

U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
OFFICE OF QUALITY ASSURANCE

AUDIT REPORT

OF

LAWRENCE LIVERMORE NATIONAL LABORATORY

LIVERMORE, CALIFORNIA

AUDIT YMP-93-14

JULY 19 - 23, 1993

Prepared by: Richard L. Weeks Date: 8/24/93  
Richard L. Weeks  
Audit Team Leader  
Yucca Mountain Quality Assurance Division

Approved by: Donald G. Horton Date: 9/8/93  
Donald G. Horton  
Director  
Office of Quality Assurance

9309150225 930909  
PDR WASTE  
WM-11 PDR

ENCLOSURE

## **1.0 EXECUTIVE SUMMARY**

As a result of Quality Assurance (QA) Audit YMP-93-14, the audit team determined that Lawrence Livermore National Laboratory (LLNL) is satisfactorily implementing an effective QA program in accordance with the LLNL Quality Assurance Program Plan (QAPP), and implementing procedures for QA Program Elements 3.0, 4.0, 7.0, 8.0, and 13.0. Satisfactory implementation could not be determined for QA Program Elements 15.0 and the Software Quality Assurance area of QA Program Element 3.0, as there was either no implementation, or insufficient implementation to permit evaluation for the period audited. Additionally, an evaluation of procurement documentation resulted in the issuance of a Corrective Action Request (CAR) in the area of QA Program Element 18, Audits; however, there was no attempt to determine satisfactory implementation of this QA program element in its entirety as it was outside the scope of this audit.

The audit team identified one deficiency during the audit that resulted in the issuance of a CAR. CAR YM-93-085 addressed the fact that an annual evaluation of subcontractors was not conducted. Five deficient conditions were identified and subsequently corrected prior to the Post-Audit meeting. These conditions are described in Section 5.5.2 of this report. Five recommendations resulting from the audit were made and are described in Section 6.0 of this report.

## **2.0 SCOPE**

The audit was conducted to evaluate compliance to, and the effectiveness of, the LLNL QA Program as described in the LLNL QAPP, Software Quality Assurance Plan and implementing procedures.

The QA program elements/requirements evaluated during the audit are in accordance with the published audit plan and are as follows:

### QA Program Elements/Requirements

- 3.0 Scientific Investigation Control
- 4.0 Procurement Document Control
- 7.0 Control of Purchased Items
- 8.0 Identification and Control of Items, Samples and Data
- 13.0 Handling, Storage and Shipping
- 15.0 Nonconforming Items

QA Program Elements 19.0, Software Quality Assurance and 20.0, Scientific Investigation Control, are addressed within QA Program Element 3.0.

QA Program Element 17.0, Quality Assurance Records, was evaluated for compliance to a specific requirement referenced in LLNL procedure 033-YMP-QP 8.0. There was no attempt to determine satisfactory implementation of this QA program element in its entirety.

QA Program Element 18.0, Audits, was evaluated only to the extent necessary to verify compliance to specific requirements described in, and applicable to, procurement documentation. There was no attempt to determine satisfactory implementation of this QA program element in its entirety.

The following QA program elements/requirements were not evaluated during the audit because they are currently not applicable to the LLNL QA Program.

- 10.0 Inspection
- 11.0 Test Control
- 14.0 Inspection Test and Operating Status

#### TECHNICAL AREAS EXAMINED

##### Work Breakdown Structure (WBS) Elements

###### WBS 1.2.2.3.1.1

Activities: D-20-53a Flow-Through Dissolution Tests on Uranium Oxide (UO<sub>2</sub>)  
D-20-53b Flow-Through Dissolution Tests on Spent Fuel  
D-20-45 Low-Temperature Oven Method for Spent Fuel Oxidation  
Testing

###### WBS 1.2.2.3.1.2

Activity: D-20-27 Unsaturated Testing of West Valley Demonstration Plant  
(WVDP) and Defense Waste Processing Facility (DWPF)  
Glass

### 3.0 AUDIT TEAM AND OBSERVERS

The following is a list of audit team members, their assigned areas of responsibility, and observers:

Individual

QA Program  
Element/Requirement

**AUDITORS:**

Richard L. Weeks, Audit Team Leader (ATL), Yucca Mountain Quality Assurance Division (YMQAD)	
Kenneth T. McFall, Auditor, Lead Technical Specialist, YMQAD	3.0/20.0
Mario R. Diaz, Auditor, YMQAD	8.0, 13.0, 15.0
Thomas J. Higgins, Auditor, YMQAD	3.0/19.0
John E. Therien, Auditor, YMQAD	4.0, 7.0
David Stahl, Technical Specialist, Management and Operating (M&O) Contractor	WBS 1.2.2.3.1.1 and WBS 1.2.2.3.1.2
John K. McCoy, Technical Specialist, M&O	Same as above

**OBSERVERS:**

Jack Spraul, Observer, U.S. Nuclear Regulatory Commission (NRC)  
Tae M. Ahn, Observer, NRC  
Robert D. Brient, Observer, NRC/Center for Nuclear Waste Regulatory Analyses  
(CNWRA)  
Rodney M. Weber, Observer, NRC/CNWRA

**4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED**

The Pre-audit meeting was held at LLNL offices in Livermore, California, on July 19, 1993. A daily debriefing and coordination meeting was held with LLNL management and staff, and daily audit team meetings were held to discuss issues and potential deficiencies. The audit was concluded with a Post-audit meeting held at the LLNL office in Livermore, California, on July 23, 1993. A list of personnel contacted during the audit, including those who attended the Pre- and Post-audit meetings are shown in Attachment 1 to this report.

**5.0 SUMMARY OF AUDIT RESULTS**

**5.1 Program Effectiveness**

The audit team concluded that, in general, the LLNL QA Program was being fully implemented and is considered to be satisfactory. Compliance evaluation was not performed for QA Program Element 15.0, Nonconforming Items, since no implementation has occurred. Due to insufficient implementation for

formal evaluation, QA Program Element 19.0, Software Quality Assurance, retains the designation of unsatisfactory until effective implementation is demonstrated. In addition, five recommendations are presented to the auditee for consideration.

**5.2 Stop Work or Immediate Corrective Actions or Additional Actions**

None

**5.3 QA Program Audit Activities**

Details of the QA program audit activities are provided in Attachment 2. A list of the objective evidence reviewed during the audit is provided in Attachment 3.

**5.4 Technical Activities**

The four activities below were covered by the technical evaluation under WBS 1.2.2.3.1.1 and WBS 1.2.2.3.1.2.

**WBS Element 1.2.2.3.1.1**

- D-20-53a Flow-Through Dissolution Tests on UO<sub>2</sub>
- D-20-53b Flow-Through Dissolution Tests on Spent Fuel
- D-20-45 Low-Temperature Oven Method for Spent-Fuel Oxidation Testing

**WBS Element 1.2.2.3.1.2**

- D-20-27 Unsaturated Testing of WVDP and DWPF Glass

The UO<sub>2</sub> tests are being conducted at LLNL. The spent fuel tests and glass tests are being conducted at Pacific Northwest Laboratory (PNL) and Argonne National Laboratory (ANL), respectively.

The audit team considers that LLNL technical staff had implemented and was applying adequate controls for the technical areas evaluated during the audit.

**5.5 Summary of Deficiencies**

The audit team identified one deficiency during the audit for which a CAR has been issued. Five additional deficiencies were identified and corrected prior to the post-audit meeting.

A synopsis of the deficiency documented as a CAR and those corrected during the audit is detailed below. An information copy of the CAR is included in Attachment 4.

#### **5.5.1 Corrective Action Request (CAR)**

As a result of the audit, the following CAR was issued:

##### **CAR YM-93-085**

033-YMP-QP 18.0, Revision 5, requires annual evaluations of subcontractors that are audited on a triennial basis. Annual evaluations had not been conducted of PNL or ANL on an annual basis, for the period September 19, 1991 to present, and September 26, 1991 to present, respectively.

#### **5.5.2 Deficiencies Corrected During the Audit**

Deficiencies which are considered isolated in nature and only requiring remedial action can be corrected during the audit. The following deficiencies were identified and corrected during the audit:

1. 033-YMP-QP 8.0, Revision 1, Paragraph 8.0.4.2 states in part, "These controls define the responsibilities (including interfaces between organizations) for documenting and tracking sample possession from sample collection and identification through handling, preservation, shipment, transfer, analysis, storage and final use.... When samples are no longer needed for scientific investigations, they are archived in accordance with a TIP...."

Paragraph 8.0.4.2.4 states in part, "Storage methods are developed and implemented to assure that samples are maintained in predetermined physical conditions commensurate with their intended purpose...."

Paragraph 8.0.4.2.6 states in part, "A record is kept of all locations and types of environments of the sample identifiers,...."

Paragraph 8.0.4.2.7 states, "If samples have a limited use or a maximum life expectancy while in storage, methods shall be established to preclude using the samples beyond their intended use of storage life. Controls are developed and implemented to assure that the identifiers specify the use limitations or the maximum life expectancy. A record of the identifiers is maintained."

Contrary to these requirements, location of samples and storage requirements were not specified for samples used for the experiment, Dissolution Test on Uranium Oxide. This deficiency was corrected when required information, addressing the aforementioned requirements, was recorded in the Principal Investigator's (PI's) Scientific Notebook (SN) No. 155, Page 86, of the Chemistry and Materials Science Department, prior to the Post-audit meeting.

2. TIP-YM-11, Revision 0, Section 6.2 states, "Each software project will have a Master File Folder. This folder contains an index to all project File Folders, the project ISP and the Software Category Form...." Contrary to this requirement, the Master File Folder for V-TOUGH, Revision 5.2 did not contain either the Individual Software Plan (ISP) or Software Category Form. A member of the audit team verified that the missing documents were located and added to the Master File Folder.
3. TIP-YM-11, Revision 0, Section 5.0 states, "When an item is added to the SCMS, it will be assigned a unique identifier by the Software Quality Technician (SQT). These identifiers will be used to track releases, versions/revisions, etc. Each identifier is made up of four required parts: software package, release number, item type, and version/revision. Optionally, a module name can be appended to the item type. Identifier format is as follows:

- PACKAGE-RELEASE#-TYPE[.model]VERSION/REVISION"

Contrary to the requirements set forth in the procedure, the configuration identifiers for VTOUGH and EQ3/6, software modules, as viewed on the computer screen and on hardcopy printouts, were incomplete in information content and did not follow the specified format. The SQT responsible for these codes provided evidence that appropriate remedial action had been completed during the audit.

4. 033-YMP-QP 17.0, Revision 5, Paragraph 17.0.5.3, states in part, "Records transmittals received by the Local Records Center are inspected to assure they are legible, identifiable, complete (in accordance with pagination and table of contents),...." Contrary to this requirement, QA records packages related to samples for the experiment, Dissolution Test on Uranium Oxide, were not paginated. Change Notice 17.0-5-1 which deleted the requirement for pagination, was approved on July 22, 1993.
5. TIP-GM-12, Revision 0, Section 3.4.1 states, "The TAL reviews Change Requests prior to authorization by the Thermodynamic Database Task Leader (TL)." Contrary to this requirement, a change to the Thermodynamic Database was made without the Technical Area Leader's (TAL's) authorization. Prior to the Post-audit meeting, the audit team was presented with objective evidence that this review had been performed.

## 6.0 RECOMMENDATIONS

The following recommendations resulted from the audit and are presented for consideration by the LLNL management:

1. It is recommended that LLNL conduct composition over checks on gases provided by the cylinder supplier. This should be performed at least annually to insure that the gas composition is as specified. Other methods, such as vendor qualification, should be considered.
2. It is recommended that LLNL delete completion dates from Activity Plans and other supporting documents when they are modified.
3. LLNL requires that after one year from the recording of data in a Scientific Notebook, copies of this data be submitted to the Local Records Center (LRC).

It is recommended that LLNL institute a method to insure timely submittal of data that has met the one year anniversary.

4. It is recommended that LLNL develop a method to paginate QA records packages containing technical data or technical work in which it is not obvious what order the pages occur, such as pages of numerical data. In addition, the different sections of each package need to be described in the table of contents of the transmittal form.

5. It is recommended that LLNL make full use of the Sun Configuration Control System (SCCS) found on its UNIX-based SPARC Work-station to meet the software QA requirements for configuration item identification and control.

## **7.0 LIST OF ATTACHMENTS**

- |                      |   |
|----------------------|---|
| <b>Attachment 1:</b> | <b>Personnel Contacted During the Audit</b>                 |
| <b>Attachment 2:</b> | <b>Audit Details</b>  |
| <b>Attachment 3:</b> | <b>List of Objective Evidence Reviewed During the Audit</b> |
| <b>Attachment 4:</b> | <b>Information Copy of CAR YM-93-085</b>                    |

ATTACHMENT 1

PERSONNEL CONTACTED DURING THE AUDIT

<u>Name</u>	<u>Organization/Title</u>	<u>Preaudit Meeting</u>	<u>Contacted During Audit Meeting</u>	<u>Postaudit Meeting</u>
Ahn, T.	Observer (NRC)	X		
Alegre B.	Records Clerk (LLNL/KMI)	X	X	
Bourcier, W.	Task Leader (LLNL)	X		X
Blink, J.	Deputy Project Leader (LLNL)	X	X	X
Brient, R.	Observer (NRC/CNWRA)	X		X
Bryan, B.	Project Administrator (LLNL)		X	X
Chou, C.K.	Deputy Associate Director (LLNL)	X		X
Clark, J.	Administrative Specialist (LLNL)	X		X
Clarke, W.	TPO (LLNL)	X	X	X
Comstock, P.	Resource Manager (LLNL)	X	X	X
Daveler, S.	SQT and LSE (LLNL)		X	
Diaz, M.	Auditor (YMQAD)	X		X
Glasse, W.	Task Leader (LLNL)	X		
Halsey, W.	Technical Area Leader (LLNL)	X	X	X
Hamati, R.	QA Engineer (LLNL)	X	X	X
Higgins, T.	Auditor (YMQAD)	X		X
Kishi, T.	Software Engineer (LLNL)		X	
Lewis, L.	Software Quality Technician (LLNL)		X	
Lewis, M.	Project Secretary (LLNL)	X		
McCright, R.	Technical Area Leader (LLNL)			X
McFall, K.	Lead Technical Specialist (YMQAD)	X		X
McCoy, J.	Technical Specialist (M&O/BWFC)	X		
Monks, R.	QA Manager (LLNL)	X	X	X
Podobnik, J.	Resource Planning and Control Manager (LLNL)	X	X	X
Quinn, T.	LSE (LLNL)		X	
Revelli, M.	Technical Staff (LLNL)	X	X	X
Sippel, J.	Training Coordinator/Records Manager (LLNL)		X	
Spraul, J.	Observer (NRC)	X		X
Stahl, D.	Technical Specialist (M&O/BWFC)	X		X
Steward, S.	Task Leader (LLNL)	X	X	X
Stout, R.	Technical Area Leader (LLNL)	X	X	X
Therien, J.	Auditor (YMQAD)			X

**PERSONNEL CONTACTED DURING THE AUDIT**

continued

<u>Name</u>	<u>Organization/Title</u>	<u>Preaudit Meeting</u>	<u>Contacted During Audit</u>	<u>Postaudit Meeting</u>
Weber, R.	Observer (NRC/CNWRA)	X		
Weed, H.	Chemist (LLNL)	X	X	X
Weeks, R.	ATL (YMQAD)	X	X	
Wilder, D.	Technical Area Leader (LLNL)	X	X	X
Wolery, T.	Geochemist/PI (LLNL)	X	X	X

Legend:

BWFC - Babcock and Wilcox Fuel Company  
KMI - Kirk Meyer, Inc.  
TPO - Technical Project Officer  
LSE - Lead Software Engineer

## ATTACHMENT 2

### AUDIT DETAILS

The following is a summary of the YMP QA Program activities covered during the audit. The list of objective evidence reviewed and specific procedures audited is provided in Attachment 3.

#### **3.0 SCIENTIFIC INVESTIGATION CONTROL**

##### **Scientific Investigations:**

The evaluation of this QA program element was based on interviews with LLNL personnel and review of objective evidence to determine the degree of compliance with selected requirements taken from the QAPP Quality Procedures (QPs) 2.8, 3.0, 3.3, and 3.4, and applicable Change Notices. The specific requirements selected for evaluation of compliance and effectiveness are listed below.

##### **Quality Assurance Grading, (QP-2.8)**

##### **Requirements:**

- Each individual technical activity must be graded. Subordinate parts of these graded activities may be graded separately.
- New technical activities must be graded prior to the start of work.
- QA grading is documented by the TL on forms such as those shown in Exhibits B, C, and D. (If another format is used to document the process, all information on the sample exhibits must be addressed.)
- Application of the following list of characteristics illuminates the issues. Documentation of this process is done using Exhibit C, and this documentation is mandatory.
  - Reproducibility or Replacement
  - Complexity
  - Quality History
  - Standardization
  - Available codes and Standards
  - Need for process control
  - Special Handling, Shipping, or Storage

- QA Grading Review is accomplished by the appropriate TAL, the Project Leader (PL) or designee, and the Quality Assurance Manager (QAM). If the TL and TAL are the same person, QA Grading Review is accomplished by the PL or designee, and the QAM.
- After the QA Grading Review has been completed, all necessary documentation is collected in a documentation package. The PL or designee is responsible for assembling the documentation. Once all documentation is in final form, the QA Grading Reviewers sign and date Exhibit A.
- Any changes to QA grading are handled through the same process used to perform the original grading.
- QA records include Exhibits A through D with attachments.

**Scientific Investigation Control. (OP-3.0)**

**Requirements:**

- Before work begins (i.e. before data is generated, analysis is performed or conclusions are reached), the work is planned, reviewed and approved by preparation of one or more of the following work planning documents:
  - Scientific Investigation Plans (SIP)
  - Study Plans (for Site Characterization activities)
  - Activity Plans
- All quality-affecting activities subject to the QA grading process are identified in the SIP.
- The intent to use SNs and the purpose for their use is identified in the SIP.
- The SN will be used to record data, information, analysis, and work progress on a daily, or as appropriate, basis.
- The extent of documentation of the SN is such that another qualified scientist can use the SN to retrace the investigation and confirm the results or repeat the experiment without recourse to the original investigator.
- The PI/TL will identify the hold points in the Activity Plan.
- Waiver of a specified hold point is approved by the QAM and documented before work can proceed beyond the designated hold point.

- The method for transmittal of information or items across interfaces, including samples of natural and man-made materials, is documented.
- Results of activities are documented in sufficient detail regarding purpose, method, assumptions, input, references, and units for a technically qualified person to review, understand, and verify the analysis without recourse to the originator. These documents shall be legible and in a form suitable for reproduction, filing, and retrieval. Calculations shall be identifiable by subject, originator, reviewer and date.

Documentation of interpretation/analysis includes the following:

- Summary of results.
- Definition of the objective of the interpretation/analysis.
- Discussion of whether the work's objectives as outlined in the planning document(s) were achieved.
- Definition of input and their sources.
- A listing of applicable references.
- Results of literature searches or other background data.
- Statement of assumptions.
- Identification of any computer calculations, including computer type, program name, revision, input, output, evidence of program verification, and the basis of application to the specific problem.
- Signatures and dates of review and approval by appropriate personnel.

**Review of Technical Publications and Data, (OP-3.3)**

**Requirements:**

- When draft reports are ready for publication, they must be submitted to a formal, controlled, and thoroughly traceable review process.

- One technical reviewer must be independent of technical efforts that resulted in the report. A peer who works for the same programmatic supervisor (usually the TL), but who did not perform the technical work, is considered independent. The next higher programmatic supervisor (usually the TAL) who did not perform the technical work is also considered independent. The responsible programmatic supervisor who did not perform the technical work is not considered independent and cannot be a technical reviewer unless the LLNL YMP Leader or designee documents, in advance, that another reviewer cannot be identified.
- The Publications Manager retains all review documentation in a fire resistant cabinet until distribution of the printed publication is completed. The Publications Manager completes the proper forms and submits the review packages, along with a copy of the printed report, to the LRC.
- QA records include the following documents, as applicable:

**Publication Review:**

- the original draft;
- completed "Technical Data, Milestones, and Records Form" (Exhibit A);
- completed "Technical Report Review Record for YMP Reports" (Exhibit B);
- completed "Technical Reviewer's Comment Form(s)" (Exhibit C);
- documentation of comment resolution, if applicable (usually a second Exhibit C);
- copy of transmittal letter to Yucca Mountain Site Characterization Project Office (YMPO) with manuscript, if different from the original;
- all supporting documentation from YMPO reviews;
- YMPO approval letter;
- any documentation of disputed comments and their resolution by the LLNL-Yucca Mountain Site Characterization Project (YMP) Leader; and
- published technical report.

**Scientific Notebooks. (OP-3.4)**

**Requirements:**

- The LRC shall keep a record of the SN Custodian, the unique identifier, and the date for issue of each SN; and the LRC must be informed regarding which SN has been reassigned, to whom, and when.

- **The Investigator is responsible for entering the following initial SN entries:**

**The title, number and version of the applicable Activity Plan (or any other Plan such as an individual Software Plan) and the number and version of a Technical Implementing Procedure (TIP) to be used with their SN, if any.**

**Plans and TIPs may be used in conjunction with SNs but are not required to render SNs acceptable. Plans and TIPs may be referenced in the initial entry or in subsequent entries of the SN. If Plans and TIPs are not referenced or if these documents did not contain the following items, the initial SN entries must describe the following subject areas to the extent known at the time the initial entries are made:**

- **The research objective**
- **Proposed approach**
- **Equipment to be used**
- **Any starting material characterization required**
- **Calibration requirements**
- **Training/qualification requirements**
- **Environmental requirements**
- **Accuracy and Precision requirements and**
- **Potential Sources of error.**

**A list of personnel using the notebook and examples of their signatures and initials.**

**Any other information necessary to understand the research to be documented.**

**Date and signature of an Investigator and of the TL. If the Investigator is a TL or TAL, a second signature is not required; however, the Investigator may solicit a review/signature from a technically qualified reviewer.**

**Other entries if applicable.**

- **If an activity requires more than one SN before it is completed, the Investigator may enter the initial SN entries on the first SN only and may refer to such entries at the beginning of every subsequent or linked SN.**

- **All SN entries shall adhere to the following:**
  - **Be recorded in the Table of Contents (TOC). If entries are made in the SN more frequently than once per week, one consolidated TOC entry per week is acceptable.**
  - **Be in permanent ink that is legible after photocopying.**
  - **Have loose materials securely fastened so they cannot be removed without detection.**
  - **Assure that blank pages or substantial blank space on a page be identified as either blank or reserved for a purpose.**
  - **Have errors corrected by single line through the incorrect entry to leave the incorrect entry readable. Each correction must be initialed and dated.**
  - **Make reference to changes in the initial entries or the referenced documents as they apply to the work covered by the SN.**
  - **Include the Investigator's name/initials and date for each entry.**
- **Final SN entries shall include signatures of the SN custodian and a Technical Reviewer prior to the final submittal of the SN to the LRC.**
- **The SN shall be reviewed by the TL at least annually, at the completion of the SN, and at completion of the activity.**
- **The TL shall sign and date the review and indicate that the entries were read and understood.**
- **If the Investigator is a TL or TAL, a TL review is not required.**
- **SNs shall be technically reviewed by a SN Technical Reviewer who is selected by the TL.**
- **The Reviewer indicates that the SN has been reviewed and understood, then signs and dates the entry.**

- The SN is submitted to the LRC for photocopying annually or when the SN is filled. Alternatively, the SN may be copied by the Investigator and these copies submitted to the LRC. If the SN contains photocopies of original data, then the SN must be submitted since third generation photocopies are not acceptable. The SN will be returned to the Custodian after photocopying.

#### Summary of Results of Technical Evaluation

The technical evaluation began with an overview presentation by R. Stout, TAL, followed by a tour of the laboratory in which  $UO_2$  testing was performed. S. Steward, PI, H. Weed, and L. Spellman participated in the tour. The laboratory was adequate for the work being conducted. Instruments were within calibration periods and standards were within their periods of expiration.

The plastic tubing used in Flow-Through Dissolution Tests on  $UO_2$  (WBS No. 1.2.2.3.1.1, Activity D-20-53a) was replaced with stainless steel tubing due to the potential for oxygen transfer through the plastic. The test solutions pass through the sample chambers containing the  $UO_2$  powders. The solutions contain mixtures of  $Na_2(CO_3)_2$  (sodium carbonate) and  $NaHCO_3$  (sodium bicarbonate) which are buffered with  $NaOH$  (sodium hydroxide). The cover gas is argon with oxygen and small amounts of  $CO_2$  to regulate pH. Certified gas analyses are provided by the supplier. LLNL does not perform an over-check (see Section 6.0) of gas analyses provided by the supplier. The solutions are collected and pH uranium concentrations are determined. Instruments are calibrated with National Institute of Standards and Technology standards or with dilutions from standards.

The four activities noted above were discussed in turn. S. Steward supported the discussions on  $UO_2$  and spent fuel (WBS No. 1.2.2.3.1.1, Activity D-20-53b). B. Bourcier supported the discussions on glass. The questions in the checklist were answered satisfactorily. This required the review of LLNL audits of PNL and ANL and included a determination of closure of Audit Finding Reports generated during the audit. Applicable procedures utilized by PNL for the spent fuel dissolution and spent fuel oxidation work (WBS No. 1.2.2.3.1.1, Activity D-20-45) were reviewed and the approval methods were checked. Procedures used by ANL (WBS No. 1.2.2.3.1.2, Activity D-20-27) were not available for examination; however, interviews with LLNL technical staff and examination of objective evidence (Activity Plan D-20-27) indicated that the scientific objectives were satisfactorily being met.

The qualifications of specific LLNL staff (refer to Attachment 3 for objective evidence) were reviewed and found to be appropriate for the work being done. Certifications were examined and found to be current. In conclusion, it was determined that the LLNL staff is very knowledgeable regarding the technical areas evaluated, the laboratory in which flow-through dissolution of  $UO_2$  tests were conducted was found to be in good shape and records were adequately maintained. The technical staff understood and were meeting QA requirements.

Based on an evaluation of SIPs, Activity Plans, Test Plans, Grading Packages, SNs, review packages for publications and qualifications and certifications for LLNL personnel, LLNL is satisfactorily implementing an effective QA program as pertains to QA Program Element 3.0, Scientific Investigations, in both programmatic and technical areas.

For those activities audited, implementation of the Scientific Investigation portion of QA Program Element 3.0, is considered satisfactory.

**Software Quality Assurance:**

The evaluation of this QA program element was based on interviews with responsible individuals and examination of the limited objective evidence of the software activity performed since its last audit. The purpose of this evaluation was to determine the degree of compliance with selected requirements from 033-YMP-R Appendix H; the Software Quality Assurance Plan (SQAP); QP 3.2, and TIP-YM-11. The specific requirements selected for evaluation of compliance and effectiveness are listed below.

**Requirements for Computer Software (033-YMP-R Appendix H)**

**Requirements:**

- Software lifecycle documents have been prepared, reviewed, and approved.
- Software verification is performed to written procedures relative to specific hardware configurations. Results are documented and reviewed.
- Software validation is performed to written procedures relative to specific hardware configurations. Results are documented and reviewed.

**Results:**

LLNL Grading Reports identify only two codes under LLNL development or modification as currently related to quality-affecting activity and therefore subject to the above requirements. These are EQ3/6 and VTOUGH and both have the requisite approved lifecycle documents for their respective lifecycle phases. Both ISPs produced since the last audit are related to EQ3/6. EQ3/6 is undergoing verification in accordance with an ISP written specifically for this purpose in which the required procedure for verification appears as an appendix. No validation has been undertaken.

### LLNL Software Quality Assurance Plan

#### Requirement:

Verify that software products intended for use in quality-affecting work are listed on the Master Log.

#### Results:

The Master Log lists all versions of EQ3/6 and VTOUGH beginning with the initial listing of those codes on the Log.

### Software Quality Assurance (OP 3.2)

#### Requirements:

- SQAPs are prepared before development, acquisition or application of the software for quality-affecting activities.
- SQAPs are revision controlled documents that address the following:
  - Organizational responsibilities
  - Criteria for the requirements of Appendix H
  - Software lifecycle model and lifecycle controls
  - Documentation required
  - Reviews required
  - Configuration management system
  - Verification and validation
  - Discrepancy reporting and corrective actions
  - Change control
  - Control of software applications
  - Control of commercial and acquired software
- SQAPs are reviewed and approved.
- Each software product meets the requirements of the LLNL SQAP either directly or through its specific ISP.
- The YMP QAM meets his/her responsibilities for the following:
  - Approval of software planning documents

- Performing audits and surveillances activities to verify compliance with QA requirement

Results:

Both ISPs, issued since last audit, were reviewed. One addresses the initial qualification of EQ3/6, Version 8, and subsequent versions. As required, both software plans have been reviewed, approved, and placed under document control and have the appropriate required content for the lifecycle phase addressed.

The controls placed on a selection of six commercial software products supporting quality-affecting activity (WBS No. 1.2.2.3.1.1) was investigated. The documentation for the single verification performed for one of these products was examined in the SN where it is recorded and found acceptable. The Software Classification Forms for each of these products was examined and all were found to have been completed in the time period examined by our previous audit (YMP-92-21).

The YMP QAM is responsible for the approval of software planning documents and verification of compliance with requirements through surveillance and audit. The SQAP and all ISPs have been signed by the QAM. In addition, one audit (93-02) has been conducted of EQ3/6 while one surveillance (93-06) of software-related activity has been cancelled thus far this fiscal year.

Software Configuration Management System (TIP-YM-11)

Requirements

- The Software Quality Technician:
  - Assigns each configuration item a unique identifier
  - Opens Software Configuration Management System File Folders as stated in the ISP
  - Maintains an index of File Folders
  - Maintains a list of documents entered into each File Folder
- Software configuration items are formally controlled and documented.
- Configuration Item Identifiers follow the prescribed convention

Objective evidence of configuration item identification and control that will be listed on the Master Log in the future was examined for EQ3/6 and VTOUGH, and PANDORA. An acceptable method of configuration item identification and control has been implemented for all three codes. However, the implementation for both

VTOUGH and EQ3/6, while effective in meeting its purpose at this time, failed to follow the procedurally required format of identification for software modules and products. This condition was identified and subsequently remedied during the audit. Consequently, no CAR was issued (see Section 5.5.2, Item 3 of this report).

Conversely, the implementation of configuration item identification and control employed for PANDORA meets all requirements. This method fully utilizes the capabilities of the configuration management utility, SCCS, that is available on the UNIX-based Sun SPARC Stations in general use at LLNL. This is addressed in Section 6.0, Item 5 of this report.

The required SCMS File Folders associated with EQ3/6 and VTOUGH were examined. In particular, those associated with EQ3/6 are remarkably detailed and complete. In all, a total of seven folders with tables of contents were examined with a listing of 79 separate items. A cursory examination of these individual items was also made. This examination revealed that the Master File for VTOUGH did not contain the ISP or Software Classification Form as required. This condition was reported to LLNL management and it was subsequently remedied during the course of the audit. Consequently, no CAR was issued (see Section 5.5.2, Item 2 of this report).

During the cursory examination of items found in the File Folder items mentioned above, documentation of a change to the Thermodynamic Database revealed that this change had been made without the required technical review by the Technical Area Leader as required in procedure TIP-GM-12, Revision 0. This condition was brought to the attention of responsible individuals and LLNL management, and it was subsequently remedied during the course of the audit. Consequently, no CAR was issued (see Section 5.5.2, Item 5 of this report).

#### Summary for the QA Program Element:

With the exception of additions to the File Folders for EQ3/6 for which there has been activity, the conduct of activities on which to evaluate the implementation of software requirements and compliance to procedures has been so limited as to prevent an overall evaluation of effectiveness for this QA program element. However, the limited activity that has occurred, promises effective future performance.

In Audit YMP-92-21, conducted August 10-14, 1992, LLNL implementation of its software QA program was determined to be unsatisfactory. This determination was based on a number of required procedures that had not been issued, the incorrect grading of several software activities, the number and content of internal LLNL deficiency reports issued in the software area, and two deficient conditions fixed during the audit. This audit (YMP-93-14) revealed that the previously reported,

unissued procedures are now being reviewed but were not yet available for examination. Also, internal CAR-021 dealing with "inconsistencies and inefficiencies in the SQAP requirements" is still open. Finally, three additional deficient conditions were identified and satisfactorily closed-out during this audit. Based on these facts, and the lack of sufficient software activity requiring compliance with quality requirements on which to base a judgement, satisfactory implementation cannot be determined at this time.

**4.0** PROCUREMENT DOCUMENT CONTROL, AND  
**7.0** CONTROL OF PURCHASED ITEMS

In summation, this QA program element can not be evaluated for effectiveness at this time due to insufficient implementation.

The evaluation of these QA program elements was based on the examination of objective evidence to determine compliance with selected requirements taken from implementing procedures QPs 4.0 and 4.1. The specific requirements selected for evaluation of compliance and effectiveness are listed below.

Procurement Document Control, (QP 4.0)

Requirements:

- The requestor includes the scope of work, technical requirements, and QA requirements in Purchase Requisition.
- The TL prepares a Procurement Document Review (PDR) form if the procurement is quality-affecting and/or a Technical Services Contract, and indicates whether the procurement is quality-affecting.
- QA reviews the procurement package to assure that necessary QA requirements are included.
- LLNL procurement notifies the QAM when the final purchase document has been completed and for quality-affecting procurement, the QAM signs the QA Procurement Action form prior to final placement.
- The QAM signs the Procurement Action form for quality-affecting SANL procurement.

**Preparation of Quality Assurance Requirements Specifications and Approval of Subcontractors QA Programs. (OP 4.1)**

**Requirements:**

- The QAM prepares the Generic QA Requirements Specification and it is approved by the YMP PL.
- The Subcontract QA Requirements Specifications are approved by the cognizant TAL, the QAM, and the PL.
- The QAM conducts a Pre-qualification QA Surveillance of the subcontractor's facilities.

**Results**

Based on the examination of two procedures and the portion of another procedure addressing annual evaluations, two major SANL procurements, two QA Requirements Specifications and associated revisions, and two Pre-qualification QA Surveys, the implementation, although limited, of activities associated with the requirements contained within QA Program Elements 4.0 and 7.0, are generally satisfactory with the exceptions identified in CAR YM-93-085.

For those activities audited, implementation for QA Program Elements 4.0/7.0 is considered satisfactory.

**8.0 IDENTIFICATION AND CONTROL OF ITEMS, SAMPLES AND DATA**

The evaluation of this QA program element was based on the examination of objective evidence to determine compliance with selected requirements taken from implementing procedure QP 8.0. The specific requirements selected for evaluation of compliance and effectiveness are listed below:

**Identification and Control of Items, Samples, and Data. (QP 8.0)**

**Requirements:**

- Identification of items (materials, parts, and components) is related to applicable documentation such as drawings, design specifications, drilling logs, test records, inspection documents, or nonconformance report.

- Physical identification is used where practical. Otherwise, records or other methods are used, but traceability to the actual item is maintained.
- Samples are identified and controlled in a manner consistent with their intended use. Additionally, when samples are no longer needed, they are archived in accordance with a TIP.
- Samples have their identifications (ID) attached or traceable. Additionally, the ID of samples is verified and documented prior to release for use by LLNL personnel.
- Samples are adequately stored in order to maintain their physical conditions and do not degrade during long-term storage.
- A record is kept for all locations and types of environments of the sample identifiers, description of any damage or deterioration and what is being done to prevent damage or deterioration from reoccurring, date of the occurrence, date the identifier is replaced, and the signature, initials, or stamp of the individual replacing the identifier.
- Assurance that the identifiers specify the use limitations or the maximum life expectancy of the samples
- Identification of data includes a reference of the origin of the data (e.g. task, test, experiment, report, or publication) and the quality controls imposed on the activity which produced the data.
- Pertinent records are collected, stored, and maintained in accordance with procedure YMP-QP 17.0.

The evaluation of this QA program element was based on interviews and examination of objective evidence for experiments related to dissolution tests on Uranium Oxide (UO<sub>2</sub>) Powder being performed at Building 227, Rooms 1083 and 1084. Some deficiencies dealing with procedural requirements were discovered, addressed, controlled and adequately corrected during the audit (see Section 5.5.2, Item 1).

For the activities audited, the implementation of QA Program Element 8.0 is considered satisfactory.

### **13.0 HANDLING, STORAGE AND SHIPPING**

The evaluation of this QA program element was based on the examination of objective evidence to determine compliance with selected requirements taken from the implementing procedure QP 13.0. The specified requirements selected for evaluation of compliance and effectiveness are listed below:

#### **Handling, Storage and Shipping, (OP 13.0)**

##### **Requirements:**

- Samples are handled, stored, and shipped in accordance with written instructions or TIPS.
- When special equipment to handle samples requires specially trained or experienced operators, those are specified and verified by LLNL personnel.
- Records of handling, storage and shipping activities are handled in accordance with YMP-QP 17.0.

The evaluation of this QA program element was based on using the same item's elements, experiment, and personnel as described in QA Program Element 8.0.

For the activities audited, the implementation of QA Program Element 13.0 is considered satisfactory.

### **15.0 NONCONFORMING ITEMS**

Checklists for this QA program element were developed from the implementing procedure QP 15.0. However, due to lack of implementation, this QA Program Element could not be evaluated.

### **17.0 QUALITY ASSURANCE RECORDS**

QA Program Element 17.0, Quality Assurance Records, was not within the scope of this audit. However, while verifying records related to samples, a specific requirement within LLNL procedure QP 17.0 was verified for compliance. Other than this specific requirement within QA Program Element 17.0, an evaluation to determine satisfactory implementation was not made (see Section 5.5.2, Item 4).

**18.0 AUDITS**

QA Program Element 18.0, Audits, was not within the scope of this audit. However, while examining procurement documentation, it was determined that required annual evaluations had not been completed. Other than this specific detail regarding QA Program Element 18.0, an evaluation was not made to determine effectiveness and adequacy of implementation. Refer to CAR YM-95-085 for details of this deficiency.

**Audits (OP 18.0)**

**Requirement:**

Subcontractor audits shall be performed on a triennial basis when supplemented by annual evaluations. Subcontractor QA programs will be evaluated on at least an annual basis to determine if an audit is necessary, and this evaluation shall be documented.

### ATTACHMENT 3

#### List of Objective Evidence Reviewed During the Audit

##### QA Program Element 3.0, Scientific Investigation Control

###### Scientific Investigation:

The checklist for this QA program element was derived from the following procedures:

033-YMP-QP 2.8, Revision 3, "Quality Assurance Grading"  
033-YMP-QP 3.0, Revision 2, "Scientific Investigation Control"  
033-YMP-QP 3.3, Revision 2, "Review of Technical Publications and Data"  
033-YMP-QP 3.4, Revision 2, "Scientific Notebooks"

###### Objective Evidence Reviewed:

###### Scientific Investigation Plans:

SIP-WF-01, Revision 1, "YMP Spent Fuel Waste Form Testing"

###### Activity Plans:

D-20-27, "Unsaturated Testing of WVDP and DWPF Glass"  
D-20-45, "Low Temperature Oven Method for Spent Fuel Oxidation Testing"  
D-20-53a, "Flow-Through Dissolution Tests on  $UO_2$ "  
D-20-53b, "Flow-Through Dissolution Tests on Spent Fuel"

###### Test Plan:

"Dependence of  $UO_2$  Dissolution Kinetics on pH, Time, Temperature, Oxygen, and Carbonate/Bicarbonate Activity"

###### Grading Packages:

LLNL-QAG-L001, Revision 0 and Change Notices 0-1 and 0-2, "Flow-Through Dissolution Tests on  $UO_2$ "  
LLNL-QAG-L009, Revision 0 "Low Temperature Oven Method for Spent Fuel Oxidation Testing"  
LLNL-QAG-L012, Revision 0 "Unsaturated Testing of WVDP and DWPF Glass"

###### Grading Package for the above included the following:

"Initiation of QA Grading" form  
"Quality-Affecting Determination Form"



**Software Quality Assurance:**

The checklist for this QA program element was derived from the following documents and procedures:

033-YMP-R Appendix H, Revision 0, Requirements For Computer Software Used To Support A High-Level Nuclear Waste Repository Application  
Software Quality Assurance Plan, Revision 0  
033-YMP-QP 3.2, Revision 0, Software Quality Assurance  
TIP-YM-11, Revision 0, Software Configuration Management System

**Objective Evidence Reviewed**

Procedures:

TIP-GM-12, Revision 0, Review and Approval of Thermodynamic Database Changes  
TIP-GM-13, Revision 0, Inputting Changes to the Thermodynamic Database

Individual Software Plans:

ISP-NF-07, Revision 1, Individual Software Plan For Software Plan For Initial Qualification of EQ3/6  
ISP-NF-08, Revision 0, Individual Software Plan For Software Plan For EQ3/6, Version 8 and Subsequent Versions

QA Grading Reports:

LLNL-QAG-L001, Revision 0, Flow-Through Dissolution Tests  
LLNL-QAG-L013, Revision 0, Supporting Calculations for Post-closure PA  
LLNL-QAG-L014, Revision 0, Scenario Identification, Categorization and Qualification  
LLNL-QAG-L022, Revision 0, EQ3/6 Documentation & Code Release  
LLNL-QAG-L023, Revision 0, EQ3/6 Code & Database Development  
LLNL-QAG-L024, Revision 0, EQ3/6 Database Development  
LLNL-QAG-L034, Revision 0, Geohydrology Model Applications/Analyses  
LLNL-QAG-L042, Revision 0, Extend Pandora 1 to 1.1  
LLNL-QAG-L046, Revision 0, Technical Development for Dissolution Tests  
LLNL-QAG-L047, Revision 0, Interaction of Actinide-Bearing Solutions with Rock Core Samples (Preliminary and Scoping Experiments)

Software Master Log:

Master Log, Revision 1, 7/93, attached to letter LLYMP 9306225, dated 7/01/93

**SCMS Folders:**

**EQ3/6**

**MR - Master File Folder  
CD - Code Documentation  
DI - Database Interface**

**MT - Maintenance  
CT - Code Transfer**

**VTOUGH**

**Master File Folder  
Development Log**

**Scientific Notebook:**

**SN No. 156, a Controlled Document, Pages 24 and 25. These pages document a verification of multilinear regression performed by RS/Explore (BBN Software Products, Inc.).**

**Software Category Selection Forms:**

**EQ3/6, 7/23/92  
VTOUGH, 7/06/92  
KPA Computer Program, v 3.0, 7/29/92  
Quattro Pro, v 4.0, 7/29/92  
Lotus 1-2-3, v 2.1, 7/29/92  
RS/1, v 4.3, 7/29/92  
RS/Explore, v 2.1, 7/29/92  
RS/Discover, v 2, 7/29/92**

**Audit Report:**

**Report of LLNL internal audit 93-02 transmitted as an attachment to LLYMP 9305212, dated 5/24/93, R. E. Monks to R. E. Spence, YMQAD.**

**Items Related to the Deficiencies Identified and Corrected During the Audit:**

**EQ3/6 File Folder MR item titled "Configuration Item Identifiers" dated 7/22/93  
Hardcopy of SCCS utility report of configuration item status for VTOUGH, dated 7/22/93  
EQ3/6 File Folder DI item titled "Recalculation of the Gibbs Energies of Magnesium Hydroxy-Sulfate Hydrate Minerals," dated 6/04/93**

LLYMP9307113, Interoffice Memorandum, titled "CNGBOCHS Change Request (CR ID No. 2) April 8, 1993," dated 7/22/93  
VTOUGH master file folder table of contents showing addition of the SCS form and the ISP on 7/21/93

**Miscellaneous:**

QA Action Item List, dated 7/09/93  
UCRL-MA-110662 PT I, PT II, PT III  
Memo, dated 6/23/93, T. Kishi to W. Glassley, "Report on Probable Error in eq3NR Pitzer calculation"  
Hard copy of computer screen displays exhibiting configuration item status for VTOUGH, EQ3/6, and PANDORA  
Memo, dated 6/04/93, T. Kashi to N. Krisa, "Monthly Report for May 1993"  
Letter LLYMP9208203, T. Wolery to Ebinger, dated 8/28/92  
EQ3/6 v.7, YMP Distribution Listing, revision dated 4/26/93  
Letter LLYMP9302155, T. Wolery to H. Nitsche, dated 2/18/93

**QA Program Element 4.0, Procurement Document Control and QA Program Element 7.0, Control of Purchased Items**

The checklist for this QA program element was derived from the following procedures:

033-YMP-QP-4.0, Revision 3 and Change Notice 4.0-3-1, "Procurement Document Control"  
033-YMP-QP-4.1, Revision 2 and Change Notice 4.1-2-1, "Preparation of Quality Assurance Requirements Specifications and Approval of Subcontractor QA Programs"  
033-YMP-QP-18.0, Revision 5, "Audits"

**Objective Evidence Reviewed:**

Procurement documents and supporting documentation:

SANL 310-001  
SANL 316-001  
PDR forms for SANL 310-001 and SANL 316-001  
Memorandums initiating SANL 310-001 and SANL 316-001

Procurement Action Forms for SANL's 310-001 and 316-001  
Generic QA Requirements and Subcontract Quality Assurance Requirements Specifications (QARS) and changes:

QARS-001, Revision 0	QARS-001-0-1	QARS-001-02
QARS-001 B, Revision 0	QARS-001 B-0-1	QARS-001 B-0-2
QARS-001B-0-3	QARS-001 C, Revision 0	QARS-001 C-0-1
QARS-001 C-0-2	QARS-001 C-0-3	

**Pre-qualification QA Surveillances:**

S 89-08 Argonne National Laboratory  
S 89-13 Pacific Northwest Laboratory

**External Audits:**

Audit No. 91-14 of PNL, performed September 18-19, 1991  
Audit No. 91-15 of ANL, performed September 25-26, 1991

**Correspondence:**

Stout to Comstock, dated 9/23/92  
Comstock to LaPre, dated 9/25/92  
Revilli to Marschman, dated 3/24/93  
Wolfe to Bates, dated 5/13/92

**QA Program Element 8.0, Identification and Control of Items, Samples and Data**

The checklist for this QA program element was derived from the following procedure:

033-YMP-QP 8.0, Revision 1, "Identification and Control of Item, Samples, and Data"  
033-YMP-QP 17.0, Revision 5, "Quality Assurance Records" (Note; verified compliance to Section 17.0.5.3 of this procedure.)

**Objective Evidence Reviewed:**

Records package 00141-2 "Back up data for SN 00141 and SN 00124 associated with experimental series 2A on Uranium Oxide (UO<sub>2</sub>) dissolution"  
Transmittal form LLYMP 9306178 "Back up for SN 00124 and SN 00141 associated with series 3"  
Transmittal form LLYMP 9306175 "Back up data for SN 00155 associated with experimental series 4"

The following samples from the Data Log for the experiment titled, Dissolution Test on Uranium Oxide (UO<sub>2</sub>) Powder, were verified:

<u>Sample</u>	<u>Date</u>
R 2 - 175/S6B	4/5/93
R 1 - 143/S6	3/4/93
R 2 - 142/S6B	3/4/93
R 2 - 84/S6B	1/4/93
R 2 - 273/S6	7/12/93

<u>Sample</u>	<u>Date</u>
C 2 - 9/S6B	10/21/92
R9 - 31/S5	8/10/92
R9 - 21/S5	7/31/92
R4 - 21/S5	7/16/92
R1A - 6/S5	7/16/92
R4 - 6 - 6/S5	7/16/92
L9 - 9/S4	4/8/92
L6 - 15/S4	4/15/92
L6 - 20/S4	4/21/92
L6 - 33/S4	5/4/92
L1 - 37/S4	5/8/92
L1 - 47/S4	5/18/92
L5 - 32/S6C	11/13/92
L5 - 28/S6C	11/9/92
L4 - 24/6A	11/5/92
L4 - 18/6A	10/30/92

QA Program Element 13.0. Handling, Storage and Shipping

The checklist for this QA program element was derived from the following procedure:

003YMP-QP 13.0, Revision 1, "Handling, Storage and Shipping"

Objective Evidence Reviewed:

Records segment from SN 155 transmitting pages dated from 3/2/92 through 7/1/93

Total of 87 pages, transmittal form LLYMP 9307046

Records segment from SN 156 transmitting pages dated from 3/2/92 through 6/23/93

Total of 28 pages transmittal form LLYMP 9306172

Plus the same samples described in QA Program Element 8.0 (See page 33).

QA Program Element 15.0. Nonconforming Items

The checklist for this QA program element was derived from the following procedure:

033-YMP-QP 15.0, Revision 3, "Nonconforming Items"

**QA Program Elements 17.0, Quality Assurance Records and 18.0, Audits**

Specific requirements evaluated within these QA program elements were done in conjunction with examination of objective evidence listed under QA Program Elements 3.0, 4.0/7.0 and 8.0.

**ATTACHMENT 4**

**INFORMATION COPIES**

**OF**

**CORRECTIVE ACTION REQUESTS**

OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

6 CAR NO.: YM-93-085  
DATE: 7/29/93  
SHEET: 1 OF 1  
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document Audit 033-YMP-QP 18.0, Revision 5		2 Related Report No. YMP-93-14	
3 Responsible Organization Lawrence Livermore National Laboratory		4 Discussed With Royce Monks/Ray Hamati	
6 Requirement: Paragraph 18.0.5.1.3 states in part, "Subcontractor audits shall be performed on a triennial basis when supplemented by annual evaluations. Subcontractor quality assurance programs will be evaluated on at least an annual basis to determine if an audit is necessary, and this evaluation shall be documented...."			
6 Adverse Condition: Contrary to the cited requirement, LLNL has neither conducted an audit nor completed an annual evaluation of Pacific Northwest Laboratory (spent fuel waste form testing) or Argonne National Laboratory (defense waste processing facility glass) since September 18-19, 1991 and September 25-26, 1991 respectively.			
9 Does a significant condition adverse to quality exist? Yes ___ No <u>X</u> If Yes, Circle One: A B C		10 Does a stop work condition exist? Yes ___ No <u>X</u> ; If Yes - Attach copy of SWO If Yes, Circle One: A B C D	
		11 Response Due Date: 20 working days from issuance	
12 Required Actions: <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Extent of Deficiency <input checked="" type="checkbox"/> Preclude Recurrence <input type="checkbox"/> Root Cause Determination			
13 Recommended Actions: 1. Perform evaluation of subcontractor's work to determine any impacts on the quality of services performed, as appropriate. 2. Perform annual evaluations and document accordingly. 3. Provide letter of re-instruction to appropriate personnel.			
7 Initiator John E. Therien <i>[Signature]</i> Date <u>7/30/93</u>		14 Issuance Approved by: QADD <i>[Signature]</i> Date <u>8/3/93</u>	
15 Response Accepted QAR _____ Date _____		16 Response Accepted QADD _____ Date _____	
17 Amended Response Accepted QAR _____ Date _____		18 Amended Response Accepted QADD _____ Date _____	
19 Corrective Actions Verified QAR _____ Date _____		20 Closure Approved by: QADD _____ Date _____	