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September 30, 2005

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Additional Information Supporting the Request for License Amendment Related to 24-Month Fuel Cycle

References:

1. Letter from Keith R. Jury (AmerGen Energy Company, LLC) to U. S. Nuclear Regulatory Commission, "Request for Amendment to Technical Specification Surveillance Requirement Frequencies to Support 24-Month Fuel Cycles in Accordance with the Guidance of Generic Letter 91-04, 'Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle'," dated May 20, 2004

2. Letter from Keith R. Jury (AmerGen Energy Company, LLC) to U. S. Nuclear Regulatory Commission, "Additional Information Supporting the Request for License Amendment Related to 24-Month Fuel Cycle," dated May 23, 2005

3. Letter from U. S. Nuclear Regulatory Commission to Christopher M. Crane (AmerGen Energy Company, LLC), "Clinton Power Station, Unit 1 – Issuance of an Amendment – Re: Request for Amendment to Technical Specifications to Eliminate Requirements for Hydrogen Recombiners and Hydrogen/Oxygen Monitors Using the Consolidated Line Item Improvement Process (TAC No. MC4493)," dated April 28, 2005

In Reference 1, AmerGen Energy Company, LLC (AmerGen) submitted a request for a change to Appendix A, Technical Specifications (TS), of Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. Specifically, the change addresses certain TS Surveillance Requirement (SR) frequencies that are specified as "18 months" by revising them to "24 months" in accordance with the guidance of Generic Letter (GL) 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle." Additional revisions to the CPS TS were proposed to support the change to a 24-month fuel cycle.

In Reference 2, AmerGen provided additional information to support the NRC's review of Reference 1. On June 29 and August 25, 2005, the NRC requested additional information related to the Static VAR Compensator protection subsystem in e-mails from Kahtan N. Jabbour (U. S. NRC) to Timothy A. Byam (AmerGen). Subsequent to the August 25 e-mail, a conference call was held that resulted in additional clarification of the request. Attachment 1 to this letter provides the requested information.

In the Reference 2 response to I&C Request 1, AmerGen stated that in performing the revised setpoint calculations to support any revised allowable values, the use of Instrument Society of America (ISA) RP67.04, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation," Part II Method 3 was not utilized. AmerGen's response to I&C Request 1 further stated that there are two existing Method 3 calculations that support current allowable values. However, as part of the AmerGen review of these calculations it was determined that changes to the calculated allowable values were not necessary to support the change in calibration frequency to 24 months.

Discussions between AmerGen and the NRC have resulted in an agreement on how to address the use of Method 3 calculated allowable values in TS. As a result, AmerGen evaluated the need to revise the TS by applying a Note to the calibration surveillance requirements (SRs) for functions with revised allowable values in those TS that implement Limiting Safety System Settings (LSSS). For a boiling water reactor, the systems these instruments are typically associated with are the Reactor Protection System (RPS) and the Emergency Core Cooling System (ECCS). Since Method 3 was not utilized for any of the proposed allowable value changes in Reference 1, as described above, no additional changes to the TS pages provided in Reference 1 are needed to reflect the agreement between AmerGen and the NRC on how to address the use of Method 3 calculated allowable values in TS. In addition, the two existing Method 3 calculations that support current allowable values are not related to RPS or ECCS instrumentation. As can be seen in the proposed TS markups provided in Reference 1, there were no allowable value changes proposed for RPS or ECCS functions as part of this amendment request. During a September 19, 2005, conference call between the NRC and AmerGen, it was requested that AmerGen evaluate whether the Loss of Power (LOP) instruments should be considered an LSSS. As documented in Attachment 2, further evaluation concluded that the LOP instruments do not constitute an LSSS. Therefore, no additional TS changes are included with this letter.

Additionally, in Reference 2, AmerGen stated that after the periodic calibration as-found readings are taken, the instrument setting is calibrated to within the as-left tolerance (ALT) limits of the actual trip setpoint regardless of the setpoint calculation method used to establish allowable values and calibration settings. Subsequent to the submittal of Reference 2, the NRC requested AmerGen to submit a procedure, as an example, that requires the instrument setting to be calibrated within the ALT limits. Attachment 3 to this letter provides procedure CPS 9431.04, "RPS Reactor Water Level B21-N080A (B, C, D) Channel Calibration," Revision 34f. This procedure is performed to support the channel calibration of reactor water level channel B21-N080A (B, C, D) (i.e., TS SR 3.3.1.1.13). Section 9.0 of this procedure provides the acceptance criteria. Step 9.2.1 requires the as-left setting to be within acceptable limits (i.e., ALT limit) as specified in section B of the data sheet. The section B limits specify the ALT limits of the actual trip setpoint. This procedure is typical of other CPS procedures that support TS instrument calibration surveillances.

Attachment 8 to Reference 1 provided excerpts or paraphrases from the NRC Status Report dated December 1, 1997 on the NRC Staff review of EPRI Technical Report TR-103335 followed by the CPS position regarding utilization of TR-103335. At the request of the NRC, AmerGen has revised the CPS position on Item 4.1, Section 1 as provided on page 1 of 12 in Attachement 1 to Reference 1. This revision was made to provide additional clarification on the CPS position. The revised Attachment 8 page 1 of 12 is provided in Attachment 4 to this letter.

On April 28, 2005, the NRC issued License Amendment No. 164 (Reference 3) which deleted the TS requirements to maintain hydrogen recombiners and hydrogen/oxygen monitors and associated surveillance requirements. AmerGen has subsequently implemented Amendment 164 and as part of this amendment relocated the requirements for the hydrogen recombiners from the TS to the Operational Requirements Manual (ORM). Therefore, the changes to TS SR 3.6.3.1.1, 3.6.3.1.2, and 3.6.3.1.3, as proposed in Reference 1, are no longer required since these SRs have been deleted from the TS.

There are no regulatory commitments associated with this letter.

AmerGen has reviewed the information supporting a finding of no significant hazards consideration that was previously provided to the NRC in Attachment 1 of Reference 1. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration.

If you have any questions concerning this letter, please contact Mr. Timothy A. Byam at (630) 657-2804.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of September 2005.

Respectfully,

Keith R. Jury

Keith R. Jury
Director, Licensing and Regulatory Affairs
AmerGen Energy Company, LLC

Attachments:

1. Response to Request for Additional Information
2. Evaluation of Loss of Power Instrumentation for Limiting Safety System Setting
3. Procedure CPS 9431.04, "RPS Reactor Water Level B21-N080A (B,C,D) Channel Calibration"
4. Revised Amendment Request Attachment 8

ATTACHMENT 1
Response to Request for Additional Information

NRC Request 1:

AmerGen's response to NRC Electrical Request No. 2 states that: "The devices functionally tested as part of this SR are electronic protective relays monitoring the output of the SVC for changes in voltage, current, and harmonic content. Since they are electronic relays, they are programmed...."

Please clarify if the protective relays are microprocessor-based components. If so, were they qualified in accordance with Generic Letter 95-02, "Use of NUMARC/EPRI Report TR-102348, 'Guideline on Licensing Digital Upgrades', in determining the acceptability of performing analog-to-digital replacements under 10 CFR 50.59," and Regulatory Guide 1.152, "Criteria for Programmable Digital Computer System Software in Safety-Related Systems of Nuclear Power Plants?"

In addition, please state the testing and maintenance that AmerGen requires to maintain qualification of these programmable protective relays.

Response 1:

On May 4, 1998, a license amendment request for Clinton Power Station (CPS) Unit 1 was submitted to the NRC to support the proposed installation of two static VAR compensators (SVCs) (i.e., one SVC on the secondary side of the reserve auxiliary transformer (RAT) and the other SVC on the secondary side of the emergency reserve auxiliary transformer (ERAT)). On October 9, 1998, the NRC issued License Amendment 117 to the Facility Operating License for CPS. The amendment approved installation of the SVCs, and included changes to the CPS Technical Specifications (TS) to incorporate a limiting condition for operation and surveillance requirements for the SVC protection systems. Additional details regarding the design, failure analysis, and protection systems are described in the NRC safety evaluation for License Amendment 117.

The devices functionally tested during the system functional test of each SVC protection subsystem are electronic protective relays that monitor the output of the SVC for changes in voltage, current, and harmonic content. Their function is to serve as the redundant protective system to the programmable high speed controller and isolate the SVC before the SVC output could negatively affect the voltage supplied to the safety related buses.

The redundant protection system contains microprocessor-based components (i.e., ABB Distribution Protection Unit DPU 2000 and ABB Capacitor Bank Overload and Unbalance Protection Relay SPAJ 160). These components were part of the original installation of the SVCs, and were not upgraded as part of an analog-to-digital replacement modification. These components are non-safety related, and the guidance of Generic Letter 95-02 and Regulatory Guide 1.152 are not applied to these components. The boundary of safety and non-safety related equipment at the 4 kV level is at the offsite source feed breakers for the safety related 4 kV buses. While the 4 kV

Division 1, 2, and 3 switchgear are safety related, the 4 kV non-segregated bus, RAT, ERAT, and SVCs are non-safety related components.

Although the components described above are non-safety related, a Failure Mode and Effect Analysis was performed, as described in the NRC safety evaluation for License Amendment 117. The evaluation determined that the internal SVC programmable high speed controller, along with the two SVC subsystems, "are designed to detect and mitigate the impacts of failures independently of each other. A failure in one system will not prevent the other system from detecting the failure and tripping the SVC." The analysis further indicated that a single failure of a component due to overvoltage, undervoltage, harmonics, short circuit, or overload will not prevent the SVC from being disconnected from the Class 1E 4.16 kV system. The redundancy in the design (e.g., double output breakers in series, double trip coils on the breakers, dual battery supplies and chargers for the control and tripping circuits, double trip schemes, etc.) reflects the need to ensure that the SVC can perform its function without posing a threat to the safety related components.

Testing of the SVC protection systems is performed in accordance with TS SRs. SR 3.8.11.1 is a daily system status check to ensure that the SVC protection systems are in service and identify any alarm or trouble conditions. In addition, SR 3.8.11.2 (currently an 18 month surveillance) is performed to ensure that each SVC protection subsystem will actuate to automatically open the associated SVC's main circuit breakers in response to signals associated with SVC failure modes that could potentially damage or degrade plant equipment. While Regulatory Guide 1.152 is not directly applicable to these non-safety related protective features, in this guidance the NRC recognizes that software failures do not follow the random failure behavior applicable to hardware, and supports qualitative deterministic criteria to evaluate system reliability. Consistent with this approach, the original request for this amendment reviewed the failure history for the SVCs and found no prior failures that would have been identified solely by the 18-month surveillance (i.e., SR 3.8.11.2). As such, it is concluded that the programmable portions of the system are reliable and would not be expected to exhibit undetected failures during the extended period between surveillances being proposed by this amendment request. These SRs ensure that the SVC protection systems remain capable of performing their intended functions.

NRC Request 2:

1. Provide documentation on manufacturer recommendations for Static VAR Compensator protection system components.
2. Provide any plant specific surveillance failure history at CPS or industry surveillance failure history at other installations.
3. Provide reason why SR 3.8.11.2 cannot be performed at power.

Response 2:

1. The SVC protection system consists of relays, output breakers and batteries/chargers. The manufacturer recommendations and the CPS periodic maintenance requirements for each of these components are provided below.

   Relays:
   Vendor manuals for the relays involved have been reviewed and the maintenance requirements specified are identified below.
   - DPU 2000: The manufacturer's manual indicates that "[b]ecause of its continuous self-testing, the DPU-2000R requires no routine maintenance. However, you can conduct testing to verify proper operation."
   - SPAJ 160C: The manufacturer's manual states that "[w]hen the synchrocheck relay is operating under the conditions specified in the section "Technical Data", the relay is practically maintenance free. The relay modules include no parts or components subject to an abnormal physical or electrical wear under normal operating conditions. If the environmental conditions at the relay differ from those specified, as to temperature, humidity, or if the atmosphere around the relay contains chemically active gases or dust, the relay should be visually inspected in association with the relay secondary test or whenever the relays are withdrawn from the case."
   - Square D type 60Q: "No routine maintenance is required on these relays. Follow test instructions to verify that the relay is in proper working order."

   Based on the above, since the manufacturers have no specific maintenance requirements, the maintenance of these relays has been defined by CPS to be a functional test of the relays every 24 months.

   Output Breakers:
   The vendor manual for the SF6 circuit breakers states that "unless otherwise specified by customer policy, routine maintenance inspections and checks are to be done monthly, yearly, and every 5 years." The manual also contains a maintenance table which lists the items/conditions that should be checked during each of the inspections and has an additional item covering major maintenance at the 10 year mark.

   The monthly checks specified in the vendor manual include gas pressure and breaker operations which are covered by the Operator rounds. While the 2, 6, and 12 year intervals listed in our preventive maintenance (PM) program do not match the vendor statements of 1 and 5 years (and 10 years for major maintenance), it does follow the "customer policy" reference.

   SVC Batteries and Chargers:
   The SVC batteries are valve-regulated lead acid batteries. The vendor recommends that the battery terminal voltage be verified on a regular basis. The recommendation for this verification is monthly. If the terminal voltage is found to be high or low, adjust charger. The manufacturer recommends recording the pilot cell voltage monthly. In addition, it is recommended that every 12 months, record

individual cell voltages, battery voltage, ambient temperature, and (optional) temperature of the negative terminal of each cell. These are minimum records, more frequent readings are desirable. The existing monthly and quarterly PM tests check the listed battery parameters within the periodicity stated by the vendor. The battery life is indicated as 20 years float operation at 25 C on the vendor drawing. No service tests or load tests are performed on the battery. Instead the battery has an accelerated replacement interval of every 4 years.

The battery charger manual (Operating and Service Instructions for SCR/SCRF series battery charger single phase input JA0041-00 R/3-97) states: "This charger is designed to require a minimum of maintenance...all components have a nominally indefinite life with no expected aging effect. It should be kept clean, dry, and checked periodically to make sure all connections are tight." As indicated, there are no vendor recommended maintenance actions for the battery chargers. The chargers do not have any PM tests specifically performed for them. However, the battery maintenance procedures include checks of the charger output voltage value and ripple voltage content. Accordingly, the existing maintenance activities go beyond the manufacturer recommendations with respect to the battery chargers.

2. There has been no surveillance testing failures of the SVC protection system at CPS. This was confirmed by a review of the last 4 surveillances for the RAT and ERAT SVC protection system at CPS. CPS has the only SVC in use in the nuclear industry. Therefore, there is no operating experience data available that would confirm the reliability of the SVCs throughout the industry. We have not been notified by the manufacturer (i.e., ABB) of any failures associated with this equipment

3. The RAT and ERAT SVCs support the operability of their respective off-site sources. The SVCs assure that the safety related bus voltages can be maintained following a trip of the CPS generating unit. There is no calculation or evaluation in place that would allow the station to consider an off-site source operable without the respective SVC in service.

   Once an SVC is taken out of service (i.e., the output circuit breakers opened), that respective source is declared inoperable. During the surveillance, the output breakers of the SVC are functionally tested. This results in the opening of both output circuit breakers, rendering the related off-site source inoperable. Tripping an SVC results in the entry into a 72-hour Limiting Condition for Operation (LCO) for an inoperable off-site source. Therefore, the following approach is utilized to perform the RAT and ERAT SVC protective relay surveillances.

   Reserve Auxiliary Transformer:
   The surveillance is scheduled to only be performed during planned refueling outages. The plant risk with the plant at power and the RAT SVC (and therefore the RAT) inoperable results in a probabilistic risk assessment (PRA) on-line risk classification of RED due to the significant adverse impact that the RAT can have

to the 4kV safety and non-safety buses and the non-safety 6.9kV buses. Therefore the protective relay surveillance is only performed during a planned outage.

Emergency Reserve Auxiliary Transformer:
The surveillance is performed with the CPS generating unit at power. This can be accomplished because the ERAT impact to the PRA risk analysis is not as severe since the ERAT impact is limited to the three 4kV safety related buses. Therefore, ERAT / ERAT SVC outages are scheduled with the unit at power. The typical work window for these outages is 30 to 34 hours with 10 to 12 hours devoted to the protective relay surveillance.

ATTACHMENT 2
Evaluation of Loss of Power Instrumentation
For Limiting Safety System Setting

10 CFR 50.36, "Technical specifications," requires that the Technical Specifications (TS) include safety limits, Limiting Safety System Settings (LSSS), and Limiting Conditions for Operation (LCO) among other items. 10 CFR 50.36(c)(1)(i)(A) sets forth the criteria for safety limits and 10 CFR 50.36(c)(1)(ii)(A) sets forth the criteria for LSSS.

- 10 CFR 50.36(c)(1)(i)(A) states "Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity."

- 10 CFR 50.36(c)(1)(ii)(A) states "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded."

As required by 10 CFR 50.36, the Clinton Power Station (CPS) Safety Limits (SLs) and LSSS are defined in the TS. The CPS Safety Limits are defined in TS Section 2.1 as follows.

- TS SL 2.1.1.1 requires that the THERMAL POWER shall be $\leq$21.6% rated thermal power with the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow.
- TS SL 2.1.1.2 requires that the Minimum Critical Power Ratio (MCPR) shall be $\geq$1.09 for two recirculation loop operation or $\geq$1.12 for single recirculation loop operation with the reactor steam dome pressure $\geq$785 psig and core flow $\geq$10% rated core flow.
- TS SL 2.1.1.3 requires that the reactor vessel water level shall be greater than the top of active irradiated fuel.
- TS SL 2.1.2 requires that the reactor steam dome pressure shall be $\leq$1325 psig.

Prior to implementation of Improved Technical Specifications (ITS), the CPS TS defined the SLs and LSSS parameters in Section 2.0. This section clearly indicated that the only LSSS parameters at CPS were those associated with the Reactor Protection System (RPS). This LSSS section became part of the RPS section as a result of approval of ITS in Amendment 95. The Background section of the RPS TS Bases was revised as part of ITS implementation to address how the LSSS parameters are directly monitored by RPS.

The LSSS are clearly specified for parameters directly monitored by the RPS. Whether the LSSS concept applies to systems or instrumentation outside of RPS is not presently defined. As documented in Reference 1, the NRC staff stated that the systems the LSSS related instruments are typically associated with are RPS and emergency core cooling systems (ECCS) for boiling water reactors (BWRs). In Reference 1, the NRC also stated that there may be other plant-specific systems that could be included within the scope of systems covered by 10 CFR 50.36. AmerGen agrees that there are LSSS

parameters monitored by CPS RPS and select ECCS instrumentation. In response to a request for additional information from the NRC in support of their review of an AmerGen amendment request to revise a number of TS allowable values (Reference 2), additional evaluation of which systems LSSS related instruments are associated with was required. As documented in Reference 3, it was determined that, in addition to RPS and certain ECCS instrumentation, the relief function of the safety relief valves is also an LSSS parameter monitored by CPS TS instruments.

At the request of the NRC in support of the CPS 24-month fuel cycle (Reference 4), AmerGen has also evaluated whether the loss of power (LOP) instrumentation directly protects an SL. The LOP instrumentation is required for the Engineered Safety Features to function in any accident with a loss of power. The LOP instrumentation monitors the 4.16kV emergency buses. If the LOP instrumentation determines that insufficient power is available, the buses are disconnected from the offsite power sources and connected to the onsite diesel generator (DG) power sources. The required channels of LOP instrumentation ensure that the ECCS and other assumed systems powered from the DGs provide plant protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

Based on the definition of an LSSS as provided in 10 CFR 50.36, the settings that are to be classified as an LSSS in TS shall protect the SLs contained in TS Section 2.1. The trip setpoint values for these parameters must be directly associated with an SL for the parameter to be an LSSS. The results of the evaluation of the LOP instrumentation parameters against the above SLs are provided below.

Reactor Core Safety Limits (Thermal Power & MCPR) and LOP Instrumentation

Safety Limits as defined in TS Sections 2.1.1.1 and 2.1.1.2 are protected by the settings associated with certain RPS functions. A reactor scram is initiated by these RPS functions to ensure that fuel limits are not exceeded. Protection of the thermal power and MCPR SLs does not require the standby AC system (i.e., DGs) or LOP instrumentation.

Reactor Coolant System Pressure SL and LOP Instrumentation

TS SL 2.1.2 is protected by both the RPS high pressure scram function as well as the pressure relief function of the Safety Relief Valves (SRVs), which are defined as LSSS. The LOP instrumentation function is not required to protect SL 2.1.2.

Reactor Vessel Water Level SL and LOP Instrumentation

The top of active fuel (TAF) SL is protected by both the RPS low level scram function and the low level initiation of the ECCS.

The CPS ECCS consists of High Pressure Core Spray (HPCS), Low Pressure Core Spray (LPCS) and Low Pressure Coolant Injection (LPCI). All of these systems have initiation signals based on low reactor pressure vessel (RPV) water level, which are required to protect the SL. Based on this, the associated ECCS settings are considered

as LSSS in the CPS TS. This position is further confirmed by review of the CPS Updated Safety Analysis Report (USAR). USAR Section 6.3 indicates that incident detection circuitry is required to initiate the ECCS on low RPV water level in order to maintain adequate core cooling.

Based on CPS USAR Table 6.3-1, the Auxiliary AC Power System is an essential auxiliary for the LPCS, HPCS and LPCI systems (i.e., pump and valve power). USAR Section 6.3 further indicates that the Auxiliary AC Power System consists of either the Offsite AC Power System or the Standby AC Power System (i.e., DGs). The DC power system is also required for the both the offsite and standby systems.

LOP instrumentation is required to transfer the station's Class 1E power system from the offsite supply system to the onsite standby AC system under conditions where the offsite supply is degraded. The primary effect of the assumption that the offsite power becomes unavailable coincident with a LOCA is an increase in the time delay for injection by the low pressure ECCS. Therefore, based on the transfer function, the LOP instrumentation is required for the Auxiliary AC Power System operation, which in turn is required for ECCS operation. Since the LOP instrumentation affects the auxiliary AC power supply availability and not the safety limit (i.e., RPV water level) directly, the LOP instrumentation is not an LSSS.

Conclusion:
The settings for the LOP instrumentation are based on station voltage regulation studies to assure that safety related equipment has an adequate power supply. In accordance with Instrument Society of America (ISA) S67.04, "Setpoints for Nuclear Safety-Related Instrumentation," instrument settings are derived from Analytical Limits (ALs), which are "established by the safety analysis to ensure that a safety limit is not exceeded." The voltage regulation analysis is not directly tied to any of the SLs. Since the LOP instrument settings are not derived to directly protect the SLs via automatic action, they are not an LSSS as specified in 10 CFR 50.36.

References:
1. Letter from James A. Lyons (U. S. Nuclear Regulatory Commission) to Alex Marion (Nuclear Energy Institute), "Instrumentation, Systems, and Automation Society S67.04 Methods for determining Trip Setpoints and Allowable Values for Safety-Related Instrumentation," dated March 31, 2005
2. Letter from Keith R. Jury (AmerGen Energy Company, LLC) to U. S. Nuclear Regulatory Commission), "Request for License Amendment Related to Revision of Instrument Channel Trip Setpoint Allowable Values," dated November 11, 2003
3. Letter from Keith R. Jury (AmerGen Energy Company, LLC) to U. S. Nuclear Regulatory Commission, "Revised Technical Specification Pages for License Amendment Related to Revision of Instrument Channel Trip Setpoint Allowable Values," dated September 21, 2005
4. Letter from Keith R. Jury (AmerGen Energy Company, LLC) to U. S. Nuclear Regulatory Commission, "Request for Amendment to Technical Specification Surveillance Requirement Frequencies to Support 24-Month Fuel Cycles in Accordance with the Guidance of Generic Letter 91-04, 'Changes in Technical

Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle'," dated May 20, 2004

ATTACHMENT 3

Procedure CPS 9431.04, "RPS Reactor Water Level B21-N080A (B, C, D) Channel Calibration"

RPS REACTOR WATER LEVEL B21-N080A(B,C,D) CHANNEL CALIBRATION

SCOPE OF REVISION:

- Dispositioned PAC 0022-94, PAC 0205-94, PAC 0129-95, PDR 97-0250.
- Added discussion step concerning partial performance of procedure.
- Simplified prerequisite for ATM Trip status associated with RHR Cut-In Permissive function.
- Changed step that input ATM reset value to more directive statement.
- Added step to transfer ATM As Found data to As Left column when ATM data is within tolerance but loop data is not.
- Added detailed steps for performance of channel checks.
- Added restoration steps to verify proper computer point and annunciator indications.
- Made editorial changes; Deleted discussion, definition, and limitation steps that were duplicates of upper tier procedures. Added definitions specific to NSPS panel. Updated impact matrix format. Simplified steps. Combined steps which verified like indications between divisions. Reworded FW hydraulic impact step for clarity. Updated position titles. Updated references. Updated procedure to current written standard.
- Revision marks not used.

❶ Changed class code from SNNN to SNND per GL 96-01 evaluation and NSED request. [H. Reed-01/12/99]
❶ Incorporated PAC 0046-99 and PDRs 00-0012 and 00-0078.
❷ Change verification designators and/or definitions to align with AD-AA-104-103.
❸ Incorporated setpoint calculation IP-C-0058, R/0 as required by ATI # 76850-01. Revised Test Equipment requirements. Added calculation to references. Incorporated CCF 2001-0098. Editorial changes to align with the Writer's Guide. [Sites]
❹ Corrected typographical errors. [Reiersen]
❺ Corrected step reference errors. [Overleese]
❻ Revised to reflect correct accuracy from NSED of +/- 0.03 inwc for the test gauge per calculation IP-C-0058.

CONTINUOUS USE

ORIGINATOR: *Ken Schaub* **CLASS CODE:** *SNND*

ITR: *N/A* **APPROVAL DATE:** *SEP 17 1997*

CURRENT CHANGES TO GENERAL REVISION

	Change #	Date	List of Affected Pages
❶	34a	03/01/00	1, 7, 10, 27, 29
❷	34b	05/09/01	1
❸	34c	11/29/01	1, 11, 19, 20, 21, 29, 32
❹	34d	04/17/02	1, 11, 18
❺	34e	11/18/03	1, 27
❻	34f	11/05/04	1,11

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1.0 PURPOSE

1.1 To perform Channel Calibration of Reactor Water Level Channel B21-N080A(B,C,D) which fully satisfies:

- ITS SR 3.3.1.1.13 T4, T5
- ITS SR 3.3.6.1.5 T5.b, T5.c

1.2 To perform Logic System Functional Test of Reactor Water Level Channel B21-N080A(B,C,D) which partially satisfies:

- ITS SR 3.3.1.1.15 T4, T5
- ITS SR 3.3.6.1.6 T5.b, T5.c

2.0 DISCUSSION/DEFINITIONS

2.1 Discussion

2.1.1 Frequency: *«LBD-1, LBD-2, LBD-3, LBD-4»*

- Normal Frequency; 18 months
- Other Triggers - None

2.1.2 Satisfactory completion of procedure satisfies requirements of CPS 9030.01C011 for channel tested.

2.1.3 Components in loops are:

Division 1		
Transmitter	B21-N080A	H22-P004/Cnmt-73-755
ATM	B21-N680A	H13-P661-D-A11-A113
Annunciator	5004-1B	H13-P680-05A
Annunciator	5004-3A	H13-P680-05A
Computer Point	B21NC005	
Computer Point	B21NC051	
Division 2		
Transmitter	B21-N080B	H22-P027/Cnmt-260-755
ATM	B21-N680B	H13-P662-B-A11-A113
Annunciator	5005-1B	H13-P680-06A
Annunciator	5005-3A	H13-P680-06A
Computer Point	B21NC006	
Computer Point	B21NC052	
Division 3		
Transmitter	B21-N080C	H22-P005/Cnmt-148-755
ATM	B21-N680C	H13-P663-C-A11-A113
Annunciator	5005-1B	H13-P680-06A
Annunciator	5005-3A	H13-P680-06A
Computer Point	B21NC007	
Computer Point	B21NC053	
Division 4		
Transmitter	B21-N080D	H22-P026/Cnmt-288-755
ATM	B21-N680D	H13-P664-B-A11-A113
Annunciator	5004-1B	H13-P680-05A
Annunciator	5004-3A	H13-P680-05A
Computer Point	B21NC008	
Computer Point	B21NC054	

2.1.4 ATM B21-N680A(B,C,D) provides two trip outputs.

a) Trip #1 provides low reactor water level 3 trip which;
- In conjunction with another level 3 trip , causes a scram.
- In conjunction with another level 3 trip , a high drywell pressure trip, or a high reactor pressure trip, causes an RHR isolation.

b) Trip #2 provides high reactor water level 8 trip which;
- In conjunction with another level 8 trip, causes a scram if Mode switch in Run position.

2.1.5 Prior to restoring ATM to service after use in calibrate mode, final calibration current is set to value of 20 %FS. This value prevents majority of single channel trip action ATMs from outputting trip signal if inadvertently selected during future testing.

2.1.6 Test pressure values for loop and transmitter are design values with instrument corrections applied. If liquid used as test medium, these values will not take into account test equipment induced head corrections.

2.1.7 Performance of individual instrument calibrations is conditional upon restoring channel to loop tolerances.

2.1.8 This procedure supports individual performance of following tasks.
- functional testing
- loop and/or instrument calibration(s)
- taking As Found and/or As Left data

2.2 Definitions

2.2.1 ATM: Analog Trip Module.

2.2.2 ATS: Analog Trip System.

2.2.3 CSD: Card Select Decoder.

2.2.4 DAC: Display and Control.

3.0 RESPONSIBILITY

Maintenance Department Head shall be responsible for implementation and review of procedure.

4.0 PRECAUTIONS

Observe appropriate radiological precautions.

5.0 **PREREQUISITES**

5.1 Circle channel under test: 80A 80B 80C 80D

5.2 **IF** testing involves transmitter (e.g., loop or transmitter calibration), **THEN** verify sensor tag number on transmitter matches number listed on data sheet. _____

5.3 M&TE used for quantitative data shall have current calibration due date.

5.4 In conjunction with Shift Management, review the following impact statements and referenced Operability Impacts to determine required plant status to perform this test:. *«CM-3»*

OPERABILITY IMPACT

ITS LCO 3.3.1.1 RPS Instrumentation, Table 3.3.1.1-1, items:

4. Reactor Vessel Water Level-Low, Level 3
5. Reactor Vessel Water Level-High, Level 8

ITS LCO 3.3.6.1 Primary Containment and Drywell Isolation Instrumentation, Table 3.3.6.1-1, items:

5. RHR System Isolation
   b. Reactor Vessel Water Level-Low, Level 3
   c. Reactor Vessel Water Level-Low, Level 3

ORM OR 2.2.14 NSPS Self Test System

SYSTEMS AFFECTED

Reactor Protection System (RPS)
Nuclear Steam Supply Shutoff System (NS4)
Residual Heat Removal (RH)

A gross failure signal is generated when ATM is placed in calibrate mode or transmitter leads are disconnected. This gross failure signal causes STS to stop its automatic testing mode.

Annunciators

- DIV 1 OR 4 RX VESSEL LO LVL TRIP [5004-1B]
- DIV 1 OR 4 RX HI WTR LEVEL 8 [5004-3A]
- STS FAILURE [5004-3H]
- DIV 2 OR 3 RX VESSEL LO LVL TRIP [5005-1B]
- DIV 2 OR 3 RX HI WTR LEVEL 8 [5005-3A]
- DIV 2 NS4 (INBOARD) SYSTEM OUT OF SERVICE [5066-8E]
- DIV 1 NS4 (OUTBOARD) SYSTEM OUT OF SERVICE [5067-8E]

Computer Points

- B21NC005, Vessel Low-Wtr Lvl Ch A
- B21NC006, Vessel Low-Wtr Lvl Ch B
- B21NC007, Vessel Low-Wtr Lvl Ch C
- B21NC008, Vessel Low-Wtr Lvl Ch D
- B21NC051, Vessel Hi-Wtr Lvl Ch A
- B21NC052, Vessel Hi-Wtr Lvl Ch B
- B21NC053, Vessel Hi-Wtr Lvl Ch C
- B21NC054, Vessel Hi-Wtr Lvl Ch D

HYDRAULIC IMPACT

☞ Applicable when returning transmitter to service.

Possible impact on FW transmitter C34-N004A(B,C).

- Could cause FW Control System to respond to momentary sensed level change (if testing channel A or B). FW reactor level channel selector switch positioned to prevent FW from responding.
- Could cause high level signal to Feedwater/Main Turbine trip logic (if testing channel A, B, or C). Coincident logic verified not tripped to prevent actuation.

Annunciators

- RX HI WTR LVL TRIP [5002-1Q]
- WTR LVL SIG FAILURE [5002-2P]
- RX WTR LVL HI-LO [5002-2Q]

RPS TRIP

Reactor Scram

- Prevented by verifying coincident logic not tripped.

CRVICS ISOLATION

Channel B21-N080A(B,C,D) provides following isolation signals. Actuation is prevented by verifying coincident logic not tripped.

- Group 2; RHR To Upper Pools
- Group 3; RHR S/D Cooling
- Group 20; Miscellaneous Conditions Moving Misc Vlvs

COINCIDENT CHANNELS THAT PREVENT ACTUATION

B21-N080A; B21-N078D (Rx Prs)
B21-N080B,C,D (Rx Lvl)
C34-N004B,C (Rx Lvl)
C71-N050D (DW Prs)

B21-N080B; B21-N078C (Rx Prs)
B21-N080A,C,D (Rx Lvl)
C34-N004A,C (Rx Lvl)
C71-N050C (DW Prs)

B21-N080C; B21-N078B (Rx Prs)
B21-N080A,B,D (Rx Lvl)
C34-N004A,B (Rx Lvl)
C71-N050B (DW Prs)

B21-N080D; B21-N078A (Rx Prs)
B21-N080A,B,C (Rx Lvl)
C71-N050A (DW Prs)

_____ / _____
Performer SMngt

CONDITIONS REQUIRED TO CONDUCT TEST

Test may be performed in any Mode of plant operation.

CAUTION

Performance of this procedure for Channels A(D) will remove the Reactor Vessel Water Level 3 Isolation capability for valves E12-F023, E12-F037A and E12-F053A as described in ITS 3.3.6.1 T5.b & c.

Performance of this procedure for Channels B(C) will remove the Reactor Vessel Water Level 3 Isolation capability for valves E12-F037B and E12-F053B as described in ITS 3.3.6.1 T5.b & c.

5.5 Verify DAC terminals not in use on H13-P661, H13-P662, H13-P663, and H13-P664. _____

5.6 Verify TRIP #1 LED not lit on following ATMs for channel under test.

☞ Requires DAC to be energized.

B21-N080A

a) B21-N680B, H13-P662-B-A11-A113 IV ___/___

b) B21-N680C, H13-P663-C-A11-A113 IV ___/___

c) C71-N650D, H13-P664-B-A11-A105 IV ___/___

d) B21-N680D, H13-P664-B-A11-A113 IV ___/___

OR

B21-N080B

a) B21-N680A, H13-P661-D-A11-A113 IV ___/___

b) C71-N650C, H13-P663-C-A11-A105 IV ___/___

c) B21-N680C, H13-P663-C-A11-A113 IV ___/___

d) B21-N680D, H13-P664-B-A11-A113 IV ___/___

OR

B21-N080C

a) B21-N680A, H13-P661-D-A11-A113 IV ___/___

b) C71-N650B, H13-P662-B-A11-A105 IV ___/___

c) B21-N680B, H13-P662-B-A11-A113 IV ___/___

d) B21-N680D, H13-P664-B-A11-A113 IV ___/___

OR

B21-N080D

a) C71-N650A, H13-P661-D-A11-A105 IV ___/___

b) B21-N680A, H13-P661-D-A11-A113 IV ___/___

c) B21-N680B, H13-P662-B-A11-A113 IV ___/___

d) B21-N680C, H13-P663-C-A11-A113 IV ___/___

5.7 **IF** testing B21-N080A(D); Observe status of following valves. [5064]

- 1E12-F008, Shutdown Cooling Outbd Suct Isol Vlv
- 1E12-F023, RHR B Supp To Rx Head Spray Valve
- 1E12-F053A, RHR A To Feedwater S/D Cooling Rtrn Vlv

a) **IF** each valve is shut or cannot actuate in shut direction, **THEN** proceed to step 5.9.

b) **IF** any valve is open and can actuate in shut direction, **THEN** verify TRIP #1 LED not lit on following ATM for channel under test.

☞ Requires DAC to be energized.

B21-N080A

B21-N679D, H13-P664-B-A12-A107 IV ___/___

OR

B21-N080D

B21-N679A, H13-P661-D-A12-A107 IV ___/___

INITIAL

5.8 **IF** testing B21-N080B(C); Observe position of following valves. [5065]

- 1E12-F009, Shutdown Cooling Inbd Suct Isol Vlv
- 1E12-F053B, RHR B To Feedwater S/D Cooling Rtrn Vlv

a) **IF** each valve is shut or cannot actuate in shut direction, **THEN** proceed to step 5.9.

b) **IF** any valve is open and can actuate in shut direction, **THEN** verify TRIP #1 LED not lit on following ATM for channel under test.

☞ Requires DAC to be energized.

B21-N080B

B21-N679C, H13-P663-C-A12-A107 **IV** ___/___

OR

B21-N080C

B21-N679B, H13-P662-B-A12-A107 **IV** ___/___

5.9 **IF** Reactor System Mode Switch [H13-P680] in RUN, **THEN** verify TRIP #2 LED not lit on following ATMs.

☞ Requires DAC to be energized.

☞ TRIP LED associated with division under test may be lit and marked N/A.

a) B21-N680A, H13-P661-D-A11-A113 **IV** ___/___

b) B21-N680B, H13-P662-B-A11-A113 **IV** ___/___

c) B21-N680C, H13-P663-C-A11-A113 **IV** ___/___

d) B21-N680D, H13-P664-B-A11-A113 **IV** ___/___

5.10 Obtain Shift Management permission to perform test.

_____/_____ _____

Date Time SMngt

NOTE

It is not the intent of step 5.11 that the RX WATER LEVEL CHANNEL A or B switch in the position listed for the entire procedure performance. Plant conditions may warrant re-positioning of switch. System Restoration section will reverify proper switch position prior to possible hydraulic impact.

5.11 **IF** testing B21-N080A(B), **THEN** place RX WATER LEVEL CHANNEL A OR B switch [5002] in position indicated (hydraulic impact). «CM-3»

B21-N080A; B LEVEL
B21-N080B; A LEVEL

RO

5.12 Notify CRS/RO leads may be lifted.

5.13 Operations: To maintain Primary Containment Isolation capability, the valves listed below are required to be closed. Coordinate with Shift Management and CLOSE the following valves in accordance with CPS 3312.01, Residual Heat Removal.

Testing Channels A or D:	A			D
1E12-F023, RHR B Supp To Rx Head Spray Valve	___ OPS	N/A	N/A	___ OPS
1E12-F037A, RHR A To CNMT Pool Cooling Shutoff Valve	___ OPS	N/A	N/A	___ OPS
1E12-F053A, RHR A To Feedwater S/D Cooling Return Valve	___ OPS	N/A	N/A	___ OPS

Testing Channels B or C:		B	C	
1E12-F037B, RHR B to CNMT Pool Cooling Shutoff Valve	N/A	___ OPS	___ OPS	N/A
1E12-F053B, RHR B To Feedwater S/D Cooling Return Valve	N/A	___ OPS	___ OPS	N/A

5.14 Communications should be established for loop and transmitter calibrations. Suggested phone jack:

- B21-N080A; G10 [H22-P004]
- B21-N080B; F9 [H22-P027]
- B21-N080C; G7 [H22-P005]
- B21-N080D; F7 [H22-P026]

6.0 LIMITATIONS

If Scram or CRVICS Isolation occurs, then procedure shall be halted. Contact Operations prior to restoring channel or recommencing test.

7.0 MATERIALS/TEST EQUIPMENT

❻ Following is test equipment required for procedure.

❻ NOTE

Accuracy specified for M&TE is required per calculation IP-C-0058. A test gauge of the same model, but a lower range may be substituted. Do not substitute other M&TE without permission of NSED. Do no revise required M&TE without permission of NSED.

❸❻ 7.1 Test Gauge (potentially contaminated system)
Range: 0 to 100 inwc
Accuracy: ± 0.03 inwc
Type: Digital Heise HQS-2
(Post calibration required)

❸❻ 7.2 Digital Voltmeter (DVM)
Range: Range appropriate to measure 1 to 5 vdc
Accuracy: ± 0.002 vdc
Type: Fluke 45 (slow resolution)

7.3 250 Ohm Precision Resistor
Accuracy: ± 0.02 ohms

❹ 7.4 Pressure Source - capable of supplying 100 inwc

7.5 DC Power Supply - capable of supplying 24 vdc

7.6 CPS 8801.04, Rosemount Series 1153 Pressure Transmitter Maintenance

7.7 CPS 8801.06, H22 Panel Mounted Instrument Valve Operation and Venting

8.0 **PROCEDURE**

8.1 **Functional Test**

8.1.1 Verify following status lights not lit.

a) RPS D1(2,3,4) ATM IN CAL OR GR FAIL [5004(5005)]

b) NS4 D1(2,3,4) ATM CAL OR GR FAIL [5067(5066)]

NOTE

ATS in calibrate mode functions only in same safety division panel as desired ATM.

Responses shown in boxes are as displayed by DAC. "X" used to identify characters which are variable.

8.1.2 On Div 1(2,3,4) NSPS panel, press ON/OFF key.

DIVISION 66X

8.1.3 Press CAL MODE key.

PLEASE WAIT

Message momentarily displayed while ATS accessing STS.

COMMUNICATIONS FAILURE WITH STS TRY AGAIN?

If message displayed, press YES/ENTER key. If message does not clear, consult Supervision.

CALIBRATE

Message momentarily displayed while ATS setting up for Calibrate mode.

DIVISION: 66X	SYSTEM: RPS?

Correct ATS response to CAL MODE.

8.1.4 Press SYST key until RPS displayed.

8.1.5 Press CHNL key until B21-N680A(B,C,D) displayed.

DIV: 66X	SYS: RPS	CH: B21-N680X

8.1.6 Press YES/ENTER key.

DO YOU WANT TO MANUALLY SET CURRENT?

8.1.7 Verify ATM MON and CAL LEDs lit. _____

8.1.8 Verify following status lights lit.

a) RPS D1(2,3,4) ATM IN CAL OR GR FAIL [5004(5005)] _____

b) NS4 D1(2,3,4) ATM CAL OR GR FAIL [5067(5066)]

_____

8.1.9 Press YES/ENTER key.

PLEASE SELECT DESIRED MODE: %FS OR ENG. UNITS

8.1.10 Press UNITS key.

ACKNOWLEDGED ENG. UNITS

Momentary response to previous entry.

B21-N680X XXXX IN WATER *ENTER DATA

NOTE

Value displayed as "IN: XXXX" indicates input current applied to ATM by CSD in engineering units.

Value displayed as "OUT: XXXX" indicates voltage at ATM analog output in engineering units.

8.1.11 Use DAC keypad to enter value (30) to reset ATM TRIP #1 and TRIP #2, press YES/ENTER key to accept value.

B21-N680X	IN: 30.00	IN WATER
NEW IN?	OUT: XX.XX	

8.1.12 Verify following computer points indicate RESET.

a) B21NC005(06,07,08) _____

b) B21NC051(52,53,54) _____

INITIAL

8.1.13 Verify following annunciators reset.

a) DIV 1 OR 4 (2 OR 3) RX VESSEL LO LVL TRIP [5004-1B(5005-1B)] _____

b) DIV 1 OR 4 (2 OR 3) RX HI WTR LEVEL 8 [5004-3A(5005-3A)] _____

☞ If actual Rx Lvl 8 condition present, annunciator will be in due to coincident logic and step may be marked N/A.

8.1.14 Use DAC keypad to enter value (8.3) to cause ATM TRIP #1, press YES/ENTER key to accept value.

8.1.15 Verify ATM TRIP #1 LED lit. *«LBD-1, LBD-3»* _____

8.1.16 Verify computer point B21NC005(06,07,08) indicates TRIPPED. _____

8.1.17 Verify annunciator DIV 1 OR 4 (2 OR 3) RX VESSEL LO LVL TRIP [5004-1B(5005-1B)] in alarm. _____

8.1.18 Use DAC keypad to enter value (52.6) to cause ATM TRIP #2, press YES/ENTER key to accept value.

8.1.19 Verify ATM TRIP #2 LED lit. *«LBD-1»* _____

8.1.20 Verify computer point B21NC051(52,53,54) indicates TRIPPED. _____

8.1.21 Verify annunciator DIV 1 OR 4 (2 OR 3) RX HI WTR LEVEL 8 [5004-3A(5005-3A)] in alarm. _____

8.1.22 Press %FS key.

B21-N680X	IN: XX.XX %FS	IN WATER
NEW IN?	OUT: XX.XX %FS	

8.1.23 (Record) Use DAC keypad to enter nominal 1, 25, 50, 75, and 99 %FS. Record DAC input and output values in AS FOUND column of data sheet.

8.1.24 Press NO key.

DO YOU WANT TO VERIFY THE
TRIP POINT SETTINGS?

8.1.25 Press YES/ENTER key.

PLEASE SELECT DESIRED MODE:
%FS OR ENG. UNITS

8.1.26 Press UNITS key.

TR 1: XXXX	2. XXXX	3. NO
RS: XXXX	XXXX	TRIP

Trip status LEDs cycle on and off until trip points checked.

8.1.27 **IF** automatic trip setpoint check feature not functioning properly, **THEN** perform following. **OTHERWISE**, proceed to step 8.1.28.

1. Press NO key until following displayed.

DO YOU WANT TO MANUALLY SET CURRENT?

2. Press YES/ENTER key followed by UNITS key.

3. Manually input values to obtain trip and reset point settings.

   a) Input nominal value close to trip/reset point without actuating it. Press YES/ENTER key to accept value.

   b) Input least significant digit value. Press CUR ⇑ or CUR ⇓ key to accept value.

   c) Use CUR ⇑ or CUR ⇓ key to step nominal value towards trip/reset point.

   d) Use TRIP LED status light to mark trip/reset point (LED on is trip, LED off is reset).

   e) Repeat a through d, as needed, until all trip/reset points checked.

8.1.28 (Record) Record Trip (TR) and Reset (RS) values in AS FOUND column of data sheet (sections A&B). *«LBD-1, LBD-3»*

8.1.29 Press NO key until following displayed.

DO YOU WANT TO VERIFY THE GROSS FAIL SETTINGS?

8.1.30 Press YES/ENTER key.

GF:	HIGH XX.XX mA	LOW XX.XX mA
HYST:	XX.XX mA	XX.XX mA

Correct ATS response to Gross Fail check.

INITIAL

8.1.31 Verify proper gross fail response on DAC display (values received for gross fail settings and no error messages received). *«LBD-1, LBD-3»* _____

8.1.32 (Record) Record GF HIGH, HYST HIGH, GF LOW, and HYST LOW values in AS FOUND column of data sheet.

8.1.33 Press NO key until following displayed.

DO YOU WANT TO MANUALLY SET CURRENT?

8.1.34 Press YES/ENTER key followed by %FS key.

8.1.35 Use DAC keypad to enter 20 %FS.

8.1.36 Press YES/ENTER key.

B21-N680X	IN: 20.00 %FS	IN WATER
NEW IN?	OUT: XX.XX %FS	

8.1.37 Press NO key until following displayed.

DO YOU WANT TO SELECT NEW MODULES?

8.1.38 Press YES/ENTER key.

DIVISION: 66X	SYSTEM: RPS?

8.1.39 Verify ATM MON and CAL LEDs not lit. _____

8.1.40 Verify following status lights lit.

a) RPS D1(2,3,4) ATM IN CAL OR GR FAIL [5004(5005)] _____

b) NS4 D1(2,3,4) ATM CAL OR GR FAIL [5067(5066)]

_____

8.1.41 Press ON/OFF key.

ARE YOU FINISHED WITH THE CALIBRATE MODE?

NOTE

Following responses occur within matter of few seconds, then display goes blank. If flashing "CONFIRMED" message not displayed, ATS has not received acknowledgment of transfer of control.

8.1.42 Press YES/ENTER key.

RETURNING CONTROL
TO THE SELF TEST SYSTEM

Primary response.

TRANSFER OF CONTROL

Secondary response.

TRANSFER OF CONTROL
CONFIRMED

Final response. If message fails to occur, inform Supervision.

8.1.43 Verify following status lights not lit.

a) RPS D1(2,3,4) ATM IN CAL OR GR FAIL [5004(5005)]

b) NS4 D1(2,3,4) ATM CAL OR GR FAIL [5067(5066)]

8.2 **Loop Calibration**

WARNING

Fluid in transmitter/piping potentially contaminated and under pressure.

8.2.1 Isolate and bleed pressure from transmitter B21-N080A(B,C,D) IAW CPS 8801.06.

8.2.2 Install and vent test equipment IAW CPS 8801.06.

8.2.3 Align to apply test pressure to low pressure side of transmitter IAW CPS 8801.06.

8.2.4 On Div 1(2,3,4) NSPS panel, press ON/OFF key followed by MON key.

8.2.5 Press SYST key until RPS displayed, then press CHNL key until B21-N680A(B,C,D) displayed.

8.2.6 Press YES/ENTER key followed by UNITS key. MON LED on ATM should be flashing.

NOTE

To monitor for response time degradation requires close coordination between transmitter and ATM. Technicians should review following steps prior to performance. Any sluggish response shall be brought to attention of Maintenance Supervision for appropriate evaluation. Response ≥ 5 seconds shall be considered unacceptable.

8.2.7 Check transmitter and ATM for response time degradation as follows. *«CM-4»*

❹

a) Adjust test pressure to ≈ 29 inwc. DAC display reading for ATM should be ≈ 60 IN WATER.

b) Close Lo Side Vent Test Valve.

c) Adjust test pressure to ≈ 73 inwc.

d) With direct communication between transmitter and ATM, quickly open Lo Side Vent Test Valve.

e) Verify DAC display reading for ATM rapidly changes to ≈ 0 IN WATER. (Time to respond shall not be ≥ 5 seconds.)

8.2.8 Check for lowering pressure and visible leakage at transmitter.

8.2.9 Monitor TRIP #1 LED on ATM. Adjust test pressure until LED not lit.

8.2.10 (Record) Slowly raise test pressure until TRIP #1 LED lit. Record test pressure in AS FOUND column of data sheet (sections A&B). *«LBD-1, LBD-2, LBD-3, LBD-4»*

8.2.11 (Record) Slowly lower test pressure until TRIP #1 LED not lit. Record test pressure in AS FOUND column of data sheet.

8.2.12 Monitor TRIP #2 LED on ATM. Adjust test pressure until LED not lit.

8.2.13 (Record) Slowly lower test pressure until TRIP #2 LED lit. Record test pressure in AS FOUND column of data sheet (sections A&B). *«LBD-1, LBD-2»*

8.2.14 (Record) Slowly raise test pressure until TRIP #2 LED not lit. Record test pressure in AS FOUND column of data sheet.

8.2.15 (Record) Apply test pressure values listed on data sheet. Record DAC display readings in AS FOUND column of data sheet.

8.2.16 Press ON/OFF key to return ATM to service.

❸ 8.2.17 (Record) If section 8.1 and 8.2 AS FOUND data within specified AS LEFT limits and better readings not desired, transfer AS FOUND data to AS LEFT column and proceed to section 8.7. *«LBD-1, LBD-3»*

8.3 **Transmitter Calibration**

8.3.1 Verify, lift following field leads for channel under test.

B21-N080A; H13-P706A, TM016,
terminal 7(-) (wht) CV ___/___
terminal 8(+) (blk) CV ___/___

OR

B21-N080B; H13-P707B, TM009,
terminal 7(-) (blk) CV ___/___
terminal 8(+) (wht) CV ___/___

OR

B21-N080C; H13-P708B, TM006,
terminal 7(-) (wht) CV ___/___
terminal 8(+) (blk) CV ___/___

OR

B21-N080D; H13-P709B, TM006,
terminal 7(-) (blk) CV ___/___
terminal 8(+) (wht) CV ___/___

8.3.2 Connect DC power supply to lifted **leads** with 250 ohm resistor in series. Observe proper polarity.

8.3.3 Energize power supply and set to ≈ 24 vdc.

8.3.4 Connect DVM (5 vdc) in parallel with resistor.

8.3.5 (Record) Apply test pressure values listed on data sheet. Record DVM readings in AS FOUND column of data sheet.

❸ 8.3.6 (Record) If section 8.3 AS FOUND data within specified AS LEFT limits and better readings not desired, transfer AS FOUND data to AS LEFT column and proceed to step 8.3.9.

8.3.7 (Record) If section 8.3 AS FOUND data not acceptable, adjust ZERO, SPAN, and/or LINEARITY to obtain acceptable values. Record final readings in AS LEFT column.

☞ Transmitter linearity should not be adjusted without consulting Maintenance Supervision.

8.3.8 If transmitter linearity was adjusted, then restore circuit-side cover IAW CPS No. 8801.04.

8.3.9 Remove DVM, resistor, and power supply.

8.3.10 Reconnect following leads, torque terminal screws snug tight.

B21-N080A; H13-P706A, TM016,
terminal 7(-) (wht) IV ___/___
terminal 8(+) (blk) IV ___/___

OR

B21-N080B; H13-P707B, TM009,
terminal 7(-) (blk) IV ___/___
terminal 8(+) (wht) IV ___/___

OR

B21-N080C; H13-P708B, TM006,
terminal 7(-) (wht) IV ___/___
terminal 8(+) (blk) IV ___/___

OR

B21-N080D; H13-P709B, TM006,
terminal 7(-) (blk) IV ___/___
terminal 8(+) (wht) IV ___/___

8.4 ATM Calibration

❸ 8.4.1 (Record) If section 8.1 AS FOUND data within specified AS LEFT limits and better readings not desired, transfer AS FOUND data to AS LEFT column and proceed to section 8.6. *«LBD-1, LBD-3»*

NOTE

The NO key can be used to step ATS to desired section for adjustments. Any adjustment made to ATM has some interaction with other adjustments. This section should be reperformed following any adjustments.

ATM relies on CSD for accurate calibration currents. If CSD out of calibration, an error will be introduced to ATM. This can be determined by comparing ATM and loop five point check data. If amount of error significant, CSD calibration should be checked.

8.4.2 On Div 1(2,3,4) NSPS panel, press ON/OFF key followed by CAL MODE key.

8.4.3 Press SYST key until RPS displayed, then press CHNL key until B21-N680A(B,C,D) displayed.

8.4.4 Press YES/ENTER key.

DO YOU WANT
TO MANUALLY SET CURRENT?

8.4.5 Press YES/ENTER key followed by %FS key.

8.4.6 Use DAC keypad to enter nominal 1 %FS, then press YES/ENTER key.

8.4.7 Adjust AMP ZERO, on ATM front panel, for output reading of input value ± 0.25%.

8.4.8 Use DAC keypad to enter nominal 99 %FS, then press CUR ⇑ key.

8.4.9 Adjust AMP GAIN, on ATM front panel, for output reading of input value ± 0.25%.

8.4.10 Use CUR ⇓ and CUR ⇑ keys to alternate between 1 and 99 %FS, adjust AMP ZERO and GAIN until no further adjustments required.

8.4.11 Check ATM linearity by entering nominal 1, 25, 50, 75, and 99 %FS. Output readings should be within ± 0.25% of input readings.

8.4.12 Repeat steps 8.4.10 and 8.4.11 until no further adjustments required.

8.4.13 **IF** automatic trip setpoint check feature is functioning properly and manual setting of trip/reset values not desired, **THEN** perform following. **OTHERWISE**, proceed to step 8.4.14.

1. Press NO key to step ATS to Trip Point step.

DO YOU WANT TO VERIFY THE TRIP POINT SETTINGS?

2. Press YES/ENTER key followed by UNITS key.

3. If necessary, adjust TRIP SET and/or HYSTR, on ATM front panel. Press YES/ENTER key followed by UNITS key to indicate new Trip Point settings.

4. Repeat step 8.4.13.3 until no further adjustments required.

5. Proceed to step 8.4.15.

8.4.14 **IF** automatic trip setpoint check feature not functioning properly or manual setting of trip/reset values is desired, **THEN** perform following. **OTHERWISE**, proceed to step 8.4.15.

1. Press NO key until following displayed.

DO YOU WANT TO MANUALLY SET CURRENT?

2. Press YES/ENTER key followed by UNITS key.

3. Manually adjust trip and reset point settings.

   a) Input desired trip/reset point (desired point should be in middle of tolerance band). Press YES/ENTER key to accept value.

   b) Adjust TRIP SET or HYSTR (as applicable), on ATM front panel, until proper TRIP LED status observed (LED on is trip, LED off is reset).

   c) Input nominal value close to trip/reset point without actuating it. Press YES/ENTER key to accept value.

   d) Input least significant digit value. Press CUR ⇑ or CUR ⇓ key to accept value.

   e) Use CUR ⇑ or CUR ⇓ key to step nominal value towards trip/reset point.

   f) Use TRIP LED status light to mark trip/reset point (LED on is trip, LED off is reset).

   g) Repeat a through f, as needed, until no further adjustments to trip/reset points required.

8.4.15 Press NO key until following displayed.

DO YOU WANT TO VERIFY THE GROSS FAIL SETTINGS?

8.4.16 Press YES/ENTER key.

8.4.17 If necessary, adjust GROSS FAIL HIGH and/or LOW, on ATM front panel. Press YES/ENTER key to indicate new gross fail settings.

☞ Gross fail hysteresis is not adjustable.

8.4.18 Repeat step 8.4.17 until no further adjustments required.

8.4.19 Press NO key.

DO YOU WANT TO
SELECT NEW MODULES?

8.4.20 Press NO key to step ATS to Manual Set Current step, then repeat steps 8.4.5 through 8.4.20 until readings within specified limits. When readings acceptable, proceed to section 8.5.

8.5 **ATM As Left Calibration Check**

8.5.1 Press NO key to step ATS to Manual Set Current step, then press YES/ENTER key.

8.5.2 (Record) Select %FS, then use DAC keypad to enter nominal 1, 25, 50, 75, and 99 %FS. Record DAC input and output values in AS LEFT column of data sheet.

8.5.3 Press NO key to step ATS to Trip Point step.

8.5.4 Press YES/ENTER key followed by UNITS key.

8.5.5 **IF** automatic trip setpoint check feature not functioning properly, **THEN** perform following. **OTHERWISE**, proceed to step 8.5.6.

8.5.5.1 Press NO key until following displayed.

DO YOU WANT
TO MANUALLY SET CURRENT?

8.5.5.2 Press YES/ENTER key followed by UNITS key.

8.5.5.3 Manually input values to obtain trip and reset point settings.

a) Input nominal value close to trip/reset point without actuating it. Press YES/ENTER key to accept value.

b) Input least significant digit value. Press CUR ⇑ or CUR ⇓ key to accept value.

c) Use CUR ⇑ or CUR ⇓ key to step nominal value towards trip/reset point.

8.5.5.3 (cont'd)

d) Use TRIP LED status light to mark trip/reset point (LED on is trip, LED off is reset).

e) Repeat a through d, as needed, until all trip/reset points checked.

8.5.6 (Record) Record Trip (TR) and Reset (RS) values in AS LEFT column of data sheet (sections A&B). *«LBD-1, LBD-3»*

8.5.7 Press NO key as needed to step ATS to Gross Fail step.

8.5.8 (Record) Press YES/ENTER key. Record GF HIGH, HYST HIGH, GF LOW, and HYST LOW values in AS LEFT column of data sheet.

8.5.9 Press NO key until following displayed.

DO YOU WANT TO MANUALLY SET CURRENT?

8.5.10 Press YES/ENTER key followed by %FS key.

8.5.11 Use DAC keypad to enter 20 %FS.

8.5.12 Press YES/ENTER key.

B21-N680X	IN: 20.00 %FS	IN WATER
NEW IN?	OUT: XX.XX %FS	

8.5.13 Press ON/OFF key followed by YES/ENTER key to return ATM to service.

8.6 **Post Adjustment Loop Calibration**

8.6.1 On Div 1(2,3,4) NSPS panel, press ON/OFF key followed by MON key.

8.6.2 Press SYST key until RPS displayed, then press CHNL key until B21-N680A(B,C,D) displayed.

8.6.3 Press YES/ENTER key followed by UNITS key. MON LED on ATM should be flashing.

8.6.4 Monitor TRIP #1 LED on ATM. Adjust test pressure until LED not lit.

8.6.5 (Record) Slowly raise test pressure until TRIP #1 LED lit. Record test pressure in AS LEFT column of data sheet (sections A&B). *«LBD-1, LBD-2, LBD-3, LBD-4»*

8.6.6 (Record) Slowly lower test pressure until TRIP #1 LED not lit. Record test pressure in AS LEFT column of data sheet.

8.6.7 Monitor TRIP #2 LED on ATM. Adjust test pressure until LED not lit.

8.6.8 (Record) Slowly lower test pressure until TRIP #2 LED lit. Record test pressure in AS LEFT column of data sheet (sections A&B). *«LBD-1, LBD-2»*

8.6.9 (Record) Slowly raise test pressure until TRIP #2 LED not lit. Record test pressure in AS LEFT column of data sheet.

8.6.10 (Record) Apply test pressure values listed on data sheet. Record DAC display readings in AS LEFT column of data sheet.

8.6.11 Press ON/OFF key to return ATM to service.

8.7 **System Restoration**

8.7.1 Perform following (hydraulic impact). *«CM-3»*

❺ a) **IF** Reactor Water Level 8 condition is present, **THEN** proceed to step 8.7.3.

❺ b) **IF** testing channel B21-N080D, **THEN** proceed to step 8.7.3.

c) **OTHERWISE**, verify following status lights not lit [5002].

☞ Status light associated with division under test may be lit and marked N/A.

- RX HIGH WATER LEVEL TRIP A **IV** ___/___
- RX HIGH WATER LEVEL TRIP B **IV** ___/___
- RX HIGH WATER LEVEL TRIP C **IV** ___/___

❶ 8.7.2 **IF** testing B21-N080A(B), **THEN** Notify Shift Management that restoration of transmitter in following step may result in hydraulic impact. **IF** testing B21-N080A(B), **THEN** verify/place RX WATER LEVEL CHANNEL A OR B switch [5002] in position indicated (hydraulic impact).

B21-N080A; B LEVEL
B21-N080B; A LEVEL

_____
OPS

8.7.3 Remove test pressure and return transmitter to service IAW CPS 8801.06.

c 8.7.4 Momentarily depress RX HIGH WATER LEVEL TRIP A(B,C) reset switch [5002] to reset high level trip seal-in, if needed. *«CM-3»*

_____
OPS

INITIAL

8.7.5 Operations; Use Monitor Compare or Monitor mode to perform channel check.

a) To enter Monitor Compare Mode:

- Press ON/OFF key.
- Press COMP key.
- Press DIV key until desired division displayed.

OR

To enter Monitor Mode:

- Press ON/OFF key.
- Press MON key.

b) Press SYST key until RPS displayed.

c) Press CHNL key until B21-N680A(B,C,D) displayed.

d) Press UNITS key.

e) Press YES/ENTER key.

f) Verify Rx Lvl ATM is operating properly. Use sister channels if available. Otherwise, use other indications or status derived from independent instrument channels measuring same parameter. _____ OPS

g) To exit Monitor Compare Mode and return ATM to service:

- Press ON/OFF key.
- Press YES/ENTER key.

OR

To exit Monitor Mode and return ATM to service:

- Press ON/OFF key.

8.7.6 Notify CRS/RO leads restored, if applicable. _____

8.7.7 Verify following annunciators.

a) DIV 1 OR 4 (2 OR 3) RX VESSEL LO LVL TRIP [5004-1B(5005-1B)] reset _____

b) DIV 1 OR 4 (2 OR 3) RX HI WTR LEVEL 8 [5004-3A(5005-3A)] reflects current plant conditions _____

8.7.8 Verify following computer points.

a) B21NC005(06,07,08) indicates RESET _____

b) B21NC051(52,53,54) reflects current plant conditions _____

INITIAL

8.7.9 **IF** testing B21-N080A(B), **THEN** place RX WATER LEVEL CHANNEL A OR B switch [5002] in position directed by SMngt. *«CM-3»*

OPS

❶ 8.7.10 Operations: Coordinate with Shift Management and restore the following valves as desired in accordance with CPS 3312.01. Circle As Left Position

Testing Channels A or D:	A	B	C	D
1E12-F023, RHR B Supp To Rx Head Spray Valve Open/Closed	OPS	N/A	N/A	OPS
1E12-F037A, RHR A To CNMT Pool Cooling Shutoff Valve Open/Closed	OPS	N/A	N/A	OPS
1E12-F053A, RHR A To Feedwater S/D Cooling Return Valve Open/Closed	OPS	N/A	N/A	OPS

Testing Channels B or C:

❸ 1E12-F037B, RHR B To CNMT Pool Cooling Shutoff Valve Open/Closed	N/A	OPS	OPS	N/A
❸ 1E12-F053B, RHR B To Feedwater S/D Cooling Return Valve Open/Closed	N/A	OPS	OPS	N/A

8.7.10 List test equipment used for quantitative data on data sheet.

8.7.11 Verify information in procedure, data sheet, and supporting documentation complete. Attach data sheet and supporting documentation to procedure.

8.7.12 Notify Shift Management of procedure completion.

Date / Time

9.0 ACCEPTANCE CRITERIA

9.1 Operability Requirements

Failure to meet Acceptance Criteria given below requires evaluation for impact on Operability Requirements. Refer to Supplemental Review Sheet.

9.1.1 AS LEFT data within Allowable Limits specified in section A of data sheet.

9.1.2 Channel trip function operable as evidenced by ATM TRIP LEDs lit (8.1.15, 8.1.19, 8.2.10, 8.2.13, 8.6.5, 8.6.8).

9.1.3 Channel failure trip function operable as evidenced by proper gross fail response (8.1.31).

9.2 Other Requirements

Failure to meet Acceptance Criteria given below requires notification of Maintenance Supervision.

9.2.1 AS LEFT data within Acceptable Limits specified in section B of data sheet.

9.2.2 All other alarms and indications responded correctly.

10.0 FINAL CONDITIONS

Channel returned to service and channel check performed.

11.0 REFERENCES

11.1 Licensing Basis Documents

11.1.1 LBD-1: ITS SR 3.3.1.1.13 T4, T5

11.1.2 LBD-2: ITS SR 3.3.1.1.15 T4, T5

11.1.3 LBD-3: ITS SR 3.3.6.1.5 T5.b, T5.c

11.1.4 LBD-4: ITS SR 3.3.6.1.6 T5.b, T5.c

11.1.5 ITS LCO 3.3.1.1

11.1.6 ITS LCO 3.3.6.1

11.1.7 ORM OR 2.2.14

11.1.8 ORM Trip Setpoint and Response Time Tables (Table 1, Table 7)

11.1.9 USAR (1.2.2.6.2.5, 7.1.1.2(1), 7.1.1.2(2), 7.1.2.1.7.1, 7.2.1.1.4.2(3), 7.2.1.1.4.4.7, 7.2.1.1.4.5, 7.2.1.1.4.8, 7.2.2.1.2.3.1, 7.3.1.1.2.4.1.1, 7.3.1.1.2.11, 7.3.2.2.2.3.1, 7.7.1.1.3.1.2, 15.3.4)

11.2 **Procedures**

11.2.1 CPS 8801.04, Rosemount Series 1153 Pressure Transmitter Maintenance

11.2.2 CPS 8801.06, H22 Panel Mounted Instrument Valve Operation and Venting

11.2.3 CPS 9030.01C011, RPS: Reactor Water Level B21-N680A(B,C,D) Channel Functional Checklist

11.3 **Design/Vendor/Print/Other**

11.3.1 Design Spec Data Sheet 22A4622AV

11.3.2 EDDL DL851E378AC

11.3.3 S&L Data Sheet LT051

11.3.4 MS-02.00, Maintenance of Equipment Qualification Program Manual (Package EQ-CL021)

11.3.5 E02-1NB99 (206, 222,223, 225, 226, 227, 230, 231, 232, 235)

11.3.6 E02-1RH99 (013)

11.3.7 E02-1RP99 (001A, 005A, 008, 009, 013, 016, 017, 019, 021, 025, 026, 027, 028, 029, 030)

11.3.8 E03-1P661 (671, 673, 678, 680, 686, 700, 701, 703, 705, 752)

11.3.9 E03-1P662 (671, 673, 679, 693, 694, 695, 696, 725)

11.3.10 E03-1P663 (648, 650, 656, 665)

11.3.11 E03-1P664 (644, 646, 652)

11.3.12 E03-1H22-P004 (01)

11.3.13 E03-1H22-P005

11.3.14 E03-1H22-P026

11.3.15 E03-1H22-P027 (01)

11.3.16 E03-1P706A (001)

11.3.17 E03-1P707B (001)

11.3.18 E03-1P708B (001)

11.3.19 E03-1P709B (001)

❸ 11.3.20 IP-C-0058, R/0, "Setpoint Calculation for RPV Level 3 and Level 8 (NR)"

11.4 **References**

11.4.1 CM-1: CR 1-88-09-058, GE SIL 470, NSED Letter Y-94738, CCT 054010

11.4.2 CM-2: CR 1-93-02-027

11.4.3 CM-3: CR 1-94-08-039

11.4.4 CM-4: IP Letter U-602376, LS-94-003, CCT 062071

11.4.5 CR 1-99-04-089

12.0 **APPENDICES** - None

13.0 **DOCUMENTS** *«CM-1, CM-2»*

9431.04D001, RPS Reactor Water Level B21-N080A Channel Calibration Data Sheet

9431.04D002, RPS Reactor Water Level B21-N080B Channel Calibration Data Sheet

9431.04D003, RPS Reactor Water Level B21-N080C Channel Calibration Data Sheet

9431.04D004, RPS Reactor Water Level B21-N080D Channel Calibration Data Sheet

SUPPLEMENTAL REVIEW SHEET

CORRECTIVE ACTION TAKEN

Operability Acceptance Criteria

ITS LCOs: 3.3.1.1 3.3.6.1

As applicable:

Initiated Condition Report _____ (yes/no)

Initiated Maintenance Request (MR) No. _____

Other Acceptance Criteria

As applicable:

Initiated Condition Report _____ (yes/no)

Initiated Maintenance Request (MR) No. _____

COMMENTS/DEFICIENCIES

RPS REACTOR WATER LEVEL B21-N080A CHANNEL CALIBRATION DATA SHEET

SCOPE OF REVISION:

- Dispositioned PDR No. 99-0627.

❶ Incorporated setpoint change IP-C-0058, R/0, as required by ATI #76850-01. Added AS FOUND/AS LEFT tolerances per calculation. [Sites]

❷ Correct typo and minor format changes. [Reiersen]

CONTINUOUS USE

ORIGINATOR: *Ken Schaub* **CLASS CODE:** *SNNN1*

ITR: *N/A* **APPROVAL DATE:** *MAY 04 1999*

CURRENT CHANGES TO GENERAL REVISION

	Change #	Date	List of Affected Pages
❶	35a	11/29/01	1, 2, 3, 4
❷	35b	04/17/02	1, 3, 4
❸			
❹			
❺			

Sensor Tag # 1B21N080A122193

NOTE
Negative input pressure indicates pressure applied to low side of transmitter.

A. Operability Data

STEP	COMPONENT	AS FOUND	ALLOWABLE LIMIT	AS LEFT
⓪❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680A (ATM Cal)	(IN WATER) _____ Initials _____	TRIP #1 ≥ 8.3 IN WATER TRIP #2 ≤ 52.6 IN WATER	(IN WATER) _____ Initials _____
⓪❶ 8.2.10 (8.2.17, 8.6.5)	B21-N680A (Loop Cal)	(INWC) _____ Initials _____	TRIP #1 ≥ -64.90 INWC	(INWC) _____ Initials _____
❶ 8.2.13 (8.2.17, 8.6.8)	B21-N680A (Loop Cal)	(INWC) _____ Initials _____	TRIP #2 ≤ -34.10 INWC	(INWC) _____ Initials _____

B. Other Data

STEP	COMPONENT	AS FOUND Input (%FS)	AS FOUND Output (%FS)	ACCEPTABLE LIMIT	AS LEFT Input (%FS)	AS LEFT Output (%FS)
8.1.23 (8.2.17, 8.4.1, 8.5.2)	B21-N680A (ATM Cal)	_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		Initials _____			Initials _____	

STEP	COMPONENT	AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680A (ATM Cal)	(IN WATER) _____ (8.6 to 9.2) _____ (10.4 to 11.0) _____ (51.7 to 52.3) _____ (49.9 to 50.5) Initials _____	TRIP #1 8.9 IN WATER RESET #1 10.7 IN WATER TRIP #2 52.0 IN WATER RESET #2 50.2 IN WATER	(IN WATER) _____ (8.8 to 9.0) _____ (10.6 to 10.8) _____ (51.9 to 52.1) _____ (50.1 to 50.3) Initials _____
8.1.32 (8.2.17, 8.4.1, 8.5.8)	B21-N680A (ATM Cal)	(mA) _____ _____ _____ _____ Initials _____	GF HIGH 30.5 mA (30.0 to 31.0) HYST HIGH (no spec) GF LOW 2.0 mA (1.0 to 3.0) HYST LOW (no spec)	(mA) _____ _____ _____ _____ Initials _____
❶❷ 8.2.10 (8.2.17, 8.6.5)	B21-N680A (Loop Cal)	(INWC) _____ (-64.86 to -64.10) Initials _____	TRIP #1 -64.48 INWC	(INWC) _____ (-64.62 to -64.34) Initials _____
❶❷ 8.2.11 (8.2.17, 8.6.6)	B21-N680A (Loop Cal)	(INWC) _____ (-63.61 to -62.85) Initials _____	RESET #1 -63.23 INWC	(INWC) _____ (-63.37 to -63.09) Initials _____
❶❷ 8.2.13 (8.2.17, 8.6.8)	B21-N680A (Loop Cal)	(INWC) _____ (-34.89 to -34.13) Initials _____	TRIP #2 -34.51 INWC	(INWC) _____ (-34.65 to -34.37) Initials _____
❶❷ 8.2.14 (8.2.17, 8.6.9)	B21-N680A (Loop Cal)	(INWC) _____ (-36.14 to -35.38) Initials _____	RESET #2 -35.76 INWC	(INWC) _____ (-35.90 to -35.62) Initials _____

STEP	COMPONENT		AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶					
8.2.15 (8.2.17, 8.6.10)	B21-N680A (Loop Cal)	Input (INWC)	(IN WATER)	DAC Display (IN WATER)	(IN WATER)
		-70.67	_____	0.0 (-0.2 to 0.2)	_____
		-60.24	_____	15.0 (14.8 to 15.2)	_____
		-49.81	_____	30.0 (29.8 to 30.2)	_____
		-39.38	_____	45.0 (44.8 to 45.2)	_____
		-28.95	_____	60.0 (59.8 to 60.2)	_____
			Initials _____		Initials _____
❶❷					
8.3.5 (8.3.6, 8.3.7)	B21-N080A (XMTR Cal)	Input (INWC)	(VDC)	DVM (VDC)	(VDC)
		-70.67	_____ (0.970 to 1.030)	1.000	_____ (0.990 to 1.010)
		-60.24	_____ (1.970 to 2.030)	2.000	_____ (1.990 to 2.010)
		-49.81	_____ (2.970 to 3.030)	3.000	_____ (2.990 to 3.010)
		-39.38	_____ (3.970 to 4.030)	4.000	_____ (3.990 to 4.010)
		-28.95	_____ (4.970 to 5.030)	5.000	_____ (4.990 to 5.010)
			Initials _____		Initials _____

COMMENTS/DEFICIENCIES

Zero Shift Correction = 0.00 inwc (-0.001 vdc)

TEST EQUIPMENT

Noun Name / Range Used	EIN	Cal Due Date

REVIEW AND APPROVAL

Surveillance Coordinator: _____
(Signature) (Date)

RPS REACTOR WATER LEVEL B21-N080B CHANNEL CALIBRATION DATA SHEET

SCOPE OF REVISION:

- Dispositioned PDR No. 99-0628.
- ❶ Incorporated setpoint change IP-C-0058, R/0, as required by ATI #76850-01. Added AS FOUND/AS LEFT tolerances per calculation. [Sites]
- ❷ Corrected typo and minor format checks. [Reiersen]

CONTINUOUS USE

ORIGINATOR: *Ken Schaub* CLASS CODE: *SNNN1*

ITR: *N/A* APPROVAL DATE: *MAY 04 1999*

CURRENT CHANGES TO GENERAL REVISION

	Change #	Date	List of Affected Pages
❶	35a	11/29/01	1, 2, 3, 4
❷	35b	04/17/02	1, 3
❸			
❹			
❺			

Sensor Tag # B21N080B060894

NOTE
Negative input pressure indicates pressure applied to low side of transmitter.

A. Operability Data

STEP	COMPONENT	AS FOUND	ALLOWABLE LIMIT	AS LEFT
⓪❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680B (ATM Cal)	(IN WATER) _____ Initials _____	TRIP #1 ≥ 8.3 IN WATER TRIP #2 ≤ 52.6 IN WATER	(IN WATER) _____ Initials _____
⓪❶ 8.2.10 (8.2.17, 8.6.5)	B21-N680B (Loop Cal)	(INWC) _____ Initials _____	TRIP #1 ≥ -65.37 INWC	(INWC) _____ Initials _____
8.2.13 (8.2.17, 8.6.8)	B21-N680B (Loop Cal)	(INWC) _____ Initials _____	TRIP #2 ≤ -34.57 INWC	(INWC) _____ Initials _____

B. Other Data

STEP	COMPONENT	AS FOUND Input (%FS)	AS FOUND Output (%FS)	ACCEPTABLE LIMIT	AS LEFT Input (%FS)	AS LEFT Output (%FS)
8.1.23 (8.2.17, 8.4.1, 8.5.2)	B21-N680B (ATM Cal)	_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		Initials _____			Initials _____	

STEP	COMPONENT	AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶❷ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680B (ATM Cal)	(IN WATER)	TRIP #1	(IN WATER)
		(8.6 to 9.2)	8.9 IN WATER	(8.8 to 9.0)
			RESET #1	
		(10.4 to 11.0)	10.7 IN WATER	(10.6 to 10.8)
			TRIP #2	
		(51.7 to 52.3)	52.0 IN WATER	(51.9 to 52.1)
			RESET #2	
		(49.9 to 50.5)	50.2 IN WATER	(50.1 to 50.3)
		Initials		Initials
8.1.32 (8.2.17, 8.4.1, 8.5.8)	B21-N680B (ATM Cal)	(mA)	GF HIGH	(mA)
			30.5 mA (30.0 to 31.0)	
			HYST HIGH	
			(no spec)	
			GF LOW	
			2.0 mA (1.0 to 3.0)	
			HYST LOW	
			(no spec)	
		Initials		Initials
❶❷ 8.2.10 (8.2.17, 8.6.5)	B21-N680B (Loop Cal)	(INWC)	TRIP #1	(INWC)
		(-65.33 to -64.57)	-64.95 INWC	(-65.09 to -64.81)
		Initials		Initials
❶❷ 8.2.11 (8.2.17, 8.6.6)	B21-N680B (Loop Cal)	(INWC)	RESET #1	(INWC)
		(-64.08 to -63.32)	-63.70 INWC	(-63.84 to -63.56)
		Initials		Initials
❶❷ 8.2.13 (8.2.17, 8.6.8)	B21-N680B (Loop Cal)	(INWC)	TRIP #2	(INWC)
		(-35.36 to -34.60)	-34.98 INWC	(-35.12 to -34.84)
		Initials		Initials
❶❷ 8.2.14 (8.2.17, 8.6.9)	B21-N680B (Loop Cal)	(INWC)	RESET #2	(INWC)
		(-36.61 to -35.85)	-36.23 INWC	(-36.37 to -36.09)
		Initials		Initials

STEP	COMPONENT		AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶ 8.2.15 (8.2.17, 8.6.10)	B21-N680B (Loop Cal)	Input (INWC)	(IN WATER)	DAC Display (IN WATER)	(IN WATER)
		-71.14	_____	0.0 (-0.2 to 0.2)	_____
		-60.71	_____	15.0 (14.8 to 15.2)	_____
		-50.28	_____	30.0 (29.8 to 30.2)	_____
		-39.85	_____	45.0 (44.8 to 45.2)	_____
		-29.42	_____	60.0 (59.8 to 60.2)	_____
			Initials _____		Initials _____
❶ 8.3.5 (8.3.6, 8.3.7)	B21-N080B (XMTR Cal)	Input (INWC)	(VDC)	DVM (VDC)	(VDC)
		-71.14	_____ (0.970 to 1.030)	1.000	_____ (0.990 to 1.010)
		-60.71	_____ (1.970 to 2.030)	2.000	_____ (1.990 to 2.010)
		-50.28	_____ (2.970 to 3.030)	3.000	_____ (2.990 to 3.010)
		-39.85	_____ (3.970 to 4.030)	4.000	_____ (3.990 to 4.010)
		-29.42	_____ (4.970 to 5.030)	5.000	_____ (4.990 to 5.010)
			Initials _____		Initials _____

COMMENTS/DEFICIENCIES

Zero Shift Correction = 0.00 inwc (-0.0045 vdc)

TEST EQUIPMENT

Noun Name / Range Used	EIN	Cal Due Date

REVIEW AND APPROVAL

Surveillance Coordinator: _____
(Signature) (Date)

RPS REACTOR WATER LEVEL B21-N080C CHANNEL CALIBRATION DATA SHEET

SCOPE OF REVISION:

- Dispositioned PDR No. 99-0629.
- ❶ Incorporated setpoint change IP-C-0058, R/0, as required by ATI #76850-01. Added AS FOUND/AS LEFT tolerances per calculation. [Sites]
- ❷ Corrected typo and minor format checks. Corrected setpoints per IC-C-0058. [Reiersen]

CONTINUOUS USE

ORIGINATOR: *Ken Schaub* CLASS CODE: *SNNN1*

ITR: *N/A* APPROVAL DATE: *MAY 04 1999*

CURRENT CHANGES TO GENERAL REVISION

	Change #	Date	List of Affected Pages
❶	35a	11/29/01	1, 2, 3, 4
❷	35b	04/17/02	1, 3, 4
❸			
❹			
❺			

Sensor Tag # 1B21N080C060994

NOTE

Values given in brackets [ ] have not been zero shift corrected. These values are only used following transmitter replacement or sensor replacement/rework. Values in bold lettering are used for normal periodic calibrations.

Negative input pressure indicates pressure applied to low side of transmitter.

A. Operability Data

STEP	COMPONENT	AS FOUND	ALLOWABLE LIMIT	AS LEFT
⓪❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680C (ATM Cal)	(IN WATER) _____	TRIP #1 ≥ 8.3 IN WATER TRIP #2 ≤ 52.6 IN WATER	(IN WATER) _____
		Initials _____		Initials _____
⓪❶ 8.2.10 (8.2.17, 8.6.5)	B21-N680C (Loop Cal)	(INWC) _____	TRIP #1 (INWC) **≥ -67.03** [≥ -67.15]	(INWC) _____
		Initials _____		Initials _____
❶ 8.2.13 (8.2.17, 8.6.8)	B21-N680C (Loop Cal)	(INWC) _____	TRIP #2 (INWC) **≤ -36.22** [≤ -36.34]	(INWC) _____
		Initials _____		Initials _____

B. Other Data

STEP	COMPONENT	AS FOUND Input (%FS)	AS FOUND Output	ACCEPTABLE LIMIT	AS LEFT Input (%FS)	AS LEFT Output
8.1.23 (8.2.17, 8.4.1, 8.5.2)	B21-N680C (ATM Cal)	_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		Initials _____			Initials _____	

STEP	COMPONENT	AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680C (ATM Cal)	(IN WATER)	TRIP #1	(IN WATER)
		(8.6 to 9.2)	8.9 IN WATER	(8.8 to 9.0)
			RESET #1	
		(10.4 to 11.0)	10.7 IN WATER	(10.6 to 10.8)
			TRIP #2	
		(51.7 to 52.3)	52.0 IN WATER	(51.9 to 52.1)
			RESET #2	
		(49.9 to 50.5)	50.2 IN WATER	(50.1 to 50.3)
		Initials		Initials
8.1.32 (8.2.17, 8.4.1, 8.5.8)	B21-N680C (ATM Cal)	(mA)	GF HIGH	(mA)
			30.5 mA (30.0 to 31.0)	
			HYST HIGH	
			(no spec)	
			GF LOW	
			2.0 mA (1.0 to 3.0)	
			HYST LOW	
			(no spec)	
		Initials		Initials
❶❷ 8.2.10 (8.2.17, 8.6.5)	B21-N680C (Loop Cal)	(INWC)	TRIP #1 (INWC)	(INWC)
		(-66.99 to -66.23) [-67.11 to -66.35]	**-66.61** [-66.73]	(-66.75 to -66.47) [-66.87 to -66.59]
		Initials		Initials
❶❷ 8.2.11 (8.2.17, 8.6.6)	B21-N680C (Loop Cal)	(INWC)	RESET #1 (INWC)	(INWC)
		(-65.74 to -64.98) [-65.86 to -65.10]	**-65.36** [-65.48]	(-65.50 to -65.22) [-65.62 to -65.34]
		Initials		Initials

STEP	COMPONENT		AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶❷ 8.2.13 (8.2.17, 8.6.8)	B21-N680C (Loop Cal)		(INWC) _____ (-37.02 to -36.26) [-37.14 to -36.38] Initials _____	TRIP #2 (INWC) **-36.64** [-36.76]	(INWC) _____ (-36.78 to -36.50) [-36.90 to -36.62] Initials _____
❶❷ 8.2.14 (8.2.17, 8.6.9)	B21-N680C (Loop Cal)		(INWC) _____ (-38.27 to -37.51) [-38.39 to -37.63] Initials _____	RESET #2 (INWC) **-37.89** [-38.01]	(INWC) _____ (-38.03 to -37.75) [-38.15 to -37.87] Initials _____
❶❷ 8.2.15 (8.2.17, 8.6.10)	B21-N680C (Loop Cal)	Input (INWC)	(IN WATER)	DAC Display (IN WATER)	(IN WATER)
		-72.80 [-72.92]	_____	0.0 (-0.2 to 0.2)	_____
		-62.37 [-62.49]	_____	15.0 (14.8 to 15.2)	_____
		-51.94 [-52.06]	_____	30.0 (29.8 to 30.2)	_____
		-41.51 [-41.63]	_____	45.0 (44.8 to 45.2)	_____
		-31.08 [-31.20]	_____ Initials _____	60.0 (59.8 to 60.2)	_____ Initials _____
❶❷ 8.3.5 (8.3.6, 8.3.7)	B21-N080C (XMTR Cal)	Input (INWC)	(VDC)	DVM (VDC)	(VDC)
		-72.80 [-72.92]	_____ (0.970 to 1.030)	1.000	_____ (0.990 to 1.010)
		-62.37 [-62.49]	_____ (1.970 to 2.030)	2.000	_____ (1.990 to 2.010)
		-51.94 [-52.06]	_____ (2.970 to 3.030)	3.000	_____ (2.990 to 3.010)
		-41.51 [-41.63]	_____ (3.970 to 4.030)	4.000	_____ (3.990 to 4.010)
		-31.08 [-31.20]	_____ (4.970 to 5.030) Initials _____	5.000	_____ (4.990 to 5.010) Initials _____

COMMENTS/DEFICIENCIES

Zero Shift Correction = +0.12 inwc (+0.0112 vdc)

TEST EQUIPMENT

Noun Name / Range Used	EIN	Cal Due Date

REVIEW AND APPROVAL

Surveillance Coordinator: _____
(Signature) (Date)

RPS REACTOR WATER LEVEL B21-N080D CHANNEL CALIBRATION DATA SHEET

SCOPE OF REVISION:

- Dispositioned PDR No. 99-0630.
- ❶ Incorporated setpoint change IP-C-0058, R/0, as required by ATI #76850-01. Added AS FOUND/AS LEFT tolerances per calculation. [Sites]
- ❷ Corrected typo and minor format checks. Corrected setpoints per IC-C-0058. [Reiersen]

CONTINUOUS USE

ORIGINATOR: *Ken Schaub* **CLASS CODE:** *SNNN1*

ITR: *N/A* **APPROVAL DATE:** *MAY 04 1999*

CURRENT CHANGES TO GENERAL REVISION

	Change #	Date	List of Affected Pages
❶	36a	11/29/01	1, 2, 3, 4
❷	36b	04/17/02	1, 2, 3, 4
❸			
❹			
❺			

Sensor Tag # 1B21N080D041494

NOTE

Values given in brackets [ ] have not been zero shift corrected. These values are only used following transmitter replacement or sensor replacement/rework. Values in bold lettering are used for normal periodic calibrations.

Negative input pressure indicates pressure applied to low side of transmitter.

A. Operability Data

STEP	COMPONENT	AS FOUND	ALLOWABLE LIMIT	AS LEFT
❶❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680D (ATM Cal)	(IN WATER) _____	TRIP #1 ≥ 8.3 IN WATER	(IN WATER) _____
			TRIP #2 ≤ 52.6 IN WATER	
		Initials _____		Initials _____
❶❷ 8.2.10 (8.2.17, 8.6.5)	B21-N680D (Loop Cal)	(INWC) _____	TRIP #1 (INWC) **≥ -66.66** [≥ -66.77]	(INWC) _____
		Initials _____		Initials _____
❶ 8.2.13 (8.2.17, 8.6.8)	B21-N680D (Loop Cal)	(INWC) _____	TRIP #2 (INWC) **≤ -35.86** [≤ -35.97]	(INWC) _____
		Initials _____		Initials _____

B. Other Data

STEP	COMPONENT	AS FOUND Input (%FS)	AS FOUND Output	ACCEPTABLE LIMIT	AS LEFT Input (%FS)	AS LEFT Output
8.1.23 (8.2.17, 8.4.1, 8.5.2)	B21-N680D (ATM Cal)	_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		_____	_____	Input ± 0.25%	_____	_____
		Initials _____				Initials _____

STEP	COMPONENT	AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶ 8.1.28 (8.2.17, 8.4.1, 8.5.6)	B21-N680D (ATM Cal)	(IN WATER)	TRIP #1	(IN WATER)
		(8.6 to 9.2)	8.9 IN WATER	(8.8 to 9.0)
			RESET #1	
		(10.4 to 11.0)	10.7 IN WATER	(10.6 to 10.8)
			TRIP #2	
		(51.7 to 52.3)	52.0 IN WATER	(51.9 to 52.1)
			RESET #2	
		(49.9 to 50.5)	50.2 IN WATER	(50.1 to 50.3)
		Initials		Initials
8.1.32 (8.2.17, 8.4.1, 8.5.8)	B21-N680D (ATM Cal)	(mA)	GF HIGH	(mA)
			30.5 mA (30.0 to 31.0)	
			HYST HIGH	
			(no spec)	
			GF LOW	
			2.0 mA (1.0 to 3.0)	
			HYST LOW	
			(no spec)	
		Initials		Initials
❶❷ 8.2.10 (8.2.17, 8.6.5)	B21-N680D (Loop Cal)	(INWC)	TRIP #1 (INWC)	(INWC)
		(-66.63 to -65.87) [-66.74 to- 65.98]	**-66.25** [-66.36]	(-66.39 to -66.11) [-66.50 to -66.22]
		Initials		Initials
❶❷ 8.2.11 (8.2.17, 8.6.6)	B21-N680D (Loop Cal)	(INWC)	RESET #1 (INWC)	(INWC)
		(-65.37 to -64.61) [-65.48 to -64.72]	**-64.99** [-65.10]	(-65.13 to -64.85) [-65.24 to -64.96]
		Initials		Initials

STEP	COMPONENT		AS FOUND	ACCEPTABLE LIMIT	AS LEFT
❶❷ 8.2.13 (8.2.17, 8.6.8)	B21-N680D (Loop Cal)		(INWC) _____ (-36.66 to -35.90) [-36.77 to -36.01]	TRIP #2 (INWC) **-36.28** [-36.39]	(INWC) _____ (-36.42 to -36.14) [-36.53 to -36.25]
			Initials _____		Initials _____
❶❷ 8.2.14 (8.2.17, 8.6.9)	B21-N680D (Loop Cal)		(INWC) _____ (-37.91 to -37.15) [-38.02 to -37.26]	RESET #2 (INWC) **-37.53** [-37.64]	(INWC) _____ (-37.67 to -37.39) [-37.78 to -37.50]
			Initials _____		Initials _____
❶ 8.2.15 (8.2.17, 8.6.10)	B21-N680D (Loop Cal)	Input (INWC)	(IN WATER)	DAC Display (IN WATER)	(IN WATER)
		-72.43 [-72.54]	_____	0.0 (-0.2 to 0.2)	_____
		-62.00 [-62.11]	_____	15.0 (14.8 to 15.2)	_____
		-51.58 [-51.69]	_____	30.0 (29.8 to 30.2)	_____
		-41.15 [-41.26]	_____	45.0 (44.8 to 45.2)	_____
		-30.72 [-30.83]	_____	60.0 (59.8 to 60.2)	_____
			Initials _____		Initials _____
❶ 8.3.5 (8.3.6, 8.3.7)	B21-N080D (XMTR Cal)	Input (INWC)	(VDC)	DVM (VDC)	(VDC)
		-72.43 [-72.54]	_____ (0.970 to 1.030)	1.000	_____ (0.990 to 1.010)
		-62.00 [-62.11]	_____ (1.970 to 2.030)	2.000	_____ (1.990 to 2.010)
		-51.58 [-51.69]	_____ (2.970 to 3.030)	3.000	_____ (2.990 to 3.010)
		-41.15 [-41.26]	_____ (3.970 to 4.030)	4.000	_____ (3.990 to 4.010)
		-30.72 [-30.83]	_____ (4.970 to 5.030)	5.000	_____ (4.990 to 5.010)
			Initials _____		Initials _____

COMMENTS/DEFICIENCIES

Zero Shift Correction = +0.11 inwc (+0.011 vdc)

TEST EQUIPMENT

Noun Name / Range Used	EIN	Cal Due Date

REVIEW AND APPROVAL

Surveillance Coordinator: _____
(Signature) (Date)

ATTACHMENT 4

Revised Amendment Request Attachment 8

CPS Evaluation of the NRC Status Report on the Staff Review of EPRI Technical Report 103335, "Guidelines for Instrument Calibration Extension/Reduction Programs"

The following are excerpts or paraphrases from the NRC Status Report dated December 1, 1997, on the Staff review of EPRI Technical Report (TR)-103335, "Guidelines for Instrument Calibration Extension /Reduction Programs." These excerpts are followed by the CPS position regarding utilization of EPRI TR-103335.

Item 4.1, Section 1, "Introduction," Second Paragraph

> "The staff has issued guidance on the second objective (evaluating extended surveillance intervals in support of longer fuel cycles) only for 18-month to 24-month refueling cycle extensions (GL 91-04). Significant unresolved issues remain concerning the applicability of 18 month (or less) historical calibration data to extended intervals longer than 24 months (maximum 30 months), and instrument failure modes or conditions that may be present in instruments that are unattended for periods longer than 24 months."

EVALUATION

Extended intervals for longer than 24 months (maximum 30 months based on Technical Specification SR 3.0.2) were not requested for any instrument calibrations.

Item 4.2, Section 2, "Principles of Calibration Data Analysis," First Paragraph

> "This section describes the general relation between the as-found and as-left calibration values and instrument drift. The term 'time dependent drift' is used. This should be clarified to mean time dependence of drift uncertainty, or in other words, time dependence of the standard deviation of drift of a sample or a population of instruments."

EVALUATION

Both EPRI TR-103335, Revision 0 and Revision 1 failed to adequately determine if there existed a relationship between the magnitude of drift and the time interval between the calibration process. The drift analysis performed by CPS looked at the time to magnitude relationship using several different statistical and non-statistical methods. First, data was grouped for the same or similar manufacturer, model number, and application combinations. After the standard deviation and other simple statistics were calculated, the data was evaluated for the time to magnitude relationship. Two separate regression type analyses were performed; the first, a simple regression calculation based on the scatter of the raw "drift" values and the absolute value "drift" regression. Second, a regression of the calculated standard deviation and mean for the different calibration frequencies was performed if sufficient samples were available. Additionally, if these analyses did not contain sufficient samples for the regression of standard deviations, then different analyses may have been used or the samples may have conservatively been assumed to have a time dependent relationship and the drift value extrapolated based on a time dependent relationship.

Item 4.2, Section 2, "Principles of Calibration Data Analysis," Second Paragraph

"Drift is defined as as-found - as-left. As mentioned in the TR, this quantity unavoidably contains uncertainty contributions from sources other than drift. These uncertainties account for variability in calibration equipment and personnel, instrument accuracy, and