

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

AUDIT REPORT

OF

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

LAS VEGAS, NEVADA

AUDIT NUMBER YM-ARP-95-05
DECEMBER 12 THROUGH 15, 1994

Prepared by: S. R. Maslar Date: 1/3/95
Stephen R. Maslar
Audit Team Leader
Yucca Mountain Quality
Assurance Division

Approved by: Donald G. Horton Date: 1/4/95
Donald G. Horton
Director
Office of Quality Assurance

1.0 EXECUTIVE SUMMARY

As a result of Performance Based Quality Assurance (QA) Audit YM-ARP-95-05, the audit team determined that Science Applications International Corporation (SAIC) is satisfactorily implementing effective QA program and process controls for the procurement, control of purchased items and services, acceptance and calibration of equipment, and training, qualification and certification of personnel associated with their ongoing meteorological programs.

The performance based evaluation of process effectiveness and product acceptability was based on 1) proper implementation of the procedure's critical process steps; 2) use of trained and qualified personnel working effectively; 3) documentation that substantiated the quality of procured items and services; and 4) acceptable results and the quality of the end products.

The audit was performed based on direct observation of the activities in process, interviews with auditee personnel and review of pertinent documents for performance based information gained throughout this process, in order to make a determination whether or not the performance was satisfactory.

The audit team identified three deficiencies during the audit that were corrected prior to the postaudit meeting; these conditions are described in Section 5.5.2 of this report. Additionally, there was one recommendation resulting from the audit which is detailed in Section 6.0 of this report.

2.0 SCOPE

The audit was conducted to evaluate the effectiveness of SAIC controls for the collection of meteorological data using calibrated equipment and trained, qualified and certified personnel.

The processes/activities/end-products evaluated during the audit, in accordance with the approved audit plan, are as follows:

PROCESS/ACTIVITY/OR END-PRODUCT

- 1. Procurement of calibration services associated with the Meteorological Program.**
- 2. Acceptance of calibration services associated with the Meteorological Program.**
- 3. Use of calibrated and acceptable meteorological monitoring equipment.**

4. Training and qualification, and the certification of inspection personnel associated with the Meteorological Program..
5. Completed record packages for calibration services of meteorological equipment.

TECHNICAL AREAS

1. Meteorology Program.
2. Monitoring of conditions in population centers relative to wind patterns.

3.0 AUDIT TEAM AND OBSERVERS

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

<u>Name/Title/Organization</u>	<u>QA Program Elements/Requirements, Processes, Activities or End-products</u>
Stephen R. Maslar, Audit Team Leader (ATL) Yucca Mountain Quality Assurance Division (YMQAD)	Procurement Document Control and Control of Purchased Items and Services
Raul A. Hinojosa, Auditor, YMQAD	Control of Measuring and Test Equipment (M&TE) and the Training and Qualification of Personnel
Donald Bullard, Technical Consultant, National Oceanic Atmospheric Administration, Department of Commerce	Technical aspects of the generated meteorological data and equipment used
George P. Vaslos, Observer, Management and Operating (M&O) contractor	

4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

The preaudit meeting was held at the SAIC office in Las Vegas, Nevada, on December 12, 1994. A daily debriefing and coordination meeting was held with SAIC management and staff, and daily audit team meetings were held to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at the SAIC office in Las Vegas, Nevada, on December 15, 1994. Personnel contacted during the audit are listed in Attachment 1. The list includes those who attended the preaudit and postaudit meetings.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Effectiveness

The audit team concluded that, in general, the SAIC process controls are effectively being implemented for the areas identified in the scope of this audit. The process controls for performing the collection of meteorological data were found to be effective based on the evaluation of the critical process steps; use of trained, qualified and certified personnel working effectively; documentation that substantiated the quality of the products; and, acceptable results and the quality of the end products.

There were three deficiencies identified by the audit team and corrected prior to the postaudit meeting. These conditions are described in Section 5.5.2 of this report. Additionally, there was one recommendation resulting from the audit which is detailed in Section 6.0 of this report.

5.2 Stop Work or Immediate Corrective Actions Taken

There were no Stop Work Orders, immediate corrective actions or related additional items resulting from this audit.

5.3 QA Program Audit Activities

A summary table of audit results is provided in Attachment 2. The details of the audit evaluation, along with the objective evidence reviewed, are contained within the audit checklists. The checklists are kept and maintained as QA Records.

5.4 Technical Audit Activities

The evaluation of the Yucca Mountain Project Meteorological Monitoring Program was based on interviews with SAIC personnel and examination of objective evidence. The areas evaluated to verify adequacy of implementation are detailed in the audit technical checklist YM-ARP-95-05-02.

The evaluation determined that the installation and calibration program for meteorological monitoring instruments is satisfactory and is effectively being implemented for the areas and activities within the scope of the audit. Technical training of field personnel is documented and complete. The requirements of procedures WI-MET-002, Revision 4, "Routine Operations and Maintenance of Meteorological Equipment" and WI-MET-003, Revision 5, "Meteorological Monitoring: Data Processing Instruction," are satisfactorily being implemented.

The evaluation of characterization of wind patterns relative to population centers was based on interviews with SAIC personnel and examination of objective evidence. The areas evaluated to verify adequacy of implementation are detailed in the pertinent portion of the technical checklist YM-ARP-95-05-02 for wind pattern equipment.

The evaluation determined that the installation and calibration of wind pattern instruments is satisfactorily and effectively being implemented for the scope of this audit. Technical training and qualification of field personnel are documented and complete. The requirements of procedures WI-MET-002, Revision 4 and WI-MET-003, Revision 5 are satisfactorily being implemented for this activity.

5.5 Summary of Deficiencies

The audit team identified three deficiencies during the audit that were corrected prior to the postaudit meeting. Additionally, there was one recommendation resulting from the audit, which is detailed in Section 6.0 of this report.

Synopses of deficiencies corrected during the audit are detailed below.

5.5.1 Corrective Action Requests (CAR)

No CARs were issued as a result of this audit.

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. A signed Position Qualification Statement required by Standard Procedure (SP) 1.31, "Initial Evaluation, Qualification, Indoctrination, and Training of T&MSS Personnel," Revision 9, Paragraph 4.2.5, was not available for one individual responsible for procurement actions. The signed statement was generated and transmitted to the training center prior to the postaudit meeting.
2. There was no objective evidence that a change to the QA requirements proposed by a supplier during the Purchase Requisition (PR) review and bid process for Purchase Order (PO) 39-950162-41, was acknowledged by the requester or QA

during the final review of the PO prior to issuance as required by SP 1.28, "Procurement of Quality Affecting Hardware and Services," Revision 8, Interim Change Notice (ICN) No. 1, Paragraph 4.6.1.1. The objective evidence was provided with an explanation that the change had no impact on the procurement action prior to the postaudit meeting.

3. The Measuring and Test Equipment and Standards Usage Log for the RM Young Anemometer Drive, SAIC I.D. No. 20003, had an entry for July 14, 1994 when it was withdrawn for use. However, there was no entry to show the process that it was used for, or the date of return as required by procedure WI-RED-006, "Control of Measuring and Test Equipment," Revision 2, Paragraphs 4.4.4 and 4.4.5. This was corrected prior to the postaudit meeting and verification of the validity of the entry was made at the time of correction by the audit team.

5.5.3 Follow-up of Previously Identified CARS

There were no previously issued CARS that were determined to be applicable to the scope of this audit.

6.0 RECOMMENDATIONS

The following recommendation resulted from the audit and is presented for consideration by the SAIC management.

1. A change to SP 1.28, "Procurement of Quality Affecting Hardware and Services," Revision 8, ICN No. 1, Paragraph 4.2.4 should be made to identify that Standard Quality Assurance Clauses are prepared with unique identification and traceability to the PR and PO to provide clarification of the existing requirement.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: Summary Table of Audit Results

ATTACHMENT 1

Personnel Contacted During the Audit

<u>Name</u>	<u>Organization/Title</u>	<u>Preaudit Meeting</u>	<u>Contacted During Audit</u>	<u>Postaudit Meeting</u>
Ambos, D.	SAIC/Meteorologist	X		
Beall, K.	SAIC/FOS Mgr.	X		
Brees, D.	SAIC/Meteorologist	X		
Bullard, D.	NOAA/Technical Consultant	X	X	X
Chandler, D.	SAIC/Dep. Support Operations	X		X
Croft, L.	SAIC/Technician	X	X	X
Dahlberg, P.	IRG/QA Specialist		X	
Donaldson, G.	SAIC/M&TE Custodian	X	X	X
Fransioli, P.	SAIC/Technician	X	X	
Hale, P.	IRG/QA Specialist	X		
Harris, M.	SAIC/Mgr. ES&RP	X		X
Helms, R.	SAIC/Sr. Staff			X
Hinojosa, R.	YMQAD/Auditor	X		
Johnson, K.	IRG/QA Mgr.	X	X	X
Keyes, A.	SAIC/Procurement Mgr.	X	X	X
Malone, M.	IRG/Sr. QA Eng.	X	X	X
Maslar, S.	YMQAD/ATL	X		X
Prowell, G.	SAIC/Meteorologist	X		
Rinderman, R.	IRG/Sr. QA Eng.	X	X	X
Roesner, P.	SAIC/Technician	X	X	
Sorensen, C.	SAIC/Mgr. REFPD	X		X
Spangler, E.	SAIC/Tech. Review Coordinator		X	
Tait, T.	SAIC/Staff	X		X
Vaslos, G.	M&O/QA/Observer	X		X
Voegele, M.	SAIC/Dep. Mgr. Tech. Programs	X		

LEGEND:

ES&RP = Environmental Services and Radiological Protection
 FOS = Field Operations Support
 IRG = Integrated Resources Group (Working under contract to SAIC)
 REFPD = Radiological/Environmental Field Programs Department
 NOAA = National Oceanic Atmospheric Administration, Department of Commerce

ATTACHMENT 2

AUDIT YM-ARP-95-05 DETAIL SUMMARY								
QA ELEMENT/ACTIVITIES	PROCESS STEPS	DETAILS Checklists YM-ARP-95-05-01 and 02 (T)	CARs	Corrected During Audit	RECOM-MENDATION	ADE-QUACY	COM-PLIANCE	OVER-ALL
Training and Qualification of Personnel	Qualified prior to doing work	Page 1	N	N	N	N/A	SAT	EFF
	Training requirements documented	Page 2	N	5.5.2.1	N	N/A	SAT	
	Updated training to new and revised requirements	Page 2	N	N	N	N/A	SAT	
Certification of Inspection Personnel	Certification properly documented	Page 3	N	N	N	N/A	SAT	EFF
	Visual acuity exam documented	Page 3	N	N	N	N/A	SAT	
	Certification record exists	Page 4	N	N	N	N/A	SAT	

QA ELEMENT/ ACTIVITIES	PROCESS STEPS	DETAILS Checklists YM-ARP- 95-05-01 and 02 (T)	CARs	Corrected During Audit	RECOM- MENDATION	ADE- QUACY	COM- PLIANCE	OVER- ALL
Procurement of Quality Affecting Services	Preparation of PR	Page 5	N	N	N	N/A	SAT	EFF
	Completion of acceptance report	Page 6	N	N	N	N/A	SAT	
	Applicability of QA requirements	Page 6	N	N	N	N/A	SAT	
	Completion of PR with all documents	Page 7	N	N	6.1	N/A	SAT	
	Review of PR	Pages 7 and 8	N	5.5.2.2	N	N/A	SAT	
	Review of bids for compliance	Page 8	N	N	N	N/A	SAT	
	Supplier on Quality Supplier List	Page 8	N	N	N	N/A	SAT	
	Issue PO	Page 9	N	N	N	N/A	SAT	
	Review PO to insure requirements are all included	Page 9	N	N	N	N/A	SAT	
	Review supplier exceptions	Page 10	N	N	N	N/A	SAT	

QA ELEMENT/ ACTIVITIES	PROCESS STEPS	DETAILS Checklists YM-ARP- 95-05-01 and 02 (T)	CARs	Corrected During Audit	RECOM- MENDATION	ADE- QUACY	COM- PLIANCE	OVER- ALL
	Conduct performance evaluation of potential supplier	Page 11	N	N	N	N/A	SAT	
	Perform acceptance of services	Page 12	N	N	N	N/A	SAT	
	Preparation of QA record package	Page 13	N	N	N	N/A	SAT	
Acceptance of hardware and services	Use of complete document package for performing acceptance activities	Page 15	N	N	N	N/A	SAT	EFF
	Inspection done using certified inspectors	Page 16	N	N	N	N/A	SAT	
	Verify all criteria has been determined to be acceptable	Pages 17 and 18	N	N	N	N/A	SAT	
	Verify acceptance of technical data	Page 19	N	N	N	N/A	SAT	
	Verify all data included in package and all reviews are complete	Page 20	N	N	N	N/A	SAT	

QA ELEMENT/ ACTIVITIES	PROCESS STEPS	DETAILS Checklists YM-ARP- 95-05-01 and 02 (T)	CARs	Corrected During Audit	RECOM- MENDATION	ADE- QUACY	COM- PLIANCE	OVER- ALL
	PO record packages are complete and submitted to the Local Records Center	Page 21	N	N	N	N/A	SAT	
Control of M&TE	Use of proper standards	Page 22	N	N	N	N/A	SAT	EFF
	Basis for tolerance and accuracy	Page 23	N	N	N	N/A	SAT	
	Control when as-found calibration condition is out-of-tolerance	Page 24	N	N	N	N/A	SAT	
	Logging of M&TE and standards usage	Page 25	N	5.5.2.3	N	N/A	SAT	
	Investigate any lost M&TE	Page 26	N	N	N	N/A	SAT	
Control of Meteorological Equipment	Calibration of wind direction and wind speed sensors	Page 27	N	N	N	N/A	SAT	EFF
	Calibration of temperature sensors	Page 27	N	N	N	N/A	SAT	
	Calibration of any other equipment	Page 28	N	N	N	N/A	SAT	

QA ELEMENT/ ACTIVITIES	PROCESS STEPS	DETAILS Checklists YM-ARP- 95-05-01 and 02 (T)	CARs	Corrected During Audit	RECOM- MENDATION	ADE- QUACY	COM- PLIANCE	OVER- ALL
Meteorological Data Collection	Additional training for reinstalled equipment	Page T-1	N	N	N	N/A	SAT	EFF
	Installation location of recently removed and recalibrated equipment	Page T-2	N	N	N	N/A	SAT	
	Documentation of location for reinstalled equipment	Page T-2	N	N	N	N/A	SAT	
	Storage of data	Page T-3	N	N	N	N/A	SAT	
	Data generated is identified traceable, validated and qualified	Page T-4	N	N	N	N/A	SAT	
	Response times for repair/replacement of equipment	Page T-4	N	N	N	N/A	SAT	
	Data generated to meet requirements in study plan	Page T-5	N	N	N	N/A	SAT	

QA ELEMENT/ ACTIVITIES	PROCESS STEPS	DETAILS Checklists YM-ARP- 95-05-01 and 02 (T)	CARs	Corrected During Audit	RECOM- MENDATION	ADE- QUACY	COM- PLIANCE	OVER- ALL
Scientific Investigation for Monitoring Conditions in Population Centers Relative to Wind Patterns	Additional training for reinstalled equipment	Page T-6	N	N	N	N/A	SAT	EFF
	Installation location of recently removed and recalibrated equipment	Page T-6	N	N	N	N/A	SAT	
	Documentation of location for reinstalled equipment	Page T-7	N	N	N	N/A	SAT	
	Storage of Data	Page T-7	N	N	N	N/A	SAT	
	Site visits to review data generated	Page T-8	N	N	N	N/A	SAT	
	Data generated is identified, traceable, validated, and qualified	Page T-9	N	N	N	N/A	SAT	
	Data generated meets the requirements defined by the scientific investigation	Page T-9	N	N	N	N/A	SAT	