



## PG&E PROCUREMENT QUALITY ASSURANCE

### SCIENTIFIC ECOLOGY GROUP

### SUPPLIER IMPLEMENTATION AND QUALIFICATION AUDIT 92050S

Dates: March 24-27, 1992

Conducted by: Jeffrey G. Ryan - PG&E  
David L. Glivinski - Portland General Electric  
Allan R. Barker - American Electric Power  
Hoda S. Elguindy - Commonwealth Edison

cc: (without AFR attachments)

RCAnderson/NECS A1411/333 Market  
WDBarkhuff/QC-DCPP/104/3/303  
BADettman/NPG/1453/77 Beale  
RGDomer/Engg/F1780/1 Calif.  
ELRussell/NSARA/A1110/333 Market  
JBHoch/A1113/333 Market  
RTNelson/NPG-HBPP/Buhne Point  
JASexton/QA/F1864/1 Calif.  
LFWomack/NOS/1485/77 Beale  
JCYoung/QA/F1876/1 Calif.

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Attachment: AFR 92-019  
AFR 92-020  
AFR 92-021  
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AFR 92-023  
AFR 92-024

PACIFIC GAS AND ELECTRIC COMPANY  
QUALITY ASSURANCE DEPARTMENT

Title: Supplier Quality Assurance Program  
Implementation and Qualification  
Audit 92050S

Audited Organization/  
Facility: Scientific Ecology Group, Inc. (SEG)  
1560 Bear Creek Rd./Gallagher Rd.  
Oak Ridge, TN 37831-2530  
(615) 376-3147

Product or Service: On-Site Radwaste Processing, Packaging,  
Transportation, Volume Reduction, and  
Decontamination

Auditors: Jeffrey G. Ryan - PG&E (Audit Team Leader)  
David L. Glivinski - Portland General Electric  
(Auditor)  
Allan R. Barker - American Electric Power  
(Auditor)  
Hoda S. Elguindy - Commonwealth Edison  
(Technical Specialist)

Dates Performed: March 24-27, 1992

## 1.0 SCOPE

The audit was conducted on behalf of PG&E and the Nuclear Utilities Procurement Issues Council (NUPIC) to determine if SEG's quality assurance (QA) program was adequate to provide the following radwaste services: On-site Processing (dewatering, demineralization, and solidification); Packaging; Transportation; Volume Reduction (incineration, compaction, and resin drying); and Decontamination. The audit was performed to NUPIC Audit Checklist, Revision 2, the criteria of which meet the applicable QA requirements of 10CFR71/Subpart H, 10CFR50/Appendix B, 10CFR21, and Regulatory Guide 1.143. In addition, this checklist was supplemented to meet the requirements of PG&E Supplier Specification FC-B-Radwaste Solidification, Revision 1 and Procurement Category 15, "Packaging for Radioactive Material," in order to meet PG&E's specific supplier qualification needs.

## 2.0 OVERVIEW

SEG is a wholly-owned subsidiary of Westinghouse Electric Corporation, maintains an independent QA program, and currently has over 700 employees. A significant part of SEG's capabilities came from acquisitions (designs, assets, and procedures) from Westinghouse Radiological Services, Hittman Nuclear and LN Technologies. They have two facilities in Oak Ridge. The Central Volume Reduction Facility (radwaste receiving, sorting, compaction, incineration, and shipping) is located at the Bear Creek Road plant. All other activities (cask maintenance, equipment services, container refurbishment and fabrication, engineering, quality assurance, and document control) take place at the

Gallaher Road facility. SEG markets additional radwaste products and services beyond the scope of this qualification, and they are currently completing construction on an induction furnace Metal Processing Facility.

### 3.0 PERSONS CONTACTED

+ H. W. "Bud" Arrowsmith	President
+* Dale Hedges	Director, Quality Assurance
+* Marsha Wilson	Supervisor, Health Physics
Peter F. Keegan	Vice President, Project Management
+* James F. Morrison	CPA, Financial Manager
+* John E. Hess	Analytical & Technical Services Manager
+* Steven Norris	Deputy Radiation Safety Officer
+* B. S. (Pete) Mays	Manager Gallaher Operations, Field Services Equipment
+ Joe J. Albenze	Vice President, Human Resources/ Administration
+* George Quinn	Production Manager
* Jay Pride	Executive Vice President
+* R. Mike McCauley	Radwaste Operations Manager
+* Paula Yarborough	Manager, Document Control
William F. Clarke	Equipment Services Specialist
+* Laticia Hodges	QA Engineer
+* Bryan Roy	Manager, Engineering
+ Timothy R. Ramsey	Senior Engineer
+* Steven Sugarman	H.P. Supervisor
* Andy Ross	QA Engineer
* Larry Harris	QA Engineer
* Patricia Walsh	Manager, Incineration Program
* Bill Horsey	Manager, Field Operations
* Roger Betow	Equipment Supervisor
Teresa Bell	Supervisor of Data Systems
Mitch Parker	HP Shipping Technician
Sue Nelson	Central Stores and Receiving
Fred Wicker	Container Supervisor
Scott Thurman	Container Technician

- + Attended preaudit conference on March 24, 1992
- \* Attended postaudit conference on March 27, 1992

### 4.0 AUDIT RESULTS

#### 4.1 Adequacy of Written Quality Program

SEG's Quality Assurance Program, Revision 3, as amended by DCN 92-065, and applicable lower-tier procedures were reviewed for compliance with 10CFR71/Subpart H, 10CFR50/Appendix B, 10CFR21, and Regulatory Guide 1.143 as they apply to SEG's operations. The audit team found that SEG's written program satisfactorily meets applicable regulatory requirements with no deficiencies identified.

One observation was made in the following area: SEG recently changed the method of defining which quality requirements apply generally (to all of their waste processing activities), and which requirements apply only to "NRC-related activities" (see DCN 92-065, issued to controlled QA Program holders). However, certain

terminology used throughout the QA program and procedures, such as "quality-related," and "safety-related and affecting" are not specifically defined (as being distinct from "NRC-related"). Despite this, the audit team concluded that SEG personnel in all areas audited were aware of the QA requirements which apply to their activities and were well-trained in their responsibilities pertaining to them. It was recommended during the exit conference that SEG review all terminology used to establish the quality requirements being applied to their operations, and clarify their intent and usage, as appropriate.

The following specific comments pertain to regulatory requirements applied to SEG operations:

- 4.1.1 The NRC has approved SEG's program for applicable 10CFR71/ Subpart H transportation package activities (Approval 0496, Revision 5).
- 4.1.2 Although SEG's QA program meets 10CFR50/Appendix B, there is no regulatory requirement invoking Appendix B on any of SEG's operations, and no customer purchase order reviewed invoked it. SEG stated that they treat the containment boundary components of shipping casks as nuclear safety-related. These components are identified in the cask safety analysis reports, and the audit team treated these items (from a procurement, dedication, and control standpoint) as nuclear safety-related.
- 4.1.3 Regulatory Guide 1.143 applies to on-site radwaste processing systems operated by SEG. The QA requirements of Section 6 of Regulatory Guide 1.143 are satisfactorily covered by SEG's program.
- 4.1.4 The most specific regulatory position found on QA requirements for High Integrity Containers (HICs) is the NRC's "Technical Position on Waste Form," Revision 1, January 1991 (9101280097 90118, PDR WASTE, WM-3). The QA requirements for HICs (described in Section 4.n of this document) are satisfactorily met by SEG's documented QA program.
- 4.1.5 Activities at the Central Volume Reduction Facility (CVRF) are governed by State of Tennessee and EPA requirements and certain radioactive package transportation activities are subject to 49CFR and DOT regulations.

#### 4.2 Implementation of Quality Program

The implementation of SEG's QA program was audited for compliance with the applicable requirements of their QA manual and procedures and NUPIC Audit Checklist, Revision 2. The objective evidence reviewed during the audit is described in the corresponding audit checklist. Implementation of the QA program was in compliance except for deficiencies described below and documented on the six Audit Finding Reports (AFRs) issued with this report.

#### 4.3 Audit Summary

The audit summary is structured in accordance with the NUPIC Audit Checklist categories.

##### 4.3.1 Section I - Order Entry

SEG's documentation of a client's waste activity values for an arriving shipment was verified to be correct, with one discrepancy in the 65 values recorded. SEG Data Systems personnel took immediate and appropriate corrective actions to determine the correct value. The audit Technical Specialist concurred with SEG that the error did not affect the waste classification. No deficiencies were identified in this area.

##### 4.3.2 Section II - Design Control

One cask safety analysis report and one HIC topical report was reviewed. All cask design changes had been appropriately submitted to and accepted by the NRC, and the certification drawings reflect these changes. There is very limited design and design change activity proceeding at this time. Two deficiencies regarding the implementation of SEG's commercial grade item evaluation program were identified and documented on AFR 92-021. These deficiencies are not considered by the Audit Team Leader to constitute significant conditions adverse to quality.

##### 4.3.3 Section III - Software Quality Assurance

SEG does not currently utilize any engineering software for design, analysis, or testing.

##### 4.3.4 Section IV - Procurement

Procurement of items to be used in safety-related applications (cask containment boundary components) was found to be satisfactory with the exception of the qualification of a bolting material supplier, documented on AFR 92-020. Because the bolting supplier is widely used and audited by the nuclear industry, the material itself is not in question. Procurement and source inspection records for the 1990 fabrication of two shipping casks was found to be acceptable. Procurement controls for nonsafety-related items also appears to be adequate.

##### 4.3.5 Section V - Material Control

The audit team witnessed radiation surveys and inspections of incoming waste shipments, compared information to customer manifests and tracked the assignment of "parent" and "daughter" bar codes throughout processing at the Central Volume Reduction Facility. Identification of containers, container internal parts and replacement cask parts was also reviewed. There were no deficiencies in these areas.



#### 4.3.6 Section VI - Fabrication/Assembly/Special Processes

The Liner Fabrication Area (Building 4) and Equipment Services Area and Cask Maintenance Areas (Building 3) were toured. With the exception of cask maintenance operations (which was found to meet all requirements), uncontrolled or unapproved procedures were noted in both areas. It was also learned that there is no QA or QC oversight (either inspections, surveillances, or internal audits) in either area. Neither of these operations is governed by 10CFR71, Subpart H, but both fall under the general requirements of SEG's QA program. See AFR 92-019 which documents these deficiencies. The audit indicated that these deficiencies have not impacted SEG services. The procedures in use appeared both comprehensive and current. Supervisory and shop personnel interviewed were knowledgeable of their job functions, and all documentation reviewed appeared to be correctly prepared and approved by plant supervision.

#### 4.3.7 Section VII - Tests and Inspections

The audit team witnessed the loading and inspection of a Radlok container into a cask/trailer for release, reviewed the associated cask maintenance inspection records, and witnessed the leak test of a refurbished Resin Express container. (Deficiencies associated with this area have been identified previously.) One observation was made pertaining to torquing calculations. Procedure WM-014, Revision L, "Operating Instructions for Loading and Unloading the LN 14-170 Series 1 Casks" requires that primary lid torque calculations be performed. For this calculation, the individual must measure the distance (in inches) from the torque wrench driver stud to the end of the wrench handle. This measurement introduces a variable into the calculation which can change based on the accuracy of this measurement. It is recommended that SEG measure each wrench and permanently record this on the wrench itself. Additionally, this data could be incorporated into the procedure by calculating the torque values for each specific wrench.

Note: There were no calculation errors noted for the cask release inspection witnessed.

#### 4.3.8 Section VIII - Handling, Storage, and Shipping

The audit team reviewed overpack shipment bracing and various material, container and spare parts in Buildings 3, 4, and 6. No deficiencies were noted in these areas. One potential personnel safety concern has been brought to SEG's attention. Operation of the lift trucks at the Bear Creek facility is conducted in a relatively small area, and several trucks may be operating at one time. The trucks are not equipped with back-up buzzers or lights, and the noise level in the plant is high enough that truck movement may not be heard by plant personnel in the immediate vicinity.

4.3.9 Section IX - Calibration

Calibration controls for survey meters, pulse generators, multimeters, torque wrenches, pressure gages, and durometers were reviewed. All were found acceptable with the exception of durometers, as documented on AFR 92-024. The frequent field checks of the durometer to test blocks, however, show that the readings are stable over time, so no significant impact due to this deficiency is anticipated.

4.3.10 Section X - Document Control/Procedure Adequacy

One minor document control deficiency concerning the filing of Document Change Notices (DCNs) was identified. See AFR 92-022. Otherwise, document controls and procedures were considered well-administered.

4.3.11 Section XI - Program Compliance

The following QA program areas were reviewed: Organization structure, audits, management assessments, personnel training records and certifications, nonconformance and corrective action reports, 10CFR71 program, and records identification, retention, and storage. AFR 92-019, regarding QA oversight in certain areas, and described under Section VI above, is also noted under the "internal audit" question. AFR 92-023 was written in the area of Corrective Action Reports (CARs). Because there is no CAR form requiring specific documentation, it is not clear that CARs involving significant conditions adverse to quality are having root cause evaluations and corrective actions to prevent recurrence performed. SEG has been requested to review their files to assure that appropriate evaluations were performed for such CARs. The audit team reviewed 1990 and 1991 CARs and did not feel that any of these issues would be cause for immediate concern by SEG clients. One final observation was made regarding the QA Manager's report to the President on the effectiveness of the QA program. Rather than relying solely on the results of the annual QA program audit for this assessment, other indicators of the program's effectiveness should be considered. These would include nonconformance reports, corrective action reports, customer-identified problems, and internal, utility, and NRC audit results. Overall, the QA program areas were considered satisfactory.

4.3.12 Attachments to the Audit Checklist

A variety of supplemental information is attached to the audit checklist, which is distributed to NUPIC member utilities. Attachments include:

- Information provided in response to requests from Northern States Power, Detroit Edison, Portland General Electric, and Commonwealth Edison.



- Follow-up information on corrective actions taken by SEG in response to the previous NUPIC audit (conducted in 1990 by Union Electric), and a 1991 NRC Inspection. Corrective actions (for both closed and pending issues) were found to be acceptable.

#### 4.4 Audit Findings

The attached AFRs were issued to describe the deficiencies identified in SEG's QA program. The findings are listed below:

- 4.4.1 There is insufficient objective evidence that QA/QC is fulfilling its QA program responsibilities to oversee Liner Fabrication and Equipment Services (exclusive of cask maintenance) activities. There is no direct QC inspection and these areas have not been subject to QA internal audits or surveillances. The following unapproved/uncontrolled procedures were noted in these areas: STD-P-03-055, Revision 0, "Installation of Press Pack Dewatering Internals in Radloks" (Liner Fabrication Area); STD-P-03-053, Draft Revision 1, "Resin Express Container Inspection and Refurbishment Procedure (Container Refurbishment Area); SS-007, Revision G, "Preshipment Check Procedure for LN Radwaste Solidification Systems" (Equipment Services Area).
- 4.4.2 Purchase Order Q13141 to Hub Inc. ordered ASTM bolting material whose application could be safety-related (ratchet binder fastener). However, the Westinghouse audit used as the basis for qualifying Hub (conducted July 31, 1990) was for their NCA-3800 (QSC) program, not Hub's ASTM program.
- 4.4.3 The following deficiencies were noted in the SEG commercial grade item dedication program:
  - There is no Commercial Grade Evaluation on file for HN 190-2 ratchet binders bought under Hittman Purchase Order 41320 to W. W. Patterson Company. This purchase order did not invoke 10CFR50 Appendix B or 10CFR21, and there is no evaluation of W. W. Patterson's quality assurance program on file at SEG.
  - Commercial Grade Evaluations for gaskets identify material as a critical characteristic, but there is insufficient basis for dedication of material. SEG performs audits (technically, commercial grade surveys) of their gasket supplier, Knoxville Rubber & Gasket, but since Knoxville does not control the material composition (they buy it in bulk, commercially), this audit does not constitute acceptable dedication. Reference Purchase Order 13634, June 5, 1991, for primary lid gaske (Dwg STD-02-091, Revision 0) and associated Commercial Grade Evaluation.
- 4.4 Contrary to procedure requirements and as contained in Procedure QA-6.1, paragraph 8.5.3, Document Change Notices (DCNs) are not being filed with the applicable drawing. This practice has apparently been discontinued because DCNs have been detached and lost.

4.4.5 SEG has developed program and procedure controls to require documentation of significant conditions adverse to quality. However, the governing procedure does not make reference to a standard corrective action request (CAR) form and, as a result, it is not clear that root cause and corrective actions to prevent recurrence are determined for those CARs that represent significant conditions adverse to quality. In addition, contrary to procedure requirements, SEG is not documenting their 10CFR21 reportability determinations for CARs issued.

4.4.6 SEG Procedure QA 12.1, Revision 2, Enclosure 3.1, establishes recall frequency for measuring and test equipment in the calibration program. Durometers (used for hardness testing for commercial grade dedication of gaskets) are specified to be calibrated to a test block every 12 months. Durometer S/N 12041 was reviewed, and the associated test block (not traceable to NIST), was found to provide a functional check of indenter extension at one point (58 Shore A). ASTM D2240, "Standard Test Method for Rubber Property - Durometer Hardness," defines other variables which influence instrument accuracy (wear on indenter and calibration of spring at a range of values), and recommends a calibration procedure with specific test apparatus and acceptance criteria. Therefore, SEG's current durometer calibration requirements are considered unacceptable.

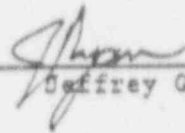
## 5.0 EFFECTIVENESS EVALUATION

The auditors determined that, except in the areas identified, SEG's QA program was adequate to provide compliance with the NUPIC Audit Checklist requirements (as described in Section 1.0) for the scope of work reviewed. The auditors determined that the findings did not have a discernible adverse impact on the quality of the radwaste services provided by SEG.

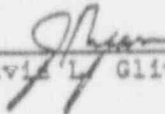
## 6.0 REFERENCES

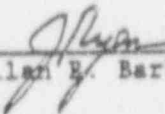
- 6.1 10CFR50, Appendix B
- 6.2 10CFR71, Subpart E
- 6.3 Regulatory Guide 1.143
- 6.4 ANSI N45.2-1971
- 6.5 PG&E Procurement Matrix dated October 17, 1991
- 6.6 PG&E Generic Supplier QA Program Requirements dated June 19, 1991
- 6.7 Scientific Ecology Group Quality Assurance Manual, Revision 3 (as amended by DCN 92-065)
- 6.8 PG&E Quality Assurance Manual for Nuclear Power Plants - Diablo Canyon Power Plant, Revision 28, March 3, 1992
- 6.9 10CFR21

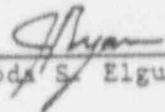
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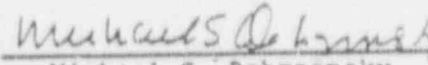
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Senior Supervisor

Attachment: AFR 92-019  
AFR 92-020  
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