

**NEI 99-02 FAQ 14-08
Prairie Island MSPI**

Plant: Prairie Island Nuclear Generating Station (PINGP) Unit 1
Date of Event: June 23, 2014
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Performance Indicator:

MS06 – Emergency AC Power Systems

Site-Specific FAQ (see Appendix D)? No

FAQ to become effective: When approved

Question Section

NEI 99-02 Guidance needing interpretation (include page and line citation):

Pg F-6 Lines 14-21:

Return to Service: Return to service is the transition from unavailable to available. A train/segment is “returned to service” when the following conditions are met: clearance tags have been removed, the train/segment has been aligned and prepared for operation, (e.g., valve line-up complete, system filled and vented), further adjustment of associated equipment is not required or expected as a result of the unavailability period, and operators concur that the train/segment is able to perform its expected functions. For standby equipment, automatic functions are aligned or can be promptly restored by an operator consistent with the requirements for crediting operator recovery stated later in this section.

Pg F-27 Lines 14-20:

Emergency power generator failure to load/run: Given that the emergency power generator has successfully started and the output breaker has received a signal to close, a failure of the generator output breaker to close or a failure to run/operate for one hour after breaker closure. The emergency power generator does not have to be fully loaded to count the failure. Failure to load/run also includes failures of the emergency power generator output breaker to re-close following a grid disturbance if the emergency power generator was running paralleled to the grid, provided breaker closure is required by plant design.

Pg F-28 Lines 39-46, Pg F-29 Lines 1-7

Human errors/component trips, inadvertent actuations or unplanned unavailability introduced as part of a test or maintenance activity are not indicative of the reliability of the

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equipment had the activity not been performed, and should NOT be counted as failures as long as they are immediately revealed and promptly reported to the control room.

This applies to human errors which result in tripping an MSPI component that:

1. Occur while the MSPI train/segment is considered available;
2. Do not result in actual equipment damage;
3. Are immediately revealed through clear and unambiguous indication;
4. Are promptly reported to the control room without delay prior to the performance of corrective actions, and;
5. Are clearly associated with a test or maintenance activity such that the failure sequence would not have occurred and cannot occur if the test or maintenance activity was not being performed.

Pg F-48 Lines 23-26

An EDG is not considered to have failed due to any of the following events:

- spurious operation of a trip that would be bypassed in a loss of offsite power event
- malfunction of equipment that is not required to operate during a loss of offsite power event (e.g., circuitry used to synchronize the EDG with off-site power sources)

Event or circumstances requiring guidance interpretation:

On June 23, 2014, a failed relay associated with a 345kV/161kV transformer (TR10) in the Prairie Island Nuclear Generating Plant (PINGP) switchyard resulted in the load tap changer receiving a signal to move to the lowest tap setting. This created a low voltage condition in the 161kV PINGP bus. As a result Engineered Safety Feature (ESF) Bus 15 was declared inoperable. The other ESF bus, Bus 16, was being energized from a different offsite source and did not experience a low voltage condition. Eventually the 161kV bus voltage dropped to less than 155kV which resulted in an undervoltage condition on Bus 15 and an auto start of Emergency Diesel Generator (EDG) D1 which then powered the loads on Bus 15.

The Control Room operators subsequently paralleled a different offsite source (CT11) with D1 in order to transfer the Bus 15 loads using procedure 1C20.7. This procedure includes a caution against allowing the load on D1 to drop to less than 100 kW to prevent motorizing the generator. This evolution is a restoration activity that procedurally requires declaring the diesel generator inoperable and unavailable.

D1 subsequently experienced a reverse power condition resulting in a trip and reverse power (86 relay) lockout. The lockout was caused by a reverse-power condition during the supply-source transfer of Bus 15 from D1 to CT11.

The trip of D1 was reported as an MSPI EAC load/run failure in the 2nd quarter of 2014; however, PINGP is seeking to retract the failure.

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If licensee and NRC resident/region do not agree on the facts and circumstances, explain:

The NRC Resident agrees with the description of the event. However, it is not clear from NEI 99-02 whether this restoration activity would meet the definition of maintenance, or whether the event constitutes an MSPI failure.

Potentially relevant FAQs: None

Response Section

Proposed Resolution of FAQ:

The trip and reverse power lockout of D1 does not count as an MSPI failure.

Per the Prairie Island MSPI Basis Document, Revision 15, the MSPI monitored function for the Emergency AC System is "To provide emergency AC power to risk-significant equipment during loss of AC power conditions." D1 was fulfilling this function by powering the loads on Bus 15 in response to the undervoltage condition.

The evolution of paralleling an emergency diesel generator to an offsite power source is considered a restoration activity by the site. For D1, this requires declaring the diesel inoperable and unavailable. Operator action is required to parallel to an alternate source, dial in droop on D1, and to open the emergency diesel generator output breaker.

The reverse power logic is a protective feature for when D1 is paralleled to a second power source. Although the reverse power trip and lockout logic are not bypassed during a loss of offsite power event, a valid reverse power condition is not possible when D1 is performing its monitored function.

The lockout condition was not indicative of the reliability of the equipment, and should not be counted as an MSPI failure. No equipment damage occurred. The lockout condition was immediately identified in the control room and corrected prior to D1 being returned to operable status.

If appropriate, provide proposed rewording of guidance for inclusion in next revision:

Pg F-28 beginning on line 39 should be clarified to reflect that events which are caused by human error that are not indicative of the reliability of the equipment should not be counted as failures:

Human errors/component trips, inadvertent actuations or unplanned unavailability which are not indicative of the reliability of the equipment had the activity not been performed, should NOT be counted as failures as long as they are immediately revealed and promptly reported to the control room.

This applies to human errors which result in tripping an MSPI component whether or not the MSPI train/segment is considered available that:

1. Do not result in actual equipment damage;
2. Are immediately revealed through clear and unambiguous indication;

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3. Are promptly reported to the control room without delay prior to the performance of corrective actions, and;
4. Are clearly associated with an activity such that the failure sequence would not have occurred and cannot occur if the activity was not being performed.

Unavailability should be counted from the time of the event until the equipment is returned to service, and classified as unplanned unless provisions of *Counting Unavailability when Planned and Unplanned Maintenance are Performed in the Same Work Window* apply.

Latent failures (failures that existed prior to the maintenance) that are discovered as part of maintenance or test activity are considered failures.

PRA update required to implement this FAQ?

No

MSPI Basis Document update required to implement this FAQ?

No

NRC Response

This FAQ describes an event where during the restoration of offsite power to a safety related bus, a reverse power of an emergency diesel generator inadvertently occurred after paralleling with offsite power. This caused a reverse power lockout of the diesel and a premature trip which the licensee initially reported as an MSPI EAC load/run failure. The licensee has re-evaluated this event and seeks to retract the failure.

Prairie Island MSPI Basis Document, Revision 13, states that “[t]he function monitored for the emergency AC power system is the ability of the emergency diesel generators (EDGs) to provide AC power to the class 1E buses upon a loss of off-site power.” This function is directly drawn from the guidance of NEI 99-02 Revision 7, Appendix F section 5 system specific guidance for Emergency AC Power Systems (pg. F-49, line 26). As a reverse power lockout during system restoration does not affect the monitored function of the system, it should not count as a failure for MSPI purposes.

The staff has concluded that retracting this failure would be in accordance with the current NEI 99-02 guidance and in keeping with the intent of the MSPI performance indicator.