

Enclosure 3

Reactor Oversight Process Task Force FAQ Log – August 7, 2013

FAQ Log Entering Public Meeting on August 7, 2013

FAQ No.	PI	Topic	Status	Plant/Co.	Point of Contact
13-02	IE03	Susquehanna Power Change	Introduced on 06/26/2013. To be discussed 08/07/2013.	Susquehanna	John Tripoli (PPL) Patrick Finney (NRC)

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FAQ 13-02 (Proposed)
Susquehanna Power Change

Plant: Susquehanna
Date of Event: June 11, 2012
Submittal Date: June 14, 2013
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Performance Indicator: IE03

Site-Specific FAQ (Appendix D)? Yes

FAQ requested to become effective when approved

Question Section:

During a planned power reduction of greater than 20% to support a scheduled control rod pattern adjustment, Susquehanna Unit 1 operators encountered a potential equipment problem. To expedite investigation of the plant equipment issue, the operators chose to manually initiate a reactor recirculation system runback which reduced power to the target power level more rapidly than originally projected. Following the runback, and resolution of the potential equipment problem, the planned rod pattern adjustment activities were performed at the target power level within the planned time frame. Power ascension proceeded as planned. Should this rapid power reduction within the planned power reduction scope be counted as an unplanned power change per 7000 critical hours?

Event or circumstances requiring guidance interpretation:

Following the Susquehanna Unit 1 Refueling Outage completed on 6/7/12, during power ascension, on 06/11/12, a planned power reduction from approximately 90% (initial) to approximately 65% (final) was scheduled to perform a rod pattern adjustment evolution. The plan was established greater than 72 hours prior to the actual power reduction.

After, the planned power reduction began at approximately 85% power, plant operators initiated a manual reactor recirculation runback at approximately 84% power to limiter #2 in order to reduce condenser area radiation levels. The runback was necessary to rapidly decrease radiation levels to allow entry into the condenser area to locate the source of water identified on an area camera in the condenser area.

The condenser area water issue was identified and remedied within 15 minutes of entry. The cause was a condenser area sump drain valve.

The planned rod pattern adjustment continued and was completed within the planned time frame of approximately 3 hours from the initial power reduction to completion of the rod pattern adjustment. At that time the ramp up from 70% power began.

PPL did not classify this as an unplanned power change because the planned rod pattern adjustment continued and was completed within the planned time frame. The condenser water

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issue was investigated and resolved within the planned time frame of the rod pattern adjustment and at the same power level as the planned evolution. The rod pattern adjustment (planned activity) was successfully performed at the planned power level with no delay.

The question is whether or not interrupting the rod pattern adjustment and initiating a reactor recirculation system runback should count as an Unplanned Power Change per 7000 critical Hours" under NRC IMC 0305 "Operating Reactor Assessment Program" and the guidance in NEI 99-02 "Regulatory Assessment Performance Indicator Guideline" Revision 6.

NEI 99-02, Rev.6, page 13, lines 3 through 6, contain the following Purpose statement for this indicator:

"This indicator monitors the number of unplanned power changes (excluding scrams) that could have, under other plant conditions, challenged safety functions. It may provide leading indication of risk-significant events but is not itself risk-significant. The indicator measures the number of plant power changes for a typical year of operation at power."

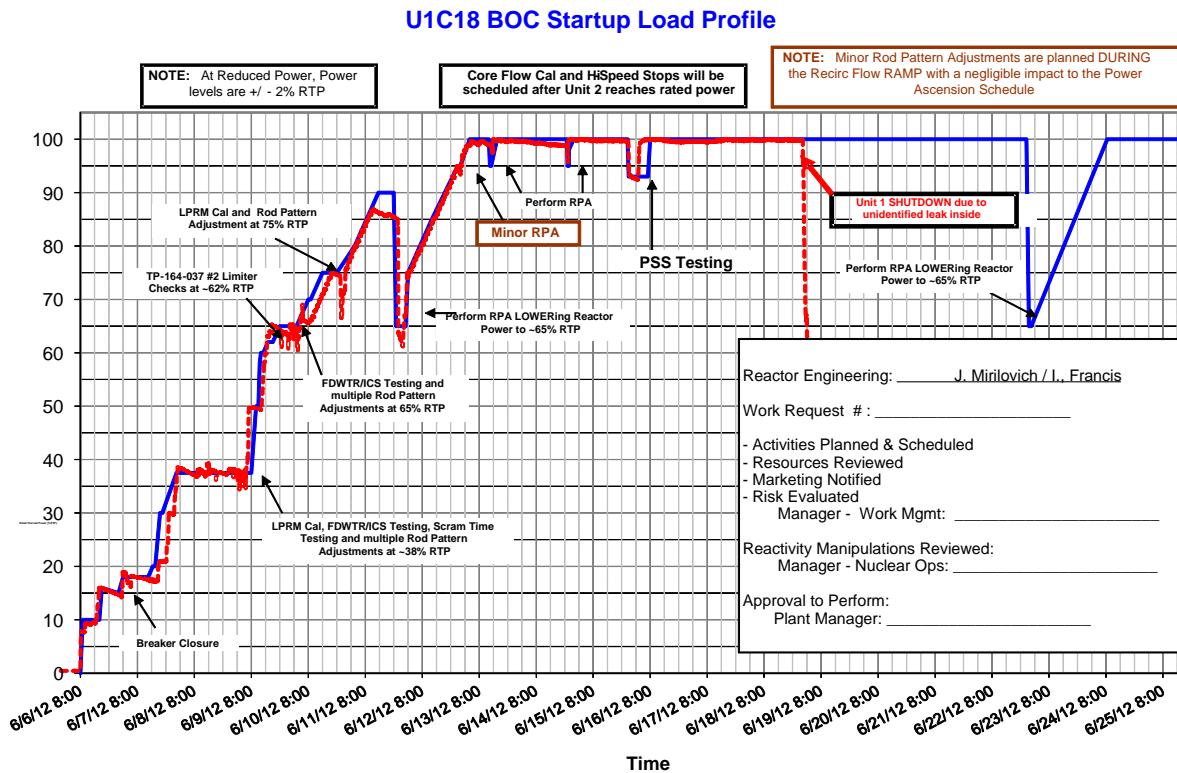
Further, NEI 99-02, Rev.6, page 14, lines 10 through 14 state:

" Equipment problems encountered during a planned power reduction greater than 20% that alone may have required a power reduction of 20% or more to repair are not counted as part of this indicator if they are repaired during the planned power reduction. However, if during the implementation of a planned power reduction, power is reduced by more than 20% of full power beyond the planned reduction, then an unplanned power change has occurred."

Susquehanna Unit 1 was in the process of reducing power on 6/11/2013, at 21:35, for a planned rod pattern adjustment. See the load profile below for a comparison of the predicted power

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changes in blue and the actual power changes in red.



PPL Susquehanna concluded that this was not an unplanned power change because:

- The power reduction was greater than 20% and was planned greater than 72 hours in advance of the rod pattern adjustment. The planned reduction was from approximately 90% power to approximately 65% power.
- Shortly after commencing the planned power reduction, in response to a “Condenser Area Transfer Sump High Level alarm, plant operators initiated a manual reactor recirculation pump runback to limiter 2. The runback started at approximately 84% power and ended at approximately 62% power.
- The emergent condenser area issue was resolved quickly and operators completed the planned rod pattern adjustment. Although the planned evolution was briefly delayed it was completed. If the planned evolution had been canceled (not just briefly delayed) because of the emergent condition, this would be considered an unplanned power change.
- The guidance from NEI 99-02, Rev. 6 page 14 discussed above provides the reasoning for this to not be an unplanned power change. Although the power change was greater than 20%, it was resolved during the planned power reduction window and the emergent issue did not require power to be reduced by more than 20% beyond the planned power reduction.

Therefore, an unplanned power change did not occur.

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Additional considerations:

The power reduction to perform the rod pattern adjustment was a planned evolution with additional personnel supporting the normal shift compliment. Consistent with the purpose of this indicator, no challenge to safety systems occurred. Shift personnel were ready for a power reduction, a potentially significant problem arose, shift personnel took conservative action to place the plant in a status where nuclear and radiological safety was maximized, and the potentially significant problem was addressed in a matter of minutes rather than a potentially longer period of time with higher radiation exposure.

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

The following NRC Resident Inspector Position (with concurrence from RI/DRP/PB4) position was provided:

A) The inspectors considered the following NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6, guidance deemed pertinent to this discussion:

- 1) Page 13, Lines 9-10: The purpose of IE03 is to monitor “the number of unplanned power changes (excluding scrams) that could have, under other plant conditions, challenged safety functions.”
- 2) Page 13, Lines 25-29: The term *Unplanned changes in reactor* power is defined as “changes in reactor power that are initiated less than 72 hours following the discovery of an off-normal condition, and that result in, or require a change in power level of greater than 20% of full power to resolve. Unplanned changes in reactor power also include uncontrolled excursions of greater than 20% of full power that occur in response to changes in reactor or plant conditions and are not an expected part of a planned evolution or test.”
- 3) Page 14, Lines 10-14: “Equipment problems encountered during a planned power reduction greater than 20% that alone may have required a power reduction of 20% or more to repair are not counted as part of this indicator if they are repaired during the planned power reduction. However, if during the implementation of a planned power reduction, power is reduced by more than 20% of full power beyond the planned reduction, then an unplanned power change has occurred.
- 4) Page 14, Lines 16-18: “Unplanned power changes and shutdowns include those conducted in response to equipment failures or personnel errors and those conducted to perform maintenance. They do not include automatic or manual scrams or load-follow power changes.”
- 5) Page 14, Lines 23-24: “Unplanned power changes include runbacks and power oscillations greater than 20% of full power.”

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- 6) Page 16, Line 14: “Downpowers of greater than 20% of full power for ALARA reasons are counted in the indicator.”

B) The inspectors considered the following information from PPL sources pertinent to this discussion:

Upon receipt of the sump alarm, the Operators used the Alarm Response Procedure, AR-125-001, Reactor and Turbine Bldg Miscellaneous Sumps Panel 1C692, Revision 8, according to operator logs. The procedure directs operators to “determine source of excessive inleakage and isolate as necessary” and “if excessive leakage is evident, perform ON-169-001.” The following Off Normal Procedures were entered: ON-169-001, Flooding in the Turbine Building, ON-164-002, Loss of Reactor Recirculation Flow, and ON-178-002, Core Flux Oscillations. Operator logs on 6/11/12 at 2148 hours stated “Initiated Recirc Pump Runback to Limiter #2 in order to lower power to reduce Condenser Area Radiation Levels in support of a pending Condenser Area investigatory entry.” The runback was reset at 2316 hours. Reactor power at that time was approximately 62 percent. PPL’s investigation into the event determined this was a mispositioning event based on a valve found in the closed position.

Reactor Engineering staff were present for the control rod pattern adjustment evolution. Their Reactivity Manipulation Request was annotated with the comments “condenser area transfer sump Hi alarm. Downpower to ~60% by *unplanned power reduction* (emphasis added) form OP-AA-338-5.” OP-AD-338-5 is the Controlled Shutdown/Unplanned Power Reduction form and has two means of entry: a controlled shutdown is required or an unplanned power reduction to below the reactor power maneuvering envelope. The copy used was annotated that a Transient was in progress and that a core flow reduction was required to mitigate the transient.

C) The inspectors questioned PPL’s basis for not counting the downpower as unplanned. This is based on A(3) above in that the power reduction was not implemented as planned. Specifically, PPL’s planned power reduction had not included a recirculation runback as part of the downpower sequence, was an interruption of the rod pattern adjustment, and was completed “more rapidly than originally projected.” The resident inspectors also considered the runback a deviation from the planned power reduction based on the off-normal procedures entered as well as the procedure entered to implement the runback as described in B) above.

Based on the runback being a deviation from the downpower plan, the inspectors further considered the other NEI 99-02 entries described in A) above.

- 1) The annunciation alarm was due to a configuration control error where an operator mispositioned a condenser bay valve. The inspectors considered this information in light of reference A(4) above. Therefore, this was a personnel error that resulted in an operator response by reducing power >20%.
- 2) The operators inserted a recirculation runback in response to the alarm. The inspectors considered this information in light of reference A(5) above. Therefore, this was a runback >20% and unplanned power change.

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- 3) Based on PPL operator logs, the runback was initiated to lower radiation levels in the condenser bay. Using reference A(6) above, the downpower occurred for ALARA reasons.
- 4) PPL's description of the event in the FAQ states, in part, that "the runback was necessary to rapidly decrease radiation levels." Based on reference A(1), the inspectors considered that the rapid reduction in power under other plant conditions could have challenged safety functions.
- 5) PPL discovered an off-normal condition that required a >20% power reduction to resolve and it was not an expected part of the planned rod pattern adjustment. Based on this and reference A(2) above, the runback was for an off-normal condition and was not an expected part of the planned evolution.

In summary, the power change that occurred was not planned as implemented. The downpower for a control rod pattern adjustment is normally executed through PPL's General Operating (GO) procedure and supporting Operations and Reactor Engineering procedures. In this case, PPL responded to an annunciator alarm resulting from a human performance mispositioning event by using Off Normal and Unplanned Power Reduction procedures and implemented a Recirculation Runback that resulted in a power change > 20%.

Potentially relevant existing FAQ numbers:

Archived FAQ's related to the Unplanned Power Changes per 7000 Critical Hours PI (IE03) were reviewed for applicability and consideration of the manner in which power was reduced. A direct correlation to this FAQ was not found. However, archived FAQs are not to be used as a reference for current situations. NEI 99-02, Rev. 6, Appendix E, page E-4 states:

"At the time of a revision of NEI 99-02, active FAQs will be reviewed for inclusion in the text. These FAQs will then be placed in an "archived" file. Archived FAQs are for historical purposes and are not considered to be part of NEI 99-02."

The currently approved IE03 FAQs (469 and 483) were reviewed and the changes proposed by these FAQ's are not applicable to the question posed by this FAQ.

Proposed Resolution of FAQ:

The resolution to this event should be to conclude that it should not be reported as an unplanned power change per 7000 critical hours.