Enclosure 3
June 2009 Meeting Handouts
Meeting Summary of the 06/17/09 Reactor Oversight Process Working Group Public Meeting
Dated June 25, 2009

Insert the following beginning on Page F-8, line 33

When a train/segment is unavailable for maintenance, there are two options for determining when it can be considered available for MSPI.

Option 1

Satisfy the criteria for operability. This means successful completion of the PMT and the train/segment was declared operable by a licensed operator.

Option 2

~~Satisfy~~Comply with all of the following:

1. For standby equipment, the equipment can automatically start by a valid starting signal or can be promptly restored either by an operator in the control room or by a designated operation stationed locally for that purpose. Restoration actions must be contained in a written procedure, must be uncomplicated (a single action or a few simple actions), must be capable of being restored in time to satisfy PRA success criteria, and must not require diagnosis or repair.
2. The control room operator concurs that equipment is returned to service prior to it being declared available
   - Clearance tags have been removed
   - The system is aligned for operation
   - The system has been prepared for operation (e.g., filled and vented)
   - Equipment adjustment is not required or expected as the result of the PMT. However, tuning that may occur based on PMT results should improve SSC reliability and is permissible.
3. There must be a documented, scrutable process that demonstrates that the availability conditions have been met
4. I~~I~~f a failure occurs during the PMT (or other testing activities prior to the PMT)~~results,~~ that is associated with the maintenance that was performed~~ance~~, ~~then~~ previously screened unavailability hours are to be recorded.
5. If a failure occurs as the result of an ~~non-Test~~Actual ESF demand, a failure is counted and the previously screened unavailability hours are to be recorded.

Whether a plant chooses to use Option 1 or Option 2, PMT failures are not reported as MSPI failures unless the failure was independent of the maintenance that was performed.

Staff Recommended Approach to Rounding of MSPI Values

The table below shows several examples of the addition of URI and UAI. These examples were selected in an attempt to make the rounded sum be different from the displayed values.

There are several cases when only two digits are displayed where the values are mismatched. I could not devise an example where the mismatch occurred if three significant digits are displayed. Therefore the staff recommends that the URI and UAI be displayed to three significant digits.

	Example	**Two Digits**	**Three Digits**	**Four Digits**
1	1.2333E-7 1.2333E-7 2.4666E-7 rounds to 1.5E-7 (Same order of magnitude)	1.2E-7 1.2E-7 2.4E-7 Mismatch	1.23E-7 1.23E-7 2.46E-7 rounds to 2.5E-7 Good	1.233E-7 1.233E-7 2.466E-7 rounds to 2.5E-7 Good
2	1.2333E-8 1.2333E-7 1.35663E-7 rounds to 1.4E-7 (One order of magnitude difference)	1.2E-8 1.2E-7 1.32E-7 rounds to 1.3E-7 Mismatch	1.23E-8 1.23E-7 1.353E-7 rounds to 1.4E-7 Good	1.233E-8 1.233E-7 1.3563E-7 rounds to 1.4E-7 Good
3	1.2333E-9 1.2333E-7 1.245633E-7 rounds to 1.2E-7 (Two orders of magnitude difference)	1.2E-9 1.2E-7 1.212E-7 rounds to 1.2E-7 Good	1.23E-9 1.23E-7 1.2423E-7 rounds to 1.2E-7 Good	1.233E-9 1.233E-7 1.24533E-7 rounds to 1.2E-7 Good
4	1.3333E-7 9.2333E-7 1.05666E-6 rounds to 1.1E-6 (Increases by a digit)	1.3E-7 9.2E-7 1.05E-6 rounds to 1.1E-6 Good	1.33E-7 9.23E-7 1.056E-6 rounds to 1.1E-6 Good	1.333E-7 9.233E-7 1.0566E-6 rounds to 1.1E-6 Good
5	3.3333E-8 9.2333E-7 9.56663E-6 rounds to 9.6E-7 (High first digit)	3.3E-8 9.2E-7 9.53E-6 rounds to 9.5E-7 Mismatch	3.33E-8 9.23E-7 9.563E-6 rounds to 9.6E-7 Good	3.333E-8 9.233E-7 9.5663E-6 rounds to 9.6E-7 Good
6	-3.7555E-8 9.2333E-7 8.85775E-7 rounds to 8.9E-7 (negative example)	-3.7E-8 9.2E-7 8.83E-7 rounds to 8.8E-7 Mismatch	-3.75E-8 9.23E-7 8.855E-7 rounds to 8.9E-7 Good	-3.755E-8 9.233E-7 8.8575E-7 rounds to 8.9E-7 Good

Staff White Paper

Evaluation Sample of Impact of EDG Fuel Oil Transfer Pump Failures on EDGs

Executive Summary

A review of the option to include the fuel oil transfer (FOT) pumps inside the EDG component boundary was performed. The effect of the FOT pumps on the EDG fail to run (FTR) needs to be evaluated for MSPI failure based on the availability of redundant pumps, capacity of the EDG FO Day tank, and mission time. If any of these values are determined to impede the EDG for its mission, the EPIX failure record should indicate the status of the EDG key component as a FTR.

This review focused on the effects that the inclusion of the FOT pump to the EDG MSPI failure determination would have on the baseline value as used in the EAC performance indicator. A single event was found that would be included in the current EDG FTR baseline, which is based on the period 1998—2002. A small change was observed in the non-rounded value. A significant change was observed in the rounded value. Additionally, a single event was identified in the 2003—2007 period, which was selected as a potential update to the original baseline.

Additionally, the staff does not support continued rounding of reported values. An analysis of the recalculation of the unrounded FTR values for the data used in NUREG/CR-6928 concluded that there is no significant change in the baseline data that should be corrected. However, if NUREG/CR-6928 continues to be the source document of record for calculating the EDG failure baseline, the EDG FTR baseline should be changed to 9.00E-04/hour, since the rounded baseline does change.

This analysis is preliminary, in that there is uncertainty that all FOT pumps have been identified for the purposes of searching for potential EDG failures.

Issue

A revised EDG component boundary is being proposed, which will include the fuel oil transfer (FOT) pumps. The purpose of this sample evaluation is to observe the treatment of the FOT pumps within EPIX.

There are zero instances listed in the EPIX database of the FOT pump failure being tied to the EDG (key) component failure or unavailability. This is due to the current EDG boundary definition, which excludes the FOT pumps. Therefore, the current baseline EDG FTR does not include FOT pump failures.

FOT Pump Identification

The first step is to identify FOT pump failure reporting in EPIX. To do this, the FOT pump DeviceIDs were identified and the appropriate failure records reviewed. Table 1 shows the counts of the FOT pumps identified in EPIX. There are 65 sites (one or more than one plant at each site) represented in EPIX, of which, 47 sites had FOT pumps listed with enough information to identify what they were. Three sites showed only a single FOT pump and several sites showed eight or more FOT pumps (not including the booster pumps). In order to identify the rest of the FOT pumps, the sites will have to be contacted and asked to provide more information.

Table 1. Fuel oil pumps at sites.

Site	Count of FOT Pumps in EPIX
Arkansas	4
Beaver Valley	
Braidwood	7
Browns Ferry	8
Brunswick	8
Byron	8
Callaway	4
Calvert Cliffs	4
Catawba	
Clinton	3
Columbia	
Comanche Peak	8
Cook	
Cooper	
Crystal River	4
Davis-Besse	2
Diablo Canyon	3
Dresden	3
Duane Arnold	2
Farley	10
Fermi	8
Fitzpatrick	8
Fort Calhoun	
Ginna	
Grand Gulf	4
Harris	
Hatch	
Hope Creek	
Indian Point	3
Kewaunee	2
Lasalle	8
Limerick	1
Mcguire	4
Millstone	
Monticello	1
Nine Mile Pt.	
North Anna	5

Site	Count of FOT Pumps in EPIX
Oconee	
Oyster Creek	4
Palisades	3
Palo Verde	6
Peach Bottom	4
Perry	
Pilgrim	2
Point Beach	
Prairie Island	6
Quad Cities	3
River Bend	2
Robinson	2
Salem	
San Onofre	8
Seabrook	2
Sequoyah	8
South Texas	1
St. Lucie	4
Summer	4
Surry	6
Susquehanna	
Three Mile Isl	4
Turkey Point	2
Vermont Yankee	2
Vogtle	8
Waterford	
Watts Bar	4
Wolf Creek	2

Failure Data Review

Once the list of FOT transfer pumps was created, any EPIX failure reports that included any of these DeviceIDs were tagged for review. Over the period of EPIX (1997 to 2008), eleven FOT pump failure records were found. These were then reviewed by staff for failure mode and recovery possibilities. The following is a summary of the results of that review.

FOT Pump Failures

4/16/1997 1051000037 FOT MDP	UA (Other Comp) Non-Test Demand Recovered La Salle 1	The AR1 relay in the control circuit for the 0 dg fuel transfer pump (located in MCC 135Y-2) failed during a bus transfer on 04/09/97. This relay is part of the control circuit that automatically transfers power between unit 1 and unit 2 so that continuous power is provided to fuel oil transfer pump. Not an EDG Failure.
4/21/1997 1040000052 FOT MDP	Fail to Start Test Not Recoverable Brunswick 2	DGB EL000 EE Z/11D BREAKER TRIPPED TO TRIPPED FREE POSITION WHEN PUMP GOT AN AUTO START SIGNAL. Impact on EDG indeterminable.
1/10/1998 1042000175 FOT MDP	UA (Maint) Non-Test Demand Recovered Robinson 2	WHILE INSTALLINTG A JUMPER IN BX-214 PER OST-701-4, THE END OF THE JUMPER CONT CTED GROUND AND THE CONTROL FUSE FOR MCC-5(16C) WAS BLOWN. NEED TO REPLACE THE CONTROL FUSE IN MCC-5(16C). THE FUSE NUMBER IS FNQ-R-2. Not an EDG Failure.
11/15/2000 937000275 FOT MDP	Fail to Run <1H Non-Test Demand Not Recoverable Diablo Canyon 1	(Diesel Fuel Oil Transfer Pump 0-1) was selected to ON, in order to recirculate the tank for sampling. After approximately 10 minutes the pump began rapidly cycling ON and OFF every couple of minutes. The operator locally at the control verified the switch was selected to run the whole time (started from Diesel Generator DG 2-3). During troubleshooting, Outside Asset Team (OST) could not find a problem. Troubleshooting included taking voltage while pump was running; voltage remained constant. Also as-found resistance across the relay 49-1H-65 was approx 2 ohms. Slight mechanical agitation and the resistance went to -0-. It was noted that the flag on the relay was slightly dropped but overload was not tripped and pump was functional. OST removed the solder pots and cleaned IAW MP E-50.1 and tested relay IAW ATT 8.1 of MP E-50.1 satisfactorily. Impact on EDG indeterminable.
7/10/2001 1062000153 FOT MDP	Fail to Stop Non-Test Demand Recovered McGuire 1	At 04:22 received OAC alarm for 1B Diesel Generator (D/G) Fuel Oil Day Tank HI and subsequently HI HI level. The Plant Senior Reactor Operator (SRO) and Non-Licensed Operator (NLO) immediately investigated and determined the Fuel Oil Transfer Pump (FOTP) (MFDPU0055) was running. The pump was secured. The Day tank overflowed approximately 80-100 gallons of fuel oil into the trench and sump. Not an EDG failure.
7/25/2001 1062000154 FOT MDP	Fail to Stop Non-Test Demand Recovered McGuire 1	While performing PT/1/A/4350/002B, the Fuel Oil Transfer Pump (MFDPU0055) is tested to ensure proper DP across the filter. The pump did not automatically stop when the Hi setpoint was reached. The Non-Licensed Operator (NLO) stopped the pump by opening the breaker (1EMXF R02B - 1B FD Transfer Pump) which rendered the 1B Diesel Generator (D/G) inoperable. No fuel oil was spilled, and all Tech Spec actions were completed. Not an EDG failure.
1/8/2002 1101000264 FOT MDP	Fail to Run Test Not Recoverable Limerick 1	During the performance of ST-6-092-312-1 D12 diesel generator operability test, local alarm D-3 F.O. Day Tank Level Low on panel 1BC514 was received, the Equipment Operator followed the ARC procedure which leads him to check the feed switch for the D12 diesel fuel oil transfer pump D124-D-G-17. He found the feed switch was tripped on thermal over loads the Operator then reset the thermal over load and the fuel oil transfer pump started. Under the system 20D (EDG Fuel Oil Storage and Transfer), Limerick Generating Station Maintenance Rule Scope and Performance Monitoring Database, it identifies that all SSC 20D components are donated to SSC 92A. This means that functional failures of any kind for system 20D components will be TRACKED under system

		92A (Diesel Generators and Auxiliaries). However, all functional failures against system 20D components will still be EVALUATED using the criteria established under system 20D. A train of the Fuel Oil Storage and Transfer System consists of a Fuel Oil Storage Tank, the associated Transfer Pump, Duplex Filters and Strainers, Day Tank and piping between the Storage Tank and engine skid Possible EDG failure.
2/29/2004 1040001139 FOT MDP	Fail to Start Test Recoverable Brunswick 2	Circuit breaker Tag No. 2-DGA-DR4-52 for DG1 Fuel Oil Transfer Pump 1B tripped magnetically following performance of 0MST-DG11R The Fuel Oil Transfer System consists of two 100% capacity pumps that serve to fill the DG saddle tank upon receipt of a low or low-low level signal. 1B was selected as the preferred pump and tripped the breaker on an attempted low level start which was due to the loaded operation of EDG No. 1 during performance of 0MST-DG11R DG-1 Load Test. The 1A pump started upon low-low level and fuel oil was transferred to the fill the saddle tank as per design. Because the back-up started and maintained saddle tank fuel oil inventory, this event does not represent an operability issue. Not an EDG failure.
8/3/2005 1039000351 FOT MDP	Fail to Run <1H Test Not Recoverable Palisades	During surveillance testing of Emergency Diesel Generator EDG 1-2 on 8/3/05, a fuel transfer pump (P-18B) motor breaker (52-123) thermal overload opened, resulting in the failure of fuel oil transfer pump P-18B. Fuel oil pump P-18B had been in service for approximately 45 minutes filling EDG 1-2 Fuel Oil Day Tank T-25B. Impact to EDG indeterminable. Probably no impact.
10/10/2005 1042000408 FOT MDP	Fail to Run Test Recovered Robinson 2	Fuel oil transfer pump 'B' failed while running in support of the 'B' emergency diesel generator during the performance of OST-411, 24 hour load test. Each emergency diesel generator (EDG) is supplied by a fuel oil transfer pump which transfers fuel from the diesel fuel oil storage tank (DFOST) to the EDG day tank. An EDG can operate a minimum of 35 minutes using the inventory in its day tank. The fuel oil transfer pump is required to maintain a fuel supply available beyond that time. The 'A' and 'B' fuel oil transfer pumps can be cross tied by opening manual valve FO-24; however, this action renders both EDGs inoperable due to single failure considerations. An alternate supply of fuel oil is available by a gravity feed from the alternate fuel oil storage tank (AFOST). The motor was disassembled in the electrical maintenance shop and the rotor removed from the motor. With the end bells and rotor removed from the motor frame, the visual inspection performed on the stator windings revealed spider webs, insects, dirt and previous moisture intrusion. A megger test was performed at 500 volts, and the insulation resistance was very high, indicating that the motor's ground-wall insulation was intact, and the motor windings were not grounded to the iron. EDG FTR
6/25/2008 1030001099 FOT MDP	Fail to Run <1H Test Not Recoverable Palo Verde 3	On June 25, 2008 during the performance of 40ST-9DG01 DIESEL GENERATOR A TEST, the Unit 3A transfer pump was transferring diesel fuel oil from the Diesel Fuel Oil Storage Tank (DFOST) to the Day Tank when a SEIS alarm of the "A" Fuel Transfer Pump was received. The control room hand switch indicated brighter than normal green indicating that the pump had tripped. The breaker PHA-M3114 (Supply Breaker for DFA-P01) was checked locally and the breaker was not tripped free. The level in the day tank was at 4.5 (normal pump shut off level) feet at the time when the pump shut off. The Unit 3A Emergency Diesel Generator (EDG) was declared Inoperable and LCO's 3.8.1 and 3.8.3 were entered. Since the pump shut off and no fuel oil was available to make up to the EDG day tank, the Key Safety Function of the EDG could not be fulfilled and this event was deemed to be a Maintenance Rule Functional Failure.

Work Mech 3192098 was issued to perform trouble-shooting as to why the pump shut off.
It was determined that the motor thermal overload contacts were open. It was also discovered that both the Pump Start and Pump Stop signals were being sent to the motor start circuit simultaneously. This was causing the Motor Contactor (42) and the AX Latching Relay to cycle on and off rapidly. The repeated high starting currents induced from the rapid starting and stopping of the motor caused the motor thermal overload contacts to open.

A failure of the diesel fuel oil transfer system would render the diesel inoperable. Technical Specifications section 3.8.1 requires two EDGs, each capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System. If a single diesel becomes inoperable, the inoperable diesel must be restored within 10 days.

EDG FTR

Current Case

The current MSPI EDG baseline data are based on the period 1998—2002. During this period, the baseline includes 50 EDG FTR events (59,875 hours). This analysis has identified a single (possible) EDG failure attributable to the FOT pump. The change in the number of failures is 2%. Since the baseline (8.00E-04) is rounded, there is a much larger change than would be expected in the result. Table 2 shows these effects. (The rounding scheme is from NUREG/CR-6928. The staff do not support continued rounding of reported values.)

Table 2. Effects of the FOT pump failure event on MSPI EDG baseline.

	FTR Events	Run Hours	Rate (point estimate)	Change Unrounded	Rounded Rate (point estimate)	Change Rounded
No FOT	50	59875	8.35E-04	-	8.00E-04	-
With FOT	51	59875	8.52E-04	2%	9.00E-04	11%

New Baseline

The proposed MSPI EDG baseline data is based on the period 2003—2007. During this period, the baseline includes 51 EDG FTR events (60,682 hours). This analysis has identified one EDG failure attributable to the FOT pump. The change in the number of failures is 2%. Since the baseline (8.00E-04) is rounded, there is a much larger change than would be expected in the result. Table 3 shows these effects. This analysis is presented for comparison and should not be considered as a valid result to use outside of this discussion.

Table 3. Effects of the FOT pump failure event on MSPI EDG proposed baseline.

	FTR Events	Run Hours	Rate (point estimate)	Change Unrounded	Rounded Rate (point estimate)	Change Rounded
No FOT	51	60682	8.40E-04	-	8.00E-04	-
With FOT	52	60682	8.57E-04	2%	9.00E-04	11%

Implementation

If the FOT pump gets included in the EDG component boundary, the events shown here need to have the EDG key component assigned to each record (as applicable). The staff has added EDG devices to failure events to account for the failures of output breakers without an EDG key component and can do this for the FOT pump events. The better option is to have industry add these to the device failure table themselves.

The current guidance in NEI 99-02 allows for identifying MSPI failures of components, if a failure outside of the component boundary leads to the observed failure of the component of interest.

> ***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.)
>
> > Run hours (pumps and emergency power generators only) are defined as the time the component is operating. Run hours include the first hour of operation of the component. Exclude post maintenance test run hours, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the run hours may be counted as well as the failure."
> >
> > 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."
> >
> > For pumps and diesels, if it was determined that the pump/diesel would start and load run, but would fail sometime prior to completing its mission time, a run failure would be assumed. A start demand and a load/run demand would also be assumed and included. The evaluated failure time may be included in run hours.

Conclusion

There has been no discernible change in the baseline; any difference is completely attributable to random fluctuations in the number of EDG failures. In other words, the fluctuations are not statistically significant. However, if the NUREG/CR-6928 rounding scheme is continued, the EDG FTR baseline should be changed to 9.00E-04/hour.

Staff White Paper

EDG Failure Mode Definitions

Executive Summary

A review of the impact of proposed changes to the NEI 99-02 MSPI EDG failure mode definitions on the current failure rate baseline was performed. As a result of this review, it is recommended that the failure mode changes proposed by NEI be adopted but with some modifications. Specifically, the definition of EDG failure to run should be modified to include the clarification "Note that if the EDG is secured from operation due to observed degraded performance, but prior to failure, then a run failure shall be assumed, even if it is secured prior to one hour of elapsed time." This clarification is consistent with current NEI guidance, but is inconsistently applied due its placement within NEI 99-02. Additionally, it is recommended that the guidelines for reporting run hours be modified to only include the time the EDG is exposed to the failure to run failure mode. The current run hours definition is not in alignment with the failure mode definition and is non-conservative.

Issue

Industry has proposed through NEI to modify the current MSPI EDG failure mode definitions provided in NEI 99-02. The existing and proposed definitions for EDG fail to start (FTS), fail to load/run (FTLR) and fail to run (FTR) are presented below. The definitions/requirements for demand and run-hour reporting are also presented. *(Note: emphasis has been added to show the major differences between the existing and proposed EDG failure mode definitions.)*

> (Existing) ***EDG failure to start:*** A failure to start includes those failures up to the point the EDG has achieved <u>required speed and voltage</u>. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.)
>
> > Other guidance: Demands (including start demands for the emergency power generators) are defined as any requirements for the component to successfully start (pumps and emergency power generators) or open or close (valves and circuit breakers).
>
> (Proposed***)*** ***EDG failure to start:*** A failure to start includes those failures up to the point where the <u>EDG output breaker has received a signal to close</u>. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.
>
> ***(***Existing***)*** ***EDG failure to load/run:*** Given that it has successfully started a failure of the EDG output breaker to close, to successfully load sequence, and to run/operate for one hour to perform its monitored functions. This failure mode is treated as a demand failure for calculation purposes. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.)

Load run demands (emergency power generators only) are defined as any requirements for the output breaker to close given that the generator has successfully started and reached rated speed and voltage. Exclude post maintenance test load run demands, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the load run demand should be counted, depending on whether the actual or estimated demand method will be used, as well as the failure.

(Proposed) ***EDG failure to load/run:*** Given that it has successfully started, a failure of the EDG output breaker to close, or a failure to run/operate for one hour during surveillance test load sequencing or actual demand. <u>The one hour clock starts at the time that the EDG output breaker closes.</u> During surveillance testing the EDG may not be fully loaded at the end of the first hour. This failure mode is treated as a demand failure for calculation purposes. Failure to load/run also includes failures of the EDG output breaker to re-close following a grid disturbance if the EDG was running paralleled to the grid. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.

(Existing) ***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.)

Other guidance: Run hours (pumps and emergency power generators only) are defined as the time the component is operating. Run hours include the first hour of operation of the component. Exclude post maintenance test run hours, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the run hours may be counted as well as the failure."

Other guidance: 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."

Other guidance: For pumps and diesels, if it was determined that the pump/diesel would start and load run, but would fail sometime prior to completing its mission time, a run failure would be assumed. A start demand and a load/run demand would also be assumed and included. The evaluated failure time may be included in run hours.

(Proposed) ***EDG failure to run:*** Given that it has successfully started, the output breaker successfully closed, <u>and the EDG has run for an hour after the output breaker closed, a failure of an EDG to run/operate.</u> (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.)

<u>Discussion of the Impact of the Proposed Changes</u>

Most of the unreliability data for EDGs comes from surveillance testing. Therefore, any discussion of EDG failure mode definitions needs to evaluate the effect of these the failure definitions on data collection during testing. The definitions of the EDG failure mode exhibit dependence to the timing of the events. The ESF (non-testing) EDG start and run sequence and timing have the best correspondence with the failure mode definitions.

Surveillance testing introduces variability to the timing of the events based on how quickly the test is completed. The timing inconsistencies are formed by differences between the rated speed and voltage event and when the output breaker is actually closed and the slow starting and warm-up of the EDG before it is loaded, which vary from plant-to-plant from 10 minutes to 45 minutes. By requirement, the EDG is run, loaded, for 1 hour. To demonstrate this concept, three cases are defined and Table 1 give representative times for three cases:

- Case A represents a plant which completes the monthly EDG surveillance efficiently with little delay.
- Case B represents a plant which performs the monthly EDG surveillance with some delays in the warming and loading portions of the test.
- Case C represents an under voltage or ESF EDG start for comparison.

Table 1. Estimated EDG event timing (min) for cases.

EDG Event	Time (min)		
	Case A: Efficient EDG surveillance.	Case B: Delayed EDG surveillance.	Case C: ESF EDG Start.
EDG start	0	0	0
EDG at rated speed and voltage	8	20	15 sec
Close Output Breaker	10	30	15 sec
EDG loaded	15	45	1
EDG 1 hr run completed	75	105	60
EDG secured	80	120	Variable

Error! Not a valid bookmark self-reference. provides an example of the exposure variability due to testing procedures. The exposure minutes represent the amount of time that a particular failure mode would have been assigned if the EDG failed at that particular event in the test using both the existing failure mode definition and for the proposed failure mode definitions.

Table 2. Exposures times to failure modes.

EDG Failure Mode	Case	Current MSPI definitions		Proposed change to MSPI definitions	
FTS	A	8		10	
	B	20		30	
	C	15 sec		15 sec	
FTLR	A	52	Due to delay between starting and closing output breaker and actual loading	60	Due to consistent definition of loading
	B	40		60	
	C	60		60	
FTR	A	20		10	
	B	60		30	
	C	Variable		Variable	

The amount of time the EDG is exposed to the FTS failure mode continues to vary based on the timing of the events due to testing procedures. The FTLR exposure time is currently variable, since this failure mode overlaps the FTS failure mode definition. However, the time the EDG is exposed to FTLR changes from variable to consistent with the proposed failure mode definitions.

Error! Not a valid bookmark self-reference. provides an example of the exposure variability due to testing procedures. The exposure minutes represent the amount of time that a particular failure mode would have been assigned if the EDG failed at that particular event in the test using both the existing failure mode definition and for the proposed failure mode definitions.

Table 2 shows that FTR exposure is minimal during testing and depends strongly on how much delay is introduced during the surveillance. By changing the failure mode definitions, the exposure to FTR failures is reduced. However, FTR failures can be recorded during the FTLR exposure time, if the EDG is stopped due to impending failure that would have occurred after the FTLR exposure timing. In this case, run hours are estimated and added to the appropriate data submittal entry.

The net impact of the proposed EDG failure mode taxonomy on the number of failures reported for each category would be:

- FTS – Possibly a very slight increase due to slightly higher exposure.
- FTLR – Increase due to some FTR events becoming FTLR due to more exposure while EDG is loaded vice running unloaded.
- FTR – Decrease due to same reason as FTLR increases (reduced exposure).

Non Conservative Run Hours Definition

The current rules for data reporting employ different criteria for collecting failure data than that for collecting the corresponding run hours. The net effect of this error is to overstate run hours, which artificially lowers the FTR rate. The current method of data collection is that run hours begin at the time the EDG is started, but the exposure to FTR failures does not occur until 60 minutes after the EDG is running at rated conditions. Using the example above, the FTR exposure time during surveillances is 20 to 60 minutes, however using the current run hour's rules, the run hours (denominator in the URI) would be 80 to 120 minutes. This problem would be exacerbated if the new definitions were implemented as FTR exposures would be reduced to 10 to 30 minutes while the denominator remained 80 to 120 minutes. The numerator and the denominator need to be aligned, or the rate will be meaningless and in this case non conservative. Even if the failure mode definitions are not changed, the rules for reporting run hours should be modified.

A review of the EPIX reliability data table shows that non-PMT testing demands (per EDG) vary from 12.2 per year to 42.5 per year over the period 1997 to 2008. The average number of non-PMT testing demands reported is 19.6 per year.

Applicable NEI 99-02 Guidance

Several applicable sections from NEI 99-02 are included for reference.

1. NEI 99-02, Appendix F2, Section F2.2.2 defines the EDG failure modes which are listed above.

2. NEI 99-02, Appendix F2, Section F2.2.1 states: "Load run demands (emergency power generators only) are defined as any requirements for the output breaker to close given that the generator has successfully started and reached rated speed and voltage. Exclude post maintenance test load run demands, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the load run demand should be counted, depending on whether the actual or estimated demand method will be used, as well as the failure.

Run hours (pumps and emergency power generators only) are defined as the time the component is operating. Run hours include the first hour of operation of the component. Exclude post maintenance test run hours, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the run hours may be counted as well as the failure."

3. NEI 99-02, Appendix F2, Section F2.2.2, also states: "For other discovered conditions where the discovery of the condition is not coincident with the failure, the appropriate failure mode must be accounted for in the following manner:

- For valves and breakers a demand failure would be assumed and included. An additional demand may also be counted.
- For pumps and diesels, if the discovered condition would have prevented a successful start, a failure is included, but there would be no run time hours or run failure. An additional demand may also be counted.

- For diesels, if it was determined that the diesel would start, but would fail to load (e.g. a condition associated with the output breaker), a load/run failure would be assumed and included. An additional start demand and load/run demand may also be counted.
- For pumps and diesels, if it was determined that the pump/diesel would start and load run, but would fail sometime prior to completing its mission time, a run failure would be assumed. A start demand and a load/run demand would also be assumed and included. The evaluated failure time may be included in run hours.

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."

Note that the guidance in this final paragraph is often ignored in the failure mode determination. There are numerous examples in which an EDG was intentionally secured prior the expiration of the 1 hour clock due to a degraded condition which would have prevented the EDG from running for its mission time, and coded as a FTLR failure.

Four Options are Evaluated.

If the failure mode definitions are going to be changed, we present some other options.

(1) Adopt the NEI industry proposal given above. Also emphasize in the FTR definition that per the guidance from NEI 99-02 paragraph 3 above, if the EDG is secured from operation due to a degraded condition discovered during the test prior to failure, it should be counted as a FTR failure even if the EDG was secured before 60 minutes had elapsed since output breaker closure. In addition, correct the rule for reporting run hours for EDGs to count the time from 1 hour after the EDG output breaker closes until the EDG is secured (i.e., operational hours prior to closure of the output breaker would not be included).

(2) Adopt a "functional" approach to the definitions. The start function of the EDG is to start the engine, flash the generator field, and come up to the required speed and voltage. Therefore a failure to start would include failures up to the point the EDG output breaker is demanded to close. The load run function of the EDG is to close the EDG output breaker and accept the load as it is sequenced on. Therefore, a load run failure would be any failure from a demand to close the EDG output breaker until the EDG is loaded. The run function of the EDG is to carry the desired load for the mission time of the EDG. Therefore any failure after the EDG is loaded until is shutdown upon completion of its desired run would be a FTR failure. In addition, the run hours reported should match the number of hours that the EDG was performing the run function.

(3) Adopt the NEI industry proposal given above.

(4) Maintain status quo. Do not change the current definitions given in NEI 99-02.

As will be discussed below, the four options for EDG failure modes have various advantages, disadvantages, and implications. The discussion below explains them.

Analysis of Options

The advantages and disadvantages are summarized below:

Option 1 Advantages:

1. More consistency between plants reporting FTLR and FTR failures during surveillances.
2. Correction of the denominator (run hours) in the URI will give a more accurate FTR rate.
3. Closer alignment between ESF performance and surveillance performance.

Option 1 Disadvantages:

1. May require a change in the MSPI baseline data.
2. Requires modification to NEI 99-02 and possibly plant training.

Option 2 Advantages:

1. Aligned with the actual EDG functions.
2. More consistency between plants reporting FTLR and FTR failures during surveillances.
3. Closer alignment between ESF performance and surveillance performance.
4. Correction of the denominator (run hours) in the URI will give a more accurate FTR rate.

Option 2 Disadvantages:

1. Will require a change to the MSPI baseline data.
2. Requires modification to NEI 99-02 and plant training.
3. Requires more judgment by the person determining the failure mode.
4. Requires a definition for "loaded" which may be difficult and could be inconsistently applied.

Option 3 Advantages:

1. More consistency between plants reporting FTLR failures during surveillances.

Option 3 Disadvantages:

1. Will require a change to the MSPI baseline data.
2. Requires modification to NEI 99-02 and plant training.
3. The URI EDG run hours are non conservative.

Option 4 Advantages:

1. Does not require modifications to NEI 99-02.
2. Does not require a change to the MSPI baseline data.

Option 4 Disadvantages:

1. Inconsistency between plants during surveillances.
2. ESF performance and surveillance performance are not closely aligned.
3. The URI EDG run hours are non conservative.

Recommendations

Option 1 is recommended. Any of the options other than 4 will require modification to NEI 99-02 and an update to the MSPI baseline data. Option 1 is more closely aligned to the ESF function of the EDG. Option 1 also eliminates a lot of the variability in data reporting due to differences in performing the monthly surveillance test. Option 1 also eliminates the error in EDG run hours, which employs different criteria for collecting failure data than that or collecting the corresponding run hours. The net effect of this error is to overstate run hours, which artificially lowers the FTR rate.

Impact To Baseline Data

The current EDG failure rate data comes from NUREG/CR-6928, which utilized EPIX data from 1998-2002. If the failure mode definitions are changed, the failure records which form the baseline will need to be evaluated against the new definitions. It is also recommended that if the baseline is re-evaluated, that data from 2003-2008 be used instead. If changes to the rules for reporting run hours are adopted, the baseline failure to run rate will need to be re-evaluated as well. Ideally, industry would correct the run hours reported to EPIX for the new baseline period.

Recommended NEI 99-02 Changes to Support Option 1

To implement the recommendations given in option 1, NEI 99-02, Appendix F2, Section F2.2.2 would be modified to change the EDG failure mode definitions to the following:

EDG failure to start: A failure to start includes those failures up to the point where the EDG output breaker has received a signal to close. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.

EDG failure to load/run: Given that it has successfully started a failure of the EDG output breaker to close, to successfully load sequence, and to run/operate for one hour to perform its monitored functions. The one hour clock starts at the time that the EDG output breaker closes. This failure mode is treated as a demand failure for calculation purposes. Failure to load/run also includes failures of the EDG output breaker to re-close following a grid disturbance if the EDG was running paralleled to the grid. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.

EDG failure to run: Given that it has successfully started, the output breaker successfully closed, and the EDG has run for one hour after the output breaker closed, a failure of an EDG to run/operate. Note that if the EDG is secured from operation due to observed degraded performance, but prior to failure, then a run failure shall be assumed, even if it is secured prior to one hour of elapsed time. (Exclude post maintenance tests, unless the cause of failure was independent of the maintenance performed.)

NEI 99-02, Appendix F2, Section F2.2.1 would have the following changes to the run hour's rules for data collection.

(Existing)
Run hours (pumps and emergency power generators only) are defined as the time the component is operating. Run hours include the first hour of operation of the component. Exclude post maintenance test run hours, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the run hours may be counted as well as the failure.

(Proposed)
Run hours (emergency power generators only) are defined as the time the component is operating after the load/run function. Run hours begin one hour after the EDG output breaker is closed. Exclude post maintenance test run hours, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the run hours may be counted as well as the failure.

Run hours (pumps only) are defined as the time the component is operating. Run hours include the first hour of operation of the component. Exclude post maintenance test run hours, unless in case of a failure, the cause of the failure was independent of the maintenance performed. In this case, the run hours may be counted as well as the failure.

Temp No.	PI	Topic	Status	Plant / Co.
09-02	ANS	Pre-conditioning	Tentative	Industry
09-04	USwC	Loss of FW after scram	Discussed	Brunswick
	IE01	Planned shutdown scrams	Introduced	Generic

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.

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.

<u>Questions requiring interpretation:</u>

[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.

FAQ TEMPLATE

Plant: Generic ________________
Date of Event: NA______________________
Submittal Date: _June 17, 2009_____________
Licensee Contact: _Jim Peschel______________ Tel/email: _603-773-7194______
NRC Contact: _John Thompson___ ________ Tel/email: _301-415-1011_____

Performance Indicator: IE01

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):

Page 11, line 10

- Scrams that occur as part of the normal sequence of a planned shutdown and scram signals that occur while the reactor is shut down.

Event or circumstances requiring guidance interpretation:

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

Potentially relevant existing FAQ numbers

Response Section

Proposed Resolution of FAQ
Revise NEI 99-02 as indicated below

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

Page 11, line 10

10 Scrams that ~~occur as part of the normal sequence of~~ are initiated at less than or equal to 35% reactor power in accordance with normal operating procedures (i.e., not an abnormal or emergency operating procedure) to complete a planned shutdown and scram signals that occur while the reactor is shutdown.