U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 99900403/80-03 Program No. 51100

Company: General Electric Company
Nuclear Energy Business Group
175 Curtner Avenue
San Jose, California 95125

Inspection at: San Jose, California, and NRC Region IV Office,
Arlington, Texas

Inspection conducted: July 7-11, 1980, and August 8, and 27, 1980

Inspectors:

J. R. Costello — 1/16/81
J. R. Costello, Principal Inspector
Vendor Inspection Branch — Date

R. H. Brickley — 1/29/81
R. H. Brickley, Principal Inspector
Vendor Inspection Branch — Date

J. R. Agee — 1/16/81
J. R. Agee, Contractor Inspector
Vendor Inspection Branch — Date

W. E. Foster — 1/16/81
W. E. Foster, Contractor Inspector
Vendor Inspection Branch — Date

Approved by:

C. J. Hale — 1-29-81
C. J. Hale, Chief
Program Evaluation Section
Vendor Inspection Branch — Date

Summary

Inspection on July 7-11, 1980, and August 8, and 27, 1980 (99900403/80-03)

Areas Inspected: Implementation of 10 CFR 50, Appendix B, and Topical Report NEDO-11209-04A in the areas of compliance with 10 CFR Part 21, followup on inspector identified problems and unresolved items, followup on deviations, and followup on regional requests. The inspection involved one hundred twenty four (124) inspector hours on site by four (4) NRC inspectors.

Results: In the five (5) areas inspected no deviations or unresolved items were identified.

DETAILS SECTION I

(Prepared by J. R. Costello)

A. Persons Contacted

J. M. Bricken, Quality Control Engineer
C. L. Buckner, Specialist Quality System Engineered Equipment
K. D. Jakabcin, Principal Quality Control Engineer
*D. E. Lee, Manager Quality Control
*J. K. Powledge, Manager Quality Assurance Engineered Equipment and Installation
E. J. Romesberg, Program Manager Safety & Licensing Brown's Ferry
B. L. Sheppard, Manager Quality Systems & Records

*Denotes those present at exit meeting

B. Followup on Previous Inspection Findings

1. (Closed) Deviation (Report No. 79-03) No source inspection or surveillances performed during fabrication of safety related fuel grapples. The fuel grapples will be repaired at GE San Jose where they will be functionally tested to twice their design loads and identified welds will be liquid penetrant examined after the test. Details of the corrective and preventive measures taken by GE are given in letters from GE to NRC Region IV dated January 28, 1980; February 22, 1980; April 3, 1980; and May 2, 1980.

2. (Closed) Unresolved Item (Report No. 80-02) It was not apparent to the inspector during a review of available documentation of 10 CFR Part 21 evaluations that six (6) items identified as potentially reportable conditions should not have been reported to the Commission. Three (3) of the six (6) items were closed during this inspection. The remaining three (3) are discussed in the letter transmitting this report. Further details on these and other items reviewed in this area of the inspection can be found in Details Section II, paragraph B.

3. (Closed) Followup Item (Report No. 80-02) The audit report of Dravo Corp. did not follow GE implementing procedures in regard to reporting persons contacted during pre-audit, audit and post-audit meetings. From a further review of audit reports this appears to be an isolated case. A memo has been issued to all audit personnel cautioning them to follow the existing procedures.

C. Followup on Regional Request

In this area of inspection a regional request relating to inadequate sensitivity of radiographs furnished by GE subsuppliers was reviewed and evaluated by the inspector. In reviewing this item, the inspector assured that the following objectives were accomplished:

1. Objectives

   a. Determination of how the item was identified.

   b. Assurance that followup actions were conducted under the requirements and procedures of the General Electric Quality Assurance Program.

   c. Determination of the status of corrective action and preventive action to assure that the item is satisfactorily resolved.

   d. Determination of the generic effects on other plants and notification of the affected utilities.

   e. Determination of the accuracy, applicability, and timeliness of reporting to the NRC.

2. Method of Accomplishment

   The preceding objectives were accomplished by discussions with GE personnel and an examination of:

   a. Engineering Operating Procedure EOP 40-12.00 dated June 25, 1979 - Materials.

   b. Engineering Operating Procedure Appendix 20 dated October 22, 1977 - Material and Process Conditions Requiring Material Applications Approval.

   c. Engineering Operating Procedure EOP 45-4.00 dated January 28, 1980 - Engineered Equipment Supplier Document Review.

   d. Engineering Operating Procedure EOP 65-4.00 dated December 15, 1977 - Potentially Reportable Conditions.

   e. Nuclear Energy Business Group Procedure No. 70-42 dated November 22, 1979 - Reporting Of Defects and Noncompliance.

   f. Documents to verify implementation of quality assurance program commitments, procedural requirements and to satisfy the intent of the objectives section. These documents are as follows:

      (1) Paragraphs T-231.1 (film processing), T-232 (type of film), T-233 (film density) and T-262.3 (number of penetrometers) of Section V of the ASME Boiler and Pressure Vessel Code 1974 Edition.

      (2) Recommended Practice SE-94 ASME Boiler & Pressure Vessel Code 1974 Edition.

(3) Associated Piping & Engineering Corporation Standard Practice Procedure SPPO-401 dated August 18, 1978, entitled "Radiographic Examination."

(4) P. O. No. 205-AL854 to Associated Piping & Engineering Corp., Compton, California, for 24" weld/CRC (corrosion resisting cladding) plus associated GE trip reports to this facility.

(5) P. O. No. 205-AH801 to Atwood & Morrell Co., Salem, Massachusetts, for Main Steam Isolation Valves plus associated GE trip reports to this facility.

(6) P. O. No. 205-XC043 to CBI Nuclear Company Memphis, Tennessee, for Core Structure Components plus assoicated GE trip reports to this facility.

(7) P. O. No. 205-AG551 to Atlas Industrial Manufacturing Company, Clifton, New Jersey, for Regenerative Cleanup Heat Exchangers.

(8) P. O. No. 205-AH735 to Engineers & Fabricators Company, Houston, Texas for Residual Heat Removal Heat Exchangers plus associated GE trip reports to this facility.

(9) P. O. No. 205-AJ740 to Anchor Darling Valve Company, Williamsport, Pennsylvania, for Recirculation Gate Valves plus associated GE trip reports to this facility.

(10) Anchor Darling Valve Company Quality Assurance Manual for ASME Section III, Division I, Construction, Issue 2, February 6, 1980.

(11) P. O. No. 205-AH802 to Rockwell International Flow Control Division, Corte Madera, California, for 26" Main Steam Isolation Valves plus associated GE trip reports to this facility.

(12) P. O. No. 205-AJ430 to G. Dikkers & Company, Hengels(O). The Netherlands, for Main Steam Safety Relief Valves plus associated GE trip reports to this facility.

(13) Trip Reports of K. D. Jakabcin dated June 3-4, 1980, and June 5, 1980, to Port Gibson, Mississippi, to review radiographs at Grand Gulf Site.

(14) Telecopy dated April 23, 1980, from Mississippi Power and Light Company to GE entitled NSSS Sub-Suppliers Radiographs.

(15) Letter A.R. Smith, Manager-Grand Gulf Project GE, to L. J. Dale, Nuclear Project Manager-Grand Gulf Project MP&L dated June 13, 1980, Subject CAR-260, PRD (Potentially Reportable Deficiency) - 80/28 and CAR-253 on NSSS radiographs meeting ASME Code requirments.

(16) FDDR's (Field Deviation Disposition Requests) JBI-212 and JB2-044. These FDDR's concerned radiographs not meeting ASME Code requirements.

(17) Letter A.R. Smith, GE, to I.E. Reeves, MP&L, dated February 12, 1980. Letter was in reply to MP&L letter concerning the NRC Inspection Report 79/34 for site inspection on December 11-14, 1979.

(18) Grand Gulf Nuclear Station NRC Inspection Report.

(19) Eleven (11) Radiographic Interpretation Sheets for Associated Piping & Engineering Corp.

(20) Dikkers Radiographic Examination Sheets for Cap (Casting), Flange, Body and Liner.

(21) P. O. No. 205-XF624 to Peabody Testing/X-Ray Engineering Company, Port Gibson, Mississippi, dated June 4, 1980. This P. O. covers services of seller's personnel at Grand Gulf site to provide radiography of Units 1&2 Steam and Recirculation Pipe in accordance with FDDR JB1-212 and JB2-044.

3. Findings

The fact that GE subsuppliers were not meeting all ASME requirements for radiographs was discovered when a MP&L reinspection of all GE supplied radiographs was made at the Grand Gulf Station.

In the reinspection a densitometer was used for measuring density. This is a practice that is not standard in industry. The densitometer is a more precise inspection tool than the density strip comparator and could reject radiographs passed by the strip comparator method commonly used in industry.

The reinspection of radiographs at Grand Gulf Station disclosed that some of the radiographs did not meet ASME code requirements. These radiographs had previously been subjected to regular inspection by GE sub-suppliers and to sampling inspection by GE Procurement Inspectors and the Authorized Nuclear Inspectors. The major deficiencies identified in the rejected radiographs were (1) failure to use two penetrometers when required, (2) failure to meet density requirements in all areas of the radiographic film, and (3) use of an improper panoramic technique for pipe girth welds.

Examination of GE purchase orders showed that the correct ASME code requirements had been imposed upon the GE sub-suppliers. However, film density in industry is frequently determined by the density strip comparators and if the sensitivity of the film as measured by the penetrometers is satisfactory the film will be accepted even though it might not meet the density requirement. This problem is fairly generic in industry.

GE has proposed that they reshoot certain additional radiographs on the steam and recirculation piping where the use of an improper panoramic technique resulted in some weld areas being obscured by the flash tab. This resulted in a density reading outside the -15% plus 30% range of Section V of the ASME Code.

GE held a joint meeting with MP&L and NRC on January 28, 1980, at the site. At that meeting GE pointed out that they believed all welds were sound and could be so determined from the existing radiographs with a possible few exceptions.

GE plans to ask for a code interpretation and has been informed that MP&L will accept a code interpretation on this matter.

To prevent future occurrences of this problem GE will place in all future purchase orders the additional requirement that sub-suppliers will measure film density with a densitometer.

GE has determined that the problem of meeting the density requirement for radiographs is generic to at least four (4) utilities namely Niagara Mohawk Power Company (Nine Mile Pt 2), Cleveland Electric Illuminating Company (Perry), Illinois Power Company (Clinton) and Mississippi Power & Light Company (Grand Gulf). GE believes this is generic to all utilities as the past and present practices have not used the more precise method of measuring film density with a densitometer.

Cognizant GE personnel indicated that they believe the welds represented by the GE radiographs at the Grand Gulf Stations are sound and therefore this problem would not pose any threat to the public safety and would not require notification under 10 CFR Part 21.

No deviations were identified in this area of inspection. However, the following were identified as follow-up items.

a. It is not apparent to the inspector why GE surveillance inspection was unable to detect the presence of defective radiographs prior to their shipment to the Grand Gulf site. GE procurement practices including source inspector responsibilities, training and qualifications will be reviewed during the next inspection.

b. During the course of this inspection it was noted that this problem probably exists at three (3) other utilities. During the course of the next inspection, the inspector will verify that these utilities have been notified and what action if any has been taken to assure that they have good radiographs.

D. Exit Meeting

A meeting was conducted with management representatives at the conclusion of the inspection on July 11, 1980. In additon to the individuals indicated by an asterisk in the Details Sections, those in attendance were:

J. Barnard, Manager, Product and Quality Assurance Operation (P&QAO)
R. C. Boesser, Manager Technical and Administrative Programs, Nuclear Power Systems Division
A. Breed, Manager Quality Assurance, P&QAO
J. M. Case, Manager Engineering Systems, P&QAO
D. H. Ferguson, Manager Quality Assurance, Nuclear Control and Instrumentation Department (C&ID)
E. Giambaluu, Program Manager S&L Support, NPSED
P. E. Novak, Manager, Engineering System Audits, P&QAO
G. A. Senn, General Manager, C&ID
L. V. Stonebraker, Specialist Quality Assurance, Nuclear Services Department

The inspector, with the assistance of the inspection team members, summarized the scope and findings of the inspection for those present at the meeting. Potential items of noncompliance were presented as unresolved items until they could be discussed with Region IV management. GE management representatives acknowledged the findings and made the following comments in regard to upgrading some of the unresolved items to possible items of noncompliance.

G.E. would like the option of discussing these findings with Region IV management before they are published.

The inspector acknowledged the GE comments and stated he would notify GE before the report is published if the unresolved items are reclassified as items of noncompliance. The items were reclassified and the inspector so notified Mr. D. Long on July 18, 1980.

Subsequent meetings were held with GE management representatives on August 8, 1980, in the Region IV offices in Arlington, Texas, and August 27, 1980, in IE headquarters in Bethesda, Maryland. Those in attendance were:

GE

J. Barnard, Manager, P&QAO
A. Breed, QA Manager, P&QAO

W. H. D'Ardenne, Manager Safety Evaluation Programs
E. Firestone, Counsel, Regulation
G. G. Sherwood, Manager Safety and Licensing

NRC

R. H. Brickley, Principal Inspector, Program Evaluation Section, Vendor Inspection Branch
R. C. DeYoung, Deputy Director, IE (August 27 only)
U. Potapovs, Chief, Vendor Inspection Branch
K. V. Seyfrit, Director, Region IV
V. Stello, Director IE (August 27 only)
J. M. Taylor, Deputy Division Director, IE (August 27 only)
H. D. Thornburg, Division Director, IE (August 27 only)

The additional information and clarification provided by GE during these meetings and subsequent evaluation of the findings in IE:HQ and Region IV resulted in the proposed Notice of Violation being reclassified to a follow-up item for further review during subsequent inspections.

DETAILS SECTION II

(Prepared by R. H. Brickley)

A. Persons Contacted

D. H. Currie, Manager, Quality Systems Audits and Records
*W. H. D'Ardenne, Manager, Safety Evaluation Programs
O. J. Foster, Technical Leader
*H. H. Hendon, Manager, Advanced Engineering
*D. E. Lee, Manager, Quality Control
J. C. Major, Manager, Piping Equipment Design
*T. R. Regenie, Senior Engineer
D. W. Reigel, Manager Systems Engineering
*G. G. Sherwood, Manager, Nuclear Safety and Licensing

*Denotes attendance at the exit meeting.

B. Compliance With 10 CFR 21

1. General

Each organization, such as General Electric, that performs "design" which involves basic components as defined under 10 CFR Part 21 is subject to its regulations. General Electric is also a firm supplying components to a facility regulated pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974. General Electric and its responsible officer must therefore ensure compliance with the requirements 10 CFR Part 21 as specified in Section 21.6 for posting, 21.21(a) for procedures, 21.21(b) for notification and written reports to the commission, 21.31 for inclusion of appropriate references in procurement documents, and 21.51 for preparation and maintenance of records, sufficient to assure compliance with regulations under Part 21.

As a means to ensure compliance with 21.21(a) regulations, General Electric must establish procedures to provide for the evaluation of deviations not already corrected in all basic components to which it is applicable when knowledge of the deviation is received (QA-22 under NUREG 0302, Revision 1 on page 21.21(a)(-9), or informing purchasers of the deviation, so the purchaser may evaluate the deviation. These procedures must also provide for informing a responsible officer within General Electric of any resulting conclusion of a defect or failure to comply.

To ensure compliance with regulations under: 21.6, 21.21(b), 21.31, and 21.51, General Electric may adopt appropriate controls in the form of procedures or other instructions, as necessary, to ensure that the stated regulatory requirements will be implemented as appropriate.

2. Objectives

To determine whether General Electric and appropriate responsible officers have established and implemented procedures and other instructions as required to ensure compliance with 10 CFR Part 21 requirements relative to the reporting of defects and noncompliance with 10 CFR Part 21, as clarified by USNRC positions in NUREG-0302, Revision 1.

3. Method of Accomplishment

The preceding objectives were accomplished by an examination of:

a. The Nuclear Energy Business Group Procedure 70-42 (Reporting of Defects and Noncompliance Under 10 CFR Part 21 or Part 50.55(e)) and Engineering Operating Procedure 65-4.00 (Potentially Reportable Conditions)

b. Documentation (e.g. internal and external memos, design review reports, etc.) related to the identification, evaluation, and determination of reportability of the following Potientially Reportable Conditions (PRC).

PRC 78-27 (ECCS Reverification Results)

PRC 78-29 (Gadolinia Results)

PRC 78-32 (Boron Carbide Loss in Control Blades)

PRC 79-03 (Safety Function Inhibition During LOCA)

PRC 79-23 (Millstone and Cooper Main Steam and Recirculation System Snubbers)

PRC 79-26 (Rosemount Model 1152 Pressure Transmitter)

PRC 79-43 (Reactor Protection System Relay Test)

PRC 80-08 (Agastat Relays Not Within GE Specs)

PRC 80-16 (Isolators In Control Panels)

4. Findings

a. Deviations and Unresolved Items

None were identified.

b. Followup Item

t does not appear that GE's procedures and/or management policies are effectively implementing the intended requirements of 10 CFR Part 21. This observation is based on the following:

(1) In regard to PRC 80-08 (Agastat Relays Not within GE Specs), the response time of the Agastat relays used in the RPS and other Class IE applications does not meet the requirements of the procurement document. G.E. Systems Engineering has reviewed the specified response time requirements and concluded that they could not be relaxed and, therefore, the relays cannot be used in the RPS design. These relays are used in the RPS and other Class IE applications at Grand Gulf, Perry, Limerick, Hope Creek, River Bend, NMP-2, and Bailly.

The Manager of Safety and Licensing concluded that this item was not reportable because the condition would not compromise the reactor coolant pressure boundary, prevent the safe shutdown of the reactor, or result in potential offsite exposure comparable to those in 10 CFR 100.11.

(2) In regard to PRC 79-03 (Safety Function Inhibition During LOCA), the blockage of a water level instrument line appears to result in the loss of a redundant and diverse safety function of a basic component. The blockage of this line was determined by GE to result in failure of the safety system to initiate scram, actuate ADS, and isolate R.H.R. The Manager of Safety and Licensing concluded that this item was not reportable because, even with this line plugged, when the dry well pressure reached 2 psig the HPCI, RCIC, and scram would be initiated; the vessel depressurized; LPCI/LPCS would be initiated; and ADS would not be required.

(3) In regard to PRC 80-16 (Isolators in Control Panels), isolator assemblies experienced high power dissipation causing an excessive temperature rise such that they become inoperable. This in turn would cause certain Class IE equipment to fail to operate. This item was identified during testing of the Grand Gulf 2 (GG-2) control panels in November 1978. Isolators with defective components are located at Grand Gulf 1 and 2 and Perry 1. Note: the GG-2 and Perry 1 units were shipped conditionally, with defects noted.

The GE evaluation concluded that the item was not reportable under 10 CFR 21 since the customer was appraised of the defect and the defect was identified and corrected. However, no documented evidence could be found at the time of the inspection, to substantiate that GG-1 had knowledge of this defect. Subsequently, GE presented documented evidence during, the August 8, 1980 meeting, that GG-1 units were also shipped conditionally.

(4) With regard to PRC 79-23 (Millstone and Cooper Main Steam and Recirculation System Snubbers), four (4) snubbers at Cooper and two (2) at Millstone were undersized for forces resulting from SSE by 4 Kips to 18 Kips. The GE evaluation concluded that the item was not reportable under 10CFR 21 due to an engineering judgement (not supported by documented analysis) that the forces would be transmitted to piping and restraints such that the system would not be overstressed. In addition GE felt that the Licensee would identify and correct these snubbers during IEB 79-14 activities.

The basis used by GE for not reporting the above items under Part 21 appears questionable if not erroneous. GE has been requested to reevaluate their policies and procedures. We will continue to inspect in this area in the future to assure that the intent of Part 21 is effectively implemented by GE.

DETAILS SECTION III

(Prepared by J. R. Agee)

A. Persons Contacted

B. P. Grim - Manager Reactor Instrumentation
R. K. Hendrix - System Engineer
R. T. Kern - Senior Engineer
N. Luria - Records Controls
L. D. Test - Principal Engineer, Advanced Engineering
K. Utsumi - Engineer, Process Instrumentation & Control
*R. K. Waldman - Engineering Programs Manager

*Attended exit meeting.

B. GE SBM Control Switch Cam Follower

This item concerns cracking of plastic cam followers of GE SBM Control Switches in nuclear power generating stations.

1. Objectives

The objectives of this area of the inspection were to:

a. Examine results of the evaluations of this product problem.

b. Determine whether this item is applicable to the GE Nuclear Energy Business Group (NEBG), is generic or plant unique.

c. Determine if this item was properly reported to the NRC.

2. Method of Accomplishment

The preceding objectives were accomplished by:

a. Determining whether GE Nuclear Energy Business Group (NEBG) had specified use of the GE SBM control switch in nuclear safety related systems on BWR projects.

b. Review of the following GE Control and Instrumentation Department (C&ID) documents:

(1) Purchase Specification for Essential Components 225A6635, Revision 5, dated January 8, 1975.

(2) Qualification Specification for Essential Components 225A6634, Revision 6, dated March 1, 1979.

(3) Seismic Qualification Procedure for Class IE Electrical Equipment 225A5766, dated January 16, 1978.

(4) Drawing and Qualification Package 145C3049 which contained the Design Review Report, No. 235A1645 Control Switch, Type SBM, and Seismic Qualification Summary No. 225A6962, Switch, GE SBM.

c. Review of the following GE Power System Management Business Department (PSMBD) documents:

(1) Standard catalog, "GE Application and Ordering Guide for SB Control and Transfer Switches, Catalog No. GET-6169."

(2) Instructions Manual, "Control and Transfer Switch, Type SBM, GEH-2038A."

d. Review of GE Power Systems Management Business Department-Philadelpha (PSMBD) letter 08609 dated February 27, 1980, concerning life tests to be conducted on SBM switches.

e. Review of GE, BWR Services Organization, Services Information Letter (SIL) No. 155, Category I dated March 19, 1976, entitled, "Possible Failures of Type SBM Control Switches" and SIL No. 155, Supplement No. 1, dated July 30, 1976, entitled, "Inspection and Cleaning of General Electric Type SBM Control Switches."

f. Review of GE PSMBD letters to GE NEBG dated October 5, 1979, and February 20, 1980, concerning test data on SBM control switch cam followers.

h. Review of NRC IE Information Notice No. 80-13, General Electric Type SBM Control Switches Defective Cam Followers, April 2, 1980.

i. Review of C&ID letter K. Utsumi to T. Cross and P. Aschoff entitled, "SBM Cam Follower Close out," dated April 7, 1980.

3. Findings

a. General

(1) At the GE NEBG facility, determination was made that NEBG has specified extensive use of the SBM control switch in operating BWR plants. According to C&ID management, C&ID will continue specifying use of the control switch in future plants.

The SBM control switches used in BWR nuclear safety related applications are commerical grade products selected from

the GE PSMBD commercial catalog. The inspector verified that generic models of this switch had been qualification tested in a simulated seismic environment, item 2.b.(4), above. Item 2.b.(4) required testing to meet criteria of IEEE standard 344-1971. An example of where the commerical grade SBM switch has been dedicated for nuclear safety related application by NEBG is shown on C&ID drawings 145C3049 and 791E418 TN as item E11A-S03AD. In this application, the switch is used for actuation of residual heat removal pumps which is typical for all BWR projects.

The SBM control switch, has a history of cam follower cracking due to exposure to hydrocarbon material, and a history of cam follower failure due to other causes. C&ID management is aware of these conditions and admits that PSMBD standard maintenance instructions, submitted with SBM switches to BWR facilities, do not caution their customers against the use of hydrocarbon cleaning materials to preclude cracking and possible failure of the cam follower. As a precaution, GE issued an SIL in 1976 alerting their customers to the potential problems relative to inspection and cleaning of the SBM switches. As a result, C&ID management feels the SBM problems and failures have been minimized on BWR installations. C&ID management is satisfied with the field performance of the switches and propose continued use of them.

(2) Two (2) SBM switches were returned to PSMBD by a PWR facility for examination. These two (2) switches, with cam follower cracks, were analyzed by PSMBD and the determination was made that the cloudy conditions of the cam followers were caused by chemical exposure. PSMBD plans to perform a life test on these switches. The data is forthcoming, but without a scheduled completion date. NEBG will evaluate the results of these tests when completed and be guided by their recommendations and conclusions.

(3) NRC IE Information Notice No. 80-13 identifies two (2) PWR nuclear facilities where SBM switches with defective cam followers were identified. The IE Notice recognizes the problem as a long-standing one for which GE issued Service Information Letters in 1976. GE NEBG is aware of this IE Notice and plans no further action on this subject unless the current tests being conducted at GE PSMBD dictate otherwise.

b. Comment

Based on the foregoing review, the inspector concludes that the GE SBM problems do not emanate from GE NEBG and the actions taken and being taken by GE NEBG appear appropriate.

From various PSMBD documents received, it appears that only a limited number of SBM switches have failed and these failures were not due to the hydrocarbon induced cracking. The cracking appears more prevalent in PWR applications than in BWRs, perhaps due to GE's SIL on this subject.

Unless additional information (e.g., PSMBD test results) indicates otherwise, no further effort is planned at NEBG relative to this problem.

Any further effort necessary will be directed toward GE PSMBD, where the switches were designed, initially manufactured, and tests are being conducted.

c. Deviations and Unresolved Items

None were identified.

C. Environmental and Seismic Qualification of Electrical Equipment

This item is a follow-up to an interim report to NRC Region I by the Niagara Mohawk Power Corporation resultant from the utility's audit made of the GE NEBG facility. In this report, a potential reportable 50.55(e) deficiency was identified regarding a lack of evidence of environmental and seismic qualification for components which had been shipped to Nine Mile Point Unit 2. In this report, three components had inadequate or no documentation to show that they met environmental and seismic qualification. The components were a conductivity element, a level transmitter, and a Rosemount 1151 transmitter.

1. Objectives

The objectives of this area of the inspection were to:

a. Determine that adequate qualification documentation exists and is retrievable.

b. Determine whether this item is generic or plant unique.

c. Determine if the item deficiency has been resolved.

2. Method of Accomplishment

The preceding objectives were accomplished by:

a. Examination of C&ID internal correspondence and data applicable to the Niagara Mohawk audit finding 0041 to determine the essentiality level of the:

(1) Conductivity element, tag No. E-12-N001 per Purchased Part Drawing 163C1544 and

(2) Level transmitter, tag No. E-12-N008, per Purchased Part Drawing 145C3156.

b. Review of C&ID records and data applicable to the Niagara Mohawk audit finding 0042 to verify that:

(1) Codes and standards imposed on the electrical equipment for the Nine Mile Point Station were in compliance with the Safety Analysis Report (SAR).

(2) Qualification requirements for the Rosemount 1151 transmitter had been defined in procurement and qualification specifications.

(3) Rosemount had completed and submitted required qualification test data for the specific 1151 transmitter to GE NEBG.

(4) Files in the records control center had been adequately organized and cross-referred so that environmental and qualification documentation for all nuclear safety related electrical components could be easily retrieved.

c. Review of GE Manufacturing Procedure MP -5.09 Shipping Inspection dated July 7, 1980.

3. Findings

a. General

(1) The inspector verified that the two (2) mechanical/electrical components, that were the subject of the subject 50.55(e) report (E-12, N001, conductivity element and E-12, N008,

level transmitter), are electrically independent components and are not required to function either during or after a design basis accident. This verification was accomplished by a review of the function of these components. The conductivity element is used to monitor system conductivity during normal system operation. The level transmitter provides local information concerning the condensate tank level. Both components provide supervisory information only. These components are displayed on the P&ID (system drawing) as passive instruments and would not be required to be qualification tested to meet specific IEEE standards; therefore there would be no qualification records for these instruments.

(2) A comparative review of the SAR relative to procurement and qualification specifications for the Rosemount 1151 transmitter revealed the transmitter had been specified and purchased to the criteria of IEEE standard-344 1971 in compliance with project requirements. Changes to project contract requirements to upgrade the instruments to meet IEEE standards 1974/1975 seismic and environmental qualification requirements were not apparent.

(3) A record center system for cross-referencing and filing all categories of qualification reports, drawings and related documents has been initiated. This cross-referencing and filing system is greater than thirty percent (30%) complete and is scheduled for full implementation by September 1980. The inspector made a random selection of three (3) drawings and three (3) unrelated qualification documents and verified they cross-referenced related documents and drawings in the record center files.

b. Comments

(1) Based on the foregoing review, it appears that the subject conductivity element and the level transmitter were not required to be qualification tested because of their functional application. This conclusion was supported by a review of the applicable SAR sections and system requirements specification. Since qualification testing was neither required nor performed, the qualification records would not exist and would not have accompanied the shipment of these components.

(2) Concerning the Rosemount 1151 transmitter, GE procedure MO-5.09 permits the shipment of equipment without a complete records package, with certain provisions. It appears that the subject transmitter was shipped without the related qualification records, but in compliance with the procedure governing such shipments. The required records have since been made available to show compliance with the requirements of IEEE 344-1971.

(3) The problem encountered during the utility's audit appears to have been due in part to the GE's system for filing such records. GE's modification to their filing system appears to have corrected the source of this problem, based on our review of the completed portion of their record center system modification discussed above.

c. Deviations and Unresolved Items

None were identified.

d. Follow-Up Item

While no deviations to required qualification testing of components were identified during this inspection, we will review other components on this and other projects during a future inspection to assure that committed qualification testing is being imposed and that documentation attesting to the qualification testing is being properly controlled.

DETAILS SECTION IV

(Prepared by W. E. Foster)

A. Persons Contacted

P. M. Briggs, Manager - Quality Control (PGCC)
F. C. Cannizzaro, Specialist - Procedures and Audits
L. Converse, Technician - Planning
J. R. Crepeau, Engineer - Quality Control (Farm-out)
R. A. Crocker, Responsible Engineer
*W. H. D'Ardenne, Manager - Safety Evaluation Programs
**B. P. Grim, Manager - Reactor Instrumentation and Protection Design
T. Gwaltney, Training Coordinator
W. H. Hendrix, Responsible Engineer
*R. E. Pingleton, Engineer - Senior Quality
J. W. Reede, Supervisor - Process Control Engineering (PGCC)
*T. R. Regenie, Engineer - Senior Safety and Standards
P. J. Ryan, Sr., Engineer - Manufacturing
A. J. Rzeszotarski, Manager - QC Engineering (Standard Products)
A. R. Smith, Project Manager - Grand Gulf
O. M. Wheye, Engineer - Senior Quality Control

*Attended Exit Meeting.

**Contacted by telephone.

B. Follow-up on Deviations

1. Objectives

The objectives of this area of the inspection were to verify that the vendor had taken the corrective actions and preventive measures stated in their correspondence to IE regarding identified deviations.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

a. Reviewing Purchase Order Revisions Nos. 1 through 7 of Purchase Order No. 282-KR083 to verify they contained the statement: "All other terms, conditions, and instructions of the original order and order revisions through this revision remain unchanged and apply hereto."

b. Reviewing Manufacturing Procedures No. 5.10, Approval Date of July 7, 1980, to verify that it had been revised to indicate

inclusion of the statement in a. above on Purchase Order Revisions was not necessary if Safety Related had been specified in the original or revised order.

c. Reviewing Material Request (MR) No. AL421, Revision 24, dated June 19, 1980, to verify that the Quality Control Workmanship Standards Manual had been deleted from MR No. AL421, Revision 0, dated June 23, 1978.

d. Reviewing four Nuclear Control and Instrumentation Department QA Program Surveillance Checklists No. 11, dated June 19, 1980, and July 3, 1980, to verify that outstanding purchase orders had been sampled to confirm that material requests and purchase orders did not contain similar type errors.

e. Reviewing Supplier QA Manual Review and Evaluation Summary, Report No. 79T-381, Revision A, dated May 6, 1980, to verify that a note had been added for Items 1, 2, and 4 for Criterion VII and that Test Control had been identified as applicable.

f. Reviewing Section 1.3, Revision 2, dated May 1, 1980, of the Bravo Manufacturing, Incorporated Quality Systems Manual to verify that a paragraph on Test Control had been added.

g. Reviewing the Supplier QA Manual Review and Evaluation Summary Report No. 79T-245, Revision 1, dated June 30, 1980, to verify that a check had been made of other reviews by the responsible individual.

h. Reviewing Control & Instrumentation Department - QA letter, dated June 20, 1980, To: J. H. Breseke, From: A. J. Rz[illegible]tarski, Subject: . . . NC&ID Audit Report No. 79T-381 to verify that notification to the responsible individual had been documented.

3. Findings

a. (Closed) Deviation (Inspection Report No. 80-02): The inspector verified that the items identified above in paragraphs B.2.a. through d. had been acted upon as stated in the General Electric Company, Nuclear Energy Business Group Response letter, dated May 29, 1980.

b. (Closed) Deviation (Inspection Report No. 80-02): The inspector verified that the items identified above in paragraphs B.2.e. through h. had been acted upon as stated in the General Electric Company, Nuclear Energy Business Group Response letter, dated May 29, 1980.

C. Follow-up on Inspector Identified Problems and Unresolved Items

1. Objectives

The objectives of this area of the inspection were to verify that inspector identified problems and unresolved items, during previous inspections, had been corrected and resolved satisfactorily.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

a. Reviewing the file on Potentially Reportable Condition (PRC) No. 79-17, Inserts 72 and 73C Panel H13-P853; specifically, Nuclear Power Systems Division Memo (TRR-83-80), dated July 1, 1980, To: PRC File 79-17 and 79-37, From: T. R. Regenie, Subject: Susquehanna Benchboard Inserts 72C and 73C; and Bechtel Nonconforming Report Nos. 3760 and 3748, to determine that evaluation for the record had been documented and the file contained information that could be assessed to verify the validity of the decision that damaged wires represented a nonreportable condition.

b. Reviewing a marked-up copy of Quality Assurance Procedure No. 2.4, Revision 1, dated April 2, 1980, to determine the intent of revising the document by deleting the requirement that subtier suppliers provide a QA Program acceptable to General Electric.

c. Reviewing the following Quality Plans (not yet issued) to determine that provisions had been made to ensure that agent/distributor initiated purchase orders contained the requirements of NC&ID initiated purchase orders:

(1) No. 30.123, Revision 5, dated July 7, 1980 - Quality Assurance Requirements for Supplier Designed Nuclear Safety-Related Items, and

(2) No. 30.124, Revision 2, dated July 7, 1980 - Quality Assurance Requirements for Suppliers of Safety-Related Items (NED Designed).

3. Findings

a. (Closed) Unresolved Item (Inspection Report No. 80-02): The inspector observed that a Nuclear Power Systems Memo, dated July 1, 1980 (TRR-83-80), had been initiated and added to PRC File No. 79-17. The memo, To: PRC File 79-17 and 79-37, From:

T. R. Regenie, Subject: Susquehanna Benchboard Inserts 72C and 73C, references a meeting conducted June 8, 1979. The inspector was informed that the evaluation occurred at that time. The file also contained an added matrix which identifies items required in the file. Additionally, a Nuclear Power Systems Division Memo, dated July 7, 1980 (WHD-86-80) had been initiated and issued. The memo was To: T. R. Regenie, From: W. H. D'Ardenne, Subject: Review of PRC Files, and gives instructions to review the PRC files and add or reference missing information, as necessary.

b. (Closed) Follow-up Items (Inspection Report No. 80-02):

(1) The inspector observed a marked-up copy of Quality Assurance Procedure No. 2.4, Revision 1, dated April 2, 1980, which deletes the requirement that GE assure that subtier suppliers provide a QA Program acceptable to General Electric.

(2) The inspector observed that the above mentioned (C.2.c) Material Quality Plans included provisions for assuring that Agent/Distributor initiated purchase orders contain the requirements of the NC&ID initiated purchase orders.

D. Follow-up of 10 CFR 50.55(e) Reports

1. Objectives

The objectives of this area of the inspection were to verify that adequate corrective actions and preventive measures had been taken regarding: (1) defective crimps of pins of cable connectors, and (2) retention of pins in cable connectors. Both conditions could result in open circuits by: (1) allowing the conductor to separate from the pin, and (2) not allowing engagement of the male and female pins. These problems were revealed at the Susquehanna Steam Electric Station.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

a. Reviewing the following documents to verify that adequate corrective actions and preventive measures had been or were being taken:

(1) Field Disposition Instructions, Nos.

(a) WJGO, Revision 3, dated April 11, 1979 - Susquehanna Unit I Cables.

(b) WAGN. Revision 0, dated January 1, 1979 - Grand Gulf, Unit . All SITS/FITS Cables, and

(c) TCHD, Revision 2, dated January 14, 1980 - Hanford, Unit II PGCC Cables.

(2) Inspection Instructions, Nos -

(a) CA-002, Revision 17, dated April 10, 1980 - Cable In-Process and Final Inspection,

(b) CA-006, Revision 4, dated February 28, 1980 - PGCC Cable Reinspection and Retest,

(c) CA-008, Revision 3, dated July 31, 1979 - Susquehanna I Field Cable Inspection,

(d) CA-010, Revision 4, dated June 20, 1979 - Field Cable Inspection, and

(e) CA-011, Revision 2, dated June 18, 1979 - Hanford Field Cable Inspection

(3) Manufacturing Standard Practice No. 11.011, Revision 2, dated May 15, 1980 - Verification of Crimping,

(4) The training program for crimping operators, and

(5) PGCC Cable Assembly Instruction Manual, Section 7, Revision 9, dated March 7, 1980 - Multi-Conductor Lug/Pin.

b. Observing Cable 4229/C12A-005, Dwg. No. 287A5191xxGxxx on Traveler T. No. TTLKA and associated records to verify implementation of the corrective actions and preventive measures.

c. Observing crimping tools to verify implementation of preventive measures.

3. Findings

The corrective actions and preventive measures relative to crimping of pins appear adequate to preclude recurrence; however, the current workload and workforce is less than one percent of its peak. Consequently, an aggressive re-training program must be implemented to ensure continued adequacy as the workload and workforce increases.

a. Deviations From Commitments

None

b. Follow-up items

The inspector was informed that the cable assembly workload is expected to increase in October 1980. At that time, or the

following inspection, the adequacy of the corrective actions and preventive measures related to the pin retention problem will be evaluated further.

E. Part 21 Report Follow-up

1. Objectives

The objectives of this area of the inspection were to verify that: (1) the report accurately described the defect or failure to comply and satisfied the reporting requirement with respect to information provided and timing of submittal; (2) the defect or failure to comply had been evaluated as required by Part 21 and reporting organization procedures; (3) the stated safety hazard is a logical conclusion, factual and complete data had been used, and generic implication had been assessed; and (4) the stated corrective action is appropriate, adequate and implemented or planned. The defects identified in the Part 21 report were the failure of silicon controlled rectifiers and blown fuses in inverters. The inverters were manufactured by Topaz Electronics.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

a. Reviewing Potentially Reportable Condition File No. 79-27 on defective silicon controlled rectifiers (SCRs) in inverters manufactured by Topaz Electronics to verify that the defect had been evaluated, reporting had been accomplished in accordance with internal procedures, and generic implication had been assessed.

b. Reviewing Drawing No. 184C4669, Revision 0, dated April 22, 1980, to verify that corrective action was appropriate and adequate.

c. Reviewing Nuclear Energy Business Group Procedure No. 70-42, Revision 3, dated May 1, 1980, (also, Revision 2, dated November 22, 1978) to verify that internal procedures had been initiated.

3. Findings

a. Deviations From Commitment

None.

b. Followup Item

Nuclear Control and Instrumentation Department Engineering has committed to resolution of the Topaz inverter problem by December 22-28, 1980. Also, Field Disposition Instructions, to correct inverters at the various stations, are scheduled for initiation later this year.

As a result of the foregoing, the inspector was unable to adequately assess the corrective action and preventive measures during this inspection.

F. Follow-up on Regional Request

1. Objectives

The objectives of this area of the inspection were to verify that adequate corrective action and preventive measures had been taken or planned regarding the failure of GE switch CR2940US203E at Grand Gulf.

2. Methods of Accomplishment

The preceding obejctives were accomplished by:

a. Reviewing Control and Instrumentation Department letter, dated February 11, 1980, To: F. Busch, From: W. Hendrix, Subject: Grand Gulf CR2940US203E Switch Failure.

b. Reviewing Mississippi Power & Light Company letter, dated February 4, 1980, To: General Electric Company, Mr. A. R. Smith, Project Manager, From: L. F. Dale, Nuclear Project Manager, Subject: Grand Gulf Nuclear Station . . . GE Handswitch CR2940 . . . .

3. Findings

a. Deviations From Commitment

None.

b. Followup Item

The inspector was informed that this switch was not supplied by the Nuclear Control and Instrumentation Department; therefore, no effort was being initiated by them to resolve the problem.

The letter referenced in 2.b. requested certain information from GE-Nuclear Energy Business Group by February 15, 1980.

The inspector was informed that it is not known if a response to the letter had been made. Further, the knowledgeable project engineers were out of the office and expected to return on July 14, 1980.

As a result, the inspector was not able to determine during this inspection what action, if any, the Nuclear Energy Business Group planned to take regarding correlation of this non-safety switch failure to the switch used in safety-related applications.