

NOTICE OF NONCONFORMANCE

GE Nuclear Energy (GE-NE)
Wilmington, NC

Docket No.: 99900003

Based on the results of an NRC inspection conducted on September 7-10, 1999, it appears that certain of your activities were not conducted in accordance with NRC requirements.

Criterion VII of Appendix B to 10 CFR Part 50, "Control of Purchased Material, Equipment, and Services," states, in part, "Measures shall be established to assure that purchased material, equipment, and services...conform to the procurement documents..."

Contrary to the above, an NRC review of a March 4, 1999, GE-NE audit of JMS Southeast, Inc. (JMS), did not adequately demonstrate that JMS's quality assurance (QA) program complied with the requirements of 10 CFR Part 21, which was imposed on JMS by purchase order. Specifically, the audit did not demonstrate that JMS had adequate procedures in-place to identify and evaluate deviations pursuant to 10 CFR 21.21. Section 4.13.3, "Recall Procedure," incorporated into the JMS QA manual in Revision 10, dated December 8, 1998, and later revised in Revision 11, dated February 26, 1999, was not adequate to allow for the identification and evaluation of nonconforming conditions as potential deviations pursuant to 10 CFR 21.21.

JMS revised its QA manual by adding Section 4.13.3 to address specific findings identified during a March 26, 1997, audit by GE-NE which identified several Corrective Action Requests (CARs). Specifically, CAR JMS-2 identified that JMS's QA program did not procedurally address the reporting of defects to customers pursuant to 10 CFR Part 21. Over the past several years GE-NE has placed over 10 safety-related purchase orders with JMS for thermocouple calibration services which imposed the requirements of 10 CFR Part 21. Based on the March 4, 1997, re-audit of JMS, GE-NE closed CAR JMS-2 and two others which had been open for two years without a documented resolution. Since the JMS QA manual revisions were not adequate to address compliance to 10 CFR Part 21, the NRC inspection team did not agree with GE-NE's closure of CAR JMS-2 (99900003/1999202-01).

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Chief, IQMB, Division of Inspection Program Management, Office of Nuclear Reactor Regulation, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each nonconformance: (1) the reason for the nonconformance, or if contested, the basis for disputing the nonconformance, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further nonconformances, and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to extending the response time.

Dated at Rockville, Maryland
December 1, 1999

Enclosure 1

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Report No.: 99900003/1999202

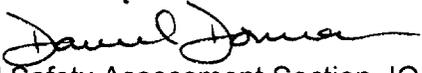
Organization: GE Nuclear Energy
P.O. Box 780
Wilmington, NC

Contact: Caroline Reda
Manager, GE-NE Quality

Nuclear Activity: Nuclear fuel assemblies and related components for BWRs.

Dates: September 7-10, 1999

Inspection Team: Robert L. Pettis, Jr., IQMB/DIPM
Dr. Shih-Liang Wu, SRXB/DSSA

Approved by: Daniel Dorman, Chief 
Quality Assurance and Safety Assessment Section, IQMB
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

1 INSPECTION SUMMARY

From September 7-10, 1999, representatives of the U.S. Nuclear Regulatory Commission (NRC) conducted a performance-based inspection of the activities at the Wilmington, North Carolina, facility of GE Nuclear Energy (GE-NE). In conducting this inspection, the team emphasized technically directed observations and evaluations of GE-NE activities related to the manufacture and testing of nuclear fuel and related components. As the technical bases for the inspection, the team relied upon the following:

- Part 21, "Notification of Failure to Comply or Existence of a Defect," as defined in Title 10 of the *Code of Federal Regulations* (10 CFR)
- 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants"
- GE-NE Quality Assurance Program Description (NEBO-11209).

1.1 Violations

No violations were identified during this inspection.

1.2 Nonconformances

Nonconformance 99900003/1999202-01 was identified during this inspection and is discussed in Section 3.3 of this report. This issue was previously identified as Unresolved Item 99900003/1999201-02 during the March 22-25, 1999, NRC inspection.

1.3 Unresolved Items

No unresolved items were identified during this inspection.

2 STATUS OF PREVIOUS INSPECTION FINDINGS

Violation 99900003/1999201-01 (CLOSED)

During the previous inspection, the inspection team identified a violation of NRC requirements associated with the failure to identify and evaluate a potential deviation related to a laboratory analyst who failed to perform over 20 required weekly calibrations of the LECO hydrogen analyzer during the period April 1996 through March 1999. The analyzer is used to perform hydrogen tests for both zirconium fuel cladding and ceramic fuel pellets. Preliminary evaluation results performed by GE-NE during the previous inspection identified several fuel pellets which appeared to exceed the GE-NE specification limit for hydrogen. At the conclusion of that inspection, GE-NE initiated Potential Safety Concern (PSC) 9907 and Corrective Action Request (CAR) AI-2170 to evaluate the condition under the reportability requirements of 10 CFR Part 21. This issue is further discussed in Sections 3.2 and 3.4 of this report.

Unresolved Item 99900003/1999201-02 (CLOSED)

During the March 22-25, 1999, NRC inspection, GE-NE could not produce documentation to support the resolution of three open CARs identified during GE-NE's March 26, 1997, audit of JMS Southeast, Inc. During the September 7-10, 1999, NRC inspection, the team further identified this issue as a Nonconformance and administratively closed the Unresolved Item. This issue, and the Nonconformance, is further discussed in Section 3.3 of this report.

3 INSPECTION FINDINGS AND OTHER COMMENTS

3.1 Background

The NRC inspection team reviewed the activities performed by laboratory analysts in the Chemet Laboratory. The Chemet Laboratory is an integral part of the in-process release of raw materials, process control, and final release of finished products at the Wilmington facility. The Chemet Laboratory consists of a metallurgical and wet laboratory. The metallurgical laboratory houses an environmental laboratory while the wet laboratory houses a mass spectrometer and standards laboratory. During the inspection, the team primarily focused its attention on the activities performed in the wet chemical laboratory. The wet chemical laboratory performs a wide variety of chemical and physical analyses on uranium dioxide powder and pellets and zirconium fuel cladding.

3.2 Review of Corrective Actions - Violation 99900003/1999201-01

a. Inspection Scope

The inspection team reviewed GE-NE corrective actions associated with Notice of Violation 99900003/1999201-01, which was identified during the March 22-25, 1999, NRC inspection.

b. Observations and Findings

During the March 1999 NRC inspection, the team identified a potential deviation in which a laboratory analyst failed to perform over 20 required weekly calibrations over a three year period for the LECO hydrogen analyzer. At the conclusion of the inspection on March 25, 1999, GE-NE initiated CAR AI-2170 to address the LECO calibration deficiencies. Potential Safety Concern (PSC) 9907, "Fuel Pellet/Zircaloy Hydrogen Analysis," and CAR AI-2170 were also initiated to evaluate if the deviation could cause a substantial safety hazard pursuant to the reportability requirements of 10 CFR Part 21. Since certain required weekly calibrations were not performed, the potential exists for fuel product to have exceeded either GE-NE or customer fabrication specifications, thereby resulting in the shipment of out-of-specification product.

In a letter to NRC dated May 20, 1999, GE-NE concluded that after completion of the evaluation for PSC 9907 and extending the review to all LECO methods, not just hydrogen, GE-NE concluded that the issue was not reportable. The LECO methods evaluated included pellet and Zircaloy hydrogen, Zircaloy nitrogen and oxygen, powder

nitrogen, and powder carbon. During the review, CAR AE-1104, dated May 3, 1999, was initiated to investigate a concern raised by a laboratory analyst regarding the furnace blanking method for Pellet Fluoride (PSC 9908) and Powder/Pellet Chloride (PSC 9912) methods and was documented in CAR AI-2212, dated April 16, 1999. This issue is further discussed in Section 3.4 of this report.

PSC 9907 reviewed calibrations performed during the period April 1996 through April 1999 and included a review of the LECO methods previously discussed. For each method, the calibration factors reported in the Laboratory Material Control System (LMCS), now replaced by the Laboratory Information Management System (LIMS), were evaluated back to April 1996. The review identified repeat calibration factors for all six LECO methods previously discussed. Eight calibrations enveloping each calibration in question (four before and four after the questioned calibration date) were evaluated for the maximum calibration factor. This factor, in addition to the original calibration factor, were used to correct the results using an equation derived by GE-NE. After applying the conservatively derived correction factor to all LECO methods, all corrected data was within specification limits except for several Zircaloy oxygen samples which exceeded the upper specification limit, which was attributed to an outlier which likely contributed to over correction of the data. The data demonstrated that even though a calibration may not have been performed per the required procedure, the calibration factor that was utilized was within the process control limits and that product performance during the suspect period was as expected and did not exceed specifications. As a result, GE-NE concluded that failure to perform weekly calibration did not have a negative impact on the originally reported results and as such, a product nonconformance or inadvertent shipment did not occur.

The inspection team also reviewed a parallel investigation initiated by GE-NE to determine if an employee integrity issue existed. GE-NE Integrity Case 99-005, "Falsification of Chemet Laboratory Data - Fluoride and Percent U Titrations," dated March 1999, reviewed three years of calibration constant data associated with the LECO analyzer. As a result, four laboratory analysts were identified as having questionable calibration standard results. Action taken by GE-NE included dismissal of one analyst for falsification of calibration data and written warnings for the others in accordance with company policy. When interviewed by GE-NE, none of the analysts could provide an explanation for the repeat calibration constants.

In addition to the CARs and PSC evaluations performed to determine if the falsified calibrations created a defect or failure to comply with the reporting requirements of 10 CFR Part 21, other preventive actions were taken by GE-NE to prevent recurrence. These actions included the disciplinary actions previously discussed; suspension of the pellet fluoride and powder/pellet chloride methods at the Wilmington facility pending re-qualification; performance of a "quality standown" for all Chemet Laboratory personnel; and sensitivity training on the requirements of 10 CFR 50, Appendix B, and 10 CFR Part 21. These actions were verified by the NRC inspection team during the inspection.

c. Conclusions

The NRC inspection team reviewed all available documentation, including the GE-NE Integrity Review, which evaluated the impact of the wet laboratory analyst copying the

previous week's calibration constant rather than performing the required weekly calibration. The team agreed with GE-NE's 10 CFR Part 21 evaluation which concluded that the failure to perform weekly calibrations did not have a negative impact on the originally reported results and as such, a product nonconformance or inadvertent shipment did not occur.

3.3 Review of Unresolved Item 99900003/1999201-02

a. Scope

Review additional documentation to demonstrate that GE-NE adequately resolved several open Corrective Action Requests (CARs) which were identified during a March 26, 1997, audit of JMS Southeast, Inc. (JMS). During the March 1999 NRC inspection, GE-NE could not provide sufficient documentation to demonstrate adequate resolution of the CARs, which have been open for two years. GE-NE has qualified JMS as an approved supplier of safety-related thermocouple calibration services in accordance with 10 CFR 50, Appendix B, 10 CFR Part 21 and GE-NE supplier quality requirements.

b. Observations and Findings

On March 26, 1997, GE-NE audited JMS and identified three CARs. CAR JMS-2 was of particular concern to the NRC inspection team since it identified that JMS's Quality Assurance (QA) program did not procedurally address the reporting of defects to customers pursuant to 10 CFR Part 21. Over the past several years GE-NE has placed over 10 safety-related purchase orders (POs) with JMS for thermocouple calibration services which imposed the requirements of 10 CFR Part 21. The CARs remained open through the early part of 1999 when it was determined that a followup audit needs to be performed to resolve these two year old open issues. During this time JMS revised its QA manual to address the specific findings and on March 4, 1999, GE-NE re-audited JMS. As a result of the audit, GE-NE closed all three CARs and certified JMS as an approved supplier of safety-related services and equipment.

The NRC inspection team reviewed the audit report and identified that the audit did not adequately demonstrate that JMS's QA program complied with the reporting requirements of 10 CFR Part 21, which was imposed on JMS by GE-NE purchase order. Specifically, the audit did not objectively demonstrate that JMS had adequate procedures in-place to identify and evaluate deviations pursuant to 10 CFR 21.21. Section 4.13.3, "Recall Procedure," incorporated into the JMS QA manual in Revision 10, dated December 8, 1998, and later revised in Revision 11, dated February 26, 1999, was added to address CAR JMS-2. However, the NRC inspection team did not agree since it was not of sufficient detail to allow for the identification and evaluation of nonconforming conditions as potential deviations pursuant to 10 CFR 21.21. On September 4, 1997, GE-NE placed PO No. 33497066632 to JMS for full calibration and recertification of two Type "C" thermocouples (GE-NE identification Nos. Z010003 and Z0098534) used to determine the thermal profile of the Centorr furnace. The PO required compliance to Part 21 and required the vendor to furnish Certificates of Traceability to the National Institute of Standards and Technology. The team reviewed preventive actions initiated by GE-NE to improve CAR reporting, tracking and closing, including modifications to its

Approved Supplier List effective January 1999, which should enhance the visibility of unresolved issues on a more timely basis. Nonconformance 99900003/1999202-01 was identified during this part of the inspection.

c. Conclusions

The NRC inspection team reviewed additional documentation during the inspection to support the resolution of three open CARs identified during GE-NE's March 26, 1997, audit of JMS Southeast, Inc. However, the team concluded that the JMS audit was inadequate in several areas. Specifically, the audit failed to provide objective evidence of JMS's compliance to 21.21 of 10 CFR 21 and as such, does not support closure of CAR JMS-2. Based on the inspection team's review, the NRC has concern over JMS's ability to identify and evaluate potential deviations in light of their status as an approved supplier of safety-related services and equipment, in accordance with 10 CFR 50, Appendix B, and 10 CFR Part 21.

3.4 Review of CAR AI-2212 - Pellet Fluoride and Chloride Evaluations

a. Inspection Scope

The inspection team reviewed GE-NE CAR AI-2212 which was initiated due to a concern raised by a laboratory analyst regarding performance of the furnace blanking method for pellet fluoride and powder/pellet chloride methods. The concern resulted in initiation of PSC 9908 for pellet fluoride and PSC 9912 for powder/pellet chloride. The CAR also addressed method qualification and laboratory analyst training.

b. Observations and Findings

During performance of GE-NE Integrity Case 99-005, discussed in Section 3.2 of this report, one of the wet laboratory analysts raised a concern to management regarding the performance of the furnace blanking method for pellet fluoride and powder/pellet chloride methods. As a result, GE-NE initiated two additional investigations for reportability pursuant to 10 CFR Part 21. PSC 9908 and PSC 9912, closed on April 29, 1999, and May 11, 1999, respectively, concluded that no defect or failure to comply, pursuant to 10 CFR Part 21, existed. GE-NE also initiated CAR AI-2213, dated April 16, 1999, to address training and procedural compliance in the Chemet laboratory.

b.1 Pellet Fluorides Method (PSC 9908)

In March 1999, an employee raised an issue to management that several of the laboratory analysts were not strictly following the procedure of blanking the furnace before each fluoride sample run as prescribed in laboratory procedures. The pyrohydrolysis method, also called the blanking method, is a method to obtain analytical blank values for analysis of fluorine in fuel pellets. An analytical blank value is a fluorine concentration level obtained when the method is followed using all standard procedures, material, and equipment but without any sample present, and is described in GE-NE Calibration and Operation Instruction (COI) 253, "Determination of Fluoride in UO₂ and UO₂/Gd₂O₃ Pellets by Pyrohydrolysis and Titration," Revision 1, dated October 14, 1998. Pending evaluation to determine if a potential safety concern existed, GE-NE

suspended performance of the test. PSC 9908 was initiated to investigate the potential impact to the product quality. A second evaluation, PSC 9912 (Discussed in Section 3.4 (b.2) of this report), was also initiated to evaluate pellet chloride analysis because it also utilizes the same blanking method.

During the wet laboratory quality stand down on April 19, 1999, a laboratory analyst was interviewed for alleged falsification of pellet fluoride tests as documented in GE-NE Integrity Case 99-005. The analyst was asked to perform a series of blanking methods for a few samples in the presence of several laboratory managers. Although the tests demonstrated that the analyst did not strictly adhere to the procedures in performing the blanking method, GE-NE concluded that no falsification of data existed. The integrity review identified that the analyst performed the test "as trained" instead of strictly following the procedure. The NRC inspection team reviewed the report, including interview notes and laboratory data, and agreed with GE-NE's conclusion that no falsification of data existed.

CAR AI-2212 was issued to assess the fluoride blanking method and address potential training issues. GE-NE evaluated the effect of uncertainty in the fluoride concentration in fuel pellets in four areas affected by specification requirements: (1) fuel failures during normal operations, (2) cladding degradation during power excursions, (3) uranium content, and (4) power generation. Fuel failures during normal operation are mainly caused by primary hydride in fuel pellets that could attack cladding. However, GE-NE indicated that due to recent implementation of the dry conversion process and a strict industry requirement regarding hydrogen control, the possibility of increasing fuel failures because of the irregularity in the blanking method were very unlikely.

Cladding degradation during power excursions is affected by stress corrosion cracking of Zircaloy cladding due to pellet-clad mechanical interaction (PCMI) in the presence of fluorine. Since GE-NE has introduced a new zirconium lined cladding, the PCMI problem was basically eliminated and thus the fluorine content had no direct effect in this assessment. With respect to uranium content, GE-NE indicated that the amount of uranium could be changed by the total impurities including fluorine. They also stated that power generation is also affected by the total uranium content and higher impurities may reduce power output. GE-NE concluded that no reportable issues existed since the first two concerns related to safety were not present and the latter two concerns were commercial in nature. The NRC inspection team reviewed the assessment and agreed that the likelihood of introducing more fluorine into the fuel pellets was very small and would not effect the overall outcome.

Currently, the procedures to determinate the amount of fluoride in UO₂ or UO₂/Gd₂O₃ pellets is documented in Quality Notice (QN) F-Q-2302, "Qualification of Pyrohydrolysis and IS Detection for Pellet Fluoride Analysis," Revision 0, dated August 12, 1999. The QN describes the determination of fluoride in UO₂ pellets using pyrohydrolysis followed by ion selective electrode detection. The pyrohydrolysis method is described in COI 253, "Sample Preparation for Fluoride in UO₂ and (AGATE)O₂ Pellets by Pyrohydrolysis," Revision 2, dated August 12, 1999, which supercedes Revision 1 of the same COI but with a different title. The ion selective electrode detection method replaced the titration method and is described in COI 252, "Determination of Fluoride in Uranium Oxides Using Selective Ion Electrode," Revision 2, dated August 12, 1999.

b.2 Pellet Chloride Method

As mentioned previously, PSC 9912 was initiated to investigate the pellet chloride method, due to the same pyrohydrolysis method, and is described in GE-NE COI 256, Revision 0, "Determination of Chloride in Uranium Oxide Pellet and Powders with and without Guideline," dated September 23, 1998. GE-NE performed a study to assess the capability of the analytical method for reliable data in chlorine concentration. They concluded that there was no safety concern since the results demonstrated that the blanking method for chlorine was adequate and that a product non-conformance did not occur. The NRC inspection team reviewed the report and agreed with the conclusion.

Currently the procedures to determine the amount of chloride in uranium powders is documented in QA F-Q-2292, "Qualification of Method for Determination of Chloride in Uranium Oxide Powders by Dissolution and Turbidimetry," Revision 1, dated June 16, 1999. In addition, COI 275, "Determination of Chloride in Uranium Oxide Powders by Dissolution and Turbidimetry," Revision 2, dated August 6, 1999, provides further detail on the pellet chloride method.

b.3 Training

As a result of PSC 9908 and PSC 9912, CAR AI-2213, dated April 16, 1999, was issued to address the laboratory training program and to develop an action plan to review current training and procedures. After management review of the current organization structure, several training courses were conducted for laboratory analysts. The training included periodic reviews, communication of procedural changes, and the new LIMS software system. On April 19, 1999, a quality shutdown was conducted with all available Chemet Laboratory staff in attendance. As a followup, all Fuel and Chemet Laboratory Quality staff were re-qualified into the requirements of 10 CFR Part 21. The NRC inspection team reviewed the documentation and concluded that the training program was acceptable.

c. Conclusions

During GE-NE's evaluation of Integrity Case 99-005, one of the wet laboratory analysts raised a concern regarding the performance of the furnace blanking method for pellet fluoride and powder/pellet chloride methods. As a result, GE-NE initiated two additional investigations for reportability, pursuant to 10 CFR Part 21, and initiated CAR AI-2213 to address training and procedural compliance in the Chemet laboratory. At the completion of their evaluation, GE-NE concluded that no defect or failure to comply existed. The NRC inspection team reviewed the documentation and agreed with their conclusion.

3.5. Review of Karl Fischer Moisture Analyzer

a. Scope

The inspection team reviewed the method employed at GE-NE Wilmington to determine the moisture level in uranium powder. The method, known as Karl Fischer titration, is documented in GE-NE COI 259.00, Revision 2, dated April 1, 1999, "Determination of Moisture in Uranium Powders By Karl Fischer Titration."

b. Observations and Findings

In March 1998, an allegation was brought to the attention of GE-NE management from a laboratory analyst who alleged 14 separate issues involving various activities performed in the wet laboratory. GE-NE initiated Integrity Case 98-006 to evaluate the issues which were grouped into the following categories: Falsification of Data; Procedure; Technique; Opinion; and Previously Identified Issues. Of these categories, GE-NE identified the most significant issues which involved deficiencies in the execution of Fluoride/Chloride pellet samples; improper use of test standards; and several discrepancies related to test results associated with the performance of Karl Fischer, Chloride, and Nitrogen tests.

GE-NE concluded from the investigation that although an employee integrity issue did not exist, improvements were needed in procedure interpretation and performance of laboratory standards and practices. Evidence of implementation of these improvements were later initiated through CAR AI-2170 and CAR AI-2212 in March 1999. The team reviewed the integrity report, reviewed the CARs, and concluded that GE-NE took appropriate action to resolve this allegation.

In June 1999, the wet laboratory supervisor was made aware of an issue involving a laboratory analyst who failed to report an out-of-control indication (OOCI) while performing moisture tests using the Karl Fischer analyzer. When twice encountered with an OOCI in running the test, the analyst wrote on the bench sheet "unable to stable" for the first occurrence and "underqualified" for the second occurrence and did not call attention to the supervisor. After review of the issue, the supervisor concluded that there was no immediate safety concern because the uncertainty involved in the moisture level was well within the nuclear safety specifications established by GE-NE. The analyst responsible for the test was reminded of his responsibility to report the OOCI in the future and was encouraged to use a more conservative approach while performing tests using the Karl Fischer analyzer. The NRC inspection team reviewed the supervisor's evaluation and concluded that the action taken was adequate to resolve the issue.

c. Conclusions

The NRC inspection team reviewed the evaluations performed by GE-NE in March 1998 and June 1999 and agreed with the conclusions.

3.6 Review of Fuel Rod Off-Gas Tests

a. Scope

The NRC inspection team reviewed a discontinued practice of performing off-gas tests to assure that all uranium dioxide fuel rods and internal metallic components meet the specified requirements for total volatiles and rod hydrogen content.

b. Observations and Findings

The practice of assuring that all uranium dioxide fuel rods and internal metallic components meet the specified requirements for total volatiles and rod hydrogen content (fuel rod hydrogen test) was performed by GE-NE in accordance with Product/Process

Quality Plan 4.0.4, "Uranium Dioxide Fuel Rod Outgassing," Revision 28, dated April 19, 1994. The practice of performing fuel rod off-gas tests was used primarily as an overcheck in the 1970s through 1990s to address hydrating in nuclear fuel components and to assure that moisture was not introduced into the components prior to final end plug welding. The primary test to determine fuel pellet hydrogen content is performed routinely by GE-NE for individual samples using the LECO hydrogen analyzer.

In 1996, GE-NE eliminated the need for off-gassing based on historical data which demonstrated that the fuel rod off-gas operation was stable and reliable and provided a great deal of margin for the measured attribute of hydrogenous material in fuel pellets. GE-NE QA F-D-1613, Revision 0, "Rationale for Elimination of Bi-Weekly Gumball Test," dated April 14, 1994, discussed the technical rationale for elimination of the test. Factors included documented historical data (no failures in the bi-weekly testing in the preceding nine years of running such test), enhanced training, use of administration limits, and GE-NE's conversion from the wet to the dry process. Quarterly qualification of all nine uranium dioxide furnaces and both Guideline furnaces will continue to be performed.

The practice, known as a "Gumball" test, required a test rod, filled with 80 fuel pellets, to be assembled and processed through a standard off-gas cycle in each oven on a bi-weekly basis. Fuel pellet samples are selected by Shop Operations from a minimum of 4 and a maximum of 10 production trays representative of the production run. This test rod was outfitted with a dummy rod extension and run through one cycle of the furnace qualification run. After the off-gas run is completed, the test rod is sent to the Chemet Laboratory for hydrogen analysis. A total of 24 pellets are selected for testing using the LECO hydrogen analyzer. Test results were recorded onto a "Fuel Rod Hydrogen Test Form" and entered into LMCS. Individual values must not exceed 1 part per million (ppm) and the average value for the test rod must not exceed 0.8 ppm hydrogen.

The NRC inspection team selected for review test rod 2CW0701, dated June 15, 1996, which was run through furnace 6Z. The test for pellet hydrogen utilized samples from pellets 3, 4 and 5 for all eight zones, a total of 24 samples. The average rod value reported on the form was 0.12 ppm with the highest individual pellet value reported as 0.24 ppm. The test was performed in accordance with QA F-Q-2067, Revision 73, dated June 23, 1996.

c. Conclusions

In 1996, GE-NE eliminated the need for off-gassing based on historical data which demonstrated that the fuel rod off-gas operation was stable and reliable and provided a great deal of margin for the measured attribute of hydrogenous material in fuel pellets. The test, known as a Gumball test, was an overcheck to determine if additional moisture had been introduced during the rod fabrication and loading process. Pellet hydrogen is primarily determined by testing samples of individual fuel pellets, taken from actual production runs, and testing them using the LECO hydrogen analyzer. This process differs from the Gumball test since it determines pellet hydrogen during the pellet manufacturing phase (after grinding but prior to fuel rod loading). Based on the inspection team's review of the Gumball test, the team concluded that the test, performed up through 1996, was adequate as an overcheck to determine additional moisture introduced during the off-gas process.

4 ENTRANCE AND EXIT MEETINGS

During the entrance meeting on September 7, 1999, the inspection team met with members of GE-NE management and staff and discussed the scope of the inspection. The team also reviewed its responsibilities for handling proprietary information as well as those of GE-NE. In addition, the team established contact persons within the management and staff of the applicable GE-NE organizations and discussed the results of the inspection with management and staff on September 10, 1999.

PARTIAL LIST OF PERSONS CONTACTED

C. Reda	Manager, GE-NE Quality
A. Moneta	Manager, GE-NE E'S
B. Fuller	Manager, Fuel & Chemet Lab Quality
R. Mack	Manager, PMQC/SCQC
S. Murray	Manager, Regulatory Compliance
W. Baker	Nuclear Quality Assurance
J. Ball	Team Leader/Lead Chemist
R. Bianchi	Senior Engineer
R. Hudson	Laboratory Analyst

ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Type</u>	<u>Description</u>
<u>Opened</u>		
99900003/1999202-01	NON	GE-NE audit of JMS Southeast, Inc., did not adequately demonstrate that their quality assurance program complied with the requirements of 10 CFR Part 21. This item was previously identified as URI 99900003/1999201-02.
<u>Closed</u>		
99900003/1999201-01	NOV	Failure to identify and evaluate a potential deviation related to the lack of calibration of the LECO hydrogen analyzer.
99900003/1999201-02	URI	GE-NE could not produce documentation to support the resolution of three open CARs identified during GE-NE's March 26, 1997, audit of JMS Southeast, Inc. This issue has been identified as Nonconformance 99900003/1999202-01.