WBN2Public Resource

From: Poole, Justin
Sent: Thursday, October 28, 2010 10:29 AM
To: Garg, Hukam
Cc: WBN2HearingFile Resource
Subject: FW: FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx
Attachments: FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx

Justin C. Poole
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From: Clark, Mark Steven [mailto:msclark0@tva.gov]
Sent: Thursday, October 28, 2010 10:05 AM
To: Poole, Justin
Subject: FW: FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx

Justin:

Please forward to Hukam for discussion at the 1:00 phone call today.

Thanks,

Steve

Steve Clark

Bechtel Power Corp.

Control Systems

Watts Bar 2 Completion Project

Phone: 865.632.6547

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From: Clark, Mark Steven
Sent: Thursday, October 28, 2010 6:55 AM
To: Crouch, William D
Subject: FW: FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx

Bill:

I talked to Steve. Please forward to Justin so we can get Hukam's comments at the 1:00 phone call today.

Regards,

Steve

Steve Clark

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From: Webb, W David
Sent: Wednesday, October 27, 2010 4:45 PM
To: Clark, Mark Steven; Hilmes, Steven A
Cc: Jarrett, Ronald A; Craig, John S; Crouch, William D; Langley, David T; Raley, Thomas R
Subject: FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx

Final version with Ron Jarrett's comments incorporated.

<<FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx>>

Hearing Identifier: Watts_Bar_2_Operating_LA_Public
Email Number: 168

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Subject: FW: FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx
Sent Date: 10/28/2010 10:29:13 AM
Received Date: 10/28/2010 10:29:17 AM
From: Poole, Justin

Created By: Justin.Poole@nrc.gov

Recipients:
"WBN2HearingFile Resource" <WBN2HearingFile.Resource@nrc.gov>
Tracking Status: None
"Garg, Hukam" <Hukam.Garg@nrc.gov>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	1724	10/28/2010 10:29:17 AM
FSAR 7.1.2.1.9 Setpoint Methodology Revised 10-22-2010 NRC comments Rev 3.docx	25521	

Options
Priority: Standard
Return Notification: No
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7.1.2.1.9 Trip Setpoints

The scope of TSTF-493 includes ~~The~~ setpoints within the reactor protection system (RPS) which includes the Reactor Trip System (RTS) and the Engineered Safeguards Features Actuation System (ESFAS). The specific setpoints within the scope of TSTF-493 are identified in Technical Specifications 3.3.1 and 3.3.2. ~~trip setpoints are the setpoints within the scope of TSTF-493.~~ These trip setpoints ~~-~~have been selected ~~in accordance with TSTF-493, Rev. 4~~ to ensure that core damage and loss of integrity of the reactor coolant system are prevented during anticipated operational events. These setpoints were analytically determined in accordance with the methodology described in References 3 and 5. The TVA instrument setpoint methodology is based on ISA standard 67.04 (Reference 3) and is incorporated into TVA technical instructions. The Westinghouse setpoint methodology is described in Reference 5. Both the nominal (trip setpoint) and limiting (allowable value) settings have been incorporated into the Technical Specifications. Nominal settings are more conservative than the limiting setpoints. This allows for measurement and calibration uncertainties and instrument channel drift which may occur between periodic tests without exceeding the ~~limiting setpoints~~allowable value. Trip setpoint values are monitored by periodic performance of surveillance tests in accordance with Technical Specification requirements.

The setpoint calculations include the effects of both measurable and unmeasurable uncertainties to ensure the associated protective actions are performed before analytical limits are exceeded. ~~Incorporating these uncertainties provides assurance that the analytical limit will not be exceeded under accident conditions if the Allowable Value is satisfied under normal conditions.~~

The square root sum of the squares (SRSS) method is used for combining uncertainty terms to meet the following three criteria: random, independent, and ~~approximately~~ normal distribution. The probability that all of the independent processes would simultaneously be at their maximum value (i.e., + or -) is very small. The SRSS method provides a means to combine individual random uncertainty terms to establish a net random uncertainty term. All other uncertainties that do not meet any of the three criteria are arithmetically summed. Single-sided correction factors are not used in ~~RPS~~ setpoint calculations within the scope of TSTF-493.

The following describes the methodology used for the ~~RPS~~ setpoint calculations within the scope of TSTF-493 revision 4 as incorporated into the WBN Unit 2 Technical Specifications.

Safety Limit (SL) - A safety limit is specified to protect the integrity of physical barriers that guard against the uncontrolled release of radioactivity. The safety limit for a parameter is typically provided in the plant safety analyses in accordance with 10 CFR 50.36(c).1.ii.A.

Analytical Limit (AL) - The analytical limit represents the parameter value at which a safety action is assumed to be initiated to ensure that the safety limits are not exceeded during either accidents or anticipated operational occurrences.

Nominal Trip Setpoint (NTSP) - The NTSP is the nominal value at which the instrument is set when it is calibrated. Since most instruments cannot be set to an exact value, the instrument is set to the nominal setpoint within an allowed tolerance band defined as Acceptable As Left (AAL).

Operational Limit (OL) - The operational limit is a value which the operating parameter is not expected to exceed during normal operation. The NTSP is set beyond the OL so that spurious trips of the instrument do not occur.

Acceptable As Found Tolerance (AAF) - A tolerance band on either side of the NTSP which defines the limits of acceptable instrument performance, beyond which the channel may be considered degraded and must be evaluated for operability prior to returning it to service. Channels which exceed the AAF will be entered into the Corrective Action Program for further evaluation and trending. The Acceptable As Found tolerance is the SRSS combination of drift, maintenance and test equipment (M&TE) accuracy and readability, and calibration/reference accuracy~~, bistable setting accuracy, and other measurable uncertainties which are present during the surveillance test~~. Other uncertainties may be included in the AAF if applicable.

Acceptable As Left Tolerance (AAL) - A tolerance band on either side of the NTSP within which an instrument or instrument loop is left after calibration or setpoint verification. The Acceptable As Left tolerance is equal to or less than the SRSS combination of reference accuracy, M&TE accuracy and M&TE readability~~ and other measurable uncertainties which are present during the surveillance test~~. Other uncertainties may be included in the AAL if applicable.

~~.~~ The trip setpoint must be adjusted within the ~~as-left~~ AAL tolerance prior to returning the channel to service.

Allowable Value (AV) - The limiting value of the as-found trip setting used during surveillance testing for the portion of the channel being tested, beyond which the channel is inoperable. The AV ensures that sufficient margin exists to the AL to account for unmeasurable uncertainties such as process effects to ensure that the protective action is performed under worst case conditions before the analytical limit is exceeded.

Calculation of the allowable value by the Westinghouse setpoint methodology is described in Reference 5. In the Westinghouse methodology, the AV is limited to rack surveillance testing. Two values are calculated. The first value is the arithmetic sum of the measurable rack uncertainties. The second value is based on the total allowance between the trip setpoint and the safety analysis limit. This value is the difference between the total allowance and those uncertainties which are not present during the rack surveillance test. These uncertainties are combined in accordance with Reference 5. The AV is the nominal trip setpoint ~~±~~plus or minus, dependent on the trip setpoint direction, the minimum of the two calculated values.

The TVA methodology for the allowable value calculation is described in TVA technical instructions based on Reference 3. ~~The following discussion applies to a high setpoint with an upper Analytical Limit; the directions would be reversed for a low setpoint with a lower AL:~~

An upper limit of AV ~~(AVmax)~~ is determined by subtracting the unmeasurable uncertainties from the AL. ~~A maximum NTSP can then be calculated by subtracting the normal measurable uncertainties plus any margin from AVmax. If margin exists between the maximum NTSP and the operational limit, a minimum NTSP can be calculated as the OL plus the normal uncertainties.~~ A lower limit of AV ~~(AVmin) can then be~~ is determined by adding the measurable uncertainties to the ~~new~~ NTSP. The actual AV is set within these limits. This applies to a high setpoint with an upper Analytical Limit; the directions would be reversed for a low setpoint with a lower AL.

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