

FAQ Log (Part 2) 3/17/05

TempNo.	PI	Topic	Status	Plant/ Co.
52.1	IE03	Initiation of contingency planning	3/17 Introduced	Nine Mile Point
52.2	EP03	Crediting of siren testing conducted at facilities that are not normally attended	3/17 Introduced	Kewaunee
52.3	IE02	Loss of main feedwater flow, condenser vacuum, or turbine bypass capability caused by <u>partial</u> loss of offsite power	3/17 Introduced	River Bend
52.4	IE02	Loss of main feedwater flow, condenser vacuum, or turbine bypass capability caused by <u>partial</u> loss of offsite power	3/17 Introduced	River Bend

FAQ 52.1

Submitted 2/14 by Terry F. Syrell

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Nine Mile Point Nuclear Station

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Question: As defined in NEI 99-02, *unplanned changes in reactor power* are changes in reactor power that are initiated less than 72 hours following the discovery of an off-normal condition, and that result in, or require a change in power level of greater than 20% of full power to resolve. The 72 hour period between discovery of an off-normal condition and the corresponding change in power level is based on the typical time to assess the plant condition, and prepare, review, and approve the necessary work orders, procedures, and necessary safety reviews, to effect a repair. The key element to be used in determining whether a power change should be counted as part of this indicator is the 72 hour period and not the extent of planning that is performed between the discovery of the condition and the initiation of the power change.

Nine Mile Point Nuclear Station (NMPNS) Unit 1 performed a >20% downpower that commenced on 6/15/04 to swap power supplies on condensate pumps in order to exit a High Pressure Coolant Injection (HPCI) LCO action. The timeline leading up to the downpower is as follows:

- 6/7/04. Condensate Pump 13 is removed from service for planned maintenance to repair gland packing problems. Condensate Pump 13 is part of HPCI train #12. A 15 day LCO is entered for the HPCI train being inoperable.
- 6/10/04. During maintenance, it was determined that the existing pump was unusable. A contingency plan was implemented to replace the existing pump with an old rebuilt pump. A second contingency plan was started by plant personnel to swap out pump power supplies to make Condensate Pump 12 act as a HPCI pump. This would allow the station to exit the LCO and complete pump repairs on a normal schedule. Swapping out power supplies required pump 12 to be removed from service which would require a planned downpower to 45% rated.
- 6/11/04. A Temporary Design Change Package was initiated to swap the HPCI power supplies.
- 6/13/04. The first contingency for installing a rebuilt pump was unsuccessful when the pump failed post-maintenance testing due to high running amps. The station then concentrated on implementing the second contingency plan.
- 6/15/04. The down-power to perform the second contingency plan began. The LCO was exited on 6/17/04.

The resident inspection staff questioned the off-normal condition that caused the power change. They considered the rebuilt pump PMT failure on 6/13/04 as the off-normal

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condition that resulted in the power change. Since the time from the PMT failure to the downpower was less than 72 hours, the resident inspection staff considered the downpower unplanned.

In evaluating this event for reporting under the NRC ROP PI process, the Licensee concluded that the down-power was planned. The basis for this position is as follows: The initial "off-normal" condition was the degraded gland packing on the Condensate pump. This condition necessitated removal of the pump from service to implement repairs. The pump was removed from service and the appropriate Technical Specification LCO was entered on 6/7/04. It was this "off-normal" condition that ultimately led to the down-power that occurred on 6/15/04. Since the down-power was more than 72 hours after the corrective maintenance evolution was initiated, it was classified as "planned."

Should the power change described above be counted in the ROP Performance Indicator for Unplanned Power Changes per 7,000 Critical?

Proposed Answer (Recommended). No. The degraded gland packing constitutes the "off-normal" condition that ultimately resulted in a down-power. Since the time between the initiation of the corrective maintenance activity and the down-power was >72 hours, the downpower is considered "planned."

Alternate Answer. No. The time that the station recognized that alternate methods of repair might be required and that one of the methods would require a down-power constitutes the "off normal" condition as described in NEI 99-02. Since the time between the initiation of contingency planning and the down-power was >72 hours, the downpower is considered "planned."

FAQ TEMPLATE

Plant: Kewaunee Nuclear Power Plant
Date of Event: none
Submittal Date: March 4, 2005
Licensee Contact: _____ Tel/email: _____
NRC Contact: _____ Tel/email: _____

Performance Indicator: Alert and Notification System (ANS)

Site-Specific FAQ (Appendix D)? No

FAQ requested to become effective when approved.

Question Section

On January 13, 2005 the NRC transmitted the results of an inspection conducted at Davis-Besse Nuclear Power Station related to a discrepant ANS Reliability Performance Indicator. The inspection report concluded that some siren tests could not be counted because they were performed from a licensee test point that was not normally attended.

NEI 99-02 Guidance needing interpretation Page 95 Lines 19-28 – Specifically lines 27 and 28 listed below and Line 25 and 26 in the NEI Document

“Siren systems may be designed with equipment redundancy or feedback capability. It may be possible for sirens to be activated from multiple control stations. Feedback systems may indicate siren activation status, allowing additional activation efforts for some sirens. If the use of redundant control stations is in approved procedures and is part of the actual system activation process, then activation from either control station should be considered a success. A failure of both systems would only be considered one failure, whereas the success of either system would be considered a success. *If the redundant control station is not normally attended, requires setup or initialization, it may not be considered as part of the regularly scheduled test.* Specifically, if the station is only made ready for the purpose of siren tests it should not be considered as part of the regularly scheduled test.”

Event or circumstances requiring guidance interpretation:

BACKGROUND: The Kewaunee siren testing procedure, states that Kewaunee County or Kewaunee Count Sheriff’s Department will initiate all actual or systems tests that are needed. The procedure also states that the tests are alternated between the two entities. The Sheriff Dispatch is manned continuously and the Kewaunee County Emergency Operations Center (EOC) is manned during most normal business hours and declared emergencies. As previously stated, both locations are expected to be able to activate the sirens. Hence the process for testing the sirens from both locations since either may be

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required to activate the sirens. This FAQ has generic implications because many county Emergency Operations Centers (EOCs) are not co-located with the dispatch centers and therefore, not normally attended .

The guidance in NEI 99-02 pertaining to the counting of tests from redundant control stations that are not normally attended could be interpreted to apply to any facility conducting a siren test and not just a specific licensee facility. The Kewaunee County EOC is not maintained for the purposes of siren testing but for the purposes of planned emergency response. This would result in excluding tests conducted at the Kewaunee County EOC and other EOCs not co-located with dispatch centers. In most situations, the EOC is the most probable location for an actual activation of the system in emergency conditions. When an emergency situation escalates the EOC is staffed and performs as the Emergency Center. If situations continued to deteriorate the ANS system would generally be activated from the EOC. Prohibiting testing from this facility could potentially reduce the reliability of the system most likely to be actually used.

Potentially Relevant Existing FAQ: 358

The following is an excerpt from FAQ 358, (emphasis in italics):

Q: Can the licensee modify the ANS testing methodology when calculating the site value for this indicator?

A: Yes. Page 95, lines 19-23 of NEI 99-02 will be modified as follows:
Changes to the activation and/or testing methodology shall be noted in the licensee's quarterly PI report in the comment section. Siren systems may be designed with equipment redundancy, multiple signals, or feedback capability. It may be possible for sirens to be activated from multiple control stations or signals. If the use of redundant control stations or multiple signals is in approved procedures *and is part of the actual system activation process, then activation from either control station or any signal should be considered a success.*

Question:

May siren testing conducted at facilities such as county EOCs that are not normally attended be credited in the ANS PI?

Proposed Response:

Answer: Yes. The restriction on crediting redundant control stations was intended to apply to control stations that are not normally attended in an emergency for purposes of activation.

FAQ

Licensee/Plant: RIVER BEND STATION

Date of Event: October 1st, 2004

FAQ Submittal Date: February 3, 2005

Licensee Contact:	Robert L. Biggs
Tel/email:	225-381-3731/rbiggs@entergy.com
NRC Contact:	Peter Alter, RBS Senior Resident Inspector
Tel/email:	225-381-4566

Performance Indicator: IE02 – Unplanned SCRAMS with Loss of Normal Heat Removal

Type of FAQ Requested: Generic

Effective Date: FAQ requested to become effective on issuance

NEI 99-02 Guidance Needing Interpretation

Current performance indicator guidance provides the following key measures by which a licensee can interpret a scram that must be evaluated as a potential input to the *Unplanned Scrams With a Loss of normal Heat Removal* performance indicator.

- NEI 99-02 Revision 2 defines a *Loss of the normal heat removal path (Power Conversion System/PCS)* as: when any of the following conditions have occurred and cannot be easily recovered from the control room without the need for diagnosis or repair to restore the normal heat removal path:
 - *complete* loss of all main feedwater flow
 - insufficient main condenser vacuum to remove decay heat
 - *complete* closure of at least one MSIV in each main steam line
 - failure of turbine bypass capacity that results in insufficient bypass capability remaining to maintain reactor temperature and pressure
- The guidance further provides that *operator actions or design features to control the reactor cooldown rate or water level*, such as closing the main feedwater valves or closing all MSIVs, are not reported in this indicator as long as the normal heat removal path can be readily recovered from the control room without the need for diagnosis or repair. However, operator

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actions to mitigate an off-normal condition or for the safety of personnel or equipment (e.g., closing MSIVs to isolate a steam leak) are reported.

NOTE: The key message here is the need to be able to rapidly recover PCS from the control room without the need for diagnosis or repair. No credit is considered for mitigation actions outside of these guidelines by NEI 99-02 Revision 2.

- NEI 99-02 Revision 2 also states that the following examples do not count:
 - *loss of all main feedwater flow, condenser vacuum, or turbine bypass capability caused by loss of offsite power;*
 - partial losses of condenser vacuum or turbine bypass capability after an unplanned scram in which sufficient capability remains to remove decay heat;

Note: Additional examples excluded due to non-applicability to this issue.

The River Bend Station Partial Loss of Offsite Power event of October 1st, 2004 that ultimately resulted in a reactor scram and a loss of normal heat removal would not count in the performance indicator process except as an unplanned scram. This is because of the following:

1. The flash-over/failure of insulators on an incoming feed line/ main generator line at the station resulted in electrical fault protection actuations. These actuations resulted in protective tripping of the unit main generator that initiated a scram.
2. Feed water pumps were lost due to partial loss of offsite power ('A' directly and 'B' and 'C' due to loss of condensate supply due to power loss).
3. Condenser vacuum was lowering because of a loss of condenser circulating water. Two of the three main condenser circulating water pumps (CWS) in service before the event shut down due to loss of power. The output of the remaining pump was short-cycled through the discharge of the idle pumps due to the loss of power to their discharge valves.

This position is consistent with the response to FAQ #355. The response is provided below:

"The clarifying notes for this performance indicator exempt scrams resulting in loss of all main feedwater flow, condenser vacuum, or turbine bypass capability caused by loss of offsite power. There is no distinction made or implied regarding a complete or partial loss of offsite power. In this case, while the loss of offsite power was not a complete loss, the loss did affect the feedwater, condensate and condenser systems."

Event description

On October 1, 2004, at 7:17 a.m., a flash-over occurred in the 230kV station transformer yard across a post insulator. This caused the loss of Reserve Station Service (RSS) No. 1, which interrupted power to the Division 1 standby bus. The Division 1 diesel generator started automatically, and restored power to the bus. This event also interrupted power to the "A" reactor protection system (RPS) bus. Operators responded to this event by restoring power to the "A" RPS bus and resetting the half scram.

At 7:30 a.m., a second flash-over occurred across a 230kV post insulator on the main generator line, resulting in a main generator trip and main turbine trip.

The main generator trip combined with the loss of RSS no. 1 resulted in the trip of two main condensate pumps and one main feedwater pump. The remaining two feedwater pumps tripped on low suction pressure following the loss of the condensate pumps. Ten main steam safety relief valves (SRVs) actuated automatically during the pressure transient resulting from the main turbine trip. SRVs were subsequently cycled manually to control reactor pressure and to aid in achieving cold shutdown.

Two of the three main condenser circulating water pumps (CWS) in service before the event shut down due to loss of power. The output of the remaining pump was short-cycled through the discharge of the idle pumps due to the loss of power to their discharge valves, diverting flow from the main condenser. It was not possible to maintain main condenser vacuum, and the operators manually closed the outboard main steam isolation valves, and then cycled SRVs as needed to control reactor pressure.

Proposed FAQ Answer:

The scram described here does not count as a scram with loss of normal heat removal. There is no distinction made or implied regarding a complete or partial loss of offsite power. In this case, while the loss of offsite power was not a complete loss, the loss did affect the feedwater, condensate and condenser systems (vacuum).

Do the licensee and NRC resident/Region agree on facts and circumstances? Yes

Potentially relevant existing FAQ numbers: 282, 249, 248, 65, 354, 355¹

FAQ #355

Question Our plant automatically scrambled at 0948 CDST on 4/24/2003 due to a turbine trip from a load reject. Breakers opened in both the local switchyard and in remote switchyards that removed all paths of generation onto the grid and offsite power to the power conversion system. At the time of the scram, there was a severe thunderstorm in the vicinity. High winds caused a closure of an open disconnect into a grounded breaker under on-going maintenance. This lockout condition led to protective relaying actuating to isolate the fault, and caused the load reject.

During the event, Division 1, 2 and 3 Diesel Generators (DGs) started and energized their respective safety busses. All safety systems functioned as designed and responded properly. During this transient, no deviations were noted in any safety functions. Offsite power was automatically restored to the East 500 KV bus, once the main turbine output breaker opened and the fault was cleared. The West 500 KV bus, which was undergoing maintenance at the time of the event, remained deenergized. While all three DGs started and supplied their buses, this did constitute a design bases Loss Of Offsite Power (LOOP) and an emergency declaration of an unusual event because one of the three sources of off site power (a 115KV line to Engineered Safety Feature (ESF) Transformer 12 (ESF12) remained energized and was available throughout the event. Any of the three ECCS buses could have been transferred to this source of power at any time during the event. Based on the above considerations, it is concluded that this event would be best modeled as a T2, or Loss of PCS (Power Conversion System), initiator. A T2 initiator results in the loss of the power conversion systems (feedwater, condenser, and condensate) and the modeling of this event does allow for recovery of the power conversion systems.

Under the current Revision 2 of NEI 99-02, does this Scram count as a Scram with Loss of Heat Removal?

Response No. The clarifying notes for this performance indicator exempt scrams resulting in loss of all main feedwater flow, condenser vacuum, or turbine bypass capability caused by loss of offsite power. There is no distinction made or implied regarding a complete or partial loss of offsite power. In this case, while the loss of offsite power was not a complete loss, the loss did affect the feedwater, condensate and condenser systems.

Proposed Resolution of NEI 99-02 Guidance, attach separate mark-up revision of NEI 99-02 wording (Attach additional sheets if required):

Revise NEI 99-02R2, Page 16, line 41 as follows:

¹ FAQ No. 355 is the most relevant to this particular circumstance although the others substantiate existing guidance that is being referenced in this FAQ.

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"There is no distinction made or implied regarding a complete or partial loss of offsite power. While a loss of offsite power may not be a complete loss, the loss did affect the feedwater, condensate and condenser systems."²

² This recommended change would essentially incorporate the response to relevant FAQ No. 355 that has already been approved.

FAQ

Licensee/Plant: RIVER BEND STATION

Date of Event: August 15th, 2004

FAQ Submittal Date: February 3, 2005

Licensee Contact:	Robert L. Biggs
Tel/email:	225-381-3731/rbiggs@entergy.com
NRC Contact:	Peter Alter, RBS Senior Resident Inspector
Tel/email:	225-381-4566

Performance Indicator: IE02 – Unplanned SCRAMS with Loss of Normal Heat Removal

Type of FAQ Requested: Generic

Effective Date: FAQ requested to become effective on issuance

NEI 99-02 Guidance Needing Interpretation

Current performance indicator guidance provides the following key measures by which a licensee can interpret a scram that must be evaluated as a potential input to the *Scrams With a Loss of normal Heat Removal* performance indicator.

- NEI 99-02 Revision 2 defines a *Loss of the normal heat removal path* as: when any of the following conditions have occurred and cannot be easily recovered from the control room without the need for diagnosis or repair to restore the normal heat removal path:
 - *complete* loss of all main feedwater flow
 - insufficient main condenser vacuum to remove decay heat
 - *complete* closure of at least one MSIV in each main steam line
 - failure of turbine bypass capacity that results in insufficient bypass capability remaining to maintain reactor temperature and pressure
- The guidance further provides that *operator actions or design features to control the reactor cooldown rate or water level*, such as closing the main feedwater valves or closing all MSIVs, are not reported in this indicator as long as the normal heat removal path can be readily recovered from the control room without the need for diagnosis or repair. However, operator actions to mitigate an off-

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normal condition or for the safety of personnel or equipment (e.g.³, closing MSIVs to isolate a steam leak) are reported.

- NEI 99-02 Revision 2 also states that the following examples do not count:
 - *loss of all main feedwater flow, condenser vacuum, or turbine bypass capability caused by loss of offsite power;*
 - partial losses of condenser vacuum or turbine bypass capability after an unplanned scram in which sufficient capability remains to remove decay heat;

Note: Additional examples excluded due to non-applicability to this issue.

The River Bend Station Partial Loss of Offsite Power event of August 15th, 2004 that ultimately resulted in a reactor scram and a loss of normal heat removal would not count in the performance indicator process except as an unplanned scram. This is because of the following:

1. The scram ultimately resulted from a partial loss of offsite power
2. Condensate and feedwater were affected by the partial loss of offsite power.
3. Condenser vacuum was lowering because of a loss of power to one of the mechanical vacuum pumps and a coincidental failure of the other pump to start.
4. MSIVs were operated consistent with good operational practice and procedure e.g., to maintain cooldown/anticipate loss of vacuum.

Event description

At 4:05 a.m. on August 15, 2004, with the plant operating at 100 percent power, an automatic reactor scram occurred as a result of a main generator trip and subsequent main turbine trip. The 230kv oil circuit breakers at the River Bend switchyard (known as Fancy Point) responded to a fault signal on the 230kv transmission system remote from the switchyard. The fault was initiated by the failure of a guy wire, leading to a structural failure of a 230kv transmission tower.

Slow operation of a total of four 230kv breakers at Fancy Point resulted in operation of breaker backup protection and led to the loss of one of the two main generator output breakers and loss of power to the Division 2 standby switchgear, as well as parts of the balance-of-plant electrical system. The Division 2 diesel generator started as designed and restored power to its switchgear. In addition, the ground fault protection system for the main generator step-up transformers actuated due to the delay in the fault clearing time. This resulted in the trip of the remaining generator output breaker.

³ *exempli gratia*

The main generator trip signal initiated a turbine trip signal, which then initiated the reactor scram. The turbine trip caused an expected reactor pressure transient that caused the actuation of all sixteen main steam safety relief valves.

Two reactor feedwater pumps shutdown at the time of the scram due to loss of their power supplies. The remaining "A" main feedwater pump tripped automatically at approximately 4:35 a.m. when reactor water level reached the high alarm setpoint. The reactor core isolation cooling (RCIC) system was initiated manually following the loss of the third main reactor feedwater pump.

The inboard main steam isolation valves were closed manually in anticipation of a loss of main condenser vacuum. Main condenser mechanical vacuum pump "B" was unavailable due to the loss of power, and the "A" mechanical vacuum pump failed to start due to a faulty relay in its feeder breaker. The loss of both mechanical vacuum pumps (one due to failure and the other due to the loss of power) resulted in a lowering condenser vacuum. Main steam safety relief valves were subsequently cycled manually to assist in controlling reactor pressure. The outboard main steam isolation valves were closed to maintain the reactor cooldown rate within limits.

The "A" feedwater pump could not be immediately restarted due to a loss of instrumentation power which disabled permissive interlocks required for the pump start sequence. Power was subsequently restored to the affected instrument buses and to the motor-operated valves in the feedwater regulating system.

The Fancy Point switchyard provides the connection to the offsite grid for the main generator, as well as the two independent sources of offsite power to the plant's safety-related buses. The switchyard contains the two 230kv buses, referred to as the North and South buses. The switchyard provides the connections to the 230kv transmission lines entering and leaving the switchyard, as well as the River Bend generator. There are four 230kv lines exiting the station connecting to the transmission grid, two lines which provide offsite power to River Bend and a main generator output line. The circuit breaker arrangement allows the two River Bend offsite power lines, the main generator line, and three of the four lines exiting the switchyard to be connected to either the North or South bus. The remaining line exiting the station can be connected only to the North bus.

The initiating event for the fault in the Fancy Point switchyard was the failure of a guy wire on a 230kV transmission tower on one of the four transmission lines south of the site. The guy wire failure allowed the pole to collapse and lean over causing a phase-to-ground fault. The faulted line connects only to the Fancy Point north bus. The associated circuit breaker at Fancy Point received a trip signal to clear the fault, but its operation was slow, resulting in actuation of the back-up breaker protection. All other circuit breakers on the North bus were tripped by the back-up protection system, but two of these also operated slowly. The fault was eventually isolated, but the River Bend main generator step-up transformer ground fault protective relay

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had already actuated due to the extended fault duration. The actuation of this relay resulted in the main generator trip, which in turn caused the main turbine trip and a reactor scram.

The structural failure of the 230kv tower also caused a second, short duration fault on a second line, adjacent to the faulted line, when the static line attached to the top of the failed structure broke and momentarily contacted or otherwise violated minimum clearance for the "C" phase. The breaker for this line also operated slowly. This resulted in operation of the remaining breaker for the reserve station service no. 2 and loss of power to the Division 2 safety related bus.

Proposed FAQ Answer:

The scram described here does not count as a scram with loss of normal heat removal. There is no distinction made or implied regarding a complete or partial loss of offsite power. In this case, while the loss of offsite power was not a complete loss, the loss did affect the feedwater, condensate and condenser systems (vacuum).

Do the licensee and NRC resident/Region agree on facts and circumstances? Yes

Potentially relevant existing FAQ numbers: 282, 249, 248, 65, 354, 355⁴

FAQ #355

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During the event, Division 1, 2 and 3 Diesel Generators (DGs) started and energized their respective safety busses. All safety systems functioned as designed and responded properly. During this transient, no deviations were noted in any safety functions. Offsite power was automatically restored to the East 500 KV bus, once the main turbine output breaker opened and the fault was cleared. The West 500 KV bus, which was undergoing maintenance at the time of the event, remained deenergized. While all three DGs started and supplied their buses, this did constitute a design bases Loss Of Offsite Power (LOOP) and an emergency declaration of an unusual event because one of the three sources of off site power (a 115KV line to Engineered Safety Feature (ESF) Transformer 12 (ESF12) remained energized and was available throughout the event. Any of the three ECCS buses could have been transferred to this source of power at any time during the event. Based on the above considerations, it is concluded that this event would be best

⁴ FAQ No. 355 is the most relevant to this particular circumstance although the others substantiate existing guidance that is being referenced in this FAQ.

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modeled as a T2, or Loss of PCS (Power Conversion System), initiator. A T2 initiator results in the loss of the power conversion systems (feedwater, condenser, and condensate) and the modeling of this event does allow for recovery of the power conversion systems.

Under the current Revision 2 of NEI 99-02, does this Scram count as a Scram with Loss of Heat Removal?

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Proposed Resolution of NEI 99-02 Guidance, attach separate mark-up revision of NEI 99-02 wording (Attach additional sheets if required):

Revise NEI 99-02R2, Page 16, line 41 as follows:

“There is no distinction made or implied regarding a complete or partial loss of offsite power. While a loss of offsite power may not be a complete loss, the loss did affect the feedwater, condensate and condenser systems.”⁵

⁵ This proposed insertion would essentially incorporate a previously approved position FAQ No. 355.