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May 8, 2014 10 CFR 50.90
GO2-14-076

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 SUPPLEMENTAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR CHANGING TECHNICAL SPECIFICATION TABLE 3.3.1.1-1 FUNCTION 7, "SCRAM DISCHARGE VOLUME WATER LEVEL – HIGH"**

References:
1) Letter, GO2-14-043, dated March 24, 2014, AL Javorik (Energy Northwest) to NRC, "License Amendment Request For Changing Technical Specification Table 3.3.1.1-1 Function 7, "Scram Discharge Volume Water Level – High""
2) Letter dated April 28, 2014, CF Lyon (NRC) to ME Reddemann (Energy Northwest), "Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment Request for Changing Technical Specification Table 3.3.1.1-1, Function 7, "Scram Discharge Volume Water Level- High" (TAC No. MF3673)"

Dear Sir or Madam:

By Reference 1, Energy Northwest requested approval of a license amendment request to revise the Columbia Generating Station Technical Specification (TS) Table 3.3.1.1-1, Function 7 "Scram Discharge Volume Water Level-High" to support planned instrumentation upgrades.

Via Reference 2, the Nuclear Regulatory Commission (NRC) indicated that additional information was needed to complete the acceptance review of the proposed TS changes. Enclosure 1 provides the requested information.

This letter and its enclosure contain no regulatory commitments. If there are any questions or if additional information is needed, please contact Ms. L. L. Williams, Licensing Supervisor, at 509-377-8148.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,

5/8/14
for A.L. JAVORIK

A. L. Javorik
Vice President, Engineering

Enclosure: As stated

cc: NRC RIV Regional Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
M Jones - BPA/1399 (email)
JO Luce - ESFEC
RR Cowley – WDOH (email)

## RESPONSE TO SUPPLEMENTAL INFORMATION NEEDED

**NRC Request:**

1. By letter dated March 24, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML 14098A400), Energy Northwest submitted a license amendment request (LAR) for Columbia Generating Station (CGS). The proposed amendment request would revise the specified function description and surveillance requirements (SRs) in Technical Specification (TS) Table 3.3.1.1-1, "Reactor Protection System [RPS] Instrumentation," Function 7, "Scram Discharge Volume [SDV] Water Level- High." The LAR supports planned upgrades to level sensing equipment different and diverse from the level sensing equipment currently used for TS Table 3.3.1.1-1, Function 7a. However, the LAR does not provide enough information regarding the proposed instrument for TS Table 3.3.1.1-1, Function 7b, for the NRC staff to be able to evaluate the proposed TS change. Please provide the following information:

    a. Manufacturer and model of the level transmitter to be used for TS Table 3.3.1.1-1, Functions 7.a and 7.b. For Function 7.b, please provide a sketch of the typical instrument channel showing the "before change" and "after change" configurations.

    b. Identify the power sources for the level sensing equipment for TS Table 3.3.1.1-1, Functions 7.a and 7.b.

    c. Please clarify whether the instrumentation for TS Table 3.3.1.1-1, Function 7.a includes a trip unit.

**Energy Northwest Response:**

The Scram Discharge Volume (SDV) consists of large diameter piping from the solenoid scram pilot valve headers to the two interconnected Scram Discharge Instrument Volume (SDIV) tanks A and B. Each SDIV tank has 4 instrument loops on each tank for sensing level in the SDIV and providing a trip signal for Reactor Protection System (RPS) Scram actuation. The instrument loops (transmitter/trip units) comprise the input to the four RPS trip channels (A1, A2, B1 & B2) of the reactor protection trip system. Each RPS channel has two SDV instrument loops (one mounted on each SDIV tank); one from Function 7.a (an existing transmitter/ indicating trip unit) and one from Function 7.b (new transmitter/non-indicating trip unit) that provide redundant and diverse trip signals to the RPS trip channel.

The change in title of the Function 7.a to transmitter/level indicating switch is administrative only. The instrument loop remains a transmitter/trip unit design. The proposed term, Transmitter/level indicating switch more accurately describes the instrumentation and was made to align to the terminology used in the plant's FSAR, the component equipment plant nomenclature (LIS), and to highlight the indicating capability of Function 7.a from the non-indicating capability of Function 7.b. Similarly, the Function 7.b title was chosen to be Transmitter/level switch (LS) which has a transmitter and a non indicating trip unit comprising the instrument loop.

Technical Specification Table 3.3.1.1-1 Function 7.a design and logic configuration are unchanged. The level transmitters (CRD-LT-12A, B, C, D) are now supplied by Ametek Gulton-Statham. The Ametek model number is PD-3218. This instrument loop includes existing Rosemount model 510 level indicating switches (indicating trip units) (CRD-LIS-601A, B, C, D) and remains unchanged. The Ametek transmitters have sensors which employ strain gauge technology for sensing a pressure differential which is converted to a level signal. The strain gage sensor converts a mechanical force (pressure) to an electrical signal. A Wheatstone resistance bridge circuit is molecularly deposited on a metal bending beam using a technique similar to the process used to manufacture high density integrated circuit chips. The sensing mechanism is isolated from the process fluid by an isolation diaphragm and silicone fill fluid.

The Technical Specification Table 3.3.1.1-1 Function 7.b sensing and trip signal design and logic configuration has changed, however the interface with RPS trip logic remains unchanged. The existing Fuction 7.b instruments are Magnetrol level switches (CRD-LS-13A, B, C, D) with associated relays that are the interface with the RPS Technical Specification Scram Function. After this change the functions that are now performed by the level float switches will be performed by new level transmitters and level switches (non-indicating trip units) (CRD-LT-13A, B, C, D and CRD-LS-613A, B, C, D).

This change replaces the instrumentation for the existing Magnetrol level switches with Rosemount 3152N Level Transmitters and the Ametek ET-1200 series non indicating trip units. The Rosemount 3150N Series pressure transmitters are electro-mechanical devices that convert a process pressure to an electrical output signal proportional to the pressure within a predetermined range of pressure values. The design uses an oil-filled cavity with a capacitance plate as the pressure-sensing element. Differential pressure changes result in a corresponding differential capacitance change in the sensing element (sensor). This signal is then decoded, amplified, and linearized by an analog circuit, converting the pressure change into a proportional 4-20mA electrical current output signal. The sensing mechanism is isolated from the process fluid by an isolation diaphragm and silicone fill fluid.

Figure 1 provides a sketch depicting a typical channel of the existing and new design for Function 7.b. There is no change to the RPS logic. Additionally, Figure 1 provides the typical channel for Function 7.a showing that channel logic remained the same.

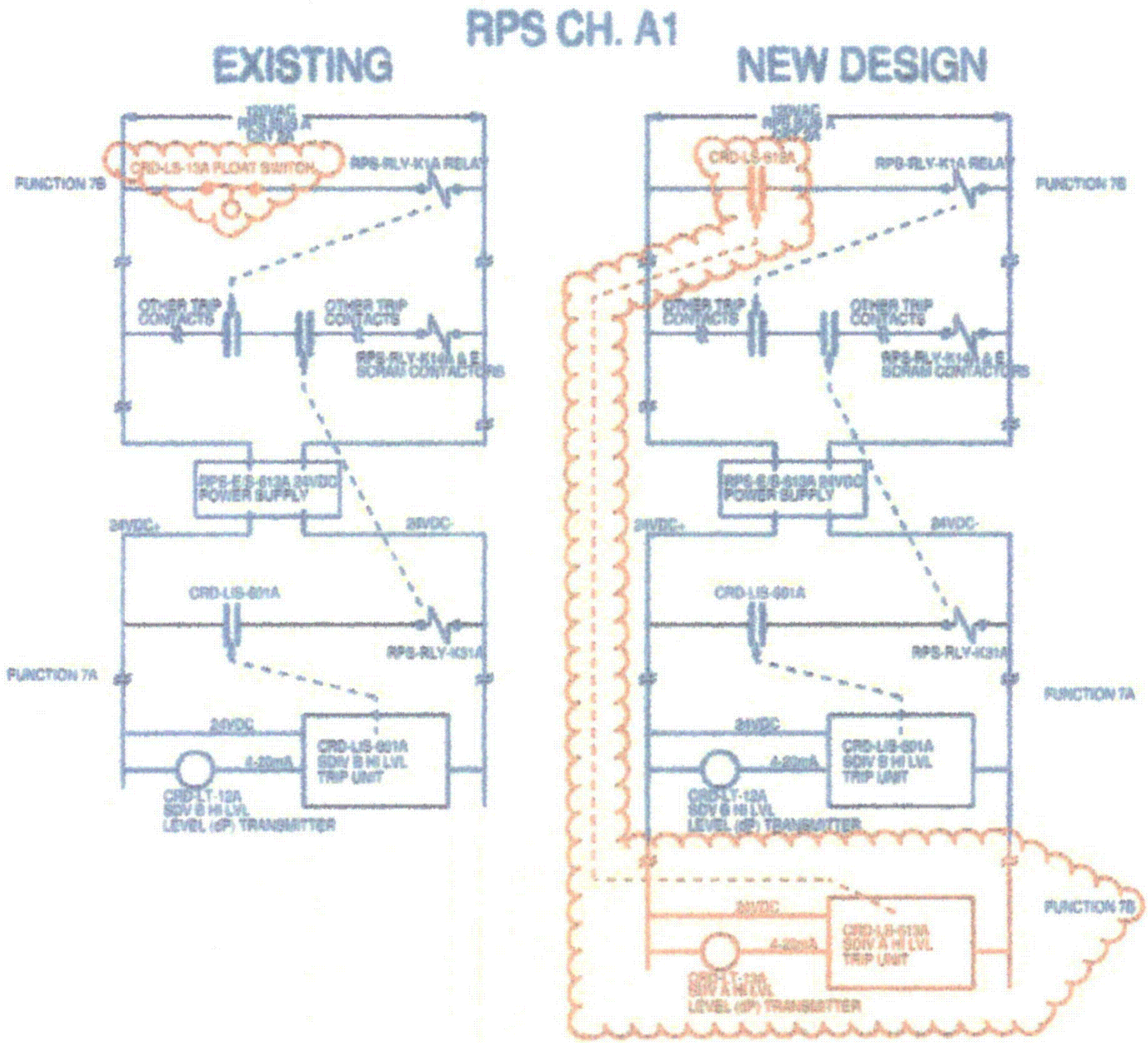


**Figure 1 - Typical SDV Water Level - High Instrument Channel (Before & After)**

A detailed explanation showing the existing and new components along with the power suppies for all SDV Function 7.b components is provided in Table 1. For completeness, Table 1 shows the component manufacturer/model and power supplies for the unchanged Function 7.a design. Table 1 also provides the Function and the SDIV Tank A or Tank B that the instrument measures.

**Table 1 – Summary of SDV Water Level - High Instrumentation (Before & After)**

| RPS Trip Logic Channel | TS 3.3.1.1 Function/ SDIV Tank A or B | Existing Devices | Manufacturer/ Model | New Devices | Manufacture/ Model | To RPS Input Relay | 120Vac Power Source | 24VDC Power Supply EPN |
|---|---|---|---|---|---|---|---|---|
| A1 | 7.b existing SDIV A | CRD-LS-13A (float switch) | Magnetrol | | | RPS-RLY-K1A | RPS-PP-C72/P001 Ckt. 2A RPS Bus A | N/A |
| | 7.b new SDIV A | | | CRD-LT-13A / CRD-LS-613A | Rosemount 3152ND2S2/ Ametek ET-1214 | RPS-RLY-K1A | | RPS-E/S-613A RPS Bus A |
| | 7.a SDIV B | CRD-LT-12A / CRD-LIS-601A | Gould PD 3218/ Rosemount 510 | CRD-LT-12A / CRD-LIS-601A | Ametek PD-3218/ Rosemount 510 | RPS-RLY-K31A | | |
| B1 | 7.b existing SDIV A | CRD-LS-13B (float switch) | Magnetrol | | | RPS-RLY-K1B | RPS-PP-C72/P001 Ckt. 2B RPS Bus B | N/A |
| | 7.b new SDIV A | | | CRD-LT-13B / CRD-LS-613B | Rosemount 3152ND2S2/ Ametek ET-1214 | RPS-RLY-K1B | | RPS-E/S-613B RPS Bus B |
| | 7.a SDIV B | CRD-LT-12B / CRD-LIS-601B | Gould PD 3218/ Rosemount 510 | CRD-LT-12B / CRD-LIS-601B | Ametek PD-3218/ Rosemount 510 | RPS-RLY-K31B | | |
| A2 | 7.b existing SDIV B | CRD-LS-13C (float switch) | Magnetrol | | | RPS-RLY-K1C | RPS-PP-C72/P001 Ckt. 2A RPS Bus A | N/A |
| | 7.b new SDIV B | | | CRD-LT-13C / CRD-LS-613C | Rosemount 3152ND2S2/ Ametek ET-1214 | RPS-RLY-K1C | | RPS-E/S-613C RPS Bus A |
| | 7.a SDIV A | CRD-LT-12C / CRD-LIS-601C | Gould PD 3218/ Rosemount 510 | CRD-LT-12C / CRD-LIS-601C | Ametek PD-3218/ Rosemount 510 | RPS-RLY-K31C | | |
| B2 | 7.b existing SDIV B | CRD-LS-13D (float switch) | Magnetrol | | | RPS-RLY-K1D | RPS-PP-C72/P001 Ckt. 2B RPS Bus B | N/A |
| | 7.b new SDIV B | | | CRD-LT-13D / CRD-LS-613D | Rosemount 3152ND2S2/ Ametek ET-1214 | RPS-RLY-K1D | | RPS-E/S-613D RPS Bus B |
| | 7.a SDIV A | CRD-LT-12D / CRD-LIS-601D | Gould PD 3218/ Rosemount 510 | CRD-LT-12D / CRD-LIS-601D | Ametek PD-3218/ Rosemount 510 | RPS-RLY-K31D | | |

**NRC Request:**

2. The LAR proposed adoption of Technical Specification Task Force (TSTF) traveler TSTF-493 (Revision 4), Option A Surveillance Notes, for Function 7.b. The LAR described the licensee's intent to replace the existing level float switches with electronic analog transmitters and trip units for Function 7.b. Installation of the proposed equipment for Function 7.b would require modifications to accommodate new level sensing instrument and trip unit. These changes could affect the TS Allowable Value (AV) and SRs for Function 7.b. Section 3.2 of the LAR stated that the setpoint calculations did not result in any changes to the TS AV for this function.

   Implementation of TSTF-493, Note 1 requires the licensee to calculate appropriate magnitudes for ALT and AFT. Please provide information necessary to confirm that the AV remains the same, and provide a description of the methodology used to calculate the As-Left Tolerance (ALT), and As-Found Tolerance (AFT). Also, please provide a summary setpoint calculation for Function 7.b, and supporting design input data, consistent with Regulatory Guide 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," December 1999 (ADAMS Accession No. ML993560062), and Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006 (ADAMS Accession No. ML051810077).

**Energy Northwest Response:**

The SDV receives the water displaced by the motion of the Control Rod Drive (CRD) pistons during a reactor scram. Should this volume fill to a point where there is insufficient volume to accept the displaced water, control rod insertion would be hindered. The header piping is sized to receive and contain all the water discharged by the drives during a full scram independent of the instrument volume. Therefore, a reactor scram is initiated when the remaining free volume is still sufficient to accommodate the water from a full core scram. However, even though the two types of Scram Discharge Volume Water Level - High Function are an input to the RPS logic, no credit is taken for a scram initiated from these Functions for any of the design basis accidents or transients analyzed in the Final Safety Analysis Report (FSAR). However, they are retained to ensure that the RPS remains OPERABLE. The Allowable Value, measured as a level in the scram discharge instrument volume is chosen low enough to ensure that there is sufficient volume with margin in the SDV to accommodate the water from a full scram.

Since the design of the scram discharge volume does not credit any of the scram discharge instrument volume to perform the scram discharge safety function, an allowable value within the instrument volume would assure ample margin for the safety function. Thus, the instrumentation of the SDIV is such that the upper allowable value for the function must be capable of accurately measuring a level in the instrument volume. A limiting design constraint for the existing Technical Specification Allowable Value is to not allow the accumulation of water in the instrument volume higher than a level that can be accurately measured. Although the calculated allowable value is higher than the existing TS allowable value, the instrumentation would not be able to accurately measure this higher value when water level rose above the instrument's diaphragm. Thus, this change maintains the existing TS allowable value limit of 529'-9" in the instrument volume.

Setpoint calculations for the new Function 7.b instruments were performed in accordance with Columbia's setpoint procedure. The basic methodology is summarized as follows:

- Define the loop to be analyzed
- Determine analytical limit for the instrument loop in question
- Determine normal and accident environmental conditions and associated effects on the accuracy of each instrument in the loop
- Determine normal drift effects for each instrument in the loop
- Combine the effect terms and determine the setting range
- Determine as-found and as-left tolerances

The following provides the appropriate magnitude for the As Left Tolerance and the As Found Tolerance. The calculation provides that a calculated allowable value higher than the current TS limit could be justified. However, due to center line of the transmitter's sensing diaphragm elevation, an allowable value above the accurate measurement range of the instrument is inappropriate. Energy Northwest has elected to maintain the more conservative existing TS allowable value. This assures additional margin for the discharge scram volume RPS scram function. A brief summary of uncertainty, calibration, drift and other factors associated with the derivation of calculated allowable value, as found tolerance and the as left tolerance is provided below. A number of normal factors which did not affect the instrument loop uncertainty and device calibration and drift were considered but not listed in this summary. These include humidity (HE), insulation resistance (IR), pressure (PE), seismic (SE), static pressure (SP) and combined accident (CAE) effects.

The summary of the calculation is provided in the following pages. Function 7.b Transmitters for the SDIV Tank B are more constraining due to the tank's height and its corresponding calibration span. This was chosen as the summary of the typical set point calculation requested.

Supporting design input data is provided in Tables 2.1 and 2.2 for level transmitters and trip units, respectively. Finally, a graphical summary of the calculation is presented in Figure 2 below.

**Table 2.1 - Instrument Uncertainties and Calibration and Drift Design Inputs for CRD-LT-13C & D**

| Design Input | Description | Basis |
|---|---|---|
| TS Calibration Frequency | 18 Months | Table 3.3.1.1-1 Function 7.b. The calibration period is 18 months. |
| Calculation Calibration Frequency | 24 months | A more conservative value is 24 months. |
| Calibration Frequency + 25% | 30 Months | 24 months plus a 25% margin of 6 months = 30 months. |
| C = Correction | 0.839 | Correction for end device when set point is approached from a single side. C = 0.839 |
| Seismic RRS (s) (g) | ~ 5g | The maximum seismic loading for the device installation location is approximately 5.0 G. |
| Power Supply Stability (V) | 2.4 VDC | The power supply to this device is assumed to be within ±10% of the nominal 24 VDC supply. |
| Instrument's nominal reading | 0.0 | Under normal conditions the water level in the SDIV will be below the lower sensing diaphragm of the transmitter. Output will be at minimum. |
| Period of operation during and after LOCA | 0.0 | The instrument will perform its safety function operation (Scram) prior to being exposed to the LOCA environment. |
| RA = Reference Accuracy | 0.2% of CS | Vendor Data Sheet- Accuracy of Calibrated Span (CS) |

| Design Input | Description | Basis |
|---|---|---|
| MT&E = Maintenance and test equipment uncertainty | 0.26% of CS | Assumes Pressure input =+/- 0.125 in wg, Span 66 inches, and MT & E accuracy of 0.25 or less than device under test per calibration standards. |
| SA = Setting Accuracy | 0.15% of CS | The input device has a minor graduation of 0.2 inwg. The reading accuracy is ½ of the minor graduation. 0.2 ÷ 2 ÷ 66.0 x 100% = 0.15% of CS. |
| CAL = Calibration Effect | 0.30% of CS | Plant Setpoint Methodology Standards EES-4, $[M\&TE^2+SA^2]^{1/2}$ |
| DR = Drift | 0.48% of CS | The manufacturer's statement of drift effect per 30 months is ±(0.1% URL + 0.1% span). |
| PSE = Power Supply Effect | 0.012% of CS | The manufacturer's statement of power supply effect for this device is ±0.005% of span per volt. The power supply stability is assumed to be ± 10% of the nominal 24 VDC loop supply voltage. |
| PPE = Process/Primary Element Effect | 0.56% of CS | Sensitivity to specific gravity (SG) is a function of process temperature. The maximum ΔSG that will occur from the calibration temperature of 70°F to maximum environmental temperature of 104°F is 0.56% of CS. |
| RE = Radiation Effect | 0.80% of CS | The manufacturer's statement of radiation effect is ±0.25% of URL during and after initial exposure to a TID of 1 Mrad at a dose rate of 0.1 Mrads/hr. Assuming the effect is linearly proportional to TID, the radiation effect in radiation dose zone 522B, TID of 8.4E5 Rads, is 0.80 % of CS. |
| TE = Temperature Effect | 6.96% of CS | The Temperature Effect of the system is determined by adding together the contributions from the transmitter and the remote diaphragm seal. The manufacturer's statement of temperature effect for the transmitter is ±(0.15% URL + 0.6% span) per 100°F and temperature effect for the remote seal with DC704 silicone oil is ±(3.0 inwg/100°F first 5 ft of capillary + 1.5 inwg/100°F each additional 5 ft). Capillary length is 40ft Maximum temperature shift from calibration temperature is 34°F. The total Temperature Effect is 6.96% of CS. |

<u>Level Transmitter Uncertainty and Drift [refer to Table 2.1 above]</u>

$$U_{D,R} = C \times [RA^2 + CAL^2 + PSE^2 + SE^2 + DR^2 + RE^2 + TE^2]^{1/2} = 5.90\% \text{ of CS}$$

$$U_{D,B} = CAE+DR+HE+IR+PE+PPE+SP = 0.56\% \text{ of CS}$$

$$U_D = U_{D,R} + U_{D,B}$$

**The device uncertainty for the transmitter is $U_D$ = 6.46% of CS**

$$CD_D = CAL + DR$$

**The device Calibration and Drift components for the transmitter is $CD_D$ = 0.78% of CS**

Level Switch (non-indicating Trip Unit) Uncertainty and Drift [refer to Table 2.2 below]

$U_{D'R} = C \times [RA^2 + CAL^2 + PSE^2 + SE^2]^{1/2} = 0.42\%$ of CS

$U_{D.B} = CAE+DR+HE+IR+PE+PPE+RE+SP+TE = 1.0\%$ of CS

$U_D = U_{D.R}+U_{D.B}$

**The device uncertainty for the trip unit is $U_D = 1.42\%$ of CS**

$CD_D = CAL + DR$

**The device Calibration and Drift components for the trip unit is $CD_D = 1.33\%$ of CS**

**Table 2.2 - Instrument Uncertainties and Calibration and Drift Design Inputs for CRD-LS-613C & D**

| Design Input | Description | Basis |
|---|---|---|
| TS Calibration Frequency | 18 Months | Table 3.3.1.1-1 Function 7.b. The calibration period is 18 months. |
| Calculation Calibration Frequency | 24 months | A more conservative value is 24 months. |
| Calibration Period Frequency + 25% | 30 Months | 24 months plus a 25% margin of 6 months = 30 months. |
| C = Correction | 0.839 | Correction for end device when set point is approached from a single side. C = 0.839 when applicable |
| Seismic RRS (s) (g) | 0.6 | The maximum seismic loading for the device installation location is approximately 0.6 G. |
| Power Supply Stability (V) | 4.8 | The voltage supplied to the level switch device must be within 20% of the nominal 24 VDC supply. The actual power supply is within 10%of the nominal voltage. This device is assumed to be within ±10% of the nominal 24 VDC supply. |
| Instrument's nominal reading | 0.0 | Under normal conditions the water level in the SDIV will be below the lower sensing diaphragm of the transmitter. Output will be at minimum. |
| Period of operation during and after LOCA | 0.0 | The instrument is located in the control room and will perform its safety function operation (Scram) prior to being exposed to the LOCA environment. |
| RA = Reference Accuracy | 0.1% of CS | Vendor Data Sheet- Accuracy of Calibrated Span |
| M&TE = Maintenance and Test Equipment Uncertainty | 0.33% of CS | The decade resistance network used for the calibration of this device is assumed to be accurate to within 0.1% of reading. The M&TE specified for this calibration is a Fluke model 45 digital multimeter with an accuracy of = 0.25% CS. Reference standards used for the calibration of the M&TE are required to have accuracy uncertainties 0.25 or less than the equipment being tested. |

| Design Input | Description | Basis |
|---|---|---|
| SA = Setting Accuracy | 0.0% of CS | The decade resistor network is a digital device. There is no uncertainty associated with the setting of this device. |
| CAL = Calibration Effect | 0.33% of CS | Plant Setpoint Methodology Standards EES-4, $[M\&TE^2+SA^2]^{1/2}$ |
| DR = Drift | 1.0% of CS | Per EES-4, in the absence of a manufacturer's expression of drift, or a calculated expression of drift as derived from actual performance histories, the default value of 1.0% of CS bias should be used. |
| PSE = Power Supply Effect | 0.36% of CS | The manufacturer's statement of power supply effect for this device is ±.0.15% of specified power variation. |
| PPE = Process/Primary Element Effect | 0.0% of CS | This device is not connected or exposed to a process. Any Process/Primary Element effects are included in the uncertainty development of the associated differential pressure transmitter. |
| RE = Radiation Effect | 0.0% of CS | The component is located within the control room and radiation effect is negligible. |
| TE = Temperature Effect | 0.0% of CS | The performance specifications for this device are for operation under ambient temperature conditions that envelope those at the instrument installation location. The Temperature Effect is zero. |

Total Loop Uncertainty

The above uncertainties for the transmitter and the trip units are combined

$U_T = U_{TR}+U_{TB}$

$U_{TR} = [\Sigma\ U_{D,R,n}{}^2]^{1/2} = 5.91$ % of CS
$U_{TB} = \Sigma\ U_{D,B+,n} = 1.56$ % of CS

$UT = U_{TR}+U_{TB} = 7.47\%$ of CS
UT = 4.9302 inches

**Total Loop Uncertainty is UT = 4.9302 inches**

Total Calibration and Drift

The above Calibration and Drift components for the transmitter and the trip units are combined

$CD = [\Sigma\ CAL_{D,R,n,}{}^2 + \Sigma DR_{D,R,n}{}^2\ ]^{1/2} + \Sigma DR_{D,B,n} = 1.66$ % of CS = 1.0956 inches

**Total Loop Calibration and Drift Component CD = 1.0956 inches.**

As-Found Tolerance (AFT) and As-Left Tolerance (ALT)

For those instruments subject to the requirements of TSTF-493, Setting Tolerance has two parts. As-Found Tolerance (AFT) and As-Left Tolerance (ALT).

AFT is defined as the bounds, within which the setpoint is expected to be found at the end of surveillance, and ALT is defined as the bounds within which the setpoint must be adjusted at the end of surveillance.

The following calculations are for instrument loop CRD-LT-13C and CRD-LS-613C, but the results also apply to CRD-LT-13D and CRD-LS-613D.

Given Data:

| EPN | CRD-LT-13C | CRD-LS-613C |
|---|---|---|
| k | 0.839* | 0.839* |
| $CAL^+ = CAL^-$ | 0.30 | 0.33 |
| $RA^+ = RA^-$ | 0.20 | 0.1 |
| $DR_R$ | 0.48 | 0.0 |
| $DR^+_B = DR^-_B$ | 0.0 | 1.00 |

*Note: k=1 for a normal distribution and 0.839 for a single sided distribution

Calculated Values:

**As Found Tolerances (AFT) are calculated as follows:**

$AFT^+ = k \times [(\Sigma CAL^+)^2 + (\Sigma RA^+)^2 + (\Sigma DR_R)^2]^{1/2} + \Sigma DR_B = 1.71\%$ of CS = 1.13 inches

$AFT^- = k \times [(\Sigma CAL^-)^2 + (\Sigma RA^-)^2 + (\Sigma DR_R)^2]^{1/2} + \Sigma DR_B = 1.71\%$ of CS = 1.13 inches

**As Left Tolerances (ALT) are calculated as follows:**

$ALT^+ = k \times [(\Sigma CAL^+)^2 + (\Sigma RA^+)^2]^{1/2} = 0.59\%$ of CS = 0.39 inches

$ALT^- = k \times [(\Sigma CAL^-)^2 + (\Sigma RA^-)^2]^{1/2} = 0.59\%$ of CS = 0.39 inches

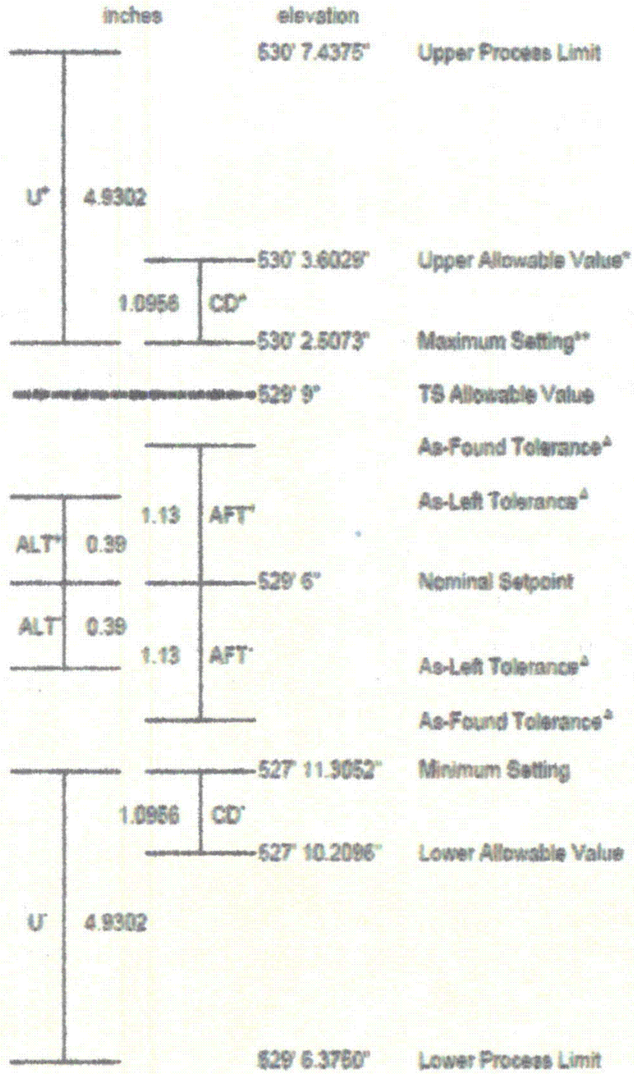


**Figure 2 - Setpoint Table for CRD-LS-613C, D Scram Setpoint**

* NOTE: The instrument accuracy is specified from centerline of the diaphragm of the reference leg to centerline of the upper sensing diaphragm. This is the 100% range of the instrument. Any further increase above the centerline of the upper sensing diaphragm affects the accuracy of the measured value. Once the upper sensing diaphragm is fully submerged no further increase in level will result in a detected level change. Therefore, the upper allowable value is limited by design to the centerline of the upper sensing diaphragm. The upper sensing diaphragm centerline elevation for these transmitters is 529'-9". Therefore, an Upper Allowable Value of 529'-9" will be used; this is in agreement with the Tech. Spec.

** NOTE: With the upper allowable value of 529'-9" per Tech Specs, the maximum setting is 529'-7.9" (529'-9" – 1.0956").

Δ NOTE: The combined As Found Tolerances AFT+ and AFT- values for instruments CRD-LT-13C/CRD-LS-613C and CRD- LT-13D/CRD-LS-613D are 0.08 mA (1.13 inches H20). The combined As Left Tolerances ALT+ and ALT- values for instruments CRD-LT-13C/CRD-LS-613C and CRD-LT-13D/CRD-LS-613D are 00.048 mA (0.39 inches H20). Margin: Nominal scram setpoint assumed to be 529'-6".

| TS Allowable Value | AFT + Nominal Setpoint | Margin to TS Allowable Value |
|---|---|---|
| 529'-9" | 529'-7.13" | 1.87" |

**NRC Request:**

3. The licensee proposed to add SRs for TS Table 3.3.1.1-1, Function 7.a. Please explain the rationale for the selection of 12 hours as the required periodicity for performance of the channel check function.

**Energy Northwest Response:**

The 12 hour Frequency was chosen as it corresponds to the frequency used for other reactor protection functions and is consistent with the Standard Technical Specifications and Bases documents. (NUREG-1434) The Frequency is based upon operating experience that demonstrates channel failure is rare.

**NRC Request:**

4. The LAR stated the proposed level instrument for TS Table 3.3.1.1-1, Function 7.b would consist of level transmitter and trip unit. Please explain if the proposed instrument for TS Table 3.3.1.1-1, Function 7.b would support performance of the channel check and whether it would require periodic trip unit calibration.

**Energy Northwest Response:**

The new trip unit for function 7.b does not include a level indication that would support a channel check surveillance. The existing design with float switches for the Function 7.b instruments does not provide the ability to perform a channel check. Because two channels per instrument volume are available from the Function 7.a instrumentation, sufficient indication is available to the operator to verify that the scram discharge volume capacity remained within the ability to support the RPS scram function.

The TS Table 3.3.1.1-1 Function 7.b transmitter and trip unit does require periodic channel functional testing (92 days) and channel calibration testing (18 months) per the existing surveillance requirements of SR 3.3.1.1.8 and SR 3.3.1.1.10 respectively.