

Enclosure 2

Reactor Oversight Process Task Force FAQ Log January 31, 2018

Document Date: 13 February 2018

FAQ Log February 2018

FAQ No.	PI	Topic	Status	Plant/Co.	Point of Contact
17-04	MS	Watts Bar Unit 2 MSPI Effectiveness Date	Introduced November 16 Finalized January 31	Watts Bar Unit 2	Clinton Woolson/Beth Wetzel (TVA) Alex Garmoe (NRC)
17-05	MS	Watts Bar 2 MSPI MS09 Effectiveness Date	Introduced November 16 th Partially Finalized and Partially Withdrawn January 31	Watts Bar Unit 2	Clinton Woolson/Beth Wetzel (TVA) Alex Garmoe (NRC)
18-01	IE	Definition of Initial Transient	Introduced January 31	Generic	Ken Heffner (Certrec) Alex Garmoe (NRC)

For more information, contact: James Slider, (202) 739-8015, jes@nei.org

NEI 99-02 FAQ 18-01
Definition of Initial Transient

NOTE

This FAQ would implement a whitepaper that proposed clarifications of the definition of "Initial Transient". The whitepaper was discussed with the NRC staff in public ROP meetings in 2013-2014. The final discussion of the whitepaper occurred at a May 14, 2014 public meeting. The NRC staff member who had the lead on performance indicators at the time was Andrew Waugh, who is listed below as the NRC Contact. The concluding discussion is documented in an NRC meeting summary available in ADAMS at accession number ML14149A293. The proposed text changes presented below reflect NRC comments and suggested edits for agency approval presented in a mark-up of the whitepaper attached to the aforementioned meeting summary. The marked-up whitepaper is available under ADAMS accession number ML14149A278.

Plant: Generic
Date of Event: September 11, 2014
Submittal Date: September 11, 2014
Licensee Contact: Lenny Sueper **Tel/email:** 612-330-6917 / Leonard.Sueper@xenuclear.com
NRC Contact: Andrew Waugh **Tel/email:** (301) 415-5601 / andrew.waugh@nrc.gov

Performance Indicator: IE04 – Unplanned Scrams with Complications

Site-Specific FAQ (see Appendix D)? No – this is generic

FAQ to become effective: When approved

Question Section

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

Page 23 Line 20:

20 Was pressure control unable to be established following the initial transient?

Page 24 Lines 39 - 40:

39 Following initial transient, did stabilization of reactor pressure/level and drywell pressure

40 meet the entry conditions for EOPs?

Event or circumstances requiring guidance interpretation:

Two of the questions in NEI 99-02 used to determine if a BWR reactor trip was an Unplanned Scram with Complications include the undefined term "initial transient"; "Was pressure control unable to be established following initial transient?" and "Following initial transient did stabilization of reactor pressure/level and drywell pressure meet the entry conditions for EOPs?" The failure to define the term has resulted in confusion, with some licensees interpreting "initial transient" to be equivalent to "scram response".

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

N/A

Potentially relevant FAQs: None

Response Section

Proposed Resolution of FAQ:

The following is proposed to be added in the Definition of Terms section of this indicator:

Initial Transient is intended to envelope the immediate and expected changes to BWR parameters as a result of a scram (e.g., pressure, level, etc.) because of the collapsing of voids in the core and the routine response of the main feedwater and turbine control systems. For example, at some BWRs the reflected pressure wave

NEI 99-02 FAQ 18-01
Definition of Initial Transient

resulting from the rapid closure of turbine valves during a turbine trip may result in a pressure spike in the reactor vessel that causes one or more safety-relief valves (SRVs) to briefly lift. The intent is to allow a licensee to exclude the momentary operation of SRVs when answering “Was pressure control unable to be established?” The sustained or repeated operation of SRVs in response to turbine control bypass valve failures or Main Steam Isolation Valve (Group I) isolations are not a part of routine BWR scram responses and are therefore not considered to occur within the initial transient. Similarly, a reactor level decrease to Level 3 following a reactor trip due to the expected collapsing of voids in the core can be excluded when answering the question “Following initial transient, did stabilization of reactor pressure/level and drywell pressure meet the entry conditions for EOPs?” as long as the feedwater control system and at least one feedwater pump were operating as designed. “Initial transient” is different from “scram response”. The initial transient is a subset of the overall scram response time.

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

See above.

PRA update required to implement this FAQ? No

MSPI Basis Document update required to implement this FAQ? No

FAQ 17-04

Watts Bar Unit 2 MSPI Effectiveness Date – Final NRC Response

Plant: Watts Bar Nuclear Plant, Unit 2 (WBN 2)

Date of Event: 3/23/2017 (Condenser Failure)

Submittal Date: 11/26/2017

Engineer/Licensee Contact: Clinton Woolson/Beth Wetzel Tel/email: (423) 365-8848/(423)751-2403

NRC Contact: Jared Nadel Tel/email: (423) 365-1776

Performance Indicator:

MS06 WBNU2 Mitigating System Performance Index (Emergency AC Power System)

MS07 WBNU2 Mitigating System Performance Index (High Pressure Injection System)

MS08 WBNU2 Mitigating System Performance Index (Auxiliary Feedwater System)

MS10 WBNU2 Mitigating System Performance Index (Cooling Water Systems)

Site-Specific FAQ (Appendix D)? Yes

FAQ requested to become effective when approved.

Question Section:

TVA requests the effective date of Watts Bar Unit 2 MSPI indicators to be extended until sufficient data is available to provide an accurate assessment value. This date has been determined to be the second quarter of 2018. The extension gives WBN Unit 2 four quarters of data and allows enough information to develop a trend.

The NRC documented the full transition of WBN Unit 2 to the Reactor Oversight Process (ROP) and the effective dates of the ROP indicators. The NRC also approved using the FAQ process if the information shows that the ROP indicators do not provide an accurate assessment value (Reference NRC Letters to TVA dated November 21, 2016 and October 22, 2015). This scheduled the indicators to be effective four quarters after the cornerstone is transitioned to the ROP. These MSPI indicators become effective the first quarter of 2018.

NEI 99-02 Guidance needing interpretation :

Items:

1. FAQ 14-02
2. NRC Letters to TVA dated November 21, 2016 and October 22, 2015.

Event or circumstances requiring guidance interpretation:

During March 2017, during the first operating cycle Watts Bar U2, the Condenser failed and required extensive repair to return to service. The reactor was shut down while the work on the secondary side was performed. This resulted in a loss of 3100 critical hours. The cause of the failure was inadequate vendor design (1970's) of the condenser wall support structure leading to support and wall failure. In addition, a 35-day refueling outage is planned for fourth Quarter of 2017 with an additional loss of 840 critical hours.

FAQ 17-04

Watts Bar Unit 2 MSPI Effectiveness Date – Final NRC Response

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

The NRC Watts Bar Site Resident Inspector was informed of this FAQ. No feedback was provided by the resident.

Potentially relevant existing FAQ numbers:

FAQ 14-02, "Simulation of MSPI Indicator Reaction to Plant in Long Shutdown and Initial Startup." Fort Calhoun

Response Section:

Proposed Resolution of FAQ:

Extend the effective date of the Watts Bar Unit 2 MSPI indicators to April 1, 2018 due to the loss of a significant number of critical hours. This loss of critical hours would significantly affect the accuracy of the assessment value.

The basis of Fort Calhoun FAQ 14-02 was a simulation that concluded the indicator was accurate after four quarters of critical hours. The WBN Unit 2 condenser failure and refueling outage loss of critical hours makes the indicators a three quarter assessment at the present effective date. The forecasted value of critical hours for Watts Bar U2 on December 31, 2017 is 6378 hours (including condenser failure and outage) compared to the four quarter maximum value of 8760.

Recommend the new effective date for Watts Bar U2 indicators MS06, 07, 08, and 10 be set at April 1, 2018. The NRC will continue to gray out the affected Watts Bar U2 indicators on NRC web site for the first quarter of 2018.

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

None

PRA update required to implement this FAQ? No

MSPI Basis Document update required to implement this FAQ? No

NRC Response

In the enclosure of a letter dated October 22, 2015 (ML15295A253), the NRC stated the following:

Similarly, at least four quarters of data is needed to calculate meaningful results from the MSPI (MS06, MS07, MS08, MS09, and MS10). As such, the data for MSPI indicators that are not shared with WBN Unit 1 will not begin to be considered as valid inputs into the Action Matrix until a minimum of four quarters of information have been provided.

In a letter dated November 21, 2016 (ML16326A210), the NRC indicated that all reactor safety cornerstones for Watts Bar Unit 2 have been transitioned to full Reactor Oversight Process oversight. As a result, the MSPI indicators were expected to become effective once the 4Q2017 data was included. However, because of a maintenance outage that resulted in zero critical hours for Watts Bar Unit 2 in 2Q2017, four quarters of information will now be available once the 1Q2018 information is submitted.

FAQ 17-04

Watts Bar Unit 2 MSPI Effectiveness Date – Final NRC Response

The resolution of FAQ 14-02 discussed a white paper that was provided to the ROP Working Group, “Simulation of MSPI Indicator Reaction to Plant in Long Term Shutdown and Initial Startup” (ML13079A693). The study concluded that situations of low critical hours should be treated on a case-by-case basis but as a starting point, MSPI should be grayed out for the startup of new plants until 12 months of operation have accumulated.

Watts Bar Unit 2 started up for the first time during 4Q2016, thus 12 months of operation would have accumulated once the 4Q2017 MSPI data was provided. In this FAQ, the licensee proposes that the MS06 (Emergency AC Power System), MS07 (High Pressure Injection System, MS08 (Heat Removal System), and MS10 (Cooling Water Systems) become valid once the 1Q2018 MSPI data is provided due to a maintenance outage that resulted in the loss of a significant number of critical hours in calendar year 2017. Specifically, Watts Bar Unit 2 lost approximately one quarter of critical hours within the first 12 months of operation, and reported zero critical hours for 2Q2018. Therefore, the licensee requests a one quarter extension before the MS06, MS07, MS08, and MS10 indicators become valid.

The NRC staff concludes that the requested one quarter extension is appropriate, such that the MS06, MS07, MS08, and MS10 performance indicators will become valid once 1Q2018 data has been included. The NRC will continue to gray out the Watts Bar Unit 2 MS06, MS07, MS08, and MS10 performance indicators on the NRC website during the first quarter of 2018.

Additionally, in FAQ 17-05, which was submitted at the same time as FAQ 17-04, the licensee proposes two separate extension requests to the time at which the MS09 (Residual Heat Removal System) performance indicator would become valid. One of the extension requests is the same one quarter request with the same basis as documented in this FAQ. An additional three quarter extension request for MS09 is included in FAQ 17-05 due to sensitivity concerns with the impact of certain components in the residual heat removal system on the MS09 performance indicator. For the same reasons as documented in this FAQ, the NRC staff concludes that the requested one quarter extension before the MS09 performance indicator becomes valid is appropriate. The NRC will continue to gray out the Watts Bar Unit 2 MS09 performance indicator on the NRC website during the first quarter of 2018. At the time of resolution of this FAQ, the NRC has not completed its review of the second extension request contained in FAQ 17-05.

FAQ 17-05

Watts Bar 2 MSPI MS09 Effectiveness Date – Withdrawn, Final NRC Response

Plant: **Watts Bar Nuclear Plant, Unit 2 (WBN 2)**

Date of Event: 3/23/17 (Condenser Failure)

Submittal Date: 11/2/2017

Engineer/Licensee Contact: Clinton Woolson/Beth Wetzel Tel/email: (423) 365-8848/423-751-2403

NRC Contact: Jared Nadel Tel/email: 423-365-1776

Performance Indicator:

MS09 WBN U2 Mitigating System Performance Index (Residual Heat Removal System)

Site-Specific FAQ (Appendix D)? Yes

FAQ requested to become effective when approved.

Question Section:

TVA requests the effective date of Residual Heat Removal (RHR) MS09 MSPI indicator be extended until sufficient data is available to provide an accurate assessment value. This date has been determined to be the First quarter of 2019. The extension gives WBN Unit 2 RHR sufficient data and allows enough time to develop a trend.

The NRC documented the full transition of WBN Unit 2 to the Reactor Oversight Process (ROP) and the effective dates of the ROP indicators. The NRC also approved using the FAQ process if the information shows that the ROP indicators do not provide an accurate assessment value (Reference NRC Letters to TVA dated November 21, 2016 and October 22, 2015). This scheduled the indicators to be effective four quarters after the cornerstone is transitioned to the ROP. This MSPI indicator becomes effective the first quarter of 2018.

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

Items:

1. FAQ 14-02
2. NRC Letters to TVA dated November 21, 2016 and October 22, 2015.

Event or circumstances requiring guidance interpretation:

During March 2017 during the first operating cycle Watts Bar U2 Condenser zone B failed and required extensive rework. The unit was not critical during this time resulting in a loss of 3100 critical hours. The cause of the failure was inadequate vendor design (1970's) of the condenser wall support structure leading to support and wall failure. In addition a 35 day refueling outage is planned for fourth Quarter of 2017 with an additional loss of 840 critical hours.

The RHR MSPI value will not have an accurate assessment value at four quarters due to the reliability value associated with the Motor Operated Valve (MOV) group. The group failure value is dominated by two MOVs that provide Loss of Coolant Containment Sump recirculation flow. The INPO CDE failure value as of September, 2017 is 6.4E-07.

FAQ 17-05

Watts Bar 2 MSPI MS09 Effectiveness Date – Withdrawn, Final NRC Response

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

The NRC Watts Bar Site Resident Inspector was informed of this FAQ. No feedback was provided by the resident.

Potentially relevant existing FAQ numbers:

1. FAQ 14-02 Fort Calhoun MSPI startup from extended shutdown. White paper discussed during the February 21, 2013 ROP WB Public Meeting -“Simulation of MSPI Indicator Reaction to Plant in Long Shutdown and Initial Startup.”
2. FAQ 17-00 Watts Bar U2 extension of MSPI 1 quarter due to loss of critical hours.

Response Section:

Proposed Resolution of FAQ:

Extend the effective date of the Watts Bar U2 Residual Heat Removal MSPI indicator 1 quarter due to the loss of critical hours and 3 quarters based on an inaccurate assessment value.

Details are contained in Watts Bar FAQ 17-00 due to the loss of critical hours associated with U2 condenser failure 1 additional quarter will be added before this indicator is effective.

The following details are provided to justify additional 3 quarters due to assessment value inaccuracy:

The additional 3 quarters is needed due to high risk ($X_d = 6.44E-7$) and low demands of RHR MOV valve group. The group is made up of the same 9 valves for both units with similar risk values. Based on MSPI calculation methods each failure of a MOV is evaluated at the same risk value. The U2 valve group has had 118 demands presently. The U1 RHR MOVs group, monitored over 12 quarters, has 271 demands and $X_d = 5.7E-7$. Based on the proposed effective date of the indicator, being January 2019 the demands for U2 is forecast to be same as U1. This would lower the U2 X_d to a value similar to U1.

The table below shows U1 and U2 Actual Data from INPO CDE.

Residual Heat Removal Actual September 2017

Measured Element	U2 Margin	U1 Margin
Residual Heat Removal Pump FTS	2	3
Residual Heat Removal Pump FTR	4	4
Motor Operated Valve	1	2
UA Residual Heat Removal Pump 2A	333	1644
UA Residual Heat Removal Pump 2B	333	1644
MSPI Results	-4.8E-08	-2.1E-07

Both units' data does not include any failures and the only difference is the time frame of the monitoring period (Critical hours, demands, and run hours). This table shows that U2 can have only one failure while U1 can have two failures and remain green. This is considered an inaccurate assessment

FAQ 17-05

Watts Bar 2 MSPI MS09 Effectiveness Date – Withdrawn, Final NRC Response

(false positive condition) because if U2 was using data from three years like U1, then the indicator would be green with two failures instead of white.

TVA had a contractor (author of NUREG 1816) prepare a report to document the basis for a three-year monitoring period used in NEI 99-02 for MSPI, which is attached. The report notes that false positives are possible during short monitoring periods. RHR MOVs are a good example where a four-quarter monitoring period does not provide an accurate assessment tool.

To determine when U2 data could tolerate two MOV failures like U1, the actual U2 data from September 2017 was placed in spread sheet. The monitoring period was increased in the spread sheet to determine when two MOV failures and 100 hours of unavailability would maintain the indicator green. This resulted in a January 2019 implementation date for RHR. The data results are shown below:

U2 Residual Heat Removal Case Forecast January 2019.

Quarters	No failures	1 MOV failures plus 60hrs UU	2 MOV failures plus 100hrs UU
Measured Element			
Residual Heat Removal Pump FTS	2 failure	1 failures	0 failures
Residual Heat Removal Pump FTR	4 failure	2 failures	0 failures
Motor Operated Valve	2 failures	1 failure	0 failure
UU Residual Heat Removal Pump 2A	986 hours	507 hours	10 hours
UU Residual Heat Removal Pump 2B	986 hours	507 hours	10 hours
MSPI Results	-1.7E-07	3.9E-06	9.9E-07

The RHR indicator evaluation determined that a January 2019 implementation date is needed to have an accurate assessment value.

Recommend the new effective date for Watts Bar U2 RHR indicator MS07 be set at January 1, 2019. The NRC will continue to gray out the affected Watts Bar U2 indicators on NRC web site for the through the fourth quarter of 2018.

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

None

PRA update required to implement this FAQ? No

MSPI Basis Document update required to implement this FAQ? No

NRC Response

The NRC approved the one quarter extension request for MS09 as a part of the approval of FAQ 17-04.

The three quarter extension request was withdrawn at the January 31, 2018 ROP public meeting. The basis for the withdrawal was that the valve demands projected for January 2019 were accrued during a refueling outage in fall 2017, which mitigated the concern about false positives with low critical hours.

NEI 99-02 FAQ 18-01
Definition of Initial Transient

NOTE

This FAQ would implement a whitepaper that proposed clarifications of the definition of "Initial Transient". The whitepaper was discussed with the NRC staff in public ROP meetings in 2013-2014. The final discussion of the whitepaper occurred at a May 14, 2014 public meeting. The NRC staff member who had the lead on performance indicators at the time was Andrew Waugh, who is listed below as the NRC Contact. The concluding discussion is documented in an NRC meeting summary available in ADAMS at accession number ML14149A293. The proposed text changes presented below reflect NRC comments and suggested edits for agency approval presented in a mark-up of the whitepaper attached to the aforementioned meeting summary. The marked-up whitepaper is available under ADAMS accession number ML14149A278.

Plant: Generic
Date of Event: September 11, 2014
Submittal Date: September 11, 2014
Licensee Contact: Lenny Sueper **Tel/email:** 612-330-6917 / Leonard.Sueper@xenuclear.com
NRC Contact: Andrew Waugh **Tel/email:** (301) 415-5601 / andrew.waugh@nrc.gov

Performance Indicator: IE04 – Unplanned Scrams with Complications

Site-Specific FAQ (see Appendix D)? No – this is generic

FAQ to become effective: When approved

Question Section

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

Page 23 Line 20:

20 Was pressure control unable to be established following the initial transient?

Page 24 Lines 39 - 40:

39 Following initial transient, did stabilization of reactor pressure/level and drywell pressure

40 meet the entry conditions for EOPs?

Event or circumstances requiring guidance interpretation:

Two of the questions in NEI 99-02 used to determine if a BWR reactor trip was an Unplanned Scram with Complications include the undefined term "initial transient"; "Was pressure control unable to be established following initial transient?" and "Following initial transient did stabilization of reactor pressure/level and drywell pressure meet the entry conditions for EOPs?" The failure to define the term has resulted in confusion, with some licensees interpreting "initial transient" to be equivalent to "scram response".

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

N/A

Potentially relevant FAQs: None

Response Section

Proposed Resolution of FAQ:

The following is proposed to be added in the Definition of Terms section of this indicator:

Initial Transient is intended to envelope the immediate and expected changes to BWR parameters as a result of a scram (e.g., pressure, level, etc.) because of the collapsing of voids in the core and the routine response of the main feedwater and turbine control systems. For example, at some BWRs the reflected pressure wave

NEI 99-02 FAQ 18-01
Definition of Initial Transient

resulting from the rapid closure of turbine valves during a turbine trip may result in a pressure spike in the reactor vessel that causes one or more safety-relief valves (SRVs) to briefly lift. The intent is to allow a licensee to exclude the momentary operation of SRVs when answering “Was pressure control unable to be established?” The sustained or repeated operation of SRVs in response to turbine control bypass valve failures or Main Steam Isolation Valve (Group I) isolations are not a part of routine BWR scram responses and are therefore not considered to occur within the initial transient. Similarly, a reactor level decrease to Level 3 following a reactor trip due to the expected collapsing of voids in the core can be excluded when answering the question “Following initial transient, did stabilization of reactor pressure/level and drywell pressure meet the entry conditions for EOPs?” as long as the feedwater control system and at least one feedwater pump were operating as designed. “Initial transient” is different from “scram response”. The initial transient is a subset of the overall scram response time.

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

See above.

PRA update required to implement this FAQ? No

MSPI Basis Document update required to implement this FAQ? No