

PROJECT OFFICE QUALITY ASSURANCE AUDIT REPORT FOR

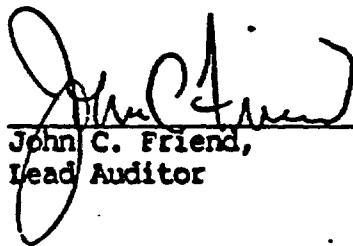
THE YUCCA MOUNTAIN PROJECT OFFICE AUDIT OF

FENIX & SCISSON, INC.

AUDIT NO. 89-1

Conducted: April 10 - 14, 1989


Prepared By:


John C. Friend,
Lead Auditor

Date:

4/27/89

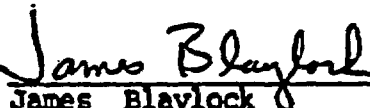
Approved By:


Henry H. Caldwell,
Division Manager, Audits

Date:

28 Apr 89

Approved By:


James Blaylock
Project Quality Manager

Date:

4/28/89

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ENCLOSURE

EXECUTIVE SUMMARY

PROJECT OFFICE AUDIT REPORT NO. 89-1

FENIX & SCISSON, INC. (F&S)

LAS VEGAS, NEVADA

APRIL 10 - 14, 1989

In the opinion of the Project Office Audit Team, the effectiveness of the Quality Assurance (QA) Program at F&S cannot be determined at this time. However, based on the results of the audit, the F&S QA Program appears adequate to support the initiation of Title II design. This is based upon the fact that staffing appears adequate, training is satisfactory, most required procedures are in place, and there are no major outstanding deficiencies.

It should be noted that the F&S QA Program, at this point, is not in total compliance with NWSI QA Plan 88-9, Revision 2. The areas not in compliance are Procurement and the Software QA Program. In addition, the 19 Observations identified should be an indication that the full program is not yet totally complete. If quality related work governed by the program had been in progress, some of the Observations would have been documented as deficiencies. These Observations should be closely scrutinized and actions taken where necessary.

The effectiveness of the QA program cannot be determined until such time as the program is completed and objective evidence to demonstrate technical adequacy and program implementation can be reviewed.

1.0 Introduction

This report contains the results of a QA Audit of F&S Yucca Mountain Project activities. The audit was conducted at the F&S facilities in Las Vegas, NV, April 10 through 14, 1989. 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 NNWSI QA Plan 88-9, Revision 2.

2.0 Audit Scope

The purpose of this audit was to evaluate the F&S Quality Assurance Program through verification of implementation of the F&S QAPP, Revision 6 (2/13/89) and its implementing procedures. Additionally, a technical review was performed to determine readiness to start Title II design activities.

3.0 Audit Team Personnel

John Friend	Audit Team Leader/Lead Auditor	SAIC, Las Vegas, NV
Stephen Hans	Auditor	" " "
Stephen Dana	Auditor	" " "
James Clark	Auditor	" " "
Sydney Crawford	Auditor	" " "
Neil Cox	Auditor-In-Training	" " "
Thomas Watson	Technical Specialist	HARZA " "
Thomas Ricketts	Technical Specialist	SAIC, " "
Arthur Watkins	Technical Specialist	" " "
John Gilray	Observer	NRC, Las Vegas, NV
John Peshel	Observer	NRC, Washington, D.C.
Michael Gonzalez	Observer	NRC, " "
Susan Zimmerman	Observer	State of Nevada
Gary Faust	Surveillant	DOE/HQ Weston
Vic Montenyohl	Surveillant	DOE/HQ Weston
Wendell Mansel	Observer	YMP, Las Vegas, NV
Ram Murthy	Observer	YMP, Las Vegas, NV
Edward Cikanek	Observer	HARZA, Las Vegas, NV

4.0 Summary of Audit Results

4.1 Statement of Program Effectiveness

In the opinion of the Project Office Audit Team, the effectiveness of the Quality Assurance Program at F&S cannot be determined at this time. Until such time as the program is completed and objective evidence to demonstrate technical adequacy and program implementation can be reviewed, the effectiveness will remain indeterminate.

However, based on the results of the audit, the F&S QA Program appears to be adequate to support the initiation of Title II design. This is based upon the fact that staffing appears adequate, training is satisfactory, most required procedures are in place, and there are no major outstanding deficiencies.

4.2 Summary of Technical Evaluation

Based upon the responses to the technical questions that the technical specialists asked of Fenix & Scisson, Inc. during the audit, it was concluded that the F&S Quality Assurance program is technically adequate. The F&S design control procedures were reviewed and found to be technically adequate for the performance of Title II design. The F&S design personnel appeared to be well qualified in the specific areas for which they have been assigned design responsibility and had an adequate understanding of their design control procedures. In summation, the technical specialists found no reason to impede F&S from starting Title II design.

4.3 Summary

A total of two Standard Deficiency Reports (SDRs)/(Enclosure 3), and 19 Observations (Enclosure 4) were identified as a result of this audit. In addition, the audit team generated seven Recommendations for consideration by F&S. A synopsis of each SDR and Observation, and the complete Recommendations, are contained in Section 6.0 of this report.

Deficiencies identified by the Project Office are qualified by Severity Level, which is related to the significance of the deficiency. A discussion of Severity Levels is provided in Enclosure 1.

At the time of the audit, one SDR (No. 267) remained open from previous Project Office surveillances and audits. The corrective actions to this SDR could not be verified during the audit. The SDR involves the use of commercial computer software; however, Fenix & Scisson's software QA Program has not yet been approved or implemented.

The following program elements were deemed to meet the requirements of NNWSI/88-9, Revision 2; and F&S QAPP, Revision 6:

- 1.0 - Organization
- 2.0 - QA Program
- 5.0 - Instructions, Procedures, Plans and Drawings
- 6.0 - Document Control
- 15.0 - Control of Nonconforming Items
- 16.0 - Corrective Action
- 17.0 - Quality Assurance Records
- 18.0 - Audits

Program elements that are not in total compliance with program requirements are:

- 3.0 - Scientific Investigation and Design Control

Program elements or portions of elements that are not in compliance with program requirements are:

- 4.0 - Procurement Document Control
- 7.0 - Control of Purchased Software QA Program

The following program elements were reviewed during the audit; however, no activities had taken place that would have required these elements to be controlled:

- 10.0 - Inspection
- 12.0 - Control of Measuring and Test Equipment

The following program elements were not audited during this audit because they are not currently an F&S responsibility and have been explained in the F&S QAPP:

- 8.0 - Identification and Control of Items, Samples and Data
- 9.0 - Control of Processes
- 11.0 - Test Control
- 13.0 - Handling, Shipping, and Storage
- 14.0 - Inspection, Test, and Operating Status

Technical review was limited during this audit to the following:

- o Technical Qualifications of Design Personnel
- o Understanding of the Design Control Process and Procedural Requirements
- o Procedural Adequacy from a Technical Standpoint

5.0 Audit Meetings

5.1 Preaudit Conference

A preaudit conference was held with the F&S Technical Project Officer (TPO) and his staff at 10:00 a.m. on April 10, 1989. The purpose, scope, and proposed agenda for the audit were presented and the audit team was introduced. A list of attendees for this meeting is provided in Enclosure 2.

5.2 Audit Status Meetings

Audit Status Meetings were held with the F&S TPO and his key staff at 8:30 a.m. on April 11, 12, and 14, 1989. A status of how the audit was progressing and identification of discrepancies were discussed daily.

5.3 Postaudit Conference

The postaudit conference was held at 10:00 a.m. on April 14, 1989. A synopsis of the preliminary SDRs and Observations identified during the course of the audit was presented to the TPO and his staff. A list of attendees of this meeting is provided in Enclosure 2.

6.0 Synopsis of SDRs, Observations, and Complete Recommendations

6.1 Standard Deficiency Reports (SDRs)

1. F&S is logging the receipt of transmittals rather than document type as required. Severity Level 2, SDR No. 313.
2. F&S Procedure DC-14, Rev. 7, was issued before all documented reviews were obtained. Severity Level 3, SDR No. 314.

6.2 Observations

1. Channels have not been established at F&S to elevate disputes progressively to the Project Quality Manager. Observation No. 89-1-01.
2. A carefully designed and detailed plan needs to be implemented during shaft and drift blasting that integrates blast design and blast damage assessment activities. The efforts of J. McKenzie (Senior Mining Engineer) and M. Mrugala (Senior Mining Engineer/Specialist) must be closely integrated in a definite plan. These individuals must work together in the planning and during the blasting operations.

After operations begin, there must be some flexibility to modify blast design when needed during day-to-day operations without going through a lengthy design process that would not change the overall design basis. Observation No. 89-1-02.
3. A documented policy is needed to establish a hierarchy among the implementing procedures, along with a delineation of the purpose and applicability of each type of procedure. Observation No. 89-1-03.
4. There is no centralized system at F&S to control the preparation and issuance of documents affecting quality. Observation No. 89-1-04.
5. The Subsystem Design Requirements Document (SDRD) draft review versions have been used by F&S as a primary input source for the Basis for Design (BFD). Observation No. 89-1-05.
6. The work authorization and planning process resulting in "Design Scope and Planning Documents" is not procedurally described, and does not require F&S QA review. Observation No. 89-1-06.
7. The BFD, Issue 2, cover sheet does not include provisions for the QA representative's approval signature. Observation No. 89-1-07.
8. Many codes and standards listed in the BFD are not identified by specific year/edition. Observation No. 89-1-08.
9. Reviews of the BFD, Issue 2, which were performed to F&S procedure DC-09, Interdiscipline Review, were not totally conducted as DC-09 requires. The BFD has not received final approval. Observation No. 89-1-09.

10. F&S procedure DC-15, "Basis for Design" program, does not describe the specific format and content for the BFD. Observation No. 89-1-10.
11. F&S procedures DC-14, "Technical Studies," and DC-09 discuss design verification as occurring before interdisciplinary review; interdisciplinary review occurs prior to design verification. Observation No. 89-1-11.
12. F&S procedure DC-07 does not clearly describe comment documentation and resolution at the check and initial review points for F&S Technical Specifications. Observation No. 89-1-12.
13. F&S performed reviews of the SDRD to DC-09. However, DC-09 does not specifically address the review of the SDRD, and some portions of the procedure are not applicable. Observation No. 89-1-13.
14. F&S Procedure DC-11 does not adequately define responsibilities and control of the Project Control Log. Observation No. 89-1-14.
15. F&S Discrepancy Report DR-10 (6/2/88) does not show independence in that the DR was written against, dispositioned, and verified by virtually the same QA organization. Observation 89-1-15.
16. Trend analysis should be performed on a more timely basis and future Trend Analysis Reports should provide for additional justification as to whether a trend is or is not adverse to quality. Observation No. 89-1-16.
17. F&S has not developed a method to identify what training is required for each person. Current practice is to train personnel in all procedures. Observation No. 89-1-17.
18. Subcontract SC-TS-88-269 did not contain technical requirements as required. This work was done for Title I; however, the contract does require Title II work and must be revised. Observation No. 89-1-18.
19. F&S does not currently have in place sufficient implementing procedures to meet the requirements of Criteria 7, "Control of Purchased Items and Services." Observation 89-1-19.

6.3 Recommendations

Recommendation No. 1

There is a requirement in QAPP-002, Rev. 6, Section 6.0, para. 6.2.2 that a reviewing organization have access to pertinent background data or information upon which to base approval of documents. The required access is difficult to prove by objective evidence; however, it was noted that no information was sent with revised procedures to explain

why changes were necessary or the rationale for the approach taken in the revision. It is recommended that in the future, document review coordinators provide such basic information to assist the reviewers in their evaluation of changed documents.

Recommendation No. 2

In F&S Procedure PP 50-01, Rev. 3, para. 6.8, the F&S Records Coordinator (RC) takes the responsibility for ensuring records have been correctly filmed, despite the verification activities performed by the Microfilm and Archival Storage Services Facility (MASSF). If the F&S RC wishes to confirm microfilming accuracy and/or completeness, the procedure should reflect this activity as a voluntary action rather than a procedural requirement.

Recommendation No. 3

The statements of cause on Corrective Action Reports associated with the deficiency reports examined during the audit were often not clear with respect to the underlying root cause. The statements were often not to the point. For example, a statement implying the "Press of Business" is not as clear as stating "insufficient time Between Release of the YMP Procedure and the Surveillance Date for the available people to update the internal procedure."

The cause statement should be to the point and should serve as the basis for preventing recurrences.

Recommendation No. 4

Design Control procedure DC-03 defines the methods to be used by Fenix and Scisson personnel in performing and documenting Design Analyses. Design Analysis Form LV-308, first sheet, has nine instructions for the originator/discipline engineer (DE) to accomplish. This completed, the discipline engineer is at liberty to proceed with the design based on all of the input required by Form LV-308.

It is suggested changing the procedure such that the Lead Discipline Engineer (LDE) should be required to review and accept the criteria written by the DE. This would ensure that any omissions of codes/regulations, or any unreasonable assumptions that may have been included, can be assessed for impact to the design by the LDE, rather than the DE completing his calculations and waiting till the interdiscipline review.

Recommendation No. 5

The education requirements for the LDE are less stringent than those of subordinate leads and senior engineer/specialists. It is the opinion of the Technical Specialists that two years of engineering education and

four years of engineering field experience do not provide an adequate educational background for the job responsibilities. To lend additional credibility to the technical decisions, judgments, and approvals of the LDE, it is recommended that the educational requirement for the position be changed to a B.S. in Civil, Mechanical, Structural, or Mining Engineering.

Recommendation No. 6

Based on responses to questions in the Technical Checklist, certain areas are considered to be lacking in personnel knowledge, which would justify the recommendation that refresher training be provided prior to the commencement of Title II design work. These areas are interface control and configuration management. Due to the importance of the subject matter that these procedures control, it is recommended that such training be provided to all design personnel for the following procedures: DC-05, DC-25, DC-26, DC-27, and DC-28.

Recommendation No. 7

In DC-04, Design Verification, the following two sentences should be deleted: "In those cases, where this timing cannot be met, the portion or portions of design which have not been verified shall be identified and controlled. In all cases, the verification shall be completed prior to relying on the component, system, or structure to perform its function." The reasons for this deletion are (1) to remove the contradiction with the Section 2.0, Applicability, and (2) to avoid the possibility of compromising the site's ability to meet its site characterization or repository performance requirements and objectives. This compromise could occur by prematurely or improperly performing construction activities at the site in accordance with the unverified designs. This change would not violate the QAP, since the deletion of these two sentences makes the verification requirements more stringent, not less.

7.0 Required Action

A written response is required for each SDR delineated in Section 6.0. Responses to each SDR are due 20 working days from the date of the SDR transmittal letter. Upon response, acceptance, and satisfactory verification of all remedial and corrective actions, the SDRs will be closed and F&S will be notified by letter of closure.

A written response is required for the 19 Observations contained in Enclosure 4 of this report. Responses are due 20 working days after the transmittal letter of this report.

Written responses are not required for the recommendations contained in this report. The recommendations were generated by the audit team for the F&S staff to consider during implementation of its QA Program.

ENCLOSURE 1

Severity Levels

Severity Level 1

Significant deficiencies considered of major importance. These deficiencies require remedial, investigative, and corrective actions to prevent recurrence.

Severity Level 2

A deficiency which is not of major importance, but may also require remedial, investigative, and/or corrective action to prevent recurrence.

Severity Level 3

A minor deficiency in that only remedial action is required. These deficiencies are generally isolated in nature or have a very limited scope. In addition, the integrity of the end result of the activity is not affected nor does the deficiency affect the ability to achieve those results.

ENCLOSURE 2

ATTENDEES

AUDIT REPORT S89-1

ENCLOSURE 2

<u>NAME</u>	<u>TITLE</u>	<u>ORGANIZATION</u>	<u>PREAUDIT</u>	<u>DURING AUDIT</u>	<u>POSTAUDIT</u>
Arshad, Ali	Sr. QA Engineer	F&S	X	X	X
Blaylock, Jim	Project QA Manager	DOE/YMP	X		X
Bolling, Pat	Div./H. Resources	F&S	X	X	X
Booth, Henry W.	Sr. QA Proc. Spec.	F&S	X	X	X
Bullock, R. L.	Sr. Project Manager	F&S	X	X	X
Burns, Allan	Observer	SAIC			X
Caldwell, Henry H.	Manager, Audit Div.	SAIC	X		
Chytrowski, B. R.	Project Design Manager	F&S	X	X	X
Cikanek, Edward	Observer	HARZA	X		X
Clark, James E.	QA Auditor	SAIC	X		X
Cocoros, A. E.	Sr. QA Engineer	F&S	X		
Cox, Neil D.	AIT	SAIC	X		X
Crawford, Sidney	QA Auditor	SAIC	X		X
Cross, Jack A.	General Manager	F&S	X		X
Dana, Stephen	QA Auditor	SAIC	X		X
Edwards, Roxanne	Engineer	DOE			X
Faust, Gary L.	HQ Surv. Lead	Weston	X		X
Ferguson, J. E.	Sr. Rec. Spec.	F&S	X	X	X
Garms, Bill	Sr. Project Engineer	F&S	X	X	
Gelinger, T. H.	Chief Comp. Serv.	F&S		X	X
Gilray, John	On-Site Rep., Observer	NRC	X		X
Gonzales, M. R.	Observer	NRC	X		X
Graves, B. J.	Manager Administration	F&S	X	X	X
Grenis, James D.	Lead Design	F&S/PB	X	X	X
Hale, Paul B.	QA Specialist	F&S	X	X	X
Hampton, Catherine	QA Specialist	DOE			X
Hans, Stephen	QA Auditor	SAIC	X		X
Jacocks, Harry L.	Dir. Procurement	F&S	X	X	
Johnson, Janet	Sr. QA Engineer	F&S		X	X
Kratzinger, Frank	Observer	SAIC			X
Mansel, Wendell B.	Observer	DOE/YMP	X		X
McConville, James	Tech. Spec. Trainee	HARZA	X		
Metta, Stephen	QA	SAIC	X		X
Mika, Deborah L.	Personnel Admin.	F&S	X	X	X

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ENCLOSURE 2

(Continued)

<u>NAME</u>	<u>TITLE</u>	<u>ORGANIZATION</u>	<u>PREAUDIT</u>	<u>DURING AUDIT</u>	<u>POSTAUDIT</u>
Mirza, Mahmood B.	Config. Cont. Manager	F&S		X	X
Montenyohl, Vic	Surveillant	Weston	X		X
Morrison, Gary L.	Cont./Proc. Specialist	F&S		X	X
Murthy, Ram B.	Observer	DOE	X		X
Pershel, John	Observer	NRC	X		X
Prestholt, Paul	On-Site Representative	NRC			X
Regenda, Michael	Manager QA	F&S	X	X	X
Ricketts, Tom	Technical Specialist	SAIC	X		X
Rue, Joseph L.	QA Coordinator	F&S		X	X
Ruth, Frederick J.	QA Engineer	SAIC			X
Sanchez, Nickie	Personnel Specialist	F&S	X	X	X
Tunney, D. J.	Director QA Engineer	F&S	X		X
Walkins, Arthur	Technical Specialist	SAIC	X		X
Watson, Tom	Technical Specialist	HARZA	X		X
Wilson, Matt	YMP Admin. Manager	F&S	X	X	X
Zimmerman, Susan	QA Manager	State of Nevada	X		X

ENCLOSURE 3
SDRs

YMPO STANDARD DEFICIENCY REPORT

N-QA-038
12/88

Completed by Originating QA Organization

1 Date 4/11/89	2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 1
3 Discovered During Audit 89-1	3a Identified By J. E. Clark	3b Branch Chief Conurrence Date	4 SDR No. 314 Rev. 0
5 Organization Fenix & Scisson	5 Persons(s) Contacted J. May, J. Rue		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) Checklist Item 6-4, NNWSI 88-9, Rev. 2, Sec. 6, Par. 2.1, states, "Changes to documents shall be reviewed and approved by the same organization that performed the original review and approval..."			
9 Deficiency Evidence was discovered that indicated issuance of DC-14, Rev. 7 was made before a documented review by all reviewers of the previous revision. The above requirement was therefore violated.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1. Assure that personnel are trained to prevent this condition from recurring.			

Aprvl.

11 QAE/Lead Auditor Date <i>[Signature]</i> 4/18/89	12 Branch Manager Date <i>[Signature]</i> 18 Apr 89	13 Project Quality Mgr. Date <i>[Signature]</i> 4/18/89
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Completed by Organization in Block 5

14 Remedial/Investigative Actions(s)	15 Effective Date _____
16 Cause of the Condition & Corrective Action to Prevent Recurrence	17 Effective Date _____
18 Signature/Date	

Comp. by Org. QA Org.

19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date	Branch Manager/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date	Branch Manager/Date
21 Verifi-cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date	Branch Manager/Date
22 Remarks				
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date	

YMPO STANDARD DEFICIENCY REPORT

N-QA-038
12/88

Completed by Originating QA Organization	1 Date 4/13/89		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2		
	3 Discovered During Audit 89-1		3a Identified By J. E. Clark	3b Branch Chief Concurrence Date		4 SDR No. 313 Rev. 0	
	5 Organization Fenix & Scisson		6 Persons(s) Contacted J. E. Ferguson, Y. Hendricks			7 Response Due Date is 20 Working Days from Date of Transmittal	
	8 Requirement (Audit Checklist Reference, if Applicable) Checklist Item 17-1, F&S Procedures PP-50-01, Rev. 3, states in part "Upon receipt, the F&S Records Center Coordinator performs the following receipt/control tasks: a. Identifies the document as a required record per the						
9 Deficiency Contrary to the above requirement, F&S is logging the receipt of transmittals rather than document type as required by procedure.							
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1. Initiate logging activities per procedure requirements. 2. Investigate to determine impact on retrievability.							
Apr. 5	11 QAE/Lead Auditor Date <i>[Signature]</i> 4/18/89		12 Branch Manager Date <i>[Signature]</i> 18 Apr 89		13 Project Quality Mgr. Date <i>[Signature]</i> 4/18/89		
	14 Remedial/Investigative Action(s) 15 Effective Date _____						
Completed by Organization in Block 5	16 Cause of the Condition & Corrective Action to Prevent Recurrence 17 Effective Date _____						
	18 Signature/Date						
Comp. by Org. QA Org.	19 Response <input type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		Branch Manager/Date		
	20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		Branch Manager/Date		
	21 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date		Branch Manager/Date		
	22 Remarks						
23 QA CLOSURE		QAE/Lead Auditor/Date		Branch Manager/Date		PQM/Date	

**YMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

**N-QA-038
12/88**

SDR No. 313

Rev. 0

Page 2 of 2

6 Persons contacted (continued)

8 Requirement (continued)

document type list and logs in receipt..."

10 Recommended Actions (continued)

3. Train personnel in more stringent receipt control measures.

ENCLOSURE 4
OBSERVATIONS

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: Stephen P. Hans	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: Dan Tunney	Response Due Date is 80 Days from Date of Transmittal
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Discussion:

No channels have been established at F & S to elevate disputes progressively to the YMP, PQM.

Reference: NWSI 88-9, Rev. 2, Sec. 1, Par. 2.2

QAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 25 Apr 89
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Completed by Responder

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed by QA Org.

Remarks:

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: Tom Ricketts	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: J. McKenzie and M. Mrugala	Response Due Date is 30 Days from Date of Transmittal
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Discussion:

A major concern of NRC is the damage around the shaft and underground openings produced by blasting during excavation. This can create man-made preferential pathways for fluid flow and the possible transport and release of radionuclides in the environment. Once the excavation is completed, the blast damage effects remain, and thus they need to be controlled in order to not compromise the site. Blasting can also affect the results of site characterization testing if it is not done carefully and if its effects are not well understood.

QAE/Lead Auditor <i>John Chin</i>	Date 4/25/89	Branch Manager <i>A. A. Caldwell</i>	Date 25 Apr 89
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Completed by Responder

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed <input type="checkbox"/>	
QAE/Lead Auditor _____ Date _____	Branch Manager _____ Date _____

Completed by QA Org.

Remarks:

Thus, it is necessary that a carefully designed and detailed plan be implemented during shaft and drift blasting that integrates blast design and blast damage assessment activities. This plan basically consists of conducting a blast(s), performing blast damage assessment measurements and then using these damage zone results to modify the blast design before the next round(s) are conducted. This process should be done on a frequent basis to insure damage is not being produced as rock properties or other site conditions change. In addition, a strict quality control program should be implemented on the drill/blast process, as well as, the explosives and detonators.

This concern translates to the fact that the efforts of J. McKenzie and M. Mrugala must be closely integrated, not only by words, but in a definite plan and by areas of responsibility defined by management. These individuals must work together both in the planning and during the blasting operations for the plan to be successful. F&S may choose to set up a working group of experts to help formulate and review the planning phase and even evaluate the results of blast damage measurements during operations. The identification of a damage assessment method or a correlation of damage zone to peak particle velocity will be difficult and suggests the use of a highly qualified and somewhat diverse working group.

Once operations commence, there is the additional concern that the blasting engineer will not have the flexibility to modify the blasting design without going through what could be a timely change control process. This needs to be thought out so that shaft sinking operations are not brought to a standstill. This concern is, at least partly, tied to the blasting specifications which need to be very carefully formulated to allow some latitude of minor design changes during day-to-day operations without going through the change control process, and would not change the overall design basis. The specifications also need to reflect the blast damage assessment issue so a blast design change will be required when a certain blast damage parameter value is exceeded.

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: J. E. Clark	Date: 4/14/89
Organization: Fenix & Scisson	Person(s) Contacted: J. Rue, J. May, D. Tunney	Response Due Date is 90 Days from Date of Transmittal

Discussion:

There are discrepant conclusions drawn among F&S QA personnel regarding the relative purposes and applications of QAPs, PPs, and DCs. These procedures constitute the F&S QA Program implementing documents, yet there was no consistent explanation as to how and to whom each type of procedure applies. A documented policy is needed to establish a hierarchy among the implementing procedures, along with a delineation of the purpose and applicability of each type of procedure.

QAE/Lead Auditor <i>John Chinn</i>	Date 4/25/89	Branch Manager <i>A. A. Caldwell</i>	Date 25 April 89
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Completed by Responses

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed by QA Org.

Remarks:

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: J. E. Clark	Date: 4/14/89
Organization: Fenix & Scisson	Person(s) Contacted: J. Rue, J. May, B. Chytrowski	Response Due Date is 90 Days from Date of Transmittal

Discussion:

There is no centralized system at F&S to control the preparation and issuance of documents affecting quality. It is recognized that document control activities are handled by several essentially identical procedures in separate work functions, but a single procedure prescribing a standard method for controlling all quality affecting documents would provide greater consistency, and simplify procedure revision and training.

QAE/Lead Auditor <i>J. Orin</i>	Date 4/25/89	Branch Manager <i>A. A. Caldwell</i>	Date 25/26/89
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Completed by Responder

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed by QA Org.

Remarks:

Completed by Originating QA Organization

Noted During: Audit 89-1	Identified By: S. Crawford	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: J. Grenia/B. Chytrowski	Response Due Date is 30 Days from Date of Transmittal
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Discussion:

The Subsystem Design Requirements Document (SDRD) has been prepared in draft review versions, but has not been formally received by F&S as Design Basis Information (logged, controlled QA record, etc.) because the SDRD had not been approved by the Project Office. Nonetheless, F&S has used the SDRD, Benchmark 3 (1/23/89) as a primary input source for the Basis for Design (BFD), Issue 2 document. Furthermore, SDRD, Benchmark 4 (1/31/89) has been used by F&S to update the BFD.

QAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 25 APR 89
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Completed by Responses

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed by QA Org.

Remarks:

Completed by Originating QA Organization

Noted During:
Audit 89-1

Identified By:
S. Crawford

Date:
4/14/89

Organization:
Fenix & Scisson

Person(s) Contacted:
J. Grenia/A. Ali/B. Chytrowski

Response Due Date is
90 Days from Date of
Transmittal

Discussion:

The work authorization and planning process, resulting in "Design Scope and Planning Documents", is not procedurally described, and does not require P&S QA review of the Design Scope and Planning Documents. Although work scope and Qa Levels may be determined by other documents including WBS Dictionary, QA Level Assignment Sheets, Basis for Design Document, etc., the scoping and planning documents should be subject to QA review.

QAE/Lead Auditor

[Signature]

Date

4/25/89

Branch Manager

[Signature]

Date

25 Apr 89

Response:

Completed By Responder

Signature:

Date:

Response Receipt Verified/Closed

QAE/Lead Auditor

Date

Branch Manager

Date

Remarks:

Completed By QA Org.

Completed by Originating QA Organization

Noted During: Audit '89-1	Identified By: S. Crawford	Date: 4/14/89
Organization: Fenix & Scisson	Person(s) Contacted: J. Grenia/A. Ali/B. Chytrowski	Response Due Date is 30 Days from Date of Transmittal

Discussion:

The Basis for Design Document, Issue 2, Cover Sheet (draft) does not include provision for QAR approval signature, a procedurally required action.

QAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 25 Apr 89
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Completed by Responder

Response:

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Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed by QA Org.

Remarks:

Completed by Originating QA Organization

Noted During:
Audit 89-1

Identified By:
S. Crawford

Date:
4/14/89

Organization:
Fenix & Scisson

Person(s) Contacted:
J. Grenia/B. Chytrowski

Response Due Date is
30 Days from Date of
Transmittal

Discussion:

Many codes and standards listed in the BFD are not identified by specific year/edition, although a few (notably ACI standards) have been listed with specific year. The BFD should reflect actual editions of codes and standards to be used for design basis.

QAE/Lead Auditor

Date

Branch Manager

Date

[Signature]

4/25/89

[Signature]

25 April 89

Response:

Completed by Responder

Signature:

Date:

Response Receipt Verified/Closed

QAE/Lead Auditor

Date

Branch Manager

Date

Completed by QA Org.

Remarks:

Completed By Originating QA Organization

Noted During:
QA Audit 89-1

Identified By:
S. Crawford

Date:
4/14/89

Organization:
Fenix & Scisson

Person(s) Contacted:
J. Grenia/B. Chytrowski

Response Due Date is
90 Days from Date of
Transmittal

Discussion: BFD (Issue 2) was reviewed by P&S for updates resulting from SDRD Benchmark 4; the review was performed to the provisions of DC-09, Interdiscipline Review. The review was documented using a Review Comment Record (RCR), Form LV-317 instead of the Document Review Notice (DRN), form LV-316, identified in DC-09. The reviews were not logged in the Project Control Logs, either the Review Comment Record Log or on the Document Review Notice Log. Although the BFD is not finally approved, the review comments and resolution are a part of the quality record base for the BFD and should be logged in the Project Control Logs.

QAE/Lead Auditor

Date

Branch Manager

Date

(Signature)

4/25/89

(Signature)

25 Apr 89

Response:

Completed By Responder

Signature:

Date:

Response Receipt Verified/Closed

QAE/Lead Auditor

Date

Branch Manager

Date

Completed By QA Org.

Remarks:

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: S. Crawford	Date: 4/14/89
Organization: Fenix & Scisson	Person(s) Contacted: J. Grenia/B. Chytrowski	Response Due Date is 90 Days from Date of Transmittal

Discussion:

Design procedure DC-15 describes the "Basis for Design" program and provides administration provisions for the control of the BFD document. However, DC-15 does not describe specific format and content provisions for the BFD, e.g., boundaries and interfaces; applicable codes, standards, and regulations; functional requirements; performance criteria; constraints; and assumptions. The preliminary BFD, Issue 2, did contain the above information.

QAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 25/8/89
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Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed By QA Org.

Remarks:

Noted During:
QA Audit 89-1

Identified By:
S. Crawford

Date:
4/14/89

Organization:
Fenix & Scisson

Person(s) Contacted:
J. Grenia/B. Chytrowski

Response Due Date is
30 Days from Date of
Transmittal

Discussion:

DC-14, Technical Studies (Par. 6.5.2 and 6.5.4) and DC-09,
Interdiscipline Review (Par. 6.1.2) discuss design
verification as occurring before interdiscipline review;
interdiscipline review occurs prior to design verification.

QAE/Lead Auditor

[Signature]

Date

4/25/89

Branch Manager

[Signature]

Date

25/4/89

Response:

Signature:

Date:

Response Receipt Verified/Closed

QAE/Lead Auditor

Date

Branch Manager

Date

Remarks:

Completed by Originating QA Organization

Completed by Responder

Completed by QA Org.

Completed By Originating QA Organization

Noted During: QA Audit 89-1	Identified By: S. Crawford	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: J. Grenia/B. Chytrowski	Response Due Date is 80 Days from Date of Transmittal
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Discussion:

Design Procedure DC-07 describes measures for preparation, review, and approval for P&S Technical Specifications (Construction and Performance). DC-07 does not clearly describe comment documentation and comment resolution at the check and initial review points; requirements to retain review comments and resolutions as QA records is not noted; Specification Engineer signoff shown on Attachment 1 of the procedure is not described in the body of the procedure.

QAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 75 Apr 89
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Completed By Responsee

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed By QA Org.

Remarks:

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: S. Crawford	Date: 4/14/89
Organization: Fenix & Scisson	Person(s) Contacted: D. Bullock	Response Due Date is 30 Days from Date of Transmittal

Discussion:

As part of its internal review of the Subsystems Design Requirements Document (SDRD), F&S performed a review of the SDRD to F&S procedure DC-09, "Interdiscipline Review." However, DC-09 does not specifically address review of the SDRD. For example, Par. 1.0, "Scope", states, "The Purpose of this procedure is to describe the interdiscipline review system that is employed on this project for technical design products," and Par. 4.1, states "Technical Work Products - These products consist of design drawings, technical specifications, technical reports, and design analysis."

QAE/Lead Auditor: <i>[Signature]</i>	Date: 4/25/89	Branch Manager: <i>[Signature]</i>	Date: 25 Apr 89
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Response:

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Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed By QA Org.

Remarks:

The definition for a technical work product does not include or reference the SDRD. In addition, sections of this procedure would not be applicable for review of the SDRD: For example: (1) Par. 6.1.2 states that, "All technical work products shall be complete and checked in accordance with the requirements of DC-03 before beginning the interdiscipline review process; (2) Par. 6.2.2, 2nd paragraph, states, "If interdiscipline review is not necessary...". If F&S intends to continue use of DC-09 for review of the SDRD, the procedure definition for a technical work product should be revised to include the SDRD; and, the procedure should be revised (e.g., Section 6.1, "General") to exclude those portions of the procedure that are not applicable to review of the SDRD.

WMPO OBSERVATION NO. 89-1-14

N-QA-012
8/88

Completed by Originating QA Organization

Noted During:
QA Audit 89-1

Identified By:
S. Dana

Date:
4/14/89

Organization:
Fenix & Scisson

Person(s) Contacted:
A. A11/J. Grenia

Response Due Date is
90 Days from Date of
Transmittal

Discussion:

F&S Procedure DC-11, Rev. 6, Par. 6.1.2, states, "The external source Review and Comment transmittals are recorded in the Project Control Log Book and forwarded to the PM or his designee for action." The Review and Comment transmittals are being recorded in the Incoming Correspondence Log, not the Project control Log. The Project Control Log contains a number of other logs (e.g., Document Review Notice Log, Comment Control Program Log,

QAE/Lead Auditor.

[Signature]

Date
4/25/89

Branch Manager

[Signature]

Date
25 April 89

Response:

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Signature:

Date:

Response Receipt Verified/Closed



QAE/Lead Auditor

Date

Branch Manager

Date

Remarks:

Completed By QA Org.

Review Comment Log, Design Sheet Log, Review Comment Record Log, Design Interface Control Log, Specification Log), which some of the logs (identified above) are designated as QA records. If F&S intends for the Project Control Log to incorporate the logs mentioned above within a single binder, the procedure should be revised to reflect the intended usage of the Log. In addition, no procedure was found that identified responsibilities for control of the Project Control Log.

Completed by Originating QA Organization

Noted During:

QA Audit 89-1

Identified By:

S. Dana

Date:

4/14/89

Organization:

Fenix & Scisson

Person(s) Contacted:

D. Tunney/J. Johnson

Response Due Date is
90 Days from Date of
Transmittal

Discussion:

F&S DR-010, written 6/2/88 by J. Johnson, documents, (1) No PP-60-01 presentation of the F&S QAPP, REV. 3, and (2) the Manager, Technical Support did not attend the indoctrination and training class. The initial DR response was provided by M. Regenda, an amended response was provided by D. Tunney (for M. Regenda), and the DR was closed by D. Tunney (3/6/89). All individuals involved in the initiation, response to, and closure of DR-010 are QA personnel, even though part 1 of the DR, QAPP training, was and still is the responsibility of F&S QA.

QAE/Lead Auditor

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Date

4/25/89

Branch Manager

[Signature]

Date

2506/89

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Response:

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Date:

Response Receipt Verified/Closed

QAE/Lead Auditor

Date

Branch Manager

Date

Completed By QA Org.

Remarks:

To assure independence of areas for which QA has direct responsibility, F&S should detail how it plans to handle audits/surveillances relative to QAPP training in the future and resolution of DRs in areas for which they have responsibility.

Completed By Originating QA Organization

Noted During: QA Audit 89-1	Identified By: S. Dana	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: D. Tunney	Response Due Date is 90 Days from Date of Transmittal
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Discussion:

1. F&S Procedure QAP-16.3(N), "Trend Analysis," states that trend analysis shall be performed on a yearly basis. It is recommended that the procedure be revised so that trend analysis can be performed more frequently (e.g., quarterly). This will ensure if an adverse trend is identified, immediate actions can be taken to correct the condition. Considering the many tasks involved in Title II design, it would be advantageous to identify an adverse trend before it is allowed to continue from one task to another.

QAE/Lead Auditor <i>J. Fraw</i>	Date 4/25/89	Branch Manager <i>R.A. Caldwell</i>	Date 25 Apr 89
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Response:

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Signature: _____ Date: _____

Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed By QA Org.

Remarks:

2. The F&S Trend Analysis Report, dtd. 3/28/89, does not go into sufficient detail explaining why the trends identified are not adverse to quality. The report stated that, "A Corrective Action Request is not required for these since this is the first analysis..." . The analysis covered the period from 5/86 - 2/89 with a sample-size (population) of 143 (deficiency reports). Two areas were identified as comprising 29% (procedure violation) and 31% (Inadequate/incomplete procedures) of the total population. The above would indicate that 2 1/2 years with a sample-size of 143 is sufficient data to conclude whether the trends are adverse to quality or not.

It is recommended that future Trend Analysis Reports provide additional justification whether a trend is or is not adverse to quality.

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: Stephen P. Hans	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: Joe Rue	Response Due Date is 90 Days from Date of Transmittal
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Discussion:

F&S has not developed a method to identify the training needs of personnel to gain the required proficiency prior to performing quality affecting work. The current practice is to train all engineers to all DC. This practice, however, does not address interaction between QA & Engineering, and DC training for QA personnel, nor has interaction with Project Procedures been established.

OAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 25 Apr 89
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Completed By Responder

Response:

J

Signature: _____ Date: _____

Response Receipt Verified/Closed

OAE/Lead Auditor	Date	Branch Manager	Date
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Completed By QA Org.

Remarks:

Completed by Originating QA Organization

Noted During: QA Audit 89-1	Identified By: Stephen P. Hans	Date: 4/14/89
Organization: Fenix & Scisson	Person(s) Contacted: H. Jacocks	Response Due Date is 90 Days from Date of Transmittal

Discussion:

A review of subcontract SC-TS-88-269, Arthur D. Little, Inc., revealed that no technical requirements, Right of Access or Documentation Requirements had been established or referenced in the subcontract. This work was accomplished during Title I; therefore, an SDR is not appropriate. However, the subcontract does include a specific Title II scope of work. Should the specific scope of work be accomplished in Title II without a modification of the subcontract, a violation of the requirements would result.

QAE/Lead Auditor <i>[Signature]</i>	Date 4/25/89	Branch Manager <i>[Signature]</i>	Date 25 Apr 89
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Completed by Responder

Response:

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Response Receipt Verified/Closed

QAE/Lead Auditor	Date	Branch Manager	Date
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Completed by QA Org.

Remarks:

Completed By Originating QA Organization

Noted During: QA Audit 89-1	Identified By: Stephen P. Hans	Date: 4/14/89
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Organization: Fenix & Scisson	Person(s) Contacted: Dan Tunney	Response Due Date is 90 Days from Date of Transmittal
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Discussion:

F&S does not currently have in place sufficient implementing procedures to meet the requirements of Criteria F; "Control of Purchased Items and Services." This fact is established in F&S letter: YMP 1238, dtd: 3/24/89, J. A. Cross to K. Gertz. Since no QA Level I or II procurement activity has taken place to date, a SDR is not appropriate. However, if QA Level I or II procurements are processed without a modification to current implementing procedures, a violation of the requirement would result. This problem has been previously identified on F&S DR-044.

QAE/Lead Auditor <i>John C. [Signature]</i>	Date 4/25/89	Branch Manager <i>AA [Signature]</i>	Date 25 08 89
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Completed By Responses

Response:

Signature: _____ Date: _____

Response Receipt Verified/Closed <input type="checkbox"/>	
QAE/Lead Auditor _____ Date _____	Branch Manager _____ Date _____

Completed By QA Org.

Remarks:



Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

APR 24 1989

WBS #1.2.9.3

"QA"

QA RECEIVED

Richard L. Bullock
Technical Project Officer for Yucca Mountain Project
Fenix & Scisson, Inc.
101 Convention Center Drive
Phase II, Suite P-250
M/S 403
Las Vegas, NV 89109

ISSUANCE OF STANDARD DEFICIENCY REPORTS (SDRs) 313 AND 314, RESULTING FROM YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) QUALITY ASSURANCE (QA) AUDIT 89-1 OF FENIX & SCISSON, INC. (F&S) (NN1-1989-2018)

Enclosed are SDRs 313 and 314, generated as a result of Project Office QA Audit 89-1 of F&S.

Please identify the corrective actions to be taken and implemented to correct the deficiencies by completing blocks 14 through 18, as appropriate, on each SDR.

Responses to the SDRs are due within 20 working days of the date of this letter. Any extension to these due dates must be requested in writing with appropriate justification prior to the due date. Please send the original of your responses to Nita Brogan, Science Applications International Corporation, 101 Convention Center Drive, Las Vegas, Nevada, 89109, and a copy to Ralph Gray, U.S. Department of Energy, P. O. Box 98518, Las Vegas, Nevada, 89193.

Your cooperation and timely response is appreciated. If you have any questions, please contact Wendell B. Mansel of my staff at 794-7945, or John C. Friend of Science Applications International Corporation at 794-7164.

James Blaylock
Project Quality Manager
Yucca Mountain Project Office

YMP:WBM-3442

Enclosure:
SDRs 313 and 314

BACKUP INFORMATION

APR 24 1989

Richard L. Bullock

-2-

cc w/encl:

J. J. Brogan, SAIC, Las Vegas, NV

L. G. Scherr, SAIC, Las Vegas, NV

J. C. Friend, SAIC, Las Vegas, NV

cc w/o encl:

Ralph Stein, HQ (RW-30) FORS

Dwight Shelor, HQ (RW-3) FORS

M. J. Regenda, F&S, Las Vegas, NV

H. H. Caldwell, SAIC, Las Vegas, NV

E. P. Ripley, SAIC, Las Vegas, NV

J. W. Gilray, NRC, Las Vegas, NV