator (EDG) in order to complete repairs and post-maintenance testing. Prairie Island proposes a three-day extension (10 days total) of the Technical Specification 3.7.B AOT for one inoperable EDG. The NOED would expire at 9:30 am CDT on April 19, 2001.

**2. The circumstances surrounding the situation, including apparent root causes, the need for prompt action and identification of any relevant historical events.**

<u>Time/Date</u>	<u>Narrative</u>
0930 4/9/2001	Prairie Island started a 24-hour surveillance run of the D6 emergency diesel generator per Technical Specification 4.6.A.3.c. D6 was declared inoperable and a 7-day LCO was entered, per the requirements of Technical Specification 3.7.B.1.
Approx. 1300 4/9/2001	An attempt was made to troubleshoot a high crankcase pressure situation on one of the D6 diesel engines by reducing load.
Approx. 1330 4/9/2001	The surveillance test on D6 was stopped so an investigation could be conducted.
Approx. 1504 4/9/2001	D5 demonstrated operable per the surveillance requirement of Technical Specification 4.6.A.1.e.
Approx. 1600 4/10/2001	A boroscopic analysis determined that a cylinder in one of the D6 diesel engines shows evidence of piston ring blow-by. This is considered to be the cause of the high crankcase pressure.

The apparent root cause of the high crankcase pressure in the D6 engine is blow-by in one cylinder. It appears this condition is limited to a single cylinder. None of the other cylinders in the affected engine show signs of blow-by and D5 operability has been demonstrated.

**3. The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action. This evaluation should include at least a qualitative risk assessment derived from the licensee's Probabilistic Risk Analysis (PRA)**

The proposed NOED would essentially extend the AOT of Technical Specification 3.7.B for the D6 emergency diesel generator from 7 days to 10 days. That is, instead of taking Unit 2 to cold shutdown within 36 hours after the expiration of the 7-day LCO, Prairie Island proposes using no more than an additional 72 hours to complete repairs and demonstrate operability of D6. During the period of the NOED, Prairie Island would comply with all the other requirements of Technical Specification 3.7.B as if the normal 7-day LCO were in effect. That is:

- Should one of two the required paths from the grid to the Unit 2 4 kV safeguards distribution system become inoperable, the 12-hour LCO of Technical Specification 3.7.B.3 will be entered.
- Should D5 become inoperable, the 2-hour LCO of Technical Specification 3.7.B.5 will be entered.
- Should both of the two required paths from the grid become inoperable, Unit 2 will be placed in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 30 hours (as required by Technical Specification 3.7.B).
- Should D5 become inoperable in conjunction with the loss of one or two of the required paths from grid, Unit 2 will be placed in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 30 hours (as required by Technical Specification 3.7.B).

There are several other sources of power to Unit 2 safeguard loads, including:

- D5 (Unit 2 Train A safeguards), which was verified operable per Technical Specification 3.7.B after the D6 surveillance run was terminated.
- Four separate paths from the transmission grid including: two transmission lines connected to the Red Rock Substation, one transmission line connected to the Blue Lake Substation, and one transmission line connected to the Byron Substation. The Red Rock and Blue Lake Substations are connected to the Minneapolis/Saint Paul area high voltage grid. The Byron substation is located in southern Minnesota.
- The grid is currently stable and is expected to remain so. Severe weather (which could threaten transmission lines) is not predicted for the area for the period of the NOED.
- The two required paths from the transmission grid (from the substation) were verified operable following the termination of the 24-hour D6 surveillance and continue to be verified operable per Technical Specification 3.7.B.1.
- Either Unit 1 EDG D1 or D2 can be manually cross-tied to their associated train's Unit 2 safeguards busses. In the event of a Unit 2 station blackout (SBO), both D1 and D2 are capable of sequentially starting and supplying the power requirements of the hot shutdown loads for Unit 1, as well as the essential loads of a blacked out Unit 2. Tests and analysis have shown that the interconnecting bus ties can be closed within ten minutes of the realization that an SBO condition exists.

A concurrent failure of all of these alternate power sources during the proposed 3-day extension of the D6 AOT is very unlikely. Safeguards AC power is required for Cold Shutdown and Hot Shutdown, as well as for Power Operation. Also, the highest loads on the safeguards busses (in a non-accident condition) are expected when the unit is in Hot Shutdown. The initiation of a design basis accident concurrent with an independent failure of D5 (or one of its ESF components) during the proposed 3-day extension of the D6 AOT is very unlikely. Thus, there is a limited safety benefit to shutting Unit 2 down

for 72 hours while D6 is being restored to operable status. The three-day AOT extension of the proposed NOED has been assessed from a risk standpoint as shown below.

### Risk Assessment

The risk incurred due to continued plant operation with the D6 emergency diesel generator unavailable for the additional 3-day NOED period was analyzed and found to be very low. Since safeguards AC power is required during all modes of plant operation, including plant shutdown, we believe that proceeding to shut down Unit 2 in compliance with the Technical Specifications action statement provides no meaningful health or safety benefit to the general public, and that continued steady-state operation is the preferred course of action until the D6 diesel generator can be returned to full operability.

The following describes the basis for the very low increase in risk to both PINGP units during the NOED period. The results of the risk analysis are provided, as are the results of sensitivity analyses performed. Also, a discussion of the additional risk management actions that will be implemented is provided. These actions include maintaining a list of equipment whose availability will be protected during the NOED period, and increasing operator awareness of the operator actions that have increased risk significance.

**Initiating event review:** The diesel generators at PINGP function only to supply a backup source of power to the plant 4160 V safeguards AC buses. This function is only required when both the normal and auxiliary sources of offsite power to those buses are lost. Loss of both offsite sources to any one bus, but not to the other buses, is not the event of concern. A more likely and much more risk significant scenario is a loss of all offsite power (LOOP) to one unit (both safeguards AC buses) or to both units at the site. The risk of core damage following all initiating events other than the LOOP initiating event is essentially unchanged with the D6 diesel generator unavailable. In the risk evaluation for this NOED request, the event chosen for analysis was the 2-unit LOOP, in which all four onsite 4160 V safeguards AC buses initially lose offsite power and the emergency diesel generators must function to supply their respective buses. All LOOP events are conservatively assumed to be dual-unit LOOP events for the purposes of this analysis.

**Restoration of power to Bus 26 from the Unit 1 Train B diesel generator:** At PINGP, the 4160 V AC buses on the same safeguards train (Train A buses 15 and 25, and Train B buses 16 and 26) can be connected manually via bus-tie breakers should a LOOP event occur and the dedicated diesel generator for a bus fail to start or otherwise be unavailable. The D6 diesel generator is the dedicated diesel generator for Unit 2

Bus 26. Therefore, if D6 is unavailable for maintenance and a LOOP event occurred, Bus 26 would initially lose power and operator action to close the bus-tie breaker from Bus 16 (D2 diesel generator) would be required to restore power to Train B safeguards equipment if required to mitigate the event. However, the necessary actions are simple and are performed entirely from the main control room, the actions are directed by procedure, and the operators are trained on the required actions. Therefore, the likelihood of successful restoration of onsite AC power to Bus 26, if necessary, is high.

**Impact on decay heat removal capability:** On a LOOP event with D6 unavailable, both auxiliary feedwater (AFW) pumps associated with each unit remain available and automatically function to supply the steam generators on that unit, providing a continuous means of decay heat removal. Also, either of the two motor-driven pumps can be cross-tied to supply the needs of the steam generators on the opposite unit if necessary. This is true even if power is not restored to Bus 26 through the manual bus-tie breaker operation, since neither pump depends on power from D6. Also, Train A emergency core cooling (ECCS) equipment remains available, as do both of the pressurizer power operated relief valves (PORVs) for bleed and feed operation should the auxiliary feedwater function completely fail.

**Analysis results:** Based on the plant operation and design characteristics discussed above, the Incremental Core Damage Probability (ICDP) to Unit 2 over this time period from the baseline level (no maintenance condition) was calculated to be significantly less than  $1E-6$ , even when considering all other planned equipment unavailability during that time. The risk of continued Unit 1 operation is even less, since both dedicated diesel generators for that unit remain available. As part of the Maintenance Rule (a)(4) compliance program at PINGP, an analysis of the plant configuration risk during plant maintenance has been performed throughout the period of D6 unavailability. Based on the ICDP limits of the NEI 93-01, Section 11, Unit 2 may remain at power for over one month in this condition without requiring the implementation of additional risk management actions. This is the case even when considering the impact of all other equipment expected to be unavailable during the NOED period.

**Sensitivity analysis:** Due to the clear association of D6 unavailability with risk of core damage from LOOP initiating events, a sensitivity study was performed to determine the impact of increasing the likelihood of a site (two-unit) LOOP initiating event during the NOED period. Another purpose of the study was to give a sense of the risk incurred should severe weather occur during that time period. The results show that even when the annual LOOP initiating event frequency is raised by an order of magnitude (by a factor of 10) the ICDP during the NOED period for Unit 1 remains well below  $1E-6$ , while the ICDP for Unit 2 increases only slightly above  $1E-6$  for Unit 2,

even when the impact of all other equipment expected to be unavailable during that time is included.

**Additional risk management actions:** Potential additional risk management actions (not already credited in the analysis) to further reduce the risk of continued Unit 2 operation during the NOED period were considered. The following actions will be performed during the NOED period:

- A. In addition to the risk assessment requirements of Maintenance Rule paragraph (a)(4), a list of important equipment to protect will be identified for each equipment unavailability configuration entered into. A "protected" component or train of equipment is considered to be one that, if it became unavailable, would result in a significant increase in either plant's risk level. This evaluation will be maintained up-to-date throughout the NOED period. All work involving unavailability of important equipment will be avoided unless absolutely necessary, and then would only be performed if further actions to manage the risk increase have been put in place.

The planned work schedule during the NOED is known and has been approved, and a list of equipment to protect has been prepared. This list may change if emergent conditions require the removal from service of additional equipment. The protected equipment list for Unit 1 is as follows:

- Instrument Air to Containment isolation valves CV-31740, CV-31741
- DC Panel 191
- DC Panel 162
- DC Panel 16
- 480 V AC Bus 111

The protected equipment list for Unit 2 is as follows:

- Instrument Air to Containment isolation valves CV-31742, CV-31743
- DC Panel 252
- DC Panel 261
- DC Panel 25
- DC Panel 26
- 480 V AC Bus 211

Note that all of the above equipment would also be considered "protected" if D6 were available for safeguards operation. The only equipment with significantly increased importance due to the NOED plant configuration are 480 V Buses 111 and 211.

B. Actions performed by the plant operations staff that are most critical to keeping risk low during the NOED period will be identified. The on-shift operations crews will have an increased awareness of the importance of the successful performance of these actions should the plant Emergency Operating Procedures lead them to perform any of these actions. These actions are:

- Perform RCS bleed and feed operations after power is recovered following station blackout (SBO).
- Locally open the RWST to charging pump suction motor-operated valve bypass manual valves (VC-1-1 [2VC-1-1]) following LOOP.
- Restore power to a 4160 V AC safeguards bus with an unavailable or failed diesel generator by closing the cross-tie breaker from the opposite unit's train-related safeguards 4160 V AC bus.

**4. The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public's health and safety and that no significant hazard consideration is involved.**

Based on the safety assessment of (3) above and the compensatory measures described in (6) below, Prairie Island concludes that extension of the D6 emergency diesel generator allowed out of service time from 7 days to 10 days will not be of potential detriment to the public's health and safety. Overall, this conclusion is based on the low likelihood, during the proposed three-day extension of the D6 AOT, of either:

- a Unit 2 design basis accident concurrent with an independent failure of D5, or
- a loss of offsite power concurrent with an independent failure of D5 and a loss of the ability to cross-tie the Unit 2 safeguards busses to either D1 or D2.

Based on the following assessment, Prairie Island has determined that the noncompliance poses no significant hazard as delineated by 10 CFR 50.92. The noncompliance:

- Does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The noncompliance does not increase the probability of an accident because the D6 emergency diesel generator cannot initiate an accident (D6 provides emergency AC power for accident mitigation).

The noncompliance does not significantly increase the consequences of an accident (both with respect to dose to the public and dose to the control room operators) because D6 is one of two normal redundant onsite power supplies for the Unit 2 safeguards systems. The D5 emergency diesel generator is

completely redundant to D6 and has been demonstrated operable per Technical Specifications. In addition, two required offsite power sources have been demonstrated operable and are verified operable at least every 8 hours, as required by Technical Specifications. In addition, Prairie Island meets the SBO rule of 10CFR50.63 and related guidance of Regulatory Guide 1.155. Thus, either Unit 1 EDG (D1 or D2) can support its own safeguards loads and the essential loads of Unit 2.

An independent failure of D5 concurrent with a loss of all offsite power to Unit 2 simultaneous with the loss of cross-tie ability is very unlikely during the proposed three-day extension of the D6 AOT. Thus, the overall risk of such an event does not change significantly for the Operational Mode Unit 2 is in when such an event might begin. Thus, any increase in consequences due to the noncompliance is mitigated by the low probability of events that could lead to consequences.

- Does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The noncompliance will not create the possibility of a new or different kind of accident because inoperability of one emergency power source is not an accident precursor.

- Does not involve a significant reduction in a margin of safety, because the plant still meets its design basis – no safety function is expected to be lost during the period of the NOED. The three-day extension of the D6 Allowed Outage Time does not significantly increase the risk of an event.

##### **5. The basis for the licensee's conclusion that the noncompliance will not involve adverse consequences to the environment.**

Prairie Island has evaluated the noncompliance and determined that:

1. The noncompliance does not involve any significant hazards consideration,
2. The noncompliance does not involve any significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or
3. The noncompliance does not involve any significant increase in individual or cumulative occupational radiation exposure. That is, none of the proposed changes will cause an increase in the expected individual or cumulative occupational radiation exposure either during normal operation or during a postulated accident.

Thus, Prairie Island has concluded that the noncompliance will not involve adverse consequences to the environment.

**6. Any proposed compensatory measure(s).**

1. For the added three days of Allowed Outage Time for D6, Prairie Island will comply with all the other conditions of the Technical Specification 3.7.B. That is:
  - Should one of two the required paths from the grid to the Unit 2 4 kV safeguards distribution system become inoperable, the 12-hour LCO of Technical Specification 3.7.B.3 will be entered.
  - Should D5 become inoperable, the 2-hour LCO of Technical Specification 3.7.B.5 will be entered.
  - Should both of the two required paths from the grid become inoperable, Unit 2 will be placed in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 30 hours (as required by Technical Specification 3.7.B).
  - Should D5 become inoperable in conjunction with the loss of one or two of the required paths from grid, Unit 2 will be placed in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 30 hours (as required by Technical Specification 3.7.B).
  
2. Prior to implementation of a NOED, Prairie Island will maintain certain compensatory measures until the D6 emergency diesel generator operability is restored. These measures include:
  - A PRA evaluation has been completed to identify risk-critical equipment.
  - The identified risk-critical equipment has been added to the protected equipment list and no work will be conducted on this equipment beyond critical emergent maintenance.
  - No planned work will be conducted in the switchyard beyond critical emergent work necessary to ensure immediate-term reliability. Access to the switchyard will be maintained by the Unit 2 Shift Supervisor.
  - The switchyard, D5 room, Unit 2 emergency AC switchgear rooms, D1 and D2 rooms, and Unit 1 emergency 4 kV switchgear rooms will be posted to restrict access for the period of the NOED.
  - No non-essential testing or maintenance will be conducted on plant equipment that could result in a Unit 2 transient, power reduction, or trip (e.g., the Unit 2 Reactor Protection system, Feedwater Pumps, etc.)

- If the Unit 2 configuration changes unexpectedly during the period of the NOED, the evaluation of risk-critical equipment will be revised and the protected equipment list updated accordingly.
  - The on-shift operating crews will be briefed on the importance of specific actions from the Risk Assessment. That is, should the plant Emergency Operating Procedures lead them to perform any of these actions, they will be aware of the importance of successful completion.
3. Xcel Energy system dispatchers have been contacted. They have assured Prairie Island that:
- Grid conditions are stable and are expected to remain so for the period of the NOED.

#### **7. The justification for the duration of the noncompliance.**

The 72 hour duration of the NOED is reasonable because there is no immediate threat (e.g., due to severe weather that might threaten offsite power or other equipment being out of service) to the alternate sources of Unit 2 emergency AC power. Our risk assessment indicates that the 72-hour extension of the D6 Allowed Outage Time yields a minimal change in risk. The 72 hour time frame is needed to complete repairs on the affected D6 engine and allow for a 24-hour surveillance run of D6 to demonstrate operability.

#### **8. A statement that the request has been approved by the facility organization that normally reviews safety issues (Plant Onsite Review Committee, or its equivalent).**

The proposed action to request enforcement discretion along with the plant specific conditions and compensatory actions requiring the need for the request were approved by the Prairie Island Operations Committee on April 13, 2001 at 1pm CDT.

#### **9. The request must specifically address which of the NOED criteria for appropriate plant conditions specified in Section B (NRC Inspection Manual Part 9900, "Technical Guidance – Notice of Enforcement Discretion"), is satisfied.**

Prairie Island Units 1 and 2 are currently in Mode 1, operating at 100% power. The applicable NOED criteria for this condition is:

- “1. For an operating plant, the NOED is intended to (a) avoid undesirable transients as a result of forcing compliance with the license condition, and, thus, minimize potential safety consequences and operational risks or (b) eliminate testing, inspection, or system realignment that is inappropriate for the particular plant conditions.”

As stated above, this request is made based on avoiding an undesirable transient (an unplanned unit shutdown) as a result of forced compliance with the license condition, and, thus minimize potential safety consequences and operational risks involved in performing an unplanned Unit 2 shutdown.

**10. If a follow-up license amendment is required...**

No follow-up license amendment is required. Prairie Island requests only a one-time extension to the AOT of Technical Specification 3.7.B for one inoperable EDG. The extension would allow us to complete repairs and post-maintenance testing of D6. The equipment issues with D6 are not expected to recur.

**11. For NOEDs involving severe weather or other natural events...**

Not applicable.