

WMPO QUALITY ASSURANCE AUDIT REPORT  
NNWSI PROJECT AUDIT OF FENIX & SCISSON, INC

AUDIT NUMBER: 88-01

CONDUCTED: FEBRUARY 23 - MARCH 2, 1988

Prepared by:

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APR 08 1988

H. H. Caldwell - Lead Auditor

Approved by:

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4-8-88

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*James Blaylock*

James Blaylock - PQM (WMPO)

## 1.0 INTRODUCTION

This report presents the results of a Quality Assurance Audit of the Fenix & Scisson, Inc. (F&S) facilities at Tulsa, OK, Las Vegas, NV and Mercury, NV. The audit was conducted to the requirements of the Waste Management Project Office (WMPO) Quality Assurance Program Plan (NVO-196-18) and Quality Management Procedure (QMP) 18-1, Rev 1.

## 2.0 AUDIT SCOPE

The purpose of this audit was to evaluate the effectiveness of the F&S Quality Assurance Program and implementing procedures with respect to the requirements of the NNWSI Project Quality Plan, NVO-196-17, Rev. 5, and to verify the implementation of the Quality Assurance Program as it relates to Exploratory Shaft Facility (ESF) activities of the NNWSI Project.

## 3.0 AUDIT TEAM PERSONNEL

The audit team consisted of:

Henry H. Caldwell, Audit Team Leader, SAIC, Las Vegas, NV  
Robert W. Clark, Observer, OGR (Weston), Washington, DC  
Roland F. Cote, Auditor, SAIC, Las Vegas, NV  
James P. Donnelly, Observer, NRC, Washington, DC  
George D. Dymmel, Technical Specialist, SAIC, Las Vegas, NV  
Gerard Heaney, Auditor, SAIC, Las Vegas, NV  
Daniel Klimas, Auditor, SAIC, Las Vegas, NV  
Royce E. Monks, Observer, DOE/WMPO, Las Vegas, NV  
John Peshell, Observer, NRC, Washington, DC  
Susan W. Zimmerman, Observer, State of Nevada, Carson City, NV

## 4.0 SUMMARY OF AUDIT RESULTS

This evaluation of the F&S Quality Assurance Program and ESF design activities identified a number of concerns as to the compliance of both of these topic areas with the requirements of NNWSI Project NVO-196-17, Rev 5. The audit team was unable to observe a high level of Quality Assurance awareness at any of the operating locations visited. A total of thirteen deficiencies and six observations were identified during the course of the audit. In addition, the audit team generated two recommendations for the consideration of the F&S NNWSI staff. Deficiencies, observations and recommendations are detailed in Section 6.0 of this report.

While none of the deficiencies identified individually warrant "stop work" measures the number and type of SDRs and observations issued, when taken in the aggregate, deserve immediate management attention. It is the recommendation of the audit team that a stop work be placed on the ESF design activities of F&S until the corrective actions outlined in the SDRs have been completed. It is further recommended that, prior to the full scale resumption of ESF design activity, a WMPO/F&S Readiness Review be performed to confirm both the implementation of approved corrective actions and to assess the overall capability of F&S to resume work.

The following program elements were deemed to be in compliance with the requirements of the NNWSI Project Quality Assurance Program:

- 6. Document Control
- 17. Quality Assurance Records

Program elements which the audit team identified as deficient were:

- 2. Quality Assurance Program
- 3. Scientific Investigation Control and Design Control
- 5. Instructions, Procedures and Drawings
- 16. Corrective Actions
- 18. Quality Assurance Audits

The following elements were deemed not within the scope of the program at this time and were therefore not audited:

- 1. Organization
- 8. Identification and Control of Samples and Items
- 9. Control of Processes
- 10. Inspection and Surveillances
- 11. Experiment and Equipment Test Control
- 12. Control of Measuring and Test Equipment
- 13. Handling, Storage and Shipping
- 14. Inspection and Test Status
- 15. Nonconformances

In addition to the programmatic areas outlined above, the following technical area was reviewed as part of this audit:

#### Exploratory Shaft Facility Design Activities

The deficiencies were qualified by the application of severity levels which were tied to the significance of the finding. A discussion of the severity levels is provided in Enclosure 1. Twelve of the thirteen SDRs issued were Severity Level 2, whereas the thirteenth was a Level 3 deficiency.

## 5.0 AUDIT MEETINGS

### 5.1 PREAUDIT CONFERENCE (TULSA, OK)

A preaudit conference was held with the Technical Project Officer (TP0) and his staff at 10:00 a.m. on February 23, 1988. The purpose, scope and proposed agenda for the audit were presented. A list of attendees for this meeting is provided in Enclosure 2.

## 5.2 AUDIT CONTINUATION MEETING (LAS VEGAS, NV)

Selected members of the WMPO Audit Team and F&S staff reconvened the audit at the F&S offices in Las Vegas, NV on February 29, 1988. A list of the people attending this meeting is outlined in Enclosure 2.

## 5.3 AUDIT CONTINUATION MEETING (NEVADA TEST SITE, NTS, MERCURY, NV)

The WMPO Audit Team, observers, and members of the F&S Staff reconvened the audit at the NTS offices of F&S on March 1, 1988 to primarily review Quality Assurance Records.

## 5.4 POSTAUDIT CONFERENCE

The postaudit conference was held on March 2, 1988, at 10:00 a.m. in the Las Vegas offices of F&S. The attendees are also identified in Enclosure 2. SDRs, observations, and recommendations identified during the course of the audit were formally presented to the TPO and his staff at this time. Draft copies of the SDRs and observations were given to the TPO, QA Manager, and observers.

# 6.0 SYNOPSIS OF SDRs/OBSERVATIONS/RECOMMENDATIONS

## 6.1 STANDARD DEFICIENCY REPORTS (SDRs)

1. Contrary to the requirement that "Design Verifications be performed prior to commencement of Interdiscipline review activities" the interdiscipline reviews for F&S Study No. 11 "ESF Structural Design Study Report" Part I and Part II commenced prior to the verifications being accepted and released for the interdiscipline review. The WMPO recognizes that this same deficiency was previously reported by F&S on Audit Deficiency Report No. QA(N)-87-01-4. However, this SDR is being written because no actions were taken or committed in the referred ADR to prevent recurrence of this deficiency. As a minimum, personnel involved with the activity should be reinstructed to procedural requirements and a review should be made to assess any adverse impacts on the final work product. Refer to SDR 104, Severity Level 2.
2. Contrary to the requirement that procurement activities be governed by an approved Quality Assurance Program, F&S Tulsa, OK initiated three (3) Quality Assurance Level II purchase orders to the following for services:
  - o Dr. E. J. Cording, Geotechnical Consultant, Contract No. 508-SC-02, initiated 6/20/86 and amended 1/27/88.
  - o Floyd C. Bossard & Associates, Ventilation Consultant, Contract No. 508-SC-04, initiated 6/20/86 and amended 1/26/88.
  - o David W. Kneebone, OCCU Safety Specialist, Contract No. 508-SC-05, initiated 7/30/86 and amended 1/26/88.

The subject purchase orders for services were amended prior to submitting a revision of the F&S QAPP-002 to WMPO personnel for approval which would address a commitment to the requirements of NVO-196-17, Rev. 5, Sec. 4.0, "Procurement Document Control" and Sec. 7.0, "Control of Purchased Items and Services." Refer to SDR No. 105, Severity Level 2.

3. Contrary to the requirement that each manager or supervisor establish a position description for each position containing minimum education and experience requirements, a review of personnel qualification/verification and training files did not indicate that F&S Tulsa, OK has established position descriptions for activities affecting quality. This condition resulted in the inability to determine the validity of the qualification of ESF personnel performing activities which effect quality. Refer to SDR No. 106, Severity Level 2.
4. Contrary to the requirement that prior to assigning personnel to complex, quality affecting activities, F&S, Tulsa, has not identified those activities which would be considered complex in nature and for which training would be deemed necessary. Refer to SDR No. 107, Severity Level 2.
5. Managers and supervisors have certified personnel as having met the requirements specified in a subject position description. Since no position descriptions have been established (re: SDR NO. 106) for the below listed personnel, these management certifications would be considered invalid.

Project Design Manager  
Lead Project Design Engineer  
Design Support Services Manager  
Project QA Representative  
Lead Mining Design Engineer  
Senior Mining Engineer  
Structural Engineer  
Lead Mechanical Design Engineer  
Lead Electrical/Instrumentation Engineer  
Quality Assurance Coordinator - LV Office

6. Contrary to the requirement that evidence of corrective action implementation be viewed prior to deficiency close out, ADR 87-06 was signed on November 30, 1987 indicating acceptance and closeout prior to completion of corrective action. The corrective action was to revise F&S procedure DC-12 to comply with NNWSI-SOP-03-02. DC-12 was approved on December 11, 1987. Refer to SDR No. 109, Severity Level 3.
7. The requirement exists that CARs shall be initiated by Quality Assurance after all reasonable means for obtaining corrective action have been exhausted and the following condition still exists:

An organization is not following or does not have approved procedures to accomplish it's assigned tasks. Contrary to this requirement, F&S AFR 87-02-04 was initiated for not having an approved procedure to accomplish surveillance activities when a Corrective Action Request (CAR) should have been issued. Refer to SDR No. 110, Severity Level 2.

8. F&S QAPP-002, Rev. 2, Sec. 18, Para. 18.10, 2nd Para. states in part: "Measures for the surveillance of site investigations will be established and executed in accordance with procedures prepared by F&S." Contrary to this requirement, F&S personnel are performing surveillance activities without an approved surveillance procedure. Reference F&S surveillances SR-88-001, SR-87-06. Refer to SDR No. 111, Severity Level 2.
9. The requirement exists that each manager and supervisor shall compare the education, experience, and training of each individual assigned against those specified in the position description and NNWSI Procedures. Only employees who meet the standard will be utilized to perform activities that affect quality. The managers and supervisors will certify that requirements have been met in the format specified in Attachment 1. A copy of this shall be sent to Central Files. The position description for an F&S NTS NNWSI Senior QA Engineer requires as educational qualifications a bachelors or higher degree in an Engineering or Scientific Discipline, and specialized training in the QA Field." Contrary to this requirement, one such individual was certified as having met the educational requirements by the Director of QA on 9/16/87. A review of the Sr. QA Engineer education requirements indicates that the individual should possess a "Master of Arts (MA) and Bachelor of Arts (BA)" which does not comply with the position description or certification of verification of education as detailed by the Director of QA.
10. "Each Department Manager is responsible for training his subordinates or in the case of the staff who report to the Project Manager, the PM shall be responsible for training those personnel."

Contrary to the above requirement, a review of the Senior Mining Engineer's training file does not indicate, by objective evidence, that the subject individual was trained in NNWSI procedures applicable to the individuals discipline, nor is there a method in place throughout the F&S organization (e.g., Tulsa, LV, and the NTS) which identifies the required standard training applicable to the individual disciplines.

It should be noted that the subject individual was certified by the F&S NNWSI Project Manager on 11/2/87 as having met the aforementioned training requirements. Refer to SDR No. 113, Severity Level 2.

11. Contrary to the requirement that each manager/supervisor compare the education, experience and training of each individual assigned against those specified in a position description, a review of personnel position descriptions for both QA and technical personnel (e.g., ESF Design Engineers) does not specify the training required for the individual position description by which the individual is then certified. Refer to SDR No. 114, Severity Level 2.

12. Contrary to the requirement that a position description be processed and treated as a quality document, a review of F&S NNWSI Project QA and technical position descriptions indicates that they do not meet the intent of F&S QAPP-002, Rev. 2 and PP-60-01, Rev. 0. Refer to SDR No. 115, Severity Level 2.
13. F&S procedure NNWSI-DC-17, "Quality Assurance Records," Rev. 3, establishes requirements for the administration of F&S QA records generated by the Tulsa Design Office, including the identification, storage, retention, and transmittal of appropriate records to permanent storage.

Contrary to the above requirements, F&S Tulsa is not complying with the stated requirements in NNWSI-DC-17. "Review and Comment Records" (form 508-TUL-29) could not be located in the F&S Nevada Test Site (NTS) Records Center for any of the F&S Tulsa NNWSI-Design Control Procedures. Refer to SDR No. 116, Severity Level 2.

## 6.2 OBSERVATIONS

### Observation No. 1

Fenix & Scisson Design Control Procedure (DCP) NNWSI-DC-05 "External Interface Control," Rev. 3, paragraph 6.3.1.A, describes that external input documents (i.e., Reference Information Base (RIB)) are issued to F&S and distributed to F&S personnel. F&S engineering personnel are responsible for reviewing and evaluating the design input to determine if it is adequate for the intended design and indicate acceptance or rejection of the design input by letter in accordance with DCP NNWSI-DC-02 "Design Methodology," Rev. 4, paragraph 6.1.1.4.

In the WMP0's view, DCP NNWSI-DC-05, paragraph 6.3.1 should be revised to explain that the external technical input documents including revisions are distributed to appropriate F&S design personnel who perform an evaluation of the technical input in accordance with DCP NNWSI-DC-02. This action would close the loop and clearly delineate procedurally that design input documents including revisions are reviewed and evaluated by F&S design personnel.

Additionally, procedure NNWSI-DC-02, para. 6.1.1.4 should be revised to explain that the evaluation of design inputs and revisions include evaluation for impact on F&S approved designs in addition to the evaluation for acceptance or rejection of the design input. These procedural controls would ensure that if technical data inputs as provided for by the RIB are revised, these revisions will receive a documented engineering evaluation for impact on current approved designs.

Observation No. 2

The verification of design performed by F&S subcontractors is performed in accordance with DCP NNWSI-DC-04, "Design Verification," Rev. 4, para. 6.1.5. F&S Design Study No. 11 "ESF Structural Design Study," Part II, which included F&S internal design inputs as well as a subcontractor design report, was verified in its entirety on one verification sheet. The audit team believes that when a subcontractor design output document is received by F&S, the verification and design analysis of that document should be independent of the verification and design analysis of F&S design output documents. The independent verification and design analysis of the subcontractor design output document should be a part of the QA record package for the F&S design output document. F&S is requested to review and revise appropriate implementing procedures to ensure this type of independent review is performed.

Observation No. 3

The F&S Quality Assurance Program Plan, Rev. 2, para. 5.1 requires that each implementing procedure will include a section which identifies the QA records which are generated during implementation of the procedure. Although this requirement is being implemented satisfactorily in each DCP, the requirement has not been included in DCP NNWSI-DC-08 "Preparation of Procedures," Rev. 3, which is the controlling document for the preparation of all DCPs.

It is requested that F&S provide a commitment date for when NNWSI-DC-08 will be revised to include this requirement.

Observation No. 4

F&S Design Control Procedure NNWSI-DC-02, "Design Methodology," Rev. 4, para. 6.1.1, describes how design inputs are provided to F&S and these design inputs are approved by the WMPO. Subcontractor design output documents (i.e., a developed computer program) may be used directly in an F&S design output document. This subcontractor design output document essentially becomes a design input provided to F&S.

The procedure does not describe how subcontract design inputs provided to F&S are handled or differentiate between design inputs provided by the WMPO and those provided by F&S subcontractors. The implication is that all design inputs (both subcontractor and WMPO provided) are to be approved by the WMPO. It was observed by the audit team that the intended practice to be followed is to have F&S, and not the WMPO, approve subcontractor design inputs. It is requested that F&S review and revise NNWSI-DC-02 as appropriate to clearly delineate how subcontractor design inputs are to be reviewed and approved by F&S.



Observation No. 5

A review of all indoctrination and training records of procedures that F&S Tulsa personnel have been trained in reveals that these records do not consistently reference the revision level of the document to which the individuals have been trained.

It is recommended that future training records which reflect the procedures that personnel have been trained in clearly indicate the revision level of the document in which the personnel have been indoctrinated and trained.

Documenting this revision level will facilitate ascertaining whether or not personnel are trained in the current document(s) associated with the activities they are implementing.

Observation No. 6

A review of activities in the F&S Tulsa office was conducted on February 10 and 11, 1987, which resulted in the identification of 22 minor concerns. This activity identified deficiencies without a system to require a response, track corrective action completion, or to require a corrective action completion date for correcting these deficiencies. Future activities of this nature should be conducted as surveillances (see SDR No. 111).

6.3 RECOMMENDATIONS

Recommendation No. 1

F&S DCP NNWSI-DC-09, "Interdiscipline Checking," Rev. 4, para. 6.2.8, should be revised to include the requirement that the Project Manager or his designee is responsible for assuring that document review comment disputes are resolved. This revision would make the comment resolution process for interdiscipline checking consistent with the comment resolution process for design verifications (refer to DCP NNWSI-DC-04, "Design Verification," Rev. 4, para. 6.1.3.2).

Additionally, if F&S procedures (i.e., DCP-NNWSI-DC-09 and DCP NNWSI-DC-04 allow for comments to be made directly on the work product, these marked-up work products should be specifically retained as QA records. These records would ensure that a method is available to check whether all comments were reconciled and incorporated into the final work product.

Recommendation No. 2

F&S DCP NNWSI-DC-17, "Quality Assurance Records," Rev. 3, describes how records generated and processed in the Tulsa design office are transmitted to Las Vegas. Once in Las Vegas, the records are processed in accordance with F&S procedure PP-50-01, "NNWSI Records Management." The combination of these two procedures addresses the F&S QAPP requirements and indicates the entire trail of F&S Tulsa records, from initial validation to transmittal to the NNWSI Project Records Center. Procedure NNWSI-DC-17 presently does not explain that records transmitted to Las Vegas are further processed in accordance with F&S procedure PP-50-01. Additionally, NNWSI-DC-17 does not reference PP-50-01. The audit team recommends that NNWSI-DC-17 be revised to indicate a reference to PP-50-01 and explain how F&S Tulsa records are further processed. This information would close the loop for the processing of these records.

7.0 REQUIRED ACTION

A written response is required for each Standard Deficiency Report and Observation delineated in Section 6.0. Responses to SDRs are due 20 working days from the date of the SDR transmittal letter, while responses to observations are due within 20 working days of the date of the audit report transmittal letter. The original SDRs were sent via WMPO Letter JB-1720. In addition, copies of these SDRs are included with this report for your information and use. Upon response, acceptance, and satisfactory completion and verification of all remedial and corrective actions, the SDRs will be closed and F&S will be notified by letter of the SDR closure.

Written responses are not required for recommendations contained herein. The recommendations were generated by the audit team to assist the USGS NNWSI staff in implementing its QA program and technical support activities for the NNWSI Project.

## 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.

PERSONNEL CONTACTED IN THE COURSE OF THE AUDIT (88-01)

<u>NAME</u>	<u>ORGANIZATION</u>	<u>TITLE</u>	<u>PREAUDIT CONFERENCE</u>	<u>TULSA</u>	<u>DURING AUDIT</u>		<u>POSTAUDIT CONFERENCE</u>
					<u>LAS VEGAS</u>	<u>MERCURY</u>	
Blaylock, J.	DOE/WMPO	PQM	X	X			X
Bolling, P.A.	F&S	Dir. Human Resources			X		X
Bullock, R. T.	F&S	TPO	X	X	X		X
Buesch, G.	F&S	Mgr. Tech. Support				X	
Caldwell, H. H.	WMPO/SAIC	Audit Team Leader	X	X	X	X	X
Clark, R. W.	OGR/Weston	Observer	X	X	X	X	X
Cox, L. K.	F&S	Records Mgt. Sup.				X	
Cote, R. F.	WMPO/SAIC	Auditor	X	X	X	X	X
Cross, J. A.	F&S	General Manager			X		
Donnelly, J. P.	USNRC	Observer	X	X	X	X	X
Dymmel, G. D.	WMPO/SAIC	Technical Specialist	X	X			
Foley, D. H.	DOE/WMPO	Gen. Engr.					X
Forshaw, H.	F&S	Manager Admin.	X	X			X
Gonzles, J. L.	F&S	Sr. Geologist				X	
Groves, B.	F&S	Admin. Mgr.			X		X
Hale, P. B.	F&S	QA Specialist	X	X			
Heaney, G.	WMPO/SAIC	Auditor	X	X	X	X	X
Hammer, W. L.	F&S	Manager-Drilling				X	
Jacobs, H. L.	F&S	Dir. of Procurement			X		X
Karnoski, P.	WMPO/SAIC	QA Engineer					X
Kazor, W. R.	WMPO/SAIC	Manager A&S					X
Klein, S. H.	WMPO/SAIC	Manager-QA					X
Klimas, D.	WMPO/SAIC	Auditor	X	X	X	X	X
Lockwood, D.	F&S			X			
McCracken, T.	F&S	QA Engr.			X	X	
Monks, R. E.	WMPO	Observer		X			X
Montgomery, J.	Weston/Jacobs	Observer					X
Newton, S.	F&S	Proj. Secretary	X	X			
Owens, J.	DOE/WMPO	Gen. Engineer					X
Pestul, J.	USNRC	Observer	X	X	X	X	X
Philippus, J.	F&S	Sr. Mining Engr.				X	

<u>NAME</u>	<u>ORGANIZATION</u>	<u>TITLE</u>	<u>PREAUDIT CONFERENCE</u>	<u>TULSA</u>	<u>DURING AUDIT</u>		<u>POSTAUDIT CONFERENCE</u>
					<u>LAS VEGAS</u>	<u>MERCURY</u>	
Regenda, M. J.	F&S	Director-QA	X	X	X	X	X
Rue, J.	F&S	QA Coordinator			X		X
Skousen, L.	DOE/WMP0	Branch Chief					X
Smith, B. A.	F&S	Project. Design Engr.	X	X			
Tunney, D. J.	F&S	QA Engineer			X	X	X
Wagand, T. W.	F&S	Project. Design Mgr.	X	X			
Wilson, M.	F&S	Proj. Admin.			X		X
Zimmerman, S.	State of NV	QA Manager	X	X			