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JAN 29 1996

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555  
Attention: Mr. S. D. Ebnetter

Dear Mr. Ebnetter:

In the Matter of the ) Docket Nos. 50-390  
Tennessee Valley Authority )

WATTS BAR NUCLEAR PLANT (WBN) - RADIATION MONITORING SYSTEM  
ASSESSMENT, SUPPLEMENTAL INFORMATION

In response to the NRC's letter of January 12, 1996, TVA provided an assessment of the Watts Bar Radiation Monitoring System (RMS) by letter dated January 22, 1996. Based on review of the RMS, including information regarding system performance since fuel load, TVA reaffirmed its conclusion that the system meets regulatory requirements and TVA commitments, and is ready to support full power operation of Unit 1.

In subsequent discussions, the NRC staff requested supplemental and detailed information supporting several of TVA's conclusions. The enclosures to this letter provide the requested information. Enclosure 1 discusses pre-fuel load activities associated with the RMS and addresses:

- Information regarding the specific monitors covered by the Radiation Monitoring Special Program (RMSP).
- The Regulatory Guides, including exceptions and clarifications, and deviations, and Industry Standards to which TVA is committed.

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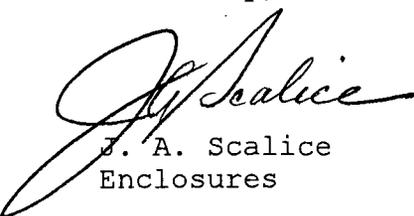
- The key issues associated with the RMS and, on a monitor-by-monitor basis, a listing of deficiencies contained in corrective action documents and design change notices associated with the RMS.
- The results of assessments of the RMSP performed by TVA's Nuclear Assurance organization.
- The basis for resolution of the 20 open items, 58 team items, and 27 observations identified in the TVA Engineering Assessment report issued in April 1995.

Enclosure 2 addresses the post-fuel load activities and includes discussions of the following:

- The availability (time in-service) of the monitors since receipt of a low power license.
- The specific training that has been provided to help ensure the RMS is operated and maintained in accordance with TVA procedures and NRC regulations.
- The methods used to ensure conformance with Regulatory Guide 1.21.
- The program that supports the availability of spare parts to maintain the system.

Should there be any questions on this information, or if the staff should require any additional information to complete its review, please contact me at (423) 365-8767.

Sincerely,



J. A. Scalice  
Enclosures

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cc (Enclosures):

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**Enclosure 1**  
**Watts Bar Nuclear Plant (WBN) Unit 1**  
**Radiation Monitoring System (RMS) Assessment**

**Pre-fuel Load Activities**

**Information Requested:**

State the impact of the activities performed under the Radiation Monitoring Special Program (RMSP) for those monitors which were not included within the scope of the RMSP.

**Response:**

The scope of the RMSP includes the monitors required for compliance with the Technical Specifications, the Offsite Dose Calculation Manual (ODCM), and Regulatory Guide (RG) 1.97 (Post Accident Monitoring).

However, the activities performed for the monitors included in the scope of the RMSP were also applied to permanently installed monitors not required by the Technical Specifications, ODCM, or RG 1.97. Therefore, there was no difference between activities performed for monitors within the scope of the RMSP and those outside of the program. Corrective actions, maintenance, modifications, calibration, and preoperational testing which applied to a particular type of monitor (i.e., area monitors) were performed for each appropriate monitor of that type.

The RMSP Closure Report identified the completion of 121 total design changes. Since closure of the RMSP, ten design changes associated with RMS have been issued and closed. However, none of the ten changes affected system compliance with regulatory requirements, commitments, or the design basis documents. Principally, the design changes were for correction of engineering documentation discrepancies and also correction of electronic or circuit noise problems discovered during integrated system operation.

One measure that provided added assurance that outstanding required design changes impacting the RMS, System 90, were complete prior to fuel load, was the System Preoperability Acceptance Evaluation (SPAЕ) process. This process was used by the Nuclear Engineering staff to assess the status of the system and to establish that the system was complete and ready for preoperational testing. The documentation developed as a package under the SPAЕ process established that all engineering work was either design complete or had been approved as a deferral or as an exception. Through this process, completion of design bases documents, control room drawings, system boundary reviews, calculations, and corrective action documents was assured. The final SPAЕ package for the RMS, System 90, was issued on October 24, 1995, and certified that engineering activities had been completed and documentation closed or partially closed as indicated in the Master Tracking System (MTS) Report attached to the SPAЕ

package. Punchlist items for previous System 90 SPAE packages were tracked by the MTS. Consequently, the final SPAE package addressed previous punchlisted items.

The final SPAE MTS report was reviewed and items were confirmed closed except for Nuclear Experience Review item SQN II-S-92-025. This item involves an issue identified at TVA's Sequoyah Nuclear Plant regarding the initiation of a containment ventilation isolation during post-maintenance testing. Final closure of this item will occur upon evaluation of WBN experience following initial power operation.

To assure that no issues had emerged since approval of the final SPAE package, Nuclear Engineering reviewed the final SPAE package, Design Change Notices (DCNs), Tracking (TROI) items, Significant Corrective Action Reports (SCARs), Problem Evaluation Reports (PERs), etc., issued subsequent to the final SPAE package. This established that the conclusions in the final SPAE package regarding completion of engineering activities remained valid.

Another program that provided assurance of the operability of the RMS as a whole, was the System Pre-Operability Checklist (SPOC) process. This process established the requirements for turnover of a system from the Startup and Test organization to plant Operations. Implementation of the SPOC process provided a systematic method to ensure that open work items and outstanding programmatic items affecting system operability or operational readiness of a system were completed or dispositioned before recommending a system was functionally ready to support Unit 1 fuel load.

The system turnover portion of the SPOC process was specifically developed to:

- A. Verify completion of required testing,
- B. Verify system and equipment readiness for jurisdictional control by Operations,
- C. Identify and document any outstanding items (design, construction or modifications, licensing, testing, and physical work) against the system which was being turned over, and
- D. Document the turnover and acceptance of systems, subsystems and components from Startup and Test to Operations.

As part of the system turnover process, a system walkdown was performed to assess the physical condition of the system. The walkdown was not performed until system testing and associated field work had been completed. Identified deficiencies from the walkdown were dispositioned using existing plant work documents and programs, (i.e., Work Requests, Work Orders, Design Change Notices, Workplans, Labeling Requests, Service Requests, Test Deficiencies, etc.).

Completion of the SPOC process ensured that open items and other issues which may have potentially affected system operation were either completed or reviewed, satisfactorily dispositioned and tracked. The MTS was used to track the status of open items. No special operating conditions were established at the completion of the SPOC turnover of any system. For the RMS, the SPOC process ensured that construction and testing were completed successfully and that the system was ready to be accepted by the plant staff for operations. The process did allow for a limited number of exceptions for open items not complete at turnover. These items are now complete.

Information Requested:

Identify the Regulatory Guides (RGs) and Industry Standards (ISs) to which TVA is committed for the RMS.

Response:

The requested information regarding commitments to RGs and ISs is provided below. Where appropriate, the exceptions, clarifications, and deviations to the RGs or ISs are listed.

Regulatory Guide 1.21, Revision 1 - "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents From Light-Water-Cooled Nuclear Power Plants."

Exceptions:

None

Clarification:

Subsequent to the issuance of Revision 1 of this RG, the NRC initiated effluent reporting using the Offsite Dose Calculation Manual (ODCM). In accordance with the ODCM approach, requirements for effluent monitors are captured in the Watts Bar ODCM as opposed to the plant technical specifications and the Effluent and Waste Disposal Report is made annually rather than to semiannually.

Regulatory Guide 1.45, Revision 0 - "Reactor Coolant Pressure Boundary Leakage Detection Systems"

Exceptions:

None

Regulatory Guide 1.97, Revision 2 - "Instrumentation for Light-Water-Cooled Nuclear Power Plant to Assess Plant and Environs Conditions During and Following an Accident."

Exceptions:

None

Approved Deviations:

1. RG 1.97 Guidance:  
Monitor - Auxiliary Building Exhaust Vent Radiation Level - Noble Gas Release

Deviations:

The range recommended in RG 1.97, Revision 2, is  $10^{-6}$  to  $10^3$  microcuries/cubic centimeter (cc); the recommendation for WBN is  $10^{-6}$  to  $10^{-2}$  microcuries/cc.

The Auxiliary Building vent monitor is provided to continuously monitor the airborne radioactivity released through the Auxiliary Building exhaust vent. An accident causing the Auxiliary Building radiation level to be high will cause all ventilation paths exhausting into the Auxiliary Building vent duct to automatically close and the Auxiliary Building gas treatment system to be activated. Because the isolation function occurs before accident-range activity is reached, a normal-range monitor only is employed to monitor activity in the Auxiliary Building exhaust vent. Therefore, the recommended range of  $10^{-6}$  to  $10^{-2}$  microcuries/cc is adequate for detecting and measuring noble gas concentrations.

2. RG 1.97 Guidance:  
Radiation Exposure Rate

Deviation:

RG 1.97, Revision 2, includes exposure rate monitors as Type E (Category 2) variables. These monitors are required to have a range of 1.0 E-1 Roentgen per hour (R/hr) to 1.0 E+4 R/hr and are to be located inside buildings or areas where access is required to service equipment important to safety. The area monitors are intended for use in detection of significant releases, release assessment, and long-term surveillance.

RG 1.97, Revision 2, also includes radiation exposure rate monitors, with ranges of 1.0 E-1 R/hr to 1.0 E+4 R/hr as Type C variables (these monitors were to be installed inside buildings or areas in direct contact with primary containment where penetrations and hatches were located). This variable was removed from RG 1.97 in Revision 3, and will not be addressed further.

WBN RG 1.97 monitoring instrumentation does not include installed high-range exposure rate monitors as Type E variables. The intended objectives of such instrumentation will be achieved in a different manner than that described in RG 1.97. The following paragraphs describe how WBN's program is designed to monitor radiation exposure rates.

A large number of useful missions outside the Main Control Room (MCR) during accident conditions may be postulated. These missions would be for activities that might enhance accident mitigation, such as equipment maintenance, grab sample acquisition, and laboratory analyses of grab samples. Exposure rates encountered on these missions would vary over a wide range. This variability arises from the fact that the greatest exposure outside the containment during accident conditions would be attributable to contained sources and, therefore, be strong functions of distance from the sources. Because of the wide exposure rate variability, the installation of even a large number of high-range exposure rate monitoring instruments at selected locations on projected mission routes might not contribute substantially, either to the planning of missions for accident mitigation purposes or to the minimization of dose equivalent to personnel performing the missions.

Based on the above considerations, the WBN radiation monitoring system design uses portable high-range exposure rate instruments in lieu of installed high-range exposure rate monitors. Crews attempting missions outside the MCR following an accident would include Radiological Control personnel provided with high-range exposure rate instrumentation. The range of the Type E portable instrumentation available for this purpose is  $1.0 \text{ E-3 R/hr}$  to  $1.0 \text{ E+4 R/hr}$ , which is consistent with the range required for area exposure rate monitoring.

Additionally, the TVA RMS presently includes normal-range area monitors, each with a range from  $1.0 \text{ E-1 mR/hr}$  to  $1.0 \text{ E+4 mR/hr}$ . These monitors are located throughout the plant in areas where personnel access is common. Area monitors are not required to be within the scope of the environmental qualification program and are not included in the Post Accident Monitoring (PAM) program. Monitors located outside the primary containment and other locations of high post-accident exposure rates can be expected to remain on scale and to continue to provide exposure rate indication with required accuracy during accident conditions. These monitors will provide useful input to MCR personnel for assessment of plant exposure rate levels during accident conditions. Based on this assessment and WBN Radiological Emergency Plan dose limitations, a decision will be made as to whether or not missions outside the MCR would be attempted.

In summary, the WBN position on high-range accident monitoring is that high-range exposure rate instrumentation will not be installed and that high-range monitoring will be provided by portable monitoring instrumentation that meets the range stated in RG 1.97.

3. RG 1.97 Guidance:  
Containment Area Radiation, High-Range

Deviation:

Note 7 of RG 1.97, Revision 2, for the subject variable states, "...detectors should respond to gamma photons within any energy range from 60KeV to 3MeV with an energy response accuracy of 20% at any specific photon energy from 0.1 MeV to 1MeV. Overall system accuracy should be within a factor of 2 over the entire range." TVA meets the guidance of RG 1.97 Revision 3, Note 7 for the subject variable, which states, "Detectors should respond to gamma radiation photons within any range from 60KeV to 3MeV with a dose rate response accuracy within a factor of 2 over the entire range."

It is acceptable to meet the guidance of RG 1.97, Revision 3.

4. RG 1.97 Guidance:  
Condenser Vacuum Pump Exhaust Vent (Noble Gas)

Deviation:

The RG 1.97, Revision 2, range for the condenser vacuum pump exhaust monitors is 1.0 E-6 to 1.0 E+5  $\mu\text{Ci}/\text{cc}$  .

TVA has determined the total gas required range of the condenser vacuum pump exhaust monitors to be less than the 1.0 E-6 value in RG for the low end of the range and 2.4 E+3  $\mu\text{Ci}/\text{cc}$  at the upper end of the range.

The steam generator tube rupture (SGTR) is the only credible accident monitored by the condenser vacuum pump exhaust monitor. NUREG-0800, Revision 2, provides that the SGTR accident be analyzed using the highest isotope concentrations allowed by the Watts Bar Technical Specifications. The specific activity of the reactor coolant is limited to:

- a) Less than or equal to 1 microcurie per gram dose equivalent Iodine-131, and
- b) Less than or equal to  $100/\bar{E}$   $\mu\text{Ci}/\text{gm}$

The dose equivalent of I-131 is greater than 4 times more restrictive than the  $100/\bar{E}$  limit. The  $100/\bar{E}$  is more conservative and is selected to demonstrate that the monitor will remain on scale during the most severe accident. The highest concentration of mixed noble gas isotopes that can be

present under the 100/E limit is  $1.45 \text{ E}+3 \text{ } \mu\text{Ci/cc}$  as determined in TVA calculation WBNAPS3-048. For the SGTR source spectrum, the maximum measurable concentration for the condenser vacuum pump exhaust monitors is  $3.53 \text{ E}+4 \text{ } \mu\text{Ci/cc}$ . Therefore, the Watts Bar required range for the condenser vacuum pump exhaust monitors meet the intent of RG 1.97, Revision 2, based on either the mixed gas or the SGTR specific source spectrum.

5. RG 1.97 Guidance:  
Auxiliary Building Exhaust Vent Radiation Level -  
Particulates and Halogens

Deviation:

The range recommended in RG 1.97, Revision 2, is  $1.0\text{E}-3$  to  $1.0 \text{ E}+2 \text{ } \mu\text{Ci/cc}$ ; WBN recommends  $1.0 \text{ E}-10$  to  $1.0 \text{ E}-5$  for particulates and  $1.0 \text{ E}-9$  to  $1.0 \text{ E}-4 \text{ } \mu\text{Ci/cc}$  for halogens (iodine).

The Auxiliary Building vent monitor is provided to continuously monitor the radioiodine and particulate radioactivity released through the Auxiliary Building exhaust vent. A design basis fuel handling accident in the Auxiliary Building or a design basis LOCA in the Reactor Building will cause the ventilation paths exhausting into the Auxiliary Building vent duct to automatically close and the Auxiliary Building gas treatment system to be activated. Because the isolation function occurs before accident-range activity is reached, a normal-range monitor only is employed to monitor activity in the Auxiliary Building vent. Therefore, the recommended range of  $1.0 \text{ E}-10$  to  $1.0 \text{ E}-5 \text{ } \mu\text{Ci/cc}$  for particulates and  $1.0 \text{ E}-9$  to  $1.0 \text{ E}-4 \text{ } \mu\text{Ci/cc}$  for halogens (iodine) are adequate for detecting and measuring normal operation particulate and radioiodine concentrations. Laboratory analysis of collected samples allows measurement over a wide range.

The following ISs were used as reference guidance in designing and evaluating the radiation monitoring system:

ANS N13.1-1969 - "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities"

ANSI/ANS-HPSSC-6.8.1-1981, "Location and Design Criteria for Area Radiation Monitoring Systems for Light Water Nuclear Plants"

Information Requested:

Define and quantify the key issues associated with the RMS.

Response:

Prior to turnover of the RMS to plant Operations, the issues which impacted the RMS could be grouped into the following four categories (corrective actions initiated to address the issues are cataloged on a monitor-by-monitor basis in Attachment 1 to this Enclosure):

1. Inconsistent documentation.
2. Noncompliance with design requirements.
3. Isokinetic sampling.
4. Maintenance or age related problems.

For the first category, inconsistencies existed in and among commitment documents (FSAR, responses to RGs, etc.), requirements documents (system design criteria), configuration control documents (drawings), and field installations. These inconsistencies involved sample line construction, equipment configuration, and system performance.

The primary corrective action document associated with this category was SCRWBNEEB8724SCA and its associated 10 CFR 50.55(e) report, CDR 390/86-49. Specific examples of inconsistencies included components which were not as specified on vendor drawings for the Shield Building, Auxiliary Building, and Service Building vent monitor isokinetic flow control stations; lack of location and mounting details for on-line area monitors; vendor change documents which were not incorporated into the vendor manuals; and discrepancies between vendor drawings and TVA drawings.

Also discussed in CDR 390/86-49 was WBP890386PER, which included deficiencies in the retrievability of QA records supporting radiation monitoring calibration transfer sources. The issue concerned the traceability to the primary calibration and to the National Bureau of Standards (NBS).

WBPER940601 documented discrepancies discovered during performance of the Engineering Assessment of the RMS, which included incorrect depiction of ball and plug valves on the control drawings, and inconsistencies between Equipment Management System (EMS) safety classifications for Class 1 sample line tubing and pressure boundary retention requirements.

Corrective actions for the documentation inconsistencies included sample line and equipment walkdowns and evaluation efforts. Sample line walkdowns and evaluations were documented in 1989 and 1995. Equipment walkdowns were completed in 1990. Equipment evaluations were performed in 1990 and 1995. DCN S-06973-A resolved documentation discrepancies associated with sample line configurations discovered during the 1989 walkdown and evaluation. DCN S-10604 resolved equipment documentation discrepancies discovered in the 1990 walkdowns and evaluations. DCNs S-36049 and S-37549 corrected the documentation discrepancies discovered during the 1995

evaluations. The validity of the corrective actions performed following the 1989 and 1990 evaluations were supported by the small number of discrepancies noted in the 1995 evaluations.

With regard to the Shield Building, Auxiliary Building, and Service Building vent isokinetic flow control station documentation discrepancies, the equipment was replaced or upgraded. In addition, new vendor documentation was received, reviewed, and approved by TVA. Revised TVA drawings were prepared for these components as part of DCNs M-03450, M-03451, and W-07445.

Discrepancies in vendor manuals were corrected under the Vendor Manual Upgrade Program as part of WBP870701SCA.

Location details for on-line area monitors were documented in DCNs W-23167, S-31335, and S-29173. Drawings controlling mounting details were verified to be available.

Records supporting the traceability of transfer calibration sources to the primary calibration and to NBS standards were located and retrievability was assured.

Recurrence control for this category of RMS issues included the revision and upgrade of design control procedures, which are specified in the report for CDR 390/86-49.

For the second category, noncompliance with design requirements, the primary corrective action documents were WBP880409SCA and WBP890192PER. WBP880409SCA reported changes made by the field in an attempt to achieve operation of the Air Monitor isokinetic flow control stations for the Shield, Auxiliary, and Service Building vent monitors within acceptable error tolerances. WBP890192PER reported undocumented changes made to radiation monitoring ratemeters and to detector preamplifier boards. The ratemeter changes were made to add a trip-inhibit feature on the model RP-1 and RP-30 radiation analyzers. The changes to the detector preamplifier boards were made to achieve higher gain and overcome inadequate photomultiplier tube performance.

To address these issues, the affected portion of the instrumentation for the Shield Building, Auxiliary Building, and Service Building vent monitors was replaced or upgraded. These modifications resulted in the equipment being supported by a new set of vendor supplied and TVA approved as-built documentation. This was accomplished by DCNs M-03450, M-03451, and W-07445 and resolved the undocumented changes reported in WBP880409SCA.

Radiation monitoring ratemeters Models RP-1, RP-2, and RP-30 were replaced with new models RP-1AM, RP-2AM, and RP-30AM for WBP890192PER. This was accomplished under DCN W-06378. The new model ratemeters incorporate the trip inhibit feature, which was desirable. A new set of documentation was supplied with the equipment so that configuration control was regained. The safety-related preamplifier boards were returned to the vendor for refurbishment. Nonsafety-related preamplifier boards were returned

to documented configuration by Instrument Maintenance. This was accomplished by DCNs W-09308, W-09309, M-09378, and M-09786.

Recurrence control included the issuance of revised and upgraded plant modification procedures specified in the 10CFR50.55(e) report, CDR 390/86-49.

Isokinetic sampling issues, the third category listed above, involved both sample line construction and equipment design. The corrective action documents associated with this category were SCRWBNEEB8724SCA, WBP880409SCA, and WBP940423. SCRWBNEEB8724SCA described problems with sample lines which may degrade representative sample capability, including long line lengths, excessive numbers of bends, inappropriate bend radii, and lack of heat tracing and insulation for processes susceptible to moisture condensation. WBP940423 included additional examples of sample line deficiencies. WBP880409SCA reported problems with maintaining isokinetic flow control for the Shield Building, Auxiliary Building, and Service Building ventilation monitors with the Air Monitor equipment; and additionally reported that the subsamples to the radiation monitors were not isokinetic after leaving the primary sample line.

As stated previously, to determine the condition of sample lines and to determine corrective action, walkdowns and evaluations of the sample lines were performed in 1989 and again in 1995.

The problems with the isokinetic sampling stations were resolved by revision to the design criteria where requirements were overly restrictive, physical changes to the sample lines to bring them into compliance with the revised criteria, and the development of calculations to determine particle loss in the sample lines so that effluent reports would be conservative.

Sample line configuration and the lack of isokinetic subsamples on the Auxiliary Building and Service Building vents were resolved by completion of particle loss calculation WBNTSR-060. This calculation provided transmission factors to be used to assess the actual particulate concentration in the effluent release path based on activity on the filter and sample line losses. For the Shield Building, the issue of non-isokinetic subsamples is no longer valid, since the radiation monitor subsample is also controlled based on flow rate in the duct.

Recurrence control for this category included the development and issuance of an adequate design criteria as described in the final report for CDR 390/86-49.

Regarding the fourth category, one of the more effective activities which addressed age-related problems was the replacement of the RP-1, RP-2, and RP-30 ratemeters. This replacement was performed as part of WBP890192PER under Design Change Notice (DCN) W-06378.

Additional examples of the resolution of age-related problems are:

- The implementation of DCNs W-09308, W-09309, M-09378, and M-09786 for the rebuilding of detectors.
- The refurbishment of preamplifiers by the vendor or TVA to support the corrective action for WBP890192PER.

State-of-the-art digital flow control systems were provided for the Shield Building, Auxiliary Building, and Service Building vent isokinetic flow control equipment. The upgrading was completed as part of the corrective action for WBP880409SCA by DCNs M-03450, M-03451, and W-07445.

Heat trace and insulation added for the prevention of moisture condensation by DCNs W-33688 and W-35465 will aid in decreasing maintenance activities caused by humidity and water problems. The heat trace and insulation was part of the corrective action required for resolution of WBP8940423.

The need for decontamination maintenance of the RMS was further decreased by the addition of purge valves as part of the corrective action for SCRWBNEEB8724SCA. The addition of these valves decreases the maintenance time required to decontaminate the monitor sample chambers.

Additional information regarding the corrective actions implemented for each monitor is contained in Attachment 1.

**Information Requested:**

Describe the results of assessments performed by TVA's Nuclear Assurance organization on the RMSP.

**Response:**

The closure verification activities associated with the RMSP performed by TVA's Nuclear Assurance organization was comprised of assessments performed at various stages of the RMSP effort. These assessments were performed in the February 94 to December 95 timeframe. The scope of these assessments included engineering, design changes, field walkdowns, open item closures, setpoint and scaling documents, testing, transfer of calibration data, and control of check sources. The following issues resulted from these assessments:

1. Duplicate design exception numbers were used on two different exceptions.
2. FSAR seismic classification was not consistent with Q-List or design criteria.
3. Radiation monitor 1-R-90-140 (non-technical specification) was discussed in the design criteria but not in the FSAR.

4. The design criteria were inconsistent with certain calculations regarding the safety-related classification of radiation monitors.
5. Walkdowns identified slope problems on three non-technical specification radiation monitors.
6. Non-technical specification radiation monitor 1-RE-90-124 would not function as designed.
7. The non-retrievability of some calibration records was noted; this had been previously identified and documented in WBP890396PER.
8. Differences between DCAs and the plant (e.g., dimensional errors).
9. Slope deviations, mistagged equipment, and loose hardware.
10. A missing tag on 1-HTR-234-0460 and incorrect nomenclature on 1-RE-090-0131A.

The final Nuclear Assurance verification of the RMSP was completed on October 26, 1995. This assessment verified that issues from prior assessments were satisfactorily corrected and 74 of 108 open items were closed. (These open items were subsequently verified as satisfactorily closed by Nuclear Assurance as part of the open item closure reviews performed prior to fuel load.)

In January 1996 an assessment was performed by Nuclear Assurance to evaluate the effectiveness of training of operations and maintenance personnel in the area of radiation monitor maintenance and operation. Each department's classroom training course was evaluated. Personnel were questioned to ascertain their level of knowledge after attending the training. No deficiencies were found. Additionally, the trending of equipment failures by Technical Support was reviewed for radiation monitoring equipment and was found to be acceptable. Nuclear Assurance concluded that maintenance and operations personnel have the appropriate knowledge level to maintain and operate the radiation monitoring system and that equipment failure analysis evaluations were satisfactory.

**Information Requested:**

The TVA Engineering Assessment report issued in April 1995 identified 20 open items, 58 team items, and 27 observations. Provide the basis for resolution of each of the items.

**Response:**

The assessment report issued in April 1995 documented a monitor-by-monitor review of the radiation monitors in System 90 to assess the

system's ability to perform its intended functions, to determine if the system met regulatory requirements, and to identify and correct inconsistencies in design documentation. Each monitor in the system was evaluated against criteria such as range, sensitivity, accuracy, background accounted for, safety classification, redundancy, location of and type of readouts, electrical and mechanical requirements, and environmental requirements. The requirements for these attributes were established from the design criteria and TVA licensing commitments. The review examined whether the hardware and associated documentation met the established requirements. It also examined whether inconsistencies existed between the design criteria and licensing commitments.

During the review 20 open items, 58 team items, and 27 observations were identified. The open items were issues that required correction and were determined to be outside of the scope of the team's charter to correct and thus were added as specific corrective actions in WBNPER940601 to document and track resolution of the conditions. A description of each open item, which monitor it related to, and how the item was resolved is provided in Table 1 of Attachment 2.

The 58 team items were issues for which it was determined that the Radiation Monitoring System Design Criteria, FSAR sections on radiation monitoring, or calculations needed to be revised to correct inconsistencies, errors, or provide clarification. The 58 team items shown in Table 2 of Attachment 2 were addressed by revisions to the documents listed above. These actions were completed prior to September 1995. The specific documents changed and the date of the change are also shown in the table.

The 27 observations were items that the team documented for information in the tables attached to the April 28, 1995, report. The items reflected work being tracked by open corrective action documents, items related to work in progress, practices used at other utilities, or informational comments. None of these items required new actions on the part of TVA to meet design requirements or regulatory commitments. Table 3 of Attachment 2 provides a listing of the observations and shows how they were dispositioned. All of the observations were evaluated and closed.

Attachment 1

Deficiencies Impacting the RMS

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
0-RE-90-003

Monitor Type:  
Area

Monitor Classification:

Tech Spec: No

ODCM: No

Reg. Guide 1.97: No

Safety Related: No

Monitor Description:

Waste Package Area Monitor

TVA Deficiency:

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WPPER940072  
WBP890492SCA

Description of Deficiency:

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

Design Change Notice:

02440  
30312  
06378  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

Related Deficiency:

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

Description of Design Changes/Field Modifications:

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,81, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-004

**Monitor Type:**  
Area

**Monitor Classification:**  
Tech Spec: No

**ODCM:**  
No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:** Decontamination Room Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to 0-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to 0-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (0-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for 0-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and 0-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete 0-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-005

**Monitor Type:**  
Area

**Monitor Classification:**

**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP890492SCA

Spent Fuel Pool Pumps Area Monitor

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP890492SCA  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-009

**Monitor Type:**  
Area

**Monitor Classification:**  
Tech Spec: No

**ODCM:**  
No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:** Waste Evaporator Condensate Tank Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSA940032  
WPPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to 0-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to 0-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (0-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for 0-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and 0-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete 0-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-011

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:**  
No

**ODCM:**  
No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:** Containment Spray & RHR Pump Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSA940032  
WBP8940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to 0-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to 0-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37586  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP8940072  
WBSA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (0-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for 0-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and 0-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete 0-R-90-63  
Add keep alive source for 1-RE-90-2

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

<b>Radiation Monitor:</b> 0-RE-90-012	<b>Monitor Type:</b> Particulate	<b>Monitor Classification:</b> Tech Spec: No	<b>ODCM:</b> No	<b>Reg. Guide 1.97:</b> No	<b>Safety Related:</b> No
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**Monitor Description:** Spent Fuel Pool Monitor  
**TVA Deficiency:** Description of Deficiency:

SCRWBNEEB8724 R3      Condition A8 of WBNEEB8724, Documentation inconsistencies

WBP890192 WBP880318 WBP890396 WBP890422 WBNEEB8553 WBP8940670	Undocumented changes to ratemeters Noise causes spurious actuations Calibration documentation missing Ratemeter cable damage on rough cable entry Lack of load data Degraded wiring from 10CFM moving filter to electronics box
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Design Change Notice:	Related Deficiency:	Description of Design Changes/Field Modifications:
03001	N/A	Installs multiplexer so particular CAM unit in alarm can be determined from recorder
06378	WBP890192	Install new ratemeters and power supply
07064	WBP890422	Add grommet to prevent wire damage
09786	WBP880318	Add noise suppression across three relay coils and buzzer; correct ground for single point ground
09786	WBNEEB8724 R3	Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62
10604	WBNEEB8724 R3	Condition A8 of WBNEEB8724, Documentation corrections
33714	WBP8940670	Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

<b>Radiation Monitor:</b> 0-RE-90-013	<b>Monitor Type:</b> Particulate	<b>Monitor Classification:</b> Tech Spec:	<b>ODCM:</b>	<b>Reg. Guide 1.97:</b>	<b>Safety Related:</b>
		No	No	No	No

**Monitor Description:** Shipping Bay Monitor  
**TVA Deficiency:** Description of Deficiency:

SCRWBNEEB8724 R3	Condition A8 of WBNEEB8724, Documentation inconsistencies
WBP890192 WBP880318 WBP890396 WBP890422 WBNEEB8553	Undocumented changes to ratemeters Noise causes spurious actuations Calibration documentation missing Ratemeter cable damage on rough cable entry Lack of load data
31105-WBN-06	Various ALARA concerns (applicable to 0-RE-90-13 only)
WBPER940423 WBPER940670	General sample line deficiencies Degraded wiring from 10CFM moving filter to electronics box

<b>Design Change Notice:</b>	<b>Related Deficiency:</b>	<b>Description of Design Changes/Field Modifications:</b>
03001	N/A	Installs multiplexer so particular CAM unit in alarm can be determined from recorder
06378 06973 07064 09786 09786	WBP890192 WBNEEB8724 R3 WBP890422 WBP880318 WBNEEB8724 R3	Install new ratemeters and power supply Condition A2 of WBNEEB8724, as constructed sample lines Add grommet to prevent wire damage Add noise suppression across three relay coils and buzzer; correct ground for single point ground Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62 Move 0-RE-90-13 and add sample line
09786 10604	31105-WBN-06 WBNEEB8724 R3	Move 0-RE-90-13 and add sample line Condition A8 of WBNEEB8724, Documentation corrections
33714	WBPER940670	Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 0-RE-90-015  
**Monitor Type:** Particulate  
**Monitor Classification:** No  
**Tech Spec:** No  
**ODCM:** No  
**Reg. Guide 1.97:** No  
**Safety Related:** No

**Monitor Description:** Holdup Valve Gallery Monitor  
**TVA Deficiency:** SCRWBNEEB8724 R3  
**Description of Deficiency:** Condition A8 of WBNEEB8724, Documentation inconsistencies

WBP890192 Undocumented changes to ratemeters  
 WBP880318 Noise causes spurious actuations  
 WBP890396 Calibration documentation missing  
 WBP890422 Ratemeter cable damage on rough cable entry  
 WBNEEB8553 Lack of load data

WBPER940423 General sample line deficiencies  
 WBPER940670 Degraded wiring from 10CFM moving filter to electronics box

<b>Design Change Notice:</b>	<b>Related Deficiency:</b>	<b>Description of Design Changes/Field Modifications:</b>
03001	N/A	Installs multiplexer so particular CAM unit in alarm can be determined from recorder
06378 06973 07064 09786 09786	WBP890192 WBNEEB8724 R3 WBP890422 WBP880318 WBNEEB8724 R3	Install new ratemeters and power supply Condition A2 of WBNEEB8724, as constructed sample lines Add grommet to prevent wire damage Add noise suppression across three relay coils and buzzer; correct ground for single point ground Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62
10604	WBNEEB8724 R3	Condition A8 of WBNEEB8724, Documentation corrections
94-22034-01	N/A	Replace defective cable ratemeter to detector for 0-RE-90-15
33714	WBPER940670	Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)
35152	N/A WBPER940423	Add sample line lengths for 15, 17, 105, and 138 Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-016

**Monitor Type:**  
Particulate

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3

**Decontamination Room Monitor**  
**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems (applicable to 0-RE-90-16 only)  
Condition A8 of WBNEEB8724, Documentation inconsistencies

WBP890192  
WBP880318  
WBP890396  
WBP890422  
WBNEEB8553

Undocumented changes to ratemeters  
Noise causes spurious actuations  
Calibration documentation missing  
Ratemeter cable damage on rough cable entry  
Lack of load data

WBP8940423  
WBP8940670

General sample line deficiencies  
Degraded wiring from 10CFM moving filter to electronics box

**Design Change Notice:**  
03001

**Related Deficiency:**  
N/A

**Description of Design Changes/Field Modifications:**  
Installs multiplexer so particular CAM unit in alarm can be determined from recorder

06378  
06973  
07064  
09786  
09786

WBP890192  
WBNEEB8724 R3  
WBP890422  
WBP880318  
WBNEEB8724 R3

Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, as constructed sample lines  
Add grommet to prevent wire damage  
Add noise suppression across three relay coils and buzzer; correct ground for single point ground  
Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62

10604

WBNEEB8724 R3

Condition A8 of WBNEEB8724, Documentation corrections

WR-C297138

N/A

Replace recorder ground strap for 0-RE-90-16, 0-RE-90-17, and 1-RE-90-62

33714  
36188

WBP8940670  
N/A

Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)  
Provide local room alarm for loop 16

S-37549

WBP8940423  
WBP8940601

Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4  
Revise WB-DC-40-24 to allow 1L(G) classification for 0-RE-90-16

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-017

**Monitor Type:**  
Particulate

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

Safety Injection Pump Area Monitor

**Description of Deficiency:**

SCRWBNEEB8724 R3

Condition A8 of WBNEEB8724, Documentation inconsistencies

WBP890192  
WBP880318  
WBP890396  
WBP890422  
WBNEEB8553

Undocumented changes to ratemeters  
Noise causes spurious actuations  
Calibration documentation missing  
Ratemeter cable damage on rough cable entry  
Lack of load data

WBPER940423  
WBPER940670

General sample line deficiencies  
Degraded wiring from 10CFM moving filter to electronics box

**Design Change Notice:**  
03001

**Related Deficiency:**  
N/A

**Description of Design Changes/Field Modifications:**  
Installs multiplexer so particular CAM unit in alarm can be determined from recorder

06378  
06973  
07064  
09786  
09786

WBP890192  
WBNEEB8724 R3  
WBP890422  
WBP880318  
WBNEEB8724 R3

Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, as constructed sample lines  
Add grommet to prevent wire damage  
Add noise suppression across three relay coils and buzzer; correct ground for single point ground  
Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62

10604

WBNEEB8724 R3

Condition A8 of WBNEEB8724, Documentation corrections

WR-C297138

N/A

Replace recorder ground strap for 0-RE-90-16, 0-RE-90-17, and 1-RE-90-62

33714

WBPER940670

Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)

35152

N/A  
WBPER940423

Add sample line lengths for 15, 17, 105, and 138  
Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4

**Watts B Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

<b>Radiation Monitor:</b>	<b>Monitor Type:</b>	<b>Monitor Classification:</b>	<b>Tech Spec:</b>	<b>ODCM:</b>	<b>Reg. Guide 1.97:</b>	<b>Safety Related:</b>
0-RE-90-101 0-LPF-90-300	Particulate, Iodine & Gas (PIG)	No	No	Yes	Yes	No

**Monitor Description:** Aux Building Ventilation Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601

WBP870728  
WBP880197  
WBP880318  
WBP880409  
WBP890192  
WBP890396  
W-272-P  
W-466-P  
WBNEEB8553  
WBNEEB8709  
CRDR HED 89/HEC 5240  
WBPER940423  
WBPER940670  
WBSCA940032  
WBPER950650  
CRDR HED 109

**Description of Deficiency:**

Condition A1 of WBNEEB8724, Non-isokinetic sample  
Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A8 of WBNEEB8724, Documentation inconsistencies  
Condition D of WBNEEB8724, Non-seismically qualified test and isolation valves  
DOE errors

Missing pipe tubing caps  
Lack of mounting details for flow elements  
Noise causes spurious actuations  
Air monitor isokinetic sampling system problems  
Undocumented changes to ratemeters  
Calibration documentation missing  
Iodine lo flow switches don't work in application  
Tube insulation not per NE output  
Lack of load data  
Particulate plateau concerns  
Recorder Scales  
General sample line deficiencies vs. design criteria  
Degraded wiring from 10CFM moving filter to electronics box  
Coax to single conductor transitions  
Grab sample valves inappropriate for application - vacuum pulls diaphragm down and sample cannot be taken  
Radiation analyzer indicator light labels

**Design Change Notice:**

02243  
03445  
06378  
06378  
06808  
06973  
07445  
07445  
09378  
09378  
09378  
09378  
25193, 36511  
10604  
10425  
10425  
36049  
34195

23237  
23237  
23237  
21861  
33714  
23167

27485  
36528  
S-37549  
S-37910  
W-37566  
S-38326

**Related Deficiency:**

WBP880197  
WBP870728  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP880409  
WBP880318  
WBNEEB8724 R3  
WBP890192  
WBP880409  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
N/A

W-272-P  
WBP880318  
CRDR HED 89/HEC 5240  
WBP880318  
WBPER940670  
WBSCA940032  
WBPER940423  
N/A  
N/A  
WBPER940601  
WBPER940601  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Document flow element mounting  
Install pipe tubing caps  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, General sample line upgrades: correct code class; slope exception  
Condition A8 of WBNEEB8724, sample line documentation correction  
Condition A1 of WBNEEB8724, upgrade Air Monitor sampling system  
Upgrade Air Monitor sampling system  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of WBNEEB8724, Rebuild detectors, standardize internal wiring  
Return defective preamp boards to documented configuration  
Add auxiliary bldg flow rate to list of PAM variables monitored on ERFDS  
Condition A8 of WBNEEB8724, Documentation corrections only  
Condition A2 of WBNEEB8724, Correct valve classification  
Condition D of WBNEEB8724, Correct valve classification  
Correct valve depiction  
Replace quick disconnects

Replace iodine low flow switch  
Wrap internal detector cables with EMI tape  
Correct recorder scales  
Delete auto ABI  
Corrects degraded wiring from 10CFM moving filter to electronics box  
Provide materials and instructions for coax to single conductor transition  
Resolves or incorporates sample line exceptions  
SSDs  
Air Monitor SSDs  
Revise WB-DC-40-24 to permit 1(L)B qualification of radiation detection and flow monitoring skid; also revise HVAC D.C. for function  
Lower flow limits  
Resolve ground loops (shield ties)  
Correct control drawings

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-102

**Monitor Type:**  
Shine

**Monitor Classification:**  
**Tech Spec:** Yes

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:** Fuel Pool Area Accident Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
SCRWBNEEB8724  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
WPPER940279  
CDR HED 109  
WBSCA940032  
CRDR HED 89/HEC 5252  
WPPER940072  
WBP890586  
WPPER930482

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, geometry documentation missing  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Unauthorized, undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1  
Vendor change to RD-1 electronics card is bad fit  
Load data missing  
MCR recorders not isolated  
Radiation analyzer indicator light labels  
Transitions from coax to TSP, triax or single conductor; connector termination to WWK at penetration.  
Recorder scales  
RT-10, RT-11 transfer data; SE calibration methods  
E-MAX rack power supplies not qualified  
Supply breakers to aux bldg exhaust fans not single failure proof

**Design Change Notice:**

06378  
06378  
10604  
11304  
23167  
23167  
23167  
23167  
31640  
S-32449  
23409  
31335  
R01014511  
W-35389  
S-37518  
M-29141  
34421

**Related Deficiency:**

WBP890192  
CRDR HED 109  
WBNEEB8724  
WBP890586  
WBNEEB8724 R3  
CRDR HED 89/HEC 5252  
WBSCA940032  
WPPER940279  
  
N/A  
  
WPPER940072  
N/A  
WPPER940279  
WPPER930482  
N/A

**Description of Design Changes/Field Modifications:**

Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A8 to SCRWBNEEB8724, documentation only corrections  
Replace power supplies in R-163,164  
Condition A4 of WBNEEB8724, Documentation: Location, mounting  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductor or TSP in MCB  
Use of separated, dedicated recorders for each loop for devices tied to 1E outputs  
Test requirements  
Issue SSDs  
Corrects location of 102, 103 (23167 is predecessor)  
New RT-10 calibrator  
Computer signals can be adjusted in the field to corrective equipment inaccuracies.  
Add notes to I-tabs, special requirements, based on seismic test contract 141254 for recorders  
Upgrade aux bldg & fuel handling circuits.  
Preop test criteria

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-103

**Monitor Type:**  
Shine

**Monitor Classification:**  
**Tech Spec:** Yes

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:** Fuel Pool Area Accident Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
SCRWBNEEB8724  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
WBPER940279  
CDR HED 109  
WBSCA940032  
CRDR HED 89/HEC 5252  
WBPER940072  
WBP890586  
WBPER930482

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, location mounting, geometry documentation missing  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Unauthorized, undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1  
Vendor change to RD-1 electronics card is bad fit  
Load data missing  
MCR recorders not isolated  
Radiation analyzer indicator light labels  
Transitions from coax to TSP, triax or single conductor; connector termination to WWK at penetration.  
Recorder scales  
RT-10, RT-11 transfer data; SE calibration methods  
E-MAX rack power supplies not qualified  
Supply breakers to aux bldg exhaust fan not single failure proof.

**Design Change Notice:**

06378  
06378  
10604  
11304  
23167  
23167  
23167  
23167  
31640  
S-32449  
23409  
31335  
RD1014511  
W-35389  
S-37518  
M-29141  
34421

**Related Deficiency:**

WBP890192  
CRDR HED 109  
WBNEEB8724  
WBP890586  
WBNEEB8724 R3  
CRDR HED 89/HEC 5252  
WBSCA940032  
WBPER940279  
  
N/A  
WBNEEB8724  
WBPER940072  
N/A  
WBPER940279  
WBPER930482  
N/A

**Description of Design Changes/Field Modifications:**

Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A8 to SCRWBNEEB8724, documentation only corrections  
Replace power supplies in R-163,164  
Condition A4 of WBBEEB8724, Documentation: Location, mounting  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductor or TSP in MCB  
Use of separated, dedicated recorders for each loop for devices tied to 1E outputs  
Test requirements  
Issue SSDs  
Corrects location of 102, 103 (23167 is predecessor)  
New RT-10 calibrator  
Computer signals can be adjusted in field to correct equipment inaccuracies.  
Add notes to I-tabs, special requirements, based on seismic test contract 141254 for recorders  
Upgrade aux bldg and fuel handling circuits.  
prop test criteria

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-118

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** Yes

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Waste Disposal System Gas Effluent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP890192  
WBP890396  
WBNEEB8553  
PIRWBNNNEB8705  
CRDR HED 109  
CRDR HED/89/HEC 5252  
WBSCA940032  
WBP880318

**Description of Deficiency:**

Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition G of WBNEEB8724, temperatures exceeding detector limits  
Missing pipe tubing caps  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Specific documentation discrepancies  
Radiation analyzer indicator light labels  
Recorder scales  
Coax to single conductor transitions  
Noise Problems

**Design Change Notice:**

03445  
06378  
06378  
06378  
09309  
09309  
09309  
10604  
10604  
23236  
23167  
27485  
S37549  
W37566

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBP880318  
WBNEEB8724 R3  
WBP890192  
WBNEEB8724 R3  
WBNEEB8705  
CRDR HED 89/HEC 5252  
WBSCA940032  
N/A  
WBPER940601  
N/A

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Correct detector loop grounds  
Condition A8 of WBNEEB8724, rebuild detectors  
Return defective preamp boards to documented configuration  
Condition A8 of WBNEEB8724, documentation corrections only  
Documentation corrections only  
Correct recorder scales  
Provide materials/instructions for coax to single conductor transition  
SSDs  
Correct Q-List classification of RE to 1(C)A  
Resolve ground loops(shield ties)

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 0-RE-90-122  
**Monitor Type:** Liquid  
**Monitor Classification:** No  
**Tech Spec:** No  
**ODCM:** Yes  
**Reg. Guide 1.97:** No  
**Safety Related:** No

**Monitor Description:** Waste Disposal System Liquid Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
 WBNEEB8724 R3  
 WBNEEB8724 R3  
 WBPER940601  
 WBP870728  
 WBP880272  
 WBP890192  
 WBP890396  
 WBNEEB 8553  
 CRDR HED 40  
 CRDR HED 109  
 CRDR HED 89/HEC 5252  
 WBPER940423  
 WBSCA940032  
 WBP880318  
 WBPER930420

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
 Condition A8 of WBNEEB8724, Documentation inconsistencies  
 Condition G of WBNEEB8724, Temperatures and pressures above detector limits  
 Doc errors  
 Missing pipe tubing caps  
 Non-seismically qualified flow switch  
 Undocumented changes to ratemeters  
 Calibration documentation missing  
 Lack of load data  
 Nuisance alarms  
 Radiation analyzer indicator light labels  
 Recorder Scales  
 General sample line deficiencies  
 Coax to single conductor transition  
 Noise problems  
 Installation of sample line not in accordance with requirements

**Design Change Notice:**

WO  
 06378  
 06378  
 06797  
  
 06973  
 09308  
 10604  
 15423  
 23235  
 23235  
 23167  
  
 34183  
 35985  
 W-37566  
 S-36049

**Related Deficiency:**

WBPER930420  
 WBP890192  
 CRDR HED 109  
 WBNEEB8724 R3  
  
 WBNEEB8724 R3  
 WBNEEB8724 , WBP880318  
 WBNEEB8724 R3  
 WBP880272  
 N/A  
 CRDR HED 89/HEC 5252  
 WBSCA940032  
 WBPER940423  
 CRDR HED 40  
  
 N/A  
 WBPER940601

**Description of Design Changes/Field Modifications:**

Correct sample line installation as necessary  
 Install new ratemeters and power supply  
 Install new ratemeters and power supply  
 Condition A2 of WBNEEB8724, Replace inlet & outlet root & isol valves; replace elbows with less severe bends where possible; replace inlet purge valve, install outlet purge valve  
  
 Condition A8 of WBNEEB8724, sample line as-constructed  
 Condition A8, Correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
 Condition A8, Documentation corrections  
 Resolves non-seismic flow switch (documentation)  
 Correct vendor manual to reflect optical grease  
 Correct recorder scales  
 Provide materials, instructions for coax to single conductor transition  
 Resolve or incorporate exceptions in R4 of design criteria, WB-DC-40-24  
 Block alarm when monitor not in use  
 SSDs  
 Ground loops- shielded ties  
 Show valves correctly

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 0-RE-90-123      **Monitor Type:** Liquid      **Monitor Classification:** No  
**Tech Spec:**      **ODCM:** No      **Reg. Guide 1.97:** No      **Safety Related:** No

**Monitor Description:** Component Cooling System Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
 WBNEEB8724 R3  
 WBP890192  
 WBP880272  
 WBP880273  
 WBP890192  
 WBP890396  
 WBNEEB8553  
 CRDR HED 40  
 CRDR HED 109  
 CRDR HED 89/HEC 5252  
 WBP8940423  
 WBSCA940032  
 WBP880318

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
 Condition A8 of WBNEEB8724, documentation inconsistencies  
 Doc Errors  
 Non-seismically qualified flow switch (0, 1-123)  
 Non-seismically qualified flow switch (2-123)  
 Undocumented changes to ratemeters  
 Calibration documentation missing  
 Lack of load data  
 Nuisance alarm  
 Radiation analyzer indicator light labels  
 Recorder Scales  
 General sample line deficiencies  
 Coax to single conductor transition  
 Noise problems

**Design Change Notice:**

06378  
 06378  
 06801  
  
 06973  
 09308  
 10604  
 15423  
 15423  
 23235  
 23235  
 23167  
 33686  
  
 W-37566  
 S-36049

**Related Deficiency:**

WBP890192  
 CRDR HED 109  
 WBNEEB8724 R3  
  
 WBNEEB8724 R3  
 WBNEEB8724 , WBP880318  
 WBNEEB8724 R3  
 WBP880272  
 WBP880273  
 N/A  
 CRDR HED 89/HEC 5252  
 WBSCA940032  
 CRDR HED 40  
 WBP8940423  
 N/A  
 WBP8940601

**Description of Design Changes/Field Modifications:**

Install new ratemeters and power supply  
 Install new ratemeters and power supply  
 Condition A2 to WBNEEB8724, replace inlet and outlet isolation valves w/ss globe; add recirc purge/test valves; take exception for carbon steel root valves  
  
 Condition A8 of WBNEEB8724, Sample line as constructed  
 Condition A8 of WBNEEB8724, Correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
 Condition A8 of WBNEEB8724, Documentation corrections resolves non-seismic flow switch (documentation)  
 Resolves non-seismic flow switch (documentation)  
 Documentation corrections resolves non-seismic flow switch (documentation)  
 Correct vendor manual to reflect optical grease  
 Correct recorder scales  
 Provide materials, instructions for coax to single conductor transition  
 Block alarm when monitor not in use  
 Resolve or incorporate exceptions in R4 of design criteria, WB-DC-40-24  
 Ground loops - shield ties (1-123 only)  
 Show valves correctly, EMS corrections

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-125

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** Yes

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:** Main Control Room Normal Air Intake Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP870728  
WBP890192  
WBP890396  
WBNEEB8553  
WBP880318  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBSCA940032  
WBP890586  
WBP900107  
WBP89040601  
WBP89040279  
WBP8904023

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
Condition A2 of SCRWBNEEB8724, general sample line routing problems  
Missing pipe tubing caps  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Noise produces spurious actuations  
Radiation analyzer indicator light labels  
Recorder scales  
Coax to single conductor transitions  
E-MAX power supplies not qualified  
Non-radioactive check source  
Documentation errors  
Recorders tied directly to ratemeters with no isolator  
General sample line deficiencies with respect to design criteria requirements

**Design Change Notice:**

03445  
06378  
06378  
09309  
09309  
09309  
10604  
36049  
06795  
06973  
11304  
34421  
23236  
W37677  
31640  
23167  
  
27485  
W37518  
S32449  
W38500  
09309

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBP880318  
WBNEEB8724 R3  
WBP890396  
WBNEEB8724 R3  
WBP89040601  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890586  
N/A  
WBP880318  
N/A  
WBP89040279  
WBSCA940032  
WBP8904023  
N/A  
WBP89040279  
  
WBP890192

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of SCRWBNEEB8724, rebuild detectors, standardize internal wiring  
Replace scintillator if required  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Depict valves correctly  
Condition A2 of SCRWBNEEB8724, gen smpl line upgrades: delete outlet rt vlv, add outlet isol vlv; slope exception  
Condition A8, of SCRWBNEEB8724, sample line as-constructed  
Replace power supply in R-163, 164  
Preoperational test criteria  
Wrap detector cbls inside mon. w/EMI tape; reroute signal cbls from ratemeter to detector in cond. for 0-RE-90-125, 126  
Resolve shield tie ground loops and isolator ground problem  
Verify wiring correct in M-12 and test recorders for interface with Class 1E ratemeters  
Provide materials and instructions for coax to single conductor transition  
R4 of design criteria, WB-DC-40-24 R4, resolved field deficiencies or incorporated exceptions  
SSDs  
Add notes to Instrument Tabs - special reqmts for recorders based on seismic test, contract 141254  
Test requirements  
Install noise suppression on LED check sources card  
Return defective preamp boards to documented configuration

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-126

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** Yes  
**ODCM:** No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
Yes

**Monitor Description:**

Main Control Room Normal Air Intake Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP870728  
WBP890192  
WBP890396  
WBNEEB8553  
WBP880318  
CRDR HED 109  
CRDR HED/89/HEC 5252  
WBSCA940032  
WBP890586  
WBP900107  
WBPER940601  
WBPER940279  
WBPER940423

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
Condition A2 of SCRWBNEEB8724, general sample line routing problems  
Missing pipe tubing caps  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Noise produces spurious actuations  
Radiation analyzer indicator light labels  
Recorder scales  
Coax to single conductor transitions  
E-MAX power supplies not qualified  
Non-radioactive check source  
Documentation errors  
Recorders tied directly to ratemeters with no isolator  
General sample line deficiencies with respect to design criteria requirements

**Design Change Notice:**

03445  
06378  
06378  
06378  
09309  
09309  
09309  
10604  
36049  
06795  
06973  
11304  
34421  
23236  
W37677  
31640  
23167  
  
27485  
W37518  
S32449  
W38500  
09309

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBP880318  
WBNEEB8724 R3  
WBP890396  
WBNEEB8724 R3  
WBPER940601  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890586  
N/A  
WBP880318  
N/A  
WBPER940279  
WBSCA940032  
WBPER940423  
N/A  
WBPER940279  
  
WBP890192

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of SCRWBNEEB8724, rebuild detectors, standardize internal wiring  
Replace scintillator if required  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct valve depiction  
Condition A2 of SCRWBNEEB8724, gen smpl line upgrades: delete outlet rt vlv, add outlet isol vlv; slope exception  
Condition A8, of SCRWBNEEB8724, sample line as-constructed  
Replace power supply in R-163, 164  
Preoperational test criteria  
Wrap detector cbils inside mon. w/EMI tape; reroute signal cbils from ratemeter to detector in cond. for 0-RE-90-125, 126  
Resolve shield tie ground loops and isolator ground problem  
Verify wiring correct in M-12 and test recorders for interface with Class 1E ratemeters  
Provide materials and instructions for coax to single conductor transition  
R4 of design criteria, WB-DC-40-24 R4, resolved field deficiencies or incorporated exceptions  
SSDs  
Add notes to Instrument Tabs - special reqmts for recorders based on seismic test, contract 141254  
Test requirements  
Install noise suppression on LED check sources card  
Return defective preamp boards to documented configuration

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 0-RE-90-132  
**Monitor Type:** Particulate, Iodine & Gas (PIG)  
**Monitor Classification:** No  
**Tech Spec:** No  
**ODCM:** Yes  
**Reg. Guide 1.97:** No  
**Safety Related:** No

**Monitor Description:** Service Building Ventilation Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
 WBNEEB8724 R3  
 WBNEEB8724 R3  
 WBP870069  
 WBP870074  
 WBP870728  
 WBP880197  
 WBP880318  
 WBP880409  
 WBP890192  
 WBP890396  
 WBP900159  
 NCR W-272-P  
 WBNEEB8553  
 CRDR HED 109  
 CRDR HED 89/HEC 5240  
 WBSCA940032  
 WBP8940423  
 WBP8940670  
 WBP8950650

**Description of Deficiency:**

Condition A1 of WBNEEB8724, non-isokinetic sample  
 Condition A2 of WBNEEB8724, general sample line routing problems  
 Condition A8 of WBNEEB8724, Documentation inconsistencies  
 Particulate filter failure due to non-metallic parts  
 ALARA concern, sample chamber contamination  
 Missing pipe tubing caps  
 Lack of mounting details for flow elements  
 Noise causes spurious actuations  
 Air Monitor isokinetic sampling system problems  
 Undocumented changes to ratemeters  
 Calibration documentation missing  
 Non-monitored potentially radioactive release path  
 Iodine low flow switches don't work in application  
 Lack of load data  
 Radiation analyzer indicator light labels  
 Recorder scales  
 Coax to single conductor transition  
 General sample line deficiencies based on the design criteria  
 Degraded wiring from the 10CFM filters to the electronics box  
 Difficulty in obtaining sample through grab sample valves

**Design Change Notice:**

02243  
 03445  
 04192  
 06378  
 06378  
 06973  
 07445  
 07445  
 09378  
 09378  
 09378  
 09378  
 10604  
 23237  
 23237  
 23237  
 09378  
 33714  
 23167  
 36528  
 S-37910  
 W-37566  
 S-38326

**Related Deficiency:**

WBP880197  
 WBP870728  
 WBNEEB8724 R3  
 WBP890192  
 CRDR HED 109  
 WBNEEB8724 R3  
 WBNEEB8724 R3  
 WBP880409  
 WBP880318  
 WBNEEB8724 R3  
 WBP890192  
 WBP870069  
 WBNEEB8724 R3  
 NCR W-272-P  
 WBP880318  
 CRDR HED 89/HEC 5240  
 N/A  
 WBP8940670  
 WBSCA940032  
 WBP8940423  
 WBP8940601

**Description of Design Changes/Field Modifications:**

Document flow element mounting  
 Install pipe tubing caps  
 Condition A2 of WBNEEB8724, piping classification documentation correction  
 Install new ratemeters and power supply  
 Install new ratemeters and power supply  
 Condition A8 of WBNEEB8724, sample line documentation correction  
 Condition A1 of WBNEEB8724, upgrade air monitor sampling system  
 Upgrade air monitor sampling system  
 Add noise suppression networks, correct detector loop grounds  
 Condition A8 of WBNEEB8724, Rebuild detectors, standardize internal wiring, delete requirement for local alarm from design criteria  
 Return defective preamp boards to documented configuration  
 Assure that metallic parts will be supplied as necessary for part filter drive  
 Condition A8 of WBNEEB8724, documentation only corrections  
 Replace iodine low flow switch  
 Wrap internal detector cables with EMI tape  
 Correct recorder scales  
 Replace yellowed NaI crystal  
 Corrects degraded wiring 10 CFR filter to electronics box  
 Provide materials and instructions for coax to single conductor transition  
 Resolves or incorporates exceptions in design criteria WB-DC-40-24 R4  
 Air monitor SSDs  
 Lower flow limits  
 Resolve ground loops - shield ties  
 Correct control drawings

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-132,  
0-LPF-90-320

**Monitor Type:**  
Particulate, Iodine & Gas (PIG)

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** Yes

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:** Service Building Ventilation Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
PIRWBNNEB8667  
WBP870728  
WBP880197  
WBP880318  
WBP880409  
WBP890192  
WBP890396  
WBP900159  
W-272-P  
WBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5240  
WBSCA940032  
WBPER940423  
WBPER940670  
WBPER950650

**Description of Deficiency:**

Condition A1 of WBNEEB8724, Non-isokinetic sample  
Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A8 of WBNEEB8724, Documentation inconsistencies  
Doc errors, missing design output  
Service Bldg piping class  
Missing pipe tubing caps  
Lack of mounting details for flow elements  
Noise causes spurious actuations  
Air Monitor isokinetic sampling system problems  
Undocumented changes to ratemeters  
Calibration documentation missing  
Non-monitored potentially radioactive release path  
Iodine low flow switches don't work in application  
Lack of load data  
Radiation analyzer indicator light labels  
Recorder Scales  
Coax to single conductor transition  
General sample line deficiencies based on the design criteria  
Degraded wiring from the 10CFM filters to the electronics box  
Difficulty in obtaining sample through grab sample valves

**Design Change Notice:**

02243  
03445  
04192  
06378  
06378  
06973  
07445  
07445  
07445  
09378  
09378  
09378  
09378  
36049  
10604  
23237  
23237  
23237  
09378  
33714  
23167  
  
36528  
S-37910  
W-37566  
S-38326  
37132  
34195

**Related Deficiency:**

WBP880197  
WBP870728  
PIRWBNNEB8667  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP880409  
WBP880318  
WBNEEB8724 R3  
WBP890192  
WBPER940601  
WBNEEB8724 R3  
W-272-P  
WBP880318  
CRDR HED 89/HEC 5240  
N/A  
WBPER940670  
WBSCA940032  
WBPER940423  
N/A  
WBPER940601  
N/A  
N/A  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Document flow element mounting  
Install pipe tubing caps  
Piping classification documentation correction  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A8 of WBNEEB8724, Sample line documentation correction  
Condition A1 of WBNEEB8724, Upgrade Air Monitor sampling system  
Upgrade Air Monitor sampling system  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of WBNEEB8724, rebuild detectors, standardize internal wiring, delete rqmt for local alarm from design criteria  
Return defective preamp boards to documented configuration  
Correct valve depiction  
Condition A8 of WBNEEB8724, documentation corrections only  
Replace iodine low flow switch  
Wrap internal detector cables with EMI tape  
Correct recorder scales  
Replace yellowed NaI crystal  
Corrects degraded wiring 10 CFM filter to electronics box  
Provide materials and instructions for coax to single conductor transition  
Resolves or incorporates exceptions in design criteria WVB-DC-40-24, R4  
Air monitor SSDs  
Lower flow limits  
Resolve ground loops - shield ties  
Correct control drawings  
Revise particulate motors  
Replace quick disconnect

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-133

**Monitor Type:**  
Liquid

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** Yes

**Reg. Guide 1.97:** Yes

**Safety Related:** Yes

**Monitor Description:** Essential Raw Cooling Water Effluent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WPPER940601  
WBP870728  
WBP880271  
WBP880318  
WBP880531  
WBP890192  
WBP890206, WBP890561SCA  
WBP890396  
WBP890586  
WPPER910387  
WBNEEB8553  
WBNEEB8572  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WPPER940279  
WPPER940423  
WBSCA940032  
WBFIR940028

**Description of Deficiency:**

Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition D of WBNEEB8724, test and isolation valves not class C  
Condition G of WBNEEB8724, Temperatures above detector limits  
Doc errors  
Missing pipe tubing caps  
Non-qualified flow switch  
Noise problems  
Carbon steel pipe not replaced by construction  
Undocumented changes to ratemeters  
Temperatures above detector limits  
Calibration documentation missing  
E-MAX isolator power supplies not qualified  
Detector sensitivity will not meet range requirements  
Lack of load data  
Thermal effects on piping not considered  
Radiation analyzer indicator light labels  
Recorder scales  
Non-qualified recorders tied directly to Class 1E ratemeters  
General sample line deficiencies  
Coax to single conductor transition  
Inconsistencies in FSAR, Q-List, design criteria

**Design Change Notice:**

03445  
04337  
06378  
06378  
06800  
06973  
07104  
09308  
10425  
30312  
10604  
11304  
17010  
23235  
23235  
09308  
30248  
23167  
PR-W-8375  
  
27485  
36031  
W-37518  
W-37677  
S-36049  
W-37566

**Related Deficiency:**

WBP870728  
WBP880531  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724, WBP880318  
WBNEEB8724 R3  
N/A  
WBNEEB8724 R3  
WBP890586  
WBP880271  
N/A  
CRDR HED 89/HEC 5252  
WBP890396  
WBP880271, WBFIR940028  
WBSCA940032  
WPPER940279  
WPPER940423  
N/A  
WPPER940279  
N/A  
WPPER940601

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Replace root valves w/ss globes  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, Exception not required (WB-DC-40-24 R4)  
Condition A8 of WBNEEB8724, Sample line as constructed  
Condition A2 of WBNEEB8724, slope/globe valve exception to ER Spec  
Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition D of WBNEEB8724, replace purge/test valves with qualified valves  
PAM upgrades  
Condition A8 of WBNEEB8724, documentation corrections  
Install qualified power supplies in R-163, 164 (E-MAX)  
Take credit for existing electrical isolation for flow switch  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Order and install correct crystal size of 0-RE-90-140  
Correct classification in Q-List for FS-90-133, 134, 140, 141, to 1(L)A  
Provide materials, instructions for coax to single conductor transition  
Test recorders for interface with Class 1E ratemeters  
Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4  
SSDs  
Downgrade pumps  
Add notes to Isolation tabs, special requirements for recorders based on seismic test, contract 141254  
Ground loops - shielded ties and isolator grounds  
Correct depiction of valves  
Ground loops - Shield ties

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-134

**Monitor Type:**  
Liquid

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** Yes

**Reg. Guide 1.97:** Yes

**Safety Related:** Yes

**Monitor Description:** Essential Raw Cooling Water Effluent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
WBP870728  
WBP880271  
WBP880318  
WBP880531  
WBP890192  
WBP890206  
WBP890396  
WBP890586  
WBP910387  
WBNEEB8553  
WBNEEB8572  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBPER940279  
WBP8940423  
WBSCA940032  
WBFIR940028

**Description of Deficiency:**

Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition D of WBNEEB8724, test and isolation valves not class C  
Condition G of WBNEEB8724, Temperatures above detector limits  
DOC ERRORS  
Missing pipe tubing caps  
Non-qualified flow switch  
Noise problems  
Carbon steel pipe not replaced by construction  
Undocumented changes to ratemeters  
Temperatures above detector limits  
Calibration documentation missing  
E-MAX isolator power supplies not qualified  
Detector sensitivity will not meet range requirements  
Lack of load data  
Thermal effects on piping not considered  
Radiation analyzer indicator light labels  
Recorder scales  
Non-qualified recorders tied directly to Class 1E ratemeters  
General sample line deficiencies  
Coax to single conductor transition  
Inconsistencies in Q-list, FSAR, design criteria

**Design Change Notice:**

03445  
04337  
06378  
06378  
06800  
06973  
07104  
09308  
  
10425  
10604  
11304  
17010  
23235  
23235  
09308  
30248  
23167  
PR-W-8375  
  
27485  
36031  
W-37518  
W-37677  
S-36049  
30312  
W-37566

**Related Deficiency:**

WBP870728  
WBP880531  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724, WBP880318  
WBNEEB8724 R3  
  
WBNEEB8724 R3  
WBP890586  
WBP880271, WBFIR940028  
N/A  
CRDR HED 89/HEC 5252  
WBP890396  
WBP880271  
WBSCA940032  
WBPER940279  
WBP8940423  
N/A  
  
WBPER940279  
  
WBPER940601  
N/A

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Replace root valves w/ss globes  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, Exception not required (WB-DC-40-24 R4)  
Condition A8 of WBNEEB8724, Sample line as constructed  
Condition A2 of WBNEEB8724, slope/globe valve exception to ER Spec  
Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition D of WBNEEB8724, replace purge/test valves with qualified valves  
  
Condition A8 of WBNEEB8724, documentation corrections  
Install qualified power supplies in R-163, 164 (E-MAX)  
Take credit for existing electrical isolation for flow switch  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Order and install correct crystal size of 0-RE-90-140  
Correct classification in Q-List for FS-90-133, 134, 140, 141, to 1(L)A  
Provide materials, instructions for coax to single conductor transition  
Test recorders for interface with Class 1E ratemeters  
Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4  
SSDs  
Downgrade pumps  
Add notes to Isolation tabs, special requirements for recorders based on seismic test, contract 141254  
Ground loops - shielded ties and isolator grounds  
Correct depiction of valves  
Pam upgrade  
Ground loop-shield ties

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-135

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** Yes

**Safety Related:** No

**Monitor Description:** Main Control Room Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to 0-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to 0-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378  
30312

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399  
N/A

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (0-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for 0-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and 0-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete 0-R-90-63  
Add keep alive source for 1-RE-90-2  
PAM upgrade

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

<b>Radiation Monitor:</b> 0-RE-90-138	<b>Monitor Type:</b> Particulate	<b>Monitor Classification:</b> Tech Spec:	<b>ODCM:</b>	<b>Reg. Guide 1.97:</b>	<b>Safety Related:</b>
		No	No	No	No

**Monitor Description:** Waste Packaging Room Monitor

<b>TVA Deficiency:</b>	<b>Description of Deficiency:</b>
SCRWBNEEB8724 R3	Condition A8 of WBNEEB8724, Documentation inconsistencies

WBP890192	Undocumented changes to ratemeters
WBP880318	Noise causes spurious actuations
WBP890396	Calibration documentation missing
WBP890422	Ratemeter cable damage on rough cable entry
WBNEEB8553	Lack of load data

WBP890423	General sample line deficiencies
WBP890670	Degraded wiring from 10CFM moving filter to electronics box
WBP890553	Unanalyzed elbow in particulate line

<b>Design Change Notice:</b>	<b>Related Deficiency:</b>	<b>Description of Design Changes/Field Modifications:</b>
03001	N/A	Installs multiplexer so particular CAM unit in alarm can be determined from recorder
06378	WBP890192	Install new ratemeters and power supply
06973	WBNEEB8724 R3	Condition A2 of WBNEEB8724, as constructed sample lines
07064	WBP890422	Add grommet to prevent wire damage
09786	WBP880318	Add noise suppression across three relay coils and buzzer; correct ground for single point ground
09786	WBNEEB8724 R3	Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62
10604	WBNEEB8724 R3	Condition A8 of WBNEEB8724, Documentation corrections
33714	WBP890670	Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)
35152	N/A	Add sample line lengths for 15, 17, 105, and 138 Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-140

**Monitor Type:**  
Liquid

**Monitor Classification:**  
Tech Spec: No

**ODCM:**  
Yes

**Reg. Guide 1.97:**  
Yes

**Safety Related:**  
Yes

**Monitor Description:** Essential Raw Cooling Water Effluent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WPPER940601  
WBP870728  
WBP880271  
WBP880318  
WBP880531  
WBP890192  
WBP890206  
WBP890396  
WBP890586  
WBP910387  
WBNEEB8553  
WBNEEB8572  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WPPER940279  
WPPER940423  
WBSCA940032  
WBFIR940028

**Description of Deficiency:**

Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition D of WBNEEB8724, test and isolation valves not class C  
Condition G of WBNEEB8724, Temperatures above detector limits  
Doc errors  
Missing pipe tubing caps  
Non-qualified flow switch  
Noise problems  
Carbon steel pipe not replaced by construction  
Undocumented changes to ratemeters  
Temperatures above detector limits  
Calibration documentation missing  
E-MAX isolator power supplies not qualified  
Detector sensitivity will not meet range requirements  
Lack of load data  
Thermal effects on piping not considered  
Radiation analyzer indicator light labels  
Recorder scales  
Non-qualified recorders tied directly to Class 1E ratemeters  
General sample line deficiencies  
Coax to single conductor transition  
Inconsistencies between Q-list, FSAR, and design criteria

**Design Change Notice:**

03445  
04337  
06378  
06378  
06800  
06973  
30312  
09308  
10425  
W-37566  
10604  
11304  
17010  
23235  
09308  
30248  
23187  
PR-W-8375  
  
27485  
36031  
W-37518  
W-37677  
S-36049

**Related Deficiency:**

WBP870728  
WBP880531  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
N/A  
WBNEEB8724 , WBP880318  
WBNEEB8724 R3  
  
WBNEEB8724 R3  
WBP890586  
WBP880271, WBFIR940028  
N/A  
CRDR HED 89/HEC 5252  
WBP890396  
WBP880271  
WBSCA940032  
WPPER940279  
WPPER940423  
N/A  
  
WPPER940279  
N/A  
WPPER940601

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Replace root valves w/ss globes  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, Exception not required (WB-DC-40-24 R4)  
Condition A8 of WBNEEB8724, Sample line as constructed  
Pam upgrade  
Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition D of WBNEEB8724, replace purge/test valves with qualified valves  
Ground loop-shield ties  
Condition A8 of WBNEEB8724, documentation corrections  
Install qualified power supplies in R-163, 164 (E-MAX)  
Take credit for existing electrical isolation for flow switch  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Order and install correct crystal size of 0-RE-90-140  
Correct classification in Q-List for FS-90-133, 134, 140, 141, to 1(L)A  
Provide materials, instructions for coax to single conductor transition  
Test recorders for interface with Class 1E ratemeters  
Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4  
SSDs  
Downgrade pumps  
Add notes to Isolation tabs, special requirements for recorders based on seismic test, contract 141254  
Ground loops - shielded ties and isolator grounds  
Correct depiction of valves

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 0-RE-90-141      **Monitor Type:** Liquid      **Monitor Classification:** No  
**Tech Spec:**      **ODCM:** Yes      **Reg. Guide 1.97:** Yes      **Safety Related:** Yes

**Monitor Description:** Essential Raw Cooling Water Effluent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
WBP870728  
WBP880271  
WBP880318  
WBP880531  
WBP890192  
WBP890206  
WBP890396  
WBP890586  
WBP910387  
WBNEEB8553  
WBNEEB8572  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBPER940279  
WBPER940423  
WBSCA940032  
WBFIR940028

**Description of Deficiency:**

Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition D of WBNEEB8724, test and isolation valves not class C  
Condition G of WBNEEB8724, Temperatures above detector limits  
Doc errors  
Missing pipe tubing caps  
Non-qualified flow switch  
Noise problems  
Carbon steel pipe not replaced by construction  
Undocumented changes to ratemeters  
Temperatures above detector limits  
Calibration documentation missing  
E-MAX isolator power supplies not qualified  
Detector sensitivity will not meet range requirements  
Lack of load data  
Thermal effects on piping not considered  
Radiation analyzer indicator light labels  
Recorder scales  
Non-qualified recorders tied directly to Class 1E ratemeters  
General sample line deficiencies  
Coax to single conductor transition  
Inconsistencies between FSAR, Q-List, design criteria

**Design Change Notice:**

03445  
04337  
06378  
06378  
06800  
06973  
30312  
09308  
10425  
  
10604  
11304  
17010  
23235  
23235  
09308  
30248  
23187  
PR-W-8375  
  
27485  
36031  
W-37518  
W-37677  
S-36049  
W-37566

**Related Deficiency:**

WBP870728  
WBP880531  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
N/A  
WBNEEB8724 , WBP880318  
WBNEEB8724 R3  
  
WBNEEB8724 R3  
WBP890586  
WBP880271, WBFIR940028  
N/A  
CRDR HED 89/HEC 5252  
WBP890396  
WBP880271  
WBSCA940032  
WBPER940279  
WBPER940423  
N/A  
  
WBPER940279  
N/A  
WBPER940601

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Replace root valves w/ss globes  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, Exception not required (WB-DC-40-24 R4)  
Condition A8 of WBNEEB8724, Sample line as constructed  
Pam upgrade  
Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition D of WBNEEB8724, replace purge/test valves with qualified valves  
  
Condition A8 of WBNEEB8724, documentation corrections  
Install qualified power supplies in R-163, 164 (E-MAX)  
Take credit for existing electrical isolation for flow switch  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Order and install correct crystal size of 0-RE-90-140  
Correct classification in Q-List for FS-90-133, 134, 140, 141, to 1(L)A  
Provide materials, instructions for coax to single conductor transition  
Test recorders for interface with Class 1E ratemeters  
Resolve or incorporate exceptions to design criteria WB-DC-40-24 R4  
SSDs  
Downgrade pumps  
Add notes to Isolation tabs, special requirements for recorders based on seismic test, contract 141254  
Ground loops - shielded ties and isolator grounds  
Correct depiction of valves  
Ground loop - shield ties

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-205

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
Yes

**Monitor Description:** Main Control Room Emergency Air Intake Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP870728  
WBP890192  
WBP890396  
WBNEEB8553  
WBP880318  
CRDR HED 109  
CRDR HED/89/HEC 5252  
WBSCA940032  
WBP890586  
WBP900107  
WBP900190  
WBPER940279  
WBPER940423  
WBPER940601

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
Condition A2 of SCRWBNEEB8724, general sample line routing problems  
Missing pipe tubing caps  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Noise produces spurious actuations  
Radiation analyzer indicator light labels  
Recorder scales  
Coax to single conductor transitions  
E-MAX power supplies not qualified  
Non-radioactive check source  
Incorrect sample withdrawal point (loops 205, 206)  
Recorders tied directly to ratemeters with no isolator  
General sample line deficiencies with respect to design criteria requirements  
Documentation errors

**Design Change Notice:**

03445  
06378  
06378  
09309  
09309  
09309  
10604  
10443  
06795  
06973  
11304  
11831  
23236  
W37677  
31640  
23167  
  
27485  
W37518  
S32449  
W38500  
09309  
30649  
34228  
34421

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBP880318  
WBNEEB8724 R3  
WBP890396  
WBNEEB8724 R3  
WBP900190  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890586  
WBNEEB8724 R3  
WBP880318  
N/A  
WBPER940279  
WBSCA940032  
WBPER940423  
N/A  
WBPER940279  
  
WBP890192  
WBPER940601  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of SCRWBNEEB8724, rebuild detectors, standardize internal wiring  
Replace scintillator if required  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Reroute 205, 206 sample line  
Condition A2 of SCRWBNEEB8724, gen smpl line upgrades: delete outlet rt vlve, add outlet isol vlve; slope exception  
Condition A8, of SCRWBNEEB8724, sample line as-constructed  
Replace power supply in R-163, 164  
Condition A2 of SCRWBNEEB8724, documentation: slope exception  
Wrap detector cbis inside mon. w/EML tape; reroute signal cbis from ratemeter to detector in cond. for 0-RE-90-125, 126  
Resolve shield tie ground loops and isolator ground problem  
Verify wiring correct in M-12 and test recorders for interface with Class 1E ratemeters  
Provide materials and instructions for coax to single conductor transition  
R4 of design criteria, WB-DC-40-24 R4, resolved field deficiencies or incorporated exceptions  
SSDs  
Add notes to Instrument Tabs - special reqmts for recorders based on seismic test, contract 141254  
Test requirements  
Install noise suppression on LED check sources card  
Return defective preamp boards to documented configuration  
Depict valves correctly  
Change rotometer  
Preoperational test criteria

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-206

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:**

Main Control Room Emergency Air Intake Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP870728  
WBP890192  
WBP890396  
WBNEEB8553  
WBP880318  
CRDR HED 109  
CRDR HED/89/HEC 5252  
WBSCA940032  
WBP890586  
WBP900107  
WBP900190  
WBP8940279  
WBP8940423  
WBP8940601  
WBP8950182

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
Condition A2 of SCRWBNEEB8724, general sample line routing problems  
Missing pipe tubing caps  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Noise produces spurious actuations  
Radiation analyzer indicator light labels  
Recorder scales  
Coax to single conductor transitions  
E-MAX power supplies not qualified  
Non-radioactive check source  
Incorrect sample withdrawal point (loops 205, 206)  
Recorders tied directly to ratemeters with no isolator  
General sample line deficiencies with respect to design criteria requirements  
Documentation errors  
Use of QA level III parts in QA level I equipment (RC networks)

**Design Change Notice:**

03445  
06378  
06378  
09309  
09309  
09309  
10604  
10443  
06795  
06973  
11304  
11831  
23236  
W37677  
31640  
23167  
  
27485  
W37518  
S32449  
W38500  
09309  
36049  
WO 93-09789-01  
34228  
34421

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBP880318  
WBNEEB8724 R3  
WBP890396  
WBNEEB8724 R3  
WBP900190  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890586  
WBNEEB8724 R3  
WBP880318  
  
WBP8940279  
WBSCA940032  
WBP8940423  
N/A  
WBP8940279  
  
WBP890192  
WBP8940601  
WBP8950182  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of SCRWBNEEB8724, rebuild detectors, standardize internal wiring  
Replace scintillator if required  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Reroute 205, 206 sample line  
Condition A2 of SCRWBNEEB8724, gen smpl line upgrades: delete outlet rt vive, add outlet isol vive; slope exception  
Condition A8, of SCRWBNEEB8724, sample line as-constructed  
Replace power supply in R-163, 164  
Condition A2 of SCRWBNEEB8724, documentation: slope exception  
Wrap detector cbis inside mon. w/EML tape; reroute signal cbis from ratemeter to detector in cond. for 0-RE-90-125, 126  
Resolve shield tie ground loops and isolator ground problem  
Verify wiring correct in M-12 and test recorders for interface with Class 1E ratemeters  
Provide materials and instructions for coax to single conductor transition  
R4 of design criteria, WB-DC-40-24 R4, resolved field deficiencies or incorporated exceptions  
SSDs  
Add notes to Instrument Tabs - special reqmts for recorders based on seismic test, contract 141254  
Test requirements  
Install noise suppression on LED check sources card  
Return defective preamp boards to documented configuration  
Depict valves correctly  
Install QA level I RC network  
Change rotometer  
Preoperational test criteria.

Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
0-RE-90-212

Monitor Type:  
Liquid

Monitor Classification:  
Tech Spec: No  
ODCM: Yes

Reg. Guide 1.97:  
No

Safety Related:  
No

Monitor Description: Turbine Building Sump Discharge Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
WBP870728  
WBP880318  
WBP890192  
WBP890396  
WBNEEB8553  
WBSCA940032  
WBPER940423

**Description of Deficiency:**

Condition A2 WBNEEB8724, General sample line routing problems  
Condition A8 WBNEEB8724, documentation inconsistencies  
Condition F WBNEEB8724, Unmonitored discharge path added by ECN 5183  
Doc errors  
Missing pipe tubing caps  
Noise problems  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Coax to single conductor transition  
General sample line deficiencies

**Design Change Notice:**

03445  
06378  
05141  
05141  
06973  
09308  
10604  
23235  
30769  
23167  
35985  
36049  
W-37566

**Related Deficiency:**

WBP870728  
WBP890192  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724, WBP880318  
WBNEEB8724 R3  
N/A  
N/A  
WBSCA940032  
WBPER940423  
WBPER940601

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, Replace inlet and outlet root valves w/ss; replace carbon steel pipe w/ss  
Condition F of WBNEEB8724, Add screen and sump pump in station drainage sump and add appropriate pump logic  
Condition A8 of WBNEEB8724, Sample line as constructed  
Condition A8 of WBNEEB8724, Correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition A8 of WBNEEB8724, Documentation corrections  
Correct vendor manual to reflect optical grease  
Change purge valves from 3/8" to 1"  
Provide materials and instructions for coax to single conductor transition  
Resolve or incorporate exceptions to design criteria, WB-DC-40-24  
SSDs  
Correct depiction of valves  
Ground loop - shield ties

**Watts B Reactor Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 0-RE-90-225  
**Monitor Type:** Liquid  
**Monitor Classification:** No  
**Tech Spec:** No  
**ODCM:** Yes  
**Reg. Guide 1.97:** No  
**Safety Related:** No

**Monitor Description:** Condensate Demineralizer Effluent Monitor

**TVA Deficiency:**

- WBNEEB8724 R3
- WBNEEB8724 R3
- WBPER940601
- WBP870728
- WBP880318
- WBP890192
- WBP890396
- WBNEEB8553
- CRDR HED 40
- CRDR HED 109
- CRDR HED 89/HEC 5252
- WBSCA940032
- WBPER940423

**Description of Deficiency:**

- Condition A2, WBNEEB8724, general sample line routing problems
- Condition A8, WBNEEB8724, documentation inconsistencies
- Doc errors ALARA concern, sample chamber contamination
- Missing pipe tubing caps
- Noise problems
- Undocumented changes to ratemeters
- Calibration documentation missing
- Lack of load data
- Nuisance alarms
- Radiation analyzer indicator light labels
- Recorder scales
- Coax to single conductor transition
- General sample line deficiencies

**Design Change Notice:**

- 03445
- 06378
- 06378
- 06973
- 09308
- 10604
- 14289
- 23235
- 30769
- 23167
- 33686
- 35985
- M-15887
- S-36049
- 23235
- W-37566

**Related Deficiency:**

- WBP870728
- WBP890192
- CRDR HED 109
- WBNEEB8724 R3
- WBNEEB8724 , WBP880318
- WBNEEB8724 R3
- WBNEEB8724R3
- N/A
- N/A
- WBSCA940032
- WBPER940423
- CRDR HED 40
- WBPER940601
- CRDR HED 89/HEC 5252

**Description of Design Changes/Field Modifications:**

- Install missing pipe tubing caps
- Install new ratemeters and power supply
- Install new ratemeters and power supply
- Condition A8 of WBNEEB8724, sample line as constructed
- Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors
- Condition A8 of WBNEEB8724, Documentation corrections
- Condition A2 of WBNEEB8724, Replace root valves with 1" ss ball; relocate monitor closer to process
- Correct vendor manual to reflect optical grease
- Change purge valves from 3/8" to 1"
- Provide materials, instructions for coax to single conductor transition
- Provide materials, instructions for coax to single conductor transition, WB-DC-40-24 R4
- Block alarm when monitor not in use
- SSDs
- Logic added to open O-FCV-14-188 on hi rad signal
- Show valves correctly
- Correct recorder scales
- Ground loop - shield ties

**Watts Ferry Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-230

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Condensate Demineralizer Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP89040072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to 0-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to 0-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP89040072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (0-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for 0-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and 0-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete 0-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
0-RE-90-231

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Condensate Demineralizer Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to 0-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to 0-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37568  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (0-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for 0-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and 0-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete 0-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts B Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-001

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Spent Fuel Pool Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN.02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP89040072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08858  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP89040072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-002

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**

Personnel Lock Monitor

**TVA Deficiency:**

**Description of Deficiency:**

SCRWBNEEB8724	Condition A8 of SCRWBNEEB8724, documentation inconsistencies
WBP870870	Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)
WBP890192	Undocumented ratemeter changes
WBP890396	Lack of calibration documentation
WBP890473P	Unauthorized keep alive source in RD-1
WBP910053	Vendor change, RD-1 electronics card change fit
WBNEEB8553	Lack of load data
23005-WBN-02	Lack of radiation monitoring in CDWE
CDR HED 109	Radiation analyzer indicator light labels (not applicable to O-RE-90-135)
CRDR HED 93	Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)
CRDR HED 89/HEC 5253	Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)
CRDR HED 89/HEC 5238	Recorder scales (applicable only to 1-RE-90-280)
WBSCA940032	Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination
WPPER940072	RT-10, RT-11 calibrator documentation, SE calibration methods
WBP890492SCA	Replace coax cable for cable damage issue

**Design Change Notice:**

**Related Deficiency:**

**Description of Design Changes/Field Modifications:**

02440	WBP870870	Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674
30312		PAM Upgrade (O-RE-90-135)
06378	WBP890192	Install new ratemeters & power supply
06378	CRDR HED 109	Install new ratemeters & power supply
06378	WBP890396	Install new detector and components, loop 002
09840	N/A	Delete loops 235 & 236
10604	SCRWBNEEB8724	Condition A8 of SCRWBNEEB8724, documentation corrections only
23167	CRDR HED 89 & 93	Correct recorder scales
23169	WBP870870	Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674
23409	N/A	SSD for O-RE-90-135
33616	N/A	Replace recorders 1-RR-90-1 and RR-90-12
RD1014511	WPPER940072	Purchase new RT-10, RT-11 calibrators
23167	WBSCA940032	Provide materials/instructions for transition from coax to single conductors
08858	WBP890492SCA	Replace coax cable for cable damage issue
08859	WBP890492SCA	Replace coax cable for cable damage issue
09153	WBP890492SCA	Replace coax cable for cable damage issue
35114	N/A	In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,81, and O-RE-90-11 for optimum area radiation detection
37566		Resolve ground loops (shield ties) (loops 2,59,60 only)
16544	F-24447	Delete O-R-90-63
06378	F-36399	Add keep alive source for 1-RE-90-2

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:** 1-RE-90-006  
**Monitor Type:** Area  
**Monitor Classification:** No  
**Tech Spec:** No  
**ODCM:** No  
**Reg. Guide 1.97:** No  
**Safety Related:** No

**Monitor Description:** Component Cooling Heat Exchanger Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
 WBP870870  
 WBP890192  
 WBP890396  
 WBP890473P  
 WBP910053  
 WBNEEB8553  
 23005-WBN-02  
 CDR HED 109  
 CRDR HED 93  
 CRDR HED 89/HEC 5253  
 CRDR HED 89/HEC 5238  
 WBSA940032  
 WBP89040072  
 WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
 Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
 Undocumented ratemeter changes  
 Lack of calibration documentation  
 Unauthorized keep alive source in RD-1  
 Vendor change, RD-1 electronics card change fit  
 Lack of load data  
 Lack of radiation monitoring in CDWE  
 Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
 Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
 Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
 Recorder scales (applicable only to 1-RE-90-280)  
 Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
 RT-10, RT-11 calibrator documentation, SE calibration methods  
 Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
 30312  
 06378  
 06378  
 06378  
 06378  
 09840  
 10604  
 23167  
 23169  
 23409  
 33616  
 RD1014511  
 23167  
 08858  
 08859  
 09153  
 35114  
 37566  
 16544  
 06378

**Related Deficiency:**

WBP870870  
 WBP890192  
 CRDR HED 109  
 WBP890396  
 N/A  
 SCRWBNEEB8724  
 CRDR HED 89 & 93  
 WBP870870  
 N/A  
 N/A  
 WBP89040072  
 WBSA940032  
 WBP890492SCA  
 WBP890492SCA  
 WBP890492SCA  
 N/A  
 F-24447  
 F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
 PAM Upgrade (O-RE-90-135)  
 Install new ratemeters & power supply  
 Install new ratemeters & power supply  
 Install new detector and components, loop 002  
 Delete loops 235 & 236  
 Condition A8 of SCRWBNEEB8724, documentation corrections only  
 Correct recorder scales  
 Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
 SSD for O-RE-90-135  
 Replace recorders 1-RR-90-1 and RR-90-12  
 Purchase new RT-10, RT-11 calibrators  
 Provide materials/instructions for transition from coax to single conductors  
 Replace coax cable for cable damage issue  
 Replace coax cable for cable damage issue  
 Replace coax cable for cable damage issue  
 In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-6, 61, and O-RE-90-11 for optimum area radiation detection  
 Resolve ground loops (shield ties) (loops 2,59,60 only)  
 Delete O-R-90-63  
 Add keep alive source for 1-RE-90-2

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-007

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:**  
**TVA Deficiency:**

Sample Room Area Monitor

**Description of Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBPER940072  
WBP890492SCA

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

**Related Deficiency:**

**Description of Design Changes/Field Modifications:**

02440  
30312  
06378  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-008

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

Aux Feedwater Pump Area Monitor

**Description of Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP8940072  
WBP890492SCA

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP8940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-58 not a listed violation) Relocate 1-RE-90-7,81, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Branch Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-010

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

CVCS Board Area Monitor

**Description of Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CRDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBPER940072  
WBP890492SCA

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies impacting RMS

Radiation Monitor:  
1-RE-90-014

Monitor Type:  
Particulate

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
No

Monitor Description:  
TVA Deficiency:

Sample Room Monitor

Description of Deficiency:

SCRWBNEEB8724 R3  
WBO890192  
WBP880318  
WBP890396  
WBP890422  
WBNEEB8553  
WBPER940670

Condition A8 of WBNEEB8724, Documentation inconsistencies  
Undocumented changes to ratemeters  
Noise causes spurious actuations  
Calibration documentation missing  
Ratemeter Cable damage on rough cable entry  
Lack of load data  
Degraded wiring from 10 CFM moving filter to electronics box

Design Change Notice:

Related Deficiency:

Description of Design Changes/Field Modifications:

03001  
06378  
07064  
09786  
09786  
  
33714

N/A  
WBP890192  
WBP890422  
WBP880318  
WBNEEB8724 R3  
  
WBPER940670

Installs multiplexer so particular CAM unit in alarm can be determined from recorder  
Install new ratemeters and power supply  
Add grommet to prevent wire damage  
Add noise suppression across three relay coils and buzzer; correct ground for single point ground  
Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62  
Corrects degraded wiring, 10 CFM moving filter to electronics box (except loops 2-14)

**Watts Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-059

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Reactor Building Upper Compartment Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WPPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-060

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

Reactor Building Upper Compartment Monitor

**Description of Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSA940032  
WPPER940072  
WBP890492SCA

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

**Related Deficiency:**

**Description of Design Changes/Field Modifications:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F.24447  
F.36399

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-061

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**

Reactor Building Lower Compartment Inst RM Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CRDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP89040072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-6,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-062

**Monitor Type:**  
Particulate

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:**  
**TVA Deficiency:**

RB Lower Compartment Instrumentation Room Monitor

**Description of Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3

Condition A8 of WBNEEB8724, Documentation inconsistencies  
Condition G of WBNEEB8724, Sample temperature exceeds detector limits (applicable to 1-RE-90-62 only)

WBP890192  
WBP880318  
WBP890396  
WBP890422  
WBNEEB8553

Undocumented changes to ratemeters  
Noise causes spurious actuations  
Calibration documentation missing  
Ratemeter cable damage on rough cable entry  
Lack of load data

DSR-045  
WBPER940423  
WBPER940670

Maintenance of 1-RE-90-62 an ALARA concern; request move to outside instrument room  
General sample line deficiencies  
Degraded wiring from 10CFM moving filter to electronics box

**Design Change Notice:**  
03001

**Related Deficiency:**  
N/A

**Description of Design Changes/Field Modifications:**  
Installs multiplexer so particular CAM unit in alarm can be determined from recorder

06378

WBP890192

Install new ratemeters and power supply

07064  
09786  
09786

WBP890422  
WBP880318  
WBNEEB8724 R3

Add grommet to prevent wire damage  
Add noise suppression across three relay coils and buzzer; correct ground for single point ground  
Condition A8, rebuild detectors; correct preamp board to as documented condition; make all wiring consistent and as documented; delete isolation transformer (doc only, except 1-RE-90-62) add diode across flow alarm relay in 1-RE-90-62

10604  
09786

WBNEEB8724 R3  
WBNEEB8724 R3

Condition A8 of WBNEEB8724, Documentation corrections  
Condition A8 of WBNEEB8724, Return 1-RE-90-62 to pre-isolation transformer configuration

WR-C297138

N/A

Replace recorder ground strap for 0-RE-90-16, 0-RE-90-17, and 1-RE-90-62

33714

WBPER940670

Corrects degraded wiring, 10CFM moving filter to electronics box (except loops 2-14)

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-106

**Monitor Type:**  
Particulate, Iodine & Gas (PIG)

**Monitor Classification:**  
**Tech Spec:** Yes  
**ODCM:** No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
Yes

**Monitor Description:** Containment Building Lower Compartment Monitor

**TVA Deficiency:**

WBNEEB8724, R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A4 of WBNEEB8724, Sample line length, traps, no heat trace, separation problems; no purge capability; pump damage on cntmt isolation  
Condition A8 on WBNEEB8724, Documentation inconsistencies  
Condition G of WBNEEB8724, Temperatures above detector limits  
Doc errors

WBP870606  
WBP870728  
WBP870870  
WBP880318  
WBP880351  
WBP890192  
WBP890396  
WBP890586  
W-272-P  
WBNEEB8553  
WBNNEB8709  
WBNNEB8643  
CRDR HED 109  
CRDR HED 89/HEC 5240  
WBPER940279  
WBPER940423  
WBPER940670  
WBSCA940032  
WBPER950650

Solenoid valves for cntmt isol replaced on MR  
Missing pipe tubing caps  
Inductive kickback from RL-1, failure resets  
Noise causes spurious actuations  
Containment isolation valve and piping classification  
Undocumented changes to ratemeters  
Calibration documentation missing  
E-MAX power supplies not qualified  
Iodine lo flow switches don't work in application  
Lack of load data  
Particulate plateau concerns  
Containment isolation valves not supplied with essential control air  
Radiation analyzer indicator light labels  
Recorder Scales  
Non-qualified recorders tied directly to class 1E ratemeters  
General sample line deficiencies, heat trace requirements  
Degraded wiring from particulate detector to electronics box  
Coax to single conductor transition  
Difficulty in obtaining good samples through grab sample valves

**Design Change Notice:**

02440  
03445  
06378  
06805  
06806  
06973  
09378  
09378  
09378  
34113  
10604  
13516  
34605  
35465  
35465  
23237  
23237  
23237  
WB-DC-40-24  
WB-DC-40-24  
33714  
34605  
23167  
27485  
W-37518  
W-37566  
W-37677  
S-36049  
34113  
36049  
30313  
34195

**Related Deficiency:**

WBP870870  
WBP870728  
WBP890192; CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP880318  
WBNEEB8724 R3  
WBP890192  
WBPER940423  
WBNEEB8724 R3  
WBP880318  
WBPER940423  
WBNEEB8724 R3  
WBPER940423  
W-272-P  
WBP880318  
CRDR HED 89/HEC 5240  
WBNEEB8724 R3  
WBPER940279  
WBPER940670  
WBPER940423  
WBSCA940032  
N/A  
WBPER940279  
  
WBPER940423  
WBPER940601  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Add diode across RL-1 alarm relay  
Install pipe tubing caps  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, general sample line upgrades for 1-RE-90-112: slope exception, bend radius exception, correct code class (documentation)  
Condition A2 of WBNEEB8724, general sample line upgrades for 1-RE-90-106: slope exception, bend radius exception, correct code class (documentation)  
Condition A8 of WBNEEB8724, Sample line documentation correction  
Add noise suppression networks, correct detector loop grounds  
Condition A8 of WBNEEB8724, Rebuild detectors, standardize internal wiring  
Return defective preamp boards to documented configuration  
Add references to calcs and other dwgs on isometrics  
Documentation corrections only  
Delete containment isolation output from hi rad alarm relay  
Revise isometric per DCN 17836 changes  
Condition A4 to WBNEEB8724, Add heat trace to sample line  
Add heat trace to sample line  
Replace iodine low flow switch  
Wrap internal detector cables with EMI tape  
Correct recorder scales  
Condition A4 of WBNEEB8724, R4 of design criteria, WB-DC-40-24, permits pumps to be isolated with no auto cut off  
Design criteria, WB-DC-40-24, R4, test recorders for interface with class 1E ratemeters  
Correct degraded wiring between 10 CFM filter and electronics box  
Reconcile isometrics 47W600-465P to walkdowns  
Provide materials, instructions for coax to single conductor transition  
SSDs  
Add notes to Isolation tabs, special requirements for recorders based on seismic test, contract 141254  
Resolve ground loops - shield ties, local indicator & ERFDS  
Resolve ground loops - ERFDS isolators  
Indicate valves correctly  
Add references to calcs and other dwgs on isometrics.  
Correct valve depiction  
PAM upgrades  
Replace quick disconnect

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-112

**Monitor Type:**  
Particulate, Iodine & Gas (PIG)

**Monitor Classification:**  
**Tech Spec:** Yes  
**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:**  
**TVA Deficiency:**

Containment Building Upper Compartment Monitor

**Description of Deficiency:**

<p>WBNEEB8724 R3 WBNEEB8724 R3 WBNEEB8724 R3 WBNEEB8724 R3 WBPER940601</p> <p>WBP870606 WBP870728 WBP870870 WBP880318 WBP880351 WBP890192 WBP890396 WBP890586 W-272-P WBNEEB8553 WBNEEB8709 WBNEEB8643 CRDR HED 109 CRDR HED 89/HEC 5240 WBPER940279 WBPER940423 WBPER940670 WBSCA940032 WBPER950650</p>	<p>Condition A2 of WBNEEB8724, General sample line routing problems Condition A4 of WBNEEB8724, Sample line length, traps, no heat trace, separation problems; no purge capability; pump damage on cntmt isolation Condition A8 on WBNEEB8724, Documentation inconsistencies Condition G of WBNEEB8724, Temperatures above detector limits Doc errors</p> <p>Solenoid valves for cntmt isol replaced on MR Missing pipe tubing caps Inductive kickback from RL-1, failure resets Noise causes spurious actuations Containment isolation valve and piping classification Undocumented changes to ratemeters Calibration documentation missing E-MAX power supplies not qualified Iodine low flow switches don't work in application Lack of load data Particulate plateout concerns Containment isolation valves not supplied with essential control air Radiation analyzer indicator light labels Recorder Scales Non-qualified recorders tied directly to class 1E ratemeters General sample line deficiencies, heat trace requirements Degraded wiring from particulate detector to electronics box Coax to single conductor transition Difficulty in obtaining good samples through grab sample valves</p>
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**Design Change Notice:**

**Related Deficiency:**

**Description of Design Changes/Field Modifications:**

<p>02440 03445 06378 06805 06806 06973 09378 09378 09378 34113 10604 13516 34605 35465 35465 23237 23237 23237 WB-DC-40-24 WB-DC-40-24 33714 34605 23167 27485 W-37518 W-37566 W-37677 S-36049 34113 36049 30313 34195</p>	<p>WBP870870 WBP870728 WBPER940192; CRDR HED 109 WBNEEB8724 R3 WBNEEB8724 R3 WBNEEB8724 R3 WBP880318 WBNEEB8724 R3 WBP890192 WBPER940423 WBNEEB8724 R3 WBP880318 WBPER940423 WBNEEB8724 R3 WBPER940423 W-272-P WBP880318 CRDR HED 89/HEC 5240 WBNEEB8724 R3 WBPER940279 WBPER940670 WBPER940423 WBSCA940032 N/A WBPER940279</p> <p>WBPER940423 WBPER940601 N/A N/A</p>	<p>Add diode across RL-1 alarm relay Install pipe tubing caps Install new ratemeters and power supply Condition A2 of WBNEEB8724, general sample line upgrades for 1-RE-90-112: slope exception, bend radius exception, correct code class (documentation) Condition A2 of WBNEEB8724, general sample line upgrades for 1-RE-90-106: slope exception, bend radius exception, correct code class (documentation) Condition A8 of WBNEEB8724, Sample line documentation correction Add noise suppression networks, correct detector loop grounds Condition A8 of WBNEEB8724, Rebuild detectors, standardize internal wiring Return defective preamp boards to documented configuration Add reference to calcs and other dwgs on isometrics Documentation corrections only Delete containment isolation output from hi rad alarm relay Revise isometrics per DCN 17836 changes Condition A4 to WBNEEB8724, Add heat trace to sample line Add heat trace to sample line Replace iodine low flow switch Wrap internal detector cables with EMI tape Correct recorder scales Condition A4 of WBNEEB8724, R4 of design criteria, WB-DC-40-24, permits pumps to be isolated with no auto cut off Design criteria, WB-DC-40-24, R4, test recorders for interface with class 1E ratemeters Correct degraded wiring between 10 CFM filter and electronics box Reconcile isometrics 47W/600-485P to walkdowns Provide materials, instructions for coax to single conductor transition SSDs Add notes to Isolation tabs, special requirements for recorders based on seismic test, contract 141254 Resolve ground loops - shield ties, local indicator &amp; ERFDS Resolve ground loops - ERFDS isolators Indicate valves correctly Add references to calcs and other dwgs on isometrics. Correct valve depiction PAM upgrades Replace quick disconnects</p>
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**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-119

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** Yes

**Reg. Guide 1.97:** Yes

**Safety Related:** No

**Monitor Description:** Condenser Vacuum Pump Air Exhaust Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP8940601  
WBP870728PER  
WBP890192  
WBP890396  
WBP900107  
WBNEEB8553  
CRDR HED 109  
CRDR HED/89/HEC 5252  
WBP8940423  
WBP880318PER  
WBSA940032

**Description of Deficiency:**

Condition A2 of SCRWBNEEB8724, general sample line routing problems  
Condition A7 of SCRWBNEEB8724, moisture in condenser vacuum pump exhaust lines  
Condition A8 of SCRWBNEEB8724, documentation discrepancies  
Condition G of SCRWBNEEB8724, temperatures exceeding detector limits  
Documentation errors  
Missing pipe tubing caps  
Undocumented changes to ratemeters  
Calibration documentation missing  
Non-radioactive check source (applicable to loop 119 only)  
Lack of load data  
Radiation analyzer labels  
Recorder scales (119 only)  
\*T\* in line to sampler 129, probes too close to disturbance, general sample line problems  
Noise Problems  
Coax to single conductor transitions

**Design Change Notice:**

03445  
06378  
06378  
17610  
36049  
06973  
09309  
S-37630  
09309  
09309  
S-37910  
17610  
17610  
23236  
W37566  
23236  
33688  
23167  
27485  
S36049  
09309  
10604  
W38500  
W38631  
30312

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBP8940601  
WBNEEB8724 R3  
WBP880318  
DD 95-371  
WBP890396  
WBP890192  
WBP8940601  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP880318  
N/A  
CRDR HED 89/HEC 5252  
WBP8940423  
WBSA940032  
N/A  
WBNEEB8724 R3  
WBNEEB8724 R3  
N/A

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A2 of SCRWBNEEB8724, general sample line upgrades: reroute S.L., add purge capability  
Correct valve depiction  
Condition A8 of SCRWBNEEB8724, sample line as-constructed  
Add noise suppression networks, correct detector loop grounds  
Correct drawing discrepancies, relative locations of flange and probe  
Replace scintillator if required  
Return defective preamp boards to documented configuration  
Lower flow limits  
Condition G of SCRWBNEEB8724, reroute sample line  
Condition A7 of SCRWBNEEB8724, reroute sample line  
Wrap detector cables inside monitor with EMI tape, Add jumper to LED driver board, loop 119 only  
Resolve ground loop problem (shield connections)  
Correct recorder scales  
Remove "T" in sample line, move 129 up one floor to its own line, abandon 99 in place  
Provide materials/instructions for coax to single conductor transition  
SSDs  
Show type valves correctly  
Condition A8 of WBNEEB8724, Rebuild detectors, correct piping interference, standardize internal wiring  
Condition A8 of WBNEEB8724, Documentation corrections only  
Install noise suppression across LED Ck source card  
Disable Ck source when not required to prevent noise from actuating diode and initiating spurious hi rad alarms (special noise problem on 119 only)  
Pam upgrades

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

<b>Radiation Monitor:</b> 1-RE-90-120	<b>Monitor Type:</b> Liquid	<b>Monitor Classification:</b> Tech Spec: No	<b>ODCM:</b> Yes	<b>Reg. Guide 1.97:</b> No	<b>Safety Related:</b> No
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**Monitor Description:** Steam Generator Blowdown Liquid Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A3 of WBNEEB8724, Undocumented manifold challenges sample content  
Condition A8 of WBNEEB8724, Documentation inconsistencies  
Condition B of WBNEEB8724, Pressure control valves shown in design not installed in the plant  
Condition G of WBNEEB8724, Temperatures and pressures above detector limits

WBP880407  
WBP890192  
WBP890396  
WBNEEB 8553  
WBNNEB8703  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBP8940423  
WBP8940572  
WBSA940032  
WBP880318  
WBP870728

Orifice plate use to reduce pressure; possible overpressurization of monitor and personal injury  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Piping Class interfaces: drawing discrepancy  
Radiation analyzer indicator light labels  
Recorder Scales  
General sample line deficiencies  
Sample heat exchanger not functioning per requirements  
Coax to single conductor transition  
Noise problems  
Missing pipe tubing caps

**Design Change Notice:**

03445  
06378  
06378  
06804  
06804  
06804  
06804  
06804  
06973  
06973  
09308  
10604  
23235  
23235  
30769  
33455  
33253  
23167  
  
31324  
35985  
W-37566  
W-38628-A  
04193  
37401

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP880407  
WBNEEB8724 R3  
WBNNEB8703 R3  
WBNEEB8724, WBP880318  
WBNEEB8724 R3  
N/A  
CRDR HED 89/HEC 5252  
N/A  
N/A  
N/A  
WBP8940572  
WBSA940032  
WBP8940423  
N/A  
  
N/A  
  
PIRWBNEEB8703  
N/A

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, install pressure control valves; rework line from flash tank  
Condition A3 of WBNEEB8724, install pressure control valves; rework line from flash tank  
Condition G of WBNEEB8724, install pressure control valves; rework line from flash tank  
Install pressure control valves; rework line from flash tank  
Condition A8 of WBNEEB8724, Sample line as-constructed  
Sample line as-constructed  
Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition A8 of WBNEEB8724, documentation corrections  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Change purge valves from 3/8" to 1"  
Provide block switch to prevent actuations during check source operation  
Reverse sample heat exchanger tube side/shell side connections  
Provide materials, instructions for coax to single conductor transition  
R4 of design criteria, WB-DC-40-24, resolves or incorporates exceptions  
Replace orifice plate with larger orifice for operability  
SSDs  
Ground loops - shielded ties  
Add noise suppression across flow alarm lights  
Correct piping class on drawing  
Correct block function to allow alarm

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

<b>Radiation Monitor:</b> 1-RE-90-121	<b>Monitor Type:</b> Liquid	<b>Monitor Classification:</b> Tech Spec: No	<b>ODCM:</b> Yes	<b>Reg. Guide 1.97:</b> No	<b>Safety Related:</b> No
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**Monitor Description:** Steam Generator Blowdown Liquid Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A3 of WBNEEB8724, Undocumented manifold challenges sample content  
Condition A8 of WBNEEB8724, Documentation inconsistencies  
Condition B of WBNEEB8724, Pressure control valves shown in design not installed in the plant  
Condition G of WBNEEB8724, Temperatures and pressures above detector limits

WBP880407  
WBP890192  
WBP890396  
WBNEEB 8553  
WBNEEB8703  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBPER940423  
WBPER940572  
WBSCA940032  
WBP880318  
WBP870728

Orifice plate use to reduce pressure; possible overpressurization of monitor and personal injury  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Piping Class interfaces: drawing discrepancy  
Radiation analyzer indicator light labels  
Recorder Scales  
General sample line deficiencies  
Sample heat exchanger not functioning per requirements  
Coax to single conductor transition  
Noise problems  
Missing pipe tubing caps

**Design Change Notice:**

03445  
06378  
06378  
06804  
06804  
06804  
06804  
06804  
06973  
06973  
09308  
10604  
23235  
23235  
30769  
33455  
33253  
23167  
  
31324  
35985  
W-37566  
W-38628-A  
04193  
37401

**Related Deficiency:**

WBP870728  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP880407  
WBNEEB8724 R3  
WBNEEB8703 R3  
WBNEEB8724, WBP880318  
WBNEEB8724 R3  
N/A  
CRDR HED 89/HEC 5252  
N/A  
N/A  
WBPER940572  
WBSCA940032  
WBPER940423  
N/A  
  
N/A  
  
PIRWBNNEEB8703  
N/A

**Description of Design Changes/Field Modifications:**

Install missing pipe tubing caps  
Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 of WBNEEB8724, Install pressure control valves; rework line from flash tank  
Condition A3 of WBNEEB8724, install pressure control valves; rework line from flash tank  
Condition G of WBNEEB8724, install pressure control valves; rework line from flash tank  
Install pressure control valves; rework line from flash tank  
Condition A8 of WBNEEB8724, Sample line as-constructed  
Sample line as-constructed  
Condition A8 of WBNEEB8724, correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition A8 of WBNEEB8724, documentation corrections  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Change purge valves from 3/8" to 1"  
Provide block switch to prevent actuations during check source operation  
Reverse sample heat exchanger tube side/shell side connections  
Provide materials, instructions for coax to single conductor transition  
R4 of design criteria, WB-DC-40-24, resolves or incorporates exceptions  
Replace orifice plate with larger orifice for operability  
SSDs  
Ground loops - shielded ties  
Add noise suppression across flow alarm lights  
Correct piping class discrepancy  
Correct block function to allow alarm

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-123

Monitor Type:  
Liquid

Monitor Classification:  
Tech Spec: No

ODCM:  
No

Reg. Guide 1.97:  
No

Safety Related:  
No

Monitor Description: Component Cooling System Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
WBP880272  
WBP880273  
WBP890192  
WBP890396  
WBNEEB8553  
CRDR HED 40  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBPER940423  
WBSCA940032  
WBP880318

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Doc errors  
Non-seismically qualified flow switch (0, 1-123)  
Non-seismically qualified flow switch (2-123)  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Nuisance alarm  
Radiation analyzer indicator light labels  
Recorder Scales  
General sample line deficiencies  
Coax to single conductor transition  
Noise problems

**Design Change Notice:**

06378  
06378  
06801

06973  
09308  
10604  
15423  
15423  
23235  
23235  
23167  
33686

W-37566  
S-38049

**Related Deficiency:**

WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
  
WBNEEB8724 R3  
WBNEEB8724, WBP880318  
WBNEEB8724 R3  
WBP880272  
WBP880273  
N/A  
CRDR HED 89/HEC 5252  
WBSCA940032  
CRDR HED 40  
WBPER940423  
N/A  
WBPER940601

**Description of Design Changes/Field Modifications:**

Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 to WBNEEB8724, replace inlet and outlet isolation valves w/ss globe; add recirc purge/test valves; take exception for carbon steel root valves  
  
Condition A8 of WBNEEB8724, Sample line as constructed  
Condition A8 of WBNEEB8724, Correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition A8 of WBNEEB8724, Documentation corrections resolves non-seismic flow switch (documentation)  
Resolves non-seismic flow switch (documentation)  
Documentation corrections resolves non-seismic flow switch (documentation)  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Provide materials, instructions for coax to single conductor transition  
Block alarm when monitor not in use  
Resolve or incorporate exceptions in R4 of design criteria, WB-DC-40-24  
Ground loops - shield ties (1-123 only)  
Show valves correctly, EMS corrections

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-129

Monitor Type:  
Sampler

Monitor Classification:  
Tech Spec: No

ODCM: Yes

Reg. Guide 1.97: No

Safety Related: No

Monitor Description:  
TVA Deficiency:

Condenser Vacuum Pump Air Exhaust Monitor

SCRWBNEEB8724  
SCRWBNEEB8724  
SCRWBNEEB8724  
WBP880402  
WBPER940423  
PIRWBNEEB8553  
WBPER940601  
WBNNEEB8709

Description of Deficiency:

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Condition A2 of SCRWBNEEB8724, general sample line routing problems  
Condition A7 of SCRWBNEEB8724, moisture in condenser vacuum pump  
Incorrect documentation of isolation valves  
Tee in line to 129, sample probe location too close to disturbance, isometrics & transmission calculation not revised for DCN-17610  
Lack of load data  
Documentation errors  
Particulate plateau concerns

Design Change Notice:

22320  
03436  
06803  
17610  
06973  
10604  
17610  
36049  
33688  
S37630  
W36528

Related Deficiency:

WBP880402  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
WBPER940423  
DD 95-0371  
F36896,F37909

Description of Design Changes/Field Modifications:

Move 0-RE-90-128 outside Unit 1 boundary  
Correct isolation valve position documentation  
Cond A2 of WBNEEB8724, gen smpl line upgrades/0-RE-90-128: inlet/outlet reversal justification; slope exception  
Cond A2 of WBNEEB8724, gen smpl line upgrades/1-RE-90-129: eval, repl nozzle; repl T w/ Y conn; add purge capability  
Condition A8 of SCRWBNEEB8724, correct sample line documentation  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Condition A7 of SCRWBNEEB8724, reroute sample line (129 only)  
Depict valves correctly  
Remove tee fm line to 129, move 129 up one floor & install new probe at proper dist fm flow disturbance, add heat trace  
Correct dwg discrepancy - tubing fittings, downstream of filter  
1-RE-90-129 SSD

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-130

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** Yes

**ODCM:** Yes

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:**  
**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP880318  
WBP890192  
WBP890396  
WBP890401  
WBP890422SCA  
WBP890586  
PIRWBNEEB8553  
PIRWBNNNEB8705  
PIRWBNNNEB8709  
WBSCA940032  
WBP8904023  
WBP8904061

**Containment Purge Air Exhaust Monitor**

**Description of Deficiency:**

Condition A8 of WBNEEB8724, general documentation inconsistencies  
Condition A2 of WBNEEB8724, general sample line routing problems  
Condition G of WBNEEB8724, detector temperature limit exceeded  
Missing pipe tubing caps  
Noise causes false actuations  
Undocumented changes to ratemeters  
Calibration documentation missing  
No continuous indication of cpm in control room  
Local RP-30 wires scrapped bare  
E-MAX power supplies not qualified  
Lack of load data  
Specific documentation discrepancies  
Particulate plateout concerns  
Coax to single conductor transition  
General sample line deficiencies with regard to design criteria requirements  
Documentation errors

**Design Change Notice:**

03445  
06378  
06802  
06973  
07064  
09309  
09309  
09309  
10604  
11304  
23236  
23236  
09309  
36049  
  
27485  
36720  
S32449  
W37677  
34421

**Related Deficiency:**

WBP870728  
WBP890192  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890422  
WBP880318  
WBNEEB8724 R3  
WBP890192  
WBNEEB8724 R3  
WBP890586  
WBP880318  
WBNNNEB8705  
WBP890396  
WBP8904061  
WBP8904023  
N/A  
  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters and power supply  
Condition A2, Gen smpl In upgrades: replace root & isol vives; 4 exceptions: slope, bend radius, separations, vive stamp  
Condition A8, Sample line as-constructed  
Add grommet to prevent wire damage  
Add noise suppression networks, correct detector loop grounds  
Condition A8, Rebuild detectors, correct piping interference, standardize internal wiring  
Return defective preamp boards to documented configuration  
Condition A8, Documentation corrections only  
Replace power supply in R-163, 164.  
Wrap detector cables inside monitor with EMI tape  
Documentation only: specific drawing discrepancies  
Replace scintillators if required  
Depict valves correctly  
R4 of Design Criteria, WB-DC-40-24, resolves or incorporates sample line exceptions  
SSDs  
Move sample points out of dead air space  
Test requirements  
Resolve ground loops - shield ties & isolator grounds  
Preoperational test criteria

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-131

**Monitor Type:**  
Gas

**Monitor Classification:**  
**Tech Spec:** Yes

**ODCM:** Yes

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:**

Containment Purge Air Exhaust Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP880318  
WBP890192  
WBP890396  
WBP890401  
WBP890422  
WBP890586  
WBNEEB8553  
WBNEEB8705  
WBNEEB8709  
WBSA940032  
WBP890423  
WBP890601

**Description of Deficiency:**

Condition A8 of WBNEEB8724, general documentation inconsistencies  
Condition A2 of WBNEEB8724, general sample line routing problems  
Condition G of WBNEEB8724, detector temperature limit exceeded  
Missing pipe tubing caps  
Noise causes false actuations  
Undocumented changes to ratemeters  
Calibration documentation missing; Eberline GM Tubes  
No continuous indication of cpm in control room  
Local RP-30 wires scrapped bare  
E-MAX power supplies not qualified  
Lack of load data  
Specific documentation discrepancies  
Particulate plateout concerns  
Coax to single conductor transition  
General sample line deficiencies with regard to design criteria requirements  
Documentation errors

**Design Change Notice:**

03445  
06378  
06802  
06973  
07064  
09309  
09309  
09309  
09309  
10604  
11304  
23236  
23236  
09309  
36049  
  
27485  
36720  
S32449  
W37677  
34421

**Related Deficiency:**

WBP870728  
WBP890192  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890422  
WBP880318  
WBNEEB8724 R3  
WBP890192  
WBNEEB8724 R3  
WBP890586  
WBP880318  
WBNEEB8705  
WBP890396  
WBP890601  
WBP890423  
N/A  
  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Add pipe tubing caps  
Install new ratemeters and power supply  
Condition A2, Gen smpl ln upgrades: replace root & isol vives; 4 exceptions: slope, bend radius, separations, vive stamp  
Condition A8, Sample line as-constructed  
Add grommet to prevent wire damage  
Add noise suppression networks, correct detector loop grounds  
Condition A8, Rebuild detectors, correct piping interference, standardize internal wiring  
Return defective preamp boards to documented configuration  
Condition A8, Documentation corrections only  
Replace power supply in R-163, 164  
Wrap detector cables inside monitor with EMI tape  
Documentation only: specific drawing discrepancies  
Replace scintillators if required  
Depict valves correctly  
R4 of Design Criteria, WB-DC-40-24, resolves or incorporates sample line exceptions  
SSDs  
Move sample points out of dead air space  
Test requirements  
Resolve ground loops - shield ties & isolator grounds  
Preoperational test criteria

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-271

Monitor Type:  
Area

Monitor Classification:  
Tech Spec: ODCM:  
Yes No

Reg. Guide 1.97:  
Yes

Safety Related:  
Yes

Monitor Description: RB Upper Compartment PAM Monitor

**TVA Deficiency:**

WBNEEB8724  
WBP890586  
WBP890396  
WBNEEB8553  
CDR HED 109  
CRDR HED 89/HEC 5250  
WBPER940519  
WBPER940534  
WBPER940072  
WBSA940032

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
E-MAX rack power supplies not qualified  
Calibration documentation  
Load data missing  
Radiation analyzer indicator light labels  
Recorder scales  
Ion chambers/boxes swapped in rework; were calibrated as a pair  
273 & 274 not mounted with flat washers as shown in VTM  
SE calibration methods  
Penetration terminations of coax; coax to single conductor transition

**Design Change Notice:**

10604  
11304  
23167  
23167  
RD1030623  
Contract 108598  
RD100708909153  
N/A  
S-32449  
27485  
34421

**Related Deficiency:**

WBNEEB8724  
WBP890586  
CRDR HED 89/HEC 5250  
WBSA940032  
WBPER940519  
WBPER940072  
WBSA940032  
WBPER940534  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Condition A8 to SCRWBNEEB8724, documentation corrections only  
Replace power supplies in R-163,164  
Correct recorder scales  
Provide materials/instructions for coax to single conductor transition  
Return ion chambers for recalibration in boxes as installed  
Purchase new RT-11 calibration source  
Correct connector to cable termination  
Incorporated into WBSA 910259; became civil issue  
Test requirements  
SSDs  
Preoperational test criteria

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-272

Monitor Type:  
Area

Monitor Classification:  
Tech Spec: Yes  
ODCM: No

Reg. Guide 1.97:  
Yes

Safety Related:  
Yes

Monitor Description: RB Upper Compartment PAM Monitor

TVA Deficiency:

WBNEEB8724  
WBP890586  
WBP890396  
WBNEEB8553  
CDR HED 109  
CRDR HED 89/HEC 5250  
WBP8940519  
WBP8940534  
WBP8940072  
WBSCA940032

Description of Deficiency:

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
E-MAX rack power supplies not qualified  
Calibration documentation  
Load data missing  
Radiation analyzer indicator light labels  
Recorder scales  
Ion chambers/boxes swapped in rework; were calibrated as a pair  
273 & 274 not mounted with flat washers as shown in VTM  
SE calibration methods  
Penetration terminations of coax; coax to single conductor transition

Design Change Notice:

10604  
11304  
23167  
23167  
RD1030623  
Contract 108598  
RD100708909153  
N/A  
S-32449  
27485  
34421

Related Deficiency:

WBNEEB8724  
WBP890586  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBP8940519  
WBP8940072  
WBSCA940032  
WBP8940534  
N/A  
N/A

Description of Design Changes/Field Modifications:

Condition A8 to SCRWBNEEB8724, documentation corrections only  
Replace power supplies in R-163,164  
Correct recorder scales  
Provide materials/instructions for coax to single conductor transition  
Return ion chambers for recalibration in boxes as installed  
Purchase new RT-11 calibration source  
Correct connector to cable termination  
Incorporated into WBSCA 910259; became civil issue  
Test requirements  
SSDs  
Preop test criteria

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-273

Monitor Type:  
Area

Monitor Classification:  
Tech Spec: Yes  
ODCM: No

Reg. Guide 1.97:  
Yes

Safety Related:  
Yes

Monitor Description:  
TVA Deficiency:

RB Lower Compartment PAM Monitor

WBNEEB8724  
WBP890586  
WBP890396  
WBNEEB8553  
CDR HED 109  
CRDR HED 89/HEC 5250  
WPPER940519  
WPPER940534  
WPPER940072  
WBSA940032

Description of Deficiency:

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
E-MAX rack power supplies not qualified  
Calibration documentation  
Load data missing  
Radiation analyzer indicator light labels  
Recorder scales  
Ion chambers/boxes swapped in rework; were calibrated as a pair  
273 & 274 not mounted with flat washers as shown in VTM  
SE calibration methods  
Penetration terminations of coax; coax to single conductor transition

Design Change Notice:

10604  
11304  
23167  
23167  
RD1030623  
Contract 108598  
RD100708909153  
N/A  
S-32449  
27485  
34421

Related Deficiency:

WBNEEB8724  
WBP890586  
CRDR HED 89/HEC 5250  
WBSA940032  
WPPER940519  
WPPER940072  
WBSA940032  
WPPER940534  
  
N/A  
N/A

Description of Design Changes/Field Modifications:

Condition A8 to SCRWBNEEB8724, documentation corrections only  
Replace power supplies in R-163,164  
Correct recorder scales  
Provide materials/instructions for coax to single conductor transition  
Return ion chambers for recalibration in boxes as installed  
Purchase new RT-11 calibration source  
Correct connector to cable termination  
Incorporated into WBSA 910259; became civil issue  
Test requirements  
SSDs  
Preop test criteria

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-274

Monitor Type:  
Area

Monitor Classification:  
Tech Spec: Yes

ODCM:  
No

Reg. Guide 1.97:  
Yes

Safety Related:  
Yes

Monitor Description:  
TVA Deficiency:

RB Lower Compartment PAM Monitor

WBNEEB8724  
WBP890586  
WBP890396  
WBNEEB8553  
CDR HED 109  
CRDR HED 89/HEC 5250  
WBPER940519  
WBPER940534  
WBPER940072  
WBSCA940032

Description of Deficiency:

Condition A8 of SCRWBNEEB8724, documentation discrepancies  
E-MAX rack power supplies not qualified  
Calibration documentation  
Load data missing  
Radiation analyzer indicator light labels  
Recorder scales  
Ion chambers/boxes swapped in rework; were calibrated as a pair  
273 & 274 not mounted with flat washers as shown in VTM  
SE calibration methods  
Penetration terminations of coax; coax to single conductor transition

Design Change Notice:

10604  
11304  
23167  
23167  
RD1030623  
Contract 108598  
RD100708909153  
N/A  
S-32449  
27485  
34421

Related Deficiency:

WBNEEB8724  
WBP890586  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBPER940519  
WBPER940072  
WBSCA940032  
WBPER940534  
  
N/A  
N/A

Description of Design Changes/Field Modifications:

Condition A8 to SCRWBNEEB8724, documentation corrections only  
Replace power supplies in R-163,164  
Correct recorder scales  
Provide materials/instructions for coax to single conductor transition  
Return ion chambers for recalibration in boxes as installed  
Purchase new RT-11 calibration source  
Correct connector to cable termination  
Incorporated into WBSCA 910259; became civil issue  
Test requirements  
SSDs  
Preop test criteria

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-275

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description: Reactor Coolant Drain Tank Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
SCRWBNEEB8680  
WBPER940072  
WBSCA940032  
WBPER950680

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, location, mounting, geometry missing  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1's  
Vendor changes to RD-1 electronics card, bad fit  
Lack of load data  
Radiation analyzer indicator light scales  
Recorder scales  
Cat A/C interface violations  
Sorrento calibration methods: RT-10, RT-11 calibrators  
Transition from coax to single conductor  
Low signal experienced before source operation results in downscale failure alarms in MCR

**Design Change Notice:**

02440  
05002  
06378  
06378  
10604  
23167  
23167  
23167  
RD1007089  
TACF 1-96-01-90

**Related Deficiency:**

WBP870870  
WBNEEB8680  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBPER940072  
WBPER950680

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1  
Add isolation for Cat A/C interface  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Condition A6 of SCRWBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
Purchase new RT-10, RT-11 calibrators  
Add temporary keep alive sources to prevent spurious alarms

**Watts Experimental Reactor Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-276

**Monitor Type:**  
Shine

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** Yes

**Monitor Description:** Reactor Coolant Drain Tank Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
SCRWBNEEB8680  
WBP8940072  
WBSCA940032  
WBP8950680  
WBP8950075

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, location, mounting, geometry missing  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1's  
Vendor changes to RD-1 electronics card, bad fit  
Lack of load data  
Radiation analyzer indicator light scales  
Recorder scales  
Cat A/C interface violations  
Sorrento calibration methods: RT-10, RT-11 calibrators  
Transition from coax to single conductor  
Low signal experienced before source operation results in downscale failure alarms in MCR  
Use of old scale in new QA ratemeter.

**Design Change Notice:**

02440  
05002  
06378  
06378  
10604  
23167  
23167  
23167  
RD1007089  
TACF 1-98-01-90  
92-1662500

**Related Deficiency:**

WBP870870  
WBNEEB8680  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBP8940072  
WBP8950680  
WBP8950075

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1  
Add isolation for Cat A/C interface  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Condition A6 of SCRWBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
Purchase new RT-10, RT-11 calibrators  
Add temporary keep alive sources to prevent spurious alarms  
Correct scale to new

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-277

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description: Reactor Building Floor and Equipment Drain Sump Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
SCRWBNEEB8680  
WBPER940072  
WBSCA940032  
WBPER950680

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, location, mounting, geometry missing  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1's  
Vendor changes to RD-1 electronics card, bad fit  
Lack of load data  
Radiation analyzer indicator light scales  
Recorder scales  
Cat A/C interface violations  
Sorrento calibration methods: RT-10, RT-11 calibrators  
Transition from coax to single conductor  
Low signal experienced before source operation results in downscale failure alarms in MCR

**Design Change Notice:**

02440  
05002  
06378  
06378  
10604  
23167  
23167  
23167  
RD1007089  
TACF 1-96-01-90

**Related Deficiency:**

WBP870870  
WBNEEB8680  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBPER940072  
WBPER950680

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1  
Add isolation for Cat A/C interface  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Condition A6 of SCRWBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
Purchase new RT-10, RT-11 calibrators  
Add temporary keep alive sources to prevent spurious alarms

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-278

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description:

Reactor Building Floor and Equipment Drain Sump Monitor

TVA Deficiency:

SCRWBNEEB8724  
SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
SCRWBNEEB8680  
WBP8940072  
WBSCA940032  
WBP8950680

Description of Deficiency:

Condition A6 of SCRWBNEEB8724, location, mounting, geometry missing  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1's  
Vendor changes to RD-1 electronics card, bad fit  
Lack of load data  
Radiation analyzer indicator light scales  
Recorder scales  
Cat A/C interface violations  
Sorrento calibration methods: RT-10, RT-11 calibrators  
Transition from coax to single conductor  
Low signal experienced before source operation results in downscale failure alarms in MCR

Design Change Notice:

02440  
05002  
06378  
06378  
10604  
23167  
23167  
23167  
RD1007089  
TACF 1-96-01-90

Related Deficiency:

WBP870870  
WBNEEB8680  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBP8940072  
WBP8950680

Description of Design Changes/Field Modifications:

Add diode, alarm relay coil, RL-1  
Add isolation for Cat A/C interface  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Condition A6 of SCRWBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
Purchase new RT-10, RT-11 calibrators  
Add temporary keep alive sources to prevent spurious alarms

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-280

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Post Accident Sampling Room Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP8940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378  
30354

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP8940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399  
N/A

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674.  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2  
Correct scale

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-290

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description: RHR Post Accident Monitor

**TVA Deficiency:**

WBNEEB8724  
WBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
WPPER940072  
WBSA940032  
WPPER950256

**Description of Deficiency:**

Condition A6 of WBNEEB8724, location, mounting, geometry missing  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1's (applicable to loops 290 and 292)  
Vendor changes to RD-1 electronics card, bad fit (applicable to loops 290 and 292)  
Lack of load data  
Radiation analyzer indicator light labels  
Recorder scales  
RT-10, RT-11 transfer data; SE calibration methods  
Transition from coax to single conductor  
Hi range (291, 293) will not alarm at local indicator because +24 volts is not supplied

**Design Change Notice:**

02440  
5002  
36274  
10604  
23167  
23167  
23167  
23409  
RD1007089  
S-37910

**Related Deficiency:**

WBP870870  
WBNEEB8680  
WPPER950256  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSA940032  
N/A  
WPPER940072  
WBNEEB8724 R3

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1  
Add isolation for Cat A/C interface  
Delete local alarm requirement for 291, 293  
Condition A8 of WBNEEB8724, documentation corrections only  
Condition A6 of WBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
SSDs  
Order new RT-10, RT-11 calibrators  
Condition A6 of WBNEEB8724, Correct RE-90-292 document change

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-291

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description:  
TVA Deficiency:

RHR Post Accident Monitor

WBNEEB8724  
WBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
PIRWBNEEB8553  
WBSA940032  
WPPER950256  
CRDR HED 109  
CRDR HED 89/HEC 5250  
WPPER940072  
WBSA940032  
WPPER950256

Description of Deficiency:

Condition A6 of WBNEEB8724, location, mounting, geometry missing  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Transition from coax to single conductor  
Hi range (291, 293) will not alarm at local indicator because +24 volts is not supplied  
Radiation analyzer indicator light labels  
Recorder scales  
RT-10, RT-11 transfer data; SE calibration methods  
Transition from coax to single conductor  
Hi range (291, 293) will not alarm at local indicator because +24 volts is not supplied

Design Change Notice:

02440  
06378  
06378  
10604  
23167  
23167  
23167  
23409  
RD1007089  
S-37910  
36274, 36836

Related Deficiency:

WBP870870  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSA940032  
N/A  
WPPER940072  
WBNEEB8724 R3  
WPPER950256

Description of Design Changes/Field Modifications:

Add diode, alarm relay coil, RL-1  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A8 of WBNEEB8724, documentation corrections only  
Condition A6 of WBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
SSDs  
Order new RT-10, RT-11 calibrators  
Condition A6 of WBNEEB8724, Correct RE-90-292 document change  
Delete local alarm requirement for 291, 293

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-292

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description: RHR Post Accident Monitor

**TVA Deficiency:**

WBNEEB8724  
WBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
WBP8940072  
WBSCA940032  
WBP8950256  
WBP8950390

**Description of Deficiency:**

Condition A6 of WBNEEB8724, location, mounting, geometry missing  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing  
Unauthorized "keep alive" source in RD-1's (applicable to loops 290 and 292)  
Vendor changes to RD-1 electronics card, bad fit (applicable to loops 290 and 292)  
Lack of load data  
Radiation analyzer indicator light labels  
Recorder scales  
RT-10, RT-11 transfer data; SE calibration methods  
Transition from coax to single conductor  
Hi range (291, 293) will not alarm at local indicator because +24 volts is not supplied  
Location not per design output

**Design Change Notice:**

02440  
06378  
06378  
10604  
23167  
23167  
23167  
23409  
RD1007089  
S-37910  
95-18363-00

**Related Deficiency:**

WBP870870  
WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
N/A  
WBP8940072  
WBNEEB8724 R3  
WBP8950390

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Condition A8 of WBNEEB8724, documentation corrections only  
Condition A6 of WBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
SSDs  
Order new RT-10, RT-11 calibrators  
Condition A6 of WBNEEB8724, Correct RE-90-292 document change  
Relocate detector

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-293

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No  
ODCM: No

Reg. Guide 1.97:  
No

Safety Related:  
Yes

Monitor Description:  
TVA Deficiency:

RHR Post Accident Monitor

WBNEEB8724  
WBNEEB8724  
WBP870870  
WBP890192  
WBP890396

Description of Deficiency:

Condition A6 of WBNEEB8724, location, mounting, geometry missing  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure resets  
Undocumented changes to ratemeters  
Calibration documentation missing

PIRWBNEEB8553  
CRDR HED 109  
CRDR HED 89/HEC 5250  
WBP8940072  
WBSCA940032  
WBP8950256

Lack of load data  
Radiation analyzer indicator light labels  
Recorder scales  
RT-10, RT-11 transfer data; SE calibration methods  
Transition from coax to single conductor  
Hi range (291, 293) will not alarm at local indicator because +24 volts is not supplied

Design Change Notice:

02440  
5002

10604  
23167  
23167  
23167  
23409  
RD1007089  
S-37910  
36274, 36836

Related Deficiency:

WBP870870  
WBNEEB8680

WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HED 89/HEC 5252  
WBSCA940032  
N/A  
WBP8940072  
WBNEEB8724 R3  
WBP8950256

Description of Design Changes/Field Modifications:

Add diode, alarm relay coil, RL-1  
Add isolation for Cat A/C interface

Condition A8 of WBNEEB8724, documentation corrections only  
Condition A6 of WBNEEB8724, document location & mounting detail  
Correct recorder scales  
Provide materials/instructions for transition from coax to single conductors  
SSDs  
Order new RT-10, RT-11 calibrators  
Condition A6 of WBNEEB8724, Correct RE-90-292 document change  
Delete local alarm requirement for 291, 293

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-400,  
1-LPF-90-400

**Monitor Type:**  
Gas Sampler

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** Yes

**Reg. Guide 1.97:** Yes

**Safety Related:** No

**Monitor Description:** Shield Building Vent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
WBNNEB8709  
391/85-48-15  
WPPER940107  
WPPER940423  
WPPER930458

**Description of Deficiency:**

Condition A1 of WBNEEB8724, non-isokinetic sample, NCR 6822SCA was resolved by corrective actions for SCRWBNEEB8724  
Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition C of WBNEEB8724, sample line bend radius  
Condition E of WBNEEB8724, Sample line bend radius  
Missing pipe tubing caps  
Lack of mounting details for flow elements  
Air monitor isokinetic sample panels problems  
Calibration documentation missing  
Specific documentation discrepancies  
Particulate plateout concerns  
Unit 2 shield building monitor required for unit 1  
Software error in RM-80 allows stack overflow  
General sample line deficiencies vs. design criteria  
Calibration interval

**Design Change Notice:**  
02243(U1)

**Related Deficiency:**  
WBP880197

**Description of Design Changes/Field Modifications:**  
Document mounting details for flow elements

03451  
03451

WBNEEB8724 R3  
WBNEEB8724 R3

Condition A1 & A2, & A8, Remove Eberline monitors 1, 2-RE-90-400, 401, 402, 403 and install WRGM 1,2-RE-90-400,402.  
Condition C & E of WBNEEB8724, Remove air monitor panels 1,2-L-398 & install new panels by Kurz

03541  
03451  
03451  
03451  
03451  
21619

WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
391/85-48-15  
N/A

Install valves as required  
Install new cabling and wiring as required

Installs flow probes in Unit 1 and 2 Shield Building vents

33276  
35465

WPPER940107  
WPPER940423  
WPPER940423  
WPPER940601

Install new EPROMS, change software rev level, Unit 1  
Add insulation and heat trace  
Resolves general sample line deficiencies or incorporate exceptions, design criteria WB-DC-40-24, R4  
Revise WB-DC-40-24 to allow seismic class 1(L)B for radiation detection, sampling, and flow monitoring and control equipment, EMS safety class  
Latest issue data base as of 7/21/95 Unit 1

S-37549  
F-37490

WPPER940601

Lower flow limits

F-38210  
F37490 (M3451)

Seismic restraints for spent filters  
Revise data base sensitivity connection factors - Unit 1

S-38097  
S-38268  
34155

Calc info output  
Limit fan operation to no ABGTS be run if both containment purges are running (exceeds flow measurement range)  
Correct flow element identifiers

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

<b>Radiation Monitor:</b> 1-RE-90-402 1-LPF-90-452	<b>Monitor Type:</b> Gas Sampler	<b>Monitor Classification:</b> <b>Tech Spec:</b> No	<b>ODCM:</b> Yes	<b>Reg. Guide 1.97:</b> Yes	<b>Safety Related:</b> No
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**Monitor Description:** Shield Building Vent Sample Conditioning Skid

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
WBNNEB8709  
391/85-48-15  
WBP8940107  
WBP8940423

**Description of Deficiency:**

Condition A1 of WBNEEB8724, non-isokinetic sample  
Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition C of WBNEEB8724, sample line bend radius  
Condition E of WBNEEB8724, Sample line bend radius  
Missing pipe tubing caps  
Lack of mounting details for flow elements  
Air monitor isokinetic sample panels problems  
Calibration documentation missing  
Specific documentation discrepancies  
Particulate plateout concerns  
Unit 2 shield building monitor required for unit 1  
Software error in RM-80 allows stack overflow  
General sample line deficiencies vs. design criteria

**Design Change Notice:**

33106  
02244(U2)  
  
03450  
03450  
  
03540  
03450  
03450  
03450  
03450  
21619  
33275  
  
35465  
  
S-37549  
  
F-37489  
S-37910  
  
F-38210  
  
F37489 (M3450)  
S-38097  
S-38268  
S-36049

**Related Deficiency:**

N/A  
WBP880197  
  
WBNEEB8724 R3  
WBNEEB8724 R3  
  
WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
391/85-48-15  
N/A  
WBP8940107  
  
WBP8940423  
WBP8940423  
WBP8940601  
  
WBP8940601

**Description of Design Changes/Field Modifications:**

Relay Unit 2 M-30 annunciator to Unit 1  
Document mounting details for flow elements  
  
Condition A1 & A2, & A8, Remove Eberline monitors 1, 2-RE-90-400, 401, 402, 403 and install WRGM 1,2-RE-90-400,402.  
Condition C & E of WBNEEB8724, Remove air monitor panels 1,2-L-398 & install new panels by Kurz  
  
Install valves as required  
Install new cabling and wiring as required  
  
Installs flow probes in Unit 1 and 2 Shield Building vents  
Install new EPROMS, change software rev level, Unit 2  
  
Add insulation and heat trace  
Resolves general sample line deficiencies or incorporate exceptions, design criteria WB-DC-40-24, R4  
Revise WB-DC-40-24 to allow seismic class 1(L)B for radiation detection, sampling, and flow monitoring and control equipment, EMS safety class  
  
Latest issue data base as of 7/21/95 Unit 2  
Lower flow limits  
  
Seismic restraints for spent filters  
  
Revise data base sensitivity connection factors - Unit 2  
Calc info output  
Limit fan operation to no ABGTS be run if both containment purges are running (exceeds flow measurement range)  
Verify safety class in EMS

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**

1-RE-90-404  
1-LPR-90-405  
1-LPR-90-450

**Monitor Type:**

Gas

**Monitor Classification:**

**Tech Spec:**

No

**ODCM:**

No

**Reg. Guide 1.97:**

Yes

**Safety Related:**

No

**Monitor Description:**

Condenser Vacuum Vent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP890396

WBP890396  
CRDR HED 151

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A7 of WBNEEB8724, Moisture in condenser vacuum pump exhaust lines  
Condition A8 of WBNEEB8724, Documentation discrepancies  
Condition G of WBNEEB8724, Temperatures exceeding detector limits  
Calibration documentation missing; Eberline GM Tubes

General sample line deficiencies with respect to design criteria requirements  
Usability of Eberline CT-2B

**Design Change Notice:**

17610  
17610  
06973  
09916  
09916  
10604  
17610  
17610  
23545  
33690  
34525  
19058  
27485  
  
30666  
S37630  
W35498  
S38097  
37637  
30312

**Related Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
CRDR HEDs 150, 151  
CRDR HEDs 150, 151 cont.  
WBNEEB8724 R3  
SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
FCRNP1048 R1  
WBP890396  
N/A  
WBP890396  
N/A  
WBP890396  
  
DD 95-0371  
  
N/A  
N/A

**Description of Design Changes/Field Modifications:**

Condition A2 of SCRWBNEEB8724, General sample line upgrades: add purge/test connections  
Condition A2 of SCRWBNEEB8724, (Sample line upgrades for monitors 99, 119, 129 may impact 404 also)  
Condition A8 of SCRWBNEEB8724, Sample line as-constructed  
Repl MEM I boards w/MEM II in MCR CT-2B & Local DAM units; inst bubble memory in CT-2B, add TSC connection  
Install relays in CT-2B & add annunciation for malf & hi rad; add take-up real for printer in CT-2B  
Condition A8 of SCRWBNEEB8724, Documentation corrections only  
Condition G of SCRWBNEEB8724, Reroute sample line, new tap  
Condition A7 of SCRWBNEEB8724, Reroute sample line, new tap  
Mounting details 1, 2-RM-90-450  
Install new pump for 404, remove bulk filter assembly  
Add data base to SSDs  
Replace Eberline GM tubes  
SSDs  
WB-DC-40-24 R4, resolves or incorporates exceptions  
Add purge capability and isolation valves  
Correct relative locations of flange & probe  
ERFDS programming for tested effluent release following radiological event  
Calc info output  
Revised firmware details  
Pam upgrades

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
1-RE-90-421

**Monitor Type:**  
Shine

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** Yes

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP890396  
WBPER910454  
CRDR HED 89/HEC 5250  
INPO OER 88-2708  
WBPER940107  
WBPER940072  
WBPER940601  
WBSCA940032

Main Steam Line Monitor

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, lack of geometry analysis  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Calibration documentation missing  
Main steam line monitors not qualified for environment  
Recorder scales  
Low range steam line monitors loose counts at SONGS  
RM-80 allows overwriting of memory  
Improper transfer calibration procedure  
No design criteria exception for unqualified low range; general equipment deficiencies  
Coax to single conductor transition

**Design Change Notice:**

09964  
10604  
23167  
23167  
29173  
RD1007089  
33273  
27485

**Related Deficiency:**

WBPER910454  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBNEEB8724 R3  
WBPER940072  
WBPER940107  
WBPER940601 (F-33273)

**Description of Design Changes/Field Modifications:**

Downgrade loops to RG 1.97 Cat 2 corrective actions based on walkdowns: add TSC, rdr, alarm outputs  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Materials/instructions for coax to single conductor transition  
Condition A6 of SCRWBNEEB8724, document monitor location  
New RD-2B detectors calibrated to new, approved procedure, new RT-10, 11 calibrators  
Upgrade E-PROMS for part 21 problem  
Rev SSDs to delete low range detector

F-38245  
S-38097

Revise SSDs (27485)

Calc infor input

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
1-RE-90-422

Monitor Type:  
Shine

Monitor Classification:  
Tech Spec: No

ODCM: No

Reg. Guide 1.97: Yes

Safety Related: No

Monitor Description: Main Steam Line Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP890396  
WBP910454  
CRDR HED 89/HEC 5250  
INPO OER 88-2708  
WBP940107  
WBP940072  
WBP940601  
WBSA940032

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, lack of geometry analysis  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Calibration documentation missing  
Main steam line monitors not qualified for environment  
Recorder scales  
Low range steam line monitors loose counts at SONGS  
RM-80 allows overwriting of memory  
Improper transfer calibration procedure  
No design criteria exception for unqualified low range; general equipment deficiencies  
Coax to single conductor transition

**Design Change Notice:**

09964  
10604  
23167  
23167  
29173  
RD1007089  
33273  
27485

**Related Deficiency:**

WBP910454  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSA940032  
WBNEEB8724 R3  
WBP940072  
WBP940107  
WBP940601 (F-33273)

**Description of Design Changes/Field Modifications:**

Downgrade loops to RG 1.97 Cat 2 corrective actions based on walkdowns: add TSC, rdr, alarm outputs  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Materials/instructions for coax to single conductor transition  
Condition A6 of SCRWBNEEB8724, document monitor location  
New RD-2B detectors calibrated to new, approved procedure, new RT-10, 11 calibrators  
Upgrade E-PROMS for part 21 problem  
Rev SSDs to delete low range detector

F-38245  
S-38097

Revise SSDs (27485)

Calc infor input

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

**Radiation Monitor:**  
1-RE-90-423

**Monitor Type:**  
Shine

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:**  
Yes

**Safety Related:**  
No

**Monitor Description:**

Main Steam Line Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP890396  
WBP8910454  
CRDR HED 89/HEC 5250  
INPO OER 88-2708  
WBP8940107  
WBP8940072  
WBP8940601  
WBSCA940032

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, lack of geometry analysis  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Calibration documentation missing  
Main steam line monitors not qualified for environment  
Recorder scales  
Low range steam line monitors loose counts at SONGS  
RM-80 allows overwriting of memory  
Improper transfer calibration procedure  
No design criteria exception for unqualified low range; general equipment deficiencies  
Coax to single conductor transition

**Design Change Notice:**

09964  
10604  
23187  
23167  
29173  
RD1007089  
33273  
27485

**Related Deficiency:**

WBP8910454  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBNEEB8724 R3  
WBP8940072  
WBP8940107  
WBP8940601 (F-33273)

Revise SSDs (27485)

**Description of Design Changes/Field Modifications:**

Downgrade loops to RG 1.97 Cat 2 corrective actions based on walkdowns: add TSC, rdr, alarm outputs  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Materials/instructions for coax to single conductor transition  
Condition A6 of SCRWBNEEB8724, document monitor location  
New RD-2B detectors calibrated to new, approved procedure, new RT-10, 11 calibrators  
Upgrade E-PROMS for part 21 problem  
Rev SSDs to delete low range detector

Calc infor input

F-38245  
S-38097

Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

**Radiation Monitor:**  
1-RE-90-424

**Monitor Type:**  
Shine

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:**  
Yes

**Safety Related:**  
No

**Monitor Description:** Main Steam Line Monitor

**TVA Deficiency:**

SCRWBNEEB8724 R3  
SCRWBNEEB8724 R3  
WBP890396  
WBP910454  
CRDR HED 89/HEC 5250  
INPO OER 88-2708  
WBP940107  
WBP940072  
WBP940601  
WBSCA940032

**Description of Deficiency:**

Condition A6 of SCRWBNEEB8724, lack of geometry analysis  
Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Calibration documentation missing  
Main steam line monitors not qualified for environment  
Recorder scales  
Low range steam line monitors loose counts at SONGS  
RM-80 allows overwriting of memory  
Improper transfer calibration procedure  
No design criteria exception for unqualified low range; general equipment deficiencies  
Coax to single conductor transition

**Design Change Notice:**

09964  
10604  
23167  
23167  
29173  
RD1007089  
33273  
27485

**Related Deficiency:**

WBP910454  
WBNEEB8724 R3  
CRDR HED 89/HEC 5250  
WBSCA940032  
WBNEEB8724 R3  
WBP940072  
WBP940107  
WBP940601 (F-33273)

**Description of Design Changes/Field Modifications:**

Downgrade loops to RG 1.97 Cat 2 corrective actions based on walkdowns: add TSC, rdr, alarm outputs  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Materials/instructions for coax to single conductor transition  
Condition A6 of SCRWBNEEB8724, document monitor location  
New RD-2B detectors calibrated to new, approved procedure, new RT-10, 11 calibrators  
Upgrade E-PROMS for part 21 problem  
Rev SSDs to delete low range detector

F-38245  
S-38097

Revise SSDs (27485)

Calc infor input

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
2-RE-90-001

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** No

**Reg. Guide 1.97:**  
No

**Safety Related:**  
No

**Monitor Description:** Spent Fuel Pool Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBP8940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33816  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBP8940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
2-RE-90-006

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Component Cooling Heat Exchanger Area Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WPPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-6, 61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
2-RE-90-007

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:** Sample Room Monitor

**TVA Deficiency:**

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WPPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

Westinghouse Bar Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

Radiation Monitor:  
2-RE-90-008

Monitor Type:

Area

Monitor Classification:

Tech Spec:

No

ODCM:

No

Reg. Guide 1.97:

No

Safety Related:

No

Aux Feedwater Pump Area Monitor

Monitor Description:  
TVA Deficiency:

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WPPER940072  
WBP890492SCA

Description of Deficiency:

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

Design Change Notice:

02440  
30312  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1014511  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

Related Deficiency:

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WPPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

Description of Design Changes/Field Modifications:

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
2-RE-90-010

**Monitor Type:**  
Area

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

CVCS Board Area Monitor

SCRWBNEEB8724  
WBP870870  
WBP890192  
WBP890396  
WBP890473P  
WBP910053  
WBNEEB8553  
23005-WBN-02  
CDR HED 109  
CRDR HED 93  
CRDR HED 89/HEC 5253  
CRDR HED 89/HEC 5238  
WBSCA940032  
WBPER940072  
WBP890492SCA

**Description of Deficiency:**

Condition A8 of SCRWBNEEB8724, documentation inconsistencies  
Inductive kickback from RL-1, failure reset (not applicable to O-RE-90-135)  
Undocumented ratemeter changes  
Lack of calibration documentation  
Unauthorized keep alive source in RD-1  
Vendor change, RD-1 electronics card change fit  
Lack of load data  
Lack of radiation monitoring in CDWE  
Radiation analyzer indicator light labels (not applicable to O-RE-90-135)  
Recorder scales (not applicable to 1-RE-90-280, 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 2-RE-90-1,6,7,8,10)  
Recorder scales (applicable only to 1-RE-90-280)  
Undocumented method of transitioning from coax to TSP, triax, or single conductor; inadequate WWK cable to connector termination  
RT-10, RT-11 calibrator documentation, SE calibration methods  
Replace coax cable for cable damage issue

**Design Change Notice:**

02440  
30312  
06378  
06378  
06378  
06378  
09840  
10604  
23167  
23169  
23409  
33616  
RD1007089  
23167  
08858  
08859  
09153  
35114  
37566  
16544  
06378

**Related Deficiency:**

WBP870870  
  
WBP890192  
CRDR HED 109  
WBP890396  
N/A  
SCRWBNEEB8724  
CRDR HED 89 & 93  
WBP870870  
N/A  
N/A  
WBPER940072  
WBSCA940032  
WBP890492SCA  
WBP890492SCA  
N/A  
F-24447  
F-36399

**Description of Design Changes/Field Modifications:**

Add diode, alarm relay coil, RL-1, General Atomic Engineering Change Order 12674  
PAM Upgrade (O-RE-90-135)  
Install new ratemeters & power supply  
Install new ratemeters & power supply  
Install new detector and components, loop 002  
Delete loops 235 & 236  
Condition A8 of SCRWBNEEB8724, documentation corrections only  
Correct recorder scales  
Add diode, alarm relay coil, RL-1 for 2-RI-90-7B,8B,10B, General Atomic Engineering Change Order 12674  
SSD for O-RE-90-135  
Replace recorders 1-RR-90-1 and RR-90-12  
Purchase new RT-10, RT-11 calibrators  
Provide materials/instructions for transition from coax to single conductors  
Replace coax cable for cable damage issue  
In WBRD 390,391/94-56 not a listed violation) Relocate 1-RE-90-7,61, and O-RE-90-11 for optimum area radiation detection  
Resolve ground loops (shield ties) (loops 2,59,60 only)  
Delete O-R-90-63  
Add keep alive source for 1-RE-90-2

**Watts Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS**

**Radiation Monitor:**  
2-RE-90-123

**Monitor Type:**  
Liquid

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** No

**Reg. Guide 1.97:** No

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBPER940601  
WBP880272  
WBP880273  
WBP890192  
WBP890396  
WBNEEB8553  
CRDR HED 40  
CRDR HED 109  
CRDR HED 89/HEC 5252  
WBPER940423  
WBSCA940032  
WBP880318

Component Cooling System Monitor

**Description of Deficiency:**

Condition A2 of WBNEEB8724, General sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Doc errors  
Non-seismically qualified flow switch (0, 1-123)  
Non-seismically qualified flow switch (2-123)  
Undocumented changes to ratemeters  
Calibration documentation missing  
Lack of load data  
Nuisance alarm  
Radiation analyzer indicator light labels  
Recorder Scales  
General sample line deficiencies  
Coax to single conductor transition  
Noise problems

**Design Change Notice:**

06378  
06378  
06801

06973  
09308  
10604  
15423  
15423  
23235  
23235  
23167  
33686

W-37566  
S-36049

**Related Deficiency:**

WBP890192  
CRDR HED 109  
WBNEEB8724 R3  
  
WBNEEB8724 R3  
WBNEEB8724 , WBP880318  
WBNEEB8724 R3  
WBP880272  
WBP880273  
N/A  
CRDR HED 89/HEC 5252  
WBSCA940032  
CRDR HED 40  
WBPER940423  
N/A  
WBPER940601

**Description of Design Changes/Field Modifications:**

Install new ratemeters and power supply  
Install new ratemeters and power supply  
Condition A2 to WBNEEB8724, replace inlet and outlet isolation valves w/ssh globe; add recirc purge/test valves; take exception for carbon steel root valves  
  
Condition A8 of WBNEEB8724, Sample line as constructed  
Condition A8 of WBNEEB8724, Correct loop grounding for single point ground, assure preamp board per drawing configuration, rebuild detectors  
Condition A8 of WBNEEB8724, Documentation corrections resolves non-seismic flow switch (documentation)  
Resolves non-seismic flow switch (documentation)  
Documentation corrections resolves non-seismic flow switch (documentation)  
Correct vendor manual to reflect optical grease  
Correct recorder scales  
Provide materials, instructions for coax to single conductor transition  
Block alarm when monitor not in use  
Resolve or incorporate exceptions in R4 of design criteria, WB-DC-40-24  
Ground loops - shield ties (1-123 only)  
Show valves correctly, EMS corrections

Wabco Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

**Radiation Monitor:**  
2-RE-90-400  
2-LPF-90-400

**Monitor Type:**  
Gas Sampler

**Monitor Classification:**  
**Tech Spec:** No

**ODCM:** Yes

**Reg. Guide 1.97:** Yes

**Safety Related:** No

**Monitor Description:** Shield Building Vent Monitor

**TVA Deficiency:**

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
WBNNEB8709  
391/85-48-15  
WBP8940107  
WBP8940423  
WBP8930458

**Description of Deficiency:**

Condition A1 of WBNEEB8724, non-isokinetic sample, NCR 6822SCA was resolved by corrective actions for SCRWBNEEB8724  
Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition C of WBNEEB8724, sample line bend radius  
Condition E of WBNEEB8724, Sample line bend radius  
Missing pipe tubing caps  
Lack of mounting details for flow elements  
Air monitor isokinetic sample panels problems  
Calibration documentation missing  
Specific documentation discrepancies  
Particulate plateout concerns  
Unit 2 shield building monitor required for unit 1  
Software error in RM-80 allows stack overflow  
General sample line deficiencies vs. design criteria  
Calibration interval

**Design Change Notice:**

02243(U1)  
34155  
1-RE-90-400  
03451  
03451  
37799  
03451  
03451  
03451  
03451  
03451  
21619  
  
33276  
35465  
  
S-37549  
  
F-37489  
S-37910  
  
F-38210  
F37490 (M3451)  
  
S-38097  
S-38268

**Related Deficiency:**

WBP880197  
WBP8930458  
WBNEEB8724 R3  
WBNEEB8724 R3  
N/A  
WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
391/85-48-15  
N/A  
  
WBP8940107  
WBP8940423  
WBP8940423  
WBP8940601  
  
WBP8940601

**Description of Design Changes/Field Modifications:**

Document mounting details for flow elements  
Correct flow element identifiers  
Revise calculation to increase calibration interval to 18 months  
Condition A1 & A2, & A8, Remove Eberline monitors 1, 2-RE-90-400, 401, 402, 403 and install WRGM 1,2-RE-90-400,402.  
Condition C & E of WBNEEB8724, Remove air monitor panels 1,2-L-398 & install new panels by Kurz  
Correct computer points on control drawing  
Install valves as required  
Install new cabling and wiring as required  
  
Installs flow probes in Unit 1 and 2 Shield Building vents  
  
Install new EPROMS, change software rev level, Unit 1  
Add insulation and heat trace  
Resolves general sample line deficiencies or incorporate exceptions, design criteria WB-DC-40-24, R4  
Revise WB-DC-40-24 to allow seismic class 1(L)B for radiation detection, sampling, and flow monitoring and control equipment  
  
Latest issue data base as of 7/21/95 Unit 2  
Lower flow limits  
  
Seismic restraints for spent filters  
Revise data base sensitivity connection factors - Unit 1  
  
Calc info output  
Limit fan operation to no ABGTS be run if both containment purges are running (exceeds flow measurement range)

Water Nuclear Plant  
Radiation Monitoring System (RMS)  
Deficiencies Impacting RMS

**Radiation Monitor:**  
2-RE-90-402  
2-LPF-90-452

**Monitor Type:**  
Gas Sampler

**Monitor Classification:**  
**Tech Spec:** No  
**ODCM:** Yes

**Reg. Guide 1.97:** Yes

**Safety Related:** No

**Monitor Description:**  
**TVA Deficiency:**

Shield Building Sample Conditioning Skid

WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBNEEB8724 R3  
WBP870728  
WBP880197  
WBP880409  
WBP890396  
WBNNEB8705  
WBNNEB8709  
391/85-48-15  
WBP8940107  
WBP8940423

**Description of Deficiency:**

Condition A1 of WBNEEB8724, non-isokinetic sample, NCR 6822SCA was resolved by corrective actions for SCRWBNEEB8724  
Condition A2 of WBNEEB8724, general sample line routing problems  
Condition A8 of WBNEEB8724, documentation inconsistencies  
Condition C of WBNEEB8724, sample line bend radius  
Condition E of WBNEEB8724, Sample line bend radius  
Missing pipe tubing caps  
Lack of mounting details for flow elements  
Air monitor isokinetic sample panels problems  
Calibration documentation missing  
Specific documentation discrepancies  
Particulate plateout concerns  
Unit 2 shield building monitor required for unit 1  
Software error in RM-80 allows stack overflow  
General sample line deficiencies vs. design criteria

**Design Change Notice:**

**Related Deficiency:**

**Description of Design Changes/Field Modifications:**

02244(U2)	WBP880197	Document mounting details for flow elements
03451 03451	WBNEEB8724 R3 WBNEEB8724 R3	Condition A1 & A2, & A8, Remove Eberline monitors 1, 2-RE-90-400, 401, 402, 403 and install WRGM 1, 2-RE-90-400, 402. Condition C & E of WBNEEB8724, Remove air monitor panels 1, 2-L-398 & install new panels by Kurz
03451 03451 03451 03451 03451 21619 33275	WBP880197 WBP880409 WBP890396 WBNNEB8705 391/85-48-15 N/A WBP8940107	Install valves as required Install new cabling and wiring as required  Installs flow probes in Unit 1 and 2 Shield Building vents Install new EPROMS, change software rev level, Unit 2
35465	WBP8940423 WBP8940423 WBP8940601	Add insulation and heat trace Resolves general sample line deficiencies or incorporate exceptions, design criteria WB-DC-40-24, R4 Revise WB-DC-40-24 to allow seismic class 1(L)B for radiation detection, sampling, and flow monitoring and control equipment
S-37549		
F-37489 S-37910	WBP8940601	Latest issue data base as of 7/21/95 Unit 2 Lower flow limits
F-38210		Seismic restraints for spent filters
F37489 (M3450) S-38097 S-38268 S-36049		Revise data base sensitivity connection factors - Unit 2 Calc info output Limit fan operation to no ABGTS be run if both containment purges are running (exceeds flow measurement range) Verify safety class in EMS

**Attachment 2**

**Resolution of Engineering Assessment Items**

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 1  
STATUS OF OPEN ITEMS

Monitor	Issue	Track/Resolved	Status
1-RE-90-106	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
1-RE-90-112	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
1-RE-90-119	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
1-RE-90-120	Drawing shows ball & plug valves as gate or globe valves	No change	Closed
0,1,2-RE-90-123	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
0-RE-90-133, 134,140,141	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
0-RE-90-212	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
0-RE-90-225	Drawing shows ball & plug valves as gate or globe valves	WBPER940601 DCN S-36049-A	Closed
0-RE-90-101	Model Numbers for B & C channel swapped in vendor manual	WBPER940601 VR-1698	Closed
0-RE-90-101	Rate meter tag # are detector model #	WBPER940601 DCN not required EMS corrected	Closed
0-RE-90-132	Model Numbers for B & C channel swapped in vendor manual	WBPER940601 VR-1698	Closed
0-RE-90-132	Rate meter tag # are detector model #	WBPER940601 DCN not required EMS corrected	Closed
1,2-RE-90-400	Safety class not verified in EMS for 2-400	WBPER940601 DCN S-36049-A	Closed
1,2-RE-90-402	Safety class not verified in EMS for 2-402	WBPER940601 DCN S-36049-A	Closed
0-RE-90-101	Skid seismic category doesn't match process duct in EMS	WBPER940601 DCN S-37549-A	Closed
0-RE-90-122	Skid seismic category doesn't match process pipe in EMS	WBPER940601 DCN S-37549-A	Closed
0,1,2-RE-90-123	Skid seismic category doesn't match process pipe in EMS	WBPER940601 DCN S-37549-A	Closed
0-RE-90-101	Revise Aux Building HVAC Sys. Description to delete auto isolation on signal from this monitor	WBPER940601 DCN S-37549-A	Closed
0-RE-90-101	Revise 1-47W610-90-3 for alarm	Was already done DCN 21861 DCA 34	Closed
1-RE-90-129	Operator aid to adjust sampler flow to vacuum exhaust flow rate	WBPER940601 DCN F-37909-A	Closed

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 2  
STATUS OF TEAM ITEMS

Monitor	Description	Completed	Status
1-RE-90-112	Revise particulate sensitivity in Table 11.4-2 & in Tech Specs - TVA determined no change required in FSAR or Tech Spec.	No change required	Closed
1-RE-90-112	Revise FSAR to show range was determined at vendor specified background	FSAR Amendment 89 Submitted 5/16/95	Closed
1-RE-90-112	Revise FSAR Table 11.4-2 Footnote on background	FSAR Amendment 89 Submitted 5/16/95	Closed
1-RE-90-112	Delete requirement for Radcon coverage - Section 3.9 of DC	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-106	Revise particulate sensitivity in FSAR Table 11.4-2 & in Tech Specs - TVA determined no change required in FSAR or Tech Spec.	No change required.	Closed
1-RE-90-106	Revise FSAR to show range was determined at vendor specified background	FSAR Amendment 89 Submitted 5/16/95	Closed
1-RE-90-106	Revise FSAR Table 11.4-2 Footnote on background	FSAR Amendment 89 Submitted 5/16/95	Closed
1-RE-90-106	Delete requirement for Radcon coverage - Section 3.9 of DC - same as 3	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-101	Generate calculation to show monitor can detect 10 DAC ; Revise I&C calc 0-RE-90-101 to correct function and provide demonstrated accuracy for iodine to 10 DAC	WBNTSR-103 R0 B26 950421 363 0-RE-90-101 R2 B26 950610 320	Closed
1-RE-90-101	same as item 9	same as item 9	Closed
1-RE-90-400	Revise NUREG-0737 submittal to reflect latest values from WBNAPS3-048 calc on range - TROI Items NUREG 0737 II.F.1.2A	T04 950616 151	Closed
1-RE-90-400	same as 11	same as item 11	Closed
1-RE-90-400	Delete requirement for pressure compensation in DC	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-400	Ensure DC does not require a root valve for this monitor	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-400	Revise DC to allow the use of flareless compression fittings	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-400	Revise DC to eliminate requirement for condensate pots; sample lines being heat traced	WB-DC-40-24 R4 Issued 4/28/95	Closed

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 2  
STATUS OF TEAM ITEMS

1-RE-90-402	Ensure DC does not require a root valve for this monitor	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-402	Revise DC to eliminate requirement for condensate pots; sample lines being heat traced	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-099	Revise 0737 submittal to reflect elimination of the monitor - In TROI - Item NUREG 0737 II.F.1.2A	T04 950616 151	Closed
1-RE-90-099	Delete reference in FSAR that sample lines in the turbine building are seismic	FSAR Amendment 89 Submitted 5/16/95	Closed
1-RE-90-119	Revise DC to allow the use of LED check sources	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-119	Delete reference in FSAR that sample lines in the turbine building are seismic	FSAR Amendment 89 Submitted 5/16/95	Closed
1,2-RE-90-404	Revise ranges in FSAR, RG 1.97, and 0737 submittal to match WBNAPS3-048 - In TROI - Item NUREG 0737 II.F.1.2A	FSAR Amendment 89 Submitted 5/16/95 T04 950616 151	Closed
1,2-RE-90-404	Revise DC to allow the use of turbine building ambient air for purge	WB-DC-40-24 R4 Issued 4/28/95	Closed
1,2-RE-90-404	Delete reference in FSAR that sample lines in the turbine building are seismic	FSAR Amendment 89 Submitted 5/16/95	Closed
0-RE-90-125 & 126	Revise WBNTSR-028 and FSAR to match on required range	FSAR Amendment 89 Submitted 5/16/95 WBNTSR-028 R1 B26 950214 396	Closed
0-RE-90-125 & 126	Revise DC to allow nonisokinetic sampling for non-particulate monitors	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-205 & 206	Revise WBNTSR-028 and FSAR to match on required range	FSAR Amendment 89 Submitted 5/16/95 WBNTSR-028 R1 B26 950214 396	Closed
0-RE-90-205 & 206	Revise DC to allow nonisokinetic sampling for non-particulate monitors	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-130 & 131	Revise WBNTSR-038 required range	WBNTSR-038 R5 B25 950303 360	Closed
0-RE-90-013	Rename monitor to reflect location in shipping bay	FSAR Amendment 89 Submitted 5/16/95 WB-DC-40-24 R4 Issued 4/28/95	Closed

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 2  
STATUS OF TEAM ITEMS

0-RE-90-138	Rename as "Waste Packaging Room Monitor" in DC & FSAR	FSAR Amendment 89 Submitted 5/16/95 WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-118	Revise DC to specify that locally is at the Waste Gas Panel (0-L-2)	WB-DC-40-24 R4 Issued 4/28/95	Closed
1,2-RE-90-120/121	Revise FSAR to delete 1-RE-90-124 - TVA decided to retain the 1 gpm leak rate capability	FSAR Amendment 89 Submitted 5/16/95	Closed
1,2-RE-90-120/121	WBNTSR-066 was revised	WBNTSR-066 R4 B26 950307 384	Closed
1,2-RE-90-120/121	Revise DC to delete requirement that all components be stainless steel	WB-DC-40-24 R4 Issued 4/28/95	Closed
1,2-RE-90-120/121	Revise DC discussion on draining the liquid monitor skids	WB-DC-40-24 R4 Issued 4/28/95	Closed
1,2-RE-90-124	Remove monitor from DC and FSAR - Removed from DC and FSAR for unit 1. Unit 2 has to stay in FSAR	Has to stay in FSAR WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-122	Clarify range values in FSAR	FSAR Amendment 89 Submitted 5/16/95	Closed
0-RE-90-122	Revise FSAR to show background at which range was determined	FSAR Amendment 89 Submitted 5/16/95	Closed
0-RE-90-122	Add discussion in DC on low flow alarm	WB-DC-40-24 R4 Issued 4/28/95	Closed
0,1,2-RE-90-123	Revise DC to clarify that these monitors do not have sample pumps	WB-DC-40-24 R4 Issued 4/28/95	Closed
0,1,2-RE-90-123	Revise required range calc WBNTSR-042 to establish a lower maximum range	WBNTSR-042 R	Closed
0,1,2-RE-90-123	Revise DC to clarify that these monitors do not have sample pumps	WB-DC-40-24 R4 Issued 4/28/95	Closed
0,1,2-RE-90-123	Revise DC to allow the use of globe valves as root valves	WB-DC-40-24 R4 Issued 4/28/95	Closed
0,1,2-RE-90-123	Revise DC to delete requirement that all components be stainless steel	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-225	Revise DC to allow the use of globe valves as root valves	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-225	Revise DC to delete requirement that all components be stainless steel	WB-DC-40-24 R4 Issued 4/28/95	Closed

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 2  
STATUS OF TEAM ITEMS

0-RE-90-212	Change monitor name from Turbine Bld Sump to Station Sump - Not changed -no technical content	Not Changed	Closed
0-RE-90-212	Revise DC to show TSC computer is used	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-212	Revise DC to allow the use of globe valves as root valves	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-212	Revise DC to delete requirement that all components be stainless steel	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-211	Revise FSAR & DC - monitor removed from plant design	FSAR Amendment 89 Submitted 5/16/95 WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-133/134 & 140/141	Revise DC to remove "operate during and after an accident" invoke RG 1.97 requirements	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-133/134 & 140/141	Revise DC to allow the use of globe valves as root valves	WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-133/134 & 140/141	Revise DC to delete requirement that all components be stainless steel	WB-DC-40-24 R4 Issued 4/28/95	Closed
1-RE-90-280	Change name to "Post Accident Sampling Room Area Monitor	FSAR Amendment 89 Submitted 5/16/95 WB-DC-40-24 R4 Issued 4/28/95	Closed
0-RE-90-102 & 103	Need location specific calc issued	WBNTSR-104 R0 B26 950414 354	Closed

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 3  
STATUS OF OBSERVATIONS

Monitor	Issue	Resolution	Status
0-RE-90-101-	Valve ISIV-90-101F is shown on dwg 1-47W610-90-3 R13. DD 9400124 was issued to remove the sample line root valve from the drawing. The sample panel can be isolated. Therefore the absence of a root valve is acceptable. Eight revisions of 1-47W610-90-3 have been issued without incorporating the DD.	No work required	Closed
0-RE-90-132	Many of the values used by Calc. WBNTSR-037 R0, come for procedure TI-18, which is on administrative hold.	TI-18 is no longer on hold.	Closed
1,2-RE-90-400	Model numbers not listed in EMS. Vendor manual is not issued yet. Available in RIMS only. Will be fixed by closure of DCNs 3450 & 3451	Documents updated as required by TVA Procedures.	Closed
1,2-RE-90-400	Vendor drawing 0403-5010 Rev B has a typo. An E-2 should be E+2	Vendor informed of typo	Closed
1,2-RE-90-400	Drawing 1-47W610-90-5 should be as built as soon as possible due to numerous changes and poor quality of the microfilm	Drawing is now CCD since completion of DCNs 3450 & 3451.	Closed
1,2-RE-90-400	Change EQ status from "Yes" to "No" in Reg Guide 1.97 response for items located in mild environments.	Changes not made. Inconsistent with TVA program.	Closed
1,2-RE-90-400	Ensure that maintenance is aware that detector correction factors are required.	Information provided in SSDs	Closed
1,2-RE-90-402	Vendor manual is in RIMS but has not been issued as an approved vendor manual. EMS does not list the vendor manual number. Model number information isn EMS is for the old monitors which were removed by DCNs 3450 & 3451. This will be corrected when the DCNs are closed	DCNs were open when this observation was made. Manual approved and EMS updated as part of DCN closure.	Closed
1,2-RE-90-402	A demonstrated accuracy calculation is not required. However, it is necessary to provide Chemistry with the results of Rev 3 to calculation WBNTSR-060.	Chemistry was provided with the calc results via WBNTSR-107.	Closed
2-RE-90-402	Safety class for 2-RE-90-402 is not verified in EMS.	WBPER940601 DCN S-36049-A	Closed

ENCLOSURE 1  
ATTACHMENT 2  
TABLE 3  
STATUS OF OBSERVATIONS

2-RE-90-402	Verify lead lined storage box for particulate filters and iodine cartridges is installed. Box is portable and Chemistry has box.	Chemistry put box in room.	Closed
1,2-RE-90-119	Change EQ status from "Yes" to "No" in Reg Guide 1.97 response for items located in mild environments.	Changes not made. Inconsistent with TVA program.	Closed
1,2-RE-90-119	Typo in ODCM Table 1.1-2	Typo corrected	Closed
1,2-RE-90-129	Provide Chemistry with the results of Rev 3 to calculation WBNTSR-060.	Chemistry was given the results of the calculation via WBNTSR-107.	Closed
1,2-RE-90-404	DD 9100021 tried to add the background detector to as designed dwg. 47W610-90-5. Background is part of the standard Eberline NGP-1 design. Since the signal is available consideration should be given to utilizing it.	Background is not required to be used by SSDs.	Closed
1,2-RE-90-404	Purge capability is by manual action of the operator to manually realign sample line valves. Ususally, purge capability is provided by push button or switch action. The existing configuration is acceptable but requires manual operator action at the sample lines.	No action needed.	Closed
0-RE-90-125, 126	Procurement requisition W 8375 must be awarded and report approved to test Unit 2 recorders to seismic criteria.	WBPER940279 was tracking this issue. Contract 141254 EX-WB-DC-30-4-37 (T2995 0721 837)	Closed
0-RE-90-205, 206	Procurement requisition W 8375 must be awarded and report approved to test Unit 2 recorders to seismic criteria.	WBPER940279 was tracking this issue. Contract 141254 EX-WB-DC-30-4-37 (T2995 0721 837)	Closed

**ENCLOSURE 1  
ATTACHMENT 2  
TABLE 3  
STATUS OF OBSERVATIONS**

1-RE-90-012	Manufacturers sensitivity report is being ordered for addition to RIMS via 2652. This applies to all Sorrento monitors purchased under PO 92759 and its supplements	Sorrento provided report (T41 951101 800)	Closed
0-RE-90-122	Operator procedures should note that a release can be terminated (RCV-77-43 closed) due to a sample flow fault without an alarm in the MCR	No change required Release is monitored by Chemistry	Closed
0-RE-90-133	The skid power feed for 0-RE-90-133 and 1-RE-90-106 should be rewired to separate breakers	Not changed. Monitors individually fused and no requirement was violated.	Closed
0-RE-90-133	Procurement requisition W 8375 must be awarded and report approved to test Unit 2 recorders to seismic criteria.	WBPER940279 was tracking this issue. Contract 141254 EX-WB-DC-30-4-37 (T2995 0721 837)	Closed
0-RE-90-133, -134, -140, -141	Change EQ status from "Yes" to "No" in Reg Guide 1.97 response for items located in mild environments.	Changes not made. Inconsistent with TVA program.	Closed
1-RE-90-421, -422, -423, -424	For the RE: RD-11 the environmental temperature exceeds that qualification temperature. Tracked by WBPER940601	DCN F-33273 abandoned low range detector	Closed
1-RE-90-277, 278	These monitors are not important to safety, so the detectors are acceptable per requirements for non-safety equipment in WB-DC-40-24 R4.	No action required.	Closed
1-RE-90-275, 276	These monitors are not important to safety, so the detectors are acceptable per requirements for non-safety equipment in WB-DC-40-24 R4.	No action required.	Closed
1-RE-90-290, 292	These monitors are not important to safety, so the detectors are acceptable per requirements for non-safety equipment in WB-DC-40-24 R4.	No action required.	Closed

**Enclosure 2**  
**Watts Bar Nuclear Plant (WBN) Unit 1**  
**Radiation Monitoring System Assessment**

**Post-fuel Load Activities**

**Information Requested:**

For monitors which fulfill Technical Specification, Offsite Dose Calculation Manual (ODCM), and Regulatory Guide (RG) 1.97 requirements, describe the availability (time in-service) of the monitors since receipt of a low power license.

**Response:**

TVA's letter dated January 22, 1996, provided cumulative average availabilities since fuel load for the RMS as a whole and for the Technical Specification and ODCM monitors. The tables contained in Attachment 1 and listed below, provide related information for each individual monitor, showing the function of the monitor, the percent availability and, where appropriate, a discussion of work activities on the monitors which affected its availability. Graphical representations of this data are also provided in Attachment 1 as follows.

Table 1. System 90 Availability by Monitor.

Table 2. System 90 Out of Service Trend by Subsystem.

Graph 1. Radiation Monitoring System Availability.

Graph 2. Technical Specification Monitor Availability.

Graph 3. ODCM Monitor Availability.

Table 3. System 90 Out of Service Trend, Chronologically by Workorder.

**Information Requested:**

For key organizations such as Operations, Maintenance, Radiological Control, and Chemistry, describe the specific training that has been provided which will help ensure that the RMS is operated and maintained in accordance with TVA procedures and NRC regulations.

Response:

Training has been established to ensure that personnel required to perform tasks involving the RMS have the skills and understanding necessary to perform their tasks correctly. Continuing training modules for key departments have been revised and augmented.

Operations, Maintenance, Radiological Controls and Chemistry Training Programs are accredited by the National Academy for Nuclear Training and use the Systematic Approach to Training (SAT) for analysis, design, development, implementation and evaluation. The SAT process which is used for the evaluation of the training programs was applied to the DCNs associated with the RMS. A review of each of the design changes included a comparison to existing tasks and training materials. Necessary training tasks are added or revised. Training materials are developed or revised and training is conducted to ensure that sufficient personnel are qualified for plant operations. Additional training will be held to enhance existing training and to increase the number of qualified technicians.

Operations Department

The classroom training lesson plans for licensed and non-licensed Operators were reviewed and revised in November 1995 to ensure that the latest RMS design changes, e.g., latest Shield Building Vent Monitor equipment, addition of annunciator and trip block functions, and changes to interlock functions, are understood by operators. The accuracy of information presented in the lesson plan was confirmed and the level of discussion was increased to provide additional assurance that operation of monitor controls at both the monitor enclosure and the main control panel will be performed correctly. Normal indications, valid alarm conditions as well as potential false indications due to equipment failure are stressed. Available methods for collecting data on the newest digital radiation monitoring equipment were presented to familiarize operators with actions performed by other personnel.

Training of Operator crews including Shift Operation Supervisors, Licensed Reactor Operators and Assistant Unit Operators was conducted using the revised lesson plan 3-OT-SYS-090A. This training was conducted over six days from December 12-20, 1995, and consisted of six and one-half hours of presentation and discussions with the RMS engineer who was present on all but one day.

On-the-job certifications (qualification cards focusing on Radiation Monitoring tasks) have been developed for all operators. Qualification card certification is in process.

## Radiological Control (RADCON) Department

Enhanced radiation monitoring training was provided for RADCON Technicians in several areas.

Classroom training was performed to enhance RADCON Technician knowledge and understanding of the RMS. The following continuing training classes have been conducted:

RMS (HPT307.016) - Eight-hour classes focusing on the functions, auto system responses, alarm response and location of RMS components.

Auxiliary Building Ventilation System (HPT307.025) - Four-hour classes on the design basis, component location and interface with the RMS.

Reactor building Purge Ventilation System (HPT 307.026) - Four-hour classes on purpose, component location and interface with the RMS.

Radiation Control Technician training includes qualification on six tasks for Continuous Air Monitors (CAMs). These tasks included:

- Change filters in CAMs
- Change filter paper in CAMs
- Verify operation of CAMs
- Conduct performance tests of CAMs
- Change chart paper in CAMs
- Respond to CAM alarms

## Instrument & Controls (I&C) Maintenance Department

I&C training program contains formal classroom training which includes training on RMS. Training includes the following:

- Initial apprentice program
- Senior Instrument Mechanic (SIM) program
- Continuing and specialized program

Approximately 30 job training specific tasks (qualification cards) which are focused on Radiation Monitoring have been developed and implemented. This effort has ensured that qualified personnel are available to perform each radiation monitoring task.

The core I&C Maintenance crew for RMS includes the following:

- Radiation monitoring qualified technicians which have obtained special knowledge from vendor interface, system engineers, and equipment installation
- Both classroom training and on-job Qualification Cards are utilized

#### Chemistry Department

Training provided for Count Room Radiochemical Laboratory Analysts (RLAs) involved with effluent permitting included required initial training and specific qualification tasks as well as recently completed enhanced training. Training is complete for personnel currently at WBN.

#### Original Required Training:

- Classroom training using RMS Module 305.205: includes comprehensive treatment of WBN radiation monitors, their design, locations, instrumentation and controls, and sampling techniques.
- Qualification Card Tasks for Count Room RLAs on tasks involved with effluent permitting.

#### Enhanced Recent Training:

- Discussion sessions with Count Room RLAs to thoroughly familiarize them with the practices included in new WBN procedure PAI-5.04, "Installed Radiation Monitoring Program."
- Group department meetings with Count Room RLAs to review WBN experience with radiation monitoring problems, e.g., interface with Operations, monitoring deficiencies, etc.
- Chemistry management field observations were performed for Count Room RLAs during the performance of specific System 90 tasks.
- Enhanced Radiation Monitoring training provided for Radio-Chemical Laboratory Analysts.

- Classroom training using RMS Module 305.205.

### System Engineer

The System Engineer (SE) with oversight for the RMS has completed in-house Engineering Support Personnel Training and additional vendor-supplied training. The SEs additional qualifications include 10 years of experience as the WBN RMS engineer as well as vendor certification on the Sorrento Electronics Wide Range Gas Monitor. The SEs competence on Radiation Monitoring was demonstrated by completion of position specific training in accordance with ESP 310.000, "System Engineering Qualification Standard."

### Information Requested:

Describe the methods through which conformance to the requirements of RG 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," are assured with respect to the process which compares effluent monitor readings with grab samples.

### Response:

Consistent with the guidance provided in Revision 1 of RG 1.21, site procedures require a routine comparison of effluent radiation monitor readings to laboratory analysis of effluent samples to be performed. This comparison is made to determine the degree of correlation between these diverse measurements thus ensuring the validity of monitor calibrations while allowing early detection of component failure or calibration drift. Review and analysis of results are performed by the Chemistry and Technical Support organization to identify and evaluate disagreements. Chemistry Department and Technical Support instructions implement the following activities to ensure that this objective is met:

- Radiation monitor readings of radioactive noble gas and radioactive liquid releases will be recorded at the time samples of the monitored process are collected.
- Determination of expected monitor response will be made when process activities are sufficient to allow meaningful analysis. This determination will be based upon analysis of the measurement data taken on the collected sample and the detector calibration curve established during initial or primary calibration.
- Comparison of expected monitor response to actual monitor response will be made to establish the degree of agreement for further evaluation.

- Evaluation of disagreement against design-required instrument accuracy for the radiation monitor will be made to determine if monitor performance is acceptable. Investigation of the cause and initiation of corrective actions will be made if unacceptable results are identified.
- Trending of comparison data will be performed and results addressed in periodic system status reports. Trend data will be used to establish normal or expected monitor performance which can then be used to identify changes in plant performance allowing early evaluation of these changes.

**Information Requested:**

Provide a discussion of the program that supports the availability of spare parts to maintain the system.

**Response:**

The WBN Critical Spares Program establishes both minimum inventory and re-order spare part quantities based on vendor recommendations and plant maintenance data. Once finalized, access to the Bill of Materials (BOMs) will be through the Equipment Management System (EMS).

To date, the identification and purchase of RMS spare parts has resulted in BOMs being completed for 60 manufacturer/model types included in the RMS spare parts scope. Examples of the completed BOMs are included in Attachment 2 to this enclosure. The 60 completed represent 220 plant sub-components. For these components, there are currently 393 line items in inventory with established reorder points (ROP) and reorder quantities (ROQ). There are an additional 27 line items on order, with established delivery dates.

Since turnover of the system to plant Operations, the unavailability of spare parts has not been an issue in maintaining and repairing RMS equipment. The actions discussed above regarding the Critical Spares Program will enhance the maintenance of the system and ensure that needed replacement components are available.

Attachment 1

Radiation Monitor Availability

TABLE 1  
SYSTEM 90  
AVAILABILITY (BY MONITOR)

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
<b>System 90A AREA Monitors</b>	6 TS/ 0 ODCM	99.46%	0.54%	
0-LPR-90-3 Waste Package Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
0-LPR-90-4 Decon Room Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
0-LPR-90-5 Spent Fuel Pit Pmps Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
0-LPR-90-9 Waste Evap Cond Tank Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
0-LPR-90-11 Cntmt Spray RHR Pmp Rm Area Mon (1.0E-1 to 1.0E+4 MRH)		85.59%	14.41%	<ul style="list-style-type: none"> <li>• Broken pin in detector cannon connector plug.</li> <li>• Indicator replacement. (1)</li> </ul>
0-LPR-90-102 Fuel Pool Area Mon (1.0E-1 to 1.0E+4 MRH)	Tech Spec	95.95%	4.05%	<ul style="list-style-type: none"> <li>• Detector was high pressure washed causing failure.</li> <li>• Channel recorder repair and adjustment. (2)</li> </ul>
0-LPR-90-103 Fuel Pool Area Monitor (1.0E-1 to 1.0E+4 MRH)	Tech Spec	100%	0%	
0-LPR-90-135 Main Cntrl Rm Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
0-LPR-90-230 Condensate Demin Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
0-LPR-90-231 Condensate Demin Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-1 Spent Fuel Pit Pmps Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
1-LPR-90-2 Personnel Lock Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-6 Comp Cool Wtr Ht Exch Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-7 Hot Smpl Rm Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-8 AUX Fdwtr Pmps Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-10 CVCS Brd Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-59 RCB Up Comp Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-60 RCB Up Comp Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-61 RCB Low Comp Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-271 RCB Up Comp Post Acc Area Mon (1.0E+0 to 1.0E+8 RH)	Tech Spec	100%	0%	
1-LPR-90-272 RCB Up Comp Post Acc Area Mon (1.0E+0 to 1.0E+8 RH)	Tech Spec	100%	0%	
1-LPR-90-273 RCB Low Comp Post Acc Area Mon (1.0E+0 to 1.0E+8 RH)	Tech Spec	100%	0%	

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
1-LPR-90-274 RCB Low Comp Post Acc Area Mon (1.0E+0 to 1.0E+8 RH)	Tech Spec	100%	0%	
1-LPR-90-275 Reactor Cool Dn Tk Area Mon (1.0E+0 to 1.0E+5 MRH)		100%	0%	
1-LPR-90-276 Reactor Cool Dn Tk Area Mon (1.0E+0 to 1.0E+5 MRH)		100%	0%	
1-LPR-90-277 Reactor Blbg Fl & Equip Drn Sump Area Mon (1.0E-9 to 1.0E+5 MRH)		100%	0%	
1-LPR-90-278 Reactor Blbg Fl & Equip Drn Sump Area Mon (1.0E+0 to 1.0E+5 MRH)		100%	0%	
1-LPR-90-280 Post Acc Smp Pl Rm Area Mon (1.0E+0 to 1.0E+5 MRH)		100%	0%	
1-LPR-90-290 RHR Post Acc Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-291 RHR Post Acc Area Mon (1.0E+3 to 1.0E+11 MRH)		100%	0%	
1-LPR-90-292 RHR Post Acc Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
1-LPR-90-293 RHR Post Acc Area Mon (1.0E+3 to 1.0E+11 MRH)		100%	0%	
2-LPR-90-1 Spent Fuel Pit Pmps Area Mon (1.0E-1 to 1.0E+4 MRH)		98.65%	1.35%	<ul style="list-style-type: none"> <li>• Low background</li> <li>• Replace indicator.(1)</li> </ul>

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
2-LPR-90-6 Comp Cool Wtr Ht Exch Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
2-LPR-90-7 Hot Smpl Rm Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
2-LPR-90-8 Aux Fdwtr Pmps Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
2-LPR-90-10 CVCS Brd Area Mon (1.0E-1 to 1.0E+4 MRH)		100%	0%	
<b>System 90B LIQUID Monitors</b>	0 TS 7 ODCM	98.74%	1.26%	
0-LPR-90-122 Wst Disp Sys Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0	
0-LPR-90-123 CCS Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)		100%	0%	
0-LPR-90-133 ERCW Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0%	
0-LPR-90-134 ERCW Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0%	
0-LPR-90-140 ERCW Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0%	
0-LPR-90-141 ERCW Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0%	

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
0-LPR-90-212 Sta Sump Disc Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	87.39%	12.61%	<ul style="list-style-type: none"> <li>• Indicator replacement. (1)</li> <li>• Low HI RAD setpoint</li> <li>• Trash in sample lines.</li> </ul>
0-LPR-90-225 Condensate Demin Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0%	
1-LPR-90-123 CCS Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)		100%	0%	
2-LPR-90-123 CCS Liq Eff Mon (1.0E+1 to 1.0E+7 CFM)		100%	0%	
<b>System 90C SAMPLE Monitors</b>	0 TS 3 ODCM	92.74%	7.26%	
0-LPF-90-300 Aux Bldg Isokinetic Mon (No Detector, Flow Only)	ODCM	89.19%	10.81%	<ul style="list-style-type: none"> <li>• Motor failure. (3)</li> <li>• Flow Controller malfunction.</li> </ul>
0-LPF-90-320 Ser: Bldg Isokinetic Mon (No Detector, Flow Only)	ODCM	100%	0%	
1-LPR-90-129 Cond Vac Exh Part & Iod Sample (No Detector, Flow Only)	ODCM	89.02%	10.98%	• Power removed when 1-LPR-90-119 removed from service.
<b>System 90D GAS Monitors</b>	4 TS 2 ODCM	94.72%	5.28%	
0-LPR-90-118 Wst Disp Sys Gas Eff Mon (1.0E+1 to 1.0E+7 CFM)	ODCM	100%	0%	
0-LPR-90-125 MCR Intake Mon (1.0E+1 to 1.0E+7 CFM)	Tech Spec	100%	0%	

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
0-LPR-90-126 MCR Intake Mon (1.0E+1 to 1.0E+7 CPM)	Tech Spec	100%	0%	
0-LPR-90-205 MCR Emer Intake Mon (1.0E+1 to 1.0E+7 CPM)		100%	0%	
0-LPR-90-206 MCR Emer Intake Mon (1.0E+1 to 1.0E+7 CPM)		100%	0%	
1-LPR-90-119 Cond Vec Exh Mon (1.0E+1 to 1.0E+7 CPM)	ODCM	57.77%	42.23%	<ul style="list-style-type: none"> <li>• Pump/Motor failure.(3)</li> <li>• Spurious alarms induced by electromagnetic noise.(4)</li> </ul>
1-LPR-90-130 Cntmt Purge Air Exh Mon (1.0E+1 to 1.0E+7 CPM)	Tech Spec	100%	0%	
1-LPR-90-131 Cntmt Purge Air Exh Mon (1.0E+1 to 1.0E+7 CPM)	Tech Spec	100%	0%	
System 90E PIG Monitors	2 TS 2 ODCM	87.13%	12.87%	
0-LPR-90-101 Aux Bldg Vent PIG Mon (1.0E+1 to 1.0E+7 CPM)	ODCM	87.61%	12.39%	<ul style="list-style-type: none"> <li>• Filter Fail alarm (moving filter).(5)</li> <li>• Back-flow through iodine/particulate channel.</li> <li>• Filter paper misalignment (moving filter paper).</li> </ul>
0-LPR-90-132 Serv Bldg Vent PIG Mon (1.0E+1 to 1.0E+7 CPM)	ODCM	90.82%	9.18%	<ul style="list-style-type: none"> <li>• Flow control valve adjustment.</li> <li>• Filter fail alarm (moving filter).(5)</li> <li>• Pump/Motor failure.(3)</li> </ul>
1-LPR-90-106 Cont Bldg Low Comp PIG Mon (1.0E+1 to 1.0E+7 CPM)	Tech Spec	77.63%	22.37%	<ul style="list-style-type: none"> <li>• Pump/Motor failure.(3)</li> <li>• Channel recorder adjustment.(2)</li> <li>• Low background iodine channel.</li> <li>• Low Flow alarm adjustment.</li> <li>• Investigation following excessive vacuum.</li> <li>• Obstruction to monitor flow (clogged when boron leak occurred).</li> </ul>

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
1-LPR-90-112 Cont Bldg Up Comp PIG Mon (1.0E+1 to 1.0E+7 CPM)	Tech Spec	92.46%	7.54%	<ul style="list-style-type: none"> <li>• Unable to obtain chemistry grab sample.</li> <li>• Filter fail alarm (moving filter). (5)</li> <li>• Low background iodine channel.</li> <li>• High background on particulate channel.</li> <li>• Investigation following excessive vacuum.</li> <li>• Test valves will not allow sufficient flow.</li> </ul>
System 90F CAM Monitors	0 TS 0 ODCM	87.44%	12.56%	
0-LPR-90-12 Spent Fuel Pit CAM (1.0E+1 to 1.0E+7 CPM)		56.76%	43.24%	<ul style="list-style-type: none"> <li>• Filter fail mechanism failure.</li> <li>• Pump/Motor failure. (3)</li> </ul>
0-LPR-90-13 Wst Pkg Area CAM (1.0E+1 to 1.0E+7 CPM)		78.38%	21.62%	<ul style="list-style-type: none"> <li>• Filter fail alarms. (5)</li> </ul>
0-LPR-90-15 Hldup Wlv Gtry CAM (1.0E+1 to 1.0E+7 CPM)		99.55%	0.45%	<ul style="list-style-type: none"> <li>• Low flow alarm adjustment.</li> </ul>
0-LPR-90-16 Decon Area CAM (1.0E+1 to 1.0E+7 CPM)		100%	0%	
0-LPR-90-17 Safety Inj Pmp Area CAM (1.0E+1 to 1.0E+7 CPM)		100%	0%	
0-LPR-90-138 Wst Pkg Area CAM (1.0E+1 to 1.0E+7 CPM)		94.59%	5.41%	<ul style="list-style-type: none"> <li>• Obstructed sample line.</li> </ul>
1-LPR-90-14 Hot Sample Rm Area CAM (1.0E+1 to 1.0E+7 CPM)		70.27	29.73%	<ul style="list-style-type: none"> <li>• Pump/Motor failure. (3)</li> </ul>
1-LPR-90-62 RB Low Comp Inst Rm CAM (1.0E+1 to 1.0E+7 CPM)		100%	0%	

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
<b>System 90G DIGITAL Monitors</b>	0 TS 4 ODCM	99.26%	0.74%	
1-LPF-90-400 Plant Vent Stack Isokinetic Mon (No Detector, Flow Only)	ODCM	100%	0%	
1-LPR-90-400 Plant Vent Stack WPGM	ODCM	98.99%	1.01%	• Data base was lost during power outage tests.
1-LPR-90-404 Cond Vac Exh Mid/Hi Rng Mon		97.30%	2.70%	• Monitor was isolated when 1-LPR-90-119 removed from service. • Low bkgnd on the background detector causing loss of counts.
2-LPF-90-400 Plant Vent Stack Isokinetic Mon (No Detector, Flow Only)	ODCM	100%	0%	
2-LPR-90-400 Plant Vent Stack WPGM	ODCM	100%	0%	
<b>System 90I HFT Monitors</b>	0 TS 2 ODCM	91.22%	8.78%	
1-LPR-90-120 Stm Gen Bldn Liq Mon (1.0E+1 to 1.0E+7 CPM)	ODCM	72.97%	27.03%	• Spurious alarms caused by electromagnetic noise.(4)
1-LPR-90-121 Stm Gen Bldn Liq Mon (1.0E+1 to 1.0E+7 CPM)	ODCM	74.32%	25.68%	• Spurious alarms caused by electromagnetic noise.(4)

**SYSTEM 90 AVAILABILITY**  
(11/9/95 through 1/22/96)

Monitor # Monitor Name (Monitor Range)	Tech Spec/ ODCM	% Available	% Not Available	Work Description
1-LPR-90-421 Stm Line Lp #1 & Relf Mon (1.0E+1 to 1.0E+7 CPM)		100%	0%	
1-LPR-90-422 Stm Line Lp #2 & Relf Mon (1.0E+1 to 1.0E+7 CPM)		100%	0%	
1-LPR-90-423 Stm Line Lp #3 & Relf Mon (1.0E+1 to 1.0E+7 CPM)		100%	0%	
1-LPR-90-424 Stm Line Lp #4 & Relf Mon (1.0E+1 to 1.0E+7 CPM)		100%	0%	

- (1) Indicator failures are not a related problem. Their failures have not been of similar nature.
- (2) Recorders have been out of service and are still in a burn in period. They have been adjusted and/or repaired promptly. Parts have not been a concern.
- (3) Preventative maintenance measures have been scheduled to rebuild pumps on a quarterly basis as recommended by vendor.
- (4) Noise suppression components have been installed to correct for EMF noise.
- (5) A vendor manual revision has been implemented, and a work order performed to ensure O-rings have been installed in all particulate moving filter assemblies to arrest filter paper slipping.

TABLE 2  
SYSTEM 90 OUT-OF-SERVICE  
TREND BY SUBSYSTEM

January 22, 1996

SYSTEM 90 OOS TREND  
(Starting Date 11/9/95)

For the purpose of this evaluation of DOWN-TIME, the following is calculated from 11/9/95, 1800 Hrs to 1/22/96, 1800 Hrs (A total of 74 days or 1776 hrs). Start time is the date WR was entered into MPAC. Stop time is the date of CR status in MPAC for WO not yet reviewed. Completed WOs are reviewed to determine actual time OOS as well as down time imposed by Chemistry installed sample cart.

SYS #	# Chnl's	% Availible Time	Monitor Not Functional
90A	37 (65712 hr)	99.46 %	0.54 % (352 hr)
90B	10 (17760 hr)	98.74 %	1.26 % (224 hr)
90C	3 (5328 hr)	92.74 %	7.26 % (387 hr)
90D	8 (14208 hr)	94.72 %	5.28 % (750 hr)
90E	4 (12 CH) (21312 hr)	87.13 %	12.87 % (2743 hr)
90F	8 (14208 hr)	87.44 %	12.56 % (1784 hr)
90G	5 (8880 hr)	99.26 %	0.74 % (66 hr)
90I	6 (10656 hr)	91.22 %	8.78 % (936 hr)
Total	89 (158,064 hrs)	95.42 % (150,822 hrs)	4.58 % (7,242 hrs)

January 22, 1996

## SYSTEM 90 OOS TREND

(Starting Date 11/9/95)

The information provided by this table was compiled from generated repair/failure work requests. Only those monitors where work has been requested are given.

For the purpose of this evaluation, the following was calculated from 11/9/95, 1800 Hrs to 1/22/96, 1800 Hrs (A total of 74 days or 1776 hrs). The % Maint Time begins when WR is entered into MPAC and ends when WO is CR statused in MPAC. Completed WOs are reviewed to determine actual time OOS as well as down time imposed by Chemistry installed sample cart.

SYS #/MON #	% Available Time	Monitor Not Functional
<b>90A Area Monitors</b>		
2-RE-90-1 (Spent Fuel Pit Area Mon)	98.65 %	1.35 % (24 hr)
0-RE-90-11 (Cntmt Spray RHR Pmp Rm Area Mon)	85.59 %	14.41 % (256 hr)
*0-RE-90-102 (Fuel Pool Area Mon)	95.95 %	4.05 % (72 hr)
*0-RE-90-103 (Fuel Pool Area Mon)	100 %	0 %
1-RE-90-292 (RHR Post Acc Area Mon)	100 %	0 %
<b>90B Liquid Monitors</b>		
0-RE-90-122 (Wst Disp Sys Liq Mon)	100 %	0 %
-RE-90-123 (Comp Cooling Liq Mon)	100 %	0 %
*0-RE-90-212 (Sta Sump Disc Eff Mon)	87.39 %	12.61 % (224 hr)
*0-RE-90-225 (Cond. Demin Eff Mon)	100 %	0 %
<b>90C Sample Monitors</b>		
*1-RE-90-129 (Cond Vac Exh Part & Iod Mon)	89.02 %	10.98 % (195 hr)
*0-RE-90-300 (Aux Bldg Isokinetic Mon)	89.19 %	10.81 % (192 hr)
<b>90D Gaseous Monitors</b>		
*0-RE-90-118 (Wst Disp Sys Gas Eff Mon)	100 %	0 %
*1-RE-90-119 (Cond Vac Exh Gas Mon)	57.77 %	42.23 % (750 hr)
*0-RE-90-126 (MCR Intake Gas Mon)	100 %	0 %
<b>90E PIG</b> Monitors of 90E have 3 channels, formula for calc is: OOS hrs/(total hrs * 3).		
*0-RE-90-101 (Aux Bldg Vent PIG Mon)	87.61 %	12.39 % (660 hr)
*1-RE-90-106 (Cont Bldg Low Comp PIG Mon)	77.63 %	22.37 % (1192 hr)
*1-RE-90-112 (Cont Bldg Up Comp PIG Mon)	92.46 %	7.54 % (402 hr)
*0-RE-90-132 (Serv. Bldg Vent PIG Mon)	90.82 %	9.18 % (489 hr)

\* Tech Spec/ODCM Monitors

January 22, 1996

## SYSTEM 90 OOS TREND

(Starting Date 11/9/95)

SYS #/MON #	% Available Time	Monitor Not Functional
<b>90F CAM</b>		
0-RE-90-12 (Spent Fuel Pit Part Mon)	56.76 %	43.24 % (768 hr)
0-RE-90-13 (Waste Pkg Area Part Mon)	78.38 %	21.62 % (384 hr)
1-RE-90-14 (Hot Smpl Rm Area Part Mon)	70.27 %	29.73 % (528 hr)
0-RE-90-15 (Holdup Vlv Gal Part Mon)	99.55 %	0.45 % (8 hr)
0-RE-90-16 (Decon Area Part Mon)	100 %	0 %
0-RE-90-17 (Safety Inj Pmp Area Part Mon)	100 %	0 %
1-RE-90-62 (Cont Bldg Low Comp Inst Rm Part Mon)	100 %	0 %
0-RE-90-138 (Wst Pkg Area Part Mon)	94.59 %	5.41 % (96 hr)
<b>90G Digital Effluent</b>		
*1-RE-90-400 (Wide Rng Gas Mon)	98.99 %	1.01 % (18 hr)
1-RE-90-404 (Cond Vac Exh Mid/Hi Gas Mon)	97.30 %	2.70 % (48 hr)
1-RE-90-450 (Cond Vac Exh Mid/Hi Com Mod)	100 %	0 %
<b>90I HFT Mons (SGBD &amp; MSL)</b>		
*1-RE-90-120 (Stm Gen Bldn Liq Samp Mon)	72.94 %	27.03 % (480 hr)
*1-RE-90-121 (Stm Gen Bldn Liq Samp Mon)	74.32 %	25.68 % (456 hr)
1-RE-90-423 (Main Steam Line Rad Mon)	100 %	0 %

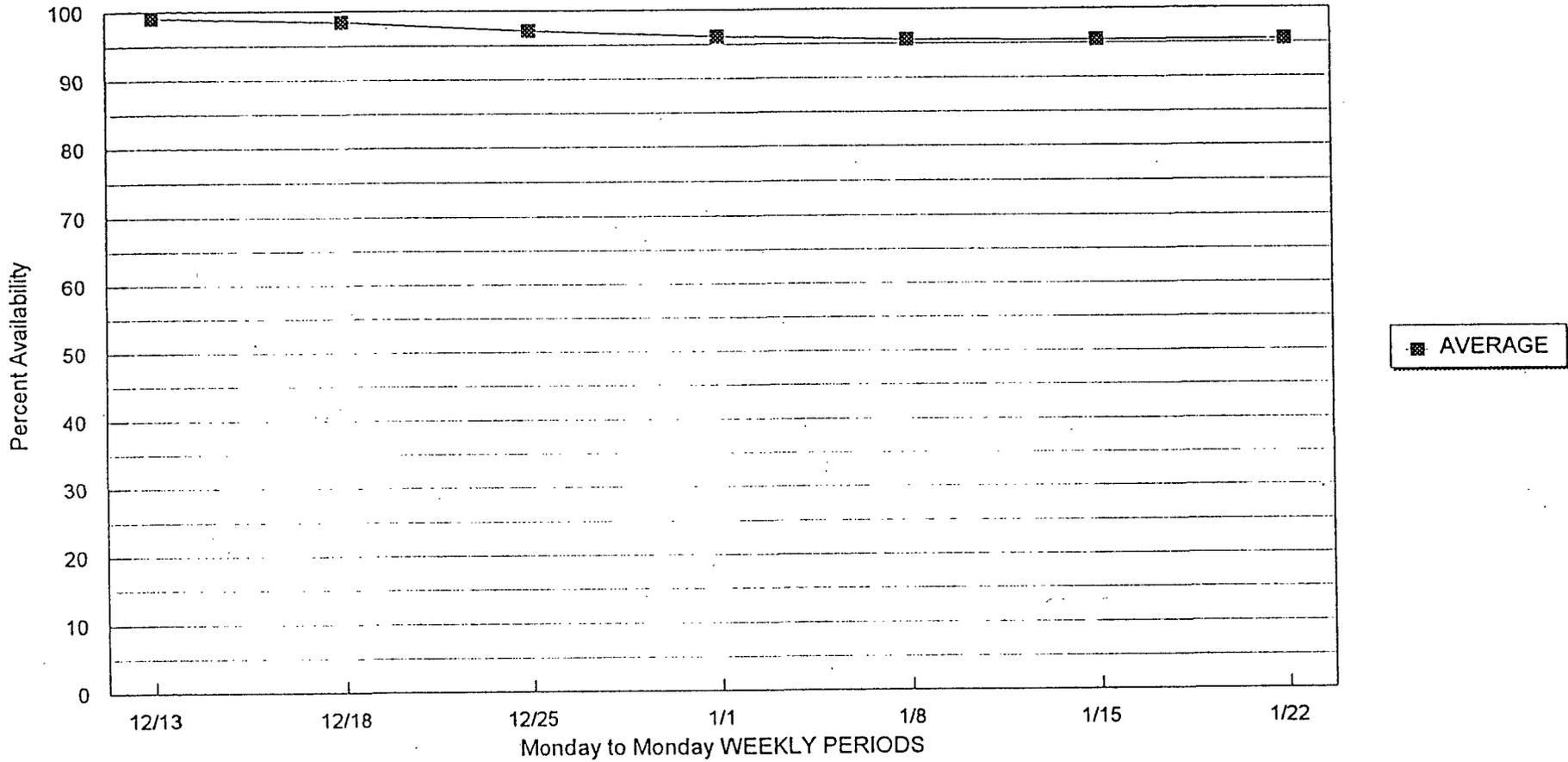
\* Tech Spec/ODCM Monitors

GRAPH 1  
RADIATION MONITORING SYSTEM AVAILABILITY

GRAPH 2  
TECHNICAL SPECIFICATION  
MONITOR UNAVAILABILITY

GRAPH 3  
ODCM MONITOR UNAVAILABILITY

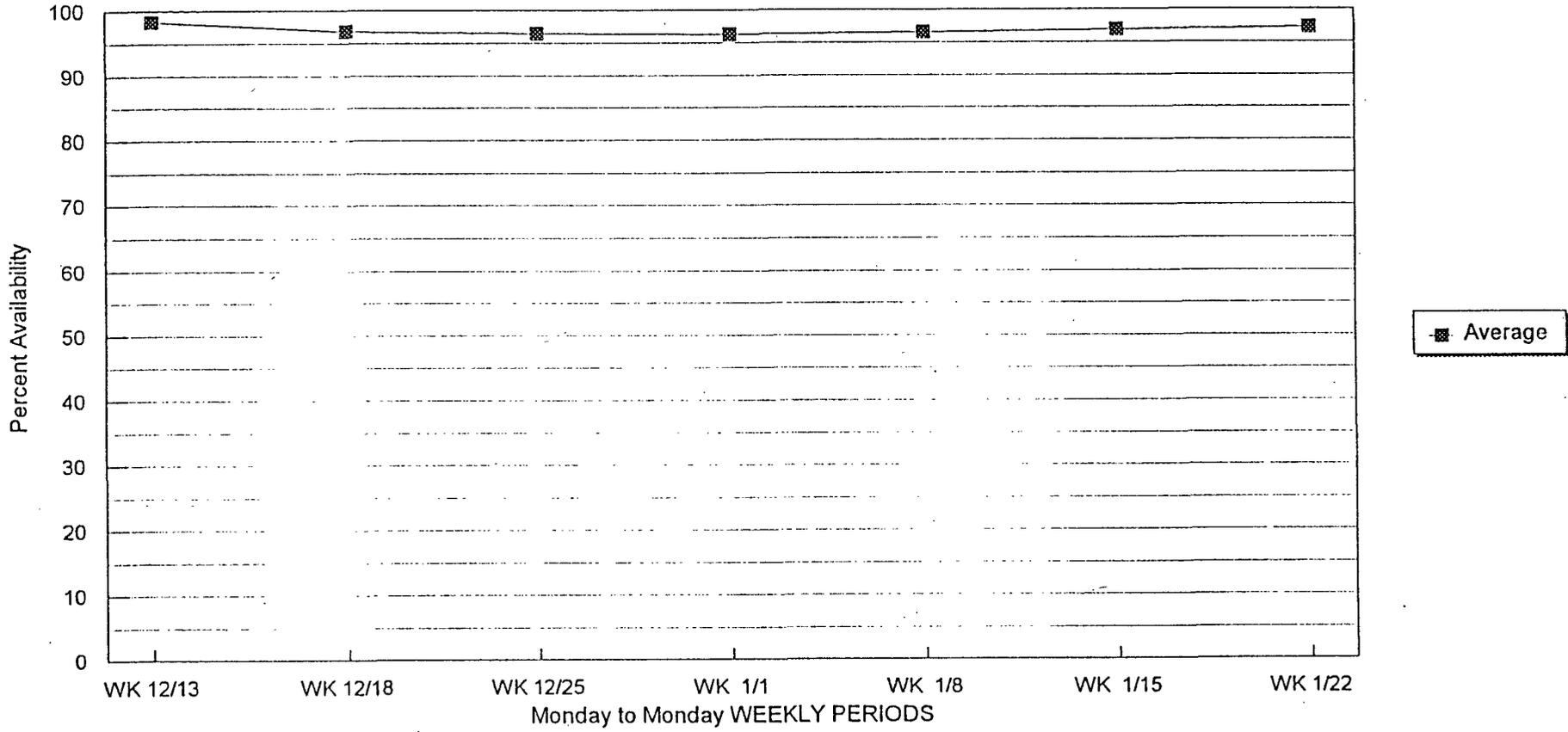
RAD MON SYSTEM  
% Availability



Principal cause for downward trend is the unavailability of monitors 1-RE-90-119, 1-LPR-90-120, and 121 to correct electronic noise issues.

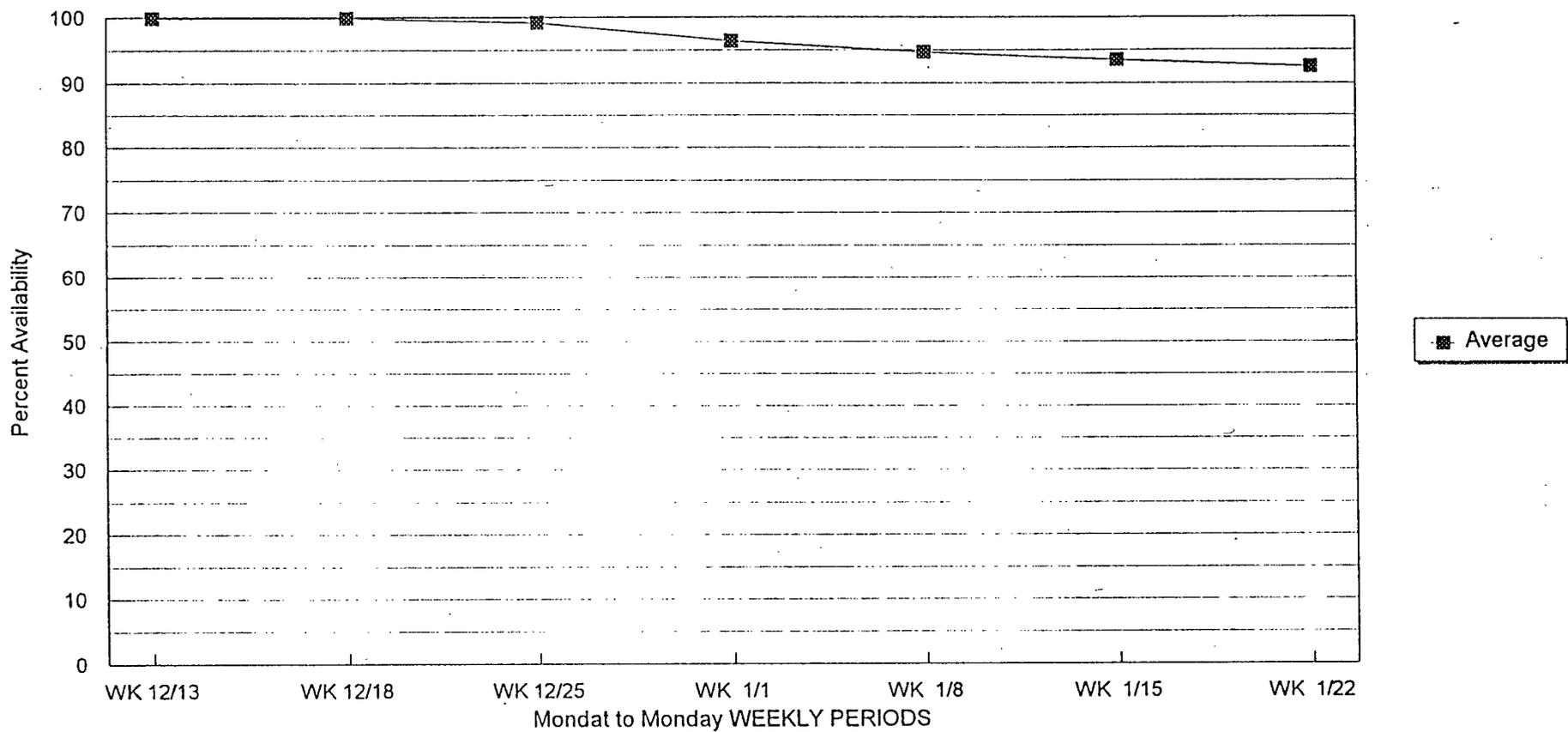
# TECH SPEC MONITORS

% Available



# ODCM Monitors

% Available



Principal cause for downward trend is the unavailability of monitors 1-RE-90-119, 1-LPR-90-120, and 121 to correct electronic noise issues.

TABLE 3

SYSTEM 90 OUT OF SERVICE TREND  
(CHRONOLOGICALLY BY WORK ORDER)

January 22, 1996

SYSTEM 90 OOS TREND  
(Starting Date 11/9/95)

Monitor #	Date WR Initiated	Date WO Comp (CR)	Duration WO Open (Days)	Time Rad Mon Actually OOS (Hours)	Reason OOS	Corrective Action
1-RM-90-112C Cnt Bldg Upper Comp PIG Rad Mon	10/30/95	11/24/95	15	6 (OOS by WO 95-25280-00)	WO 95-25128-00: Operate light will not stay lit	Verified proper HV, LLD, ULD and Cal source readings. ALL were within as left tol.
1-LPR-90-112A Cnt Bldg Upper Comp PIG Rad Mon	11/1/95	11/24/95	15	48	WO 95-25280-00: Unable to obtain Grab Sample Bypass	Exercised relf vlv. Performed IMI-90.003. Adjusted filter feed clutch. Inst O-ring on filter paper
0-LPR-90-13 Wst Pkg Area CAM	11/3/95	11/10/95	7	N/A	WO 95-25339-00: Filter Fail Alarm	Replaced paper. (A VM revision has been generated to resolve slipping paper) Paper was moving but not resetting timer
1-LPR-90-106 Cnt Bldg Lower Comp PIG Rad Mon	11/6/95	11/20/95	11	264	WO 95-25662-00: Pump locked up causing motor failure and 1-HS-90-106A failure.	Pump, motor and HS replaced
0-LPR-90-12 Spent Fuel Pit CAM	11/10/95	11/20/95	10	24	WO 95-25948-00: Filter Fail Alarm	Changed fast speed mtr clutch & adj filter feed micro-switch
1-LPR-90-400 Shield Bldg Vent NROM	11/11/95	11/12/95	1	18	WO 95-25919-00: Communication between monitor and MCR has failed	Reloaded RM-80 data base
0-RR-90-122 Wst Disp Sys Hig Rad Mon	11/12/95	11/15/95	4	N/A	WO 95-25939-00: RR does not record same value as ratemeter indicating.	Cleaned contacts of amplifier card & calibrated RR
0-LPR-90-138 Waste Pkg Area CAM	11/14/95	11/18/95	4	96	WO 95-26066-00: Flow Alarm, Apparent particulate flow restriction	Cleared obstructed sense line. Also repaired RR door catch
0-LPR-90-101 Aux Bldg Vent Part Rad Mon	11/19/95	11/22/95	3	43	WO 95-26399-00: Particulate flow alarm, apparent flow restriction	Replaced filter paper & installed O-rings
0-RR-90-16 Decon Area CAM	11/19/95	AP status		N/A	WR C318789: (Minor Maintenance) Chart paper not advancing	WO went to I&C shop 11/22/95
0-RR-90-17 Safety Inj Imp Area CAM	11/19/95	AP status		N/A	WR C318796: (Minor Maintenance) Chart drive not operating properly	WO went to I&C shop 11/22/95
1-RR-90-106 Cnt Bldg Lo Comp PIG Rad Mon	11/20/95	11/30/95	10	N/A	WR C288396: (WR cancelled & tied to WO 95-24535-00) Red pin sticking, will not ink	Cleared red pin pathway

January 22, 1996

## SYSTEM 90 OOS TREND (Starting Date 11/9/95)

Monitor #	Date WR Initiated	Date WO Comp (CR)	Duration WO Open (Days)	Time Rad Mon Actually OOS (Hours)	Reason OOS	Corrective Action
0-LPR-90-132 Serv Bldg Vent PIG Rad Mon	11/22/95	11/18/95 CI status	26	115	WO 95-27213-00: Unable to calibrate flow controller for Pmp #1, cnt vlv sticking	Replaced drive mtr, Installed O-rings on filter paper, performed IMI-90.003. Replaced filter fail micro switch. Replaced sheared pin on slow drive filter paper mtr
0-LPR-90-102 Spent Fuel Pit Area Rad Mon	11/24/95	11/26/95	2	48	WO 95-26794-00: Rad Mon failed HI after RE was Hi pressure washed	Connector plug reconnected & tightened
2-RE-90-1 Spent Fuel Pit Pmp Area Rad Mon	11/25/95	12/6/95	11	N/A	WO 95-27183-00: Failed low, will not source check	Troubleshooting revealed no problems. OPS reported no problems, check source test responded properly
0-RR-90-102 Spent Fuel Pit Area Rad Mon	11/27/95	11/29/95	2	N/A	WO 95-27242-00: Repair door on recorder	Repaired door latch
0-LPR-90-102 Spent Fuel Pit Area Rad Mon	11/27/95	11/28/95	1	24	WO 95-26809-00: Loop will not respond to check source test	Replaced detector
1-LPR-90-112 Cnt Bldg Up Comp PIG Rad Mon	11/27/95	12/13/95	16	N/A	WR C288349: Filter fail alarms once or more each day	WR cancelled, will be performed by WO 95-28136-00
0-RE-90-11 Cont Spray Pmp Pm Area Rad Mon	11/28/95	12/8/95 CI status	10	240	WO 95-27251-00: Green operate light will no stay lit	Broken connector pin. Replaced cannon plug
1-LPR-90-292 Pmp Post Acc Area Rad Mon	11/28/95	12/7/95	8	N/A	WO 95-27249-00: Green operate light will not stay lit	No problems found, operating properly.
1-LPR-90-106C Cnt Bldg Lo Comp PIG Rad Mon	12/1/95	12/11/95	10	240 (1-PE-90-106C only)	WO 95-25003-00: Ann window continuously alarming due to low counts	Replaced bridge rectifier & properly reconnected the detector connector
0-RI-90-212A Stat Sump Disc Liq Rad Mon	12/2/95	12/8/95 CI status	6	8	WO 95-27326-00: Ratemeter indicator would not calibrate, (sticking)	Ratemeter indicator replaced and calibrated
1-LPR-90-106C Cnt Bldg Lo Comp PIG Rad Mon	12/3/95	12/7/95	4	N/A (OOS by WO 95-25003-00)	WO 95-27323-00: Following black-out test, iodine flow alarm would not clear	No problems found. Setpoints verified with no adjustments needed.
0-LPR-90-17 Safety Inj Pmp Area CAM	12/5/95	A status			WR C061974: Chronic filter fail alarm	

January 22, 1996

SYSTEM 90 OOS TREND  
(Starting Date 11/9/95)

Monitor #	Date WR Initiated	Date WO Comp (CR)	Duration WO Open (Days)	Time Rad Mon Actually OOS (Hours)	Reason OOS	Corrective Action
0-LPR-90-15 Holdup Vlv Gallery CAM	12/7/95	12/14/95	7	8	WR C318602: Flow alarm will not clear	WR cancelled to WO 95-28131-00 which was cancelled to WO 95-24558-00 which was completed 12/14/95 (TR#380424)
1-LPR-90-106 Cnt Bldg Lo Compt PIG Rad Mon	12/7/95	12/8/95	1	8 (1-RE-90-106C was OOS by WO 95-25003-00)	WO 95-27726-00: Corrective action following excessive vacuum	WBPER950650 Calibrated flow controllers & verified no leakage
1-LPR-90-112 Cnt Bldg Up Comp PIG Rad Mon	12/7/95	12/11/95	3	8	WO 95-27727-00: Corrective action following excessive vacuum	Performed inspection and verification of calibration. No problems found
0-RE-90-132 Ser Bldg Vent PIG Rad Mon	12/8/95	12/12/95	4	N/A	WO 95-27907-00: Malfunction alarm comes in & out before OPS can investigate	WO cancelled: work to be performed by WO 95-27213-00
0-LPR-90-12 Spent Fuel Pit CAM	12/9/95	1/9/96 CE status	31	744	WO 95-27781-00: Local breaker trips immediately after being closed	
0-RM-90-212A Station Sump Disc Lig Rad Mon	12/10/95	12/11/95	1	N/A	WO 95-27765-00: Troubleshoot to determine high alarm failure	Setpoint to low for plant conditions. Adjusted to new setpoint
Various	12/11/95	1/12/96 CI status	32	N/A	WO 95-27778-00: Remove Tech Spec name tags from 0-M-12 & 1-M-30 PNLs	Removed name tags
1-LPR-90-112 Cnt Bldg Up Comp PIG Rad Mon	12/13/95	12/18/95	5	N/A	WO 95-28136-00: Ratemeter reads 3000 CPM, background appears to be high. Verify calibration	WO cancelled: no problems found
0-RE-90-103 Spent Fuel Pit Area Rad Mon	12/13/95	12/20/95	7	N/A	WO 95-28173-00: Reading bottom of scale, can not verify Bkgnd per 1-SI-0-2	WO cancelled. To be performed by WO 95-27205-00
0-LPR-90-118 Nucle Gas Sys Gas Rad Mon	12/15/95	1/11/96 CI status	27	N/A	WO 95-28201-00: RR reads 6000 CMP while RM reads 2000 CPM	Loose connector. Cleaned RR mechanical components and calibrated.
Various	12/15/95	A status		N/A	WR C311067: Verify O-ring installation on particulate moving filter monitors	

January 22, 1996

**SYSTEM 90 OOS TREND**  
(Starting Date 11/9/95)

Monitor #	Date WR Initiated	Date WO Comp (CR)	Duration WO Open (Days)	Time Rad Mon Actually OOS (Hours)	Reason OOS	Corrective Action
1-RE-90-14 Hot Sample Pm CAM	12/18/95	1/9/96 CE status	22	528	WO 95-28212-00: No flow through CAM, monitor in Flow Alarm status	Broken belt. Replaced Pmp/Mtr belt
1-RE-90-119 Cond Vac Exh Gas Rad Mon	12/18/95	12/21/95 CX status	3	78	WO 95-28188-00: Flow element bypassed	WPPER950681 TR# 373886 1/10/96
1-RE-90-129 Cond Vac Exh Part & Iod Rad Mon	12/18/95	12/21/95	N/A	75	Monitor was isolated when 1-RE-90-119 was removed from service	
1-RE-90-404 Cond Vac Exh Mid:Hi Png Gas Rad Mon	12/19/95	12/21/95	N/A	48	Monitor was isolated when 1-RE-90-119 was removed from service	WPPER950681
0-LPR-90-101 Aux Bldg Vent. FIG Rad Mon	12/20/95	12/22/95 CE status	2	48	WO 95-28425-00: Iodine pre-filter indicating back flow	WPPER950676 (See WO 95-28425-01)
1-RE-90-119 Cond Vac Exh Gas Rad Mon	12/24/95	1/21/96 CR status	28	672	WO 95-28701-00: Monitor appears to be to sensitive to electrical interference	DCN generated to replace present check source AC relay with a DC relay to reduce noise susceptibility.
0-LPR-90-101 Aux Bldg Vent. FIG Rad Mon	12/26/95	1/1/96 CI status	6	121	WO 95-28425-01: Iodine pre-filter indicating back flow	0-RE-90-101C pig door bent. Corrected deformation, revised plant instructions to STOP 0-FMP-90-300 before 0-RE-90-101 pump and START 0-RE-90-101 pump before 0-PMP-90-300
0-RE-90-13 Haste Pkg Area CAM	12/26/95	1/11/96 CI status	16	384	WO 95-28732-00: continuous filter fail alarm	
1-LPR-90-120 Stm Gen Bldn Liq Rad Mon	12/27/95	1/16/96 CR status	20	480	WO 95-28956-00: Low Flow & Hi Rad alarm will not clear	Noise problem. DCN W-38628 generated to install RC networks.
1-LPR-90-123 CCS Liq Rad Mon	12/27/95	AP status			WO 96-00446-00: Flow alarm will not clear	
0-RR-90-225 Cond Demin Liq Rad Mon	12/28/95	12/29/95	1	N/A	WO 95-28973-00: Recorder does not advance	WO cancelled, chart paper advancing properly. No work performed
1-LPR-90-121 Stm Gen Bldn Liq Rad Mon	12/29/95	1/16/96 CR status	18	432	WO 95-28956-00: Low Flow & Hi Rad alarm will not clear	Noise problem. DCN W-38628 generated to install RC networks.

January 22, 1996

**SYSTEM 90 OOS TREND**  
(Starting Date 11/9/95)

Monitor #	Date WR Initiated	Date WO Comp (CR)	Duration WO Open (Days)	Time Rad Mon Actually OOS (Hours)	Reason OOS	Corrective Action
0-LPR-90-12 Spent Fuel Pit CAM	12/29/95	1/6/96 CI status	8	(OOS by WO 95-27781-00)	WO 95-27781-01: Replace pump, found seized.	Replaced pump.
1-LPR-90-112 CNC Bldg Up Comp PIG Rad Mon	12/30/95	1/8/96 CI status	9	216 (1-PE-90-112c only)	WO 95-28978-00: Inst. Malf. alarming periodically.	
1-LPR-90-106 CNC Bldg Lox Comp PIG Rad Mon	12/30/95	1/1/96 CI status	2	48	WO 95-28980-00: Particulate alarm will not clear.	Filters clogged by boron leak. Calibrated flow controller.
0-RI-90-11 Cont Spray PWR Pmp Rm Area Rad Mon	11/2/95	1/17/96 CI status	46	16	WO 95-24966-00: During performance of 92 day COT, RI would not calibrate	Replaced indicator
0-FS-90-129 Cond Vac Exh Part & Iod Mon	1/4/96	1/9/96 CE status	5	120	WO 95-26681-01: Troubleshoot to correct problem found during WO 95-26681-00	
0-RR-90-102 Spent Fuel Pit Area Rad Mon	1/4/96	1/10/96 CE status	6	N/A	WO 95-27200-01: Found recorder inoperable during 92 day COT	
0-RR-90-126 MCR Intake Gas Rad Mon	1/5/96	1/12/96 CI status	7	N/A	WO 96-00461-00: Recorder reading does not match ratemeter	
1-ISIV-90-120J Stm Gen Bldg Liq Rad Mon	1/6/96	1/7/96 CX status	1	(OOS by WO 95-28956-00)	WO 96-00579-00: Valve appears to be broken, stuck closed.	TR# 373885 1/9/96
0-LPR-90-101 Aux Bldg Vent PIG Rad Mon	1/11/96	1/15/96 CR status	4	8	WO 96-00905-00: Correct filter paper alignment problem.	
0-RM-90-212A Station Sump Disc Lig Rad Mon	1/13/96	AD status			WO 95-26231-00: Clogged rotameter	
0-RM-90-300 Aux Bldg Isokinetic Sample Mon	1/15/96	1/23/96 CR status	8	192	WO 96-00935-00: Replace broken belt and frozen motor.	
0-RM-90-16 Decon Area CAM	1/17/96	CANCELLED			WO 96-01302-00: Inst Malf alarming sporadically	To be worked by WR 287210

January 22, 1996

**SYSTEM 90 OOS TREND**  
(Starting Date 11/9/95)

Monitor #	Date WR Initiated	Date WO Comp (CR)	Duration WO Open (Days)	Time Rad Mon Actually OOS (Hours)	Reason OOS	Corrective Action
0-RM-90-16 Decon Area CAM	1/17/96	AA status			WR 287210: Place O-rings on filter feed and take-up spool for listed RMs	
0-FMP-90-132 Serr. Bldg Cent PIG Rad Mon	1/17/96	1/19/96 CI status	2	48	WO 96-01318-01: Replace pump motor.	Replaced motor
1-LPR-90-450 Cond Vac Bldg Mid Hi Com Mod	1/17/96	AE status		N/A	WO 96-01333-00: Recurring FAIL alarm	Background detector is failing because of low background (Loss Of Counts)
0-RM-90-300 Aux Bldg Isokinetic Sample Mon	1/19/96	1/22/96 CR status	3	72	WO 95-27598-01: Troubleshoot 0-LPF-90-300 for CFV not responding during 0-ODI-90-300.	Cleaned card edge, cleared problem.
1-TTIV-90-112 Cnt Bldg Up Comp PIG Rad Mon	1/19/96	PL status		N/A	WO 96-01421-00: Valve will not allow adequate flow.	
1-LPR-90-62 Cnt Bldg Low Comp Inst Rm Part Rad Mon	1/20/95	PG status			WO 96-01452-00: Low flow alarm did not respond when pump turned off.	
2-RE-90-1 Spent Fuel Pit Pmp Area Rad Mon	1/21/96	1/22/96 CR status	1	24	WO 95-27141-01: Troubleshoot to determine 2-RI-90-1 not responding during performance of IMI-90.015 (COT).	
1-RM-90-423 Main Steam Line Rad Mon	1/21/96	PL status		N/A	WR 287019: Green LED for 1-RM-90-423 not bright. Repair/Replace	

Attachment 2

Critical Spares Program BOMs

## System 90 Component Evaluations

Complete and loaded into EMS Database

0-BKR-090-0101-A	AB VENT RAD MON (0-RE-90-101)	I005	EF3-B020	CAD521	BOM	1310	Rev 000
0-BKR-090-0125-A	MCR AIR INTAKE RAD MON (0-RE-90-125)	I005	EF3-B020	CAD521	BOM	1310	Rev 000
0-BKR-090-0126-B	MCR AIR INTAKE RAD MON (0-RE-90-126)	I005	ED63B020	CAD521	BOM	1310	Rev 000
0-BKR-090-0132-A	SB VENTILATION RAD MON (0-RE-90-132)	I005	ED63B020	BTN034F	BOM	585	Rev 000
0-BKR-090-0205-A	MCR EMERG AIR INTAKE RAD MON (0-RE-90-205)	I005	EF3-B020	CAD521	BOM	1310	Rev 000
0-BKR-090-0206-B	MCR EMERG AIR INTAKE RAD MON (0-RE-90-206)	I005	EF3-B020	CAD521	BOM	1310	Rev 000
0-BKR-090-L397-B	480V C&A VT BD 1B1-B BKR 12E1 RAD MONITOR	I005	EF3-B020	CAD521	BOM	1310	Rev 000
0-CKV-090-0101	0-RE-90-101 AIR CHECK	C339	N89-180	AVR777	BOM	497	Rev 000
0-CKV-090-0101A	AUX BLDG VENT RAD MON FAN A EXHAUST CHECK	C339	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0101B	AUX BLDG VENT RAD MON FAN B EXHAUST CHECK	C339	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0122	WASTE DISPOSAL SYS LIQ EFFLUENT MON DISCH CHK	C339	259T-8PP	BXM183	BOM	496	rev 0
0-CKV-090-0125	MCR AIR INTAKE RAD MONITOR CHECK	G063	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0126	MCR AIR INTAKE RAD MONITOR CHECK	G063	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0128	WDS GAS EFFLUENT SAMPLE CHECK	N425	SS-4CP2-1	AYM875	BOM	875	rev 0
0-CKV-090-0132A	SERV BLDG VENT RAD MON FAN A EXHAUST CHECK	C339	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0132B	SERV BLDG VENT RAD MON FAN B EXHAUST CHECK	C339	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0133	ERCW LIQUID RAD MON CHECK	G063	259T-8PP	BXM183	BOM	496	rev 0
0-CKV-090-0134	ERCW LIQUID RAD MON CHECK	G063	259T-8PP	BXM183	BOM	496	rev 0
0-CKV-090-0205	MCR EMERG AIR INTAKE RAD MONITOR CHECK	G063	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0206	MCR EMERG AIR INTAKE RAD MONITOR CHECK	G063	119T-6PP	BXM130	BOM	543	rev 0
0-CKV-090-0211	ABANDONED IN PLACE	C339	259T-8PP	BXM183	BOM	496	rev 0
0-CKV-090-0212	STATION SUMP DISCHARGE RAD MONITOR CHECK	C339	259T-8PP	BXM183	BOM	496	rev 0
0-FC-090-0012	SPENT FUEL PIT PART MON FLOW CONT	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0013	WSTE PKG AREA PART MON FLOW CONT	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0015	HOLDUP VLV GALLERY PART MON FLOW CONT	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0016	DECONTAMINATION AREA PART MON FLOW CONT	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0017	SAF INJ PMP AREA PART MON FLOW CONT	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0101A	AUX BLDG VENT MON FAN A FLOW CONT	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0101B	AUX BLDG VENT MON FAN B FLOW CONT	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0105	MAIN CONT RM PART MON FLOW CONT	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0132A	SERV BLDG VENT MON PART-GAS FLOW CONT	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0132B	SERV BLDG VENT MON IODINE FLOW CONT	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FC-090-0138	WASTE PKG AREA PART MON FLOW CONT	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FCV-090-0300	ISOKINETIC SAMP SYS FLOW CONT VLV	D006	58501-A25-B52	CAD935	BOM	1427	Rev 000
0-FI-090-0128	WDS GAS EFFLUENT PART-IODINE SAMP FLOW	D295	VFA-9-SSV	AYM906	BOM	1684	rev 0
0-FI-090-0300/1A	ISOKINETIC SAMP SYS STACK VELOCITY (FPM)	D033	DM-4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0300/1B	ISOKINETIC SAMP SYS STACK VOL (CFM)	D033	DM-4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0300/2A	ISOKINETIC SAMP SYS NOZZLE WITHDRAWAL VEL	D033	DM4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0300/2B	ISOKINETIC SAMP SYS SAMP VOL (CFM)	D033	DM-4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0320/1A	ISOKINETIC SAMP SYS SAMP VELOCITY (FPM)	D033	DM-4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0320/1B	ISOKINETIC SAMP SYS STACK VOL (CFM)	D033	DM-4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0320/2A	ISOKINETIC SAMP SYS NOZZLE WITHDRAWAL VEL	D033	DM4100L	BAR605	BOM	1426	rev 0000
0-FI-090-0320/2B	ISOKINETIC SAMP SYS SAMP VOL (CFM)	D033	DM4100L	BAR605	BOM	1426	rev 0000
0-FS-090-0012	SPENT FUEL PIT PART MON LOW FLOW SW	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000

## System 90 Component Evaluations

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0-FS-090-0013	WSTE PKG AREA PART MON LOW FLOW SW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0015	HOLDUP VLV GALLERY PART MON LOW FLOW SW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0016	DECONTAMINATION AREA PART MON LOW FLOW SW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0017	SAF INJ PMP AREA PART MON LOW FLOW SW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0101A	AUX BLDG VENT MON PART-GAS LOW FLOW	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0105	MAIN CONT RM PART MON LOW FLOW	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0125-A	MAIN CONT RM INTAKE MON LOW FLOW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0126-B	MAIN CONT RM INTAKE MON LOW FLOW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0128	WDS GAS EFFLUENT PART- IODINE SAMP LOW FLOW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0132A	SERV BLDG VENT MON PART LOW FLOW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0138	WASTE PKG AREA PART MON LOW FLOW	B069	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0205-A	MAIN CONT RM EMER INTAKE MON LO FLOW	G063	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FS-090-0206-B	MAIN CONT RM EMER INTAKE MON LO FLOW	B074	D2T-H18SS	BQT868	BOM	1003	Rev 000
0-FSV-090-0101A	AUX BLDG VENT MON PART PURGE AIR	A610	8210C88	BYW929	BOM	878	Rev 000
0-FSV-090-0101B	AUX BLDG VENT MON PART PURGE AIR	A610	8210A38	BYX035	BOM	877	Rev 000
0-FSV-090-0132A	SERV BLDG VENT MON PART PURGE AIR	A610	8210C88	BYW929	BOM	878	Rev 000
0-FSV-090-0132B	SERV BLDG VENT MON PART PURGE AIR	A610	8210A38	BYX035	BOM	877	Rev 000
0-HS-090-0125-A	MAIN CONT RM INTAKE MON FAN	G063	MBG-2	BPV719	BOM	1415	REV 0
0-HS-090-0126-B	MAIN CONT RM INTAKE MON FAN	S345	MBG-2	BPV719	BOM	1415	REV 0
0-HS-090-0205-A	MAIN CONT RM EMER INTAKE MON FAN	G063	MBG-2	BPV719	BOM	1415	REV 0
0-HS-090-0206-B	MAIN CONT RM EMER INTAKE MON FAN	G063	MBG-2	BPV719	BOM	1415	REV 0
0-MTR-090-0012A	MOTOR FOR 0-PMP-90-12	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-MTR-090-0013A	MOTOR FOR 0-PMP-90-13	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-MTR-090-0015A	MOTOR FOR 1-PMP-90-15	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-MTR-090-0016A	MOTOR FOR 0-PMP-90-16	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-MTR-090-0017A	MOTOR FOR 0-PMP-90-17	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-MTR-090-0105A	MOTOR FOR 0-FCV-90-105	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-MTR-090-0138A	MOTOR FOR 0-PMP-90-138	G292	0281-5050-01	BXM141	BOM	387	Rev 000
0-PCV-090-0300A	ISOKINETIC SAMP SYS SUPPLY AIR REGULATOR	N174	11-018	BAH135F	BOM	452	Rev 000
0-PMP-090-0105	MAIN CONTROL ROOM MON FAN	DR05	RAI	CAP056	BOM	1709	Rev 000
0-PX-090-0102T-A	ISOLATORS 12 & 48V DC POWER SUPPLIES	PW03	HC12-3.4-A	CAP539	BOM	1421	REV 0
0-PX-090-0103-B	FUEL POOL RADIATION MON POWER SUPPLY	S637	RP-23/0281-0600-0	CAP539	BOM	1421	REV 0
0-PX-090-0103T-B	ISOLATORS 12 & 48V DC POWER SUPPLIES	PW03	HC12-3.4-A	CAP539	BOM	1421	REV 0
0-RM-090-0102T-A	FUEL POOL MON ISOLATOR	EM03	175C-304	BNQ423	BOM	1403	rev 0000
0-RM-090-0103T-B	FUEL POOL MON ISOLATOR	EM03	A/N 175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0125T-A	MAIN CONT RM INTAKE MON ISOLATOR	EM03	175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0126T-B	MAIN CONT RM INTAKE MON ISOLATOR	EM03	A/N 175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0133T-A	ERCW LIQ MON ISOLATOR	EM03	175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0134T-B	ERCW LIQ MON ISOLATOR	EM03	A/N 175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0140T-A	ERCW LIQ MON ISOLATOR	EM03	175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0141T-B	ERCW LIQ MON ISOLATOR	EM03	175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0205T-A	MAIN CONT RM EMER INTAKE MON ISOLATOR	EM03	175C304	BNQ423	BOM	1403	rev 0000
0-RM-090-0206T-B	MAIN CONT RM EMER INTAKE MON ISOLATOR	EM03	A/N 175C304	BNQ423	BOM	1403	rev 0000
1-BKR-090-0106-A	480V C&A VT BD 1A1-A BKR 6F1 AIR MONITOR	I005	ED63B020	CAD521	BOM	1310	Rev 000

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1-BKR-090-0112-B	CNTMT BLDG UPPER COMPT RAD MON (1-RE-90-112)	I005	ED63B020	CAD521 BOM 1310 Rev 000
1-BKR-090-0119A-A	COND VAC PMP AIR EXH RAD MON (1-RE-90-119)	I005	EF3-B020	CAD521 BOM 1310 Rev 000
1-BKR-090-0130-A	CNTMT PURGE AIR EXH RAD MON (1-RE-90-130)	I005	EF3-B020	CAD521 BOM 1310 Rev 000
1-BKR-090-0131-B	CNTMT PURGE AIR EXH RAD MON (1-RE-90-131)	I005	EF3-B020	CAD521 BOM 1310 Rev 000
1-BKR-090-0452-A	480V C&A VT BD 1A1A BKR12E1 SHLD BLDG FL MON	I005	EF3-B020	CAD521 BOM 1310 Rev 000
1-CKV-090-0099	ABANDONED IN PLACE	C339	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0106A	CNTMT BLDG LOWER COMPT RAD MON FAN A EXH	G063	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0106B	CNTMT BLDG LOWER COMPT RAD MON FAN B EXH	G063	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0112A	CNTMT BLDG UPPER COMPT RAD MON FAN A EXH	G063	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0112B	CNTMT BLDG UPPER COMPT RAD MON FAN B EXH	G063	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0119	COND VAC PMP AIR RAD MONITOR CHECK	C339	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0120	STM GEN BLDN LIQ SAMPLERAD MONITOR CHECK	C339	259T-8PP	BXM183 BOM 496 rev 0
1-CKV-090-0124	STM GEN BLDN LIQ SAMPLERAD MON DISCH CHECK	C339	259T-8PP	BXM183 BOM 496 rev 0
1-CKV-090-0129	CNDS VAC PMP AIR EXH RAD MONITOR CHECK	N425	SS-4CP2-1	AYM875 BOM 875 rev 0
1-CKV-090-0130	CNTMT PURGE AIR EXH RAD MONITOR CHECK	G063	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0131	CNTMT PURGE AIR EXH RAD MONITOR CHECK	G063	119T-6PP	BXM130 BOM 543 rev 0
1-CKV-090-0452A	SHIELD BLDG VT MON SYS CHECK VLV	KU01	UN-3-150-C	BWV285 BOM 1540 Rev 000
1-CKV-090-0452B	SHIELD BLDG VT MON SYS CHECK VLV	KU01	UN-3-150-C	BWV285 BOM 1540 Rev 000
1-FC-090-0014	SAMPLE RM PART MON FLOW CONT	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FC-090-0062	LWR COMPT REAC BLDG PART MON FLOW CONT	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FC-090-0106B-A	CNTMT BLDG LWR COMPT MON IODINE FLOW CONT	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FC-090-0112B-B	CNTMT BLDG UP COMPT MON IODINE FLOW CONT	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FC-090-0452	SHIELD BLDG VT MON SYS PRI SA FL CONTROLLER	KU01	4200	BYA227J BOM 982 rev 0
1-FCV-090-0107-A	CNTMT BLDG LOWER COMPT AIR RAD MON SUPPLY	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0108-B	CNTMT BLDG LOWER COMPT AIR RAD MON SUPPLY	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0109-B	CNTMT BLDG LOWER COMPT AIR RAD MON SUPPLY	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0110-B	CNTMT BLDG LOWER COMPT AIR RAD MON RETURN	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0111-A	CNTMT BLDG LOWER COMPT AIR RAD MON RETURN	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0112A-B	CNTMT BLDG UPPER COMPT AIR RAD MON FAN A FLO	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FCV-090-0113-A	CNTMT BLDG UPPER COMPT AIR RAD MON SUPPLY	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0114-B	CNTMT BLDG UPPER COMPT AIR RAD MON SUPPLY	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0115-B	CNTMT BLDG UPPER COMPT AIR RAD MON SUPPLY	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0116-B	CNTMT BLDG UPPER COMPT AIR RAD MON RETURN	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0117-A	CNTMT BLDG UPPER COMPT AIR RAD MON RETURN	K085	TV-D-9957X01AC	AWG199 BOM 729 Rev 000
1-FCV-090-0452	SHIELD BLDG VT MON SYS PRI SA FCV	KU01	1361D7008	BXT905L BOM 1048 rev 0
1-FE-090-0400A1	SHIELD BLDG VT MON SYS CNTMT PURGE A FL ELEM 1	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400A2	SHIELD BLDG VT MON SYS CNTMT PURGE A FL ELEM 2	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400A3	SHIELD BLDG VT MON SYS CNTMT PURGE A FL ELEM 3	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400A4	SHIELD BLDG VT MON SYS CNTMT PURGE A FL ELEM 4	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400B1	SHIELD BLDG VT MON SYS CNTMT PURGE B FL ELEM 1	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400B2	SHIELD BLDG VT MON SYS CNTMT PURGE B FL ELEM 2	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400B3	SHIELD BLDG VT MON SYS CNTMT PURGE B FL ELEM 3	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400B4	SHIELD BLDG VT MON SYS CNTMT PURGE B FL ELEM 4	KU01	KB12-316-HT-4-TSD	BXV600 BOM 1226 Rev 000
1-FE-090-0400C1	SHIELD BLDG VT MON SYS ABGTS FLOW ELEMENT 1	KU01	KB12-316-HT-4-TSD	BXV604X BOM 1225 Rev 000

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1-FE-090-0400C2	SHIELD BLDG VT MON SYS ABGTS FLOW ELEMENT 2	KU01	KB12-316-HT-4-TSD	BXV604X BOM 1225 Rev 000
1-FE-090-0400C3	SHIELD BLDG VT MON SYS ABGTS FLOW ELEMENT 3	KU01	KB12-316-HT-4-TSD	BXV604X BOM 1225 Rev 000
1-FE-090-0400C4	SHIELD BLDG VT MON SYS ABGTS FLOW ELEMENT 4	KU01	KB12-316-HT-4-TSD	BXV604X BOM 1225 Rev 000
1-FE-090-0400D1	SHIELD BLDG VT MON SYS EGTS FLOW ELEMENT 1	KU01	KB12-316-HT-3-TSD	BXV598 BOM 1227 Rev 000
1-FE-090-0400D2	SHIELD BLDG VT MON SYS EGTS FLOW ELEMENT 2	KU01	KB12-316-HT-3-TSD	BXV598 BOM 1227 Rev 000
1-FE-090-0400D3	SHIELD BLDG VT MON SYS EGTS FLOW ELEMENT 3	KU01	KB12-316-HT-3-TSD	BXV598 BOM 1227 Rev 000
1-FI-090-0129	CNDS VAC PMP AIR EXH PART-IODINE SAMP	D295	VFA-9-SSV	AYM906 BOM 1684 rev 0
1-FI-090-0400A	SHIELD BLDG VT MON SYS LOW RANGE FLOW IND	B440	13012CL28A	BYB659F BOM 1767 rev 0
1-FI-090-0400B	SHIELD BLDG VT MON SYS MID/HIGH RANGE FLOW IND	B440	1355EA2DCJA1A	BRX592 BOM 1766 rev 0
1-FI-090-0404	COND VAC VT NOBLE GAS FLOW INDICATOR	D295	VFB-66-SS	BYA380 BOM 1685 rev 0
1-FM-090-0400A	SHIELD BLDG VT MON SYS FLOW CMPTR/MODIFIER	KU01	155	BYA182E BOM 1229 rev 0
1-FS-090-0014	SAMPLE RM PART MON LOW FLOW SW	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0062	LOWER COMPT REAC BLDG PART MON LOW FLOW	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0099	ABANDONED IN PLACE	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0106A-A	CNTMT BLDG LWR COMPT AIR MON PART LO FLOW	G063	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0112A-B	CNTMT BLDG UP COMPT MON PART LOW FLOW	G063	SWITCH #D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0119	COND VAC PMP AIR EXH MON LOW FLOW	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0129	CNDS VAC PMP AIR EXH PART IODINE SAMP	B069	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0130-A	CNTMT PURGE AIR EXH MON LOW FLOW SW	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0131-B	CNTMT PURGE AIR EXH MON LOW FLOW SW	B074	D2T-H18SS	BQT868 BOM 1003 Rev 000
1-FS-090-0400	SHIELD BLDG VT MON SYS SAMPLE LOW FLOW SWITC	S637	03600895-001	BRY280 BOM 1768 rev 0
1-FS-090-0404	COND VAC VT NOBLE GAS SAMPLE LOW FLOW SWITC	A501	D420VXTA	CAP631 BOM 1425 REV 0
1-FSV-090-0400A	SHIELD BLDG VT MON SYS LOW RANGE FLOW SOL VL	A609	WPHTX8210B30EMB12	BRX620 BOM 1727 rev 0
1-FSV-090-0400B	SHIELD BLDG VT MON SYS MID/HIGH RNG FL SOL VLV	A610	WPHB8262A152E	BRX610 BOM 1725 rev 0
1-FSV-090-0400C	SHIELD BLDG VT MON SYS LOW RNG AIR SUP FL SOL	A609	WPHB8218C87EMB	BRX405J BOM 1728 rev 0
1-FSV-090-0400D	SHIELD BLDG VT MON SYS MID/Hi RNG AIR SUP FSV	A610	WPHB8262B230E	BRX394 BOM 1726 rev 0
1-FSV-090-0402A1	SHIELD BLDG VT MON SYS LOW RANGE SA FLTR A FS	A610	WPHB8210C87EMB	BRX405J BOM 1728 rev 0
1-FSV-090-0402A2	SHIELD BLDG VT MON SYS LOW RANGE SA FLTR B FS	A610	WPHB8210C87EMB	BRX405J BOM 1728 rev 0
1-FSV-090-0402A3	SHIELD BLDG VT MON SYS LOW RANGE GRAB SA 1 FS	A610	WPHB8210C87EMB	BRX405J BOM 1728 rev 0
1-FSV-090-0402B1	SHIELD BLDG VT MON SYS MID/Hi RANGE SA FLTR C	A610	WPHB8262B230E	BRX394 BOM 1726 rev 0
1-FSV-090-0402B2	SHIELD BLDG VT MON SYS MID/Hi RANGE SA FLTR D	A610	WPHB8262B230E	BRX394 BOM 1726 rev 0
1-FSV-090-0402B3	SHIELD BLDG VT MON SYS MID/Hi RANGE GRAB SA 2	A610	WPHB8262B230E	BRX394 BOM 1726 rev 0
1-HS-090-0112A-B	CNTMT BLDG UP COMPT MONFAN A MTR CNTL ON/OF	S345	CLASS 2510	BPV719 BOM 1415 rev 0000
1-HS-090-0112B-B	CNTMT BLDG UP COMPT MONFAN B MTR CNTL ON/OF	S345	CLASS 2510	BPV719 BOM 1415 rev 0000
1-HS-090-0131-B	CNTMT PURGE AIR EXH MON PUMP	S345	CLASS 9001	BPV719 BOM 1415 REV 0
1-HS-090-0452A	SHIELD BLDG VT MON SYS PRI SA FL VAC PMP 1 HS	SI01	3SB02-3MKB	BXX604K BOM 984 Rev 000
1-HS-090-0452B	SHIELD BLDG VT MON SYS PRI SA FL VAC PMP 2 HS	SI01	3SB02-3MKB	BXX604K BOM 984 Rev 000
1-ISIV-090-0452A	SHIELD BLDG VT MON SYS VAC PMP 1 DISCH ISOL	KU01	96-4-RT-4-L	BXV574B BOM 1220 Rev 000
1-ISIV-090-0452B	SHIELD BLDG VT MON SYS VAC PMP 2 DISCH ISOL	KU01	96-4-RT-4-L	BXV574B BOM 1220 Rev 000
1-ISIV-090-0452C	SHIELD BLDG VT MON SYS PRI SA INLET ISOL VLV	KU01	96-4-RT-4-L	BXV574B BOM 1220 Rev 000
1-MTR-090-0014A	MOTOR FOR 1-PMP-90-14	G292	0281-5050-01	BXM141 BOM 387 Rev 000
1-MTR-090-0062A	MOTOR FOR 1-PMP-90-62	B060	L1319TF374	BXM141 BOM 387 Rev 000
1-MTR-090-0099	ABANDONED IN PLACE	G292	ELB281-5050-3 ITE	BYY762L BOM 366 rev 0000
1-MTR-090-0119	MOTOR FOR 1-PMP-90-119	G292	ELB281-5050-3 ITE	BYY762L BOM 366 rev 0000

EE-90-112, A, C  
106, A, C

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1-MTR-090-0404	MOTOR FOR 1-PMP-90-404	R165	28950	BXV745A BOM	1465 Rev 000
1-PI-090-0452A	SHIELD BLDG VT MON SYS PRI SA FL PRESS IND 1	E010	271950	BXX613H BOM	1444 Rev 000
1-PI-090-0452B	SHIELD BLDG VT MON SYS PRI SA FL PRESS IND 2	E010	271950	BXX613H BOM	1444 Rev 000
1-PLOT-090-0452	SHIELD BLDG VT MON SYS PRI SA FL PRINTER	KU01	155	BXY089R BOM	1769 Rev 000
1-PMP-090-0452A	SHIELD BLDG VT MON SYS PRI SA FL VAC PMP 1	KU01	036104	BXT903 BOM	1049 rev 0
1-PMP-090-0452B	SHIELD BLDG VT MON SYS PRI SA FL VAC PMP 2	KU01	036104	BXT903 BOM	1049 rev 0
1-PS-090-0452A	SHIELD BLDG VT MON SYS PRI SA FL PRESS SW 1	M235	AP-7021-153-33	BWJ246 BOM	1221 rev 0
1-PS-090-0452B	SHIELD BLDG VT MON SYS PRI SA FL PRESS SW 2	M235	AP-7021-153-33	BWJ246 BOM	1221 rev 0
1-PX-090-0405	COND VAC VT NOBLE GAS POWER SUPPLY	P015	PS-12360	CAP544 BOM	2344 REV 0
1-REEL-090-0450	TAKEUP REEL FOR 1-RR-090-0450	D033	APP-TR50	BKN624 BOM	2296 Rev 000
1-RFV-090-0452	SHIELD BLDG VT MON SYS PRI SA FL VAC RELIEF	KU01	4614K12	BXT904N BOM	1050 rev 0
1-RM-090-0106TA-A	CNTMT BLDG LWR COMPT MON ISOLATOR (P)	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0106TB-A	CNTMT BLDG LWR COMPT MON ISOLATOR (G)	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0106TC-A	CNTMT BLDG LWR COMPT MON ISOLATOR (I)	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0112TA-B	CNTMT BLDG UP COMPT MON ISOLATOR (P)	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0112TB-B	CNTMT BLDG UP COMPT MON ISOLATOR (G)	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0112TC-B	CNTMT BLDG UP COMPT MON ISOLATOR (I)	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0130T-A	CNTMT PURGE AIR EXH MON ISOLATOR	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0131T-B	CNTMT PURGE AIR EXH MON ISOLATOR	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0210B	BACKUP SOURCE RNG CHANNEL DRAWER ASSY		6051D50G01	CAF180 BOM	920 rev 0000
1-RM-090-0271T-A	UPR INS CNTMT POST ACD MON ISOLATOR	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0272T-B	UPR INS CNTMT POST ACD MON ISOLATOR	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0273T-A	LWR INS CNTMT POST ACD MON ISOLATOR	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RM-090-0274T-B	LWR INS CNTMT POST ACD MON ISOLATOR	EM03	175C304	BNQ423 BOM	1403 rev 0000
1-RR-090-0450	RAD MON CNTL RM PRINTER	D033	APP-48A1	CAE828 BOM	1416 Rev 000
1-ZS-090-0107-A	CNTMT BLDG LOWER COMPT MON-ISV POS SW	N007	EA180-12302	BVG941 BOM	564 Rev 000
1-ZS-090-0107B-A	CNTMT BLDG LWR COMPT MON-ISOL VLV POS SW	N007	EA18012302	BVG943 BOM	1044 REV 2
1-ZS-090-0108-B	CNTMT BLDG LOWER COMPT MON-ISV POS SW	N007	EA180-14302	BVG940 BOM	854 Rev 000
1-ZS-090-0109-B	CNTMT BLDG LOWER COMPT MON-ISV POS SW	N007	EA180-14302	BVG940 BOM	854 Rev 000
1-ZS-090-0110-B	CNTMT BLDG LOWER COMPT MON-ISV POS SW	N007	EA180-14302	BVG940 BOM	854 Rev 000
1-ZS-090-0111-A	CNTMT BLDG LOWER COMPT MON-ISV POS SW	N007	EA180-11302	BVG943 BOM	1044 REV 2
1-ZS-090-0111B-A	CNTMT BLDG LWR COMPT MON-ISOL VLV POS SW	N007	EA18011302	BVG941 BOM	564 Rev 000
1-ZS-090-0113-A	CNTMT BLDG UPPER COMPT MON-ISV POS SW	N007	EA180-12302	BVG941 BOM	564 Rev 000
1-ZS-090-0113B-A	CNTMT BLDG UP COMPT MON ISOL VLV POS SW	N007	EA18012302	BVG943 BOM	1044 REV 2
1-ZS-090-0114-B	CNTMT BLDG UPPER COMPT MON-ISV POS SW	N007	EA180-14302	BVG940 BOM	854 Rev 000
1-ZS-090-0115-B	CNTMT BLDG UPPER COMPT MON-ISV POS SW	N007	EA180-14302	BVG940 BOM	854 Rev 000
1-ZS-090-0116-B	CNTMT BLDG UPPER COMPT MON-ISV POS SW	N007	EA180-14302	BVG940 BOM	854 Rev 000
1-ZS-090-0117-A	CNTMT BLDG UPPER COMPT MON-ISV POS SW	N007	EA180-11302	BVG943 BOM	1044 REV 2
1-ZS-090-0117B-A	CNTMT BLDG UP COMPT MON ISOL VLV POS SW	N007	EA18011302	BVG941 BOM	564 Rev 000
2-FCV-090-0113-A	CNTMT BLDG UP COMPT MON-ISOL VLV	K085	TV-D-9957	AWG199 BOM	729 Rev 000
2-FCV-090-0114-B	CNTMT BLDG UP COMPT MON-ISOL VLV	K085	TV-D-9957	AWG199 BOM	729 Rev 000
2-FCV-090-0115-B	CNTMT BLDG UP COMPT MON-ISOL VLV	K085	TV-D-9957	AWG199 BOM	729 Rev 000
2-FCV-090-0116-B	CNTMT BLDG UP COMPT MON-ISOL VLV	K085	TV-D-9957	AWG199 BOM	729 Rev 000
2-FCV-090-0117-A	CNTMT BLDG UP COMPT MON-ISOL VLV	K085	TV-D-9957	AWG199 BOM	729 Rev 000