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Jerry C. Roberts
Director, Nuclear Safety Assurance

RBG-47279

September 5, 2012

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

SUBJECT: Response to Request for Additional Information on License Amendment Request 2011-05
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

REFERENCES:
1. Entergy letter to NRC, dated December 8, 2011, License Amendment Request 2011-05, Degraded Voltage Surveillance Frequency Extension and Allowable Value Changes (Letter No. RBG-47193)

2. NRC letter to Entergy (via email), dated August 7, 2012, Request for Additional Information

RBF1-12-0126

Dear Sir or Madam:

On December 8, 2011, Entergy Operations, Inc. (Entergy) submitted a request to extend the frequency of a surveillance requirement and revise the allowable value for degraded voltage relays (Reference 1). During their review, the NRC staff determined that additional information is needed to complete the processing and approval of Entergy's request. The request for that information was transmitted to Entergy per Reference 2. The attachment to this letter contains the requested information.

This letter contains no commitments. If you have any questions on this matter, please contact Joey Clark, Manager – Licensing, at 225-381-4177.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 5, 2012.

Sincerely,

JCR/dhw

A001
NRR

Attachment 1: Response to Request for Additional Information

cc: Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
1600 E. Lamar Blvd.
Arlington, TX 76011-4511

NRC Senior Resident Inspector
River Bend Station

U. S. Nuclear Regulatory Commission
Attn: Mr. Alan Wang
MS 8-G14
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Department of Environmental Quality
Office of Environmental Compliance
Radiological Emergency Planning and Response Section
JiYoung Wiley
P.O. Box 4312
Baton Rouge, LA 70821-4312

Ms. Tracie Lowery
Public Utility Commission of Texas
1701 N. Congress Ave.
Austin, TX 78711-3326

Attachment 1
RBG-47279

Response to Request for Additional Information

1. It is stated in RAI Responses 1, 3, 4 to RAI REQUEST No. 1, that outliers were rejected based on t-Test. Indicate what additional investigations, other than t-Test, were performed.

   RESPONSE

   No additional evaluations were performed for the outlier evaluation, the EOI drift analysis followed the River Bend Drift Analysis Design Guide, ECH-NE-08-0015, which the NRC evaluated as acceptable in ML 02350266, (SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO AMENDMENT NO. 168 TO FACILITY OPERATING LICENSE NO. NPF-47 ENTERGY OPERATIONS, INC. RIVER BEND STATION, UNIT 1 DOCKET NO. 50-458). The drift design guide specifically states in Section 3.6.1, Detection of Outliers, "This design guide utilizes the Critical Values for t-Test (Extreme Studentized Deviate)." Section 3.6.2 identifies the equations used and Section 3.6.3 defines the limits of outlier expulsion. The t-Test as identified is consistent with the drift evaluations performed for the River Bend 24 Month Fuel cycle license Amendment Request and also with the license amendment requests for several other 24-Month fuel cycle requests. The analysis never removes more than a single outlier as discussed with NRC.

2. It is stated in RAI Response 3 to RAI REQUEST No. 1, that the maximum recorded drift was 6.31 VAC and was not rejected as outlier while the drift permitted by setpoint calculations for 30 months has been selected to be $\pm$ 5.823 VAC. Provide justifications why maximum drift of 6.31 VAC is considered acceptable.

   RESPONSE

   The 6.31 VAC was a historical change between an as-left condition and the next as-found condition. As explained in Section 3.2.1.2 of the above referenced drift design guide, while termed as drift, these changes in output value from one calibration to the next can also contain accuracy errors, Measurement and Test Equipment uncertainty, uncertainty due to minor temperature variations and other possible environmental related uncertainties. The statistics as identified in the drift design guide are used to generate an acceptable and conservative computation of the 30 month drift. Section 4.6 of the drift design guide identifies the methods used to calculate the drift value. In summary, the random portion of the Analyzed Drift is calculated by multiplying the standard deviation of the Final Data Set by the Tolerance Interval Factor for the sample size and the Normality Adjustment Factor (if required from the Coverage Analysis) and then extrapolated as necessary. Since the drift value is determined based on 95/95 criteria, it is possible that single values within the analysis will exceed the limits computed. Research into the historical information did not reveal any problems with the data such as data transcription errors, calibration errors,

Measurement & Test Equipment errors, scaling or setpoint changes, failed instruments or design / application deficiencies, as outlined in Section 3.6 of the drift design guide. In this case, the value is an unidentified anomaly, but is the second outlier identified (and as such, could not be removed by the drift design guide criteria).

3. RAI Response 3 to RAI REQUEST No. 1, Function 2.a, Division 3 – 4.16 kV Emergency Bus, indicates that more than 50 samples have been reviewed for Normality test. Provide similar minimum number of samples used for each of the functions listed in RAI Response to REQUEST No. 1.

RESPONSE

In accordance with the drift design guide discussed above, a minimum sample set of 30 samples was generally used to derive a 95/95 confidence drift value. The following table provides the final data set sample size, after removal of outliers, for each calculation addressed.

Calculation	Title	Sample Size
G13.18.6.3-006	Drift Study for ABB Model ITE-27H Undervoltage Relays	41
G13.18.6.3-009	Drift Study for ABB ITE-62 Timers	42
G13.18.6.3-012	Drift Study for General Electric Model NGV13B Undervoltage Relays	58
G13.18.6.3-014	Drift Study for Agastat ETR Series Time Delay Relays	48

4. It is stated in response to REQUEST No. 4, "The setpoint calculation methodology allows for using the Loop Calibration Tolerance instead of Loop Reference Accuracy to determine Loop Uncertainty when the Loop Calibration Tolerance is greater than the Loop Reference Accuracy." Clarify what parameters are used in calculating these two tolerances and how the adequacy of those parameters have been established.

RESPONSE

The value of Loop Calibration Tolerance (LCT) used in setpoint and measurement uncertainty calculations is equal to the calibration tolerance specified in the associated Surveillance Test Procedure (STP) for the loop in question. The adequacy of this value is established by the fact that it is the actual tolerance used by the technician in performing the calibration. LCT may be equal to or greater than the Loop Reference Accuracy (LRA). Where the LCT is greater than LRA, then the LCT replaces the LRA term in the Channel Uncertainty calculation. This ensures that the actual tolerance around the setpoint is accounted for in the Channel Uncertainty.

Loop Reference Accuracy is the combined vendor published accuracy for all Loop devices. Reference accuracy is a value that defines the limit that errors will not exceed when the device is used under the vendor specified operating conditions.

5. Response to REQUEST No. 4 states, "...the STP 'As-Found' and 'As-Left' calibration tolerance is the same..." Provide clarification how the As-Found and As-Left tolerances are calculated, especially if drift is included in them.

   RESPONSE

   STP 'As-Found' and 'As-Left' calibration tolerances are the same because neither 'As-Found' nor 'As-Left' calibration tolerances contain an allowance for drift. See the response to question 4 above for a discussion of how 'As-Found' and 'As-Left' calibration tolerances are determined. This represents a very conservative as-found value since some drift is expected between calibrations.

6. Section 9.0 in Setpoint Calculation G13.18.3.1-004 addresses Maximum Loop Setting Tolerance, CT_{LV} and TRM. Explain what CT_{LV} and TRM represent and what tolerances are included in them.

   RESPONSE

   The term TRM Trip Value in Calculation G13.18.3.1-004 Section 9.0 refers to the Technical Requirements Manual Nominal Trip Setpoint, which includes allowance for Total Loop Uncertainty. Section 10.1 of calculation G13.18.3.1-004 provides a TRM setpoint of TRM ≤ 52.55 seconds and Section 10.2 provides a TRM setpoint of TRM ≥ 51.23 VAC. CT_{LV} represents Loop Calibration Tolerance. This value is obtained from uncertainty calculations G13.18.6.2-ENS*002 and G13.18.6.2-ENS*006 and is equivalent to the Loop Calibration Tolerance value used in the associated Surveillance Test Procedures (STP-302-1600, STP-302-1601, STP-302-1602 and STP-302-1603). The variable CT_{LV} described in Section 9.0 of calculation G13.18.3.1-004 is identified as CT_L in Section 10.1 of that calculation, where CT_L = 3 seconds. It is also identified as CT_L in Section 10.2 of the calculation, where CT_L = 0.87 VAC.

7. Section 8.4 in Calculation G13.18.6.2-ENS*007, Rev. 1, refers to References 3.2, 3.3, and 3.11, which the staff has not received. Clause 8.4 addresses CT_{LT} and procedural as-left band (PALB) parameters. Provide the relevant information on how the CT_{LT} and PALB parameters are established, especially to ensure 95/95 confidence level.

RESPONSE

The CT_{LT} parameter is set equal to PALB in Section 8.4 of Calculation G13.18.6.2-ENS*007. PALB is the Loop Calibration Tolerance used in the associated Surveillance Test Procedures (STP-302-1604 and STP-302-1605). Therefore, although treated as 95/95 confidence level values in calculation G13.18.6.2-ENS*007, since the tolerance value is verified 100% of the time during the performance of the surveillance, the confidence level of PALB and CT_{LT} are actually greater because they are the actual tolerance values used during calibration.

8. Assumption 7.1.2 in Calculation G13.18.6.2-ENS*007, Rev. 1, states, "For conservatism all uncertainties given in vendor data specifications are assumed to be 2σ unless otherwise specified." Provide justifications for this assumption.

   (a) Please be sure to identify any components NOT purchased as safety-related (i.e., commercially dedicated)

   (b) Please be sure to include the exact statement that the vendor made regarding the uncertainties (e.g., Tolerance interval, distribution, and confidence level).

RESPONSE

Assumption 7.1.2 in calculation G13.18.6.2-ENS*007, Rev. 1, is based on vendor published specifications for normal operating conditions, including ambient temperature and power supply voltage variations. The vendor does not provide any information regarding the confidence level, tolerance interval or distribution for the specified accuracy values. However, the assumption that vendor data specifications are 2σ is supported by the drift evaluation performed in Reference 3.16.3 (calculation G13.18.6.3-014). This calculation evaluated relay performance using 48 data points at various plant environmental and power supply conditions within the relay normal operating range and concluded that 30 month drift is within ± 3.725% of setpoint with a 2σ confidence level. Calculation G13.18.6.2-ENS*007, Rev. 1, utilizes a vendor supplied reference accuracy value of ± 5% of setting. Additionally, although the vendor specifies that this ± 5% of setting accuracy value includes an allowance for normal environmental temperature and power supply voltage variations, calculation G13.18.6.2-ENS*007, Rev. 1, includes an additional ± 5% of setting uncertainty for temperature effect and an additional ± 5% of setting uncertainty for power supply effect. Since the ± 5% of setting allowance for reference accuracy is significantly larger than the ± 3.725% of setpoint value resulting from the drift study and a large amount of conservatism was included in the calculation by combining additional allowances for temperature effect and power supply effect with reference accuracy, it was concluded that the vendor supplied accuracy value may be conservatively treated as having a 2σ confidence level.

All components evaluated by calculation G13.18.6.2-ENS*007, Rev. 1, are purchased as safety related.

9. Sections 8.7.3.1 and 8.7.3.2 in Calculation G13.18.6.2-ENS*007 Rev. 1, state,

"Relay Drift for Time Delay Setting (DR_{RT}) (Assumption 7.1.14)

$DR_{RTI} = \pm$ 3.725% Setpoint"

Assumption 7.1.14 states Instrument Drift is deleted.

Provide clarification between the above two statements.

RESPONSE

The content of Sections 8.7.3.1 and 8.7.3.2 in Calculation G13.18.6.2-ENS*007 Rev. 1, is correct, with the exception of reference to Assumption 7.1.14. Section 7.1.14 contained an assumption regarding relay drift in a previous revision of the calculation which is no longer required with the inclusion of the results of the drift study performed in Reference 3.16.3.

10. Sections 8.3.1 and 8.3.2 in Calculation G13.18.6.2-ENS*007 Rev. 1, refer to Sections 8.2.3, 8.1.3, and 8.1.5 but there are no Sections 8.2.3 and 8.1.5 in this calculation. Section 8.1.3 refers to Reference 3.9.1, and Assumption 7.1.6. Assumption 7.1.6 refers to Reference 3.9.6 which also the staff has not received. Provide the necessary information.

RESPONSE

An error exists in the section numbers referenced by Sections 8.3.1 and 8.3.2 in Calculation G13.18.6.2-ENS*007 Rev. 1. Section 8.3.1 should reference Sections 8.2.1, 8.1.1 and 8.1.3. Section 8.3.2 should reference Sections 8.2.2, 8.1.2 and 8.1.4.