

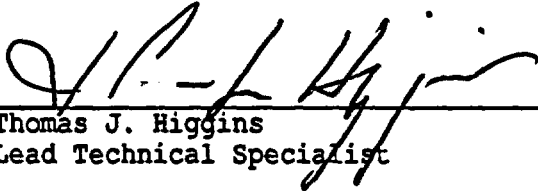
PROJECT OFFICE QUALITY ASSURANCE AUDIT REPORT FOR

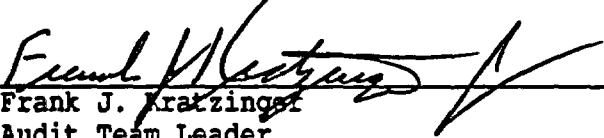
THE YUCCA MOUNTAIN PROJECT OFFICE AUDIT OF

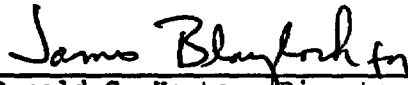
FENIX & SCISSON OF NEVADA

AUDIT NUMBER 90-07

CONDUCTED SEPTEMBER 25 - 28, 1990

Prepared by:  Date: 10/4/90
Thomas J. Higgins
Lead Technical Specialist

Prepared by:  Date: 10/4/90
Frank J. Kratzinger
Audit Team Leader

Approved by:  Date: 10/9/90
Donald G. Horton, Director
Quality Assurance
Yucca Mountain Project Office

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ENCLOSURE 1

EXECUTIVE SUMMARY

The Yucca Mountain Project Office (Project Office) Quality Assurance (QA) conducted a limited scope audit of Fenix & Scisson of Nevada (FSN) activities associated with the following criteria:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation Control and Design Control
- 5.0 Instructions, Procedures, Plans, and Drawings
- 6.0 Document Control
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

The activities audited for the above criteria (except Software QA) were all in compliance with the procedural requirements and appear to be effectively implemented.

All QA controls on Software Quality Assurance (SQA) have been approved by FSN and training has been accomplished to an adequate extent. However, there has been no effort, up to the time of this audit, to apply these controls to actual software items. Consequently, nothing can be said about the effectiveness of the SQA program. The Project Office's exception to the FSN QA Program in 1989, as a result of the lack of a SQA Program, cannot yet be removed, since the quality of this incipient SQA Program is indeterminate.

1.0 INTRODUCTION

This report contains the results of a Quality Assurance (QA) limited scope audit of Yucca Mountain Project Office (Project Office) activities performed by Fenix & Scisson of Nevada (FSN). The audit was conducted at the FSN facilities in Las Vegas, Nevada on September 25 - 28, 1990. The audit was conducted in accordance with the requirements of QMP-18-01, Revision 3, "Audit System for the Waste Management Project Office." The QA program requirements to be verified were taken from the FSN Quality Assurance Program Plan (QAPP), Revision 6.

2.0 AUDIT SCOPE

The following program elements were audited to assess compliance with the FSN QAPP, Revision 6, and to verify the implementation of the QA program as it relates to the Yucca Mountain Project:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation Control and Design Control
- 5.0 Instructions, Procedures, Plans, and Drawings
- 6.0 Document Control
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

3.0 AUDIT TEAM PERSONNEL

The Audit Team consisted of the following personnel:

<u>Responsibility</u>	<u>Individual</u>
Audit Team Leader	Frank J. Kratzinger
Auditors	Edward A. Cocoros Neil D. Cox Robert H. Klemens Kenneth T. McFall Richard L. Weeks
Auditors-in-Training	Cynthia H. Prater Craig G. Walenga
Lead Technical Specialist	Thomas J. Higgins
Technical Specialist	Edward M. Cikanek

Observers

James Conway
U.S. Nuclear Regulatory Commission (NRC)

John Buckley
NRC

Bruce Mabrito
NRC

Susan W. Zimmerman
State of Nevada

Englebrecht Von Tiesenhausen
Clark County, Nevada

4.0 SUMMARY OF AUDIT RESULTS

4.1 Statement of Program Effectiveness

The following is the Audit Team's summation of the effectiveness of the criteria audited. This summation is the result of measuring the implementation of the FSN Yucca Mountain Project procedures.

The activities audited for all the criteria reviewed (except Software QA) were in compliance with the procedural requirements and appear to be effectively implemented.

All QA controls on Software Quality Assurance (SQA) have been approved by FSN and training has been accomplished to an adequate extent. However, there has been no effort, up to the time of this audit, to apply these controls to actual software items. Consequently, nothing can be said about the effectiveness of the SQA program. The Project Office's exception to the FSN QA Program in 1989, as a result of the lack of a SQA Program, cannot yet be removed, since the quality of this incipient SQA Program is indeterminate.

4.2 Summary of Technical Activities

Technical specialists reviewed FSN's participation in the Exploratory Shaft Facility (ESF) Alternative Study Task 4, Access Options, and in the production of Study Plan 8.3.1.14.2, Study Plan to Provide Soil and Rock Properties of Locations of Surface Exploratory Shaft Facilities.

The initial set of ESF Alternative Study options provided to Sandia National Laboratory for screening, as well as the subsequent development of the reduced set of 17 options (later 34 with the inclusion of the Calico Hills scenario) were found to be technically adequate. This work was documented in a clear manner with readily available references and support material.

Study Plan 8.3.1.14.2 was produced by FSN and is now at the Project Office for Project Office review and approval. The body of the document is very well done technically. However, the document is imperfect in that the list of references, which transmit technical specifications for the work to be accomplished, has mistakes. This condition is noted in Observation No. 90-07-03.

4.3 Summary of Findings

There were no findings generated during this audit. However, the following discrepancies, which would have been findings, were corrected during the audit:

1. A letter was sent by the FSN Technical Project Officer (TPO) rectifying the omission of principle investigators from the Study Plan, to the Director of Regulatory and Site Evaluation Division naming the principal investigators and commenting on their qualifications to perform as investigators on the Study Plan as required by Project Procedure PP-70-01.
2. A records package was resubmitted to the Central Records Facility (CRF) with the required attachment that was missing from the original submittal.
3. A records package, which consisted of two segments, was submitted to the CRF as two separate record packages. The records package was resubmitted to the CRF as one record package.
4. Master copies of six software items were taken from a bookshelf and placed in the fire-resistant compartment of a safe to comply with the intent of PP-80-01.

5.0 AUDIT MEETINGS

5.1 Preaudit Conference

A preaudit conference was held with the FSN TPO and his staff at 10:00 a.m. on September 25, 1990. The audit scope and proposed agenda for the audit were presented and the Audit Team introduced. A list of the attendees for this meeting is provided in Enclosure 1 to this report.

5.2 Personnel Contacted During the Audit

See Enclosure 1.

5.3 Postaudit Conference

The postaudit conference was held at 11:00 a.m. on September 28, 1990. The results of the audit were presented to the TPO and his staff. A list of the attendees for this meeting is provided in Enclosure 1 to this report.

6.0 SYNOPSIS OF STANDARD DEFICIENCY REPORTS AND OBSERVATIONS

6.1 Standard Deficiency Reports

There were no Standard Deficiency Reports generated during this audit.

6.2 Observations

The observations are contained in Enclosure 2 to this report and are summarized below:

No. 90-07-01 FSN has not conducted a readiness review nor has the first readiness review been scheduled.

Since it is a requirement of the QAPP to conduct readiness reviews, it is important to the Project Office in assessing the adequacy of the FSN QA program to know the specific major scheduled or planned activities where FSN will conduct a readiness review. These specific readiness reviews should be listed in the QAPP (or possibly the PP-10-09) to ensure that they are auditable for implementation purposes.

No. 90-07-02 Several Quality Assurance Plans (QAPs) provide responsibility statements for and require action by line personnel. It was established that, at least for design engineers, these applicable QAPs were not identified as training requirements and training was not provided. Also, it is unclear as to how other line personnel training requirements are affected.

- No. 90-07-03 FSN conducted an internal review of Study Plan 8.3.1.14.2 in accordance with FSN Design Control procedure DC-09 before this document was submitted to the Project Office. In spite of this review, the Study Plan's reference list contains national consensus standards that are not current, are no longer appropriate, or are incorrectly cited. In addition, the transmitted text contains errors introduced during the incorporation of resolved review comments. The quality of execution of this procedure for the review of the Study Plan was inadequate.
- No. 90-07-04 QAP-6.1(N) requires the FSN QAPP to be distributed to the TPO and other interfacing organizations for review and comment. The TPO serves as the interfacing organization and his review is considered to cover both the TPO's and the interfacing organizations' review responsibilities. This combination of reviews and responsibilities by the TPO is not stated in the FSN procedures. It would improve the clarity of the situation if the requirement for interfacing organizations review is modified and the dual review role of the TPO is plainly established.

7.0 RECOMMENDED ACTION

A written response is required for the observations contained in Enclosure 2 of this report. Responses are due within 20 working days from the date of the transmittal letter of this report.

ENCLOSURE 1

FSN AUDIT 90-07
PERSONNEL CONTACTED

<u>Name</u>	<u>Organization</u>	<u>Title</u>	<u>Pre- Audit</u>	<u>Contacted During Audit</u>	<u>Post- Audit</u>
Ali, Arshad	FSN	QA Engineer	X	X	
Bonabian, Saeed	FSN	Engr. Tech. Analyst		X	
Booth, Henry W.	FSN	Sr. QE Procedures	X	X	
Buckley, John	NRC	Observer	X	X	X
Bullock, Richard L.	FSN	TPO	X	X	X
Cikanek, Edward M.	Harza/T&MSS	Technical Specialist	X	X	
Cocoros, Edward A.	MACTEC/YMP	Auditor	X	X	X
Conway, James T.	NRC	Observer	X	X	X
Cox, Neil D.	SAIC/YMP	Auditor	X	X	X
Criddle, Ray	FSN	Computer Cert. TO		X	
Diaz, Mario R.	DOE/YMP	Project Office QA	X		
Diersen, Nickie E.	FSN	Personnel Admin.		X	
Douglass, Joann C.	FSN	Computer Cert. Rec.	X	X	X
Ferguson, J. Earl	FSN	Sr. Rec. Mgmt. Spec.	X	X	X
Greiner, Tom D.	FSN	Lead Elect. Eng.	X		
Grenia, Jim D.	FSN	Lead Proj. Dsgn. Eng.		X	
Hale, Paul B.	FSN	Sr. QA Specialist	X	X	X
Hardin, Mary J.	FSN	Executive Secy.		X	
Higgins, Thomas J.	SAIC/YMP	Lead Tech. Spec.	X	X	X
Hill, John A.	FSN	Lead Dftg. Coord.	X		
Hilsinger, Russell J.	FSN	Config. Control Spec.	X	X	X
Klemens, Robert H.	SAIC/YMP	Auditor	X	X	X
Kratzinger, Frank J.	SAIC/YMP	Audit Team Leader	X	X	X
Mabrito, Bruce	NRC	Observer	X	X	X
McFall, Kenneth T.	SAIC/YMP	Auditor	X	X	X
McKee, B. Jean	FSN	Design Records Mgmt.	X	X	X
Mirza, Mahmood B.	FSN	Config. Control Mgr.	X		X
Prater, Cynthia H.	SAIC/YMP	Auditor-in-Training	X	X	
Regenda, Mike J.	FSN	Manager QA	X	X	X
Rue, Joseph L.	FSN	Training Manager	X	X	X
Stanley, Bruce T.	FSN	Lead Mining Eng.	X	X	X
Straight, Harry W.	FSN	Sr. QA Engineer	X	X	X
Tamondons, Nick B.	FSN	Lead Mech. Engineer	X		
Tiesenhausen, E. V.	Clark County	Observer	X	X	X
Tunney, Dan J.	FSN	Director QA	X	X	X
Walenga, Craig G.	CER	Auditor-in-Training	X	X	X
Walker, Jan F.	FSN	Project Secretary		X	
Weeks, Richard L.	SAIC/YMP	Auditor	X	X	X
Wilson, Matt H.	FSN	Sr. Admin. Manager	X		X
Zimmerman, Susan W.	St. of Nev.	Observer	X	X	X

ENCLOSURE 2

YUCCA MOUNTAIN PROJECT OFFICE
1 YMPO OBSERVATION NO. 90-07-01

N-QA-012
4/89

Completed by Originating Organization	2 Noted During: FSN Audit 90-07	3 Identified By: C.G. Walenga/R.L. Weeks	4 Date: 9/27/90
	5 Organization: FSN	6 Person(s) Contacted: R.L. Bullock	7 Response Due Date is 20 Days from Date of Transmittal
	8 Discussion: <p>QAPP, Revision 6, Section 2.1 addresses the criteria to be used to determine when a readiness review should be conducted. FSN has not conducted a readiness review nor has the first readiness review been scheduled. Discussions with FSN TPO revealed that while no readiness reviews have been scheduled, FSN management has intentions to conduct at least one readiness review prior to start of Title II ESF design.</p> <p>Since it is a requirement of the QAPP to conduct readiness reviews, it is</p>		
9 QAE/Lead Auditor <i>[Signature]</i> 10/3/90		10 Branch Manager <i>[Signature]</i> 10/3/90	
Completed by Respondee	11 Response:		
	12 Signature: _____ Date: _____		
Completed by QA Org.	13 Response Receipt Acceptable <input type="checkbox"/>		
	Initiator _____ Date _____	QA/Lead Auditor _____	Date _____
14 Remarks:			

8 Discussion: (continued)

important to DOE in assessing the adequacy of the FSN QA program to know the specific major scheduled or planned activities where FSN will conduct an internal or external readiness review. These specific readiness reviews should be listed in the QAPP (or possibly the PP-10-09) to ensure that they are auditable for implementation purposes.

YUCCA MOUNTAIN PROJECT OFFICE
1 YMPO OBSERVATION NO. 90-07-02

N-QA-012
4/89

Completed by Originating Organization	2 Noted During: FSN Audit 09-07	3 Identified By: C.G. Walenga/R.L. Weeks	4 Date: 9/27/90
	5 Organization: FSN	6 Person(s) Contacted: J. Rue	7 Response Due Date is 20 Days from Date of Transmittal
	8 Discussion: QAPP-002, Revision 6, Section 2.5.1.3 states in part, "Prior to assigning person to perform activities affecting quality, (personnel) will be indoctrinated as to the purpose, scope, methods of implementation, and applicability of the following documents (including changes thereto), as a minimum, as they relate to the work to be accomplished.... o Implementing Procedures and Work Instructions (applicable to the individual's responsibilities)..."		
Completed by Respondee	9 QAE/Lead Auditor <i>Frank Meagher</i>	Date 10/3/90	10 Branch Manager <i>Catherine Hanger</i>
	Date 10/3/90		
Completed by QA Org.	11 Response:		
	12 Signature: _____ Date: _____		
Completed by QA Org.	13 Response Receipt Acceptable <input type="checkbox"/>		
	Initiator _____ Date _____	QA/Lead Auditor _____	Date _____
14 Remarks:			
			Page 1 of 2

8 Discussion: (continued)

Several QAPs provide responsibility statements for and require action by line personnel. It was established that, at least for design engineers, these applicable QAPs were not identified as training requirements and training was not provided. Also, it is unclear as to how other line personnel training requirements are affected.

YUCCA MOUNTAIN PROJECT OFFICE
1 YMPO OBSERVATION NO. 90-07-03

N-QA-012
4/89

Completed by Originating Organization	2 Noted During: FSN Audit 90-07	3 Identified By: E. M. Cikanek	4 Date: 9-27-90	
	5 Organization: FSN	6 Person(s) Contacted: J. Grenia, B. Stanley	7 Response Due Date is 20 Days from Date of Transmittal	
	8 Discussion: FSN conducted an internal review of Study Plan 8.3.1.14.2 in accordance with FSN procedure DC-09 before this document was submitted to the Project Office. In spite of this review, the Study Plan's reference list contains national consensus standards that are not current, are no longer appropriate, or are incorrectly cited. In addition, the transmitted text contains errors introduced during the incorporation of resolved review comments. The quality of execution of this procedure for the review of the Study Plan was inadequate. Specific examples are provided on the continuation page.			
Completed by Respondee	9 QAE/Lead Auditor	Date	10 Branch Manager	Date
	<i>Frank [Signature]</i> 10/3/90		<i>Catherine [Signature]</i> 10/3/90	
	11 Response:			
Completed by QA Org.	12 Signature:		Date:	
	13 Response Receipt Acceptable <input type="checkbox"/>	Initiator	Date	QA/Lead Auditor
14 Remarks:				
				Page 1 of 2

8 Discussion: (continued)

Reference List examples:

- ASTM D-1586-67 as listed is outdated. The current version is ASTM D-1586-84.
- ASTM D-421-58 as listed is outdated. The current version is ASTM D-421-85.
- ASTM D-2166-66 is listed twice. The second listing uses the title "Uniaxial Compressive Strength of Rock Materials" The current version of this standard, ASTM D-2166-85, is titled "Unconfined Compressive Strength of Cohesive Soils."
- 19 of the ASTM references listed have some form of error - typographical or other.

Text example:

- Sections 2.2.2, para. 3
 - 4.2.2, item 1
 - 3.2.3, para. 3
- In each of the referenced sections, there is mention of "sand cone penetration resistance" which does not exist. The reviewed draft mentioned "Dutch Cone Penetration Test" which is correct. Documentation of the review gives no indication that such a change was to be made.

YUCCA MOUNTAIN PROJECT OFFICE
1 YMPO OBSERVATION NO. 90-07-04

N-QA-012
4/89

Completed by Originating Organization	2 Noted During: FSN Audit 90-07	3 Identified By: K. McFall	4 Date: 9/29/90
	5 Organization: FSN	6 Person(s) Contacted: W. Straight	7 Response Due Date is 20 Days from Date of Transmittal
	8 Discussion: QAP-6.1(N), Rev. 3, Para. 6.1.1.6 requires the FSN QAPP to be distributed to the TPO and other interfacing organizations for review and comment. The TPO serves as the interfacing organization and his review is considered to cover both the TPO's and the interfacing organizations review responsibilities. This combination of reviews and responsibilities by the TPO is not stated in the FSN procedures. It would improve the clarity of the situation if the requirement for interfacing organizations review is modified and the dual review role of the TPO is plainly established.		
Completed by Respondee	9 QAE/Lead Auditor <i>Frank Westerman</i>	Date 10/3/90	10 Branch Manager <i>Catherine Hays</i>
	11 Response:		
Completed by QA Org.	12 Signature:		Date:
	13 Response Receipt Acceptable <input type="checkbox"/>	Initiator	Date
	QA/Lead Auditor	Date	
14 Remarks:			
			Page <u>1</u> of <u>1</u>