Enclosure 8

Temp No.	PI	Topic	Status	Plant/ Co.
09-01	MSPI	EDG Failure	Tentative	Cooper
09-02	ANS	Pre-conditioning	Discussed	Industry
09-03	MSPI	AFW Pump Failure	Withdrawn	SONGS
09-04	USwC	Loss of FW after scram	Introduced	Brunswick

FAQ TEMPLATE

Plant: Cooper Nuclear Station, Nebraska Public Power District
Date of Event: 10/30/2008
Submittal Date: 3/9/2009
Licensee Contact: Steve Nelson Tel/email: (402) 825-5058 / sknelso@nppd.com
NRC Contact: Nicholas Taylor Tel/email: (402) 825-5659/ nht@nrc.gov
Performance Indicator: MSPI-EAC

Site-Specific FAQ (Appendix D)? No

FAQ requested to become effective when approved.

Question Section

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

Appendix F, Section F2.2.2 Lines 7 through 9 on page F-26, lines 18 through 21 on page F-27, and lines 7 through 15 on page F-28 state,

"EDG failure to run: Given that it has successfully started and loaded and run for an hour, a failure of an EDG to run/operate. (**Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.**)"

"For a running component that is secured from operation due to observed degraded performance, but prior to failure, then a run failure shall be assumed unless evaluation of the condition shows that the component would have continued to operate for the mission time starting from the time the component was secured."

"Failures of SSC's that are not included in the performance index will not be counted as a failure or a demand. Failures of SSC's that would have caused an SSC within the scope of the performance index to fail **will not** be counted as a failure or demand. An example could be a manual suction isolation valve left closed which would have caused a pump to fail. This would not be counted as a failure of the pump. Any mis-positioning of the valve that caused the train to be unavailable would be counted as unavailability from the time of discovery. The significance of the mis-positioned valve prior to discovery would be addressed through the inspection process. (Note, however, in the above example, if the shut manual suction isolation valve resulted in an **actual** pump failure, the pump failure would be counted as a demand and failure of the pump.)"

Event or circumstances requiring guidance interpretation:

See attached CNS MSPI Basis Document (EAC Excerpts) for system description and boundaries.

Condition Report CR-CNS-2008-8017 identified that, on 10/30/2008, the Control Room received a DG#1 trouble alarm and DG#1 Day Tank low level alarm during surveillance testing. The Station Operator reported DG fuel transfer flow at ~2 to 2.5 gpm with sporadic drops to 0 gpm, by local flow meter.

The Root Cause determined that the fuel oil low flow resulted from foreign material blockage in the Day Tank Float Operated Valve (FOV). The foreign material was debris generated from a degraded Ethylene Propylene Rubber (EPR) or Polyisoprene (IR) gasket material from a component upstream of the FOV. The source of the gasket material was identified as the inlet gasket to an upstream flow meter. The flow meter is only placed in service during the monthly Operability Tests and quarterly IST transfer pump tests. The FOV is mounted on the side of the Day Tank and provides a fuel oil transfer system inlet flow path to the Day Tank.

CNS understands the NEI definition of "fuel system (local or Day Tank)" as excluding all fuel oil transfer system components required to transfer fuel oil from the Storage Tanks to the Day Tanks. A separate FAQ has been submitted to address fuel oil transfer component boundaries.

Note: This FAQ is submitted for evaluation irrespective of the EDG component boundary regarding fuel oil transfer system components (i.e. – interpretation is requested assuming fuel oil transfer system components may be considered within and not-within the boundary).

The Root Cause provided additional information concerning the system impact associated with the foreign material, specifically;

- The flow meter is only placed in service during the monthly Operability Tests and quarterly IST transfer pump tests. Therefore, between tests the gaskets at the inlet and outlet of the flow meter are not subjected to flow and pieces of the gasket would not be introduced into the system when the DG is in a standby lineup.
- During the October 30 surveillance the DG was inoperable during the time the flow meter was lined up to test the fuel oil transfer flow, until correcting the fuel oil transfer flow reduction.

Cooper Nuclear Station (CNS) interpretation of NEI 99-02, Appendix F, Section F2.2.2 guidance is that securing the EDG during the failed surveillance on October 30 shouldn't be counted as a run failure. The basis for not counting this as a run failure includes the following,

- With the flow meter normally isolated the foreign material was not capable of entering the fuel oil transfer system in the standby condition or following an actual demand. Therefore, the EDG was not in an unknown/latent failed state (Appendix F, page F-26, lines 34 -39 and FAQ ID 463 Response).

- The cause of low fuel oil transfer flow on October 30 was due to opening valves to line-up the flow meter for data collection purposes. These valves are maintained closed during standby and post accident conditions. The condition was identified during the surveillance and corrected before returning the EDG to operable status. The alignment of the flow meter for surveillance data collection is a maintenance/test activity, which post maintenance testing discovered and corrected the condition (Appendix F, page F-26, lines 7 -9 and FAQ ID 458 Response).
- The fact that the EDG was secured from operation due to observed degraded performance, but prior to failure does not require a run failure be counted, provided the EDG would have performed its function for the entire mission time while in the standby condition. The EDG degraded performance was introduced by the surveillance test alignment and corrected (Appendix F, page F-27, lines 18 -21). The degraded performance was directly related to the maintenance/test configuration and the DG remained inoperable prior to opening the flow meter isolation valves, until the condition was corrected and testing completed.

Questions

1. Per NEI 99-02, does realignment of manual isolation valves to support surveillance testing, which results in placing the EDG in an off-normal (e.g. - test alignment, not standby, etc) alignment constitute a maintenance activity? If this off-normal alignment results in a degraded condition or failure that is discovered during the performance of the surveillance, does the exclusion discussed in Appendix F, page F-26, lines 7 through 9 apply?
2. Should the guidance in Appendix F, page F-27, lines 18 – 21 be applied to consider run failures when securing the equipment if the EDG would have met mission time in the standby alignment and the degraded condition was introduced and corrected during the same surveillance test that discovered it?
3. For failures and discovered conditions for non-monitored structures, systems, and components (SSC), does securing from a surveillance test due to degraded performance or failure of the non-monitored SSC constitute an actual failure, as discussed in Appendix F, page F-28, lines 14 – 15? Does securing the monitored components meet the intent of the word "actual" in lines 14 – 15?

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

The NRC Resident Inspector (RI) concludes that the opening of the valves on the flow meter during performance of the surveillance test on October 30, 2008 should be counted as a run failure per the guidance in Appendix F, page F-27, lines 18-21. Additionally, the RI points to guidance contained in Appendix F, page F-28, lines 14 – 15 as another example for why this should be counted as an EDG run failure even if it is associated with non-monitored SSCs.

The RI provided his position on this issue which is quoted here verbatim.

"The NRC believes that the failure should count as a failure to run for the MSPI based on loss of fuel oil to allow the EDG to run for its mission time. The failure of the engine was a result of a low fuel oil transfer rate from the clogged float valve that would have prevented the EDG from meeting its mission time.

NEI 99-02, Appendix F, Section F2.2.2, Failures, states on page F-27, lines 18-21 that, "For a running component that is secured from operation due to observed degraded performance but prior to failure, then run failure shall be assumed unless evaluation of the condition shows that the component would have continued to operate for the mission time starting from the time the component was secured." In this case, the EDG was secured from operation to prevent damage due to a lack of adequate fuel oil supply. Lines 18-21 requires that the DG needed to be able to run for its 24 hour mission time when it was secured. At that time the Day Tank level was lowering below its low level annunciator setpoint and the flow meter was indicating 2 to 2.5 gpm with negative spiking to zero gpm noted. The DG at this time, with the low Day Tank level, would have required a fuel transfer rate near the 4.64 gpm fully loaded DG fuel consumption rate to permit mission time to be achieved.

NEI 99-02, Appendix F, Section F2.2.2, Failures, states on page F-26, lines 27-29 that, "Treatment of Demand and Run Failures. Failures of monitored components on demand or failures to run, either actual or test are included in unreliability. The flow meter introduced foreign material into the essential fuel oil flow path during the October 31, 2008 failed surveillance when the float valve was severely clogged (2 to 2.5 gpm with spikes to zero).

The NRC recommends the 4th Quarter MSPI EAC input be corrected to include this run failure."

CNS disagrees with the SRI's interpretation of NEI 99-02. CNS contends that if it is agreed that no unknown/latent failed state existed prior to placing the flow meter in-service for surveillance testing and the condition was introduced and corrected prior to returning the DG to an operable status, that this shouldn't be counted as a run failure regardless of monitoring boundary definitions.

Potentially relevant existing FAQ numbers

FAQ 458, 463

Response Section

Proposed Resolution of FAQ

The introduction of foreign material during the October 30 surveillance test would have challenged the ability to meet a 24-hour mission time, but is excluded due to the fact it was introduced during the surveillance while the EDG was inoperable and corrected before returning the EDG to operable status. The alignment of the flow meter for surveillance data collection is a maintenance/test activity, which post maintenance testing discovered and corrected the condition (Appendix F, page F-26, lines 7 -9 and FAQ ID 458 Response).

The current guidance provided in NEI 99-02 details that the event involving the diesel generator fuel oil transfer function would not qualify as a MSPI failure, or require accrual of unavailability time for the emergency AC power function.

Plant: NEI
Date of Event: NA
Submittal Date: 1-16-09
Licensee Contact: Martin Hug Tel/email: MTH@nei.org 202.739.8129
NRC Contact: Steve LaVie Tel/email: Steve.Lavie@NRC.gov

Performance Indicator: Alert and Notification System Reliability

Site-Specific FAQ (Appendix D)? No

FAQ requested to become effective when approved.

Question Section

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

NEI 99-02 Revision 5, page 57, lines 12 to 15

Event or circumstances requiring guidance interpretation:

Are actions taken before an ANS test specifically for the purpose of improving the outcome of a scheduled test appropriate?

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

There are no facts or circumstances where disagreement exists.

Potentially relevant existing FAQ numbers: There are no other relevant FAQ.

Response Section

Proposed Resolution of FAQ

The following text would be inserted following line 15 on page 57 of NEI 99-02:

15 counted in the performance indicator database. ***Actions that could affect the as found condition of sirens prior to testing are not allowed.***

The following text would be inserted following line 29 on page 58 of NEI 99-02:

Actions specifically taken to improve the performance of a scheduled test are not appropriate. The test results should indicate the actual as-found condition of the ANS. Such practices will result in an inaccurate indication of ANS reliability.

Examples of actions that are NOT allowed and DO affect the as found conditions of sirens (not an all inclusive list):

- Preceding test with an unscheduled test with the sole purpose to validate the sirens is functional.
- Prior to a scheduled test, adjustment or calibration of siren system activation equipment that was not scheduled to support post maintenance testing.
- Prior to a scheduled test, testing siren system activation equipment or an individual siren(s) unless the equipment is suspected damaged from adverse weather, vandalism, vehicular strikes, etc.
- Prior to a scheduled test, testing siren system activation equipment or an individual siren(s) unless the equipment is suspected as being non-functional as a result of a computer hardware or software failure, radio tower failure, cut phone line, etc.

However, in no case should response preclude the timely correction of ANS problems and subsequent post-maintenance testing, or the execution of a comprehensive preventive maintenance program.

Testing opportunities that will be included in the ANS performance indicator are required to be defined in licensee ANS procedures. These are typically: bi-weekly, monthly quarterly and annual tests. The site specific ANS design and testing document approved by FEMA is a reference for the appropriate types of test, however licensees may perform tests in addition to what is discussed in the FEMA report.

Examples of actions that ARE allowed and do not affect the as found conditions of sirens (not an all inclusive list):

- Regardless of the time, an unscheduled diagnostic test and subsequent maintenance and repair followed by post maintenance testing after any event that causes actual or suspected damage, such as:

1. Severe/inclement weather (high winds, lightning, ice, etc.),
2. Suspected or actual vandalism,
3. Physical damage from impact (vehicle, tree limbs, etc.),
4. Computer hardware and software failures,
5. Damages communication cables or phone lines.
6. Problems identified by established routine use of the siren feedback systems.

- Scheduled polling tests for the purpose of system monitoring to optimize system availability and functionality.

FREQUENTLY ASKED QUESTION

Plant: San Onofre Nuclear Generating Station
Date of Event: December 19, 2008
Submittal Date: March 6, 2009
Licensee Contact: Lee Kelly, 949-368-6657, lee.kelly@sce.com
NRC Contact: Greg Warnick, 949-368-6362, greg.warnick@nrc.gov

Performance Indicator: Mitigating System Performance Index MS08, Heat Removal System

Site-Specific FAQ?

FAQ requested to become effective: From the time of the event (December 19, 2008)

Question Section

NEI guidance needing interpretation:

NEI 99-02, Revision 5, Appendix F, page F-5, lines 19 & 20:

"Fault exposure hours are not included; unavailable hours are counted only for the time required to recover the train's monitored functions."

NEI 99-02, Revision 5, Appendix F, page F-5, lines 34-40:

"Unplanned unavailable hours: These hours include elapsed time between the discovery and the restoration to service of an equipment failure or human error (such as a misalignment) that makes the train unavailable. Unavailable hours to correct discovered conditions that render a monitored component incapable of performing its monitored function are counted as unplanned unavailable hours. An example of this is a condition discovered by an operator on rounds, such as an obvious oil leak, that resulted in the equipment being non-functional even though no demand or failure actually occurred."

NEI 99-02, Revision 5, Appendix F, page F-26, lines 34-46 and page 27, lines 1-2:

"Treatment of Discovered Conditions that Result in the Inability to Perform a Monitored Function
"Discovered conditions of monitored components (conditions within the component boundaries defined in section F 2.1.3) that render a monitored component incapable of performing its monitored function are included in unreliability as a failure, even though no actual failure on demand or while running existed. This treatment accounts for the amount of time that the condition existed prior to discovery, when the component was in an unknown failed state.

"Conditions that render a monitored component incapable of performing its monitored function that are immediately annunciated in the control room without an actual demand occurring are a special case of a discovered condition. In this instance the discovery of the condition is coincident with the failure. This condition is applicable to normally energized control circuits that are associated with monitored components, which annunciate on loss of power to the control circuit.

For this circumstance there is no time when the component is in an unknown failed state. In this instance appropriate train unavailable hours will be accounted for, but no additional failure will be counted."

NEI 99-02, Revision 5, Appendix F, page F-27, lines 23-24:

"Unplanned unavailability would accrue in all instances from the time of discovery or annunciation consistent with the definition in section F1.2.1."

Event or circumstances requiring guidance interpretation:

On December 19, 2008, a loose fuse caused a turbine-driven auxiliary feedwater pump (TAFWP) governor control circuit interruption, which immediately alarmed in the control room at San Onofre Unit 3. The pump was declared inoperable at 1651. The fuse was repaired and the pump's post maintenance return to service run was completed satisfactorily at 0228 on December 20, 2008 (9.62 hours after being declared inoperable).

There was no indication of the degraded condition prior to December 19 when the failed fuse alarmed. Upon investigation, SCE discovered the fuse was installed incorrectly on December 9, 2008, with the bottom clip that holds the fuse spread too wide. SCE could not determine a particular reason why the fuse lost contact on December 19 (under non-seismic conditions) considering the circuit was functional during outage return-to-service testing of the pump on December 10 and 12, 2009. SCE concluded that although the fuse was providing electrical continuity until it alarmed on December 19, the loose clip may have prevented the circuit from performing its required function during a seismic event. Because the TAFWP was in service while it may not have been seismically qualified for greater than the Technical Specification allowed outage time, this condition was reported in LER 2008-002.

For the fourth quarter 2008 MSPI submittal, Southern California Edison (SCE) (1) counted 9.62 hours of unavailability from when the alarm annunciated until the repair was completed and the pump declared operable in accordance with unavailable hours as defined in the NEI 99-02 Appendix F sections referenced above and (2) did not count an additional failure in accordance with the second paragraph from NEI 99-02, page F-26 above, since the condition of the fuse losing contact was annunciated in the control room without an actual demand occurring.

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

The licensee and senior resident inspector agreed the questions below should be resolved via the FAQ process.

(1) Should the unavailable hours also include any of the time between when the fuse was installed on December 9 and when it annunciated in the control

room on December 19, 2009, since the TAFWP may not have been able to fulfill its required function during that time?

(2) Should a failure be counted, since the potential lack of seismic capability is a condition that is not immediately annunciated in the control room?

Potentially relevant existing FAQ numbers

FAQs 431, 435, and 459 are relevant as discussed below. More information on these FAQs is included in Attachment 1.

FAQ 431 Relevance to SCE FAQ:

The response to FAQ 431 applies directly to the San Onofre TAFWP governor fuse in that SCE believes the time of discovery would be when the alarm annunciated and the pump was declared inoperable; and the time period between when the fuse was installed on December 10 until the alarm annunciated in the control room would be "fault exposure, which is not included in the MSPI unavailability calculation." (Words in quotes are from the FAQ.) In addition, SCE believes "the ROP significance determination process is an appropriate tool for addressing the performance issues associated with failed discovery." The "failed discovery" in our situation was slightly different in that there was no indication of the fuse failure before the alarm annunciated that could have been missed and if the potential failure actually occurred during a demand, it would have immediately annunciated in the control room enabling a response (manual control was not impacted by the fuse failure).

FAQ 435 Relevance to SCE FAQ:

The response that stated: "periods of time when the EDG is not capable of performing its risk-significant function, and where the licensee has not recognized this unavailability, unplanned UA should not be counted," is directly applicable to the SCE FAQ in that SCE did not recognize the potential unavailability of the TAFWP during the time period between when the fuse was installed and the alarm annunciated and so did not count this time as unavailability in the MSPI.

FAQ 459 Relevance to SCE FAQ:

The definition to be added to the NEI 99-02 guidance resulting from FAQ 459 states: "Time of discovery of a failed monitored component is when the licensee determines that a failure has occurred or when an evaluation determines that the train would not have been able to perform its monitored function(s)." This definition supports SCE's position that time of discovery of the failed fuse should be when the alarm annunciated in

the control room, since that is the earliest point at which "the licensee determined that a failure occurred."

Response Section

Proposed Resolution of FAQ:

(1) In accordance with FAQ 459, time of discovery for the purpose of counting unavailable hours for the MSPI should be when the alarm annunciated in the control room on December 19. Since there was no indication of the failure prior to the alarm, the period of time (between December 9 and 19) when the TAFWP may not have been able to fulfill its required function and was not recognized by SCE, should not be counted as unavailability.

(2) Because the failure of the fuse on December 19, 2008, is a "special case of a discovered condition" (since the monitored function is immediately annunciated in the control room without an actual demand occurring), the appropriate unavailable hours (9.62 hours) should be accounted for, but no additional failure should be counted.

Attachment 1 - Relevant FAQs

FAQ 431 - Posted on 10/18/2007:

FAQ 431 Question: "Clarification of the guidance related to whether "time of discovery" is when the licensee first becomes aware that the component cannot perform its monitored function or when the licensee completes a cause determination and concludes the component would not have performed its monitored function at some earlier time, similar to the situation described in the event section below.

"Lines 19-20 on page F-5 of section F1.2.1 in discussion about train unavailable hours. 'Fault exposure hours are not included; unavailable hours are counted only for the time required to recover the train's monitored functions.'

"Lines 18-19 on page F-22 of section F2.2.2. 'Unplanned unavailability would accrue in all instances from the time of discovery or annunciation consistent with the definition in section F1.2.1.'

"Lines 34-40 on page F-5 of Section F 1.2.1. '*Unplanned unavailable hours*: These hours include elapsed time between the discovery and the restoration to service of an equipment failure or human error (such as a misalignment) that makes the train unavailable. Unavailable hours to correct discovered conditions that render a monitored component incapable of performing its monitored function are counted as unplanned unavailable hours. An example of this is a condition discovered by an operator on rounds, such as an obvious oil leak, that resulted in the equipment being non-functional even though no demand or failure actually occurred.'"

FAQ 431 "Event or circumstances requiring guidance interpretation: On June 28, 2006 a small leak (one drop per minute) was identified in a diesel generator fuel oil system. A work request was written on that day to repair the leak, but no operability determination or repair was performed. On July 20, the diesel was successfully run for 2.6 hours with the leak still present. On August 17, the diesel was run for 0.35 hours, at which time it was identified that the leak became more significant. The diesel was shut down 1 hour after being started. At this time the diesel was declared inoperable. The diesel was considered operable up until the time the leak became more significant on August 17. The fuel line was repaired and the diesel was returned to service August 18.

"A diesel failure was assigned in the MSPI data for 3Q06 and unplanned unavailability hours were assigned for the August 17-18, 2006

FAQ 431 "If licensee and NRC resident/region do not agree on the facts and circumstances explain: The Kewaunee Senior Resident Inspector believes the 'time of discovery' should start when the original small leak on the fuel oil line

was discovered on June 28, 2006. This was based on the fact that the station did not perform an operability determination (OD) when this leak was found and that a reasonable conclusion of a proper OD at that time would have been that the EDG would not have been able to complete its monitored safety function, and therefore, the unplanned unavailable hours should start in June."

FAQ 431 Response:

"After weighing the arguments presented by staff and industry in this FAQ, I've concluded that the MSPI 'unavailability' time does not include periods of 'failed discovery,' such as that which occurred at Kewaunee from June 28, 2006, through August 17, 2006. I find this to be the interpretation most consistent with the definition of 'unavailability' contained on page 29 of NEI 99-02, Revision 5, and on balance, the most appropriate way to read the guidance of NEI 99-02 in its entirety.

"I recognize that the MSPI unreliability index value may under-represent conditional core damage frequency for situations in which failed discovery extends longer than a routine surveillance period. While this is less exact for the purpose of measuring system performance, it is consistent with the recognized limitation that MSPI does not capture the effect of latent defects such as design errors that are identified through analysis rather than by surveillance testing. This limitation in the MSPI is one of the factors leading to the use of both the MSPI Performance Indicator and the inspection and assessment process when evaluating regulatory response under the ROP. The ROP significance determination process is an appropriate tool for addressing the performance issues associated with failed discovery, such as occurred at Kewaunee.

"FAQ effective for 3Q07 data submittal."

FAQ 435 - Posted on 12/5/2007:

FAQ 435 Question: "In summary, the licensee stated that '...unavailability should accrue on August 18, 2004 when the failure occurred.' The licensee believes that the duration between July 21 and August 19, should be counted as Fault Exposure Hours. However, Region IV staff does not agree with this position. The licensee had ample opportunity to identify and correct this condition, as was stated in a previously cited 10 CFR 50, Appendix B, Criterion XVI violation. Region IV staff believes the duration that DG-1 was non-functional should be counted as Unavailability Hours."

FAQ 435 Response: "The 29-day period beginning on July 21, 2004 covering when the emergency diesel generator (EDG-2) was not capable of performing its risk-significant function, and with the licensee assuming it was functional, should not be counted as unplanned unavailability.

"The situation and facts in this FAQ are similar to the circumstances in the Kewaunee EDG FAQ (FAQ [431]sic) in that the question of what is meant by the term "discovery" (of an equipment failure) is in question. Although the Kewaunee FAQ was resolved by an appeal decision and was a site-specific response, the area of the guidance impacting both licensees is the same.

"After careful weighing of the facts in this situation, along with the Kewaunee appeal decision (FAQ 69.2), the staff believes that based on the current wording of NEI 99-02 (Revisions 4 & 5), that periods of time when the EDG is not capable of performing its risk-significant function, and where the licensee has not recognized this unavailability, unplanned UA should not be counted.

"The part of the NEI 99-02 Appendix F guidance that prompted this FAQ is focused on what is meant by the term "discovery," as stated on page F-22 of NEI 99-02, Revision 4. Both the staff and the industry recognize that this aspect of the guidance is not clear and thereby there is no current consensus on how to interpret this definition. Further, this response is also not meant to provide a replacement for that definition."

FAQ 459 - Posted on 7/16/2008:

FAQ 459 Question: **"**'Time of discovery' is used in the Mitigating Systems Performance Index (MSPI) for the assignment of train unavailable hours when the train cannot perform one or more of its MSPI monitored functions. The "time of discovery" is the start time for the train unavailable hours and the end time is when the train's capability to perform its monitored function(s) is restored. Typically, "time of discovery" occurs when a component failure happens causing the train to become unavailable. At other times, a component degraded condition may occur that prevents a train from performing its monitored function(s). In some of these cases it may take an evaluation to determine the impact of the degraded condition on the train's monitored function(s).

"An assumption of MSPI is that monitored function(s) are promptly restored after a component failure. ("Promptly" is not defined.) Therefore, degraded conditions are expected to be evaluated promptly so that if a degraded condition prevents the performance of a monitored function, the monitored function can be restored quickly.

"For MSPI purposes, the "time of discovery" is when a component failure occurs that renders a train unable to perform a monitored function. For a component degraded condition, "time of discovery" is when an evaluation is completed that determines that a train is/was unable to perform a monitored function. In both of these cases, train unavailability is assigned only for the time it takes to restore the ability to perform the monitored function(s) from the time the failure is known. In the case of a component degraded condition that renders a train unable to perform a monitored function, an appropriate type failure is assigned to the component in

MSPI unreliability to account for the amount of time that the condition existed prior to discovery, when the component was in an unknown failed state.

"Delays in initiating or completing evaluations of degraded conditions would be addressed through the inspection process."

FAQ 459 Response: "Change the guidance as follows:

"Page 29, section titled Indicator Definition, second paragraph, line 20. Add the following sentence after the last sentence (in the parentheses) of the second paragraph; "Time of discovery of a failed monitored component is when the licensee determines that a failure has occurred or when an evaluation determines that the train would not have been able to perform its monitored function(s)." In any case where a monitored component has been declared inoperable due to a degraded condition, if the component is considered available, there must be a documented basis for that determination, otherwise a failure will be assumed and unplanned unavailability would accrue. If the component is degraded but considered operable, timeliness of completing additional evaluations would be addressed through the inspection process.

Page F-5, section titled "Actual Train Unavailability," paragraph starting "Unplanned unavailable hours:" After the first sentence of this paragraph add "Time of discovery of a failed monitored component is when the licensee determines that a failure has occurred or when an evaluation determines that the train would not have been able to perform its monitored function(s)." In any case where a monitored component has been declared inoperable due to a degraded condition, if the component is considered available, there must be a documented basis for that determination, otherwise a failure will be assumed and unplanned unavailability would accrue. If the component is degraded but considered operable, timeliness of completing additional evaluations would be addressed through the inspection process.

Page F-5, section titled "Actual Train Unavailability," paragraph starting "Unplanned unavailable hours:" In the third sentence on line 39, revise the sentence to read "oil leak that was determined to have resulted in the equipment being non-functional....."

The background information above should be placed in a performance indicator basis document such as IMC 0308.

FAQ

Plant:	Brunswick Unit 1		
Date of Event:	11/26/2008		
Submittal date:	01/30/2009		
Licensee Contact:	Lee Grzeck	Tel/email:	910-457-2487 / lee.grzeck@pgnmail.com
NRC Contact:	Phil O'Bryan	Tel/email:	910-457-2831 / philip.o'bryan@pgnmail.com

Performance Indicator: IE04 - Unplanned Scram with Complications
Site-Specific FAQ (Appendix D)? No
FAQ requested to become effective when approved.

QUESTION

NEI 99-02 Guidance needing interpretation:

Page 21-22, "Was Main Feedwater not available or not recoverable using approved plant procedures?"

If operating prior to the scram, did Main Feedwater cease to operate and was it unable to be restarted during the reactor scram response?[1] The consideration for this question is whether Main Feedwater could be used to feed the reactor vessel if necessary.[2] The qualifier of "not recoverable using approved plant procedures" will allow a licensee to answer "No" to this question if there is no physical equipment restraint to prevent the Operations staff from starting the necessary equipment, aligning the required systems, or satisfying required logic circuitry using plant procedures approved for use that were in place prior to the scram occurring.

The Operations staff must be able to start and operate the required equipment using normal alignments and approved normal and off-normal operating procedures. Manual operation of controllers/equipment, even if normally automatic, is allowed if addressed by procedure. Situations that require maintenance activities or non-proceduralized operating alignments will not satisfy this question. Additionally, the restoration of Main Feedwater must be capable of being restored to provide feedwater to the reactor vessel in a reasonable period of time. Operations should be able to start a Main Feedwater pump and start feeding the reactor vessel with the Main Feedwater system within 30 minutes.[3] During startup conditions where Main Feedwater was not placed in service prior to the scram, the question would not be considered, and should be skipped.

Event or circumstances requiring guidance interpretation:

On 11/26/2008, at 1200 hours (EST), Unit 1 scrammed when a Group 1 primary containment isolation occurred, resulting in an automatic actuation of the Reactor Protection system. Investigation determined that a pressure-load gate amplifier circuit board in the Electro-Hydraulic Control (EHC) system operated erroneously. The Main Steam (MS) isolation valves (MSIVs) closed on the Group 1 isolation. As designed and described in Brunswick operating procedures, following a Group 1 isolation with the MSIVs closed, Reactor Core Isolation Cooling (RCIC) was

used to effectively maintain reactor water level. At approximately 1241 hours, IAW 1OP-25 (MS System Operating Procedure), low condenser vacuum switches are placed in bypass to support resetting the Group 1 isolation. A few steps later, the Main Steam supply valve 1-MS-V28 is closed by the Operator in preparation for re-opening the MSIVs (this valve provides main steam to the Reactor Feed Pumps). Note that during the approximately 40 minutes of the initial scram response the 1-MS-V28 valve remained open and available. At 1511, Operations reopened the MSIVs, per 1OP-25. A few steps later, an attempt was made to open the Main Steam supply valve 1-MS-V28 from the Control Room, but the valve did not open. An attempt was made to manually open the valve, however, the valve was thermally bound and would not open. Main Feedwater was not needed for reactor water level control, as RCIC was being effectively utilized for level control. Engineering was contacted to provide torque values to be used to open the valve. After shift turnover, and early in the next shift (after 1800 hours), the Operators attempted to manually open the 1-MS-V28 valve with the use of the provided torque values, however they found the valve was no longer thermally bound closed and opened it by hand.

Questions requiring interpretation:

[1] - The first line of the guidance states "did Main Feedwater cease to operate and was it unable to be restarted during the reactor scram response?"

Main Feedwater (FW) ceased to operate upon the Group 1 isolation (MS lines, MS drain lines, Recirc sample valves). Immediately following the scram, an expected reactor vessel coolant level shrink occurred. As a result of the low water level, primary containment Group 2 (DW equipment and floor drains, TIPs, RHR discharge to RW, and RHR process sample valves) and Group 6 (CAC/CAD, CAM, and Post-Accident Sampling system) isolation signals were received. All required isolations occurred properly as a result of the reactor low water level isolation signals. All control rods fully inserted on the scram and all safety-related systems responded as designed. No Safety Relief Valves (SRVs) lifted during the scram. Per established procedures, the RCIC system was manually started to restore reactor water level to the normal band (note that RCIC is used for both level and pressure control).

Normal operating procedure following a Group 1 isolation (with MSIVs closed) is to use RCIC for feeding the reactor vessel. It wasn't until approximately three hours and fifteen minutes after the scram occurred that Operations began the system alignment to get MS, and thus FW, back. At that point, the reactor scram response was essentially complete and recovery actions were in progress. The failure of the 1-MS-V28 valve to initially open at a later time and allow the restart of FW did not impact Operator response during the initial transient. No additional procedures were entered beyond the normal scram response procedure.

[2] - From the second sentence in the guidance, "The consideration for this question is whether Main Feedwater could be used to feed the reactor vessel if necessary."

Per design, Main Feedwater ceased to operate once the Group 1 isolation occurred, and per procedure, RCIC was successfully used to maintain reactor water level. Main Feedwater

was not required as part of the normal scram response procedure. This scram presented no significant challenges to the Operations personnel during the reactor scram response, and normal operating procedures were used.

[3] - Guidance states that "Main Feedwater must be capable of being restored to provide feedwater to the reactor vessel in a reasonable period of time. Operations should be able to start a Main Feedwater pump and start feeding the reactor vessel with the Main Feedwater system within 30 minutes."

During the first 41 minutes (approximate) of the initial reactor scram response, valve 1-MS-V28 remained open, and thus not subject to the thermal binding conditions encountered approximately three hours later. As noted above, it wasn't until approximately three hours and fifteen minutes after the scram occurred that Operations began the system alignment to get MS, and thus FW, back. There was no attempt to use Main Feedwater "during the reactor scram response," as RCIC was providing adequate feed to the reactor vessel. As previously described, this is the preferred method of reactor water inventory control following a Group 1 isolation.

In summary, Main Feedwater was capable of being restored to feed the reactor vessel in a reasonable amount of time. It is believed that within the first 30 minutes following the scram, with valve 1-MS-V28 still open, Main Feedwater was available as a source to provide reactor vessel level if needed. However, the timeline of events discussed above does not allow Brunswick to quantify that timeframe as prescribed in NEI 99-02. Thus, the NEI 99-02 guidance requires clarification as to what constitutes the "reactor scram response," and at what point are the entry conditions for the indicator exited.

NRC Senior Resident Inspector position:

"For this event specifically, I think the question boils down to – could main feed have been restored had RCIC and HPCI not functioned correctly? For the first 40 minutes after the scram when the steam isolation valve to main feed was open, would the same sequence of events occurred if operators tried to restore main feed , i.e. would the valve have been shut during restoration and subjected to the same conditions that caused the thermal binding? If not, then you probably have a good argument for no complications. If the valve would have been subjected to the same conditions that caused the thermal binding, then I think it should be classified as a scram with complications."

The NRC Senior Resident Inspector also does not agree with the proposed rewording of the guidance. For the proposed change to Page 21 (see the Response on the following page), "it would not capture those events that are of higher safety significance because main feed is not available, even if it was not required to be used," and "30 minutes is a completely arbitrary number." Similarly for the proposed change to page 22, even if the main feed steam supply is temporarily isolated, the PI should capture those events where main feed couldn't be restored in a relatively short time. "It might be different if the equipment was designed such that restoration was not possible, but in this case main feed should have been available and it was not." For our situation, he asked what would've happened if RCIC quit operating after an hour or hour and a

half, i.e., at some time following 1241 when 1-MS-V28 was closed. The activity to restart Feedwater at that point should still be considered part of the scram response.

Potentially relevant existing FAQ numbers: None.

RESPONSE

Proposed Resolution of FAQ:

Provide clarification to the guidance as to what timeframe constitutes the reactor scram response. Consider rewording of the guidance as noted below.

Proposed rewording of guidance:

NEI 99-02, Page 21:

> Was Main Feedwater not available or not recoverable using approved plant procedures? If operating prior to the scram, did Main Feedwater cease to operate and was it unable to be restarted during the reactor scram response? The consideration for this question is whether Main Feedwater could be used to feed the reactor vessel if necessary. When considering the availability of Main Feedwater, it should be able to be restarted within the first 30 minutes following the scram.

NEI 99-02, Page 22:

> Operations should be able to start a Main Feedwater pump and start feeding the reactor vessel with the Main Feedwater System within 30 minutes of the initial scram transient. During startup conditions where Main Feedwater was not placed in service prior to the scram, the question would not be considered, and should be skipped.