UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

# NRC INSPECTION MANUAL



TEMPORARY INSTRUCTION 2515/087

## INSPECTION OF LICENSEE'S IMPLEMENTATION OF MULTIPLANT ACTION A-17: INSTRUMENTATION FOR NUCLEAR POWER PLANTS TO ASSESS PLANT AND ENVIRONS CONDITIONS DURING AND FOLLOWING AN ACCIDENT (REGULATORY GUIDE 1.97)

### 2515/087-01 PURPOSE

To verify that boiling-water and pressurized-water reactor licensees have an instrumentation system for assessing plant conditions during and following the course of an accident that meets the criteria specified in Regulatory Guide (RG) 1.97, Revision 2 or Revision 3, as applicable, and that this system is installed in accordance with licensee commitments concerning Generic Letter No. 82-33, "Requirements For Emergency Response Capability" (Supplement 1 to NUREG-0737).

This temporary instruction (TI) is one of a series that describes NRC inspection requirements and guidance needed to verify satisfactory completion of licensee actions in response to a multiplant action (MPA).

### 2515/087-02 OBJECTIVES

To compare the installed plant instrumentation with the commitments contained in correspondence related to MPA A-17 and described in the safety evaluation report (SER) and to identify any deviation from these commitments which may exist without supporting documentation.

### 2515/087-03 RESPONSIBILITIES AND AUTHORITIES

03.01 Associate Director for Inspection and Technical Assessment, NRR

a. Coordinate with the regional offices to obtain specific information and identify items to be inspected.

b. Coordinate with regions as required to complete the requirements of this TI.

c. Review the results of the inspections when so requested by the regions. Determine whether further generic actions need to be taken after the effort directed by this TI has been completed.

03.02 Regional Management

a. Coordinate with NRR as needed to perform the inspection requirements of this TI. Ensure that the inspector has the latest revision of the SER.

b. At most facilities, this inspection effort is expected to verify satisfactory licensee implementation of the requirements imposed under MPA A-17. In such cases, the regional offices will be able to verify satisfactory completion and report MPA verification as complete. However, if the inspection produces results which are unclear and require additional technical resolution, the regional offices should contact the Associate Director for Inspection and Technical Assessment, NRR for resolution. Recommendations for additional action should be provided, if appropriate.

2515/087-04 BACKGROUND

Generic Letter No. 82-33 issued Supplement 1 to NUREG-0737 on December 17, 1982. This document specifies those requirements regarding emergency response capability that have been approved by the NRC for implementation and discusses in part the application of RG 1.97 to the emergency response facilities, including the control room, technical support center (TSC), and emergency operations facility (EOF). RG 1.97 identifies the plant variables to be measured and the instrumentation criteria for assuring acceptable emergency response capabilities during and following the course of an accident. With few exceptions all licensees have committed to the guidelines provided in RG 1.97, Revision 2 or Revision 3.

2515/087-05 BASIC REQUIREMENTS

05.01 Preliminary Review. Before the site visit, the inspector should review the licensee's SER to identify exceptions taken by the licensee to RG 1.97 and approved by NRR and to determine which revision to RG 1.97 applies. This information is needed to verify that the commitments described in the SER have been implemented and the related instrumentation installed (see 05.03).

At this time the inspector also should develop a sample audit system which identifies all Type A, selected Category 1, and selected Category 2 instrument measuring systems (e.g., drywell pressure, reactor water level, suppression pool water level, and reactor coolant pressure). Through the resident inspector, the inspector should request the licensee to provide the necessary documentation needed for this sample to complete the inspection items under Categories 1 and 2 listed in Section 05.03 a. through b. Category 3 items from RG 1.97 need not be inspected. R R

05.02 Onsite Review

a. The inspector should verify that the licensee will have certain documentation readily available for onsite review, including:

1. Functional diagrams showing redundancy, physical and electrical separation, related electrical power sources, and the electrical isolation interface points of the instrumentation.

2. Q and EQ Master Equipment lists of relevant instrumentation identified in RG 1.97. These lists are needed to confirm that these instruments have been or will be evaluated and inspected for confirmation of required environmental, quality assurance, and seismic qualifications, including the EQ instruments qualified per the requirements of 10 CFR 50.49.

3. Information regarding the frequency for testing/calibrating the instruments.

b. Schedule the inspection with the licensee.

05.03 Specific Requirements. The basic design and qualification requirements for the instrumentation needed to monitor those variables described in RG 1.97 have been classified as Category 1, 2, and 3. Category 1 has similar requirements to those associated with Class 1E equipment; Category 2 has a less stringent set of criteria than Category 1; and Category 3 requirements are aimed at assuring the use of high quality commercial grade equipment.

Tables 1 and 2 of RG 1.97, Revision 2, and Tables 2 and 3 of Revision 3 assign one of the three categories to each (instrument) measured variable required. These tables together with the SER should be used to identify the instruments required in the plant control room and to identify the applicable category for each instrument.

Before starting the actual inspection effort, please note that the following variables of RG 1.97 do not need to be inspected:

° in core thermocouples (temperature monitoring) for BWRs are not currently required pending further development

° steam generator water level monitoring for PWRs is only required to be redundant in two-loop plants

° inspections related to meteorological and radiological parameters (except containment high range area radiation) indicated in RG 1.97, Revision 2 or Revision 3, have been covered in TI 2500/18 and TI 2515/65. R

The items to be inspected in each category are identified below.

a. Category 1 (including Type A) R

Equipment Qualification

(1) Environmental Qualification - Review the EQ Master Equipment list for confirmation that the licensee has addressed environmental qualification. If equipment is required to be environmentally qualified but is not included in the EQ Master Equipment list, verify that the licensee has documentation to justify the omission.

(2) Seismic Qualification - Review licensee's Q list for confirmation of seismic qualification.

Redundancy

(1) Determine by documentation review that redundant instrument circuits have been utilized, that power supplies to the redundant circuitry are also redundant, and that the required separation of the instruments' circuits and their power supplies are maintained.

(2) Verify by visual observation that the monitoring device so specified is installed.

Power Source

Determine by documentation or drawing review that the instrumentation is being energized from a safety-related power source.

Quality Assurance

Review licensee's Q list for confirmation that the instrument is covered under the licensee's quality assurance program.

Display and Recording

(1) Review the drawings that indicate the method and number of indicators/recorders per measured variable. As a minimum, two indications per measured variable (one per division) and one recording of readout information from at least one redundant channel should be available in the control room.

(2) Verify documentation review by visual observation of installed equipment.

Range

(1) Confirm that actual range of installed equipment meets the range specified for the variable in the applicable revision of RG 1.97 or as accepted in the SER.

(2) Confirm that the overlapping feature specified in RG 1.97 exists if two or more instruments are needed to cover a particular range.

(3) Determine if the sensitivity of the instruments has been compromised by attempting to cover a wide range.

Equipment Identification

Confirm that Type A and Category 1 instruments in the applicable revision of RG 1.97 are specifically identified with a common designation on the control panels so that the operator can easily discern that they are intended for use under accident conditions. R

Interfaces

Confirm that all selected Category 1 monitoring systems that interface with lesser qualified systems or transmitted for other use have been identified. For such systems, confirm by documentation review that the design includes isolation devices that meet the relevant qualification requirements for the associated Category 1 instrument. R

Service, Testing, and Calibration

Determine the testing/calibration frequency by documentation review, and verify conformance with RG 1.97 or with the deviations accepted in the SER.

Direct Measurement

(1) Verify by documentation review that the parameters of interest are being monitored either by sensors that directly sense the parameter or by sensors that indirectly sense the parameter. If an indirect measurement is being used, review the SER for an acceptance of this method.

(2) Identify in the inspection report as an "unresolved item" any instrument that indirectly measures the parameter of interest and has not been specifically accepted in the plant SER.

b. Category 2

Equipment Qualification

Environmental Qualification - Review the EQ Master Equipment list to confirm that the licensee has addressed environmental qualification. If equipment is required to be environmentally qualified but is not included in the EQ Master Equipment list, verify that the licensee has documentation to justify the omission.

Quality Assurance

Review licensee's Q list for confirmation that the instrument is covered under the licensees quality assurance program. (Note: Quality assurance requirements for some instruments may be less stringent than for others. This is dependent on the importance to safety of the instrument).

Display and Recording

Verify that the instrument signal is displayed in the control room on an individual instrument or is processed for display on demand.

Range

(1) Confirm that actual range of installed equipment meets the range specified for the variable in the applicable revision of RG 1.97 or as accepted in the plant SER.

(2) Confirm that the overlapping feature specified in RG 1.97 exists if two or more instruments are needed to cover a particular range.

(3) Determine if the sensitivity of the instruments has been compromised by attempting to cover a wide range. R

Interfaces

Confirm that the licensee has identified all selected Category 2 monitoring systems that interface with lesser qualified systems or are transmitted for other use. For these systems, confirm by documentation review that an acceptable isolation device is used between the two. R

Service, Testing, and Calibration

Determine the testing/calibration frequency by documentation review and verify conformance with RG 1.97 or the SER.

Direct Measurement

(1) Verify by documentation review that the parameters of interest are being monitored either by sensors that directly sense the parameter or by sensors that indirectly sense the parameter. If an indirect measurement is being used, review the SER for an acceptance of this method.

(2) Identify in the inspection report as an "unresolved item" any instrument that indirectly measures the parameter of interest and has not been specifically accepted in the plant SER.

2515/087-06 REPORTING REQUIREMENTS

Some or all of the inspection requirements for this TI may have been previously accomplished as a part of other inspections conducted at a particular facility. In such cases where the basis for findings resulting from these inspection requirements is adequately documented in an earlier inspection report, use the previously completed inspection results and enter the inspection report number, completion date, and other pertinent data in the SIMS data base for the affected facility.

The inspection effort shall be documented in a routine inspection report. Copies of the inspection report should be sent to Barry Marcus and Claudia Abbate of NRR. R R

When inspection activities required by this TI are completed, enter the status of these activities in the following SIMS data fields. The SIMS issue number for this TI is 67.3.3.

a. Inspection Report Number. Up to five inspection report numbers may be entered to identify those instances where the inspection activities are documented in more than one inspection report.

b. Inspection Report Date. This data field lists either the date of the final inspection report on this item, the date of the most recent inspection report on this item, or a projected final inspection date for this item.

c. Comments. This data field contains 300 characters and can be used to describe the status of NRC inspection activities for this item at each plant. Useful information in this field would include mentioning of outstanding open items or future licensee action needed to close the item, if applicable.

2515/087-07 EXPIRATION

The TI shall remain in effect until September 30, 1991 or until all the re R
quired inspections have been completed.

2515/087-07 CONTACT

Questions regarding this TI should be addressed to Barry Marcus (301) 492-0823.

2515/087-08 STATISTICAL DATA REPORTING

Record actual time spent to perform the inspection and the time spent on followup items identified in the inspection report against 2515/087 for R
RITS, and 25587 for the 766 system.

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