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See Rpt

SUBJECT: Forwards response to request for addl info re 24 month cycle evaluation & Rev 1 to "Guidelines for Instrument Loop Performance Evaluation & Setpoint Verification."

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ROBERT C. MECREDY
Vice President
Nuclear Operations

October 6, 1995

U.S. Nuclear Regulatory Commission
Document Control Desk
Attention: Mr. Allen R. Johnson
Project Directorate I-1
Washington, D.C. 20555

Subject: Conversion to Improved Technical Specifications
24 Month Cycle Evaluation, Response to Request for Additional Information
Rochester Gas & Electric Corporation
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Reference: (a) Letter from A.R. Johnson, NRC, to R.C. Mecredy, RG&E, Subject: *Request for Additional Information - Improved Technical Specifications - Attachment H, Extension of Instrument Surveillance Intervals, R.E. Ginna Nuclear Power Plant (TAC No. M92963)*, dated September 21, 1995.

Dear Mr. Johnson,

By Reference (a), the NRC requested additional information with respect to the proposed technical specification changes to extend the instrument surveillance intervals to accommodate a 24-month fuel cycles. Enclosed, please find the requested information. Please contact Mark Flaherty at (716) 724-8512 if you have additional questions on this response.

Very truly yours,

Robert C. Mecredy

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Ginna Senior Resident Inspector

Response to Request for Additional Information dated September 21, 1995

1. *Provide a copy of Engineering Work Request 5126, "Guidelines for Instrument Loop Performance Evaluation and Setpoint Verification," August 1992.*

   A copy of the requested guidelines is attached.

2. *Provide justification to show how and what were the sample sizes chosen from the instrument population and based on what section of MIL-STD-105D, "Sampling Procedures and Tables for Inspection By Attributes," to support a claim of 95/95 confidence level.*

   The method of selecting the instrument population and sample sizes is contained in Section 7.1 of the Design Analysis (Ref. 1). However, this is further explained below.

   The first step performed was to generate a list of all instrumentation subject to the increased surveillance intervals in the proposed improved technical specifications (ITS) for Ginna Station (Ref. 2). This population is listed in Table 1 of the Design Analysis and contains the instrumentation for which the channel calibration surveillance interval is being proposed to increase from 18 months to 24 months. From this population listing, all components of each instrumentation loop were reviewed to identify those devices which were subject to drift considerations. Devices such as transmitters, indicators, alarm bistables, and various signal processing modules were included while devices such as RTDs and thermocouples which have no inherent means for performing calibration adjustments were excluded from further consideration. The devices subjected to drift considerations were then placed in a data base containing information such as equipment identification number (EIN), model number, and vendor name. The data base was then sorted and grouped by vendor, model number, and EIN (see Table 2 of Design Analysis).

   The data base contains 489 components subjected to drift considerations. It was estimated that it would take approximately 6 man months to retrieve the necessary data for each of these components. Therefore, a sampling approach was selected. This sampling approach was based on each model category specified in Table 2 of the Design Analysis. That is, a representative sample of the entire data base population was not performed; instead, a representative sample of each model number contained in the data base was performed. This approach ensured that sufficient historical data was retrieved for each model number so that the increased surveillance frequency could be justified. It also resulted in the evaluation of 191 devices, or almost 40% of the total population.

MIL-STD-105D Table 1, "General Inspection Levels," Column II and Table II-A, "Acceptable Quality Level," column "4.0" were selected for the determination of the representative sample sizes and the acceptance criteria. Table 1 of this standard provides a cross reference to Table II-A for a given population size. For the purpose of the instrumentation review, the population size is based on the number of EINs for each model number. Table II-A provides the sample sizes for each model number population. Column "4.0" of Table II-A provides "acceptance" and "rejection" standards for these sample sizes. This column shows the number of number of failures which can be expected in a given sample population size (i.e., the number of "acceptable" failures) and the number of failures in which the sample size is considered invalid such that the 95/95 confidence level would no longer apply (i.e., the number of "rejection" failures). RG&E used these two tables to determine the sample size for each model number and the maximum number of failures which could be tolerated in each sample population. A failure was defined as the failure of a device to meet the TIU value as discussed in the response to Question 9. In no case did the sample size exceed the maximum number of allowed failures such that the sample size was invalid. (Note - for the LT-2039 "failure" discussed in the response to Question 10, there were only two level transmitters in the associated model population, both of which were evaluated). Therefore, the 95/95 confidence level was met.

A sampling approach was considered acceptable since almost 40% of the total population was eventually evaluated. RG&E has also committed to a program for monitoring and assessing the effects of the increased calibration surveillance intervals. In addition, the Maintenance Rule (10 CFR 50.65) requires a program to monitor the effectiveness of maintenance activities at Ginna Station.

3. *Instrument Drift Study is based on only a sample of the installed instrumentation at Ginna. Is this appropriate considering: instrument types, installation, characteristics, manufacturer and service requirements? Explain the bases for stating that the confidence level is 95/95.*

The basis for determining the sample size and stating that the confidence level is 95/95 is discussed in the response to Question 2. As stated above, the sample size appropriately considered instrument types, installation, characteristics, manufacture, and service requirements since all sample sizes were based on the number of devices with the same model number and almost 40% of the total population was evaluated.

4. *Are the instrument uncertainties listed referenced to the sensor/transmitter only or to all components in the loop?*

   In the Setpoint Analysis (Ref. 3), instrumentation uncertainties are calculated for every device in the instrument loop. The values provided in the Design Analysis are the uncertainties associated with each applicable device (i.e., the total instrument uncertainty (TIU) value provided in the Design Analysis is for each device, not for the instrument loop).

5. *Drift is the difference between as-left and as-found. In the submittal, the year data sheet uses "desired/calculated" and "as-found" values. Explain the difference.*

   This issue is explained in Section 7.3 of the Design Analysis. However, this is further explained below.

   The data sheets which are completed by I&C technicians during their calibration of an instrument loop typically contain 5 fields (see attached example). The first field contains the "input" value(s) used in the test. Most components are tested over a wide range of "input" values to ensure their operability. The second field is the "desired/calculated" value which contains the expected output value for each "input." The third field is the "as found" value which is to completed by the I&C technician during the channel calibration. The fourth field contains the "allowable tolerance band," typically a 1% span around the "desired/calculated" value. The final field is the "as left" value to be completed by the I&C technician. If the "as found" value is approaching or has exceeded the "allowable tolerance band," the device is adjusted. If the "as found" value is considered acceptable by the I&C technician, no change is made and the "as found" and "as left" values will be same.

   For the purpose of the Design Analysis, instrument drift was determined by calculating the difference between the previous test "as left" value and the next test "as found" value. This was performed for 5 years of historical data (i.e., 1990 through 1994) and provides information with respect to instrument drift for a typical 12 months between tests. However, for the first year of data sheets, the previous test "as left" value was not known (i.e., the 1989 value was not retrieved). Therefore, in this case, the "as left" value was compared to the "desired/calculated" value (i.e., the "desired/calculated" value was assumed to be previous test "as left" value for the first year data sheets).

6. *The submittal states that the worst case consecutive three year variance is selected. What is the basis for selecting three consecutive calibration results? Also, our review of the data indicates that the selected intervals widely vary (1.5 to > 3 years), not always three years.*

RG&E proposes to increase the channel calibration surveillance interval from 18 months to 24 months. However, SR 3.0.2 of the ITS for Ginna Station allow this surveillance interval to be increased by up to 25% such that the maximum surveillance interval could actually be 30 months. RG&E performs most of these channel calibrations during refueling outages. Since these outages are currently on an annual basis (i.e., 12 months), a three year window was selected for purposes of the historical data review. That is, if the historical data showed that the observed instrument drift was acceptable over a 3 year window, then this would bound the worst case surveillance interval of 30 months.

As stated in the response to Question 5, a total of 5 years of historical data was retrieved. This data was retrieved for each test point (i.e., a device is typically tested using multiple input values as discussed above). The "as found" and "as left" values were then determined for each test point. The single worst case difference (or "variance") between all test points was then selected and added to the summary sheets contained in Attachment A of the Design Analysis. This worst case "variance" was then determined for every channel calibration performed during the 5 year window and added to the summary sheets.

The summary sheets were then reviewed to determine what the worst case "variance" would be over any 3 year window in the 5 years of data. Since absolute values were not used, the worst case "variance" could actually occur in less than 3 years (e.g., if you added additional "variance" values after 1.5 years, this would no longer be the worst case). Absolute values were not used since the summary sheets contain the worst case "variance" of all test points for each test as discussed above. Consideration of any data beyond 3 years was unnecessary since the maximum surveillance interval would only be 30 months.

7. *The submittal states that the 3 consecutive calibration intervals demonstrates acceptable instrument performance for calibration intervals greater than 30 months. Explain the methodology and assumptions to support this conclusion. How is the instrument calibration handled when included in the 3 consecutive interval criteria (no longer representative of a 36 month interval)?*

See response to Question 6.

8. *The term "variance" as used in the discussion and the summary sheets appear to be misleading. Does this represent the fluctuation of the data (10 point calibration results) around the mean?*

See response to Question 6.

9. *The total instrument uncertainty (TIU) term referenced in the submittal appears to represent an "allowable value." Provide a description of the Ginna setpoint methodology and the development of the allowable value.*

A summary of the Ginna setpoint methodology and development of "allowable values" follows.

The accident analyses use conservative values for various unit parameters to provide margin with respect to normal operating conditions and to account for all process errors, environmental considerations, instrument uncertainties, and drift considerations. The instrument loops for these unit parameters are comprised of many components including bistables, transmitters, square root converters, etc. Each component of this loop is tested separately in the field such that, in general, an actuation value for the entire instrument loop is not generated during surveillances (otherwise a trip may occur). Therefore, even though the Ginna Station Setpoint Analysis (Ref. 2) is performed on an instrument loop basis, it focuses on the devices which actually comprise the loop.

Trip setpoints are provided for unit parameters to ensure that the accident analyses remain valid after assuming worst case values for process errors, environmental considerations, instrument uncertainties, and drift considerations. The Setpoint Analysis begins with the trip setpoints for each instrument loop and calculates the worst case values for each component. This is performed by calculating a total instrument uncertainty (TIU) which is the statistical consideration of instrument accuracy, instrument drift, instrument calibration tolerance, and test equipment accuracy for each device in the instrument loop. This TIU does not include those process errors and environmental considerations which cannot be appropriately evaluated during normal system testing. Therefore, the TIU can be considered the "allowable value" for each device.

It should be noted that TIU is not the "allowable tolerance band" contained on the calibration data sheets as discussed the response to Question 6. The "allowable tolerance band" is a smaller value than the TIU (typically only 1%) and provides the basis for the "as left" value of the devices. In addition, the TIU's, process errors, and environmental considerations for each device are not combined in the Setpoint Analysis to determine an instrument loop allowable value. The instrument loop allowable value is not required to be calculated since each device on this loop is tested and controlled separately. Only an instrument loop trip setpoint is required.

10. *Sheet 5 of the drift study (LT-2039) proposes an increase of TIU to 3.14% and total channel uncertainty to 4.57%. How does the change in acceptance criteria affect instrument operability determination? It appears that the instrument may in fact be failing and is not indicative of performance for this type of transmitter.*

Sheet 5 of Attachment A to the Design Analysis relates to the results for the Viatran Model #511 level transmitters. For LT-2039, it was determined that the worst case variance over a three year period would be 3.14%. This exceeded the TIU value of ± 1.24% as calculated in the Setpoint Analysis. The summary sheet's conclusion is that the instrument is not used for any EOP or safety related or technical specification requirement and was therefore, found to be acceptable.

LT-2039 is the containment sump A level transmitter. This level transmitter was originally determined to be required for ITS LCO 3.4.15, "RCS Leakage Detection Instrumentation." However, upon further review, this level transmitter only provides indication of level in the containment sump that is used for detecting normal operational leakage (a second sump is used for recirculation purposes following an accident). The actual detection of RCS leakage is performed by tracking the time between actuation of the sump pumps located in containment sump A. These actuation times are independent of the level transmitter. However, since the Design Analysis had already performed the evaluation of this level transmitter, it was included in the package.

RG&E is aware of the performance issues related to this level transmitter and is reviewing the available options. However, this level transmitter is only a secondary instrument as noted above.

11. *The drift analysis presented does not reference current industry guidance as expressed by EPRI, ISA, Westinghouse or GE. Justify authenticity of the method chosen.*

The Design Analysis is based on the "Guidelines for Instrument Loop Performance Evaluation and Setpoint Verification" that was requested in Question 1. This document references ISA-S67.04.

12. *Is RG&E's conclusion that instrument drift generally occurs shortly after the calibration is based solely on observed data? Then such data should be provided for our review. Surveillance intervals can be increased if it is established by extensive data that the instrument drift is independent of time after the calibration.*

RG&E has assumed that instrument drift generally occurs shortly after calibration based on industry and manufacturer information. RG&E does not have specific historical data to base this on since this would require real-time monitoring capability or a test program which performs channel calibrations over various time frames to see the different drift results. However, GL 91-04 allows plants with limited or no operational experience to pursue 24 month cycles based on industry and manufacturer information. In addition, RG&E has committed to monitor the effects of the increased surveillance intervals in the future to ensure that the instrument loops remain operable. Therefore, plant specific data is not considered necessary.

References:

1. Design Analysis DA-EE-95-0109, "Evaluation of 24 Month Instrument Surveillance Intervals."

2. Letter from R.C. Mecredy, RG&E, to A.R. Johnson, NRC, Subject: *Application for Amendment to Facility Operating License, Conversion to Improved Technical Specifications,*" dated May 26, 1995.

3. Engineering Work Request 5126, *Ginna Station Instrument Loop and Setpoint Verification.*