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21G-08-0077
GOV-01-55-04
ACF-08-0127
May 15, 2008

Mr. Luis A. Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II, Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, GA 30303

Reference:
1) Docket No. 70-143: SNM License 124
2) NRC Confirmatory Order Modifying License, dated February 21, 2007
3) NRC Letter, Dr. W. D. Travers to D. B. Ferguson, dated November 16, 2007
4) Letter, B. M. Moore to L. A. Reyes, dated May 15, 2008 (21Y-08-0002)

Subject: **Information to Fulfill Confirmatory Order, Section V, Paragraph 3.c**

Dear Sir:

As required by Reference 2 above, Nuclear Fuel Services, Inc. (NFS) hereby submits the third party contractor's report documenting its findings and assessment of the safety culture at NFS and the NFS plan and schedule for implementing the recommendations from the assessment. The original due date for providing this information was modified in Reference 3.

Attached to this letter is "NFS' Comprehensive Safety Culture Improvement Initiative" report which describes the NFS plan to achieve a position of excellence in safety culture within the nuclear industry by the end of 2011. The focus and context for much of this report was provided through the findings and attendant recommendations from the independent team of safety culture experts who delivered two major documents to NFS. The "NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report" is enclosed. The additional report on nuclear material security is being submitted by a separate cover letter due to classified contents (Reference 4).

If you or your staff have any questions, require additional information, or wish to discuss this matter further, please contact me or Mr. Rik Droke, Licensing and Compliance Director, at (423) 743-1741. Please reference our unique document identification number (21G-08-0077) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

B. Marie Moore
Vice President
Safety and Regulatory

RPD/smd

Attachment

Enclosure

cc: Mr. Manuel G. Crespo
Project Inspector
U. S. Nuclear Regulatory Commission
Region II
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61 Forsyth Street, SW
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Mr. Kevin Ramsey
Project Manager
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Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

Mr. Stephen Burris
Senior Resident Inspector
U. S. Nuclear Regulatory Commission

21G-08-0077
GOV-01-55-04
ACF-08-0127

Enclosure

NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report

(144 pages to follow)

UNCLASSIFIED

RA Drake 05/15/08
Reviewed By Date

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SCUBA REPORT
2/16/08

February 16, 2008

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Mr. Dwight B. Ferguson, Jr.
President and Chief Executive Officer
Nuclear Fuel Services, Inc.
1205 Banner Hill Road
Erwin, TN 37650

Subject: NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report

Dear Mr. Ferguson:

The purpose of this letter is to transmit the subject Results Report.

On February 21, 2007, the NRC issued a Confirmatory Order to Nuclear Fuel Services, Inc. (NFS), which reflected an agreement between NRC and NFS that "NFS will conduct, via a third party, an independent safety culture assessment..." The assessment was to include:

- All licensed activities at the NFS-Erwin site, including nuclear material security.
- The commitments NFS made at a management meeting with the NRC on September 18, 2006.
- An assessment template based on the 13 safety culture components discussed in the NRC's Regulatory Issue Summary (RIS) 2006-13.

A team of expert consultants was assembled to serve as the NFS Safety Culture Board of Advisors (collectively known as the SCUBA Team). The team was originally scheduled to complete its assessment report by November 18, 2007. However, a request from the NRC to include a site-wide workforce survey in the assessment scope extended the schedule for completion of the final report to February 16, 2008.

In the conduct of its independent assessment activities, which began in May of 2007, the SCUBA Team has obtained sufficient information to objectively and accurately characterize the current safety culture at the NFS-Erwin site; determine areas of relative strength and weakness; identify and characterize any needs for improvement in organizational safety culture; and establish an initial baseline of information on the NFS-Erwin organizational culture that can be used to support trending activities in the future.

The focus of the SCUBA Team's assessment was on the organizational Safety Culture at the NFS-Erwin Site, rather than on NFS-Erwin's compliance with Nuclear Regulatory Commission (NRC) requirements. During the conduct of its assessment, the SCUBA Team reviewed the design and implementation of a number of NFS-Erwin programs, processes, procedures and functions that are subject to NRC requirements. With the exception of a few instances of apparent procedural non-compliance in the field, the SCUBA Team did not identify any areas where minimum NRC requirements were not met. The SCUBA Team did identify areas where NRC "regulatory expectations" (as implied by the information presented in NRC Regulatory Issue Summary 2006-13) were either not being met or were being minimally met.

NFS senior management requested the SCUBA Team to perform a critical assessment of NFS-Erwin's safety culture based upon comparison with industry best practices. In this regard, the SCUBA Team utilized commercial nuclear power plant industry best practices for this comparison; however, best practices at nuclear fuel cycle facilities and from the chemical industry were also considered.

Application of these challenging evaluation criteria has led to the identification of a significant number of identified "Areas for Improvement" and "Areas in Need of Attention". In this regard, the SCUBA Team has identified the areas that it believes to be the most significant in terms of addressing near-term challenges and of achieving progress towards attainment of the NFS-Erwin vision of excellence. It is important to recognize that near-term actions will need to be taken in a number of areas to provide the "building blocks" for vision attainment.

The SCUBA Team wishes to express its gratitude to the management staff and employees at NFS-Erwin. Throughout the course of this assessment, NFS personnel have been unfailingly courteous and responsive to requests for information and steadfastly forthright in sharing their opinions and beliefs. The task of the SCUBA Team could not have been accomplished without such a cooperative spirit.

Sincerely,

John C. Guibert
SCUBA Team Leader

Cc:
Mr. Tim Lindstrom, Executive Vice President and General Manager, NFS
Ms. B. Marie Moore, Vice President of Safety and Regulatory Management, NFS

Attachment:
NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report

NFS-Erwin Site
2007 Independent Safety Culture Assessment

RESULTS REPORT

February 16, 2008

NFS Safety Culture Board of Advisors

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

I.A Introduction

Nuclear Fuel Services, Incorporated (NFS) is the holder of Special Nuclear Materials License Number SNM-124, which was issued by the Nuclear Regulatory Commission (NRC) pursuant to 10CFR Part 70. This license authorizes the operation of the facilities located at the NFS site in Erwin, Tennessee in accordance with specified license conditions.

On February 21, 2007, the NRC issued a Confirmatory Order modifying License Number SNM-124, which, among other things, reflected an agreement between the NRC and NFS that "NFS will conduct, via a third party, an independent safety culture assessment within the parameters described in Section V (of the Order)."

The NFS 2007 Independent Safety Culture Assessment (ISCA) was conducted by an independent Safety Culture Board of Advisors (SCUBA) with the assistance of the independent SCUBA Team Advisor on matters related to nuclear material security.

By letter dated May 22, 2007, NFS submitted to the NRC:

- Information on the expert consultants who performed the 2007 ISCA, including the experience of these individuals in conducting safety culture assessment activities.
- Revision 0 of the 2007 ISCA plan, which was developed by the SCUBA Team.

By letter dated September 24, 2007, NFS submitted to the NRC Revision 1 of the 2007 ISCA plan, which reflected (1) a decision to include a survey of the NFS-Erwin workforce as an additional source of assessment input and (2) the associated impacts of that decision on the assessment schedule.

I.B Assessment Scope and Objectives

Scope

The primary emphasis of the 2007 ISCA was on organizational safety culture and the influence of organizational safety culture on safety-related performance, including the adequacy of the structure and implementation of policies, programs, processes and functions supporting safety-related performance. The 2007 ISCA evaluated NFS-Erwin safety-related performance to the extent necessary to identify inter-dependent relationships and effects on organizational safety culture.

The scope of the 2007 ISCA:

- Included the Safety Culture Components set forth in NRC Regulatory Issue Summary 2006-13 (NRC RIS).
- Covered all safety-related activities authorized or required at the NFS-Erwin site by License Number SNM-124, including nuclear material security and the activities at the BLEU Complex managed by AREVA.
- Included cultural considerations related to industrial/personnel safety.
- Included all functional groups working at the NFS-Erwin Site and all levels of management with line responsibility for licensed facility operations, up to and including NFS corporate management personnel.

The scope of the 2007 ISCA also included specific coverage of the following additional assessment areas:

- Assessment of the adequacy of the corrective actions taken (or planned) by NFS in response to the issues identified in Sections V.1 and V.2 of the NRC Confirmatory Order for Program Improvements dated February 21, 2007.
- Assessment of the adequacy of the actions taken (or planned) by NFS with respect to the commitments made by NFS at the management meeting with the NRC on September 18, 2006.
- Assessment of the NFS-Erwin safety culture as it applies to nuclear material security.
- Assessment of the adequacy of the June/July 2007 NFS internal self-assessment of NFS-Erwin's current status with respect to the Safety Culture Components and associated attributes set forth in NRC RIS 2006-13.

The SCUBA Team did not perform a specific assessment of chemical safety at NFS-Erwin. However, in the course of conducting other assessment activities, the SCUBA Team developed a set of observations and suggestions related to chemical safety, which have been provided separately to NFS management.

Objectives

The 2007 ISCA was designed to obtain sufficient information to objectively and accurately characterize the current safety culture at the NFS-Erwin site, to determine areas of relative strength and weakness, to identify, characterize and prioritize any needs for improvement in organizational safety culture and to identify additional opportunities for continued improvement in organizational safety culture.

The 2007 ISCA was also designed to establish an initial baseline of information on the NFS-Erwin organizational safety culture that could be used to support trending activities in the future.

I.C Summary of Results

Overview

The model of Safety Culture set forth in NRC RIS 2006-13 was established as the basic framework for the conduct of the 2007 ISCA. This model, which includes 13 Safety Culture Components, was designed for application at operating commercial nuclear power plants. Nonetheless, with a few exceptions, the SCUBA Team considered this model to be directly applicable to NFS-Erwin. It should be noted that the details contained in this model reflect high expectations for safety culture and safety performance.

NFS senior management informed the SCUBA Team that, with respect to Safety Culture, its vision for NFS-Erwin is "Within the next four years all NFS employees will demonstrate excellence in everyday safety resulting in an organizational Safety Culture recognized by stakeholders as a standard in the nuclear industry."

2007 NFS-Erwin Independent Safety Culture Assessment
SCUBA Team Results Report

The NFS-Erwin Safety Culture Leadership Team requested the SCUBA Team to perform a critical assessment of NFS-Erwin's safety culture based upon comparisons with industry best practices. In this regard, with one exception[1], the SCUBA Team utilized commercial nuclear power plant industry best practices for these comparisons.

Accordingly, the following evaluation criteria were used by the SCUBA Team in assigning rating characterizations to the various components of the Safety Culture at NFS-Erwin.

1. *Area for Improvement (AFI):* A component or attribute of the NFS-Erwin safety culture that is considered to be deficient when compared to industry best practices. Such components or attributes require corrective action.

2. *Area in Need of Attention (ANA):* A component or attribute of the NFS-Erwin safety culture that is considered to be marginally effective when compared to industry best practices. Such components or attributes are significant candidates for continuous improvement.

3. *Opportunity for Improvement (OFI):* A component or attribute of the NFS-Erwin safety culture that is considered to be acceptable when compared to industry best practices, but that is a noteworthy candidate for continuous improvement.

Application of these challenging evaluation criteria led to the identification of a significant number of identified "Areas for Improvement" and "Areas in Need of Attention" in the NFS-Erwin Safety Culture. However, it is important to recognize that the application of somewhat less challenging criteria (e.g., "industry norms") would also have led to the identification of a significant number of areas needing improvement.

The focus of the SCUBA Team's assessment was on the organizational Safety Culture at the NFS-Erwin Site, rather than on NFS-Erwin's compliance with Nuclear Regulatory Commission (NRC) requirements. During the conduct of its assessment, the SCUBA Team reviewed the design and implementation of a number of NFS-Erwin programs, processes, procedures and functions that are subject to NRC requirements. In this regard, with the exception of a few instances of apparent procedural non-compliance in the field, the SCUBA Team did not identify any areas where minimum NRC requirements were not met. On the other hand, the SCUBA Team identified that most components of the NFS-Erwin Safety Culture fail to meet (or only minimally meet) NRC "regulatory expectations" (as set forth in or implied by NRC RIS 2006-13).

The following tables provide summary-level results of the SCUBA Team's assessment of each Safety Culture Component based on comparisons with industry best practices and from a regulatory perspective.

[1] The one exception was for the "Work Control" Safety Culture Component. Due to significant differences in the safety-related considerations that apply to commercial nuclear power plants and nuclear fuel cycle facilities in this area, the SCUBA Team decided to use nuclear fuel cycle facility best practices for comparison purposes.

TABLE 1
SCUBA TEAM RATING CHARACTERIZATIONS
NRC RIS 2006-13 SAFETY CULTURE COMPONENTS

SAFETY CUTURE COMPONENT	SCUBA TEAM RATING CHARACTERIZATION
OVERALL SAFETY CULTURE	**AREA FOR IMPROVEMENT**
Human Performance Components	**Area for Improvement**
> Decision Making	Area for Improvement
> Resources	Area for Improvement
> Work Control	Opportunity for Improvement
> Work Practices	Area for Improvement
Problem Identification and Resolution Components	**Area for Improvement**
> Corrective Action Program (PIRCS)	Area for Improvement
> Operating Experience	Area for Improvement
> Self/Independent Assessment	Area for Improvement
Safety Conscious Work Environment Components	**Area in Need of Attention**
> Environment for Raising Concerns	Area in Need of Attention
> Prevent, Detect and Mitigate Perceptions of Retaliation	Area for Improvement
Other Safety Culture Components	**Area for Improvement**
> Accountability	Area for Improvement
> Continuous Learning Environment	Area for Improvement
> Organizational Change Management	Area for Improvement
> Safety Policies	Area in Need of Attention

TABLE 2
SUMMARY TABLE OF SCUBA TEAM FINDINGS
FOR EACH OF THE NRC RIS 2006-13 SAFETY CULTURE COMPONENTS

SAFETY CUTURE COMPONENT	SCUBA TEAM FINDINGS (TOTAL, # BY TYPE)
ALL 13 COMPONENTS COMBINED	**41 TOTAL** **29 AFI, 6 ANA, 6 OFI**
Human Performance Components	**15 Total** **9 AFI, 3 ANA, 3 OFI**
> Decision Making	3 Total 2 AFI, 1 ANA, 0 OFI
> Resources	7 Total 4 AFI, 1 ANA, 2 OFI
> Work Control	2 Total 0 AFI, 1 ANA, 1 OFI
> Work Practices	3 Total 3 AFI, 0 ANA, 0 OFI
Problem Identification and Resolution Components	**10 Total** **8 AFI, 1 ANA, 1 OFI**
> Corrective Action Program (PIRCS)	5 Total 4 AFI, 1 ANA, 0 OFI
> Operating Experience	3 Total 2 AFI, 0 ANA, 1 OFI
> Self/Independent Assessment	2 Total 2 AFI, 0 ANA, 0 OFI
Safety Conscious Work Environment Components	**3 Total** **2 AFI, 1 ANA, 0 OFI**
> Environment for Raising Concerns	2 Total 1 AFI, 1 ANA, 0 OFI
> Prevent, Detect and Mitigate Perceptions of Retaliation	1 Total 1 AFI, 0 ANA, 0 OFI
Other Safety Culture Components	**13 Total** **10 AFI, 1 ANA, 2 OFI**
> Accountability	5 Total 5 AFI, 0 ANA, 0 OFI
> Continuous Learning Environment	5 Total 3 AFI, 1 ANA, 1 OFI
> Organizational Change Management	1 Total 1 AFI, 0 ANA, 0 OFI
> Safety Policies	2 Total 1 AFI, 0 ANA, 1 OFI

TABLE 3
SUMMARY TABLE OF SCUBA TEAM CONCLUSIONS RELATED TO MEETING NRC REGULATORY EXPECTATIONS FOR EACH OF THE NRC RIS 2006-13 SAFETY CULTURE COMPONENTS

SAFETY CUTURE COMPONENT	SCUBA TEAM CONCLUSION
Human Performance Components	**Does not meet regulatory expectations**
> Decision Making	Does not meet regulatory expectations
> Resources	Does not meet regulatory expectations
> Work Control	Does not meet regulatory expectations
> Work Practices	Does not meet regulatory expectations
Problem Identification and Resolution Components	**Does not meet regulatory expectations**
> Corrective Action Program (PIRCS)	Partially meets regulatory expectations
> Operating Experience	Does not meet regulatory expectations
> Self/Independent Assessment	Does not meet regulatory expectations
Safety Conscious Work Environment Components	**Meets minimum regulatory expectations**
> Environment for Raising Concerns	Meets minimum regulatory expectations
> Prevent, Detect and Mitigate Perceptions of Retaliation	Meets minimum regulatory expectations
Other Safety Culture Components	**Does not meet regulatory expectations**
> Accountability	Does not meet regulatory expectations
> Continuous Learning Environment	Does not meet regulatory expectations
> Organizational Change Management	Does not meet regulatory expectations
> Safety Policies	Meets minimum regulatory expectations

I.D Conclusions

The SCUBA Team considers the organizational Safety Culture at the NFS-Erwin Site to be generally deficient when compared to industry best practices.

The SCUBA Team considers the organizational Safety Culture at the NFS-Erwin Site to generally not meet regulatory expectations as set forth in NRC RIS 2006-13.

With the exception of recurring procedural compliance issues, the SCUBA Team considers the NFS-Erwin Site to meet minimum regulatory requirements.

The most significant challenges for NFS are to:

- Convince the organization of the need to change
- Develop and implement an effective action plan
- Ensure that appropriate resources are made available, effectively deployed, and steadfastly reinforced by NFS management.

NFS has historically provided sufficient resources to assure operation of its primary production facilities. However, the investment has generally been at the "meets minimum regulatory requirements" level. Over the past few years, rather than consistently focusing on improving its Safety Culture and its safety-related performance, NFS has diverted its scarce resources to address situational challenges (e.g., the workforce strike and the operational problems at the BLEU Processing Facility) or to pursue new business opportunities. As a result, initiatives to move beyond a minimally compliant culture have been slow, deferred or abandoned. Resource constraints have contributed to a culture tolerant of degraded conditions and low accountability. The current NFS leadership team desires to achieve excellence in safety culture and safety-related performance within the next four years. The SCUBA Team acknowledges movement towards that end. However, it is essential that a set of key improvement initiatives be undertaken and completed in a timely manner to demonstrate success and set the stage for additional improvement initiatives.

The SCUBA Team recognizes and applauds the recent (December 2007) decision by NFS management to suspend production operations to effect repairs to safety-related components as reflecting the proper sensitivity for conservative operational decision making under difficult circumstances. While there were some dissenting opinions and engineering justifications offered, the principle of safe operations led to a collegial approval of the shutdown recommendation across inter-disciplinary lines. This behavior is commendable and has demonstrated to the entire organization that the current management team places safety first. The challenge is to institutionalize the processes and behaviors that led to this outcome.

I.E Integrated Recommendations

As indicated in Table 2, the SCUBA Team has identified a significant number of Findings. Detailed information on the individual Findings and associated SCUBA Team recommendations to address them are provided in Section III of this Report.

The SCUBA Team recognizes that:

- The individual Findings are not all equal in importance and/or urgency.
- There are significant variations in the nature and level of effort that will be necessary to address individual Findings.

As specified in the 2007 ISCA Assessment Plan, the SCUBA Team has developed recommendations on the relative priority of the identified Findings. To facilitate this process, the SCUBA Team developed and used a set of nine major themes to organize, categorize and cross-correlate the individual Findings.

Although this approach and the results of its application are subject to interpretation, it is suggested that the site leadership adopt either this approach or a similar binning process to evaluate and address the Findings. The SCUBA Team believes that such an approach will help to ensure that assigned corrective action issue owners are aligned and can effectively coordinate their efforts with co-workers who are working on similar broad themes within different Safety Culture Components.

The SCUBA Team's recommendations on the relative priority of the identified Findings are presented below within the context of the nine over-arching themes that the SCUBA Team has used to group the individual Findings.

ORGANIZATIONAL VALUES, STANDARDS AND EXPECTATIONS

NFS-Erwin management has stated that its goal is to achieve a position of excellence within the nuclear industry by the end of 2011. To achieve this goal, it is essential that open and receptive lines of communication be developed to allow the site to obtain and evaluate information related to deficient conditions or potential opportunities for improvement. The organization must encourage, expect and enable individuals to report problems, concerns and suggestions for improvement. Supervision, management and leadership must value, encourage and reinforce a questioning attitude on the part of all employees. Once confronted with an issue to resolve, supervision and management must ensure appropriate conservatism in the decision making process. The December 2007 decision to shut down the HEU process in response to a safety-related challenge is an example of a proper questioning attitude, open reporting, collegial evaluation and conservative decision making. Supervision and management must consistently model the behaviors that make such a response the rule rather than the exception. In this regard, the SCUBA Team has concluded that the following three Findings are most significant:

AFI-ACC-01, Questioning attitude
AFI-CAP-02, Remove barriers to problem identification and reporting
ANA-DEC-01, Expectations for conservative decision making

In addition to these three, the SCUBA Team believes that the following eight additional Findings are most efficiently grouped under this theme:

AFI-PDM-01, SCWE (Prevent, Detect, Mitigate)
AFI-CLE-03, Leadership/management skill development
ANA-ERC-01, SCWE (Environment for Raising Concerns)
ANA-CLE-01, Employee engagement
AFI-WP-03, Lock-out/Tag-out procedure
ANA-RES-01, Fitness for Duty (fatigue considerations)
OFI-RES-02, Operational focus; Maintenance Department reporting chain
ANA-WC-01, Industrial safety in the field

COMMUNICATION OF VALUES, STANDARDS AND EXPECTATIONS

The NFS-Erwin leadership team recently developed the "Safety Strong" concept, which is based on the key principles set forth in the 13 Safety Culture Components. In this regard, the NFS-Erwin General Manager met with the workforce to introduce them to the "Safety Strong" concept. Additional and continuing actions are needed to ensure that the workforce fully understands how the "Safety Strong" concept and its associated principles apply to their day-to-day work activities, thereby reinforcing organizational values, standards and expectations. For similar reasons, management should adopt a proactive communications strategy to deliver timely and effective communications on the bases/reasons for decisions, particularly decisions that could otherwise potentially be interpreted by the workforce as compromising nuclear safety or industrial/personnel safety. Supervisory and managerial behaviors should consistently demonstrate and reinforce organizational values, standards and expectations as embodied in the "Safety Strong" principles. Their behaviors and decisions will set the tone and will speak louder than any other message that will be delivered. In this regard, the SCUBA Team has concluded that the following three Findings are most significant:

AFI-SP-01, Reinforce "Safety Strong"
AFI-DEC-02, Communicate the bases for decisions
AFI-ACC-03 Management must model high-accountability behaviors

In addition to these three, the SCUBA Team believes that the following additional Finding is most efficiently grouped under this theme:

AFI-OCM-01, Organizational Change Management

HUMAN PERFORMANCE CHALLENGES

The SCUBA Team acknowledges the initial development of a Human Performance (HuP) training program at NFS-Erwin. This represents a beginning to a much needed comprehensive approach to improving human performance at NFS-Erwin, which should result in a variety of cascading benefits. A key issue of immediate importance at NFS-Erwin is procedural compliance. Additional near-term actions are needed to understand and address recurring problems in this area. In this regard, the SCUBA Team has concluded that the following two Findings are most significant:

AFI-WP-01, Comprehensive Human Performance Program
AFI-WP-02, Procedural compliance

EMPHASIZE OWNERSHIP AND ACCOUNTABILITY

NFS-Erwin has been and continues to be weak in establishing and reinforcing clear ownership, accountability and responsibility for performance and results. This applies at both the organizational level and at the individual level. The SCUBA Team has concluded that addressing this weakness is essential to the successful achievement of other desired and/or necessary improvements. In this regard, the SCUBA Team has concluded that the following three Findings are most significant:

AFI-ACC-04, Institutionalize single points of accountability
AFI-ACC-05, Institutionalize a personnel performance management process
AFI-CLE-02, Drive performance improvement by goal setting and management reviews

RESOURCING FOR SUCCESS

Lack of sufficient resources and decisions related to the allocation of resources have contributed to many of the identified Findings and, as one would expect, many of the identified Findings have resource implications. In this regard, the SCUBA Team has concluded that the following Finding is most significant:

AFI-RES-04, Resource functions to meet higher standards of performance

In addition to this one, the SCUBA Team believes that the following additional four Findings are most efficiently grouped under this theme:

AFI-RES-03, Engineering resources
OFI-RES-01, Emergency Brigade readiness
OFI-CLE-01, Miscellaneous training program enhancements
OFI-SP-01, Knowledge transfer

ENHANCE EFFECTIVENESS OF PROGRAMS AND PROCESSES

A formalized process for operational decision making is needed to ensure that decisions are fully informed and sufficiently conservative. The effectiveness of key programs and processes needs to be enhanced in order to attain the desired high level of performance. The organizational culture is one of minimum regulatory compliance; this standard will not support the site's goal to match industry best practices. In some cases, additional dedicated resources will be required. In this regard, the SCUBA Team has concluded that the following four Findings are most significant:

AFI-DEC-01, Operational Decision Making
AFI-CAP-01, Re-evaluate the scope of the Corrective Action Program
AFI-CAP-03, CAP effectiveness and quality
AFI-ERC-01, Employee Concerns Program

In addition to these four, the SCUBA Team believes that the following additional four Findings are most efficiently grouped under this theme:

AFI-CAP-04, Commitment management
ANA-OE-02, Internal operating experience
AFI-ACC-02, Quality of commitment responses
ANA-CAP-01, CAP enhancements

ELIMINATE TOLERANCE FOR DEGRADED CONDITIONS

The existence of long-standing degraded material conditions, recurring equipment problems and operational work-arounds does not reflect high organizational standards and expectations and has resulted in an organizational culture that has a high tolerance for degraded conditions. This has a deleterious effect on the attitude of the workforce, including a dampening of enthusiasm for problem reporting due to frustration with the lack of corrective actions. In this regard, the SCUBA Team has concluded that the following two Findings are most significant:

AFI-RES-01, Top Ten Lists
AFI-RES-02, Site Infrastructure Improvement Plan

In addition to these two, the SCUBA Team believes that the following Finding is most efficiently grouped under this theme:

OFI-WC-01, Comprehensive Work Management System

EXPAND THE FRAME OF REFERENCE

NFS-Erwin is challenged by years of insularity that have led to an outdated frame of reference with respect to industry standards and expectations and industry best practices. In this regard, the recent decision to join INPO has opened up a key avenue for obtaining outside knowledge. The site should develop and implement a strategic plan for industry benchmarking and other related activities to obtain external information that can be used both to raise internal standards and expectations and to enhance overall organizational effectiveness. In this regard, the SCUBA Team has concluded that the following Finding is most significant:

AFI-CLE-01, Benchmarking

FOCUS ON CONTINUOUS IMPROVEMENT

NFS-Erwin does not currently use a comprehensive set of indicators and metrics (beyond those needed to monitor production) to monitor performance and to drive continuous improvement. Similarly, NFS-Erwin has only recently begun to focus on the importance of self-assessment activities and to embrace the value of proactive self-criticism. The current self-assessment program requires improvement in execution and should be expanded to include additional implementing elements. In this regard, the SCUBA Team has concluded that the following two Findings are most significant:

AFI-SA-02, Performance indicators and metrics
AFI-SA-01, Self and Independent assessment

In addition to these two, the SCUBA Team believes that the following two Findings are most efficiently grouped under this theme:

AFI-OE-01, External operating experience
OFI-OE-01, BLEU Processing Facility (BPF) lessons learned

II. ASSESSMENT METHODOLOGY

II.A Introduction

The SCUBA Team utilized the Safety Culture component framework set forth in NRC RIS 2006-13 for the conduct of the 2007 ISCA and was informed by the relevant guidance contained in NRC Inspection Procedure 95003 and its Enclosures[2].

The assessment was conducted in three phases:

- Phase 1 involved information gathering through personnel interviews, behavioral observations and documentation reviews, and integration of this information to develop preliminary findings.
- Phase 2 involved a continuation of information gathering through personnel interviews, behavioral observations and documentation reviews and the evaluation and integration of the results of the workforce survey with the Phase 1 results.
- Phase 3 involved the continued evaluation and integration of all sources of assessment input to develop final findings, conclusions and recommendations. Phase 3 culminated with the development and issuance of this Report.

As indicated in the Assessment Plan, the SCUBA Team committed to:

- Inform the NFS-Erwin Safety Culture Leadership Team of potentially significant issues identified through the 2007 ISCA on a real time basis, including key findings and conclusions.
- Provide recommendations and suggestions to address identified issues on a real time basis, to the extent practicable.
- Document any such real-time recommendations and suggestions in an attachment to the 2007 ISCA Final Report. (Attachment E to this Report identifies the in-process recommendations provided by the SCUBA Team to NFS management.)

[2] Specifically, Sections 02.07-02.09, 03.07-03.09 and Enclosures A through F.

II.B Assessment Sources of Input

In performing the 2007 ISCA, the SCUBA Team utilized five diverse sources of input:

- Confidential personnel interviews
- Behavioral observations
- Documentation reviews
- Workforce survey numerical results
- Workforce survey confidential write-in comments

All sources of information were evaluated on an integrated basis by the SCUBA Team in the process of identifying findings and reaching conclusions.

Confidential Personnel Interviews

All personnel interviews were conducted either by members of the SCUBA Team or by the independent SCUBA Team Advisor on matters related to nuclear material security. All personnel interviews were individual interviews as opposed to group interviews.

The SCUBA Team developed and used a guidance document for the conduct of personnel interviews, including a requirement for the use of interview checklists; i.e., a listing of potential questions or areas to be covered in the interviews. These checklists incorporated information derived from the SCUBA Team's review of several sources of information on safety culture attributes, including but not limited to NRC RIS 2006-13 and NRC Inspection Procedure 95003 (including Enclosure 95003-B).

Information obtained from personnel interviews that contributed to SCUBA Team conclusions and findings is included in:

- The "Supporting Information" sub-section of the individual Safety Component Results Sections of this Report (Sections III.A through III.M).
- Attachments A, B, C and D to this Report, which address the additional area of assessment scope.
- The SCUBA Team's separate classified report on NFS-Erwin nuclear material security.
- Confidential documents that present the results of the SCUBA Team's interview-based exploration of the underlying reasons for lower workforce survey numerical ratings provided by individual NFS-Erwin sub-organizations that were identified as "organizational outliers" based on the survey results (Refer to Section V of this Report).

In this regard, the information obtained from personnel interviews has been treated as confidential information with respect to attribution of the source of such information. To provide further protection of the confidentiality of interviewees, the information obtained from personnel interviews has been reported collectively with information obtained from other sources of assessment input.

Personnel interviews were conducted in two sequenced phases.

Phase 1 Personnel Interviews consisted of "targeted interviews" with personnel most knowledgeable of and/or most directly involved in the design and implementation of:

- NFS-Erwin policies, programs and processes that support each of the 13 safety culture components identified in NRC RIS 2006-13.
- NFS-Erwin policies, programs and processes related to nuclear material security;
- NFS-Erwin corrective actions taken (or planned) in response to the issues identified in Sections V.1 and V.2 of the Confirmatory Order for Program Improvements.
- NFS-Erwin actions taken (or planned) with respect to the commitments made by NFS at the management meeting with the NRC on September 18, 2006.
- The NFS internal self-assessment of its current status with respect to the safety culture components and associated attributes set forth in NRC RIS 2006-13.

The Phase 1 personnel interviews included the use of both structured and unstructured interview methods depending on the nature and purpose of each interview.

The SCUBA Team conducted 269 Phase 1 personnel interviews across a broad spectrum of the NFS-Erwin organization. This total does not include follow-up interviews, "casual interviews" with NFS-Erwin personnel in the field or question and answer sessions associated with NFS presentations requested by the SCUBA Team, all of which occurred during the conduct of the assessment. Attachment F to this Report provides information on the distribution of the Phase 1 personnel interviews by worker category, by organizational affiliation and by Safety Culture Component.

Phase 2 personnel interviews were primarily based on the results of the workforce survey. These interviews were conducted either due to low survey participation rates by individual functional organizations or due to the need to obtain additional information related to "organizational outliers" identified through the analysis of the survey results. The number of personnel interviews conducted within each such organization was in accordance with the criteria specified in the Assessment Plan, and the specific personnel interviewed were selected using random selection methods. In several instances, the SCUBA Team interviewed more than the minimum required number of personnel[3].

Interviews of personnel from low-responding organizations were structured in nature and used a specific set of pre-established core interview questions, which were augmented with a selection of questions from a specific set of additional pre-established generic interview questions.

Interviews of personnel from "outlier organizations" used a combination of structured and unstructured interview methods. The SCUBA Team used interview questions drawn from a pre-established core set of interview questions that were augmented with questions developed based upon the analysis of the survey results, including the analysis of the write-in comments, for each identified "outlier organization."

The SCUBA Team conducted 75 Phase 2 personnel interviews. Attachment F to this Report provides information on the distribution of the Phase 2 personnel interviews by worker category, by organizational affiliation and by the purpose for the interviews.

[3] In these instances, the additional interviewees were not selected randomly but rather were selected at the discretion of the SCUBA Team member leading the specific evaluation. This situation occurred on several occasions when the random selection process did not result in a sufficiently diverse demographic profile of the organization under evaluation.

Behavioral Observations

All behavioral observation were conducted either by members of the SCUBA Team or by the independent SCUBA Team Advisor on matters related to nuclear material security.

The SCUBA Team developed and used guidance documents for the conduct of behavioral observations. Three guidance documents were used – one for each of the three Types of Behavioral Observations that were conducted as part of the 2007 ISCA.

- Observations of Meetings
- Observations of Field Work Activities
- Observations of Training Activities

These guidance documents provided behavioral observation checklists that were "fit for purpose" for the type and nature of each type of activity to be observed. These checklists incorporated information derived from the SCUBA Team's review of several sources of information on conducting behavioral observations, including but not limited to NRC Inspection Procedure 95003 (including Enclosure 95003-D).

The SCUBA Team conducted:

- 88 observations of NFS-Erwin meetings ranging from NFS Board of Directors meetings through work planning and scheduling meetings.
- 85 observations of field work activities ranging from conduct of facility operations to product packaging and transportation.
- 27 observations of training activities ranging from craft technical training to the employee re-indoctrination training provided to workers returning from the strike.

Attachment F to this Report provides information on the distribution of these behavioral observations for the sub-categories of these three general categories.

Information obtained from behavioral observations that contributed to SCUBA Team conclusions and findings is included in:

- The "Supporting Information" sub-section of the individual Safety Component Results Sections of this Report (Sections III.A through III.M).
- The SCUBA Team's separate classified report on NFS-Erwin nuclear material security.

Documentation Reviews

All documentation interviews were conducted either by members of the SCUBA Team or by the independent SCUBA Team Advisor on matters related to nuclear material security.

The SCUBA Team developed and used guidance documents for the conduct of documentation reviews. Five guidance documents were used – one for each of the five types of documentation reviews conducted as part of the 2007 ISCA:

- Documents related to NFS-Erwin policies, programs, processes and procedures.
- Documents that provide evidence of policy/program/process implementation.
- Documents related to NFS-Erwin actions and/or plans that address specific provisions of the Confirmatory Order for Program Improvements dated February 21, 2007.

- Documents related to the NFS-Erwin internal self-assessment of its status with respect to the safety culture components and associated attributes set forth in NRC RIS 2006-13.
- Documents related to other areas of interest to the SCUBA Team.

Information obtained from documentation reviews that contributed to SCUBA Team conclusions and findings is included in:

- The "Supporting Information" sub-section of the individual Safety Component Results Sections of this Report (Sections III.A through III.M).
- Attachments A, B, C and D to this Report, which address the additional area of assessment scope.
- The SCUBA Team's separate classified report on NFS-Erwin nuclear material security.

The SCUBA Team obtained and reviewed an extensive amount of documentation, including a large portion of the NFS-Erwin policy statements, process documents, and procedures in order to develop a basic understanding of the licensing basis and operating philosophy for the company. The initial bibliography was developed in consort with the NFS-Erwin Safety Culture Component owner and expanded to include such pertinent items as second-tier references found in the governing documents as well as leads developed during interviews and meetings.

In addition to the list of approximately 1500 documents that can be found in the NFS Policy Listing, the SCUBA Team reviewed selected information, nominally developed over the past two years (i.e., 2005-2007), from such diverse sources as:

- NFS-Erwin Operating License
- NRC Licensee Performance Reports
- PIRCS Problem Reports
- Root Cause Analyses
- Apparent Cause Analyses
- PIRCS Review Committee Agendas
- PIRCS Oversight Committee Minutes
- Safety and Safeguards Review Committee Minutes
- Training Lesson Plans
- Benchmarking Trip Reports
- Quality Assurance Audit Reports
- Radiation Protection Program Records
- Preventive Maintenance Database
- Work Orders (completed and pending)
- Equipment Logbooks
- Murray Guard Force Training and Employee Manual
- Fitness for Duty Records
- Human Resources Correspondence
- "NFS Currents" (site newspaper)
- "NFS Supervisor News"
- Policy, Process, and Procedure documents in draft
- Employee Concerns Investigations (Human Resources records)

This body of documented information covered each of the 13 Safety Culture Components, nuclear material security and the additional areas of scope included in the assessment.

Workforce Survey

In August 2007, NFS obtained the services of SYNERGY Consulting Services Corporation (SYNERGY) to conduct a survey of the NFS-Erwin workforce to obtain information to support the SCUBA Team's assessment activities.

The 2007 NFS Safety Culture Survey questions were specifically designed and specifically modeled to address the cultural attributes associated with each of the NRC RIS 2006-13 safety culture components as they apply to licensed activities at the NFS-Erwin Site[4].

The target population for participation in the survey included all employees (including AREVA employees) and long-term contractors working at the NFS-Erwin Site. Participation in the survey was voluntary, but was highly encouraged by NFS-Erwin Site management. The survey was administered during the August 19-31, 2007 time period by NFS-Erwin Site workforce personnel who had been trained by SYNERGY to serve as survey administrators.

The survey participation rate was 88%, which is significantly higher than the industry average of 77% for surveys conducted by SYNERGY. The participation rate for NFS Employees was 93%. The participation rate for NFS-Erwin Contractors was 75%. The participation rate for NFS Hourly/Union Employees was 84%. All of these participation rates are higher than industry norms as observed by SYNERGY.

Two NFS-Erwin individual Functional Organizations were identified as low-participating organizations based on low survey participation rates. Both of these organizations provided survey numerical rating results that were higher than the NFS-Erwin Site Composite ratings. The SCUBA Team conducted interviews with randomly-selected personnel from those two organizations and determined that the survey results for the two organizations were sufficiently representative of the entire population within those organizations.

The survey results served as a source of information that was used by the SCUBA to:

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[4] In light of the fact that NFS-Erwin is a fuel cycle facility and that some of SYNERGY's standard cultural survey questions used at commercial nuclear power plants were customized to reflect the specific nature of the activities conducted at the NFS-Erwin Site, SYNERGY obtained the services of Westat, a recognized leader in statistical survey research, to perform psychometric analyses of the specific survey questions and the specific modeling used in the NFS Safety Culture Survey. In its report entitled, "Analysis of the Psychometric Properties of the NFS 2007 Safety Culture Survey," dated October 16, 2007, Westat concluded that:

> *"The psychometric properties of the 2007 NFS Safety Culture Survey were found to be well within commonly accepted standards for such instruments. The factor analysis results provided support that the questions were grouped according to their respective nuclear safety culture dimensions and the reliability analysis provided evidence that the respondents were answering consistently across the questions within dimensions. Analyses were conducted to differentiate functional organizations from one another on several key culture survey metrics. This analysis found that SYNERGY's priority rating criteria were similar to or slightly more conservative than a banding approach in that the SYNERGY criteria identified more functional organizations as needing to take remedial action in the near-term than a banding approach identified."*

- Validate and/or clarify preliminary findings and conclusions based on the SCUBA Team's collective evaluation of information obtained through personnel interviews, behavioral observations and documentation reviews.
- Identify potential additional areas for further assessment.
- Identify potential additional findings and/or conclusions.
- Identify and evaluate individual NFS-Erwin Functional Organizations that were identified as "organizational outliers" based on the survey results.
- Determine the need for additional personnel interviews.

Information obtained from the workforce survey that contributed to SCUBA Team conclusions and findings is included in the "Supporting Information" sub-section of the individual Safety Component Results Sections of this Report (Sections III.A through III.M).

Detailed information on the workforce survey results are presented in the "2007 NFS-Erwin Site Safety Culture Survey Results Report," dated November 21, 2007, prepared by SYNERGY Consulting Services Corporation.

Survey Numerical Results

NFS requested SYNERGY to characterize the survey numerical results using commercial nuclear power plant industry norms.

SYNERGY provided survey numerical rating results for the Overall Nuclear Safety Culture, for each of the Safety Culture Components and sub-Components set forth in NRC RIS 2006-13 and for individual cultural attributes/survey questions. This information was provided for the NFS-Erwin Site Composite organization, for all NFS-Erwin functional organizations and for all NFS-Erwin demographic categories.

SYNERGY identified a number of cautionary considerations related to interpreting NFS-Erwin workforce perceptions as reflected in the survey numerical results, including the following:

- In interpreting the benchmarking of the survey numerical results, NFS management and the SCUBA Team should be mindful that the nature of the activities conducted at the NFS-Erwin Site differ substantially from the activities conducted at commercial nuclear power plants, as do the associated risks to individual workers and to the public.
  - The workforce is likely to think of nuclear safety in terms of nuclear criticality safety and in terms of radiological exposure, radiological contamination and radiological uptake.
  - The nature of the risks to public health and safety are very different as compared to the nature of the risks associated with the operation of commercial nuclear power plants. Commercial nuclear power plants have numerous safety-related features and systems that are designed, operated and maintained to prevent and mitigate the consequences of potential events and accidents that are unique to commercial nuclear power plant operations. NFS-Erwin does not require this level of checks and balances in its approach to system design and operation.
- To the extent that NFS-Erwin has been insular with respect to commercial nuclear power plant industry standards of excellence, workforce perceptions associated with some ratings/rating characterizations may be artificially high due to the lack of an adequate frame of reference or adequate understanding of a particular cultural attribute. For

example, this appears to be the case for ratings associated with "Self-Assessment and Independent Assessment."

- Some ratings/rating characterizations may be comparatively high due to the more limited scope of nuclear safety considerations/applications at a fuel cycle facility such as NFS-Erwin.
- Some numerical ratings may be high on an absolute basis, but may have lower rating characterizations due to the higher levels of excellence reflected in commercial nuclear power plant norms. For example, this appears to be the case for certain attributes related to the Safety Conscious Work Environment.
- Some numerical ratings may be low on an absolute basis, but may have higher rating characterizations due to the lower levels of excellence reflected in commercial nuclear power plant industry norms. For example, this appears to be the case for certain attributes related to staffing levels and the adverse impacts of workload.

In comparing the workforce survey numerical results with the information obtained from other sources of assessment input, the SCUBA Team found that NFS-Erwin workforce perceptions were generally (and in some cases were significantly) more positive than warranted. In most cases this was clearly the result of an inadequate frame of reference with respect to industry standards of excellence. The NFS-Erwin workforce did accurately identify a significant number of specific areas in need of improvement, but failed to recognize or appreciate the need for improvement in other areas.

In this regard, the numerical survey results served to validate and amplify the SCUBA Team's concerns with respect to the "frame of reference" issue at NFS-Erwin, as well as to validate specific areas in need of improvement.

Based on the survey numerical results several individual NFS-Erwin Functional Organizations were identified as "organizational outliers" based on having provided numerical ratings that deviated significantly from industry norms. This is discussed further in Section V of this Report.

Confidential Survey Write-In Comments

Approximately 48% of the survey respondents provided write-in comments, which is significantly higher than the industry average of 33% observed by SYNERGY. This reflects a high level of engagement by the workforce. A total of 1,114 comments were provided. Of these, approximately 36% were positive in nature and 64% were negative in nature. Based on SYNERGY's experience, this is a typical distribution of survey write-in comments.

Write-in comments served to obtain information that:

- Was used to validate the interpretation of the numerical survey results.
- Provided insights into the underlying reasons for the numerical survey ratings.
- Identified issues that were not specifically addressed by the survey questions.
- Provided insights into the underlying reasons for the lower numerical survey ratings provided by individual NFS-Erwin organizations identified by SYNERGY as "outlier organizations."

The write-in comments were solicited with the guarantee that they would be treated in confidence with respect to potential attribution of the comments to specific individuals. Hence,

access to the write-in comments is controlled and limited. In accordance with SYNERGY's Confidentiality Protection Policy:

- The NFS-Erwin write-in comments were redacted as necessary to protect the identity of the individuals providing the comments.
- A copy of the redacted write-in comments has been provided to NFS-Erwin senior management on the basis that access to this information will be controlled and limited to those with a genuine "need to know."

SYNERGY provided a copy of the redacted write-in comments to the SCUBA Team based on its clear "need to know."

The SCUBA Team found the write-in comments to be a valuable source of assessment input.

III. ASSESSMENT RESULTS – SAFETY CULTURE COMPONENTS

The SCUBA Team's assessment of the NFS-Erwin Safety Culture with respect to each of the 13 Safety Culture Components set forth in NRC RIS 2006-13 is presented below.

For each Safety Culture Component, the SCUBA Team has provided:

- The RIS 2006-13 Safety Component description
- An Overall Conclusion
- An Overall Rating Characterization based on comparisons with industry best practices
- A Conclusion with respect to NRC regulatory expectations as expressed in or implied by NRC RIS 2006-13
- Findings and Recommendations
- Supporting Information

III.A DECISION MAKING SAFETY COMPONENT

RIS-2006-13 Component Description

Licensee decisions demonstrate that nuclear safety is an overriding priority.

SCUBA Team Conclusions

This component of NFS-Erwin safety culture is considered to be deficient when compared to commercial nuclear power plant industry best practices and represents an Area for Improvement (AFI). The Site does not meet regulatory expectations with respect to formalization of the decision making process, and does not consistently meet regulatory expectations with respect to conservatism in decision making.

In this regard, the SCUBA Team has concluded that:

- Although industry standards call for an orderly approach to operational decision making, examples exist where the process was hurried or shortcuts were taken -- particularly when continued production was at stake.
- The process for operational decision making is not sufficiently formalized or systematically implemented.
- Decisions are not consistently developed with the requisite degree of conservatism, particularly when a potential for personal injury is involved.
- Communication of the bases for key decisions affecting safety is in many instances untimely, insufficient or lacking.

Recent observations indicate improvement in conservative operational decision making. Notably, the decision in December 2007 to suspend HEU production in order to correct faulty drain lines (IROFS) clearly demonstrated that nuclear safety was the overriding priority in that instance.

SCUBA Team Findings and Recommendations

AFI-DEC-01 NFS-Erwin does not have a systematic, rigorous, and formalized system for making operational decisions when risk-significant or safety-significant issues arise.

In this regard, the SCUBA Team recommends the following:

- Formally define the authority, roles and formal process steps for making operational decisions when issues involving safety and safe facility operations are under consideration.
- Develop and implement an Organizational Decision Making (ODM) process of the type utilized in the commercial nuclear industry. This process should include participation of both inter-disciplinary and multi-level reviewers to broaden the opportunity for employee involvement and input, ensure quality decision making, and promote organizational sponsorship.

AFI-DEC-02 NFS does not adequately communicate the bases for decisions related to nuclear safety or safe facility operations to the work force. The SCUBA Team recommends that management adopt a proactive communications strategy to deliver timely and effective communications on the bases/reasons for decisions, particularly decisions that could otherwise potentially be interpreted by the workforce as compromising nuclear safety or industrial/personnel safety.

ANA-DEC-01 NFS-Erwin lacks an appropriate focus on conservatism when making decisions. Too frequently, operations focus has come to be interpreted as production focus. The basic premise for going forward with any safety-significant or risk-significant activity should be that it has been shown that it is safe to proceed as planned, rather than that it is acceptable to proceed unless it can be proven that it is unsafe to do so. The SCUBA Team recommends that management establish and enforce the expectation that clear and convincing evidence that a proposed action is safe and compliant will be required before approval is given to proceed.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Decision Making Component for the NFS-Erwin Site Composite Organization was characterized as an "Opportunity for Improvement" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization near the bottom of the third quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are more positive than is justified by actual performance. In particular, the rating of "a systematic and rigorous approach is used to make nuclear safety related decisions" as a perceived area of strength reflects an organizational frame of reference issue (i.e. a lack of sufficient knowledge of industry standards and expectations in this area).

Numerical ratings of several individual cultural attributes indicate that the workforce perceives the need for improvement in the following areas:

- Decision making as it applies to the timely and effective resolution of equipment problems.
- Obtaining first-hand information from personnel most intimately familiar with and involved in important issues or activities that could affect nuclear safety or safe plant operations.
- Sufficiency and appropriateness of management involvement in important issues or activities that could affect nuclear safety or safe plant operations.
- Properly balancing nuclear safety, production, schedule and cost priorities in decisions related to safe facility operations.

There were relatively few survey write-in comments related to "Decision Making." The positive comments indicated that decisions are being made appropriately, conservatively and with nuclear safety as a priority. The negative comments indicated that there is insufficient involvement of (or consultation with) the most knowledgeable people, such as operators and front line workers, in the process of making decisions, and that, on occasion, supervision and management have ignored or did not act upon expressed warnings and concerns from operators and front line employees.

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team gained significant insights during interviews, observations, and documentation reviews. Some examples include:

- The recent decision (December 2007) to suspend HEU operations to effect repairs to items relied on for safety (IROFS) reflects the proper sensitivity for conservative operational decision making and has resonated through the organization. The problem centered on a lack of translucent piping in process drain lines. A conservative decision to shut down and repair was made. There were some dissenting opinions and engineering justifications offered, but the principle of safe operations led to a collegial approval of the shutdown recommendation across inter-disciplinary lines. This behavior is commendable and demonstrates appropriate operational decision making. The challenge is to institutionalize the processes and behaviors that led to this outcome.
- The site lacks a procedure that defines the operational decision making process when risk-significant or safety-significant issues arise. This procedure should include defined roles and authority, formal process steps, and explicit expectations for inter-disciplinary reviews by all affected stakeholders. Responsible individuals must be aware of their roles and take steps to ensure that critical decisions are made at the appropriate level of the organization. The INPO Operational Decision making model is an industry standard that can be applied at NFS-Erwin.
- There are occasions when non-conservative decisions are made in the field in order to allow continued production. An example is a recent decision, made by a fuel area supervisor, to continue a production run although he knew there was uncertainty as to whether there was a violation of operating procedures. The individual's motivation was to avoid jeopardizing the production run and the resultant loss of product. The action taken was a violation of operating procedures, and the supervisor was ultimately subjected to disciplinary action.
- Effectiveness reviews of safety-related decisions to verify validity of underlying assumptions, identify unintended consequences, and improve future decisions are not typically performed.
- The decision making process is typically multi-disciplinary, but is not fully participative in that operators and craft personnel are not typically involved. This is borne out by feedback from the workforce survey and the interview process.
- Information obtained from employee interviews indicates that employees rarely understand the basis for decisions involving risk-significant or safety-significant situations. It appears this is due to the lack of a communication tool for informing employees about key decisions. As a result, information flows down the chain of authority with varying degrees of effectiveness.

NFS Self-Assessment

NFS-Erwin self-assessed its conservatism in decision making as "Sometimes effective, somewhat reactive, requires monitoring." NFS had the following observations relative to Decision Making:

- An integrated systematic approach to making day-to-day decisions is not utilized.
- Integrated Safety Analyses (ISA) are utilized to establish nuclear safety design bases and provide a decision making framework.
- In the case where an event is not evaluated by an Integrated Safety Assessment, the organization relies upon the training and experience of Safety and Operations Management for decision making.
- Authority for decisions is clearly defined via the NFS-HS procedures.
- Decision making is viewed as appropriately conservative.
- There are a variety of review processes to assure appropriately conservative decisions are made for project work.
- Communications of decisions was viewed as occurring principally through the work order system and occasionally through the Operational Readiness Review process.

The SCUBA Team believes NFS was self-critical in that it accurately characterized the lack of formality that characterizes most of its decision making processes. However, the team also determined that (1) decision making is not consistently conservative, and (2) reasons for significant decisions related to nuclear safety and safe facility operations are not effectively communicated to the workforce by management.

III.B RESOURCES SAFETY COMPONENT

RIS-2006-13 Component Description

The licensee ensures that personnel, equipment, procedures and other resources are available and adequate to assure nuclear safety.

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Resources Safety Culture Component is deficient when compared to commercial nuclear power plant industry best practices and, as a result, represents an Area for Improvement (AFI). It has also concluded that this Safety Culture Component does not meet regulatory expectations.

In this regard, the SCUBA Team has concluded that:

- Conduct of day-to-day operations is adequate from a nuclear safety perspective.
- An embedded tolerance of degraded conditions raises significant concerns regarding the current general safety culture and the potential for carryover effects on nuclear safety.
- Weaknesses or fragilities exist in the effectiveness of key supporting functions, program and processes, the most notable of which are (1) the shortage of project and process engineering expertise, and (2) inadequate support personnel for the Corrective Action, Quality Assurance/Self Assessment and Configuration Management Programs.

SCUBA Team Findings and Recommendations

AFI-RES-01 The NFS-Erwin organization has become accustomed to tolerating recurring equipment problems, operational burdens and work-arounds, degraded equipment conditions and degraded infrastructure issues. For the most part, these do not represent immediate challenges to nuclear safety per se, but there are a number of situations that represent challenges to industrial/personnel safety. Organizational tolerance of such degraded conditions and the corresponding message that is sent with respect to management values and standards represents (1) a deficiency with respect to industry standards and norms, (2) a challenge to be overcome in leadership's quest for excellence and, unless abated, (3) the potential for adverse carryover effects on the organization's nuclear safety culture.

In this regard, the following near-term actions are recommended:

- Demonstrate higher management standards by focusing organizational attention and resources on resolving these conditions through the use of "top ten priority lists" in the following areas:
  - Operational burdens and work-arounds with nuclear safety implications
  - Operational burdens and work-arounds with industrial/personnel safety implications
  - Recurring equipment problems
- Develop "on the shelf" resolutions for known degraded conditions such that they can be implemented as soon as the opportunity arises.

AFI-RES-02 In the past, insufficient financial resources have been applied to meet NFS-Erwin's facility infrastructure needs. The current physical condition of the facility is considered to be deficient when compared to industry standards and norms.

In this regard, it recommended that NFS provide funding and allocate resources to support implementation of the NFS-Erwin Infrastructure Improvement Plan in a timely and aggressive manner, with priority applied to those areas representing the highest operational and regulatory compliance risks.

AFI-RES-03 While it appears that NFS has sufficient engineering resources to support safe operations of its nuclear facilities, these resources are frequently diverted to support new business opportunities. This has contributed to significant engineering work backlogs, tolerance of degraded equipment conditions, delays in resolving recurring equipment problems and delays in addressing facility infrastructure improvement needs. It also represents a challenge to the timely and effective evaluation and resolution of problems identified through the Corrective Action Program (PIRCS).

In this regard, the SCUBA Team recommends the following:

- Inventory and prioritize the entire engineering work backlog.
- Develop and effectively implement a strategic approach to ensure the adequacy and sufficiency of engineering support resources, both internal and external.

AFI-RES-04 NFS-Erwin must successfully address a number of staffing issues in order to ensure the effectiveness of key programs and processes, as well as to successfully implement the additional and/or augmented programs, processes and functions necessary to support NFS leadership's quest for excellence. Appropriately qualified and trained staff is needed in the areas identified below. In some cases, this additional staffing is needed to ensure that regulatory commitments and/or regulatory expectations are met. (This staffing issue is also reflected in SCUBA Team Findings AFI-CM-01 and -02.)

In this regard the SCUBA Team recommends the following:

- Corrective Action Program staffing needs to be augmented. There is inadequate staffing at the present time to ensure that root cause analyses, corrective actions, and tracking and trending activities are conducted in a timely and effective manner.
- Industrial/Personnel Safety staffing needs to be increased to assure (1) that all applicable regulations are identified and effectively implemented and (2) that there is increased field presence to provide first-hand behavioral reinforcement of industrial safety standards and required practices (e.g., Lock-out/Tag-out).
- The Configuration Management program needs to be adequately resourced to ensure that regulatory commitments are met on schedule and in a high quality manner.

- The current level of staffing of the Quality Assurance "compliance based" function is marginally adequate.
- Implementation of a proactive Employee Concerns Program will require a full-time personnel assignment.
- Implementation of a "performance based" Nuclear Oversight function will require additional personnel to support a robust self and independent assessment program.
- Implementation of other initiatives under the Safety Culture Improvement Plan will likely require the dedication of additional resources.

ANA-RES-01 Establish an appropriate policy for working hours and overtime that addresses fitness-for-duty fatigue considerations. Although excessive overtime is not worked on an organization-wide basis, individual departments and employees occasionally have to work excessive amounts of overtime (multiple, repetitive 16-hour days) due to shipping and receipt workloads, seasonal vacation schedules, and unplanned leaves of absence. Recent efforts on the part of NFS executive leadership have been successful in mitigating this problem, but a permanent policy change is needed.

OFI-RES-01 The operational readiness of the Emergency Response Brigade (including both personnel and equipment) has not been recently evaluated by an external expert. It is recommended that such an evaluation be performed.

OFI-RES-02 The NFS-Erwin Maintenance organization has historically not reported directly to same organizational chain of command as the Operations organization. In order to provide additional "operational focus," it is recommended that the Maintenance organization report through the same organizational chain as the Operations organization.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Resources Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Adequacy/Competency" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the second quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are significantly more positive than is justified by actual performance. In particular:

- The rating of "sufficiency of financial resources to maintain nuclear safety and safe facility operations" as a perceived area of strength is inconsistent with the lack of sufficient engineering and financial resources to address operator workarounds, operator burdens, degraded conditions and work backlogs.
- The rating of "staffing levels are consistent with the demands of maintaining nuclear safety and safe facility operations" as a perceived area of strength is potentially

misleading due to the fact that commercial nuclear power plant norms for this cultural attribute are particularly low. On an absolute basis, the NFS-Erwin numerical rating of this attribute is not particularly high. In fact, it was one of the ten lowest rated cultural attributes.

Numerical ratings of several individual cultural attributes indicate that the workforce perceives the need for improvement in the following areas:

- Maintaining low backlogs of work (e.g., maintenance work requests, corrective actions, and engineering projects).
- Minimizing and effectively controlling deferrals of scheduled preventative maintenance.
- Sufficiency of staffing levels to avoid the need for extensive or continuous overtime work.
- Ensuring that work order packages are of high quality.
- Correcting deficient procedures in a timely manner.
- Maintaining procedures, drawings and calculations consistent with operational practices and facility physical configuration.
- Ensuring that the programs and processes that support nuclear safety and safe facility operations are of high quality.

There were a significant number of survey write-in comments related to Resources.

- Many of the comments were related to staffing levels and were almost exclusively negative in nature. The comments indicated that there is inadequate staffing for current and planned workload, which results in significant amounts of forced overtime. Many of those providing comments also indicated that forced overtime is creating concerns about the potential impacts of excessive worker fatigue on nuclear safety. The SCUBA Team has observed that excessive overtime is not worked on an organization-wide basis. However, individual departments and employees occasionally have to work excessive amounts of overtime (multiple, repetitive 16-hour days) due to shipping and receipt workloads, seasonal vacation schedules, and unplanned leaves of absence.
- Many of the comments were related to equipment and facilities and were predominantly negative in nature. The comments expressed concerns about degraded material and equipment conditions including problems not being fixed, difficulties in maintaining aging equipment, lack of needed equipment and spares as well as concerns about the condition of site facilities including leaks, lighting, temperature control, alarms, and general upkeep.
- Many of the comments were related to procedures and were generally balanced in nature. The positive comments indicated that procedures, including postings and limit cards, are generally considered to be good and strength. The negative comments indicated that procedure quality is considered to be poor for various reasons including being vague, confusing, too long, complex, cumbersome, and including excessive requirements.
- A few of the comments were related to training and were more negative than positive in nature. The positive comments indicated that nuclear safety training and emergency training are considered to be adequate. The negative comments indicated that there are needs and/or desires for additional training focused on the recognition and mitigation of criticality and radiation hazards.

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team has observed that NFS has historically provided sufficient resources to assure safe operations of its primary production facilities, particularly with respect to nuclear criticality considerations, but that such assurance has generally been at the "meet minimum regulatory requirements" level. Over the past few years, rather than consistently focusing resources on pursuing improvements in its safety culture and its safety-related performance, NFS has been in a position of diverting its relatively scarce resources to address immediate situational challenges (e.g., the workforce strike and the operational problems at the BPF facility) and/or to pursuing and responding to new business opportunities. Among other things, this has fostered a culture that tolerates degraded conditions. Some examples are as follows:

- The SCUBA Team has observed a significant number of operator burdens/work-arounds (some of which involve the use of administrative controls in lieu of engineering controls) as a response to degraded equipment conditions. A specific example is the venturi scrubber in the fuel area that requires operators to make manual caustic additions for pH control because the automated system is not functional. This situation has existed so long that the operating procedure has been modified to make the manual addition process the standard mode of operation. (The original operating procedure only allowed manual additions for "off-normal" conditions.) This is clearly a case where industrial safety margin has been sacrificed in that (1) operators must manually handle hazardous chemicals, and (2) administrative controls have replaced engineered controls.
- The SCUBA Team has observed degraded conditions, some of which create industrial/personnel safety risk and some of which create risk to continued productions. An example of the former is the catastrophic failure of the waste water filter press, while an example of the latter is the HVAC fan system that services the Material Access Area (MAA). In all cases, tolerance of these degraded conditions reinforces lower than desired management standards and contributes to a poor value system that has the potential to carry over into the nuclear safety culture.
- The SCUBA Team has observed (1) recurring equipment problems that have not been corrected in a timely manner, such as the false alarms that have plagued the criticality alarm system; and (2) equipment problems that have become accepted on the basis of a "run to failure" philosophy, such as the frequent calciner high pressure interlock shutdowns in the fuel recycle area (approximately one/week).
- There are numerous plant infrastructure needs including roof replacements, HVAC system component replacements, selective process equipment replacements, paving, etc.

NFS developed an Infrastructure Improvement Plan in August 2007 to aid in the development of capital budgets. The plan identified a long list of problems that need to be fixed. A key issue is prioritizing this list so that degraded conditions, including security, nuclear safety, personnel safety, and production capability are addressed in a timely manner commensurate with risk. It will also be necessary to ensure that engineering resources are available to execute this plan. This will require a strategic approach that will likely include: (1) increasing the project engineering and process engineering design staffs, (2) freeing up process engineers to focus on operations-related activities, and (3) establishing relationships with larger contractors and constructors to facilitate execution of major projects. This plan will require strategies to deal with the ever-present security clearance issues and the shortage of resources in the Johnson City locale.

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that several other key NFS programs, processes and functions needed to support a strong safety culture are not sufficiently staffed for success or to meet regulatory expectations. As discussed in other Safety Culture Component Sections of this Report, additional staffing is needed to ensure the effective implementation of (1) the NFS Corrective Action Program, (2) the NFS Industrial/Personnel Safety Program, (3) the NFS Configuration Management recovery program and (4) the NFS compliance-based Quality Assurance Program.

The SCUBA Team has also concluded that additional resources will be needed to effectively implement several new programs, processes or functions designed to improve both safety culture and safety performance. As discussed in other Safety Culture Component Sections of this Report, these include, but are not limited to:

- Implementation of a proactive Employee Concerns Program (alternate channel for raising safety concerns) will require a full-time personnel assignment.
- Implementation of a performance-based Nuclear Oversight function will require additional personnel assignments.
- Training resources appear to be adequate at this time; however, additional training resources may well be required as the NFS-Erwin Safety Culture Improvement Plan progresses.

In August 2007, the SCUBA Team identified that the NFS Fitness for Duty policy did not address worker fatigue considerations and expressed concern in this regard to NFS senior management. Identification of this concern was prompted in large part by information obtained regarding excessive amounts of overtime (multiple, repetitive 16-hour days) due to shipping and receipt activities that were ongoing at that time. The SCUBA Team has observed the actions taken by NFS management to correct these situations, and has provided comments and suggestions on draft versions of the new (but not yet released) NFS Policy that addresses this concern.

There were a number of workforce survey write-in comments that expressed concerns about the status of Emergency Brigade equipment. The team subsequently determined that the operational readiness of the Emergency Brigade (including both personnel and equipment) has not been recently evaluated by an external expert. Given the importance of this function to the facility, and the many OSHA regulations that are applicable to emergency brigades, it recommended that a comprehensive and independent audit be performed in the near future.

The SCUBA Team has the following observations related to conduct of maintenance:

- Maintenance backlogs are low enough to support safe operations. There is typically a two to three week backlog of work orders, which is normal for a fuel cycle facility of this size. Maintenance of Safety Related Equipment (SRE) is given priority and there is little or no backlog for SRE work orders.
- NFS-Erwin has a reactive approach to preventive maintenance and tends to operate equipment until it fails. This approach can lead to degraded safety margins and does not exemplify high standards or best business practices. While not rising to the level of a Finding, the SCUBA Team recommends consideration of a reliability-centered approach to preventive maintenance.

- In terms of reporting structure, the Maintenance organization has historically not reported directly to same organizational chain of command as the Operations organization. In order to provide increased "operational focus" throughout the NFS organization, the SCUBA Team believes that a reporting relationship similar to that used throughout the commercial nuclear power plant industry would facilitate increased organizational attention on the resolution of operator burdens/work-arounds, recurring equipment problems and degraded conditions. In this regard, the SCUBA Team recommends that the Maintenance organization report through the same organizational chain as the Operations organization.

Reviews and observations of procedures and other process-related documentation revealed the following:

- A substantial amount of effort is being expended by the Configuration Management Program to provide up-to-date process documentation (e.g., P&IDs).
- Labeling of components in the MAA seems to be very good. Labeling of components outside the MAA (e.g., the tank farm) is frequently lacking.
- A number of employees stated that the current procedures are too detailed and clumsy to use in the field, and that it is difficult to make timely changes to procedures. (It is believed that this is largely due to the shortage of process engineering support resources.) In fact, several employees indicated that the deficiencies in the procedure change process contributed to inconsistent procedure use. There was also frustration over procedure changes made without operator consultation, in that the resultant procedures were frequently impossible to implement without operator work-arounds or manual compensation. Procedure compliance issues are discussed in detail in the Work Practices Safety Culture Component section of this Report.

NFS Self-Assessment

NFS rated the Resources Safety Culture Component as "sometimes effective, somewhat reactive, requires monitoring" when compared to the attributes identified in NRC RIS 2006-13. NFS provided the following summary statements related to this rating:

- NFS maintains adequate resources and available equipment to meet regulatory requirements for safe operation.
- The number of bargaining unit personnel is sufficient for safe operations.
- Critical support resources, such as engineering (both project engineering and process engineering), are stretched very thin, and this will continue to be the case even after current vacancies are filled. This results in inadequate documentation of design related information where it is not a regulatory requirement.
- Work package development and planning is often shortchanged thereby increasing the risk of delay or problems during execution.
- Infrastructure replacement has been inadequate for many years. This has created a significant backlog of infrastructure projects that will take many years to complete.
- There are several factors that will continue to put immediate pressure on resources, particularly engineering and ISA/Nuclear Criticality Safety (NCS) resources.
  - The company continues to aggressively pursue business expansion opportunities.

  - Due to the availability of trained personnel, the first response is to recruit from within the organization to fill new vacancies. Since there is limited bench strength, this places an additional burden on remaining resources.
  - Planned enhancements to the Configuration Management Program, although it will reduce the burden on engineering resources long-term, will, in the short-term, require additional effort to enter and validate configuration data.
  - Utilization of PIRCS is increasing, thereby increasing the number of investigations and corrective actions requiring, primarily engineering, attention.
- Although an effort has been made to staff positions above budgeted levels (so-called "load-the-bench"), current vacancies have yet to be filled, primarily in engineering. The short-term pressure on resources coupled with an inability to meet recruiting objectives, is a significant concern.

The SCUBA Team is in general agreement with the NFS self assessment. However, the team also observed that:

- The organization has developed a tolerance for degraded equipment, degraded infrastructure, recurring equipment problems and the associated operator burdens and work-arounds.
- Although the most severe resource shortages are in the project and process engineering areas, there are resource requirements in other key areas.
- A strategic plan needs to be developed to manage NFS-Erwin's resource needs.

III.C WORK CONTROL SAFETY COMPONENT

RIS-2006-13 Component Description

The licensee plans and coordinates work activities consistent with nuclear safety.

RIS-2006-13 was developed for application at commercial nuclear power plants. Although, most of the Safety Culture Components set forth in RIS-2006-13 are directly applicable to fuel cycle facilities, this is not the case for the Work Control Safety Culture Component.

Commercial power reactors have large amounts of stored energy in the form of fission products and decay heat. They also have relatively complex, integrated safety systems, almost all of which have multiple trains, redundant systems, or other back-up capabilities. Maintenance of these systems requires careful planning, resource coordination and risk assessment lest such activities lead to an unintended impact on plant operations and protection of the reactor core. Fuel cycle facilities have neither the stored energy, complexity nor integrated systems typical of a nuclear power plant. Instead, fuel cycle facility safety systems are based on Integrated Safety Analyses (ISA) that identify items relied on for safety (IROFS) that are not typically redundant. Maintenance activities at fuel cycle facilities are focused on assuring the reliability and availability of these IROFS. Thus, risk assessment and management activities do not involve Probabilistic Risk Assessment or other comparable tools. The SCUBA Team has evaluated the Work Control Safety Culture Component with these differences in mind.

SCUBA Team Conclusions

Work Control is an attribute of the NFS-Erwin safety culture that is considered to be an Opportunity for Improvement (OFI). Work Control performance is acceptable when compared to fuel cycle facility industry best practices, but is a noteworthy candidate for continuous improvement. It does not meet regulatory expectations in that existing processes have contributed significantly to the creation of a significant backlog of undocumented maintenance issues. This backlog has, in turn, contributed to (1) increased operator burdens/work-arounds, and (2) the use of compensatory measures that rely on manual actions and administrative controls.

In this regard, the SCUBA Team has concluded that:

- NFS does not have a comprehensive work management process/system to identify, prioritize, plan, schedule, manage risks and execute work. A work management system of the type described would (1) significantly improve equipment/process equipment reliability, safety margins and operating efficiency, and (2) support resolution of the backlog of degraded equipment issues that currently exists at NFS-Erwin site.
- The quality of work orders should be upgraded. Current documents are loosely worded and do not provide the degree of specificity needed to assure error-free implementation.
- The preventive maintenance program needs to be expanded. It is more reactive than proactive. There is little or no equipment performance monitoring or equipment life-cycle management; and reliability-centered maintenance is not a focal point for the organization.
- Industrial Safety oversight of site activities needs to be improved for the specific purpose of providing enhanced reinforcement of safety requirements. This is particularly important for contractor activities performed outside the Material Access Area (MAA).

SCUBA Team Findings and Recommendations

ANA-WC-01 Industrial Safety oversight of maintenance, project, and contractor activities needs to be increased. There is little or no Industrial Safety presence in these areas; thus, there is little reinforcement of safety requirements. This is particularly true for contractor activities outside the MAA, as demonstrated by the number and seriousness of contractor events documented in the PIRCS system.

OFI-WC-01 NFS-Erwin should implement a comprehensive Work Management System to provide an integrated, organization-wide process for identifying and prioritizing issues, planning the required work and associated resources, and executing the work in a safe and error-free manner. Objectives of this initiative should include:

- Improving equipment safety margin and reliability.
- Increasing the rigor, formality and management oversight of the work order process.
- Increasing organizational focus on reliability-centered maintenance.
- Eliminating the backlog of degraded equipment facilities, equipment and processes, and the associated operator work-arounds.

A benchmarking visit to the Westinghouse Columbia Fuel Fabrication Facility is recommended to start this effort. Interactions with INPO and manufacturing facilities having world-class maintenance programs are recommended as well.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Work Control Component for the NFS-Erwin Site Composite Organization was characterized as an "Area in Need of Attention" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the bottom quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterizations, are generally consistent with actual performance. In this regard, the characterizations of the following individual cultural attribute ratings are noteworthy exceptions:

- The rating of "effectiveness of measures and controls to ensure the radiological safety of the workforce" as a perceived area for improvement is potentially misleading due to the fact that commercial nuclear power plant norms are particularly high for this cultural attribute. On an absolute basis, the NFS-Erwin numerical rating of this attribute is high (and would likely have been even higher if the bases for programmatic changes had been more effectively communicated to the workforce).
- The rating of "the effectiveness of work prioritization and management processes" as a perceived area of adequacy/competency is potentially misleading due to the fact that commercial nuclear power plant norms are particularly low for this cultural attribute. On an absolute basis, the NFS-Erwin numerical rating of this attribute is not particularly high. In fact, it was one of the lower rated cultural attributes.

- The rating of "the minimization and control of use of temporary modifications and other compensatory measures that rely on manual actions" as a perceived area of adequacy/competency reflects an organizational frame of reference issue (i.e., a lack of sufficient knowledge of industry standards and expectations in this area).

Numerical ratings of several other individual cultural attributes indicate that the workforce perceives the need for improvement in the following areas:

- Anticipating potential problems associated with planned work activities and taking appropriate precautions to minimize adverse impacts.
- Appropriately utilizing insights from risk analyses in planning and decision making.

There were a reasonable number of write-in comments related to Work Control. The vast majority of these were negative in nature. The negative comments indicated that many have concerns about perceived reductions in radiological protection, including decreases in the frequency of conducting air sampling, routine radiological surveys, and personal surveys as well as increasing allowable dose rates. The SCUBA team believes that (1) these comments are the result of a management failure to effectively communicate the bases for changes that have been made to the radiation safety program, and (2) the NFS radiation protection program has been effective in the past, and remains so today.

Personnel Interviews, Behavioral Observations, and Documentation Reviews

NFS does not have either a formal, comprehensive work management system to identify, prioritize, plan, schedule, coordinate and execute work. It does, however, control maintenance and project work and manage risk through SOP 392, "Work Request Procedure," and the associated permitting procedures and processes. These include Safety Work Permits, Confined Space Entry, Lock-out/Tag-out, Hot Work, Underground Work Release, Security Escort, MAA Penetration, Utility Interruption, Firewall Penetration, Fire System Impairment and Radiation Protection. Risk assessment efforts are focused on assuring that the work being performed can be executed safely; and that the safety of structures, systems and components (SSC) and the associated license requirements are not compromised once the work has been completed.

NFS also has a procedure system to govern the operation and maintenance of structures, systems and components (SSC). Included in this system is an ISA procedure that provides guidance on performing safety analyses on NFS processes, as well as providing comprehensive guidance regarding Fire Protection, Industrial Safety, Chemical Safety, Nuclear Criticality Safety, Environmental Protection, Radiation Safety, ALARA, and Safety Related Equipment (SRE).

Reviews of the Work Order system revealed that there is typically a two to three week backlog of maintenance work orders, most of which are reactive and corrective action focused. This backlog does not include equipment issues where a Work Order has not yet been generated. Examples include work requests that are in queue for engineering support, and equipment that is in a degraded condition, but for which no corrective action request has been documented (that is, no Work Order, engineering work request, or PIRCS corrective action system entry has been generated). It is not clear how many systems or how much equipment requires corrective action that has not been documented, but there are multiple examples where degraded conditions have become a way of life and Operations personnel have learned to live with and accommodate these

degraded conditions. (This is discussed further in the Resources Safety Culture Component Section of this Report.) Reviews of existing Work Orders revealed that these documents are frequently loosely worded and do not consistently provide the degree of specificity needed to assure error-free implementation.

NFS has a formal preventive maintenance program. Maintenance requirements for individual systems are established by the system owner (typically a Process Engineer), and turned over to Maintenance to execute the requirements. Although IROFS and SRE are identified along with any functional testing requirements, there is no systematic effort to identify other critical plant components, manage critical spare parts, or perform contingency planning. Preventive maintenance activities appear to be completed on schedule; but there is, little or no effort expended in the areas of equipment performance monitoring, equipment reliability improvement, or equipment life-cycle management. As a result, the overall system and equipment maintenance effort is much more reactive than proactive. The preventative maintenance program for SRE and IROFS is also reactive in that functional testing failure determines when SRE and IROFS receive maintenance attention.

The organization does not consider work-related risk analyses in the context of Human Performance (HuP) concepts such as Latent Organizational Weaknesses, Flawed Defenses, Error Precursors, or the Initiating Actions that can lead to an event; and HuP tools are not widely used to provide and/or manage risk insights. Pre-job briefs are a component of SOP 392 and are used by maintenance personnel. A guidance document for performing pre-job briefs has been developed by the Maintenance Department, but it has not been formalized. As a result, the structure, content and quality of pre-job briefs vary substantially. Contingency planning and abort criteria tend to be developed on an ad hoc basis depending on the magnitude and extent of any unanticipated problems that occur. It is anticipated that the newly implemented HuP program will ultimately correct the above deficiencies. (The benefits of implementing a robust HuP program are discussed in detail in the Work Practices Safety Culture Component section of this Report.)

Oversight of maintenance, work orders, and shop floor project work is typically provided by work group and work area supervision as time pressures permit. Radiation Protection oversight is also provided for these activities and appears to be appropriate in scope. Industrial Safety oversight of these activities is typically limited in scope or non-existent.

Oversight of contractor work activities is provided by project engineers, construction superintendents and work area supervisors, as appropriate. This oversight is more comprehensive in the HEU processing areas than in the balance of the plant. The limited oversight that is performed for contractors working in the balance of the facility is reflected by the greater number and severity of contractor-related safety events that are documented in the PIRCS system.

The impact of work on the shop floor and on other work groups is communicated through a variety of regularly scheduled meetings, including shift turnover meetings. However, shift turnover meetings are not formalized and the content is left to the discretion of the individuals. Special meetings are called on an as-needed basis. The system used to coordinate work has not been formalized per se; however, roles and responsibilities of maintenance personnel, project engineers, process engineers, construction coordinators, etc. are described in project management

procedures. These communications (e.g., shift-turnovers) are not as well-structured or as well-documented as those that typically occur in the nuclear or chemical industries.

NFS Self-Assessment

NFS management's overall evaluation of Work Control was that the processes were "sometimes effective, somewhat reactive, requires monitoring." Specific observations were as follows:

- NFS management reviewed the procedures used to manage risk and control work to verify the procedure required risk considerations to be incorporated into work scheduling. It was determined that SOP 392 is designed to assure that reviews of risk considerations are completed as the work request is routed for approval. The Integrated Safety Assessment, Nuclear Criticality Safety, Radiological Safety and Security groups have the responsibility to review the appropriate sections of the work package. The scope of this review is dependent upon the category of the work request (Minor 1, Minor 2, or Major).
- Operationally, procedures for each area are reviewed and approved through the plant's Safety and Safeguards Review Committee (SSRC). Risks, contingencies, job site conditions and compensatory measures are reviewed and discussed prior to procedure approval.
- The review of the pre-job and shift briefing processes revealed that there were no formal procedures. However, the Fuel, BPF, Radiological, and Maintenance Departments utilize shift turnover tools such as supervisor meetings, log books, white boards, planned schedules and face-to-face meetings.
- A number of meetings were identified where work is planned and coordinated. It is management's belief that these provide for the free flow of information, including dissenting opinions, as well as a strong focus on operations' priorities.
- No documents were identified that provide specific guidance with respect to communication, coordination and cooperation between on-site and off-site work groups. Sub-contracted off-site work is controlled via SOP 392. The majority of contact with off-site organizations doing work at NFS-Erwin is handled by construction coordinators, process engineers or on-site contractors.

The SCUBA Team's assessment is in general agreement with NFS's self-assessment of Work Control. Observations made by the SCUBA Team are that (1) there is no comprehensive/integrated work management process to identify, prioritize, plan, schedule, manage risks and execute work; (2) there is a backlog of equipment issues that is not in the Work Order system whose scope is not fully understood; (3) maintenance activities are more reactive than proactive; (4) Human Performance principles are not utilized in performing work-related risk analyses; and (5) Work Control processes would benefit from increased management oversight.

III.D WORK PRACTICES SAFETY COMPONENT

RIS-2006-13 Component Description

Work practices support human performance.

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Work Practices Safety Culture Component at NFS-Erwin is deficient when compared to commercial nuclear power plant industry best practices and represents an Area for Improvement (AFI). Human performance, particularly in the area of procedural compliance, does not meet regulatory expectations and has led to occasional failure to meet regulatory requirements.

In this regard, the SCUBA Team has concluded that:

- Organizational standards are principally focused on getting tasks completed to support production.
- There is a strong supervisory presence in place in the field, but its primary focus is to respond to production and quality issues. Observations and interviews indicate very little supervisory time is spent on establishing, coaching and reinforcing safety performance standards, including procedural compliance.
- Middle management is not frequently seen in the field, except in response to problems. As a result, there is generally little management reinforcement of safety performance standards in the field, including procedural compliance.
- Human error prevention methods are currently being used sparingly, inconsistently and ineffectively.
- When faced with uncertainty, employee decisions in the field are not always conservative.
- A recurring theme of procedural non-compliance problems has been identified and is supported by interviews, behavioral observations and documentation reviews. Contributing factors appear to include:
  - A lack of awareness of desired standards and expectations.
  - A value system that encourages putting production ahead of procedural compliance.
  - Failure to reinforce desired behaviors.
  - Occasional peer and/or supervisor pressure to operate outside of procedures.
  - Failure to establish individual accountability and ownership for procedural compliance.

Findings and Recommendations

AFI-WP-01

NFS-Erwin does not have a comprehensive Human Performance (HuP) Program. As a result, employees are not trained or expected to recognize error-likely situations, or to apply tools that minimize the frequency and severity of events.

In this regard, the SCUBA Team recommends[5] that NFS implement a comprehensive and formal HuP/human error prevention program.

- Designate a HuP manager and provide sufficient and appropriate resources to ensure effective program implementation.
- Benchmark against "industry best" programs.
- Align the organization and establish expectations. Support the program with the appropriate training.
- Implement an effective management observation program to support the HuP Program.
- Establish performance metrics with reinforcement and communication systems.
- Frequently evaluate program effectiveness and make necessary adjustments.

AFI-WP-02

Procedural compliance is a significant problem at NFS-Erwin. The site has a history of NRC violations associated with procedural adherence deficiencies, and procedural non-compliance continues to be an area for improvement. An immediate intervention with a proactive approach is necessary to address and correct this continuing problem.

In this regard, the SCUBA Team recommends[6] the following:

- Clearly communicate expectations and responsibilities to the organization along with the reasons for an immediate step-change in organizational focus on meeting procedural adherence expectations.
- Hold individuals, supervisors, and managers accountable for consistently meeting expectations for procedural adherence.
- Establish an oversight/observation program with a reinforcement plan specifically focused on procedural adherence.
- Evaluate results of the initiative and adjust as necessary to reinforce strict procedural adherence.
- Commit the appropriate resources to successfully effect a change in procedural adherence.

[5] Additional, more detailed suggestions are provided later in this Section.
[6] Additional, more detailed suggestions are provided later in this Section.

AFI-WP-03 The Lock-out/Tag-out practices at the NFS-Erwin site need to be strengthened in order to ensure employee safety.

In this regard, the SCUBA Team recommends the following:

- Eliminate the practice of not locking out energy sources in the immediate vicinity of work.
- Develop and implement a work practice utilizing individually keyed system locks for system isolation.
- Develop and implement a records system to identify all personnel working on an isolated system and any changes occurring with locks and tags. Any interim lock change should require documentation, a new tag identifying the individual applying the lock, and a re-validation of system integrity.
- Formalize Lock-out/Tag-out communications, particularly at morning briefings and shift turnovers, so that all individuals working with the system are kept up-to-date on current work status and safety hazards.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Work Practices Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Adequacy/Competency" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the second quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are significantly more positive than justified by actual performance. In particular:

- The numerical ratings leading to the characterization of three cultural attributes related to the "adherence with procedural requirements, radiological requirements and personnel/industrial requirements" as perceived areas of strength are inconsistent with both behavioral observations performed by the SCUBA Team and with the regulatory enforcement history at NFS-Erwin. Such inconsistencies reflect an organizational frame of reference issue with respect to industry standards and expectations.

Numerical ratings of several individual cultural attributes indicated that the workforce perceives the need for improvement in the following areas:

- Conducting effective pre-job briefings to assure that the workforce is adequately prepared to do its work.
- Reviewing work in progress through self-checking and or peer checking.
- Proceeding with caution and conservatism in the face of uncertainty or unexpected conditions.

There were a reasonable number of write-in comments related to Work Practices. There were slightly more positive comments than negative comments. Most of the positive comments indicated that the workforce is careful, conscientious, formal, and disciplined in their approach to performing work and achieving procedural compliance. The negative comments indicated that some workers are considered to be apathetic, complacent, not paying attention to detail, and generally not taking nuclear safety seriously, and that there are instances of inappropriate work practices including procedure violations, short cuts, and records manipulations.

Personnel Interviews, Behavioral Observations and Documentation Reviews

Key Observations

Industry standards for work practices have increased over time. Human Performance techniques are well established as an industry standard. The integration of a Human Performance (human error prevention) program is still largely in the planning stage at NFS-Erwin. Thus, the workforce understanding of human performance principles is limited and an expectation for effective utilization of human error prevention techniques has not been firmly established. For example, Peer checking is informal and only occasionally occurs and operator shift exchange information is mostly left to the individual's discretion. Pre-job briefs are narrowly focused on the very basics of the maintenance work with little else discussed. There are general guidelines in the governing procedure for maintenance work, NFS-GH-03, but it lacks typical Human Performance techniques. Implementation of a formal Human Performance Program has implications for multiple Safety Culture Components.

Supervisory oversight is focused on production, resolving technical issues, and ensuring product quality. Safety (nuclear and industrial) is not emphasized in work practices or in work orders. Interviews and observations indicated that management above the Building Supervisor level spends little time on the shop floor. A Management Observation Program is being implemented, but has had minimal impact to date. This program is not currently specifically focused on improving human performance. The program should reinforce expectations, support the desired behaviors and present the opportunity to receive feedback. Expectations for participation are unclear and not strictly enforced. Metrics associated with this program have not been developed. Material issues and procedural violations were observed without supervisory intervention or corrective action.

The NFS T&Q (Training and Qualification) system provides a format to ensure all employees are trained and qualified for the assigned work. Operators are trained to stop when uncertain, and then inform the supervisor. Based on field observation, some operators will proceed in a non-conservative manner. Decisions and direction in situations of uncertainty are normally left to the supervisor. Observations indicated that some challenges in the field could be avoided by consultation further up the management chain. Operators are open and willing to report issues to supervision; however, they also display a reluctance to interrupt production to do so. The importance of production is well understood.

Interviews indicated that employees are skeptical that supervisors and management take industrial and personal safety seriously. This perception is reinforced by a sense of compartmentalization. When production is discussed, only production is discussed. When safety is discussed, only safety is discussed. The independence of these discussions creates a perception of production being more important, since the primary briefing focus is production.

The gap in perception is significant. The workforce interviews indicated reluctance about raising concerns that interfered with production. Interviewees also expressed concern over what they described as management's reluctance/refusal to take input from operators on operational decisions. A focused management observation program and an effective corrective action program can assist in dispelling these views.

The SCUBA Team observed that work-arounds are often implemented and sometimes become permanent solutions. The workforce often describes the environment as a production-oriented environment where work-arounds are rewarded if they can "save a run." Workarounds undermine conservative approaches to uncertainty, procedure compliance and the seriousness of industrial and personal safety.

The Lock-Out/Tag-Out process requires attention. The practice of utilizing common keyed locks for system isolations is not consistent with industry norms. It has the potential to compromise the integrity of an isolated system. One technician's master lock and key set were observed to be in the possession of another technician. The practice of an "Arm's Reach Rule" (locks not required if in an arm's reach during work) for system isolation is not in agreement with industry norms for lock-out/tag-out programs and is a precursor for an accident or event (human error "trap"). A work practice to manage the custody (and control) of keys for isolation devices is not deployed at NFS-Erwin. Procedures only require the individuals initiating work and completing work be identified in the records. Any individuals working in between the beginning and end of work are not recorded. Observations indicated that tags are removed to perform intermediate steps such as system checks by someone other than the originator and are re-locked without a change of responsibility signature. This is contrary to OSHA guidance. Observations indicated that coordination between system owners and maintenance technicians is lacking and has resulted in confusion/disagreement in the field over proposed blocking points. Individuals have been observed to use another individual's lock (red lock) for personal isolation. This provides multiple accesses to an individual's personal protection lock.

The Fitness for Duty Program is well documented and rigorously applied. A review of the previous year's records indicated the program and policies are administered and maintained accurately. The program is understood and accepted by the workforce for drug and alcohol issues. The management of overtime can and has resulted in fatigued individuals working for extended periods. This is addressed in SCUBA Team Finding ANA-RES- 01.

Specific Examples from Field Observations

- Operators occasionally work without lock-out/tag-out of all devices. Locks are not used on an isolation valve within a tag-out boundary to isolate one area from another area to preclude a production interruption.
- Operators have occasionally been instructed to operate outside of procedure scope by supervisors. At least two situations were identified to SCUBA Team members.
- Weekly plant shutdown and restart procedures are not followed precisely. Additional steps are frequently involved as well as altered sequencing. The omission of other requirements also occurs. None of these procedural challenges are the subject of a revision request.

- Known procedural deficiencies and equipment problems (e.g., instrument plugging) are common knowledge to operators and supervision. Action is taken to deal with the situation without requesting a procedural change.
- Supervisors are present when procedural violations occur yet violations go unreported or undetected. An operator did not refer to the procedure, failed to use the correct technique, or follow the required sequence in an evolution being observed by a supervisor for proficiency. No corrective action resulted.
- An operator was observed to allow a tank level to drop, activating an interlock stopping a pump instead of manually shutting down the pump as specified in the procedure.
- A procedure calls for automatically shifting material between two tanks. The operator chose to intervene at ten-minute intervals because the process worked better that way. A procedure change recommendation has not been submitted.
- During maintenance of a scrubber assembly, several procedural violations, procedural omissions, and lapses in safety behavior were observed involving radiological safety and industrial safety. Few honored the radiological boundaries, equipment lifting practices and harness standards were violated (a yellow-and-magenta rope was used as a lifting sling), and inadequate material was available for containment of potentially contaminated equipment.
- Operators disconnect process lines to clear blockages outside of defined procedures and do not always utilize the appropriate personnel protective equipment (PPE).
- After a scrubber chemical addition system failed, the chemicals were added manually via an open panel in the scrubber as a long term alternative to correcting the deficiencies of the addition system. These types of workarounds undermine procedural compliance.

Summary

Based upon the information presented above, it is the SCUBA Team's conclusion that organizational standards are principally focused on getting tasks completed to support production. There is inconsistent ownership and accountability for and reinforcement of procedural compliance in comparison to the focus on production. These behaviors reinforce the organizational perception that the current procedural compliance performance level is acceptable.

A comprehensive Human Performance Program encompasses formalized processes, consistent expectations and work standards, accountability and a well-designed and implemented reinforcement system, and will address the procedural compliance deficiencies noted above. However, interim compensatory measures are needed to effect an immediate change in organizational focus and performance related to procedural adherence. Sufficient and appropriate resources, with adequate time and focus, will be required to change the existing culture. Clear ownership and accountability must be established with clear expectations and consistently applied consequences (both positive and negative) to achieve the desired results.

Additional Detailed SCUBA Team Recommendations

The SCUBA Team offers the following additional suggestions with respect to Findings AFI-WP-01 and AFI-WP-02:

AFI-WP-01:

- Utilize INPO and a firm such as Aubrey Daniels International (ADI) to assist in the performance of evaluations, planning, and the development of reinforcement systems.
- Redirect the management observation program. The near-term focus of this program should be on observing and coaching the behaviors and practices associated with nuclear, industrial, personal safety and procedure compliance. This will provide management with the opportunity to discuss any particular safety or business topic, to reinforce caution and conservatism in the face of uncertainty and to communicate desired performance standards.
- Develop and implement (with INPO or ADI assistance) a training program for supervisors and managers on how to observe and reinforce proper behaviors for procedural compliance in the field and establish a team of supervisors and managers specifically tasked to conduct field observations focused on procedural compliance.
- Schedule benchmarking visits to nuclear facilities that have struggled with procedural compliance problems, but have subsequently become "best in class" in implementing Human Performance.

AFI-WP-02:

- Ensure that there is organization-wide ownership and accountability for procedural compliance. Managers and supervisors need to be assigned responsibility and ownership for procedural compliance in their area of responsibility (no exceptions).
- Management must encourage the workforce to develop a questioning attitude. If someone is not sure if they are in compliance with existing procedures, they should stop and ask questions. Management and supervision must support and reinforce these traits to achieve the desired culture.
- Initiation of a change in procedural expectations is likely to increase demands for support functions. This will quickly quantify gaps in the procedures, training, qualifications and knowledge of standards and expectations. Management must be prepared to support these issues with technical, administrative, and training resources, as the site is likely to encounter a rash of questions and requests for procedure changes or letters of authorization (LOA) for temporary changes.
- Reinforce classroom lessons on procedural use and reference. Standard Operating Procedures do not lend themselves to easy identification in terms of level of essentiality of the document. Establish expectations regarding the level of required procedural compliance (verbatim, step-by-step, in-hand, refer as needed, etc.) and identify such on all procedures. For example, it might be reasonable to print "Use Every Time" procedures on different color paper to emphasize the expectations for their use. Letters of Authorization should receive the same treatment in order to flag temporary changes that might reflect equipment or procedural anomalies.

- Union management should be apprised of the changes necessary in procedural compliance expectations and performance, and afforded the opportunity to participate in plan development and implementation.
- Contractor management must subscribe to the same standards and expectations as the balance of the site.

NFS Self-Assessment

The NFS self-assessment evaluated Work Practices as "ineffective, unsatisfactory, poor understanding of all requirements and requiring monitoring." However, first line supervisory performance was viewed positively.

The SCUBA Team is in general agreement with the items identified in the NFS self assessment, with the exception of supervisory performance. Performance relative to industry norms in areas such as procedure compliance and industrial safety indicated gaps in supervisory effectiveness/management oversight. Survey results, interviews and observations indicated that employees believe decisions are not always conservative in the face of uncertainty and that supervision and management do not always take safety seriously. Finally, the self assessment acknowledges a gap in human performance techniques and indicates a positive trend. The SCUBA Team believes the significance of this trend is mitigated by the results of the interview and observation information discussed above.

III.E CORRECTIVE ACTION PROGRAM SAFETY COMPONENT

RIS-2006-13 Component Description

The licensee ensures that issues potentially impacting nuclear safety are promptly identified, fully evaluated, and that actions are taken to address safety issues in a timely manner, commensurate with their significance.

SCUBA Team Conclusions

The Corrective Action Program (CAP) at NFS-Erwin relies primarily on an intranet-based tool (PIRCS) for the identification of site issues. There have been a number of improvements made in the PIRCS system in the past few years, and the fundamentals of the CAP are sound if appropriately applied. However, CAP execution lacks rigor and insufficient management oversight and control:

- The effectiveness and timeliness of CAP investigations, corrective actions, and common cause analyses is lacking.
- The CAP is not consistently utilized to drive timely resolution of problems, to continuously improve performance, or to systematically evaluate the extent of condition of individual issues to effectively prevent repeat findings.
- PIRCS is not utilized as the only method and central repository for issue identification and resolution, a practice which is inconsistent with most nuclear industry corrective action programs.

This component of NFS safety culture is considered to be deficient when compared to commercial nuclear power plant industry best practices and represents an Area for Improvement (AFI). It meets minimum regulatory expectations with respect to problem identification and resolution but fails to meet regulatory expectations with respect to management oversight and control of program implementation.

SCUBA Team Findings and Recommendations

AFI-CAP-01 NFS-Erwin needs to clearly define the types of issues that are required to be processed through the CAP using PIRCS. PIRCS is not currently being used to record every issue or problem that is identified at the NFS-Erwin site. It is important for management to reestablish standards and expectations for the use of CAP/PIRCS.

In this regard, the SCUBA Team suggests consideration of a change to a more limited scope of applicability of the CAP to provide organizational focus on achieving excellence in performance with respect to safety-related programs, processes, procedures and equipment and with respect to regulatory commitments. Once sufficient performance improvement has been achieved for this initial scope of applicability, the coverage of the CAP could be expanded.

AFI-CAP-02 Several barriers to workforce participation in CAP/PIRCS issue identification exist that should be mitigated to the extent practicable. In this regard, the SCUBA Team recommends:

- Including a feature in PIRCS that would allow for Problem Report entry on an anonymous basis.
- Increasing PIRCS training and computer access/availability
- Streamlining the process for providing feedback to Problem Report originators. The e-mail based system proposed is currently in beta testing.
- Demonstrating that the CAP/PIRCS is effective in resolving identified problems. (This issue is also addressed in SCUBA Team Finding AFI-RES-01.)
- Establishing a more proactive and visible alternate channel for raising potential safety issues or concerns. (This issue is also addressed in SCUBA Team Finding AFI-ERC-01.)

AFI-CAP-03 NFS-Erwin management must make a significant commitment to improving the timeliness and quality of both event investigations (Root Cause and Apparent Cause Analyses) and identified corrective actions. Investigations tend to seize on the first compliance failure and describe that failure as the cause. Process improvements to correct these shortcomings can best be achieved by a combination of improved training, full-time investigative personnel, and increased management oversight. Similarly, the quality, frequency, and ability to perform Common Cause Analyses needs to be improved. There is a tendency to produce corrective actions that lack a rigorous accountability trail (e.g., owner, due date, metrics) or that have limited potential to change behaviors that will prevent recurrence. Improvements in these areas will require management to commit additional full-time personnel to the CAP/PIRCS process. (This issue is also addressed in SCUBA Team Finding AFI-NOV-01.)

The SCUBA Team recommends the following:

- Assign additional personnel to support the Corrective Action Program Coordinator in the effective execution of the program. These individuals should serve as subject matter experts with responsibility for establishing liaison throughout the organization in order to ensure a high quality, responsive product.
- Expand the population of individuals who are qualified and experienced to serve as problem analysis team leaders. Too many individuals are qualified but not proficient and the site has not used formal training to spread the workload across the supervisory element.
- Improve the quality of Root Cause, Apparent Cause and Common Cause Analyses to ensure understanding of the underlying systemic conditions that created the opportunity for failure.
- Increase the number of Common Cause Analyses conducted in response to trending data collected through routine PIRCS problem reports. Ensure that a common cause is, in fact, determined.

- Consolidate ownership and accountability for the quality and effectiveness of the CAP/PIRCS within the PIRCS Oversight Committee. Transfer the CAP/PIRCS functions currently being performed by the Safety and Safeguards Review Committee (SSRC) to the PIRCS Oversight Committee.
- Improve the metrics used to measure the success of PIRCS, especially those that are quality related. Measures such as root cause analysis quality, corrective action effectiveness, repetitive occurrence, rework, average age, relative number of each category of investigation, and total hours spent on analysis teams are examples of potentially useful additions.
- Formalize the effectiveness review process to ensure that timely evaluations of corrective actions are conducted.
- Establish a quality review board to periodically perform a formal and comprehensive evaluation of CAP/PIRCS products, selected on the basis of risk and consequence. The quality of Root Cause Analyses, Apparent Cause Analyses, corrective action identification and implementation will benefit from the feedback obtained through this process. One of the by-products should be a clear tie between problem analysis and the promulgation of lessons learned.
- Control the size of the backlog by establishing a low level of tolerance for overdue items. (NOTE: When the population of lingering CAP/PIRCS issues periodically reaches unacceptable levels, the solution has been to declare a day of site-wide focus to clear the backlog. This occurred twice in 2007 and was effective in reducing the numbers. However, it is reasonable to question the quality of products that are mass processed in a short time frame. The site needs to conduct an effectiveness review of this technique to assure corrective action quality is not sacrificed.)

AFI-CAP-04 NFS-Erwin needs to fully convert the commitment tracking process to the PIRCS system as intended. There are currently multiple processes and unclear ownership for effectiveness of corrective actions. This diffusion of responsibility provides the opportunity for administrative error and could lead to an inadvertent lapse in regulatory compliance. In addition, the current commitment approval process does not systematically evaluate the effectiveness of corrective actions taken and allows commitments to be closed when work is merely scheduled, not completed. (This issue is also reflected in SCUBA Team Finding AFI-RCC-01.)

The SCUBA Team recommends the following:

- Develop a process to evaluate commitment closure that verifies completion and adequacy. The process should specify a committee or senior management review and should require more evidence of closure than a simple PIRCS entry.
- Close the gaps between COMTRACK (the previous commitment tracking program) and PIRCS. The COMTRACK procedure is still used for commitment tracking guidance. If retained, this procedure needs to be updated to formally recognize PIRCS as the corrective action commitment

tracking system and fully describe how this system is to function. If COMTRACK is not retained, a new procedure should be generated that does formalize the process and contains all of the pertinent information.

- Consolidate responsibility for tracking all commitments under one owner. The primary tracking system (PIRCS) should be formalized and robust enough that an independent tracking system is not required.
- Establish regular quality reviews of the commitment closure process by an independent review source (i.e., Quality Assurance).
- Eliminate the practice of allowing one commitment to be closed by another. The chain of control is easily lost and the generation of a new initiation date with each new commitment complicates the business of controlling the age of the backlog, ensuring timely closure, and tracking adequacy of the actions taken to resolve the issue.

ANA-CAP-01 NFS-Erwin needs to improve the implementation of PIRCS to take full advantage of the capabilities resident in the software. When problem reports are entered, the process should flow smoothly from problem identification to problem resolution. When oversight is required, PIRCS should be capable of providing effective search tools that overlap with other record-keeping systems – in particular the Configuration Management Program. This capability requires computerized aids to properly bin deficiencies, search tools to easily check for extent of condition, commitment tracking processes, and feedback systems to seamlessly provide status reports to the originator.

In this regard, the SCUBA Team recommends the following:

- Develop a common cause trending methodology and capability. Common Cause Analyses performed to date are limited in number and have not been effective at identifying organizational attributes, which if corrected, would minimize or prevent repeat events. This is primarily due to the lack of granularity of the cause codes available for use in binning and analyzing reported problems.
- Develop a cause code to designate commitments in PIRCS for ease of search and report generation.
- Establish an expectation for a physical, as well as digital, search of similar components (or procedures) for extent of condition problems.
- Modify the PIRCS database to allow designation of discrepancies that can be attributed to configuration management issues.
- Blend the paper-based Letter of Authorization (LOA) tracking system into the LINC software being used to populate the Configuration Management database.
- Establish software linkage between problem reporting and work control. Maximo® has reportedly been designated as the software of choice for use with work control. Develop a transition plan that will mesh Maximo® with PIRCS to allow both to make coordinated progress in order to be able to cross-correlate problem reports with work orders. The current proposal for transition to Maximo® is the second quarter of 2008.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Corrective Action Program Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Strength" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the top quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are significantly more positive than is justified by actual performance. In particular:

- The numerical rating of workforce confidence that the NFS-Erwin Corrective Action Program will ensure that issues that could potentially have an adverse impact on nuclear safety are resolved through effective corrective actions as an Area of Strength indicates that the NFS-Erwin organization's frame of reference on what constitutes effectiveness is inconsistent with commercial nuclear power plant standards and expectations. This higher than justified rating may also be influenced by a narrower interpretation of what "nuclear safety" includes.
- The numerical ratings of workforce confidence that the NFS-Erwin Corrective Action Program will ensure that adverse trends that could potentially have an adverse impact on nuclear safety are (1) identified, (2) communicated to appropriate personnel, (3) appropriately addressed, and (4) addressed in a timely manner consistent with significance as Areas of Strength indicates that the NFS-Erwin organization's frame of reference on what constitutes an effective trending program is inconsistent with commercial nuclear power plant standards and expectations. This higher than justified rating may also be influenced by a narrower interpretation of what "nuclear safety" includes.

The numerical rating of one individual cultural attribute indicates that the workforce perceives the need for improvement in the responsiveness of the PIRCS process (as it positively affects individual willingness to identify and pursue resolution of potential nuclear safety issues or concerns).

There were a reasonable number of write-in comments related to the Corrective Action Program. There were more negative comments than positive comments. Most of the positive comments indicated that the PIRCS system is considered to be an area of strength and a good mechanism for the identification of issues. The negative comments indicated that some have concerns that:

- Problems are not being effectively resolved as a result of (1) inadequate root cause determination; (2) defined corrective actions that do not address the root cause; and/or (3) ineffective implementation of corrective actions.
- There is a lack of timeliness of issue resolution.
- The PIRCS system is being overloaded with non-nuclear safety issues, and that this is diverting scarce resources from being able to focus on the more important issues.
- There is a lack of communication back to the organization about identified causes, actions taken, and lessons learned.

- Some issues that enter the PIRCS system are ignored.

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team gained significant insights during interviews, observations, and documentation reviews. This information tended to fall into three major categories (issue identification, PIRCS quality and timeliness, and issue trending).

Issue Identification

- NFS-Erwin has not rigorously abided by the procedural guidance given in the process document, NFS-GH-65, for stipulating the types of issues that are required or expected to be processed through PIRCS. In particular, issues categorized as "equipment difficulty" or "rule not followed" are evident by their absence, particularly when the equipment or rule does not pertain to fuel production.
- There are parallel databases on the site that compete with PIRCS. In addition to IROFS records (discussed in *Issue Trending*), the security force maintains separate records for reasons of classification, LOAs are tracked on paper, commitments are shared by three different individuals and systems, and the results of benchmarking trips are informally reported and filed for action. The PIRCS software is capable of handling the needs of each of these sub-systems but there is no formal plan for consolidation.
- The PIRCS reporting process in not as universally used as would be expected, based on industry norms. According to interviews and survey results, material problems are frequently not reported because many employees believe that the process is too cumbersome, especially when issues go unresolved with little or no feedback.
- It is not uncommon for workers to verbally report a problem to their supervisor rather than enter the data themselves. The PIRCS software is equipped with process wizards to lead an individual through the data entry process but computer unavailability or unfamiliarity with the process are the typical reasons cited for passing the responsibility up the chain. This practice deprives the site of the technician's judgment and input as well as disconnects the originator from the automated feedback system. This electronic link, although described in NFS-GH-922 as fully functional, has been in beta testing for several months.
- There were occasional reports of instances when problem reports are filed to use PIRCS as a weapon rather than a tool.
- The Engineering Department establishes many project priorities based on perceived organizational needs and thus has "pocket veto" authority over jobs deemed to be of inadequate priority. It also accepts work requests that are not processed through PIRCS reports. The lack of a collegial process to establish project priorities detracts from the effectiveness of the Corrective Action Program and convinces some employees of the futility of writing Problem Reports.

PIRCS Quality and Timeliness Issues

- Training and qualification requirements for personnel responsible for carrying out PIRCS activities are clearly delineated in NFS-GH-922; the SCUBA Team did not observe any deviations from the prescribed standards. The only suggested addition to the list of participants is a group of PIRCS analysts who would serve as assistants to the Coordinator and supplement the Plant Superintendent (who serves as the single point of

accountability for the initial screening) in order to provide consistency and efficiency in the processing of Problem Reports from identification to closure. The PIRCS Screening Committee is specifically charged with responsibility for oversight of the process of screening and prioritizing identified issues; SCUBA Team observations confirm that they routinely arrive at the meeting prepared to discuss the issues before the Committee.

- NFS-Erwin has developed and promulgated a thorough program objectives document, NFS-GH-922, in which roles and responsibilities are clearly designated for both implementation and oversight of the process. The PIRCS Oversight Committee is designated by title and specifically charged with responsibility for the timeliness, responsiveness, comprehensiveness, and effectiveness of the CAP. The designation of senior managers as Committee members serves to ensure that site leadership is involved in management control and oversight of the process. The only notable shortcoming is the reliance on performance metrics that are entirely quantitative in nature, as this data would not be expected to provide early indications of emerging problems. The information reviewed at each PIRCS Oversight Committee is not widely disseminated in that the charts and graphs used to measure performance are not systematically promulgated to the organization as a whole.
- There are inadequate resources assigned to administer the program. The Coordinator, who is assisted by only one analyst, is expected to handle the details of a program whose software has not been adequately refined to provide the intrusive analysis needed to ensure comprehensive resolution of identified problems or to search for related issues without significant data manipulation and review.
- The Vice President of Safety and Regulatory is responsible for assigning all Investigation Team Leaders, and Vice Presidents must approve non-QA Root Cause Analyses in their area of responsibility, per NFS-GH-922. However, root cause analysis training has not been systematically administered in the past ten years; and there are no annual or bi-annual re-qualification requirements for analysts or reviewers. No formal training is offered relative to the conduct of apparent cause evaluations. The lack of periodic training on root cause analysis techniques limits effectiveness of this management oversight. It also presents other problems in that it (1) limits the population of new root cause participants, (2) leads to some individuals being qualified in name only, and (3) results in an excessive demand for and on the more capable and experienced root cause analysts.
- The CAP has not been effective in applying the corrective action needed to reverse adverse trends associated with safety-related issues. Although nuclear criticality safety receives the highest priority, there are recurring issues associated with production-related components, involving business risk and the potential for personal injury. For example, the failure to fix the automated caustic addition system on the Material Access Area venturi scrubber requires operators to manually handle hazardous materials on a regular basis – a practice that a number of members of management consider unnecessarily hazardous. A second example is the decision to cancel installation of a new wastewater filter press because an alternative solidification process supposedly made component replacement unnecessary. The old press was run to catastrophic failure and could have resulted in a serious, if not fatal, injury. Again, there were members of management who considered the operation hazardous enough to warn operations personnel to stay away from the press when in operation.

- The site lacks a comprehensive self-assessment tool and the CAP has not received a self-assessment that would meet industry standards
- The NRC commitment tracking process has potential gaps that began with the incomplete transition between COMTRACK (per NFS-GH-923) and PIRCS (NFS-GH-922). The process has not been formalized, and the sampling Quality Assurance over-check that was performed per NFS-Q-173 is no longer performed. As a result, there is incomplete confidence in the quality of the commitment closure and review process.
- Two commitments made to the NRC were overdue for completion until the due dates were successfully re-negotiated. Specifically, the centrifuge U-Al bowl wash procedure and the U-Metal process were scheduled as pilots for full incorporation into the Configuration Management Program in the second and third quarters of 2007, respectively. The CM Specialist is actively working on both, but the site had taken the position that the scheduled dates for these written commitments were only targets. Neither is yet complete although the NRC has subsequently agreed to extend the due dates into 2008.
- Equipment rework and problem recurrence are not tied together in PIRCS. It is not uncommon to find dozens of repeat occurrences without follow-up action to prevent recurrence.
- Procedure NFS-GH-922 formally outlines the types of investigations available and the reasons for conducting each, ranging from No Investigation to a Full Team Root Cause Investigation. Root cause analyses use TapRoot® techniques almost exclusively and are conducted in accordance with NFS-GH-918. This is the only tool that is called out, but there are cases where failure modes and effects analyses, barrier analyses, human performance event investigations, or the why staircase would be better options. The site has chosen to train Investigation Team Leaders in only one discipline.
- There are occasions when PIRCS commitments are closed to other commitments, with neither resulting in definitive action. (Problem Reports 3246, 4716, and 4865) This practice is considered to be unacceptable and is inconsistent with industry practice.
- There is no indication of the use of effectiveness reviews to evaluate the adequacy of PIRCS actions despite the provision for such a capability in paragraph 7.5.7 of procedure NFS-GH-922. The issue owner is given the option of choosing this tool, but none have chosen to do so and management has not challenged that behavior.
- Some PIRCS items that should be quality records (e.g., those pertaining to corrective actions following the BPF spill) were resolved by using informal memoranda or recorded in e-mail traffic. (Problem Reports 3237, 3292, and 3293)
- An Apparent Cause Evaluation conducted to resolve a missed calibration check resulted in disciplinary action but the conclusion drawn by the evaluation team was that "People make mistakes." This mixed message detracts from the effectiveness of the process. (Problem Report 10489)

Issue Trending:

- The cause codes assigned to problem categories are not granular enough to break issues down into component parts for more precise trending or extent of condition reviews.
- There are no expectations that PIRCS will be systematically used as a vehicle for tracking and trending the performance of safety related equipment (SRE) or items relied on for safety (IROFS). Typically, repairs are promptly made when a safety-related piece of

equipment fails a periodic test. Trend data is available in paper form, but is not correlated in any systematic fashion to allow for intervention prior to a system fault. Procedure NFS-GH-56 refers. Stated another way, SRE and IROFS are run to failure. Strategic use of data, tracked and trended in PIRCS, could reverse this process.

- There is no category or PIRCS drop-down menu available in the computer program to designate a Common Cause Analysis and that tool is not described in NFS-GH-922. Instead, Small Team TapRoot® Investigations are specifically designated to fulfill that function, but there are no programmatic requirements for their conduct. By virtue of the large number of repeat events logged in PIRCS, this tool seems to be under-utilized. It is important to develop proficiency with this tool, as it needs to be employed frequently and effectively, at least initially, in order to provide prompt insight to the management team when negative trends begin to develop.

NFS Self-Assessment

In the NFS self-assessment, the site graded its overall performance as "Sometimes effective, somewhat reactive, requires monitoring" with a positive trend. Specific observations were as follows:

- There is a low threshold for identifying issues, and issues are completely and accurately entered into PIRCS.
- Timeliness of data entry in PIRCS is commensurate with safety significance
- Selected data from PIRCS is trended and reported monthly to the PIRCS Oversight Committee.
- Key information, including recurring issues and safety statistics, is regularly reviewed in a variety of forums.
- Problem investigation priorities are assigned on the basis of the associated risk.
- It is recognized that "no root cause identified" was a common finding for Apparent Cause Evaluations.
- There is no formal program for effectiveness reviews, although selected effectiveness reviews were performed.
- Common Cause Analyses have been performed, but infrequently.
- Timeliness of corrective action is on an improving trend.
- An alternative process is available to employees for raising issues.

The SCUBA Team believes NFS was not sufficiently self-critical in its self-assessment of CAP/PIRCS.

- Interviews and observations indicate that some employees have lost faith in the ability of the CAP/PIRCS to resolve identified problems, and consequently choose not to use the system. This attitude is more prevalent among, but not limited to, hourly employees and detracts from the full utilization of PIRCS.
- Trending, effectiveness reviews of corrective action, and timeliness of response are areas where improvement is needed.
- Many hourly workers are unaware of the alternative process for anonymously reporting safety concerns, and the utilization rate of that process is far below industry norms.

III.F OPERATING EXPERIENCE SAFETY COMPONENT

RIS-2006-13 Component Description

The licensee uses operating experience information, including vendor recommendations and internally generated lessons learned, to support plant safety.

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Operating Experience Safety Culture Component is deficient when compared to commercial nuclear power plant industry best practices and, as a result, represents an Area for Improvement (AFI). The SCUBA Team has also concluded that NFS-Erwin does not meet regulatory expectations related to this Safety Component.

In this regard, the SCUBA Team has concluded that:

- NFS has no formal written internal or external Operating Experience (OE) program.
- The limited regulatory requirements for use of external operating experience appear to be met. NRC generic communications are reviewed by licensee staff for action and action taken, if needed.
- With respect to use of internal operating experience, there have been ad hoc responses to significant or recurring events, but these tend to be narrowly focused. Examples include repetitive RWP violations in 2005, a design problem relating to Nuclear Criticality Safety (NCS) in 2005, the March 6, 2006, spill, and the filter press event in 2007.

SCUBA Team Findings and Recommendations

AFI-OE-01 NFS-Erwin currently does not currently have a systematic, thorough and formal program/process in place for obtaining, evaluating and acting upon external operating experience. NFS-Erwin lacks a single point of accountability and ownership for the success of such a program/process.

In this regard, the SCUBA Team recommends the following:

- Develop and implement an NFS-Erwin Operating Experience Program. The program should include guidance on objectives, process, management oversight, training, and performance metrics.
- Assign an appropriately qualified and experienced individual as the site OE lead.
- Conduct benchmarking activities to identify industry best practices for the design and implementation of an OE Program that is applicable to NFS-Erwin.
- Identify the potential sources of OE information applicable to NFS-Erwin. Sources related to a fuel-cycle facility include, but are not limited to:
  - NRC/Nuclear Material Safety & Safeguards Office
  - Nuclear Energy Institute (NEI)
  - Institute of Nuclear Power Operations (INPO)/World Association of Nuclear Operators (WANO)
  - Other fuel cycle facilities
  - Chemical industry facilities

- Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- Industry peer groups
- Professional Societies
- NFS-Erwin equipment vendors

AFI-OE-02 NFS-Erwin currently does not have a systematic, thorough and formal program/process in place for obtaining, evaluating and acting upon internal operating experience. The SCUBA Team believes that NFS-Erwin will identify more useful operating experience information, at least in the near term, from internal performance history than it will from external sources.

In this regard, the SCUBA Team recommends the following:

- The same actions recommended in Finding AFI-OE-01 are applicable to the development and management of an internal OE program. NFS should jointly develop and manage the internal and external OE programs, to ensure comprehensive review of all pertinent Operating Experience information sources.
- Utilize the PIRCS system and the Corrective Action Program to identify and evaluate recurring events, such that opportunities to learn from internal operating experience are effectively captured and acted upon.

OFI-OE-01 The SCUBA Team believes that NFS Erwin would benefit from a systematic, comprehensive evaluation and application of the lessons-learned from the BLEU Processing Facility Project to the Reliable Fuel Supply Project (from design through construction and operation). While it appears that this has occurred to some degree, there is no evidence of the use of a systematic and thorough approach. Such an approach could take place within the context of Operational Readiness Reviews for the RFS Project.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Operating Experience Component for the NFS-Erwin Site Composite Organization was characterized as an "Area in Need of Attention" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the fourth quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are generally consistent with actual performance.

Numerical ratings of individual cultural attributes indicate that the workforce perceives the need for improvement in:

- Placing importance on obtaining information on the operating experience of other nuclear facilities and chemical industry facilities.

- Effectiveness in evaluating and acting on the operating experience of other facilities to prevent the occurrence of similar events at our Site.
- Ensuring that the lessons-learned from both NFS-Erwin and industry events are communicated in a timely manner to affected personnel.

There were very few write-in comments (9) related to Operating Experience, which suggests that this Safety Component may not be well understood by the workforce.

The positive comments indicated that everyone is more aware of nuclear safety since the near-miss event of a year ago, and changes to procedures based on safety issues are occurring in a timely manner.

The negative comments indicated that there is less than adequate communication of nuclear safety issues, corrective actions, and benchmarking and that there is a lack of timeliness in making changes based on events.

Personnel Interviews, Behavioral Observations and Documentation Reviews

SCUBA interviews and procedure reviews indicate that there is no formal written Operating Experience program at NFS, which at least partially explains why this Safety Culture Component is not well understood throughout the organization. The following information provides additional insights into NFS-Erwin processes related to OE:

- There is a reasonable approach to internal review of NRC generic communications. There are several communication paths, with redundancy. However, there is no data base or formal mechanism to create an institutional memory of how these generic communications have been addressed. Some NRC issues do create permanent changes in policies, plans and procedures particularly for security and material control and accountability (MC&A).
- There is no systematic review of NRC inspection reports to identify trends other than numbers of violations.
- There is no formal program to utilize vendor information. Vendor notices are received and routed but there is no consistent process for handling this kind of information. In some cases NFS relies on vendors to maintain specific pieces of specialized equipment. Most of the equipment used by NFS is either commercial off-the-shelf equipment or special fabrication. Equipment used in safety related applications is usually commercial and is distinguished by receiving a special inspection when received; however, there is no requirement for vendors to supply post-purchase notifications.
- The Quality Assurance department conducts audits of major suppliers, but does not search for vendor notices or bulletins.
- NFS-Erwin has not identified any vendor groups or user groups like those that exist in the commercial nuclear power plant industry.
- NFS-Erwin uses the PIRCS system to collect internal operating experience from incidents and events. Some of these result in investigations and corrective actions that involve changes to hardware, procedures and training. However this process is neither systematic nor consistently used; events tend to be documented in isolation. "Similar Events" shown in PIRCS are rarely related. Until recently, looking for root causes did not consistently receive a high priority. Common cause investigations are inconsistent and not available yet in PIRCS options. PIRCS has an advanced search capability that

could be used to extract OE. However, utilization is low, because there is no desktop guide for the system and training has not been provided.

- The opportunity to intervene and prevent recurring errors is hampered by low employee use of the "Similar Events" marker. There is no simple method for culling common causes.
- There is no indication that lessons learned from internal events are factored into an operating experience program designed to prevent repeat events. Pre-job briefs are a typical occasion where one would expect to observe such lesson sharing but the SCUBA Team has not observed this practice. Pre-job briefings are often cursory and provide little opportunity to communicate operating experience. By virtue of the recent initiation of human performance skills training, it is reasonable to presume that this practice does not currently exist at NFS-Erwin. There has been no apparent attempt to incorporate OE into pre-job briefings, as is the standard in commercial nuclear power.
- PIRCS is not used as a source of training material. There is no database of information available to feed lessons learned from site experience into lesson plans used in continuing training. These lessons should be job-specific and tailored to the affected employee population.
- There is an underlying concern that some of the pitfalls encountered during the design and installation of the BLEU Processing Facility are still in existence as the Reliable Fuel Supply and Commercial Development Line projects near the same point in their design lives. There has not been an effectiveness review conducted or a significant effort made to advertise lessons learned and conservatism applied from previous projects. The discussion at some planning sessions infers that this doubt exists among senior managers.

The NFS Security organization has been somewhat proactive in the past several years in benchmarking itself against other facilities, including nuclear power plants which have physical security systems comparable to NRC Priority 1 fuel facilities. In recent months, there has been activity that indicates the intention to develop and use OE in the security department: identifying repetitive logged security events, identifying root cause, and initiating actions to prevent repetition. Much of the effort in the physical security area is still a work in progress. Dissemination of security information across the organization is constrained by security classification protection requirements.

NFS Self-Assessment

The self-assessment conducted by the NFS-Erwin staff in June/July, 2007, concluded that this area was "sometimes effective, somewhat reactive, and requires monitoring" when compared to the attributes identified in NRC RIS 2006-13. It was rated as having an improving trend.

The following summary statements were provided in support of this self-assessment:

- The Self-Assessment acknowledged that a formal program was lacking in this area.
- For NRC generic communications, the existing informal process was considered adequate from the viewpoint of the NRC.
- Credit was taken for recent efforts to join INPO and for receipt of communications from NEI and the American Nuclear Insurers.
- The Self-Assessment stated that communications from outside sources, including equipment vendors, were reviewed (some by the Safety and Security Review Committee) and changes made to facility processes and procedures. All of this occurred with no

formal procedures and no examples were provided.

- The contribution to Operating Experience by the Corrective Actions Program was evaluated as generally ineffective and required action.

The SCUBA Team is in general agreement with the NFS self assessment. However, the team also observed that, given the lack of plans or stated intent to develop a formal OE program, it is difficult to support the finding that the trend is improving.

III.G SELF AND INDEPENDENT ASSESSMENT SAFETY COMPONENT

RIS-2006-13 Component Description

The licensee conducts self and independent assessments of their activities and practices, as appropriate, to assess performance and identify areas for improvement.

SCUBA Team Conclusions

The SCUBA Team has concluded that the Self and Independent Assessment Safety Culture Component at NFS-Erwin is deficient with respect to nuclear power plant industry best practices and represents an Area for Improvement (AFI). The SCUBA Team has also concluded that this Safety Culture Component does not meet regulatory expectations in that (1) NFS-Erwin does not use a comprehensive set of performance indicators to drive improvement, and (2) the self-assessment program is compliance focused rather than performance focused.

In this regard, the SCUBA Team has concluded that:

- Management is currently focused on improving the effectiveness of a new self-assessment program (NFS-GH-945, "Self-Assessment Program") which was initiated in July, 2007. This program, which primarily focuses on management field observations, is a good first step.
- NFS-Erwin conducts or participates in additional assessments related to nuclear safety and security that are required by regulatory authorities or as a result of contractual agreements. These include audits performed either by the NFS internal Quality Assurance (QA) or Quality Control (QC) departments, inspections by regulatory authorities, and reviews by Naval Reactors or other Department of Energy (DOE) related organizations. These audits are primarily compliance oriented rather than performance-based (i.e., in-depth, self-critical assessments).
- Opportunities to exercise flexibility in shaping the focus and frequency of QA audits are not taken. For example, a QA audit of the Configuration Management program completed in April 2007 lacked any reference to NRC regulatory commitments, even though this area was a focus of NRC enforcement activity. Further, even though major corrective actions were ongoing in this area there was no indication that QA audit scope or frequency reflected these actions.
- NFS does not use a comprehensive set of performance indicators and metrics to drive improvements in organizational performance. The one site-wide metrics system, the Strategic Management System (SMS), is not systematically maintained (although a few components have been maintained current).

SCUBA Team Findings and Recommendations

AFI-SA-01: In mid-2007, NFS instituted a formal Self-Assessment Program, which is documented in NFS-GH-945. This program primarily focuses on management field observations. Compared to nuclear power plant industry best practices, the scope of this Self-Assessment Program is somewhat limited in nature. Since this Program is in the early stages of implementation, it is premature to reach a conclusion as to its effectiveness. On the other hand, the SCUBA Team has concluded that there are a number of additional opportunities to enhance organizational effectiveness through increased emphasis on additional self-assessment and external assessment activities.

In this regard, the SCUBA Team recommends the following:

- Develop and implement a multi-year, integrated self-assessment plan that:
  - Includes a combination of compliance-based audits (which are focused on compliance with regulatory and customer requirements) and performance-based assessments (which are designed to evaluate the effectiveness of programs, processes and functions as compared to industry standards and best practices).
  - Includes an appropriate mix of external assessments and/or industry peer participation on NFS performance-based self-assessments to ensure that NFS-Erwin keeps abreast of evolving industry standards and best practices.
  - Includes forward-looking elements designed to self-identify potential fragilities in organizational effectiveness and performance.
  - Is sufficiently flexible to address unanticipated or emerging performance assessment needs.
  - Is managed and coordinated by a specifically assigned individual who serves as a single point of accountability and ownership for the success of the integrated plan. (The most likely candidate for this role would be the newly-appointed NFS Chief Nuclear Safety Officer.)
- Conduct benchmarking activities to identify industry best practices for the design and implementation of the integrated self-assessment plan.
- Enhance the current Self-Assessment Program by including a program element focused on periodic (e.g., semi-annual) comprehensive self-assessments of organizational performance and effectiveness conducted by line organizations. Conduct a formal, collegial management team review of these self-assessments at the completion of each assessment period.
- Conduct benchmarking activities to identify industry best practices for the design and implementation of periodic (e.g., semi-annual) comprehensive self-assessments of organizational performance and effectiveness performed by line organizations. (This issue is further addressed in SCUBA Team Finding AFI-CLE-01.)
- Continue to enhance the effectiveness of management field observations (i.e., "Management by Walking Around") by providing training to

participants on standards and expectations for the conduct of their observations, as well as on the standards and behaviors that they are expected to reinforce in the field.
- Train managers in program and process self-assessment methods, using external facilitators with demonstrated competence.
- Include "demonstrated effectiveness in conducting self-assessment activities" as a performance measure in the annual performance evaluations of NFS managers and supervisors.

AFI-SA-02: NFS-Erwin currently does not currently have a comprehensive, formal program/process in place to effectively utilize performance metrics for evaluating and addressing weaknesses in organizational effectiveness and organizational performance. NFS-Erwin lacks a single point of accountability and ownership for the success of such a program/process.

In this regard, the SCUBA Team recommends the following:

- Assign an appropriately qualified and experienced individual as the lead (i.e., ownership and accountability) for the development and implementation of an NFS-Erwin site-wide performance metrics system, including metrics relevant to nuclear safety, nuclear safety culture and security.
- Conduct benchmarking activities to identify industry best practices for the design and implementation of a site-wide metrics system that is applicable to NFS-Erwin.
- Include, as applicable, metrics associated with the implementation of NFS performance and cultural improvement initiatives.
- Conduct a formal, collegial management team review of site-wide performance metrics on a monthly basis. (This issue is further addressed in SCUBA Team Finding AFI-CLE-02.)

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Self-Assessment/Independent Assessment Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Adequacy/Competency" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the third quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Numerical ratings also indicate that the workforce perceives that the NFS-Erwin organization has significantly improved its effectiveness in identifying and resolving problems before they are identified by others or by an event.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization and by the individual attribute rating characterizations, are more positive than is justified by actual performance. It is apparent that the NFS-Erwin organization's frame of reference on what

constitutes effective self-assessment, both philosophically and programmatically, is inconsistent with commercial nuclear power plant standards and expectations.
Numerical ratings of individual cultural attributes indicate that the workforce does not perceive the need for improvement in this area.

There were very few write-in comments (13) related to Self Assessment/Independent Assessment, which suggests that this Safety Component may not be well understood by the workforce.

The positive comments indicated that the site is adequately self-identifying issues and that there is adequate monitoring and oversight.

The negative comments indicated that there is insufficient implementation of the self-assessment program in inspecting sufficient areas and self-identifying issues, and that there is a lack of timeliness in addressing assessment findings, communicating assessment results, and collecting and disseminating effective performance indicator information.

Personnel Interviews, Behavioral Observations and Documentation Reviews

The following information provides additional insights into the state of the Safety Culture Component:

- When interviewed about self-assessments and external assessments, some NFS-Erwin staff showed confusion over what self-assessments were intended to be. Several described self-assessments as self-checking or as a way to verify an earlier result. One offered a problem-solving event as an example of a self-assessment. Most interviewees cited QA audits, which analysis showed to be mostly compliance reviews, with an occasional good insight.
- Interviews with managers and supervisors indicated that many view self-assessment to be a self-checking or compliance-based check rather than an in-depth, critical review of an activity.
- A new procedure NFS-GH-945, Rev. 0, "NFS Self-Assessment Program" was issued on July 11, 2007. This represents a significant step in the right direction, but it is only in the initial stages of implementation. The procedure does not discuss a role for independent/external assessments.
- Initial program reviews of this area were conducted in September 2007 by NFS management. Initial reviews indicated that most managers adopted a compliance type check list approach to this procedure. This should not be the sole focus of self-assessment.
- Some of the attachments to the procedure, such as the self-assessment forms and the "Management by Walking Around" process, while of substantial merit, tend to create a check-list approach to self-assessment.
- After an initial series of reviews, the General Manager (GM) found initial self-assessments required by procedure NFS-GH-945 to be unsatisfactory because they were not in-depth and self-critical and did not incorporate all other source of information as required by the procedure. These include internal and external audits and inspections, PIRCS items, benchmarking, observations, and discussions with employees. After these initial reviews, the GM provided further direction, including the revision of NFS-GH-945. Subsequent self-assessments showed substantial improvements.

- NFS-Erwin does not currently have a program for conducting performance-based self-assessments.
- The Quality Control and Quality Assurance Departments behave as totally separate entities. It is important for them to intersect, even though they do have distinct charters. In the nuclear power industry, QC findings give rise to situational QA reviews, and QA observations guide QC inspectors to potential weak points. These attributes are not evident at NFS-Erwin.
- There is no comprehensive nuclear safety performance metrics program. The Strategic Management System (SMS) appears to be the only site-wide performance metric system at NFS-Erwin and it does include some metrics relevant to nuclear safety, industrial safety, and nuclear security. However it has not been systematically maintained and reportedly the system "died on the vine."
- A review of the SMS indicated no presentation of data such as corrective actions, NRC commitments, QA audits, incident investigations and self-assessment program data. The General Manager stated that the SMS system would be replaced in the future with a new metrics program.
- Some departments maintain some current metrics relevant to safety and security and some site-wide metric data relevant to nuclear safety and security are maintained. These tend to be driven by outside forces such as regulatory agencies or customer requirements and are useful.
- Metrics for the PIRCS system have been recently developed but are still evolving.
- Industrial Safety metrics are not only maintained but posted at the entrance to the Material Access Area where they can be seen by the workforce. They are reviewed weekly at operations meetings.

NFS Self-Assessment

The self-assessment conducted by the NFS-Erwin staff in June/July, 2007, concluded that this area was "sometimes effective, somewhat reactive, and requires monitoring." It was rated has having an improving trend. Credit is taken for the required QA, QC and departmental compliance checks which are not in-depth, self-critical reexaminations of programs. However, a review of nine QA audits indicates they do fulfill their regulatory compliance function, which is their basic purpose. The self-assessment correctly notes that NFS-GH-945 had just been deployed and the results were too early to assess.

The SCUBA Team is in general agreement with NFS's self-assessment.

III.H ENVIRONMENT FOR RAISING CONCERNS COMPONENT

RIS-2006-13 Component Description

An environment exists in which employees feel free to raise concerns both to their management and/or the NRC without fear of retaliation, and employees are encouraged to raise such concerns

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Environment for Raising Concerns Safety Culture Component is marginally effective at NFS-Erwin when compared to commercial nuclear power plant industry best practices and, as a result, represents an Area in Need of Attention (ANA). The SCUBA Team has also concluded that this Safety Culture Component meets minimum regulatory expectations.

In this regard, the SCUBA Team has concluded that:

- The vast majority of NFS employees are willing to raise issues or concerns related to nuclear safety, both to management and to the NRC, without worrying about retaliation.
- Areas of potential fragility exist in the environment for raising safety concerns at NFS-Erwin, including:
  - Legacy issues involving perceived instances of retaliation in the past.
  - Beliefs held by some employees that, under certain circumstances, negative reactions short of retaliation may result from raising issues or concerns.
  - Perceptions that individuals who demonstrate a questioning attitude and are willing to challenge assumptions on matters related to nuclear safety and safe facility operations are not sufficiently valued.
  - Perceptions that open and honest discussion and debate is not sufficiently encouraged when nuclear safety matters are being evaluated.
  - Perceptions that differing professional opinions on matters related to nuclear safety are not sufficiently respected or resolved in a fair and objective manner.
- The following barriers may be inhibiting the free reporting of issues or concerns:
  - Lack of sufficient confidence that management will act in a timely manner on identified issues.
  - Lack of sufficient confidence that adequate feedback will be provided on the evaluation and resolution of identified issues or concerns.
  - Perceptions that some personal risk may be involved in raising concerns that slow or halt production activities.
  - Perceptions, particularly among bargaining unit employees, that raising certain types of issues or concerns has the potential for creating negative consequence for co-workers.
  - Lack of sufficient confidence in the viability of raising potential issues through the two alternate reporting processes currently available to employees (due to concerns regarding independence and objectivity).
- NFS does not have a Differing Professional Opinion (DPO) process, a common nuclear power plant industry method for resolving technical conflict.
- NFS does not have an independent reporting process comparable to the Employee Concerns Program (ECP) model, which is standard in the nuclear power industry.

SCUBA Team Findings and Recommendations

AFI-ERC-01 The alternate path for raising concerns at NFS-Erwin needs to be enhanced. The SCUBA Team recommends establishing a more visible, independent, proactive and effective alternative path for raising potential nuclear safety or safety conscious work environment issues or concerns.

In this regard, the SCUBA Team recommends developing and implementing an Employee Concerns Program, such as is deployed in the commercial nuclear power plant industry, with a dedicated ECP Representative reporting directly to the NFS Chief Nuclear Safety Officer. This reporting chain provides an alternate path that is completely outside line management, thereby establishing its independence.

ANA-ERC-01 Deployment of the NFS Safety and Compliance Conscious Work Environment (SCCWE) Policy has not yet fully achieved the desired goal of a completely free reporting environment. In this regard, NFS should develop and implement a program to improve the SCCWE at the NFS-Erwin Site

In this regard, the SCUBA Team recommends the following:

- Develop and implement a communication plan around SCCWE expectations
- Establish and reinforce SCCWE expectations for management and supervision. Include behavioral expectations in performance evaluations that management and supervision are obligated and expected to:
  - Encourage and welcome the identification of potential safety issues, regardless of the potential impact of the concerns.
  - Be responsive to potential safety issues identified by the workforce, including providing feedback on the status of evaluation and resolution of identified issues.
- Provide feedback (e.g., through PIRCS and the ECP) to employees regarding safety-related issues that they have raised.
- Demonstrate that validated safety concerns will be addressed in a timely and effective manner.
- Develop and implement a Differing Professional Opinion process to facilitate the impartial resolution of disagreements on technical matters.
- Work with Union Representatives to resolve shop floor issues that influence the environment for raising safety concerns.
- Revise SCCWE policies (NFS-MGT-04-006 REV 01 and NFS-MGT-05-007 REV 2) to include requirements for contractor compliance and metrics that will be used to track compliance.
- Bring contractors into the environment on an active basis; currently there is no oversight of contractor SCCWE.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Environment for Raising Concerns Component for the NFS-Erwin Site Composite Organization was characterized as an "Opportunity for Improvement" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization at the bottom of the third quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area are generally consistent with the actual current work environment.

With respect to indicators of a potentially chilled work environment, the percentages of NFS-Erwin Site Composite survey respondents indicating that they had personally received a negative reaction for identifying or pursuing issues related to nuclear safety or that they know of someone else who had received a negative reaction are well within commercial nuclear power plant norms[7]. The following numerical ratings of individual cultural attributes related to indicators are noteworthy:

- The NFS-Erwin Site Composite numerical ratings related to personal willingness to identify and pursue resolution of potential nuclear safety issues or concerns without worrying about receiving a negative reaction from peers, immediate supervision, management or site senior management were high and were characterized as "Areas of Strength."
- The NFS-Erwin Site Composite numerical ratings related to having personally received a negative reaction from peers or site senior management (during the past year) for having pursued issues related to nuclear safety were high and were characterized as "Areas of Strength."
- The NFS-Erwin Site Composite numerical ratings related to having personally received a negative reaction from immediate supervision or management (during the past year) for having pursued issues related to nuclear safety were well within commercial nuclear power plant norms and were characterized as "Areas of Adequacy/Competency."
- The NFS-Erwin Site Composite numerical rating related to knowing someone else who has received a negative reaction from immediate supervision or management (during the past year) for having pursued issues related to nuclear safety was characterized as an "Area of Strength."
- The NFS-Erwin Site Composite numerical rating related to informing supervision and/or documenting a potential nuclear safety issue or concern (once one was identified) was very high on an absolute basis, but was characterized as an "Area in Need of Attention" based on very high (and closely spaced) commercial nuclear power plant norms. Due to

[7] Survey write-in comments indicate that some members of the workforce believe that they or others have received negative reactions. Due to the fact that the survey questions requested input on experience during the past year, the possibility exists that the survey write-in comments may (at least partially) reflect legacy issues rather than more recent experience.

the high absolute value rating, this rating characterization is not of particular concern on a site-wide basis. Particularly low ratings by individual organizations warrant management attention.

- The NFS-Erwin Site Composite numerical ratings related to willingness to escalate a potential nuclear safety issue or concern further up the management chain if not satisfied with the response by supervision was reasonably high on an absolute basis, but was characterized as an "Area in Need of Attention" based on very high (and closely spaced) commercial nuclear power plant norms. Due to the reasonably high absolute value rating, this rating characterization is not of particular concern on a site-wide basis. Particularly low ratings by individual organizations warrant management attention.

With respect to precursors of a potentially chilled work environment, the NFS-Erwin Site Composite numerical ratings related to several cultural attributes were characterized as perceived Areas for Improvement. While these characterizations should be considered in the context of high commercial nuclear power plant norms, the associated cultural attributes indicate some fragility in the site-wide SCWE. In this regard, the numerical ratings of the following individual cultural attributes indicate that the workforce perceives a need for improvement in the following areas:

- Valuing individuals who challenge assumptions on matters related to nuclear safety and safe facility operations.
- Respecting differing professional opinions on matters related to nuclear safety and resolving them in a fair and objective manner.
- Encouraging open and honest discussion and debate when nuclear safety matters are being evaluated.

There were a reasonable number of survey write-in comments related to the Environment for Raising Concerns. There were more negative comments than positive comments.

The positive comments indicated that:

- There is an open environment where individuals are comfortable to speak out and report concerns without fearing or experiencing negative reactions, harassment, or retaliation.
- Management encourages the raising and open discussion of issues.

The negative comments indicated that some individuals believe that they have experienced or observed negative reactions for having raised concerns. It appears that some of these comments are related to legacy issues. The types of negative reactions identified include:

- Non-specified negative reactions.
- Retaliation in various forms including the assignment of more work, a bad performance evaluation, reassignment, and denial of promotion.
- Being labeled as a troublemaker.
- Intimidation and threats, including threat of termination.
- Behaviors that created fear of receiving a negative reaction.
- Being ridiculed and ignored.

2007 NFS-Erwin Independent Safety Culture Assessment
SCUBA Team Results Report

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team reviewed all NFS-Erwin Policy Statements and procedures related to nuclear safety culture. In this regard, the following two NFS Policy Statements are the highest level policies related to nuclear safety, the SCWE and organizational safety culture:

- "NFS Safety and Compliance Conscious Work Environment Policy", NFS-MGT-04-006, Revision 1
- "NFS Safety and Compliance Culture Policy", NFS-MGT-05-007, Revision 2

NFS-MGT-04-006 was found to be adequate, and workforce training on this policy was found to be adequate. However, additional actions are needed to effectively deploy and reinforce this policy.

NFS-MGT-05-007 was found to be adequate; however, as indicated below, the SCUBA Team has concluded that additional actions are needed to effectively deploy and reinforce this policy.

The SCUBA Team gained significant insights during interviews, observations, and documentation reviews.

- Interviewees expressed a decreasing sense of trust and confidence when moving issues up the management chain. Employees are very comfortable raising all types of concerns with their immediate supervisor. However, the further away employees move from the comfort zone of that familiar relationship, the greater the uncertainty about their willingness to raise issues. Employees express doubt that any employee can raise any issue at any time to anyone in the organization
- The policies (NFS-MGT-04-006 Revision 01, "NFS Safety and Compliance Conscious Work Environment Policy" and NFS-MGT-05-007 Revision 2, "NFS Safety and Compliance Culture Policy") set expectations for creating an environment where employees feel free to raise issues. However, the policies do not address policy deployment elements like SCWE metrics and management oversight, which are commonly seen in the nuclear power industry.
- Employees generally believe that their immediate supervisors will champion their issues; however, there are indications this confidence may occasionally be misplaced. Some supervisors do not genuinely advocate their employees' issues, preferring to attribute lack of response to upper management inaction. This undermines employee confidence in upper management. There are also indications that upper management historically has not always been supportive of issues forwarded by supervisors. Regardless of where past blame has been assigned, these historic perceptions (legacy issues) are not being actively mitigated in the present.
- Some employees reported reservations about escalating concerns above their own supervisors and/or challenging the opinions of certain members of the organization.
- Offers of the opportunity for truly open and honest debate are viewed with skepticism by some employees.
- Raising concerns that do not reach nuclear safety significance is regarded by some employees as potentially risky. In particular, reporting issues that pose a threat to continued operations or production are viewed as probable triggers for a negative management response. Some employees report signs of management anger or irritation when production is jeopardized. They cited examples of raising issues that affect

production and a negative consequence (e.g., assignment of unpleasant work, lack of opportunity or promotion, etc.) for the individual viewed as "stopping production." They view this as an example of management saying one thing (safety over production), but signaling through their behaviors that the real priority is different.

- Another barrier to raising issues is the fear of "getting someone in trouble." The organizational culture has "learned" that admitting to or reporting mistakes can lead to time off for the employee who made the mistake. This seems truer for bargaining unit employees, but there are indications that exempt employees also feel a sense of reservation, especially when using a public reporting forum like PIRCS.
- The absence of a Human Performance program, standard in the nuclear power industry, may contribute to the belief that management focuses on placing blame rather than on understanding the error and preventing recurrence. The SCUBA Team is aware of a draft Policy on "Employee Integrity, Responsibility and Performance," which is expected to be issued shortly, that is focused on this issue.
- Alternate reporting processes are available at NFS-Erwin. However, an employee seeking confidentiality must contact the company's General Counsel. Interviewees said they would be willing to use that avenue if it was important enough, but expressed reluctance to go that high in the organization with a minor problem; they would just let it go. There have been only two instances of employees using that venue in the last two years. That is a statistical anomaly, compared to the number of confidential concerns received by the average ECP in the nuclear power industry.
- The lack of a Differing Professional Opinion process inhibits the resolution of technical issues, since the current process is to go through line management, which may be the source of conflicting opinion.
- Another alternate path for raising issues is the site Discrimination Committee, comprised of volunteers from within the line organizations. Employees can select a Committee member for concern intake; however, the Committee member merely turns the concern over to Human Resources for investigation. The Committee member does not participate in the investigation, nor does he or she have any control over the timeliness of the investigation, the resolution, or the feedback to the employee.
- The company has one additional external investigative process, but it is limited to sensitive issues and is only employed at the discretion of the Chairman of the Board.
- The lack of a truly independent reporting process (like the industry standard ECP model) may be a barrier to reporting certain kinds of relationship-based concerns, because the current reporting methods and alternatives are perceived as too public, too slow, or not sufficiently independent.
- The processes for responding to non-technical employee concerns are neither timely nor oriented to corrective action. The industry norm for investigating employee concerns is two-tiered: three working days for relatively simple ("rapid resolution" is the industry term) issues, and 30 days for formal investigations. NFS-Erwin sets no expectations for the timeliness of its investigations, nor is there an expectation for monitoring compliance with whatever corrective action may result from an investigation.
- Interviews with NRC Residents indicate the regulator has a high level of confidence in employee willingness to bring issues and concerns to their attention. They attribute the low numbers of NRC allegations to the fact that NFS management responds well to informal discussion on employee concerns relayed by the Resident Inspectors. Resident Inspectors report no signs of reluctance or need for confidentiality on the part of NFS-

Erwin employees when it comes to speaking with the NRC. It is their view that employees clearly understand their rights and protections under the Whistleblower Act and employee interviews confirm this.

NFS Self-Assessment

The NFS Self-Assessment of the Environment for Raising Concerns Safety Culture Component (SCC) was sufficiently self-critical in that it identified and discussed a number of opportunities for improvement in the alternate paths for raising safety issues

The NFS Self-Assessment resulted in an Overall Assessment Rating as "sometimes effective, sometimes reactive, requires monitoring", and a trend of "Positive (Improving)." This finding is less conservative than the SCUBA assessment, which identified significant gaps between current NFS-Erwin standards and practices and those in the nuclear power industry. The improving trend seemed to rest on an absence of negative trend information instead of the presence of positive indicators.

III.I PREVENTING, DETECTING AND MITIGATING PERCEPTIONS OF RETALIATION SAFETY COMPONENT

RIS-2006-13 Component Description

A policy for prohibiting harassment and retaliation for raising nuclear safety concerns exists and is consistently enforced.

SCUBA Team Conclusion

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Preventing, Detecting, and Mitigating Perceptions of Retaliation Safety Culture Component is deficient at NFS-Erwin when compared to commercial nuclear power plant industry best practices and, as a result, represents an Area for Improvement (AFI). The SCUBA Team has also concluded that this Safety Culture Component meets minimum regulatory expectations.

In this regard, the SCUBA Team has concluded that NFS:

- Has a policy prohibiting harassment and discrimination. It also has a policy that establishes zero tolerance for retaliation. Employees receive some training on company expectations and available reporting processes. Discrimination claims are investigated, primarily by Human Resources (HR). Union leadership participates in discipline decisions (above a certain level) affecting bargaining unit employees.
- Does not have sufficient policy guidance or demonstrate a proactive approach to preventing, detecting, and mitigating perceptions of retaliation. While there are formal processes in place to review discipline decisions, they do not include an analysis of potential chilling effects, nor do they require mitigation of potentially chilling decisions. Management administrative actions (adverse performance evaluations, demotions, transfers, promotions) are not routinely reviewed for potential chilling effects. The company does not have processes in place to evaluate and mitigate other actions and decisions (e.g., work assignments, changes to work or holiday routine, contractor decisions) that have the potential to create the perception of retaliation.

SCUBA Team Findings and Recommendations

AFI-PDM-01 NFS-Erwin should reinforce its "Zero Tolerance" policy for harassment, intimidation, retaliation and discrimination (HIRD) through a more formal and proactive approach.

In this regard, the SCUBA Team recommends the following:

- Establish an independent Employee Concerns Program (ECP) as per SCUBA Team Finding AFI-ERC-01. Adjust SCWE policies and procedures accordingly. This program should investigate HIRD issues.
- Establish and reinforce behavioral expectations for supervision and management:

  - Increase awareness of the potential for negative perceptions of their actions and reactions.
  - Coordinate with the Employee Concerns Program Manager and the Human Resources Manager when faced with personnel actions that have the potential to create a chilling effect.
  - Include HIRD-related behavioral expectations in individual performance evaluations.
  - Incorporate mitigation strategies into major changes as appropriate.

- Develop and implement a Potential Chilling Effect Oversight Process
  - Perform a periodic review of management actions to verify that they are consistent with the prevention of HIRD. Take corrective actions as appropriate.
  - Review controversial changes and decisions so as to identify and prevent any systematic perceptions of HIRD.

- Ensure that the NFS Discipline Policy (revision pending) includes guidance on how to recognize and mitigate potentially chilling events.

- Revise NFS-HR-04-001-A, Rev. 2 to increase the degree of rigor and formality of this procedure:
  - The document does not address retaliation or intimidation.
  - It is a general guideline and does not specifically tie its prohibitions to the raising of nuclear safety concerns.
  - There is no requirement for training identified in the procedure; training on this component is not imbedded in initial/continuing training.
  - There is no requirement for collecting and trending data to determine whether or not the policy expectations are being met.
  - Responsibility for ensuring procedure compliance is not clearly defined.
  - The document does not mention the confidential alternate reporting path available through the company's General Counsel.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Preventing, Detecting and Mitigating Perceptions of Retaliation Component for the NFS-Erwin Site Composite Organization was characterized as an "Area for Improvement" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the bottom decile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area are generally consistent with the actual situation.

Numerical ratings of the following individual cultural attributes indicate that the workforce perceives a need for improvement:

- Having effective methods in place to detect and prevent harassment, intimidation, retaliation or discrimination against individuals for raising or pursuing potential nuclear safety issues or concerns.
- Increasing belief that harassment, intimidation, retaliation or discrimination against individuals for raising or pursuing potential nuclear safety issues or concerns is not tolerated at the NFS-Erwin Site.

There was only one write-in comment related to the Preventing, Detecting and Mitigating Perceptions of Retaliation. It was negative in nature, indicating that if you report harassment or retaliation, nothing is done about it.

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team reviewed all NFS Policy Statements and procedures related to nuclear safety culture. In this regard, the following NFS Policy Statements are the highest level policies related to HIRD:

- NFS-MGT-04-006, Rev. 01 -- "NFS Safety and Compliance Conscious Work Environment Policy" is comprehensive in its description of management expectations for reporting safety issues and in describing the company's zero tolerance for retaliation. However, the policy uses the term "encouraged" in regard to employee responsibilities for reporting issues, whereas the industry standard is to establish employee reporting responsibilities as an expectation.

- NFS-HR-04-001-A, Rev. 02 -- "NFS Procedure Against Harassment and Discrimination" was found to be adequate, and workforce training on this policy was found to be inadequate. Additional actions are needed to effectively deploy and reinforce this policy.

The SCUBA Team gained significant insights during interviews, observations, and documentation reviews.

- Functionally, investigative responsibility for retaliation claims resides in Human Resources. Some employees view this as a potential conflict of interest.
- On occasions of extreme sensitivity, NFS may utilize external investigative resources.
- Employees who lack confidence in HR's investigative performance may use the site General Counsel instead. This option is not widely understood, nor is it used with any frequency.
- Investigations do not always take place in a timely manner; there is no target time frame for investigations to be completed, as is the industry norm.
- Investigator training requirements are not established, and investigative report quality is inconsistent. Guidance on specific investigation requirements (e.g., investigation plan, expert assistance, interview outlines) is non-existent.
- Feedback to concernees is inconsistent, and there is no process for tracking corrective actions or verifying their effectiveness.
- There are no specific performance expectations or behavioral expectations for supervisory personnel in this component area. Training and guidance documents

emphasize the negative behaviors (the "do not" side), but do not describe the behaviors needed to be proactive.

- Interviews indicate a low level of management self-awareness when it comes to behaviors that could have a potentially chilling effect. Interviews also indicate employees have very low recognition/recall of attempts by management to mitigate chilling events.
- Most employees regard their relationship with their immediate supervisors as healthy. However, as hierarchical distance increases, trust decreases. When management decision bases are not explained, employees often fill in the blanks with speculation and assumptions.
- Interviews, observations, and survey results agree that employees would not let worry about receiving negative reactions or retaliation prevent them from raising nuclear safety issues at NFS-Erwin. Some employees believe there is some potential for receiving a negative reaction or perhaps even retaliation – however that would not stop them from reporting. Some employees perceive that negative management reactions (and, in some instances, retaliation) have occurred when issues or concerns that had the potential to interrupt production were raised.
- Some employees indicate that they have experienced negative reactions for raising safety issues. Based on the low number of HIRD claims, it appears that these negative reactions have not typically risen to the level of retaliation.
- There are some employees who believe the concerns reporting processes (PIRCS in particular) are being used for peer-on-peer retaliation, primarily when the report involves an employee who crossed the picket line during the last strike. This belief is not widespread, and management seems to be aware of the possibility when evaluating concerns. However, there is little indication of steps by management and Union leadership to mitigate this potential threat to the credibility of reporting processes.
- It should be noted that the threshold for taking offense is low for some employees, and terms like "harassment" and "intimidation" are sometimes used improperly.
- There is also a tendency on the part of some employees to settle for assumptions about motive rather than insisting on the facts.

NFS Self-Assessment

The Self-Assessment conducted by NFS-Erwin in this component area resulted in an evaluation of "Sometimes effective, somewhat reactive, needs monitoring." The self-assessment properly noted the absence of active mitigation processes and discussed a number of opportunities for improvement in the recognition of potentially chilling events and the steps appropriate to mitigate perceptions of retaliation. However, the analysis of potentially chilling events at NFS-Erwin only focused on reviewing the employee concerns that had been raised and on the investigations conducted of those concerns. It did not consider administrative or personnel actions that may have been viewed by employees as retaliatory.

III.J ACCOUNTABILITY SAFETY COMPONENT

RIS-2006-13 Component Description

Management defines the line of authority and responsibility for nuclear safety.

SCUBA Team Conclusions

The SCUBA Team has determined that Accountability is an Area for Improvement (AFI). Performance is considered to be deficient with respect to commercial nuclear power plant industry best practices. It does not meet regulatory expectations in that accountability has not been systematically and consistently reinforced at the workforce, supervisor, or management levels.

The above conclusion is based on a number of significant deficiencies noted in NFS's accountability-related management practices:

- Historically, NFS management has not consistently demonstrated and promoted a questioning attitude. As a result, there is an embedded reluctance to raise issues or concerns that could potentially impact production or key organizational objectives (a form of self-censorship) that must be overcome and reversed. A key factor seems to be the continuing perception that the burden of proof rests with the individual raising a concern or issue.
- Management ownership and accountability for regulatory commitments is deficient. Commitments are not consistently executed in a high quality or timely manner. Follow-through to assure effectiveness of corrective actions occurs infrequently.
- Management does not consistently model high-accountability behaviors (an example being compliance with administrative procedures such as the new self-assessment/management by walking around procedure). This undercuts organizational and individual accountability.
- Assignment of single-point ownership and accountability is not an institutionalized organizational practice. As a result, lines of accountability can and have become unclear.
- NFS-Erwin has not institutionalized a formal performance management system, essential to promote organizational and individual alignment.

SCUBA Team Findings and Recommendations

AFI-ACC-01 Management has not consistently demonstrated and promoted a questioning attitude in that there is an embedded reluctance to raise safety-related concerns that impact production or key organizational objectives (a form of self-censorship). This is, in part, due to the perception that the burden of proof rests with the individual that raises an issue or concern. In this regard, the SCUBA Team recommends the following:

- Executive leadership needs to clearly communicate and reinforce the desired organizational behavior that all employees, especially management, are expected to demonstrate a questioning attitude. This requirement should be part of every employee's annual performance objectives and appraisal.

AFI-ACC-02 Management ownership and accountability for regulatory commitments is lacking in that commitments are not consistently executed in a high quality or timely manner, and documented corrective action effectiveness reviews are rarely performed. In this regard the SCUBA Team recommends the following:

- Implement and institutionalize individual management ownership and accountability for regulatory commitments to assure regulatory commitments are fully implemented and effective on a long-term basis. These requirements should be implemented through a formal performance management/appraisal process.

AFI-ACC-03 Management does not consistently model high-accountability behaviors. For example, the newly-created initiative, "Management by Walking Around" only has a 60-70% participation rate after being in force for approximately six months. Management's failure to consistently follow all procedures undercuts organizational and individual accountability. In this regard, the SCUBA Team recommends the following:

- Establish a zero-tolerance environment for management deviation from procedures – including administrative procedures. This should be implemented through a formal performance management/appraisal process.

AFI-ACC-04 Single-point accountability is not an institutionalized organizational practice. As a result, lines of accountability can become unclear (accountability by all is accountability by none). In this regard the SCUBA Team recommends the following:

- Institutionalize use of single-point accountability for key organizational functions, objectives, and initiatives. Document and enforce these accountabilities through a formal performance management/appraisal process.

AFI-ACC-05 NFS executive leadership has not institutionalized a formal performance management process. Performance agreements are not routinely required of managers, supervisors, or salaried personnel; and formal performance appraisals are not performed. This results in a lack of organizational and individual alignment with, and progress toward, key safety-related improvement initiatives. Furthermore, management does not consistently or regularly interact with employees to reinforce desired behaviors and performance expectations. In this regard, the SCUBA Team recommends the following:

- Develop a living strategic plan for safety and compliance. This vehicle must establish an organization-wide standard of excellence, to which all personnel are held accountable.
- Develop and implement a formal performance management system. This system should be utilized to directly tie individual performance objectives to leadership's vision, strategic plan, and objectives.

- Significantly increase management interaction with employees for the specific purpose of communicating and reinforcing safety and compliance standards and expectations. These interactions should (1) include regular reinforcement of performance objectives established through the performance management system; and (2) incorporate a much greater presence on the shop floor by both line and support group management.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Accountability Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Adequacy/Competency" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the second quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating, are significantly more positive than is justified by actual behaviors and performance. In particular:

- The comparatively high numerical ratings of attributes such as "supervisors and managers hold individuals appropriately accountable for performance and results," "standards and expectations for nuclear safety performance are actively reinforced by peers," "standards and expectations for nuclear safety performance are consistently adhered to by individual workers" and "supervisors and managers demonstrate that nuclear safety is our top priority by walking the talk and leading by example" are not consistently supported by information obtained through other sources (i.e., personnel interviews and behavioral observations).
- The numerical rating leading to the characterization of the cultural attribute "the system of rewards and sanctions encourages behaviors that are consistent with a strong Safety and Compliance Conscious Work Environment" as a perceived Area of Strength is misleading due to the fact that commercial nuclear power plant industry norms are very low for this cultural attribute. In fact, this cultural attribute received one of the five lowest NFS-Erwin Site Composite numerical survey ratings.

The numerical rating of one individual cultural attribute indicates that the workforce perceives the need for improvement in:

- Management ensuring effective ownership and accountability for planned actions related to important issues or activities that could affect nuclear safety or safe facility operations.

There were a reasonable number of write-in comments related to Accountability. There were significantly more negative comments than positive comments. The few (5) positive comments indicated that some individuals self-report problems, exhibit high standards, and exhibit accountability. The negative comments indicated that:

- Some believe that there is insufficient ownership and accountability for actions on the part of various individuals and groups.
- Some believe that Union workers are complacent and/or do not care about work.
- Some supervisors and managers are not adequately enforcing accountability.
- Some believe that there is inconsistency and discrimination in the application of discipline.
- A few believe that some supervisors and replacement workers are "untouchable."

Personnel Interviews, Behavioral Observations, and Documentation Reviews

The lines of authority and responsibility for nuclear safety are defined through NFS's policies, procedures and organization charts. The organization-wide understanding is that the Regulatory/Safety organization is responsible for assuring that regulatory requirements are adequately defined and incorporated into the organization's policies and procedures; while the balance of the organization has the responsibility to comply with these policies and procedures. It is also understood that everyone has specific roles and responsibilities to fulfill in order to assure safe operations.

There are several specific concerns regarding (1) roles and responsibilities, and (2) management's reinforcement of safety standards and safety-related behaviors as an overriding priority:

- Management does not consistently exhibit or reinforce a questioning attitude. For example, most employees indicated that they would always raise a concern if they felt they were dealing with an issue that presented an "imminent danger" to an individual or the organization. However, many employees, including members of management, expressed reluctance to raise a concern when confronted with an issue that presented the "potential for a safety problem." This reluctance arose from the concern that they might not be able to defend their position. This perspective is reinforced by the observation that management will frequently proceed with a course of action unless it can be proven to be unsafe, as opposed to proceeding only if it can be proven that it is safe.
- Management ownership and accountability for regulatory commitments is deficient. There is minimal management oversight and control to assure corrective actions are completed in a high quality and timely manner, and effectiveness reviews are not systematically performed.
- Assignment of single-point ownership and accountability is not an institutionalized organizational practice. As a result, lines of accountability can become unclear – particularly for project activities where multi-department support is required to accomplish a task.
- First line supervision and the training organization have a significant presence on the shop floor -- particularly in the highly enriched uranium (HEU) areas. Their presence provides some reinforcement for the message that safety is an important priority. However, most supervisors are much more production focused than safety focused. This leads to the perception held by some employees that production is more important than safety and undermines individual safety focus and accountability for same.
- Management has traditionally not spent a significant amount of time on the shop floor practicing "Management-By-Walking-Around"; thus, it has largely missed an

opportunity to reinforce safety objectives and desired safety-related behaviors with employees on a systematic small-group or one-on-one basis.

There are several management/organizational behaviors that tend to undermine management's appearance of leading by example. As a result, employee ownership and accountability for safety tends to be undermined. The most serious management behavioral concern is related to procedural compliance:

- Examples can be found where supervisors and/or managers proceed without understanding procedural requirements in response to perceived production pressures. There are also examples where management does not consistently follow administrative procedures. An example is the Self-Assessment and Observation procedure, which had achieved approximately 60% - 70% participation after being in place for approximately six months. Although these examples may be relatively limited in number, they feed the perception that procedural compliance is not really an organizational priority ("your actions are speaking so loudly, I can hardly hear you").

Other management behaviors that contribute to the undermining of individual accountability include the following:

- The organization is extremely tolerant of degraded equipment/conditions and frequently develops work-arounds to deal with them. Many of these work-arounds become formalized (via changes in operating procedures) in order to avoid procedural non-compliance. The inconsistency between these practices and management statements that safety is the organization's overriding priority is not lost on the work force. The message is that management does not hold itself accountable for fixing equipment problems. The degraded equipment issue is discussed further in the Resources Safety Culture Component section of this Report.
- There are strong organizational silos that inhibit communication, cooperation, and accountability. This is particularly evident in the project management process, which by industry norms is very informal and rather unstructured. As a result, roles, responsibilities, and the ultimate accountability for safety frequently become unclear.
- Many key decisions, including those related to safe operations, tend to made by a relatively small group of managers. These are frequently not well communicated or explained; and there is typically limited opportunity for the workforce to give input to these decisions or review/comment once they are made. This also undermines individual ownership and accountability.
- Vertical communication within the organization is poor. There is a tendency to communicate an issue once or twice and assume that communication will cascade throughout the organization without any loss of content or impact. As a result, many employees do not understand where the organization is headed from a safety perspective or why, thus undermining individual employee ownership and accountability.

NFS does not have an active formal performance management system for salaried or hourly employees. Thus, performance objectives and reviews, and the associated rewards and sanctions, are not utilized to reinforce safety objectives or requirements. Three systems, in various stages of completion, could provide the basis for a robust organization-wide performance

management system. They include the SMS (metrics), performance agreement, and policy deployment programs. Unfortunately, there seems to be minimal effort being expended on developing and maintaining these systems.

Safety-related attitudes are an informal consideration when considering individuals for promotion. There is a "good catch" award program, but many employees do not understand how it works or how to nominate individuals to achieve the award.

Field observations and interviews support the NFS assessment that employees are generally safety conscious, and would not knowingly let a fellow employee put themselves or others in a position of imminent danger. There is little or no evidence, however, to indicate that Human Performance (HuP) based tools like Peer-Check are in widespread use at the NFS facility. This is expected to change once NFS has fully implemented its own HuP program. An aggressive HuP program will generate employee accountability for safety-related performance and substantially improve safety focus – including procedural compliance, which has been a long-standing organizational problem at NFS. (The benefits of a robust Human Performance Program are discussed in detail in the Work Practices Safety Culture Component section of this Report.)

NFS Self-Assessment

NFS management's overall self-assessment was that accountability is an area that is unsatisfactory. It was concluded that there is a poor understanding of requirements, and that this safety culture component required action. Specific observations were as follows:

- NFS management reviewed decision making and management accountability programs, procedures, and policies to verify alignment with safety culture objectives. It was concluded that decisions are generally being made with safety as a priority. The self-assessment also determined that performance evaluations had not been performed for salaried employees in two years, and that there was no performance review system for hourly employees. These results were viewed to be unsatisfactory and require action.
- Reviews of decision making and priorities were performed to verify alignment with safety culture objectives; and horizontal and vertical communication practices were reviewed to verify safety concepts were properly prioritized. Management's conclusion was that decision making and communication were not consistently effective.
- Observations of the work force failed to reveal reinforcement of safety principles among peers – a situation considered to be unsatisfactory.

The SCUBA Team's assessment is in general agreement with NFS's self-assessment of Accountability. As noted above, the insights gained from the safety culture survey, personnel interviews and behavioral observations indicate that accountability has not been systematically and consistently reinforced at the workforce, supervisor, or management levels.

III.K CONTINUOUS LEARNING ENVIRONMENT SAFETY COMPONENT

RIS-2006-13 Component Description

The licensee ensures that a learning environment exists.

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Continuous Learning Environment component of the NFS-Erwin safety culture is deficient when compared to commercial nuclear power plant industry best practices and represents an Area for Improvement (AFI). The Site does not meet regulatory expectations in that the organization is insular and has a poor frame of reference with regard to industry standards and best practices.

In this regard, the SCUBA Team has concluded that:

- NFS-Erwin has allowed itself to become insular in the nuclear industry, resulting in a poor frame of reference for its performance and progress against industry standards. Compounding this problem is the fact that benchmarking has not been valued as a source of institutional learning and improvement. Significant focus on benchmarking activities and other similar activities is needed to improve the organization's frame of reference with respect to industry standards and expectations.
- NFS-Erwin does not have a standardized process for soliciting feedback and digesting lessons learned in order to manage goals and continuously improve organizational performance.
  - There are no regularly-scheduled, periodic management review meetings where functional area managers are expected to report on their organization's performance and to discuss gaps to excellence in a collegial setting. The General Manager's staff meetings are the closest approximation to this, but they are focused on daily problems and production.
  - NFS management does not sufficiently value opinions and suggestions from the workforce (particularly from shop-floor workers) to resolve problems and improve performance. As a result, the site is not taking full advantage of the opportunity to involve the entire workforce in seeking and implementing performance improvements.
- There is variability between the work practices taught in the classroom and those observed at the work site once the technicians are qualified and comfortable with their job. On-the job experience is allowed to replace procedural reference and this practice goes uncorrected by supervisors.
- The site administers an adequate "just in time" training program. NFS-Erwin relies heavily on Toolbox training to disseminate information on a monthly basis and complements it with a computerized "read-and-sign" regimen for reviewing updates to procedures and processes. The "read-and-sign" program is cross-connected with access authorization and the task qualification matrix. The Toolbox method reaches the intended population but does not assure standardization because the quality of instruction varies with the supervisor and venue.
- There is essentially no professional development program for soft skills and leadership training.

- Performance agreements are not frequently used. Consequently, managers do not consistently carry through with their own plans for professional growth through education or adequately mentor their subordinates through the same process.
- Performance agreements are also intended to serve as the basic document for outlining the knowledge transfer expected to occur when an individual accepts a new position. This expectation is not uniformly applied or enforced and allows the potential for critical information to depart with the employee.

SCUBA Team Findings and Recommendations

AFI-CLE-01 NFS has developed a frame of reference that is based primarily upon its own experience as opposed to one based upon current nuclear industry standards and best practices. This is largely due to organizational insularity, which appears to have developed as a result of the organization's sense of the uniqueness of its operations.

In this regard, the SCUBA Team recommends the following:

- Industry benchmarking is needed to enhance overall organizational effectiveness and to address the existing organizational frame of reference issue. NFS should establish and implement a strategic, multi-year approach for conducting benchmarking activities at commercial nuclear power plants, other nuclear fuel cycle facilities and chemical industry facilities. A single point of accountability and ownership should be assigned for the success of this strategic benchmarking program.
- Scheduling INPO Assist Visits, participating on external industry assessments and engaging external peers as participants in NFS-Erwin internal assessments will further enhance the development of a current, industry-based frame of reference.
- Management must adopt and enforce a regulatory standard of excellence where minimum levels of compliance are not considered to be acceptable.
- Management must create an environment where proactive self-criticism becomes the norm and where management holds itself, as well as the balance of the workforce, accountable for complying with all operational and administrative procedures.

AFI-CLE-02 NFS-Erwin does not have a formal goal-setting process and an associated systematic review process to drive improvements in organizational performance across the site. The nuclear industry standard is to convene periodic meetings of all functional managers and to conduct a collegial review of performance using second tier performance indicators as metrics. The goal of such reviews is to identify and address performance gaps in support of continuous organizational improvement.

In this regard, the SCUBA Team recommends the following:

- Conduct periodic management review meetings. Designate functional managers as the representatives for their organizations to discuss current levels of organizational performance, challenges and solutions, progress

on organizational performance improvement initiatives and other activities to close gaps to excellence.
- Establish challenging goals and progress curves. Develop performance indicators and metrics that are based on industry best practices.

AFI-CLE-03 Leadership skills at NFS-Erwin have been suborned to technical competence and there is no current training program to address this gap.

In this regard, the SCUBA Team recommends the following:

- NFS needs to create and sustain a leadership development program for its supervisors and managers. Both soft skills and management development training are needed in order to improve human performance. The intent of the program should be to align the organization, motivate the leadership team, and achieve the vision of excellence.
- The executive leadership team should perform a critical assessment of the current management/supervisor team to ensure there is reinforcing sponsorship for and alignment with NFS's safety culture programs and initiatives.

ANA-CLE-01 Increased emphasis should be placed on soliciting and acting on ideas and suggestions from the workforce to resolve problems and to continuously improve performance. This should be appropriately reflected in the performance evaluation expectations for supervisors and managers.

OFI-CLE-01 There are aspects of the NFS-Erwin training program that represent opportunities for improvement. The site's performance is considered to be acceptable when compared to industry best standards, but this is a noteworthy candidate for continuous improvement. (This training issue is also reflected in SCUBA Team Findings OFI-SP-01 and AFI-CM-03.)

In this regard, the SCUBA Team recommends the following:

- Establish a Curriculum Review Committee and Training Review Council to mirror industry best practices. These forums would provide a collegial review of training requirements and match them with adequate resources on a site-wide basis. Perform industry benchmarking in this area.
- Conduct a comprehensive review of all aspects of formal training (an INPO assist visit could be beneficial in this regard).
- Implement a basic site qualification process to establish a fundamental level of understanding of all aspects of the work at NFS-Erwin. The curriculum could serve as the foundation for a continuing training program and would facilitate the transfer of information and lessons among work groups.
- Administer instructional methods training to Subject Matter Experts in order to standardize the quality of Toolbox training sessions.
- Develop classroom skills training for "occasional" instructors, to enhance the quality of the product.

- Train managers and selected supervisors in program self-assessment skills, using outside facilitators with demonstrated competence in this area.
- Develop instructors skilled in Configuration Management, dedicated to teaching the details of configuration management to system users and subject matter experts.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Continuous Learning Environment Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Adequacy/Competency" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization near the top of the third quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are more positive than is justified by actual performance.

The numerical ratings of individual cultural attributes indicate that the workforce perceives the need for improvement in:

- Placing importance upon actively seeking out new ideas and best practices from other nuclear and chemical industry facilities.
- Effectively utilizing individual and group performance goals to achieve improvements.
- Receptivity of supervisors and managers to input and feedback.
- Having an environment where individuals feel safe to voice their opinions and ideas.

The low rating of "having an environment where individuals feel safe to voice their opinions and ideas" is of particular concern as it represents an area of fragility in the safety conscious work environment.

There were a reasonable number of write-in comments related to the Continuous Learning Environment. There were more negative comments than positive comments.

The positive comments indicated that many individuals consider technical training to be good and that some believe that the work force is willing to learn and improve.

The negative comments indicated that:

- That there is insufficient involvement of experienced employees in the process of identifying and implementing improvements and/or that their ideas are not considered.
- There is a need for more in-depth and improved training.
- There are number of impediments to improvement including lack of benchmarking and resistance to change.

2007 NFS-Erwin Independent Safety Culture Assessment
SCUBA Team Results Report

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team gained significant insights during interviews, observations, and documentation reviews. Some examples:

- NFS-Erwin has only recently begun to use benchmarking activities to improve its knowledge, skills, and safety performance. The site has not yet taken a strategic approach to benchmarking to include a multi-year plan and a diverse range of methods for obtaining external information.
- There is no central database of information (in PIRCS or elsewhere) to track either the lessons learned during benchmarking visits or the actions taken or planned to apply those lessons learned. The recent visit to Limerick Generating Station is cited as an example of applying newly learned behaviors, but it is difficult to find that these lessons have gained traction at NFS-Erwin; and there is no simple means of checking.
- The SCUBA Team intended to monitor management meetings held to review progress against established standards and performance indicators. Such meetings are not held and performance indicators, though available within each functional area, are not used strategically to improve long-term performance against industry standards or close gaps to excellence as defined by NFS-Erwin. The available tools are used to track production progress instead.
- Performance agreements are not uniformly used for individual goal setting or to document knowledge transfer when individuals change jobs. When they are used, they are not treated as living documents. The SCUBA Team reviewed four performance agreements and interviewed the owners. Two were inadequate and, in all four cases, managers had not reviewed individual progress to ensure that milestones had been met and goals accomplished.
- There is no leadership or management development program to train new or potential supervisors or managers in basic leadership skills. Instead, salaried employees are expected to negotiate performance agreements with their supervisor or manager (for example, professional development classes at local colleges). These add to the skill set of the individual leader, but do not necessarily provide training that is tailored to the needs and expectations of NFS-Erwin.
- Survey results and personnel interviews reveal a sense of frustration, particularly among the craftsmen, that opinions and suggestions to resolve problems have been neither solicited nor entertained by NFS-Erwin leadership. As a result, the site is not taking full advantage of the opportunity to involve the entire workforce in seeking and implementing performance improvements.
- Survey results and interviews indicate that employees are satisfied with the level of training available, the quality of the instructors, and the support that management provides for training. However, most of the training that is not related to fuel production is taught off-site and is subject to cancellation due to inadequate funding or loss of an educational grant.
- The site does not operate in the same manner as it trains. For example, procedure use in the field is not to the standard set by instructors during classroom instruction.
- The strike contingency response and the worker re-indoctrination program are specific examples of targeted training conducted in a timely manner in order to ensure continuity of safe, routine operation.

- It is difficult to differentiate between "read-and-sign" and Toolbox training. The standard for a monthly Toolbox session should be a short presentation or formal pre-shift brief with handouts and some form of post-training review (perhaps an occasional quiz) conducted by an individual who has received basic instructor training. This is not the method seen by SCUBA Team members who observed Toolbox sessions.
- Much of the training outside of the technical aspects of fuel production is conducted by vendors (e.g., Master Mechanic training for Maintenance Technicians and PLC Certificate training for I&C Technicians in Engineering).
  - There is no evidence of a needs analysis having been performed to tailor these to site requirements.
  - There is no reviewing body established to suggest improvements or audit results. The Facility Operations Council serves this purpose for the fuel production side of the operation, but it does not focus on training excellence and there is no counterpart elsewhere in the organization to deal with other disciplines.
- Beyond annual re-indoctrination training, there is no evidence of a continuing training program designed to review and refresh skills once initial qualifications are complete. One obstacle to such a program is that training on a scale common to the rest of the nuclear industry would have to be treated as overtime. The SCUBA Team did review several lesson plans dealing with technical skills but the subject matter was limited to that needed for operation of new equipment.
- The site does not have a formalized process to periodically refresh proficiency or review situational needs for additional training. Training Review Councils and Curriculum Review Committees serve this purpose elsewhere in the nuclear industry but there is no such entity at NFS-Erwin.
- The site has provided an initial round of baseline training on configuration management to all employees. It will be necessary for this training to be treated as the first of several sessions needed to qualify the employee body on the specifics of the CM Program. These scheduling milestones should be included in the strategic plan.
- There is a general expectation among the craft workers that their supervisors should be superior technical experts and that job skills training is limited to the salaried employee. Training hourly workers to become subject matter experts is the industry standard.

NFS Self-Assessment

NFS rated its overall performance in Continuous Learning Environment component as "Sometimes effective, somewhat reactive, requires monitoring." This generally agrees with the information obtained by SCUBA from document reviews, interviews, and observations. One of the elements detected during the safety culture assessment is the tendency of NFS employees to judge their current performance against their past performance. This creates significant frame of reference gaps. A rigorous benchmarking program will help improve this situation.

III.L ORGANIZATIONAL CHANGE MANANGEMENT SAFETY COMPONENT

RIS-2006-13 Component Description

Management uses a systematic process for planning, coordinating, and evaluating the safety impacts of decisions related to major changes in organizational structures and functions, leadership, policies, programs, procedures, and resources. Management effectively communicates such changes to affected personnel.

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Organizational Change Management Safety Culture Component is deficient at NFS-Erwin when compared to commercial nuclear power plant industry best practices and, as a result, represents an Area for Improvement (AFI). The SCUBA Team has also concluded that Organizational Change Management does not meet regulatory expectations.

NFS does not have a formal process to pre-identify and manage the safety impact of major change in organizational structures, organizational functions, leadership, policies, programs, and resources. No documents, standards/expectations, tools, or training are available with respect to Organizational Change Management; thus, there is no guidance as to what changes should be evaluated, or how these evaluations should be performed. Failure to manage the safety-related impacts associated with organizational change can pose a risk to regulatory compliance, several examples of which were observed by the SCUBA Team.

It should be noted that NFS has demonstrated the capability to safely manage significant change evolutions. In this regard, the Pre-Strike plan and the Return-to-Work plan were well-conceived and effectively carried out.

SCUBA Team Findings and Recommendations

AFI-OCM-01 NFS Erwin does not have a formal organizational change management program. Changes are not formally reviewed for potential safety or resource implications. Major changes are not consistently or effectively communicated throughout the organization. This safety culture component does not meet regulatory expectations, and is considered to be deficient when compared to industry standards. The SCUBA Team considers this to be an "Area for Improvement."

The SCUBA Team recommends the following:

- Formalize a process to evaluate and manage the safety-related impacts of organizational change.
- Assign individual accountability and responsibility for the Organizational Change Management process and the conduct of the associated reviews, including the approval process. (The SCUBA Team recommends that the NFS General Manager have official responsibility for the program with implementation support from the Safety and Regulatory function.)

- The process should include development of formal communication plans appropriate to the scope of the change.
- Significant changes should be reviewed by the Safety Culture Leadership Team prior to implementation.
- Union management should be incorporated into the change management process when appropriate. The process should include the preparation of key stakeholders and sponsors to prevent any potential chilling effects of the proposed change.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Organizational Change Management Component for the NFS-Erwin Site Composite Organization was characterized as an "Area of Adequacy/Competency" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the second quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating characterization, are significantly more positive than is justified by actual performance. The NFS-Erwin organization appears to have an inadequate frame of reference with respect to standards of excellence in this area.

It should also be noted that commercial nuclear power plant industry norms are generally quite low in this area. In particular, the numerical rating leading to the characterization of the cultural attribute "supervisors and managers obtain workforce input before implementing significant changes" as a perceived Area of Adequacy/Competency is potentially misleading due to the fact that industry norms are low for this cultural attribute. On an absolute basis, the NFS-Erwin numerical rating of this attribute is not particularly high. In fact, it was one of the ten lowest rated cultural attributes.

The numerical rating of "management's effectiveness in communicating to the workforce the reasons for major changes" indicates that the workforce perceives the need for improvement.

There were very few write-in comments (7) related to "Organizational Change Management," which suggests that this Safety Culture Component may not be well understood by the workforce and that there is an overall lack of awareness of NFS-Erwin organizational change management practices.

The single positive comment indicated that there has been some improvement in ensuring that new or modified processes are ready before bringing them on line. The negative comments indicated that various aspects of change management including planning, coordination of changes, and communication of the bases for changes are not performed well.

Personnel Interviews, Behavioral Observations and Documentation Reviews

NFS-Erwin does not have a formal process to pre-identify and manage the safety impact of major change in organizational structures, organizational functions, leadership, policies, programs, and resources. No documents, standards/expectations, tools, or training are available with respect to Organizational Change Management; thus, there is no guidance as to what changes should be evaluated, or how these evaluations should be performed. Failure to perform these evaluations can result in organizational and/or individual performance gaps which in turn threaten the organization's regulatory compliance and safety performance. An example is the failure to transfer ownership of a formal NRC commitment when making a change in management responsibility for the Corrective Action Program.

Procedure changes in Operations are reviewed by the Training and Process Engineering organizations before going into effect. Procedure changes in other organizations do not currently require review. Although the Safety and Safeguards Review Committee (SSRC) does consider NRC licensing requirements when evaluating plant modifications, these reviews are typically technical in nature, and do not systematically evaluate the impact of any associated organizational changes on safety.

A key element of Organizational Change Management is communication of the reason for change to affected personnel. The normal process for communicating site-wide information is e-mail and or "town hall/all hands" meetings. These tools are useful and appropriate; however, important issues require repeated communications and follow-up. The absence of a cascading approach can also leave some managers and supervisors vulnerable to a poor understanding of the reasons for and details of the change. Procedures for communicating management decisions have not been developed; and as a result, the methods used to communicate change to affected employees or organizations are not consistent and often lack sufficient explanation. An example of poor change communication was the decision to reduce the frequency of air monitoring. The basis for this change was technically sound and did not degrade the radiation protection program. However, the reasons for this change were not effectively communicated to the workforce, who perceived it as a reduction in safety margin.

NFS-Erwin is in a period of major change – from both a regulatory and a business perspective. Interviewed employees report a wide variance in the quality of the change management process and tend to attribute it to the diligence (or lack thereof) of the individual responsible for the specific change. Employees also report organizational change is frequently not well executed in that positions are left vacant for sustained periods of time, assignments and responsibilities get lost or are neglected, transition periods takes longer than they should, and more confusion is generated than is necessary. It is the SCUBA Team's opinion that the adoption of a formal change management methodology would prevent most of the above problems, greatly increase employee acceptance, and substantially increase the organization's success rate and efficiency level when implementing major change.

NFS Self-Assessment

The Self-Assessment conducted by NFS resulted in a rating of "ineffective, unsatisfactory, poor understanding of requirements, and requires action." The self-assessment noted the absence of any formal process and correctly identified the consequences that result. The SCUBA Team agrees with the findings of the NFS Self Assessment.

III.M SAFETY POLICIES SAFETY COMPONENT

RIS-2006-13 Component Description

Safety policies and related training establish and reinforce that nuclear safety is an overriding priority.

SCUBA Team Conclusions

Based on the integration of all sources of assessment input, the SCUBA Team has concluded that the Safety Policies Safety Culture Component is marginally effective at NFS-Erwin when compared to commercial nuclear power plant industry best practices and, as a result, represents an Area in Need of Attention (ANA). The SCUBA team has also concluded that this Safety Culture Component meets minimum regulatory expectations.

In this regard, the SCUBA Team has concluded that NFS:

- Has established policies that adequately address Nuclear Safety and the Safety Conscious Work Environment.
- Has not yet provided sufficient communications and training on its revised "Nuclear Safety and Compliance Culture Policy" and the "Safety Strong" concept and principles that stem from that revised Policy.
- Provides adequate training on its "Safety and Compliance Conscious Work Environment (SCCWE) Policy."
- Needs to take additional actions to effectively deploy and reinforce its key Safety Policies.

SCUBA Team Findings and Recommendations

AFI-SP-01 There is a need to reinforce workforce understanding of NFS safety policies through enhanced communications and training. Objectives should include ensuring that the workforce (1) understands the underlying concepts associated with NFS safety policies and (2) appreciates how their day-to-day work activities relate to proper application of these underlying concepts. Specific examples of actions that should be taken to accomplish these objectives include:

- Systematic use of "daily safety message" discussions at all Site meetings, including daily briefings by supervisors and shift turnovers. Multiple (5 to 10) discussion themes/topics should be developed in advance for each of the 13 principles used in the "Safety Strong" concept, thereby creating a matrix of themes/topics for use (on a rotational basis) in daily safety messages across the Site.
- Systematic use of periodic (i.e., weekly) General Manager messages focused on individual principles of the "Safety Strong" concept, including providing examples of recent events, decisions, etc. that demonstrate and reinforce the proper application of NFS standards and expectations with respect to "Safety Strong," as a means to reinforce the importance of safety.
- Incorporation of specific training on the thirteen principles of "Safety Strong" and on the SCCWE that is designed to bring these concepts alive to the NFS-

Erwin workforce. As a minimum, such training should be included in the General Employee Training (GET) curriculum and in the annual GET refresher training curriculum.

- Timely communication on the bases/reasons for key decisions that could potentially be interpreted by the workforce as compromising nuclear safety as top priority, as a means of demonstrating that organizational decisions and actions are consistent with safety policies.

OFI-SP-01 At the present time, knowledge and understanding of the NFS-Erwin licensing bases (including the Integrated Safety Analysis) and how they are reflected in operational procedures, safety limits, etc. resides primarily with personnel in the NFS-Erwin Safety and Regulatory organization. Spreading such knowledge and understanding across the NFS-Erwin organization through training would serve to strengthen the organization's overall Safety Culture.

Supporting Information

Workforce Survey Results

Based on the workforce survey numerical ratings, the overall rating of the Safety Policies Component for the NFS-Erwin Site Composite Organization was characterized as an "Area in Need of Attention" based on comparisons to industry norms. This rating places the NFS-Erwin Site Composite Organization in the fourth quartile of the commercial nuclear power plant Sites in SYNERGY's industry database.

Based on information obtained through other sources of input, the SCUBA Team believes that workforce perceptions in this area, as reflected by the overall rating, are generally consistent with actual performance.

Numerical ratings of individual cultural attributes indicate that the workforce perceives that the following attributes represent Areas of Strength:

- Workforce understanding that individuals have the right and the responsibility to identify and pursue resolution of potential nuclear safety issues or concerns.
- Conduct of thorough nuclear criticality safety evaluations.

Numerical ratings of individual cultural attributes indicate that the workforce perceives the need for improvement in the following areas:

- Providing adequate training on the NFS-Erwin "Safety and Compliance Conscious Work Environment Policy" and how it applies to day to day work activities.
- Consistently conducting nuclear-safety related activities in accordance with procedures and regulatory requirements.
- Providing adequate training on the processes available for reporting and documenting potential nuclear safety issues or concerns.
- Senior Site management communicating frequently and consistently to reinforce the message that nuclear safety is the highest priority.

There were a significant number of positive survey write-in comments related to Safety Policies. Many of these noted the quality of support and expertise provided by the Nuclear Criticality Safety organization. On the other hand, there were a significant number of negative survey write-in comments related to the perception that production is given priority over nuclear safety.

The positive write-in comments also noted that:

- Personnel are very aware, concerned, and focused on nuclear safety as the top priority.
- Standards and expectations for nuclear safety are being effectively included in training and reinforced by management.
- Management is demonstrating a desire to pursue and address identified concerns.
- The quality of safety calculations and assessments is high.

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team reviewed all NFS Policy Statements and NFS Procedures related to nuclear safety culture. In this regard, the following two NFS Policy Statements are the highest level policies related to nuclear safety, the SCWE and organizational safety culture:

- "NFS Safety and Compliance Conscious Work Environment Policy", NFS-MGT-04-006, Revision 1
- "NFS Safety and Compliance Culture Policy", NFS-MGT-05-007, Revision 2.

NFS-MGT-04-006 was found to be adequate, and workforce training on this policy was found to be adequate. As discussed in the SCWE-related Safety Culture Component Sections of this Report, the SCUBA Team has concluded that additional actions are needed to effectively deploy and reinforce this policy.

NFS-MGT-05-007 was found to be adequate; however, as indicated below and in AFI-SP-01, additional training and communications is needed on this policy. As indicated below, the SCUBA Team has concluded that additional actions are needed to effectively deploy and reinforce this Policy.

In August 2007, the SCUBA Team identified the need for inclusion of worker fatigue considerations in the NFS Fitness for Duty Policy. NFS management has been actively working on instituting such a policy and it should be issued shortly[8]. The SCUBA Team is aware of another important policy on "Employee Integrity, Responsibility and Performance" that is also expected to be issued shortly.

SCUBA Team members reviewed the training curriculum for the key NFS safety policies and observed and/or participated in (as trainees) the following training activities:

- Training provided to members of the workforce returning from the strike, which included training on Safety Culture and the Safety and Compliance Conscious Work Environment.
- General Employee Training, including Radiation Worker Training.
- Annual General Employee Refresher Training.
- Training provided by the NFS-Erwin General Manager on the "Safety Strong" concept and principles.

[8] The details of this Policy are currently under review and discussion with Union representatives.

The NFS Safety Culture leadership Team (SCLT) has established the following Vision Statement related to organizational Safety Culture:

> "Within the next four years, all NFS employees will demonstrate excellence in everyday safety resulting in an organizational Safety Culture recognized by stakeholders as a standard in the nuclear industry."

Similarly, the NFS SCLT has established the following Mission Statement related to organizational Safety Culture:

> "Safety Strong: Every Thought, Every Act, Every Time"

In July 2007, the NFS SCLT adopted a set of 13 key principles, which are collectively described as "Safety Strong," to articulate its value system related to safety culture. NFS-MGT-05-007 was revised accordingly to reflect this change.

Actions were subsequently taken to communicate "Safety Strong" to the NFS workforce, which included employee meetings led by the NFS-Erwin General Manager and the deployment of a variety of "cultural artifacts," such as banners, computer screen savers, and ball caps. These actions served to introduce the workforce to the new "Safety Strong" concept. However, the concept and its supporting principles have yet to be systematically reinforced through training, communications and management actions that would serve to bring these concepts to life in terms of how they translate into day-to-day standards and expectations for the workforce. Accordingly, much remains to be accomplished. (This area is also addressed in SCUBA Team Finding AFI-SP-01)

As discussed in other Safety Culture Component Sections of this Report, the SCUBA Team determined that:

- The NFS organization has a number of weaknesses in its safety culture that, unless effectively addressed, serve to undercut the values, standards and expectations set forth in "Safety Strong." Findings related to acceptance of a "meet minimal regulatory requirements" approach, tolerance of degraded conditions, weaknesses in procedural compliance, lack of thoroughness of Corrective Action Program evaluations and insufficient focus on self-assessment and the continuous improvement of organizational culture and performance are particularly important in this regard, as the underlying cultural weaknesses do not reflect or reinforce desired organizational values, standards, and expectations. These weaknesses are addressed in SCUBA Team Findings associated with other Safety Culture Components Components.
- Effective implementation of programs, processes and functions that support the "Safety Strong" concept are adversely affected by, lack of sufficient accountability and ownership (both individual and organizational), lack of effective management oversight and lack of effective organizational change management. These weaknesses are addressed in SCUBA Team Findings associated with other Safety Culture Components Components.
- Additional dedicated resources are needed to ensure the effective deployment of key programs, processes, and functions in a manner that demonstrates NFS management's commitment to the "Safety Strong" concept and that reinforces desired organizational values, standards, and expectations. In this regard, the key programs, processes, and

functions in need of particular attention are listed below. (These and other areas with additional staffing needs are identified in SCUBA Team Findings AFI-RES-03 and AFI-RES-04.)

- Corrective Action Program
- Nuclear Oversight
- Safety Conscious Work Environment (Alternate Reporting Channels)
- Industrial/Personnel Safety

The SCUBA Team believes that the NFS-Erwin overall safety culture would be strengthened by increasing the breadth of organizational knowledge and understanding of the licensing and safety bases (including the Integrated Safety Analysis). At the present time, such knowledge and understanding resides primarily in the Safety and Regulatory organization. It is recommended that NFS begin to systematically transfer this knowledge and understanding to other parts of the organization, particularly to the Operations and Engineering organizations, through defined training programs. In doing so, a graded approach would be appropriate such that the extent of knowledge transferred is correlated to the needs and desires of individual organizations. (This area is also addressed in SCUBA Team Finding OFI-SP-01)

NFS Self-Assessment

NFS rated the Safety Policies Safety Culture Component as "sometimes effective, somewhat reactive, requires monitoring" when compared to the attributes identified in NRC RIS 2006-13. NFS did not provide an overall summary statement supporting this rating; however, the ratings of all of the individual attributes assessed were identical. The discussion of the bases for the overall rating (and the individual attribute ratings) indicates that the identified needs for improvement in key NFS safety policies are primarily related to policy deployment and reinforcement rather than to the policies themselves.

The following is a partial listing of the NFS self-identified needs for improvement:

- Establishing an environment that encourages employees to raise nuclear safety issues.
- Weaknesses associated with involving employees in the actual resolution of issues prior to the end of the resolution process.
- Employee feedback mechanism with regard to the resolution of identified issues.
- Effectiveness of training and deployment/implementation of safety policies (inconsistent).
- Reinforcement of nuclear safety by example (e.g., communication by using specific examples and by "walking the talk").
- Communication vehicles and associated actions to reinforce nuclear safety. (There are times when personnel perceive that production, cost and schedule goals are of high importance versus nuclear safety.)

IV. ASSESSMENT RESULTS – ADDITIONAL SCOPE

As indicated in the Assessment Plan, the scope of the 2007 ISCA, included coverage of the following additional assessment areas.

1. Notices of Violation (NRC Confirmatory Order – 2/21/2007)
2. NFS Commitments of 9/18/2006 (NRC Confirmatory Order – 2/21/2007)
3. Configuration Management (NRC Confirmatory Order – 2/21/2007)
4. NFS-Erwin Self-Assessment of Safety Culture (June/July 2007)
5. Nuclear Material Security (NRC Confirmatory Order – 2/21/2007)

The results of the SCUBA Team's assessment of these areas are summarized below. Additional information is provided in Attachments A through D for the first four areas, respectively. The SCUBA Team prepared a separate, classified Report on the results of its assessment of NFS-Erwin nuclear material security. That Report is available for review at the NFS-Erwin Site by those with both the appropriate security clearance and a demonstrated need to know.

IV.A Notices of Violation (NRC Confirmatory Order – 2/21/2007)

Attachment A to this Report presents the results of the SCUBA Team's independent assessment of the adequacy of corrective actions taken (or planned) by NFS in response to the issues identified in Section V.1 (Notices of Violation), Section II, items A, C, and E of the NRC Confirmatory Order for Program Improvements dated February 21, 2007[9].

This assessment was accomplished through (1) a review of PIRCS data and commitment tracking spreadsheets, and (2) interviews with the NFS Vice President of Safety and Regulatory, the CAP manager, the Director of Licensing, and the Commitment Tracking Project Manager.

SCUBA Team Conclusion: Area for Improvement (AFI)

NFS provided minimally adequate responses to the specifics identified in the NRC violations, but did not adequately address the underlying causes and associated cultural issues. This represents a deficiency when compared to commercial nuclear power plant industry best practices. This also is indicative of an organization that is satisfied with minimum regulatory compliance.

IV.B.NFS Commitments of 9/18/2006 (NRC Confirmatory Order – 2/21/2007)

Attachment B to this Report presents the results of the SCUBA Team's independent assessment of the adequacy of the actions taken (or planned) by NFS with respect to the commitments made at the management meeting with the NRC on September 18, 2006.

This assessment was accomplished through (1) a review of PIRCS data and commitment tracking spreadsheets, and (2) interviews with the NFS Vice President of Safety and Regulatory, the Corrective Action Program Manager, the Director of Licensing, and the Commitment Tracking Project Manager.

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[9] Paragraphs B, D, and F of Section II contain classified information. The adequacy of NFS corrective actions related to those Notices of Violations is addressed in a separate classified SCUBA Team Report.

SCUBA Team Conclusion: Area in Need of Attention (ANA)

At a management meeting with the NRC on September 18, 2006, NFS committed to completing fourteen (14) action items designed to improve the Corrective Action Program (CAP). Most of the commitments have been met. A few have not, either because the due date has not yet been reached or, in one case, because the action taken to close the commitment is considered to be insufficient.

Based on its assessment in this area, the SCUBA Team concluded that NFS standards and practices for regulatory commitment closure do not meet industry best practices or regulatory expectations. In this regard:

- Commitments should not be closed unless the action has actually been completed (that is, it is not appropriate to close a regulatory commitment to a work request).
- Oversight requirements are not sufficiently formalized.
- A formal or systematic approach for reviewing the effectiveness of corrective actions taken to meet commitments does not currently exist.
- Accountability and ownership for the regulatory commitment control process is unclear; there is evidence of multiple procedures, some of which are inactive.

IV.C Configuration Management (NRC Confirmatory Order – 2/21/2007)

Attachment C to this Report presents the results of the SCUBA Team's independent assessment of the adequacy of corrective actions taken (or planned) by NFS in response to the issues identified in Section V.2 (Configuration Management) of the NRC Confirmatory Order for Program Improvements dated February 21, 2007.

SCUBA Team Conclusion: Area for Improvement (AFI)

The SCUBA Team has concluded that the Configuration Management (CM) Program improvement initiatives are not adequately resourced to ensure that regulatory commitments will be met. Accordingly, this situation represents an Area for Improvement.

There is sufficient documentary evidence to confirm that the programmatic elements necessary to comply with the stated objectives of the CM program are planned and that some are in place in final form. The draft guidance document (NFS-GH-901, "Configuration Management"), if appropriately augmented by supporting procedures that are being concurrently developed, should support effective implementation. However, the governing document must be finally reviewed, approved, and tested. Additionally, significant milestone events still need to be completed in an expeditious manner in order to comply with the Confirmatory Order (and attendant commitments). Although the timetable for some of these commitments, specifically those associated with data entry for selected components and systems, has been eased by obtaining the NRC's concurrence to extend deadlines from 2007 to 2008, it is imperative to train and dedicate the additional personnel needed to complete the work on time. The BLEU Processing Facility Project is scheduled for full implementation in 2008, Navy Fuel in 2009 and the entire site in 2010; the CM Manager estimates the workload at 26 man-years.

When the SCUBA Team reviewed the status of existing documentation designed to ensure that it would support development of the new Reliable Fuel Supply facility, pending full software

automation, it became apparent that program implementation is currently facing schedule challenges and requires corrective action.

IV.D NFS-Erwin Self-Assessment of Safety Culture (June/July 2007)

Attachment D to this Report presents the results of the SCUBA Team's evaluation of the Safety Culture Self-Assessment (SCSA) performed in June and July, 2007, by the NFS Safety Culture Leadership Team (SCLT). As part of its assessment of the NFS-Erwin safety culture, the SCUBA Team requested the SCLT to conduct is own self-assessment of the NFS-Erwin safety culture as compared against the cultural attributes set forth in NRC Regulatory Issue Summary 2006-13. The SCUBA Team requested this action because it believed that:

- In order for the NFS SCLT to design and implement effective initiatives to improve the NFS-Erwin safety culture, the SCLT needed to understand and acknowledge its current status through its own efforts.
- It would be a good opportunity for the SCUBA Team to obtain information on the extent to which the SCLT demonstrated the ability to be sufficiently self-critical.
- The insights, findings, and conclusions of the NFS self-assessment would be a source of valuable input to the SCUBA Team.

Summary of the Results of the SCUBA TEAM'S Evaluation of the NFS SCSA

The overall accuracy of the NFS SCSA was affected by the lack of an adequate frame of reference for excellence in the nuclear industry. This fact became more evident during the SCUBA Team's review of individual Safety Culture Components. Although there were differences in perspective between the SCUBA and NFS SCSA evaluations, the NFS SCSA was generally self-critical with respect to identifying problem areas and weaknesses. It is noteworthy, however, that the NFS SCSA was considered as not being sufficiently self-critical for the three safety components that constitute Problem Identification and Resolution (Corrective Action Program, Operating Experience, and Self and Independent Assessments).

IV.E NFS-Erwin Nuclear Material Security (NRC Confirmatory Order – 2/21/2007)

The NRC identified three nuclear material security violations in Section V.1 of the NRC Confirmatory Order for Program Improvements dated February 21, 2007. The SCUBA Team reviewed NFS responses and associated corrective actions to fulfill the NRC Confirmatory Order.

The SCUBA Team also conducted an overall assessment of NFS Nuclear Material Security Program and its relationship to the overall safety culture work environment at NFS-Erwin. The Nuclear Material Security Program includes the broad area of most security disciplines (i.e. physical, protective forces, information, personnel) and Material Control and Accountability (MC&A).

The SCUBA Team concluded that the NFS Nuclear Material Security Program currently meets minimum safeguards and security regulatory requirements but represents an Area for Improvement when compared to industry best practices. This program has improved from a period of degraded condition.

2007 NFS-Erwin Independent Safety Culture Assessment
SCUBA Team Results Report

The SCUBA Team prepared a separate Nuclear Material Security Report, which documents the results of its assessment of the NFS Nuclear Material Security Program. That Report contains Confidential National Security Information (CNSI) as identified in the Department of Energy (DOE) Classification Guide for Safeguards and Security Information, CG-SS-4. Consequently, the Report is available for review at the NFS-Erwin Site by personnel with appropriate personnel security clearances and a demonstrated need-to-know.

V. OUTLIER ORGANIZATIONS BASED ON WORKFORCE SURVEY NUMERICAL RATINGS

Introduction

Based on the workforce survey results, seven individual NFS-Erwin Functional Organizations were identified by SYNERGY as Priority Level 1 or 2 "organizational outliers" due to having provided low numerical ratings for key cultural metrics (i.e., Overall NSC and Overall SCWE ratings). These organizations are:

- BLEU Complex Operations (NFS Only) – Priority Level 1
- Analytical Services – Priority Level 1
- Health Physics (including Radiation Monitoring & Nuclear Measurements) – Priority Level 1
- Transportation & Waste Management – Priority Level 1
- HEU Fuel Production – Priority Level 1
- BPF Operations – Priority Level 2
- Other Operations Support – Priority Level 2

In this regard, SYNERGY indicated that Priority Level 1 and 2 designations correlate to the following recommended action levels:

- Priority 1 = There is a potential need to take remedial action in the immediate future.
- Priority 2 = There is a potential need to take remedial action in the near-term.

SCUBA Team Evaluation

In accordance with the NFS Erwin 2007 ISCA Assessment Plan, the SCUBA Team conducted confidential interviews with personnel from the Priority Level 1 and 2 "outlier organizations" to determine the underlying reasons for the lower ratings provided by those organizations.

These interviews revealed the following:

- Survey results and interview results were in alignment.
- There are on-going communication problems between management and employees in several of the organizations.
- There are legacy issues, e.g. the strike, that continue to influence the relationship between management and some employees.
- Excessive overtime is a concern to some employees. (NFS management has implemented interim compensatory measures to address overtime issues.)
- No NSC or SCWE problems or concerns were identified as a result of the focused interviews.

Based on the above results, the SCUBA Team has concluded that no independent corrective action is required for three of the outlier organizations. The SCUBA Team recommends that management take remedial action with four of these organizations to proactively surface and resolve the issues identified through the workforce survey and the personnel interviews conducted by the SCUBA Team. The SCUBA Team has provided confidential reports, detailing its findings, to NFS-Erwin executive management.

SCUBA Team Findings and Recommendations

ANA-LOC-01 The workforce survey identified a number of organizations which were outliers from either a Nuclear Safety Culture (NSC) or Safety Conscious Working Environment (SCWE) perspective, indicating a potential need for management to take action in either the near-term or immediate future. These prompted the need for the SCUBA Team to conduct personnel interviews to identify the underlying issues which led to the low survey ratings.

In this regard, the SCUBA Team recommends the following:

- BLEU Complex Operations (NFS Only): NFS and AREVA Management should meet and develop solutions to the communication problems that currently exist between AREVA management and the NFS employees at the BLEU Complex. Details are provided in the Confidential BLEU Complex Outlier Organization Report.
- Analytical Services: Near term management intervention is required to resolve work-related and strike-related environmental issues in the Analytical Services organization. Details are provided in the Confidential Analytical Services Outlier Organization Report.
- Health Physics Monitoring & Nuclear Measurements: The current radiation protection program, and the associated ALARA principles, needs to be explained to the senior Radiation Technicians (RT); the RTs should explain the program to the balance of the workforce. RTs should also take part in work planning and pre-job briefs. Details are provided in the Confidential Health Physics Monitoring & Nuclear Measurements Outlier Organization Report.
- Transportation & Waste Management: An overtime policy needs to be developed that ensures worker hours are reasonable. The material condition of the Waste Water facility needs to be improved and work-arounds corrected. Details are provided in the Confidential Transportation & Waste Management Outlier Organization Report.

Management should ensure that the specific concerns of the remaining outlier organizations, as identified in the workforce survey, are successfully addressed as NFS progresses in implementing its Safety Culture improvement program.

VI. REPORT ATTACHMENTS

Additional information related to the 2007 NFS-Erwin Independent Safety Culture Assessment results is provided in Attachments to this Report. These are listed below:

Attachment A:	Adequacy of NFS Corrective Actions in Response to Section V.1 (Notices of Violation) of NRC Confirmatory Order dated 02/21/07
Attachment B:	Adequacy of NFS Actions Related to Commitments Made During the NRC Meeting of 9/18/06
Attachment C:	Adequacy of NFS Corrective Actions in Response to Section V.2 (Configuration Management) of NRC Confirmatory Order dated 02/21/07
Attachment D:	SCUBA Team Evaluation of the NFS Safety Culture Self-Assessment Performed in June/July 2007
Attachment E:	SCUBA Team In-Process Recommendations to NFS Management
Attachment F:	Personnel Interview Tables and Behavioral Observation Tables
Attachment G:	Basic Reference List for Industry Best Practices
Attachment H:	Table of Acroynyms

VII. ADDITIONAL INFORMATION PROVIDED SEPARATELY

The following additional information has been provided to NFS on CD-ROM disks:

CD-ROM Disk #1

1. NFS-Erwin 2007 Independent Safety Culture Assessment Plan (Revision 1), dated 09/24/2007
2. SCUBA Team Guidance Document for the Conduct of Personnel Interviews
3. SCUBA Team Guidance Document for the Conduct of Behavioral Observations
4. SCUBA Team Guidance Document for the Conduct of Documentation Reviews
5. SCUBA Team Phase I Personnel Interviews Checklists
6. 2007 NFS-Erwin Site Safety Culture Survey Results Report, dated 11/21/2007, SYNERGY Consulting Services Corporation
7. Westat Report entitled, "Analysis of the Psychometric Properties of the NFS 2007 Safety Culture Survey," dated October 16, 2007 (NON-PROPRIETARY VERSION)
8. Non-Proprietary Appendices to the 2007 NFS-Erwin Site Safety Culture Survey Results Report, dated November 21, 2007:
    - Appendix A – Survey Participation Details
    - Appendix B – Key Cultural Metric Ratings for All NFS-Erwin Organizations and Demographic Categories
    - Appendix L – Survey Write-In Comments: Background and Summary

CD-ROM Disk #2 (SYNERGY Proprietary Information)

1. A copy of the 2007 NFS Safety Culture Survey instrument. (PROPRIETARY)
2. Westat Report entitled, "Analysis of the Psychometric Properties of the NFS 2007 Safety Culture Survey," dated October 16, 2007. (PROPRIETARY VERSION)
3. Proprietary Appendices to the 2007 NFS-Erwin Site Safety Culture Survey Results Report, dated November 21, 2007:
    - Appendix C – Assignments of Survey Questions to the NRC RIS 2006-13 Safety Culture Components (PROPRIETARY)
    - Appendix D – Survey Question Ratings by Safety Culture Component: NFS-Erwin Site Composite Organization (PROPRIETARY)
    - Appendix E – Survey Question Ratings by Safety Culture Component: NFS-Erwin Operations/General Manager Organizations (PROPRIETARY)
    - Appendix F – Survey Question Ratings by Safety Culture Component: NFS-Erwin Safety & Regulatory Organizations (PROPRIETARY)
    - Appendix G – Survey Question Ratings by Safety Culture Component: NFS-Erwin Applied Technology and Site Services Organizations (PROPRIETARY)
    - Appendix H – Survey Question Ratings by Safety Culture Component: NFS-Erwin New/Off-Site Programs, Other President & CEO, and AREVA Operations Organizations (PROPRIETARY)
    - Appendix I – Survey Question Ratings by Safety Culture Component: NFS-Erwin Demographic Categories (PROPRIETARY)
    - Appendix J – Identification of Outlier Organizations (PROPRIETARY)
    - Appendix K – Detailed Analysis of Key SCWE-Related Metrics and Attributes (PROPRIETARY)

- Appendix M – Psychometric and Other Properties of the NFS Safety Culture Survey Instrument (PROPRIETARY)

3. 2007 Survey Question Ratings for the NFS-Erwin Site Composite Organization, Major Functional Organizations, Individual Functional Organizations and Demographic Categories. This information is presented in a format with questions ranked from low to high based on mean value rating. (PROPRIETARY)
4. 2007 Survey Question Mean Value Rating Tables and Negative Response Percentage Tables for the NFS-Erwin Site Composite Organization, Major Functional Organizations, Individual Functional Organizations and Demographic Categories. This information is presented in a format with questions listed in survey question number sequence. (PROPRIETARY)

CD-ROM Disk #3 (Confidential Information)

1. A redacted copy [10] of the 2007 NFS Safety Culture Survey Write-In Comments. (CONFIDENTIAL)
2. Results of confidential interviews with personnel in Priority Level 1 and 2 "outlier organizations." (CONFIDENTIAL)

[10]The write-in comments were redacted as necessary to protect the identity of the individuals who provided comments.

ATTACHMENT A
Adequacy of NFS Corrective Actions in Response to
Section V.1 (Notices of Violation) of NRC Confirmatory Order dated 02/21/07

Introduction

This Attachment presents the results of the SCUBA Team's independent assessment of the adequacy of corrective actions taken (or planned) by NFS in response to the issues identified in Section V.1 (Notices of Violation), Section II, items A, C, and E of the NRC Confirmatory Order for Program Improvements dated February 21, 2007[1].

This assessment was accomplished through (1) a review of Corrective Action Program software (PIRCS) data and commitment tracking spreadsheets, and (2) interviews with the NFS-Erwin Vice President of Safety and Regulatory, the Corrective Action Program Manager, the Director of Licensing, and the Commitment Tracking Project Manager.

SCUBA Team Conclusion: Area for Improvement (AFI)

NFS provided minimally adequate responses to the specifics identified in the NRC violations, but did not adequately address the underlying causes and associated cultural issues. This represents a deficiency when compared to commercial nuclear power plant industry best practices. This also is indicative of an organization that is satisfied with minimum regulatory compliance.

SCUBA Team Findings and Recommendations

AFI-NOV-01 As demonstrated by the responses to these three specific NOVs, the use of root cause analysis by NFS does not meet commercial nuclear power plant industry best practices. Investigations tend to focus on the compliance failure itself and describe that failure as the cause. There is insufficient pursuit of the "whys" that would enhance understanding of the underlying human performance or systemic process failures that contributed to the event. Accordingly, there is a tendency to produce corrective actions that have limited potential to address the underlying causes or to effectively change behaviors. There is also a tendency to produce corrective actions that lack a rigorous accountability trail (owner, due date, metrics, etc). (This problem identification and resolution issue is also reflected in SCUBA Team Finding AFI-CAP-03.)

In this regard, the Assessment Team recommends the following:

- Benchmark the commercial nuclear power plant industry's use of root cause analysis, particularly for events involving human performance.
- Improve the quality of root cause analysis to ensure identification of underlying systemic conditions that create the opportunity for failure, particularly for events involving human performance.
- Ensure that robust, high-accountability corrective actions are developed and implemented for events leading to regulatory compliance issues.

[1] Paragraphs B, D, and F of Section II contain classified information. The adequacy of NFS corrective actions related to those NOVs is addressed in a separate classified SCUBA Team Report.

ATTACHMENT A
Adequacy of NFS Corrective Actions in Response to
Section V.1 (Notices of Violation) of NRC Confirmatory Order dated 02/21/07

Supporting Information

1. Violation Cited in Order Section II, Para A (Failure to Wear Respirator)

   Citation: On June 22, 2005, an NFS-Erwin supervisor willfully failed to wear a full face respirator while performing maintenance and repairs on a Building 302 calciner as required by Safety Condition S-1 of Special Nuclear Materials License No. SNM-124, Section 3.1.2 and 3.1.3 of the License Application, Procedure NFS-GH-03, "Radiation Work Permits, Revision 11" and Standard Radiation Work Permit (RWP) # 05-04-032 (EA-06-129).

   Corrective actions related to disciplinary action, document revisions, and refresher training responses appear to be adequate. However, some of the initiatives identified in the NFS reply letter (April 20, 2007) lack the specifics that would help ensure effective execution of the planned initiatives. (Examples: Enhanced oversight is promised, but no implementation process or means for tracking is provided. Business Project Improvement study was launched – no due date provided).

   The Apparent Cause Analysis did not penetrate the issue to the depth reflected in commercial nuclear power plant industry best practices; no causal factor was identified. The analysis failed to determine why the employee chose to knowingly violate a procedure he was trained on and understood. No Common Cause Analysis was conducted as a result of this incident; however, a SCUBA Team review of the PIRCS database identified 40 occurrences of "Rule not followed, radiological safety, RWP" in the last 12 months. This implies the existence of a potentially fundamental problem with radiological procedure compliance.

2. Violation Cited in Order Section II, Para C (Unauthorized Raffinate Transfer)

   On May 31, 2005, an NFS-Erwin acting Building Manager willfully transferred solvent extraction raffinate waste solution to the condensate waste storage area, Tank 5A01, without the approval of Building Supervision, Industrial Safety, or Nuclear Criticality Safety through work instructions, as required by Safety Condition S-1 of Special Nuclear Material License No. SNM-124, Section 2.7 of the License Application, and Standard Operating Procedure (SOP) 409, Caustic and Discard Tank, Revision 2 (EA-06-141).

   Corrective actions related to disciplinary action, document revisions and training responses appear to be adequate.

   The quality of the root cause investigation did not meet commercial nuclear power plant industry best practices. The root cause was determined to be "a willful violation of procedure," yet no attempt was made to understand why the employee either willfully violated or incorrectly interpreted Letter of Authorization, LOA-18771-40-2.

   The corrective actions take credit for the issuance of a Safety and Compliance Culture Policy (NFS-MGT-05-007, Rev 2) and for Safety and Compliance Conscious Work Environment training. The former is, in effect, a restatement of the NRC RIS 2006-13 Safety Culture Components. It does not provide any metrics to track and monitor

performance. The latter policy provides expectations for behaviors in the area of harassment, intimidation, retaliation, and discrimination (HIRD). These documents have the potential to reinforce desired behaviors, but do not deal directly with willful violations of procedure. Their relevance as corrective actions in this case seems tenuous.

3. Violation Cited in Order Section II, Para E (HEUN Spill)

Citation (abbreviated): On March 6, 2006, NFS-Erwin inadvertently transferred high enriched uranyl nitrate (HEUN) solution into an enclosure that was not approved for operation. Eight (8) separate violations are involved in the inadvertent transfer, primarily relating to configuration management and reporting errors.

Corrective actions related to document revisions, Operational Readiness Reviews, and walk-downs appear to be adequate. Some responses seem defensive. The "corrective actions taken to prevent recurrence" also take credit for steps taken during the recovery phase.

The Root Cause Analysis did not meet commercial nuclear power plant industry best practices for depth of investigation. For example, employee misidentification of the "yellowish substance" spotted on the floor as testing material and not enriched material is given as a cause; "why" there was misidentification was not pursued. (This cause seems to point to an opportunity for improvement in training.)

The Root Cause Analysis of Violation 3 of Para E ("failure to establish a configuration management system to evaluate, implement, and track changes to the filter enclosure M205 as required by 10 CFR 70.72(a)") notes that backflow was prevented in previous evolutions by filter seals and an isolation valve, which was open at this time due to plans to move the glovebox enclosure. The fact that the valve was open is cited as a cause; the systemic configuration management weakness that allowed flow with an open valve is not discussed.

The apparent cause of Violation 6, Para E ("failure to conduct SNM operations and safety function activities within procedures, as required by Safety Condition S-1 of the license and Section 2.7 of the license application") states that the procedures contained "less than adequate limitations." However, it does not address "why" the document was inadequate.

Credit is taken for a comprehensive Configuration Management Plan revision. However, the actions in support of that change have not begun. The site waited for the NRC response to their plan submittal before starting, even though some of the actions are appropriate whether approval is granted or not. This is indicative of an organization that is satisfied with minimal regulatory compliance.

ATTACHMENT B
Adequacy of NFS Actions Related to Commitments
Made During the NRC Meeting of 9/18/06

Introduction

This Attachment presents the results of the SCUBA Team's independent assessment of the adequacy of the actions taken (or planned) by NFS with respect to the commitments made at the management meeting with the NRC on September 18, 2006.

This assessment was accomplished through (1) a review of Corrective Action Program software (PIRCS) data and commitment tracking spreadsheets, and (2) interviews with the NFS-Erwin Vice President of Safety and Regulatory, the Corrective Action Program (CAP) Manager, the Director of Licensing, and the Commitment Tracking Project Manager.

SCUBA Team Conclusion: Area in Need of Attention (ANA)

At a management meeting with the NRC on September 18, 2006, NFS committed to completing fourteen (14) action items designed to improve the NFS-Erwin Corrective Action Program. Most of the commitments have been met. A few have not, either because the due date has not yet been reached or, in one case, because the action taken to close the commitment is considered to be insufficient.

NFS standards and practices for regulatory commitment closure do not meet industry best practices or regulatory expectations. In this regard:

- Commitments should not be closed unless the action has actually been completed (that is, it is not appropriate to close a regulatory commitment to a work request).
- Oversight requirements are not sufficiently formalized.
- A formal or systematic approach for reviewing the effectiveness of corrective actions taken to meet commitments does not currently exist.
- Accountability and ownership for the regulatory commitment control process is unclear; there is evidence of multiple procedures, some of which are inactive.

SCUBA Team Findings and Recommendations

AFI-RCC-01 The NFS-Erwin standards for closure of regulatory commitments do not meet commercial nuclear power plant industry best practices. Closure should only be signed off when work is actually completed. Oversight and approval of commitment closure is somewhat subjective, relying on individual judgment and is not subjected to review and approval by a committee or by senior management. The current commitment management process does not require an evaluation of the effectiveness of corrective actions that have been taken to meet commitments. The current process also lacks a regular, systematic, independent third party (i.e., Quality Assurance) review. (This commitment tracking issue is also reflected in SCUBA Team Finding AFI-CAP-02.)

The SCUBA Team recommends the following:

- Revise commitment closure guidelines to include a prohibition against closing commitments to a scheduled event or task; that is, the work required to meet the intent of the commitment must be completed.

ATTACHMENT B
Adequacy of NFS Actions Related to Commitments
Made During the NRC Meeting of 9/18/06

- Develop a process to evaluate commitment closure that verifies completion and adequacy. This process should specify a committee or panel review prior to closure.
- Engage senior management in the closure approval process.
- Revise commitment closure guidelines to include an effectiveness review, unless clearly not warranted.
- Establish periodic quality reviews of commitment closure process by an independent review source (i.e., Quality Assurance).

Supporting Information

1. Commitment 1 (Develop & Implement Common Cause Analysis for CAP)

    a. Finding: Inadequate response. A Common Cause Analysis is not available as an option on a PIRCS pull-down menu, as was intended. The previous commitment owner closed this commitment to an Information Technology request, rather than the completed installation of the option. The new owner of the CAP process was unaware of this commitment made by his predecessor. This has implications for Organizational Change Management as well as commitment response management
    b. A query of PIRCS revealed that some common cause analyses have taken place, but also revealed numerous examples of common problems (e.g., 115 high pressure shutdowns logged in PIRCS) that have not been identified as candidates for common cause investigation.
    c. There is no apparent prescribed threshold for triggering the need for a common cause analysis. It is currently performed at the request/discretion of the PIRCS Review Committee.

2. Commitment 2 (Post CAP metrics in meeting rooms)

    a. Finding: Adequate response. However, metrics are only posted in a single meeting room, as opposed to multiple rooms, as implied in the commitment. The metrics chosen for display (4) do not reflect commercial nuclear power plant industry best practices.

3. Commitment 3 (PIRCS entry for "failure to use PIRCS")

    a. Finding: Marginally adequate response. Records indicate low utilization (six entries since September 18, 2006). This enhancement to the PIRCS process was introduced via a single e-mail. There was no training or reinforcement through tracking and trending for utilization or compliance. The roll-out did not address the issue of "supervisor cut-out," where employees bring issues to their supervisor for PIRCS input, but the supervisor elects to forego the PIRCS process in favor of a work request.

ATTACHMENT B
Adequacy of NFS Actions Related to Commitments
Made During the NRC Meeting of 9/18/06

4. Commitment 4 (Review problem reports prior to screening meeting – PIRCS Screening Committee)

    a. Finding: Satisfactory response. Problem reports are issued in a timely manner, and the PIRCS Screening Meeting members (generally) are in compliance with the requirement for review prior to the meeting. Meeting productivity has increased.

5. Commitment 5 (Develop frequency diagrams)

    a. Finding: Adequate response. Diagrams were developed, but the commitment does not specify the use to which the diagrams will be put, who owns them, frequency of publication, where they will be displayed, etc.

6. Commitments 6 (Modify SOP 392)

    a. Finding: Satisfactory Response. The document was modified to include the recommended language.

7. Commitment 7 (Modify Procedure NFS-GH-901)

    a. Finding: Satisfactory Response. The document was modified to include the recommended language.

8. Commitment 8 (Form Configuration Management Oversight Committee)

    a. Finding: Satisfactory Response. The committee was formed, and it meets weekly to review Minor 2 and Major Work Orders. The committee lifetime has been extended, pending completion of system upgrades.

9. Commitment 9 (Modify NFS-RM-008 Rev 7 & NFS-RM-019 Rev 6)

    a. Finding: Satisfactory Response. The documents were modified to include the recommended language.

10. Commitment 10 (Independent review of completed Configuration Management (CM) Program upgrades)

    a. Finding: Incomplete, pending CM upgrade completion.

11. Commitments 11 – 14 (Evaluate CAP Enhancements: Due December 31, 2008)

    Finding: Incomplete.
    a. 11 "e-mail notification of problem closure" is in Beta testing.
    b. 12 "interface with maintenance work order" – no action initiated yet.
    c. 13 "Lessons Learned" program is being designed.
    d. 14 "INPO Human Performance precursor" – no action initiated yet.

ATTACHMENT C
Adequacy of NFS Corrective Actions in Response to
Section V.2 (Configuration Management) of NRC Confirmatory Order dated 02/21/07

Introduction

This Attachment presents the results of the SCUBA Team's independent assessment of the adequacy of corrective actions taken (or planned) by NFS in response to the issues identified in Section V.2 (Configuration Management) of the NRC Confirmatory Order for Program Improvements dated February 21, 2007.

Topic Description

The Configuration Management (CM) Program should (1) exhibit the ability to track each plant modification that could affect safety, (2) not degrade the performance capabilities of items relied on for safety (IROFS) or other safety controls that are part of the safety design basis, and (3) effectively identify and document the effects of plant modifications to IROFS and other safety controls, processes, equipment, computer programs, and activities of personnel.

SCUBA Team Conclusion: Area for Improvement (AFI)

The SCUBA Team has concluded that the CM Program improvement initiatives are not adequately resourced to ensure that regulatory commitments will be met. Accordingly, this situation represents an Area for Improvement.

There is sufficient documentary evidence to confirm that the programmatic elements necessary to comply with the stated objectives of the CM program are planned and that some are in place in final form. The draft guidance document (NFS-GH-901, "Configuration Management"), if appropriately augmented by supporting procedures being concurrently developed, should support effective implementation. However, the governing document must be finally reviewed, approved, and tested. Additionally, significant milestone events still need to be completed in an expeditious manner in order to comply with the Confirmatory Order (and attendant commitments). Although the timetable for some of these commitments, specifically those associated with data entry for selected components and systems, has been eased by obtaining the NRC's concurrence to extend deadlines from 2007 to 2008, it is imperative to train and dedicate the additional personnel needed to complete the work on time. The BLEU Processing Facility (BPF) Project is scheduled for full implementation in 2008, Navy Fuel in 2009 and the entire site in 2010; the CM Manager estimates the workload at 26 man-years.

When the SCUBA Team reviewed the status of existing documentation designed to ensure that it would support development of the new Reliable Fuel Supply facility, pending full software automation, it became apparent that program implementation is currently facing schedule challenges and requires corrective action.

ATTACHMENT C
Adequacy of NFS Corrective Actions in Response to
Section V.2 (Configuration Management) of NRC Confirmatory Order dated 02/21/07

SCUBA Team Findings and Recommendations

AFI-CM-01 Currently there are inadequate resources assigned to ensure that CM Program improvements will be completed in accordance with the schedules specified in regulatory commitments. Initial short-term commitments have been extended in time, and the long-range goal of complete conversion of all affected systems by the end of 2010 is in jeopardy. Staffing levels need to be substantially augmented beyond the two individuals currently assigned. (This staffing issue is also reflected in SCUBA Team Finding AFI-RES-04.)

The SCUBA Team recommends the following:

- Establish ownership of the CM Program as a major project. Currently, it is not well defined. The Oversight Committee meets weekly; the Steering Committee meets sporadically. Place clear responsibility and accountability with one individual, possibly the CM Steering Committee Leader. Use milestone accomplishment dates as the basis for resource requests. The individuals assigned to complete this effort should be dedicated to the task, or at least assigned minimal responsibilities elsewhere.
- Additional resources must be allocated and/or a revised time-line calculated to ensure that regulatory commitments can realistically be met. The CM database needs to be populated with information from the U-Al bowl wash procedure and U-Metal process. Meeting these NRC commitments, originally scheduled for the second and third calendar quarters of 2007, respectively, will be a challenge. Based on estimates provided by NFS-Erwin personnel, 26.3 man-years of effort will be required to complete all tasks associated with CM conversion. There four additional personnel currently requested to support this project will not be sufficient to complete the work in the remaining three years allotted. The alternative is to request NRC concurrence to adjust the project schedule on the basis of risk and consequence.
- Critically monitor the "cross-walk" technique for integrating existing procedures and processes into the framework of draft NFS-GH-901. Specifically, the Engineering Change Request and Engineering Change Notice processes need to be aligned shortly after the draft version is approved. The present April 2008 due date presents a challenge to full incorporation of the BPF Facility by the end of 2008. Currently, there are administrative disconnects that need to be closed although many of the subordinate procedures have been reviewed and aligned with the new CM process.
- Assign responsibility for evaluating and maintaining the design margin, as represented in the design documents and as-built conditions. The CM Manager has acknowledged this requirement as a primary function of the CM effort. NFS must establish a plan of action for each of the affected systems, structures, and components selected for inclusion in the database.

- Designate CM Coordinators within each department or organizational group that has a major role in the process. These individuals should assist and be held accountable for constancy of purpose and should mitigate the natural tendency to alter the program to fit individual preferences.
- Revise the draft NFS-GH-901 to ensure that suggested practices are mandated. For example, a safety review should be required whenever a modification change is submitted. Currently, the verbiage states, "safety review, when applicable." Such checks should not be optional.

AFI-CM-02 NFS has not formalized the process for reviewing the progress of the conversion to a centralized CM database nor is a timeline for proactive oversight included in the project plan. Such reviews must be conducted in a timely manner in order to protect the design margin from errors being introduced as well as to reduce the potential for costly rework. (This staffing issue is also reflected in SCUBA Team Finding AFI-RES-04.)

The SCUBA Team recommends the following:

- Modify the PIRCS database to allow designation of discrepancies that can be attributed to configuration management issues. This change will allow for better trending and lessons learned processes.
- Accelerate the timetable for the next biennial audit of the CM Program to occur in the first calendar quarter after NFS-GH-901 is approved and the first pilot procedure and prototype process are entered into the LINC software. This will provide an early opportunity to identify strengths and weaknesses before significant additional effort is expended.
- Conduct a self-assessment of the CM Program.
- The LINC software provides the capability for tracking outstanding Letters of Authorization (LOA), which temporarily authorize procedure modifications. The site should take the opportunity to establish criteria for maintaining these temporary changes and use the new tracking tool to reduce the population.
- Correct the behaviors that led to a QA audit finding that biennial walk-downs to verify the accuracy of Process and Instrumentation Drawings (P&ID) were completed late. This problem with schedule compliance should be corrected to ensure that the entry of each system in the LINC database is checked in order to ensure a match between design documentation and the as-built condition.
- Audit the LOA process. The tracking system should be computerized to improve the record keeping for these temporary documents that can have significant impact on system operation and design. Currently, the master LOA logbook is maintained by the Quality Control Department in accordance with NFS-RM-008. Each organization generates LOAs, categorized by Sales Number, using a hand-written index. Although the standard lifetime of an LOA is 90 days, that expectation is not

enforced. Other LOAs appear never to have been issued and some are still assigned to individuals who are no longer employed at NFS-Erwin.

AFI-CM-03 Although all employees have received introductory training on the CM process, it is necessary to conduct additional training in order to saturate the site with the requisite level of knowledge to make configuration management an integral part of the daily routine. Specialized skills need to be taught to a significant part of the workforce in an aggressive manner during the coming year. (This training issue is also reflected in SCUBA Team Finding OFI-CLE-01.)

The SCUBA Team recommends the following:

- All employees must be trained on those specifics of the CM Program needed to do their job. General employee training was completed in November 2007 but it will be necessary to follow up with specialty training for individual groups, tailored to meet their particular needs. In this regard, the CM Manager has acknowledged the need to develop roles and responsibilities and then designate subject matter experts; this has not been completed to date.
- Increase the population of individuals qualified to review safety scenarios during the configuration change process per NFS-GH-55. The site currently has one person qualified to perform the "What If" analysis and none qualified to perform the "Hazop" analysis. Additionally, there is not a requirement to include operators in the Integrated Safety Analysis process as OSHA suggests. Their inclusion would improve the product and better align NFS-Erwin with practices across the nuclear and chemical industry.

Supporting Information

Workforce Survey Results

The NFS-Erwin workforce survey included two survey questions related to configuration management:

- The NFS-Erwin Site Composite Organization rating of "At our Site, we maintain our procedures, drawings and calculations to be consistent with operational practices and the physical configuration of our facilities" was characterized as an Area in Need Attention based on comparison with commercial nuclear power plant industry norms.
- The NFS-Erwin Site Composite Organization rating of "During the past year, we have improved the effectiveness of our configuration management program" indicates that the workforce perceives that significant improvement has been achieved over the past year.

There were few (10) survey write-in comments directly related to configuration management. The positive comments noted improvements in control of PI&Ds since the March 2006 event. The negative comments generally indicated that this was an area requiring continued attention and resourcing.

ATTACHMENT C
Adequacy of NFS Corrective Actions in Response to
Section V.2 (Configuration Management) of NRC Confirmatory Order dated 02/21/07

Personnel Interviews, Behavioral Observations and Documentation Reviews

The SCUBA Team gained significant insights during interviews, observations, and documentation reviews. Some examples:

- The site has taken each of the recommendations of the third party review (completed in September 2006) for action, but most of the responses remain a work in progress. PIRCS Problem Report #4068 committed the site to submitting a license amendment to revise the CM Program and that was completed on April 20, 2007. The elements of the third party review comprised the bulk of the submittal; however, progress on several of the items listed in that docketed correspondence has been slower than committed. It is appropriate for NFS to develop an updated, accurate action plan with aggressive milestone tracking to ensure that the new timetable is not challenged.
- Two commitments made to the NRC were overdue for completion until the due dates were successfully re-negotiated. Specifically, the centrifuge U-Al bowl wash procedure and the U-Metal process were scheduled as pilots for full incorporation into the CM Program in the second and third calendar quarters of 2007, respectively. The CM Specialist is actively working on both, but NFS had taken the position that the scheduled dates for these written commitments were only targets. Neither is yet complete although the NRC has subsequently agreed to extend the due dates into 2008.
- The CM organization is under-manned. Currently, only the Manager and one Specialist are assigned to the project. It does not appear that the next major milestone of fully integrating the BPF Project into the CM Program will occur in 2008 unless additional people are assigned, or at least specifically dedicated, to the project.
- The governing procedure, NFS-GH-901, remains in development. The CM Oversight Committee has reviewed the draft that is currently being routed for approval by March 31, 2008. It is important to complete this review promptly because several subordinate policies and procedures have been revised and the adequacy of the governing document will be subject to the accuracy of these revisions. The station calls this transition process a "cross-walk." An administrative review of the "cross-walk" by the SCUBA Team revealed a few defects that were corrected, but there are likely more that will only be fully recognized when every procedure is linked and in use.
- The CM Steering Committee has been charged with the responsibility to ensure that site-wide standards are uniformly accepted as the way of doing the business of configuration management rather than allowing individual departments to set their own rules. However, this mandate is yet to be enforced. The principles of configuration management should not be subject to customization by individual departments.
- The site has provided an initial round of baseline training on configuration management to all employees. It will be necessary for this training to be treated as the first of several sessions needed to qualify the employee body on the specifics of the CM Program. These scheduling milestones should be included in the strategic plan.

ATTACHMENT C
Adequacy of NFS Corrective Actions in Response to
Section V.2 (Configuration Management) of NRC Confirmatory Order dated 02/21/07

NFS-Erwin used an independent a third-party review, conducted from September 12-18, 2006 by EI Review & Company, Inc as a proxy self-assessment to review the effectiveness of the corrective actions taken to close the gaps noted in Section V.2 of the NRC Confirmatory Order for Program Improvements dated February 21, 2007. A comparison of those findings with the state of the program today reveals that, while the Site had good intentions, the lack of the commitment to match the workload with resources has been an impediment to progress.

ATTACHMENT D
SCUBA Team Evaluation of the NFS Self-Assessment (June/July 2007)

A. INTRODUCTION

This attachment presents the results of the SCUBA Team's evaluation of the Safety Culture Self-Assessment (SCSA) performed in June and July, 2007, by the NFS Safety Culture Leadership Team (SCLT). As part of its assessment of the NFS-Erwin safety culture, the SCUBA Team requested the SCLT to conduct is own self-assessment of the NFS-Erwin safety culture as compared against the cultural attributes set forth in NRC Regulatory Issue Summary 2006-13 (NRC RIS). The SCUBA Team requested this action because it believed that:

- In order for the NFS SCLT to design and implement effective initiatives to improve the NFS-Erwin safety culture, the SCLT needed to understand and acknowledge its current status through its own efforts.
- It would be a good opportunity for the SCUBA Team to obtain information on the extent to which the SCLT demonstrated the ability to be sufficiently self-critical.
- The insights, findings, and conclusions of the NFS self-assessment would be a source of valuable input to the SCUBA Team.

In conducting the SCSA, NFS assigned each of the 13 NRC RIS Safety Culture Components (SCC) to individual members of the SCLT. After completing these component-level self-assessments, the SCLT validated the findings and conclusions for each of the components.

The SCLT considered that the purpose of the SCSA was to provide a baseline set of information to facilitate the conduct of the SCUBA Team's independent assessment. Consequently, the results of the SCSA were not systematically evaluated by NFS to identify deficiencies for processing through the Corrective Action Program. NFS management did not formally or systematically use the SCSA to create a road map for future action at that time, since they believed that they would receive the final report of the SCUBA Team's independent assessment in November 2007. Once it became clear that the schedule for completion of the independent assessment would be extended into early 2008, the SCLT commenced activities to support the development of a strategic plan for improving the NFS-Erwin safety culture. In this regard, the SCLT has been influenced by the results of its SCSA as well as by preliminary findings and recommendations that were provided to NFS management by the SCUBA Team during the conduct of its independent assessment.

B. DEFINITION OF TERMS

Areas of strength and weakness in the NFS-Erwin safety culture were identified by the SCUBA Team using the following characterizations:

- Area of Strength: A component or attribute of the NFS-Erwin safety culture that is considered to conform with (or to surpass) industry best practices.

- Area for Improvement: A component or attribute of the NFS-Erwin safety culture that is considered to be deficient when compared to industry best practices. Such components or attributes require corrective action.

- Area in Need of Attention: A component or attribute of the NFS-Erwin safety culture that is considered to be marginally effective when compared to industry best practices. Such components or attributes are significant candidates for continuous improvement.

- Opportunity for Improvement: A component or attribute of the NFS-Erwin safety culture that is considered to be acceptable when compared to industry best practices, but that is a noteworthy candidate for continuous improvement.

Areas of strength and weakness in the NFS-Erwin safety culture were identified by the NFS SCLT using the following characterizations:

- Green: Usually effective, proactive, meets expectations, eliminates problems, acceptable

- Yellow: Sometime effective, somewhat reactive, requires monitoring

- Red: Ineffective, unsatisfactory, poor understanding of requirements, requires action

It should be noted that the NFS SCLT determined SCC ratings on the basis of comparisons against the NRC RIS 2006-13 attributes, while the SCUBA Team determined ratings on the basis of comparisons against commercial nuclear power industry best practices. Accordingly, it is expected that the ratings provided by the SCUBA Team will be more conservative (i.e., lower) than the ratings provided by the NFS SCLT.

C. SUMMARY OF THE RESULTS OF THE SCUBA TEAM'S EVALUATION OF THE NFS SCSA

The overall accuracy of the NFS SCSA was affected by the lack of a frame of reference for excellence in the nuclear industry. This fact became more evident during the SCUBA Team's review of individual SCCs. Although there were differences in perspective between the SCUBA and NFS SCSA evaluations, the NFS SCSA was generally self-critical with respect to identifying problem areas and weaknesses. It is noteworthy, however, that the NFS SCSA was viewed as not being sufficiently self-critical for the three safety components that constitute Problem Identification and Resolution (Corrective Action Program, Operating Experience, and Self- and Independent Assessments).

D. DETAILED RESULTS

Human Performance

Decision Making

The NFS SCSA of the "Decision Making" SCC was not sufficiently self-critical in that it did not adequately address deficiencies in formality of operational decision-making, effective communication of decisions, or conservatism in decision-making.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with no trend assigned.

Within the context of the different rating characterization bases used by the NFS SCLT and those used by the SCUBA Team, the overall Rating assigned by the NFS SCLT is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The lack of a frame of reference for industry best practices contributed to the rating assigned by the SCUBA Team.

Resources

The NFS SCSA of the "Resources" SCC was sufficiently self-critical in that it did identify and discuss the NFS-Erwin engineering organization's lack of capability to support activities much beyond maintaining minimal regulatory compliance. The challenges facing NFS-Erwin in this regard were effectively communicated. It should be noted that this self-assessment focused predominantly on engineering-related resources issues and did not identify some of the resource-related issues discovered by the SCUBA Team in other organizations or functions.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with a level trend in performance.

Within the context of the different rating characterization bases used by the NFS SCLT and those used by the SCUBA Team, the overall rating assigned by the NFS SCLT is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." Shortly after the NFS SCSA was conducted (June/July 2007), events unfolded that placed significant additional pressure on already thinly stretched resources and increased the fragility of the overall organization, particularly in the engineering-related functions. These events were associated with business expansion activities (e.g., the Reliable Fuel Supply project). This contributed to the lower rating assigned by the SCUBA Team.

ATTACHMENT D
SCUBA Team Evaluation of the NFS Self-Assessment (June/July 2007)

Work Control

The NFS SCSA of the "Work Control" SCC was sufficiently self-critical in that it identified and discussed a number of opportunities for improvement. Management's overall conclusion was that there were a number of opportunities to improve Work Control, including risk management and contractor compliance with site standards.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with a level trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e. as an "Opportunity for Improvement." The SCUBA Team believes that by the time of the NFS SCSA (June/July 2007), the increased management attention paid to elements of this SCC, particularly the planned implementation of a formal work management system and human performance program, resulted in an improving trend.

Work Practices

The NFS SCSA of the "Work Practices" SCC was sufficiently self-critical in that it identified procedure compliance and the use of human performance techniques as ineffective. The site took credit for the recent institution of a "Management by Walking Around" (MBWA) program as the basis for an improving trend and characterized the fitness for duty (FFD) program as effective.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Red" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement. The SCUBA Team does not concur with rating the FFD program as effective because the SCSA failed to address the impact of excessive overtime on fatigue, but acknowledges that since the NFS SCSA (June/July 2007), site leadership has put measures in place to reduce the scope of the problem. Additionally, the SCUBA Team does not believe that the impact of MBWA has been sufficient to warrant an improving trend.

ATTACHMENT D
SCUBA Team Evaluation of the NFS Self-Assessment (June/July 2007)

Problem Identification and Resolution

Corrective Action Program

The NFS Self-Assessment of the "Corrective Action Program" SCC was not sufficiently self-critical in that it identified the PIRCS reporting threshold and the alternative process for reporting safety concerns as effective, and evaluated the use of performance indicators and extent of condition determinations as somewhat effective but improving. The site's characterization of these attributes indicates the lack of an industry frame of reference.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." However, due to the fact that PIRCS has been in place for several years, and some features that are standard in the nuclear industry have not been implemented, the SCUBA Team disagrees with the categorization of an improving trend.

Operating Experience

The NFS SCSA of the "Operating Experience" SCC was not sufficiently self-critical in that it cited strengths or improving trends in processes associated with collecting operating experience and disseminating the lessons learned throughout the site. The bulk of the examples cited dealt with responses to generic NRC communications rather than industry lessons.

The NFS SCSA of this SSC resulted in an overall assessment rating of "Yellow" with an improving trend in performance. Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The site's characterization of its programmatic response to NRC communications as a strength infers the lack of a frame of reference for industry best practices. The SCUBA Team does not support an improving trend in performance without a formal procedure that defines the source, then evaluates and communicates the lesson.

Self- and Independent Assessments

The NFS SCSA of the "Self and Independent Assessments" SCC was not sufficiently self-critical in that the site takes credit for the mandatory quality assurance, quality control and departmental compliance checks which are not in-depth, self-critical examinations of programs. The site also takes credit for the SMS system to disseminate safety-related performance indicators although the system has fallen into disuse.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The SCUBA Team believes that NFS-Erwin suffers from a poor frame of reference for this component. However, the SCUBA Team acknowledges since the NFS SCSA (June/July 2007), this area has continued to receive management attention in the form of procedural guidance and more participation. This contributed to the improving trend and the SCUBA Team concurs with the evaluation.

ATTACHMENT D
SCUBA Team Evaluation of the NFS Self-Assessment (June/July 2007)

Safety Conscious Work Environment

Environment for Raising Concerns

The NFS SCSA of the "Environment for Raising Concerns" SCC was sufficiently self-critical in that it identified and discussed a number of opportunities for improvement in alternative reporting paths for raising safety issues.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area in Need of Attention." The SCUBA Team disagrees with the assignment of an improving trend. There have been indications, since the employee survey and analysis conducted by Middle Tennessee State University in 2004, that there was some degree of hesitancy to report concerns due to dissatisfaction, but the site had not followed through on these clues.

Preventing, Detecting, and Mitigating Perception of Retaliation

The NFS SCSA of the "Preventing, Detecting, and Mitigating Perceptions of Retaliation" SCC was sufficiently self-critical in that it correlated established disciplinary processes and continuing training to prevent harassment, retaliation and discrimination with the lack of allegations in those areas as demonstrative of effective, proactive intervention.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The SCUBA Team suggests that the site follow through with a campaign of management-employee interaction to verify their hypothesis that the lack of negative data is an indication of satisfaction with these policies and practices.

Other Safety Culture Components

Accountability

The NFS SCSA of the "Accountability" SCC was sufficiently self-critical in that it identified and discussed a number of opportunities for improvement, including performance reviews, formalized management expectations, and coaching to reinforce safety principles.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Red" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The December 2007 decision to stop production and repair IROFS components in the HEU production line is a good, recent demonstration of management accountability for nuclear safety. The SCUBA Assessment Team has concluded that this area has continued to receive management attention and focus, and as a result, is likely to continue to improve.

Continuous Learning Environment

The NFS SCSA of the "Continuous Learning Environment" SCC was sufficiently self-critical in that it identified the communication of information learned from internal and external industry sources as ineffective and acknowledged benchmarking activities as somewhat effective after being identified as a gap in 2006.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Yellow" with a level trend of performance in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The SCUBA Team acknowledges the emphasis on benchmarking in the past two years and has concluded that this area is receiving the management attention needed to develop into a mature process.

Organizational Change Management

The NFS Self-Assessment of the "Organizational Change Management" SCC was sufficiently self-critical in that it identified and discussed the absence of any formal organizational change management process and correctly identified the consequences that result.

The NFS SCSA of this SCC resulted in an overall assessment rating of "Red" with an improving trend in performance.

Within the context of the rating characterization protocol used by NFS-Erwin, the overall rating is reasonable and roughly equivalent to the SCUBA Team's rating of this SCC; i.e., as an "Area for Improvement." The SCUBA Team acknowledges the effectiveness of the strike contingency plan and the re-indoctrination plan for returning workers as positive examples that support the evaluation of an improving trend and also acknowledges the potential for similar success with the recently developed Strategic Plan for the site.

Safety Policies

The NFS SCSA of this SCC was sufficiently self-critical in that it identified and discussed a number of needs for improvement in the deployment and reinforcement of NFS policies related to Safety Culture.

The NFS SCSA of this SSC resulted in an overall assessment rating of "Yellow" with an improving trend.

Within the context of the different rating characterization bases used by the NFS SCLT and those used by the SCUBA, the overall rating assigned by the NFS SCLT is reasonable and roughly equivalent to the SCUBA Assessment Team's rating of this SCC; i.e., as an "Area in Need of Attention." After the NFS SCSA was conducted (June/July 2007), NFS management increased its attention to several elements of this SCC. The SCUBA Team has concluded that this area has continued to receive management attention and focus, and as a result, has continued to improve. This contributed to the rating assigned by the SCUBA Team.

ATTACHMENT E
SCUBA Team In-Process Recommendations To NFS Management

Introduction

As indicated in the Assessment Plan for the 2007 Independent Safety Culture Assessment, the SCUBA Team committed to inform the NFS-Erwin Safety Culture Leadership Team (SCLT) on a real-time basis of any potentially significant issues it identified, including key assessment findings and conclusions.

The SCUBA Team also committed to document any such in-process recommendations and suggestions in an Attachment to the 2007 ISCA Final Report. This Attachment meets that commitment.

SCUBA Team In-Process Recommendations and Suggestions

1. In August 2007, the SCUBA Team became aware of an imminent NFS reorganization that was primarily related to the creation of the General Manager (GM) position and the associated realignment of the reporting relationship for certain NFS-Erwin organizations and organizational functions. By this point in time, the SCUBA Team had concluded that it would be recommending that NFS:

    - Adopt an approach to Nuclear Oversight that included both "compliance-based" and "performance-based" oversight and assessment activities.
    - Create a new senior management position to serve as the leader of the Nuclear Oversight function with that position/function reporting directly to the NFS Chief Executive Officer (CEO).

    In light of the imminently pending NFS reorganization, the SCUBA Team provided these recommendations to the NFS CEO and the soon-to-be NFS GM at that time.

2. In August 2007, the SCUBA Team became aware of the lack of an NFS policy on fitness for duty (FFD) fatigue considerations. Based on observations of excessive use of overtime (i.e., multiple, repetitive 16 hour days), the SCUBA Team met with the NFS GM and recommended the development of an overtime policy that appropriately addressed FFD fatigue considerations.

3. In August 2007, the SCUBA Team developed concerns regarding project management and control over the new Reliable Fuel Supply (RFS) Project and found that those concerns were shared by a spectrum of NFS-Erwin staff. The SCUBA Team met with the NFS GM to discuss those concerns and specifically recommended that the individual assigned overall project management responsibility for the RFS project be relieved of other concurrent responsibilities.

4. In September 2007, NFS management informed the SCUBA Team that they were re-opening consideration of the 2008 budget and requested SCUBA Team input on any likely SCUBA Team recommendations that would have potential resource-related implications. The SCUBA Team responded to that request in telephone conversations and in a meeting with the NFS GM. The recommendations discussed included the following:

    - Establishment of an Employee Concerns Program.
    - Augmentation of resources supporting the implementation of the NFS-Erwin Corrective Action Program.

- Augmentation of resources supporting the implementation of the NFS-Erwin Industrial/Personnel Safety Program.
- Augmentation of resources to implement the "compliance-based" Quality Assurance organization and addition of resources to implement a "performance-based" Nuclear Oversight function.
- Augmentation of engineering resources to ensure increased availability of process and project engineers.
- Hiring a qualified leader for the NFS Human Performance Program.
- Allocation of resources necessary for the implementation of a supervisor/manager leadership training program.
- Evaluation of the adequacy of current Health Physics staffing in light of attrition.
- Evaluation of the adequacy of operations staffing in light of then-current high levels of overtime.
- Evaluation of augmenting engineering resources, including but not limited to providing support for resolution of HVAC issues.

In the course of these discussions, the SCUBA Team also recommended the following actions for consideration:

- Increase the focus of recruiting activities to fill currently open positions.
- Conduct an inventory of currently exiting operator burdens/work-arounds and other degraded conditions, and dedicate resources to aggressively work them off.
- Evaluate the readiness (personnel and material) of the NFS Emergency Brigade.
- Evaluate working conditions at the NFS firing range.
- Assign ownership and accountability to a single person for design and coordination of the implementation of an NFS Operating Experience Program.
- Evaluate and address the reasons underlying high levels of attrition in Security.
- Evaluate changing the Maintenance organization's reporting relationship from Engineering to Operations.

5. In October, 2007 the SCUBA team briefed the NFS GM on the status of the NFS-Erwin Configuration Management Program – in particular the impact that the lack of resources was having on the schedule milestone dates.

6. In November 2007, the SCUBA Team made a presentation to the NFS Board of Directors on the workforce survey results and on preliminary findings of the overall SCUBA Team Assessment. In December 2007, the SCUBA Team made a similar but more detailed presentation to the NFS SCLT.

7. On February 8, 2008, the SCUBA Team made a presentation to NFS senior management, including members of the NFS SCLT, on the key findings, recommendations and conclusions of its Independent Assessment of the NFS-Erwin Safety Culture.

ATTACHMENT F
Personnel Interview Tables and Behavioral Observation Tables

Introduction

In implementing the Assessment Plan for the 2007 Integrated Safety Culture Assessment (ISCA) of the NFS-Erwin Site, the SCUBA Team conducted numerous personnel interviews and behavioral observations. As indicated in the Assessment Plan, the SCUBA Team has developed a set of Tables that:

- Present the distribution of these personnel interviews by worker category and by organizational affiliation. This information is provided separately for both the Phase 1 and Phase 2 personnel interviews. For the Phase 1 personnel interviews only, a distribution by Safety Culture Component is also provided.
- Present the distribution of these behavioral observations for the three general categories used; i.e., Meetings, Field Work Activities and Training Activities.

These Tables of information are presented below.

In light of the comprehensive and extensive amount of documentation that was reviewed by the SCUBA Team during the conduct of the 2007 ISCA, a detailed listing of this bibliography is not provided in this document. The SCUBA Team will make such information available for review in electronic form.

Personnel Interviews

As discussed in the Assessment Plan and in the Final Report, the SCUBA Team conducted personnel interviews in two Phases.

Phase 1 Personnel Interviews

Phase 1 Personnel Interviews consisted of "targeted interviews" with personnel most knowledgeable of and/or most directly involved in the design and implementation of:

- NFS-Erwin policies, programs and processes that support each of the 13 safety culture components identified in NRC RIS 2006-13;
- NFS-Erwin policies, programs and processes related to nuclear material security;
- NFS-Erwin corrective actions taken (or planned) in response to the issues identified in Sections V.1 and V.2 of the Confirmatory Order for Program Improvements;
- NFS-Erwin actions taken (or planned) with respect to the commitments made by NFS at the management meeting with the NRC on September 18, 2006; and
- The NFS internal self-assessment of its current status with respect to the safety culture components and associated attributes set forth in NRC RIS 2006-13.

The Phase 1 personnel interviews included the use of both structured and unstructured interview methods depending on the nature and purpose of each interview.

The SCUBA Team conducted 269 Phase 1 confidential personnel interviews across a broad spectrum of the NFS-Erwin organization. This total does not include follow-up interviews, "casual interviews" with NFS-Erwin personnel in the field or question and answer sessions associated with NFS presentations requested by the SCUBA Team, all of which occurred during the conduct of the assessment.

ATTACHMENT F
Personnel Interview Tables and Behavioral Observation Tables

The distribution of these 269 personnel interviews by worker category is provided in Table F.1 below.

Table F.1

INTERVIEW CATEGORY	NUMBER
Executive/Director	75
Manager	118
Supervisor	18
Salaried Employee	34
Hourly Employee	24
Total	**269**

The distribution of the 269 personnel interviews by Major Functional Organization is provided in Table F.2 below.

Table F.2

MAJOR ORGANIZATION	NUMBER
NFS Executive	30
HEU Fuel Production	25
BLEU Operations	12
BPF Operations	12
Operations Support	9
Human Performance & Learning	11
Security	29
Safety & Regulatory	37
Integrated Safety	22
Engineering	31
Site Services	20
Analytical Services	4
Health Physics/Radiation Monitoring	11
Maintenance	15
Finance	1
Total	**269**

ATTACHMENT F
Personnel Interview Tables and Behavioral Observation Tables

The distribution of these 269 personnel interviews by Safety Culture Component is provided in Table F.3 below.

Table F.3

SAFETY CULTURE COMPONENT	NUMBER
Decision Making	22
Resources	34
Work Control	14
Work Practices	14
Corrective Action Program	15
Operating Experience	13
Self and Independent Assessments	12
Environment for Raising Concerns	21
Preventing, Detecting, and Mitigating Retaliation	20
Accountability	18
Continuous Learning Environment	12
Organizational Change Management	9
Safety Policies	24
Security	27
Special Topical Areas	14
Total	**269**

Phase 2 Personnel Interviews

Phase 2 personnel interviews were primarily based on the results of the workforce survey. These interviews were conducted either due to low survey participation rates by individual functional organizations or due to the need to obtain additional information related to "organizational outliers" identified through the analysis of the survey results. The number of personnel interviews conducted within each such organization was in accordance with the criteria specified in the Assessment Plan, and the specific personnel interviewed were selected using random selection methods. In several instances, the SCUBA Team interviewed more than the minimum required number of personnel[1].

Interviews of personnel from low-responding organizations were structured in nature and used a specific set of pre-established core interview questions, which were augmented with a selection of questions from a specific set of additional pre-established generic interview questions. A sample of these questions is provided at the end of this Attachment.

[1] In these instances, the additional interviewees were not selected randomly but rather were selected at the discretion of the SCUBA Team member leading the specific evaluation. This situation occurred on several occasions when the random selection process did not result in a sufficiently diverse demographic profile of the organization under evaluation.

ATTACHMENT F
Personnel Interview Tables and Behavioral Observation Tables

Interviews of personnel from identified "outlier organizations" used a combination of structured and unstructured interview methods. The SCUBA Team used interview questions drawn from a pre-established core set of interview questions that were augmented with questions developed based upon the analysis of the survey results, including the analysis of the write-in comments, for each identified "outlier organization."

The SCUBA Team conducted 75 Phase 2 confidential personnel interviews.

The distribution of these 75 personnel interviews by worker category is provided in Table F.4 below.

Table F.4

INTERVIEW CATEGORY	NUMBER
Executive/Director	4
Manager	10
Supervisor	10
Salaried Employee	14
Hourly Employee	37
Total	**75**

The distribution of the 75 personnel interviews by Major Functional Organization is provided in Table F.5 below.

Table F.5

MAJOR ORGANIZATION	NUMBER
Analytical Services	8
BLEU Operations	5
BPF Operations	6
Controller (Low Survey Participation)	4
Facilities	8
Health Physics	18
HEU Fuel Production	10
Other Engineering (Low Survey Participation)	6
Other HEU Production	4
Transportation and Waste Management	6
Total	**75**

The distribution of these 75 personnel interviews by organizational characterization is provided in Table F.6 below.

Table F.6

ORGANIZATIONAL CHARACTERIZATION	NUMBER
Low Participating Organizations	10
Identified "Outlier Organizations"	65
Total	**75**

Behavioral Observations

The SCUBA Team conducted 200 behavioral observations:

- 88 observations of NFS-Erwin meetings ranging from NFS Board of Directors meetings through work planning and scheduling meetings.
- 85 observations of field work activities ranging from conduct of facility operations to product packaging and transportation.
- 27 observations of training activities ranging from craft technical training to the employee re-indoctrination training provided to workers returning from the strike.

The distribution of the 200 observations is provided in Table F.7 below.

ATTACHMENT F
Personnel Interview Tables and Behavioral Observation Tables

Table F.7

TYPE OF OBSERVATION	NUMBER
Meetings	
Board of Directors	3
President & CEO Staff	3
General Manager Staff	13
Engineering Director Staff	5
Safety Culture Leadership Team	5
Daily Facility Operations	20
Operational Readiness & Review Board	2
Safety & Safeguards Review Council	4
PIRCS Oversight Committee	4
PIRCS Review Committee	4
Work Planning & Scheduling	8
Project Engineering Portfolio Management	5
Miscellaneous Meetings	9
Subtotal	88
Field Work Activities	
Facility Operations	19
Facility Maintenance	31
Operations Shift Turnovers	5
Security-Related Wok	23
Waste Processing	3
Transportation & Waste Management	2
Product Packaging & Transportation	2
Subtotal	85
Training Activities	
Employee Re-Indoctrination	2
Genera Employee Training	9
Radiation Worker Training	2
Craft Technical Training	7
Reactive Training	2
Security Training	5
Subtotal	27
Total	**200**

ATTACHMENT F
Personnel Interview Tables and Behavioral Observation Tables

Sample of Structured Interview Questions (Phase 2)

NOTE: If the interviewee has nuclear material security job responsibilities, you should substitute the term "nuclear safety" or "nuclear material security" for the term "safety" in the questions below.

If you identified a potential safety issue or concern, what would you do?

Do you know how to use PIRCS to identify a potential safety issue or concern? Have you ever used PIRCS to do so? If so, were you satisfied with the manner in which your concern was treated and resolved? If not, please elaborate. If not, what did you do?

Are there any conditions under which you would be hesitant to raise a safety issue or concern? If so, please elaborate.

Have you ever received a negative reaction (from peers, supervision, management or senior management) for having raised or pursued a safety or quality-related issue or concern? Please elaborate.

Do you know of anyone else at NFS-Erwin who has received a negative reaction for having raised or pursued a safety or quality-related issue or concern? Please elaborate.

Have you received adequate training to perform your assigned work activities? If not, please elaborate.

Have standards and expectations for safety and safety performance been effectively communicated to the workforce? What are they? Are they well understood by the workforce? Have you received adequate training on these standards and expectations as they apply to your day-to-day work activities?

Do you have sufficient time to perform your day-to-day work activities in a high quality manner? If not, please elaborate.

Have you experienced any difficulties in meeting your safety-related or quality-related job responsibilities? If so, have they been satisfactorily resolved? Please elaborate.

Are you experiencing any difficulties in adhering strictly with the procedural requirements that apply to your day-to-day work activities? If so, please elaborate.

Do you believe that safety is the top priority at NFS-Erwin? Please elaborate.

Are you aware of any situations where safety has been compromised at NFS-Erwin? If so, please elaborate. (Focus on nuclear safety and nuclear material security first, if possible in light of the interviewee's job responsibilities.)

If you had the authority to make three changes to improve the safety culture/safety performance at NFS-Erwin, what would they be?

ATTACHMENT G

Tabulation of Basic References For Industry Best Practices

The SCUBA Team recommends that NFS-Erwin consider the following sources of information as helpful reference material that will assist the Site as the leadership team addresses the Findings offered in the SCUBA Team's Independent Safety Culture Assessment. These recommendations represent the collective experience of the team members, but it is should be noted that the site's recent decision to become a member of the Institute of Nuclear Operations (INPO) will pay dividends in developing professional associations and contemporary suggestions that may be more useful. In that vein, the following recommendations are offered for each Safety Culture Component (SCC).

The information presented herein provides basic references. Individual SCUBA Team members have provided and will continue to provide NFS management with specific references to organizations (commercial nuclear power plants, nuclear fuel cycle facilities and chemical industry facilities) that are believed to be demonstrating best practices in specific areas.

DECISION MAKING

INPO document, "Principles for Effective Operational Decision Making" contains the fundamentals needed to implement a basic program that will address the areas for improvement noted in AFI-DEC-01 through -03. A benchmarking trip to a nuclear utility, recommended as exemplary by INPO, is recommended after the operational decision-making tool has been put in place at NFS-Erwin.

RESOURCES

INPO document AP-903, "Performance Improvement Process Description" presents a holistic approach to the allocation of resources in order to achieve uniform improvement across an organization. The four areas for improvement (AFI-RES-01 through -04) noted in the report for this SCC address recommended steps to coordinate an improvement in equipment, process, and individual performance. AP-903 offers reasonable options on the scale necessary for NFS-Erwin to attain its goal of excellence in the next four years.

In terms of overtime management (ANA-RES-01), the Nuclear Energy Institute (NEI) was instrumental in developing the industry position of the fatigue rule that became 10CFR26. This document is scheduled to be issues in the next calendar quarter and will become law in 2009. It would be appropriate to become familiar with the regulation and contact the Operations Department of NEI for interpretive guidance.

Development plans for the two opportunities for improvement (OFI-RES-01 and -02) are self-contained in the Supporting Information section of the report for this SCC.

WORK CONTROL

INPO document AP-930. "Supplemental Personnel Process Description," provides a structured approach for nuclear utilities to use whenever supplemental personnel are needed, whether for work on- or off-site. These lessons have direct correlation to the issues cited in Finding ANA-WC-01.

INPO document AP-928, "Work Management Process Description," outlines a method to identify, select, plan, schedule, and execute work in a manner that ensures high levels of safe and

reliable plant operation. This document deals selectively with the on-line portion of utility maintenance and would have the greatest relevance for NFS-Erwin. The scope of the respective problems will differ in magnitude and complexity but the basic principles and practices are directly transferrable to the issues discussed in OFI-WC-01. Additionally, INPO Topical Report TR6-56, "Work Package Planning and Preparation" offers step-by-step recommendations to improve the process of work planning and schedule execution.

WORK PRACTICES

INPO documents INPO 06-002, "Human Performance Tools for Workers," INPO 05-002, "Human Performance Tools for Engineers and Other Knowledge Workers," and INPO 07-006, "Human Performance Tools for Managers and Supervisors" are a companion set of documents that offer guidance for adopting error prevention techniques and learning personal standards of behavior that have proven successful in nuclear utilities. The recent information brought back from the INPO Human Performance Workshop will provide similar tools that can be brought to bear in order to resolve the deficiencies outlined in Finding AFI-WP-01.

INPO document AP-907, "Processes and Procedures Process Description" is an industry standard for the proper use of process and procedures, in addition to offering a template to assist in their development. Using the information contained in the Supporting Information section of the report for this SCC and supplementing the lessons of AP-907 as a foundation for helping the workforce appreciate the basis for procedure compliance is offered as a resource for correcting the behaviors noted in Finding AFI-WP-02.

Development plans for improving the Lock-out/Tag-out Program (Finding AFI-WP-03) are self-contained in the Supporting Information section of the report for this SCC.

The DuPont Safety Training Observation Program (STOP) provides basic philosophy and training for a management behavioral based observation program. The utilization of STOP and other commercially available behavioral based observation programs are being applied in the chemical industry.

CORRECTIVE ACTION PROGRAM

INPO document "Principles for Effective Self-Assessment and Corrective Action Programs" outlines a practical application of measures needed to apply the tools of the PIRCS software system in a fashion that extends beyond Criterion XVI of Appendix B of 10CFR50 (the regulatory guidance for power reactors) in order to develop an effective process for problem identification and resolution. There are many variations on the principles put in practice throughout the nuclear industry, largely dependent on the software tool chosen. NFS-Erwin is advised to study the first principles and conduct a benchmarking trip (or ask for an INPO Assist Visit) in this particular area in order to address the challenges cited in Findings AFI-CAP-01, -02 and ANA-CAP-01. Additional suggestions for improving the Corrective Action Program are self-contained in the Supporting Information section of the report for this SCC.

Development plans for improving the quality of root cause (and other, less comprehensive) analyses, discussed in Finding AFI-CAP-03, are self-contained in the Supporting Information section of the report for this SCC. It is recommended that NFS-Erwin refresh the quality of its

team leaders by conducting initial and refresher training for potential analysts, using the services of one of the companies that provide such training to nuclear utilities.

Development plans for the improving the commitment tracking program (Finding AFI-CAP-04) are self-contained in the Supporting Information section of the report for this SCC.

OPERATING EXPERIENCE

Findings AFI-OE-01 and -02 address the related issues of using external and internal operating experience in order to improve performance. The basic principles for developing such a program can be found in INPO 97-011, "Guidance for the Use of Operating Experience." The document describes key elements of a systematic approach to data review and focuses on organizational learning in order to reduce the frequency and consequence of events. Additionally, it recommends use of the Significant Event Evaluation and Information Network (SEE-IN), an extensive database of previous events throughout the nuclear industry, as a tool for self-improvement that can be found on the INPO website.

Development plans for the applying these tools to a review of the Reliable Fuel Supply Project (Finding AFI-OE-03) are self-contained in the Finding and Supporting Information section of the report for this SCC.

SELF- AND INDEPENDENT ASSESSMENTS

Findings AFI-SA-01 and -02 address shortcomings in the newly established self-assessment program for both collecting and measuring information pertinent to improving performance at NFS-Erwin. INPO document "Principles for Effective Self-Assessment and Corrective Action Programs" outlines a practical means of applying those measures needed to be taken to improve a site's ability to critically assess performance. Although it focuses on self-assessment, the lessons are equally applicable to scenarios where independent auditors and observers (outsiders as well as the NFS-Erwin Quality Assurance organization) are brought in to serve as unbiased commentators. This guidance should be considered in addition to the development plans self-contained in the Finding and Supporting Information section of the report for this SCC.

ENVIRONMENT FOR RAISING SAFETY CONCERNS

The first principles for the nuclear industry are outlined in INPO document "Principles for a Strong Nuclear Safety Culture." Development plans for the applying these tools to establishing an effective alternative path for raising potential Nuclear Safety Culture/Safety Conscious Work Environment issues or concerns (Finding AFI-ERC-01) are self-contained in the Finding and Supporting Information section of the report for this SCC. The SCUBA Team further recommends that NFS-Erwin consider adopting a Differing Professional Opinion policy from a utility recommended by INPO as exemplary in this area. The National Association of Employee Concerns Professionals (NAECP) is another valuable source of information. The NEI website contains the document: "Nuclear Power Plant Personnel-Employee Concerns Program: Process Tools in a Safety Conscious Work Environment". This was jointly developed by NAECP and NEI and contains excellent guidance for the establishment of an ECP.

ATTACHMENT G

Tabulation of Basic References For Industry Best Practices

PREVENTING, DETECTING, AND MITIGATING PERCEPTIONS OF RETALIATION

Similar to the Environment for Raising Safety Concerns SCC, the first principles for the nuclear industry are outlined in INPO document "Principles for a Strong Nuclear Safety Culture." Development plans for the applying these tools to ensuring the work place that is free from harassment, intimidation, retaliation, and discrimination (Finding AFI-PDM-01) are self-contained in the Finding and Supporting Information section of the report for this SCC. The National Association of Employee Concerns Professionals is another valuable source of information. The NEI website contains the document: "Nuclear Power Plant Personnel-Employee Concerns Program: Process Tools in a Safety Conscious Work Environment". This was jointly developed by NAECP and NEI and contains excellent guidance for the establishment of processes for managing perceptions of retaliation.

ACCOUNTABILITY

Recommended actions to improve the environment for issue reporting are closely linked to those described in the two preceding SCCs. It is recommended that NFS-Erwin similarly apply the principles outlined in INPO document "Principles for a Strong Nuclear Safety Culture" as the basis for resolving Finding AFI-ACC-01.

Development plans for improving the commitment tracking program (Finding AFI-CAP-04) are self-contained in the Supporting Information section of the report for the Corrective Action Program SCC and are equally effective for improving the personal accountability aspect of this programmatic issue, as outlined in Finding AFI-ACC-02. It is recommended that resolution of the two Findings be pursued in parallel.

Development plans for improving personal accountability, as discussed in Findings AFI-ACC-03 through -05 are self-contained in the Finding and Supporting Information section of the report for this SCC.

CONTINUOUS LEARNING ENVIRONMENT

Improving benchmarking skills and effectiveness have symptoms similar to those outlined in Findings AFI-OE-01 and -02 and the recommended remedy is likewise similar. INPO 97-011, "Guidance for the Use of Operating Experience" offers guidance for collecting and digesting industry experience from databases available through the site's membership in INPO. Extending the lessons to benchmarking (Finding AFI-CLE-02) requires application of the development plans that are self-contained in the Finding and Supporting Information section of the report for this SCC.

Improving leadership and management skills through training (Finding AFI-CLE-03) is close coupled to the need for improving feedback mechanisms to improve organizational performance (Finding ANA-CLE-01). Development plans for improving performance in both of these areas are self-contained in the Finding and Supporting Information section of the report for this SCC.

Finding OFI-CLE-01 suggested several areas of the training process itself that are in need of improvement. INPO document AP-921, "Systematic Training Process Description" describes the systematic approach to training applied as a best practice at nuclear utilities. In addition to

reviewing the precepts in this document, it would be advisable for sample programs at generating stations recommended by INPO as exemplary in the area.

ORGANIZATIONAL CHANGE MANAGEMENT

INPO document, "Principles for Effective Operational Decision Making" discusses communication as a critical facet of making any decision and these precepts are well suited to correcting the shortcomings in formally managing change as discussed in Finding AFI-OCM-01. The recommendations should be applied in parallel with those discussed in Finding AFI-DEC-02 as well as with the recommendations self-contained in the Supporting Information section of the report for this SCC.

SAFETY POLICIES

Development plans for reinforcing workforce understanding of NFS safety policies, as discussed in Finding AFI-SAF-01 and for improving the general knowledge level of general site operations as a whole, as discussed in Finding OFI-SAF-01, are self-contained in the Finding and Supporting Information section of the report for this SCC.

ATTACHMENT H
Table of Acroynyms Used in ISCA Results Report

ACC	Accountability
ADI	Aubrey Daniels International
AFI	Area for Improvement
ALARA	As Low As Reasonable Achievable
ANA	Area in Need of Attention
BLEU	Blended Low Enriched Uranium
BPF	BLEU Processing Facility
BPI	Business Process Improvement
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CLE	Continuous Learning Environment
CM	Configuration Management
DEC	Decision Making
DOE	Department of Energy
DPO	Differing Professional Opinion
ECP	Employee Concerns Program
EPA	Environmental Protection Agency
ERC	Environment for Raising Concerns
FFD	Fitness for Duty
GET	General Employee Training
GM	General Manager
HEU	Highly Enriched Uranium
HIRD	Harassment, Intimidation, Retaliation, and Discrimination
HR	Human Resources
HuP	Human Performance
HVAC	Heating, Ventilation, and Air Conditioning
INPO	Institute of Nuclear Power Operations
IROFS	Items Relied On For Safety
ISA	Independent Safety Analysis
LOA	Letter of Authorization
LOC	Low Participation/Outlier Organization Category
MAA	Material Access Area
MBWA	Management by Walking Around
MC&A	Material Control and Accountability
NCS	Nuclear Criticality Safety
NEI	Nuclear Energy Institute
NFS	Nuclear Fuel Services, Inc.
NMSS	Nuclear Material Safety and Safeguards
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
NSC	Nuclear Safety Culture
OCM	Organizational Change Management
ODM	Operational Decision Making
OE	Operating Experience
OFI	Opportunity for Improvement

ATTACHMENT H
Table of Acroynyms Used in ISCA Results Report

OSHA	Occupational Safety and Health Administration
P&ID	Process and Instrumentation Drawing
PDM	Prevent, Detect, and Mitigate Perceptions of Retaliation
PIRCS	Problem Identification, Reporting, and Correction System
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
RCC	Related to Commitment Closure
RES	Resources
RFS	Reliable Fuel Supply
RIS	Regulatory Issue Summary
RT	Radiation Technician
RWP	Radiation Work Permit
SA	Self and Independent Assessment
SCC	Safety Culture Component
SCCWE	Safety and Compliance Conscious Work Environment
SCLT	Safety Culture Leadership Team
SCSA	Safety Culture Self-Assessment
SCWE	Safety Conscious Work Environment
SCUBA	Safety Culture Board of Advisors
SEE-IN	Significant Event Evaluation and Information Network
SMS	Strategic Management System
SNM	Special Nuclear Material
SOP	Standard Operating Procedure
SP	Safety Policies
SRE	Safety Related Equipment
SSC	Structures, Systems, and Components
SSRC	Safety and Safeguards Review Committee
T&Q	Training and Qualification
WANO	World Association of Nuclear Operators
WC	Work Control
WP	Work Practices

Attachment

NFS' Comprehensive Safety Culture Improvement Initiative
Revision 0

(82 pages to follow)

21G-08-0077
GOV-01-55-04
ACF-08-0127

NFS'

COMPREHENSIVE SAFETY CULTURE

IMPROVEMENT INITIATIVE

Revision 0

UNCLASSIFIED

RP Drake 05/15/08
Reviewed By Date

TABLE OF CONTENTS

Attachments

Tables

1.0 INTRODUCTION

NFS has declared its commitment to achieve a position of excellence in safety culture within the nuclear industry by the end of 2011. This document describes and augments NFS' strategic plan to successfully attain that goal of excellence.

This NFS Comprehensive Safety Culture Improvement Initiative:

- Provides near-term focus on the highest priority (assigned as "most significant") Findings and attendant Recommendations as assigned by an independent team of safety culture experts termed the Safety Culture Board of Advisors (SCUBA). See Section 2.0 "Background" below.
- Facilitates NFS' continual consideration of the other SCUBA Findings/Recommendations while actions are being taken by NFS on the higher priority Findings/Recommendations.
- Focuses the entire NFS'-Erwin Site on the desire and need for significant, sustainable, and continual improvements in NFS' safety culture.
- Requires milestones and target completion dates for NFS actions in the 2008 Safety Culture Strategic Plan and in the responses to SCUBA recommendations. See Section 4.0 below.
- Utilizes, as the articulation of the NFS Safety Culture Strategic Plan and as a management tool, annual "*One Page Plan*[1]*s*" - a comprehensive, integrated, internet planning tool which includes vision, mission, up to nine detailed objectives with metrics, strategies and action plans by Department/work unit. Each One Page Plan was developed, and is amended, collegially among NFS work units and reviewed and approved by next higher level of NFS supervision. Each includes performance metrics ("Scorecards"), status indicators, and progress reports. Each is being reviewed and modified monthly, as appropriate, by NFS' senior management.
    - Includes a mechanism (the "Crosswalk" (included as Attachment 1 to this Report)) that identifies where a specific SCUBA recommendation is addressed in NFS Action Plans or derivative documents and which NFS Manager is responsible for successful implementation of a responsive action.
    - Correlates with numerous NFS derivative implementation plans/programs/documents relevant to safety culture improvements.
    - Requires periodic, comprehensive self-assessments of NFS' performance on improving in each of the thirteen Safety Culture components.

[1] The One Page Business Plan is a registered trademark of the One Page Business Plan Company. See Appendix A for a detailed description of "The One Page Planning and Performance System".

- Includes performance- based metrics that will be used to measure the progress and success of this Safety Culture Improvement Initiative. In addition, a significant task of this Initiative is to conduct benchmarking activities to identify industry best practices for the further design and implementation of site-wide metrics.
- Recognizes the NFS commitment to have an additional independent safety culture assessment of the NFS- Erwin Site in the February, 2010 time frame.

2.0 BACKGROUND

In September and November 2006, NFS and the NRC met in Alternate Dispute Resolution (ADR) sessions and discussed NFS' recent, apparent regulatory violations and NFS' overall enforcement history. NFS and the NRC acknowledged that a deficient safety culture at NFS appeared to be a contributor to the recurrence of violations. NFS and the NRC agreed that a comprehensive, third party review and assessment of the safety culture at NFS represented the best approach for the identification and development of focused, relevant and lasting corrective action. The agreements reached were documented in a Confirmatory Order for Program Improvements (Reference 1) issued by the NRC on February 21, 2007 and subsequently modified by (Reference 2).

In accordance with the Confirmatory Order agreement, NFS assembled an Independent Safety Culture Board of Advisors[2] (SCUBA). By letter dated May 22, 2007, NFS submitted to the NRC information on qualifications of each of the expert consultants that comprised the SCUBA team. See Reference 3. SCUBA developed, independent from NFS, a detailed, comprehensive plan[3] to conduct the *NFS 2007 Independent Safety Culture Assessment (ISCA)*. This ISCA plan was submitted to the NRC in the May 22, 2007 submittal (Reference 3) and subsequently revised in September 2007 (Reference 4) to incorporate the decision to include a written survey of the NFS-Erwin workforce in the ISCA.

The 2007 ISCA focused on: The NRC Regulatory Issue Summary, RIS-013 (Reference 5) and NFS' Commitments to the NRC at a meeting on September 18, 2006. The ISCA also addressed nuclear material security. SCUBA conducted an extensive ISCA implementation. As prescribed by the 2007 ISCA Plan, SCUBA conducted in a comprehensive structured manner:

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[2] SCUBA subsequently hired an independent, experienced advisor to assist SCUBA on matters related to classified information and nuclear material security.

[3] This plan and its subsequent implementation is detailed in "*Section I, Executive Summary, NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report*," submitted by NFS' Safety Culture Board of Advisors, February 16, 2008 (Reference 6)

- Confidential Personnel Interviews. There were 269 targeted (Phase 1) interviews across a broad spectrum of the NFS-Erwin organization and 75 Phase 2 interviews subsequent to the workforce survey.
- Behavioral Observations of NFS-Erwin meetings (88), field work activities (85), and training activities (27).
- An extensive amount of document reviews, including a large portion of NFS policy statements, process documents, and procedures.
- A specifically designed and specifically modeled 2007 NFS Safety Culture Survey of the NFS Workforce. The survey participation rate was 88%, which is significantly higher than the industry average of 77% for surveys conducted by SYNERGY Consulting Services Corporation (SYNERGY).

In addition to providing NFS management with valuable communications throughout the 2007 ISCA, SCUBA delivered two major documents[4] to NFS. Namely:

- *The "Results Report"* entitled: "*NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report*," submitted by NFS' Safety Culture Board of Advisors, February 16, 2008
- The nuclear material security assessment entitled: "*NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report, Special Topical Area: Nuclear Material Security*, (Confidential)" submitted by NFS' Safety Culture Board of Advisors, February 16, 2008.

These two ISCA documents, through the SCUBA Findings and attendant Recommendations, provide the focus and context for much of the NFS Comprehensive Safety Culture Improvement Initiative, as described herein.

3.0 SUMMARY OF *ISCA "RESULTS REPORT"*

3.1 MAIN BODY OF RESULTS REPORT

The 2007 ISCA was completed on February 16, 2008 with the delivery to NFS of the "Results Report." Per the NFS request, the ISCA compared, for each of the thirteen safety culture components, NFS practices to the best practices in the nuclear power industry and nuclear fuel cycle facilities. In the "Results Report," SCUBA provides extensive discussion of their Findings and Recommendations and how and why these Findings and Recommendations were developed by SCUBA. In summary, SCUBA:

[4] Those ISCA documents are enclosed with the submission of this "NFS' Comprehensive Safety Culture Improvement Initiative" to the NRC.

- Found that minimum NRC regulations were met in all areas. Especially significant to NFS were the SCUBA conclusions that:
  - The NFS radiation protection program has been effective in the past and remains so today.
  - The Fitness for Duty Program is well documented and rigorously applied.
  - NFS management is appropriately focused on improving the effectiveness of a new self-assessment program begun in July 2007.
  - NFS has established policies that adequately address Nuclear Safety and the Safety Conscious Work Environment at NFS; and, NFS provides adequate training on its Safety and Compliance Conscious Work Environment.
  - The vast majority of NFS employees are willing to raise issues or concerns related to nuclear safety, both to management and to the NRC, without worrying about retaliation.
- NRC expectations, implied by RIS 2006-13, were not met in nine of the thirteen safety culture component areas. Such expectations were minimally or partially[5] met in the other four safety culture component areas.
- Forty-one Findings were provided in the main body text of the "Results Report" and thirteen recommendations in the nuclear material security addendum to the "Results Report." Each Finding is coded, by SCUBA, to a Safety Culture Component designator. An example is "AFI-DEC-01" is relevant to the Safety Culture Component designated by RIS 13 as "Decision Making."
- SCUBA identified twenty-one of their Findings as "most significant" and grouped the Findings into nine over-arching themes. These are shown in Table 1 below. In Section 4.3.5 below, NFS' progress to date and 2008 plans are summarized for each of the 21 Findings.
- At least one and usually several recommendations were provided, by SCUBA, for each Finding. Recognizing the expertise of SCUBA, NFS plans to consider all of the 2007 ISCA recommendations and expects to use almost all of the ISCA recommendations[6] in NFS' pursuit of safety culture excellence. Each recommendation will be considered and implemented in a manner appropriate to NFS.

[5] Expectations were met for the Safety Culture components entitled: "Environment for Raising Concerns," "prevent, Detect and Mitigate Perceptions of Retaliation," and "Safety Policies." Expectations were partially met for the "Corrective Action Program" component.

[6] NFS will provide a written justification for any ISCA recommendation that is not pursued.

- SCUBA concluded that the most significant challenges (for attaining an excellent safety culture) for NFS are to:

  - convince the organization of the need to change,
  - develop and implement an effective action plan, and
  - ensure that appropriate resources are made available, effectively deployed, and steadfastly reinforced by NFS management.

  The NFS Comprehensive Safety Culture Improvement Initiative described in Section 4.0 below is focused on meeting those challenges.

3.2 THE NUCLEAR MATERIAL SECURITY ASSESSMENT

The SCUBA Team also conducted an overall assessment of the NFS nuclear material security program and its relationship to the overall safety culture work environment at NFS. The nuclear material security program includes several security disciplines and Material Control and Accountability (MC&A). The results of this assessment were provided to NFS in a classified document (Reference 7) entitled: "*NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report, Special Topical Area: Nuclear Material Security*, (Confidential)" submitted by NFS' Safety Culture Board of Advisors, February 16, 2008.

SCUBA concluded that the NFS nuclear material security program currently meets minimum safeguards and security regulatory requirements but is an Area for Improvement. SCUBA presented thirteen recommendations for improvements. An unclassified synopsis of the recommendations has been incorporated in the NFS "Crosswalk" (see Section 4.3.2 below). The NFS Security Department has developed a detailed, classified (Confidential) response to the classified SCUBA Report. The NFS response includes actions taken, actions planned, and target completion or implementation dates, where appropriate. This classified NFS response is available for review upon request.

3.3 ADDITIONAL SCUBA RECOMMENDATIONS

Embedded in the Attachments (A through G) to the ISCA "Results Report" are numerous additional recommendations and suggestions by SCUBA for improving the safety culture at NFS. NFS has assembled these, compared them to the forty-one Findings in the main body text of the "Results Report," and integrated the recommendations in the Attachments into the Safety Culture Improvement Initiative via the NFS Crosswalk document.

TABLE 1

SAFETY CULTURE THEMES FOR 2007 ISCA "MOST SIGNIFICANT" FINDINGS

Organizational Values, Standards And Expectations – Questioning attitude – Barriers to problem identification – Conservative decision making
Communication Of Values, Standards And Expectations – Reinforce "Safety Strong" – Communicate basis for decisions – Management model high accountability behaviors
Human Performance Challenges – Comprehensive Human Performance Program – Procedural Compliance
Emphasize Ownership And Accountability – Single Points of Accountability – Personnel Performance Evaluation process – Goal setting and management reviews
Resourcing For Success – Resource Functions to meet higher performance standards
Enhance Effectiveness Of Programs And Processes – Operational Decision Making – CAP scope – CAP quality, and effectiveness – Employee Concerns Program
Eliminate Tolerance For Degraded Conditions – Top Ten Lists – Site Infrastructure Improvement Plan
Expand The Frame Of Reference – Benchmarking
Focus On Continuous Improvement – Performance Indicators and Metrics – Self and Independent Assessments

4.0 NFS' SAFETY CULTURE IMPROVEMENT INITIATIVE IMPLEMENTATION

4.1 NFS VISION FOR SAFETY CULTURE IN FOUR YEARS

In the NFS Safety Culture Strategic Plan[7], the NFS Executive Vice President and General Manager stated the NFS vision as: "Within the next four years[8] all NFS employees will demonstrate excellence in everyday safety resulting in an organizational Safety Culture recognized by stakeholders as a standard in the nuclear industry." This NFS Safety Culture Improvement Initiative is the vehicle to implement actions on the path to achieve this vision.

4.2 ACTIONS/ ACCOMPLISHMENTS BY NFS PRIOR TO ISCA REPORT

Even as SCUBA was being formulated, and the 2007 ISCA was being developed and executed, NFS was taking numerous actions to significantly improve the safety culture at NFS-Erwin. Significant actions included:

- Established the NFS Safety Culture Leadership Team to organize and prioritize safety culture efforts until a more formal process had been instituted.
- Published the "NFS Safety and Compliance Culture Policy." This policy authorized the Leadership Team to 1) plan for continuous improvement in safety and compliance culture and 2) develop and maintain, as needed, metrics to provide a continuing means of understanding current performance in important safety and compliance culture areas.
- Initiated a strategic planning and execution process (Policy Deployment and One Page Plan) that incorporates as one planning element the Safety Culture Strategic Plan. This process is described in Appendix A of this Report.
- Reorganized to include the positions of the General Manager and the Chief Nuclear Safety Officer and thereby strengthen both accountability and independent oversight.
- Joined in 2006 the Institute of Nuclear Power Operations (INPO) as a fuel cycle member. This provided NFS with 1) immediate, on-line access to documents relevant to safety culture and "best practices" in the nuclear industry and 2) access to relevant training, seminars, and other participatory events for managers and supervisors.

[7] Included in "Planning Unit, Safety Culture Strategic Plan," in "One Page Plan" for the NFS Executive. Vice President and General Manager
[8] Before the end of the year 2011

- Developed, funded, and began implementation of a Site Infrastructure Improvement Plan. This multi-year effort will substantially replace or rehabilitate the aging facilities (such as building roofs and paving).
- Initiated (via an already established NFS procedure) in July 2007 a comprehensive self-assessment of the NFS safety culture versus each of the thirteen Safety Culture components.
- Obtained mentoring, by the SCUBA experts, of NFS' managers in performing rigorous self-assessment practices, with the 2007 NFS Safety Culture Self-Assessment as a focus.
- Used the NFS Safety Culture Self-Assessment as support to the development of the NFS Initiative for improving the NFS-Erwin safety culture via the NFS 2008 Strategic Plan.
- Included consideration of safety culture improvements in the 2008 budget revaluation.
- Benchmarked, procured, and installed an electronic configuration management program with additional up-to-date process documentation and component labeling.
- Made "Safety Strong" a major NFS communication focus on the thirteen safety culture components.
- Initiated the development of a major Human Performance Implementation Program.
- Launched an External Communications Plan.
- Briefed the NFS Board of Directors (by SCUBA and NFS Senior Management) on the safety culture improvement needs and plans and obtained concurrence.

4.3 NFS SAFETY CULTURE IMPROVEMENT INITIATIVE ACTION PLANS

4.3.1 Corporate Direction

The NFS 2008 Consolidated Plan, as expressed by the NFS President & CEO, identifies eight strategies. One strategy, the Safety Culture Strategic Plan (SCSP), is directly focused on significant improvement in NFS safety culture. This strategy states: "Become the industry standard in safety culture by implementing SCP/SCUBA items." The corresponding 2008 Action Plan for this strategy is "Implement all 2008 Safety Culture Plan items by 31-DEC-2008." This is accomplished via flow down through the CEO's direct reports (Executive Vice President and General Manager, Vice President and Chief Nuclear Safety Officer, and the Vice President of Human Resources). These "items" are described and discussed below.

In addition to the specific corporate strategy on safety culture, there are several other corporate strategies that encompass improvements in safety culture as well as their primary focus of other "good business practice." Namely:

- Enhance human talent by implementing Enterprise Human Resource System.
- Enhance stakeholder relationships by developing and implementing a communication plan of NFS values.
- Evolve Management by a system of accountability, cost effectiveness, self assessment, etc.
- Establish Project Management accountability with respect to cost, schedule, and performance.

As these latter NFS corporate strategies relate to many ISCA Findings and Recommendations as detailed in the SCUBA "Results Report," they are being utilized in the development of NFS' actions to attain sustainable excellent performance.

4.3.2 NFS Responses to Findings/ Recommendations of the 2007 ISCA

In the "Results Report," SCUBA concluded that the most significant challenges (for attaining an excellent safety culture) for NFS are to:

- convince the organization of the need to change,
- develop and implement an effective action plan, and
- ensure that appropriate resources are made available, effectively deployed, and steadfastly reinforced by NFS management.

The NFS Initiative to substantially improve the safety culture at the NFS-Erwin Site involves a comprehensive set of actions that, during 2007 – 2011, is focused on meeting those challenges. The Initiative actions will, collectively:

- Provide near-term focus on the 21 priority ("most significant[9]") Findings (and attendant Recommendations) as assigned by SCUBA in the "*Results Report*" and the twelve recommendations presented for consideration in the nuclear material security-related "Special Topical Report" (classified document) to the "*Results Report*". Very high priority is being given to those NFS actions that might significantly improve either procedural compliance or the NFS configuration management program.

- Recognize that the 2007 ISCA recommendations by SCUBA will require time to complete successfully in a sustainable manner. However, NFS is committed to: carefully considering each SCUBA recommendation; plan an appropriate NFS

[9] See Table 1 of Section 3.1 above.

action; and, to the extent practical, initiate a significant response in 2008. NFS management has set NFS action priorities as:

- VERY HIGH (VH) – successful action may have a significant impact on improved Configuration Management and/or Procedural Compliance Programs. Also, the action may be a needed precursor or facilitator to other VH or H actions. Actions, to which NFS has assigned a VH priority, are to be initiated, if not already underway, by June 30th, and are to have a targeted completion or implementation in 2008, if practical.

- HIGH (H) – successful action may have some impact on improved Configuration Management and/or Procedural Compliance or significant impact in improvement in another Safety Culture component at NFS. Actions, to which NFS has assigned an H priority, are to be initiated within 6 months with a targeted completion or implementation by mid- 2009.

- MODERATE (M) - successful action may have little impact on improved Configuration Management and/or Procedural Compliance but may have some impact on improvements in the other Safety Culture components at NFS. Actions, to which NFS has assigned an M priority, are to have the planning completed by mid-2009; initiated in 2009; and, completed or implemented by mid-2010.

- LOW (L) – Has either a lesser impact in improving Safety Culture components at NFS or might require resources that are better utilized on other safety culture improvement actions. Actions, to which NFS has assigned an L priority, are to be considered in 2009; initiated (if appropriate) in 2010; and completed or implemented (if pursued) by the Spring 2011.

- Allow for awareness and continual consideration of the other ISCA Recommendations accompanying the twenty SCUBA Findings that were not rated as "most significant" while actions are being taken on the twenty-one "most significant" Findings and the nuclear material security recommendations. This is facilitated by inputting each SCUBA recommendation/suggestion into PIRCS, the automated NFS Problem Identification, Resolution and Correction System.
- Emphasize both the early obtainment of the references and the establishment of the contacts (such as INPO and benchmarking facilities), as recommended by SCUBA, to facilitate continual improvement in each safety culture component.
- Include milestones and target completion periods for NFS actions in response to ISCA recommendations. The major interim target is for substantial NFS improvement in each of the Safety Culture components when assessed by a SCUBA re-look in early 2010. The overall target is excellence in each safety culture component by the end of 2011.

- Include a "Crosswalk" (included as Attachment 1 to this Report) that is being used to identify where a specific SCUBA recommendation is addressed in: the Results Report, an NFS Strategic Plan, or a derivative NFS document. See Appendix B and Attachment 1 of this Report.
- Incorporate the NFS tasks being performed to achieve a major improvement in Configuration Management. Although Configuration Management was a separate element of the Confirmatory Order dated February 21, 2007, NFS recognizes that Configuration Management is one of the 13 significant components of Safety Culture. Configuration Management initiatives have been integrated into the Safety Culture Improvement Initiative.
- Correlate with various NFS derivative implementation plans/programs/documents (that either exist, are being considered for implementation, or are being planned) relevant to safety culture improvements, notably the:

NFS Safety and Compliance Culture Policy
NFS Conduct of Operations
Facility Organization Plan
Critical Infrastructure and Replacement Plan
Corporate Compliance Program
Employee Concerns Program
Contractor SCCWE Policy and Oversight Plan
Engineering Resource Rationalization Plan
External Communication Plan
Configuration Management plans
Internal Communication Plan
Leadership Development Training Program
Regulatory Formality Improvement Plan
Human Performance Program and Implementation Plan
QA Learning Opportunities Plan
Training Range Master Plan
Security Personnel Development Program
Revised Procedure Simplification Plan
Management by Walking Around (MBWA) Policy
Security Department's documented response to ISCA
Revised NFS Self-Assessment Procedure

4.3.3 NFS Responses to the SCUBA *"In-Process Recommendations"*

As indicated by SCUBA in their 2007 ISCA Plan, SCUBA committed to inform the NFS management on a real-time basis of any potentially significant issues that SCUBA identified and committed to document such in-process recommendations and suggestions in an attachment of the ISCA final report. Attachment E of the "Results Report" provided that documentation. The NFS General Manager discussed those recommendations/suggestions with SCUBA, as they occurred and has taken

appropriate responses. This SCUBA input has been used by NFS in support of the NFS Safety Culture Improvement Initiative. The individual SCUBA "In-Process" recommendations/suggestions (IP) have been incorporated into the Crosswalk where they are either referenced to duplicate or very similar recommendations provided in the main body text of the 2007 ISCA or are to be entered into the NFS correction action monitoring program (PIRCS) directly.

4.3.4 2008 Safety Culture Strategic Plan

As noted above the NFS Corporate strategy is to "Become industry standard in safety culture by implementing SCP/SCUBA items." The NFS actions to respond to the 2007 ISCA (SCUBA) are discussed in Sections 4.3.2 and 4.3.3 above.

The 2008 Safety Culture Strategic Plan (SCP) is the responsibility of the NFS Executive Vice President and General Manager and utilizes, as strategic planning and execution tool for safety culture improvement, the annual "*One Page Plan*[10]*s*" - a comprehensive, integrated, internet planning tool which includes vision, mission, up to nine detailed objectives (each with the potential for metrics), strategies and action plans. The 2008 Safety Culture Strategic Plan is shown in Table 2 below. Each annual Safety Culture Strategic Plan will be communicated broadly to NFS employees and major contractors.

The Objectives, Strategies, and Action Plans of the 2008 Safety Culture Strategic Plan flow down to the appropriate Department or work unit. Each One Page Plan was developed collegially among appropriate NFS work units, was reviewed and approved by next higher level of NFS supervision and includes potential performance metrics ("Scorecards"), status indicators, and progress reports. Each One Page Plan is reviewed and modified, if appropriate, by NFS' leadership monthly.

[10] The One Page Business Plan is a registered trademark of the One Page Business Plan Company. The use at NFS of this process is described in Appendix A of this Report.

TABLE 2
2008 SAFETY CULTURE STRATEGIC PLAN

Vision	Within the next four years all NFS employees will demonstrate excellence in everyday safety resulting in an organizational Safety Culture recognized by stakeholders as a standard in the nuclear industry.
Mission	Safety Strong: Every Thought, Every Act, Every Time
Objectives	• Achieve positive feedback through public website and internal intranet of at least 50% of the feedback • Establish mean time between clock resets • Execute elements of infrastructure plan within 5% of approved schedule by quarter • Establish mean time to complete Event Evaluation at less than 24 hours • Establish and decrease mean time to correct PIRCS items by 30% • Increase number of staff achieving professional development activities per performance agreements to 70% • Increase number of employee identified safety items by 10% • Reduce number of managers with less than 2 recorded MBWA observations/month to zero • Increase Management by Walking Around recorded observations to average 2/month per manager
Strategies	• Improve external communications by involvement in stakeholder and public outreach program • Improve HuP by improving procedures, HuP program elements, and improved CM • Execute critical Infrastructure Plan by obtaining funding and staffing • Institutionalize SCCWE by implementing One Page Plan with responsibility and reinforcement • Execute timely resolute 2 safety issues by training, prioritizing resources and feedback • Improve responsibility and accountability by implementing a comprehensive management system with reinforcement • Improve internal communication thru frequent E-mail, newsletters, memos, meetings, intranet, feedback • Demonstrate robust SCCWE by building fair and rapid HuP evaluations, educating, feedback
Action Plans	• Conduct Engineering resource study by May 2008 • Launch an External Communication Plan by March 15, 2008 • Develop and launch a HuP Program Plan with procedure simplification in pilot area by May 15, 2008 • Incorporate critical infrastructure plan into 2008 and 2009 budgets by April 2008 • Launch resource allocation and training to reduce mean time for PIRCS corrections by June 2008 • Evaluate SCCWE against SCUBA assessment and update and launch by April 21, 2008 • Evaluate and launch benchmarked management system across all departments by September 2008 • Complete Configuration Management plans to bring BPF systems into EB software by September 2008 • Launch an Internal Communication Plan by July 15, 2008

4.3.5 NFS Progress and 2008 Plans Related to "Most Significant" Findings.

As discussed above, NFS has focused near-term action on the twenty-one Findings identified by SCUBA as "Most Significant (MS)" and grouped by SCUBA into the nine "safety culture themes," (See Table 1 above). The NFS progress to date on these MS Findings is summarized below relative to the NFS Strategic Plan elements for 2008. As implementation of the Safety Culture Improvement Initiative proceeds, NFS senior management will conduct monthly reviews and adjust specific actions and timetables as warranted by circumstances or effectiveness reviews.

4.3.5.1 SC Theme: "Organizational Values, Standards, and Expectations"

- "Questioning attitude" (AFI-ACC-01)[11] – NFS has initiated both a comprehensive Human Performance Program (HuP)[12] and an extensive personnel Performance Evaluation Program (PEP). Both of these programs address the requirement for NFS employees to demonstrate a questioning attitude with regard to safety-related concerns. The HuP is described in the "Human Performance Implementation Plan" that has been drafted and is expected to be issued in the 2nd Quarter of 2008. In the 3rd Quarter of 2008, the HuP will be evaluated, and adjusted as appropriate, by a pilot implementation in a Fuel Facility area. The Performance Evaluation Program (PEP)[13], which features extensive automated, electronic capability to facilitate flow down of corporate and departmental goals as well as competency requirements, was initiated in the Spring of 2008, used for the 2007 personnel evaluations and is now being prepared for the early 2009 evaluations of 2008 personnel performance.
- "Remove barriers to problem identification and reporting" (AFI-CAP-02) – NFS is scheduled to complete a PIRCS upgrade in June of 2008 and expects to perform additional PIRCS upgrades in the 4th Quarter of 2008 and about every six months thereafter. This next upgrade provides the computer coding for anonymous problem reporting; the administrative provisions to fully implement this capability will be completed in 2008.
- "Expectations for conservative decision making" (ANA-DEC-01) – Two NFS Vice presidents (Fuel Production and the Chief Nuclear Safety Officer) have begun to benchmark industry standards of excellence. Their findings will be utilized in the revisionof the NFS Conduct of Operations document scheduled for completion in 2008.

[11] A SCUBA identifier from the "Results Report" which is also used as a tracking number in the NFS Crosswalk.
[12] HuP is detailed in the NFS "Human Performance Implementation Plan" drafted in April 2008
[13] Copyright by SuccessFactors, Inc

4.3.5.2 SC Theme: "Communication of Values, Standards, and Expectations"

- "Reinforce 'Safety Strong'" (AFI-SP-01) – The requirement to utilize "Safety Strong" to reinforce workforce understanding of NFS safety policies was initiated in 2007 with frequent safety E-mails from the General Manager and extensive "Safety Strong" signage, screen savers, etc. A formalized system for frequent safety messages is being developed as an Internal Communication Plan by an NFS Vice President. This Action Plan is included in that Vice President's 2008 strategic plan. The Communication Plan has been drafted and will be completed in 2008.
- "Communicate the bases for decisions" (AFI-DEC-02)[14] – as noted above, the Strategic Plan elements for 2008 include a formalized [14]Internal Communication Plan being developed by an NFS Vice President. This Action Plan is included in that Vice President's 2008 strategic plan. The Communication Plan has been drafted and will be completed in 2008.
- "Management must model high accountability behaviors" (AFI-ACC-03) – The recently installed NFS Performance Evaluation Program (PEP) is an automated, integrated employee performance management application that facilitates identification of expectations and individual performance. PEP has been implemented and modeling high accountability behavior will be included as a specific evaluation item for the 2008 evaluation period (conducted in early 2009). Furthermore the Strategic Planning and Execution Process (SPEP) includes a monthly review of the managers' progress to achieve their assigned annual objectives. See also Footnote 14.

4.3.5.3 SC Theme: "Human Performance Challenges"

- "Comprehensive Human Performance Program" (AFI-WP-01) – NFS management has determined that among the critical success factors necessary for NFS to fulfill its vision of becoming the industry standard of excellence is that NFS must achieve excellence in human performance. A comprehensive Human Performance Program (HuP) is under development. To date, HuP has been benchmarked, planned, and resourced. This program will be initially implemented in the 3rd Quarter of 2008 via a pilot area test. While the HuP has progressed under the leadership of the NFS Director of Human Performance and Learning, NFS is actively recruiting for a manager for the day-to-day leadership of this program.
- "Procedural Compliance" (AFI-WP-02) - A significant objective of NFS' comprehensive HuP (see above) is to significantly improve procedural

[14] Additionally, NFS response to this ISCA Finding will be included in a substantial revision to the Conduct of Operations procedure. That revision of the Conduct of Operations procedure will be briefed to all NFS employees and major contractors by the General Manager, with a target date of November 30, 2008.

compliance. One element of that program being planned for implementation is incorporation of Behavioral Management reinforcement techniques for supervision. NFS has already started the training of NFS supervision for the implementation of a behavioral observation program. Also, NFS plans to train NFS supervision and management using Aubrey Daniels International (ADI) materials. In addition, NFS will meet with the Union leadership in May 2008 and discuss changes necessary in procedural compliance expectations and performance. NFS will continue to extend invitations to the Union to participate in programs such as Human Performance, Safety Initiatives, etc. See also Footnote 14.

4.3.5.4 SC Theme: "Emphasize Ownership and Accountability"

- "Institutionalize single points of accountability" (AFI-ACC-04) – As noted above, the recently installed NFS Performance Evaluation Program (PEP) facilitates identification of expectations and individual performance and the Strategic Planning and Execution Process (SPEP) includes a monthly review of the managers' progress to achieve their specific annual objectives. See also Footnote 14.
- "Institutionalize a personnel performance management process" (AFI-ACC-05) – The NFS PEP was implemented in early 2008; the 2007 evaluation was completed; the 2008 goal planning is scheduled for completion by June 2008; and PEP is expected to be fully operational with mid-year review in August.
- "Drive performance improvement by goal setting and management reviews" (AFI-CLE-02) – Goal setting and management reviews are integral to both the NFS strategic planning process and the NFS personnel performance evaluation process (PEP) that have been implemented and are described in this Section.

4.3.5.5 SC Theme: "Resourcing for Success"

- "Resource functions to meet higher standards of performance" (AFI-RES-04) – NFS has approved and budgeted new or additional positions to assure success of the Safety Culture Initiative. An NFS Chief Nuclear Safety Officer, reporting to the NFS President, has been added to the NFS executive team to provide oversight independent of the operational responsibilities of the NFS General Manager. A position for a Deputy to the Vice-President of Safety and Regulatory has been approved. The Human Performance Program will be led by an experienced, or especially trained, Human Performance Manager. Significant augments have been approved for both the number of Configuration Management Specialists and the Quality Assurance Specialists. Also, Industrial Safety Specialists, Radiation Technicians, Maintenance Mechanics, and Chemical Operators will be added to reduce required overtime and thus minimize the potential for fatigue detrimental to Fitness for Duty. Additional engineering support will be hired or contacted in order to reduce the backlog of engineering projects.

4.3.5.6 SC Theme: "Enhance Effectiveness of Programs and Processes"

- "Operational Decision Making" (AFI-DEC-01) NFS has initiated participation by NFS Vice Presidents in INPO (and similar organizations) training in systematic, rigorous, and formalized system for making operational decisions. This training will be used in the development of a revision to the NFS Conduct of Operations document scheduled for completion in 2008. See also Footnote 14.
- "Re-evaluate the scope of the Corrective Action Program" (AFI-CAP-01) – NFS senior management considered the SCUBA recommendation to more narrowly focus the scope of the NFS corrective action program (PIRCS) and has decided instead to focus on improving the management of PIRCS. NFS will revisit this decision in 2009 as results of this Safety Culture Improvement Initiative are attained.
- "CAP effectiveness and quality" (AFI-CAP-03) – As noted above, NFS is scheduled to complete a PIRCS upgrade in June of 2008 and expects to perform additional PIRCS upgrades in the 4th Quarter of 2008 and about every six months thereafter. This next upgrade will support the capability for anonymous problem reporting and will be completed in 2008.
- "Employees Concerns Program" (AFI-ERC-01) – NFS will launch an Employee Concerns Program in 2009. The position of Employee Concerns Program manager has been approved and a Manager is being recruited. The Vice President and Chief Nuclear Safety Officer is currently planning benchmarking at other facilities so that the NFS ECP program should be on point at kickoff. The Chief Nuclear Safety Officer, the Vice President of Human Resources and the Corporate Security Director are planning to integrate the ECP throughout NFS and its major contractors.

4.3.5.7 SC Theme: "Eliminate Tolerance for Degraded Conditions"

- "Top Ten Lists" (AFI-RES-01) – The NFS Plant Superintendent Manager has solicited, from NFS employees and major contractors, input on what are the items that affect the ability of front line employees and supervisors in all areas to do their jobs efficiently and safely. Items/Issues identified will be ranked and the list will be distributed for comment and additions. A "Top Ten" list will be developed in 2008 and NFS will make correcting these items top priorities for maintenance and engineering. The top ten issues will be entered into PIRCS, if not already entered, and tracked to closure.
- "Site Infrastructure Improvement Plan" (AFI-RES-02) – NFS has developed, funded, and begun implementation of a Site Infrastructure Improvement Plan. This multi-year effort will substantially replace or rehabilitate the aging facilities (such as buildings, roofs and paving)

- "Benchmarking" (AFI-CLE-01) – NFS began significant benchmarking in 2007 with visits to nuclear facilities and upon joining INPO. In 2008, NFS has expanded its benchmarking activity via INPO and with further visits to nuclear and chemical facilities. NFS has also joined the Energy Facilities Contractor Operations Group (EFCOG) which will provide access to relevant experience at DOE facilities. In 2009 a formalized and focused program of benchmarking will be incorporated into a revision of the self-assessment program.

4.3.5.9 SC Theme: "Focus on Continuous Improvement"

- "Performance indicators and metrics" (AFI-SA-02) – As discussed in Section 4.5 below, NFS has embedded performance metrics in the 2008 NFS Strategic Planning Process. A large number of these metrics are relevant to safety culture improvements.
- "Self and Independent assessment" (AFI-SA-01) – As noted in Section 4.4 below, NFS plans to perform periodic comprehensive, self-assessments of its safety culture versus the thirteen safety culture components. These self-assessments will be facilitated by the NFS program of "Management By Walking Around (MBWA)" – the 2008 performance requirements for the leadership in the Fuel Production, D&D, HEU Operations/Projects, and the Plant Superintendents departments include increased MBWA participation. The NFS capability to perform independent assessments was greatly expanded by the reorganization that established the Nuclear Safety Oversight Department reporting directly to the NFS President and CEO. The NFS ability to perform rigorous Self-Assessments will also be enhanced as 2008/2009 benchmarking visits and discussions occur (see Benchmarking, AFI-CLE-01, in SC Theme Section 4.3.5.8 above).

Additional near-term progress is expected as NFS rigorously and effectively implements responses to the Findings and Recommendations of the ISCA.

4.4 NFS CONTINUING SELF-ASSESSMENTS OF ITS SAFETY CULTURE.

As noted in Attachment D of the "Results Report," SCUBA, during the 2007 ISCA, requested that the NFS SCLT conduct its own self-assessment of the NFS-Erwin safety culture against the cultural attributes set forth in NRC Regulatory Issue Summary (RIS) 2006-13. NFS performed the requested self-assessment during the summer of 2007 and the self-assessment was critiqued by SCUBA (see Attachment D of the "Results Report"). NFS plans to continue the NFS periodic self-assessments of NFS' performance on improving in each of the 13 Safety Culture components. Comprehensive self-assessments of NFS' performance on improving in each of the thirteen Safety Culture components will be scheduled and conducted annually, except in years in which similarly comprehensive independent assessments are completed. It is anticipated that the next self-assessment will be conducted in 2009.

4.5 PERFORMANCE BASED METRICS

Performance based metrics have been established[15]; are being monitored; and will be evaluated and broadly communicated to achieve the NFS Corporate vision[16] of "Within the next four years all NFS employees will demonstrate excellence in everyday safety resulting in an organizational Safety Culture recognized by stakeholders as a standard in the nuclear industry." These performance based metrics presently include the following:

- The 2008 NFS Consolidated Plan, which is the responsibility of the NFS President & CEO, includes the Objective to reduce the NFS-Erwin quarterly safety index[17] in 2008. This is a specific, major performance metric that is included in the One Page Plan of the NFS President & CEO.
- The newly-formed Nuclear Safety Oversight Department (NOSD), reporting to the NFS President, has as its vision: "Over the next 3 years, establish a corporate nuclear safety oversight capability that with increasing effectiveness guides and enables a strong safety culture and superior safety and regulatory performance." The NOSD plan for 2008 includes three NOSD Objectives with corresponding safety culture performance metrics. These metric types [18] are to
  - Reduce allegations
  - Improve demonstrated employee awareness
  - Improve regulatory compliance
- The 2008 Safety Culture Strategic Plan, under the responsibility of the NFS Executive. Vice President and General Manager, has nine Objectives (with corresponding strategies and action plans) to achieve the Mission of: "Safety Strong: Every Thought, Every Act, Every Time." Each of these Objectives (see Table 2 in Section 4.3 above) has a corresponding performance metric ("Scorecard"). The 2008 Safety Culture Objectives and the corresponding performance metric type are shown in Table 3. For each calendar year, appropriate Safety Culture Objectives and safety culture performance metrics will be developed, included in the Safety Culture Strategic plan, monitored, evaluated, and broadly communicated.

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[15] The NFS 2008 performance metrics are quantified, either as goals or current values, and are available for review at the NFS-Erwin site but are described here and in Appendix C by the objective and the metric type.

[16] Articulated in the 2008 Safety Culture Strategic Plan under the responsibility of the NFS Executive. Vice President and General Manager

[17] This is the highest level metric used at NFS relating to safety performance. The safety Index comprises severity-weighted, occurrence-based components involving *Injury Prevention* and *Regulatory Compliance* (NOVs); survey-based *Change Management* performance; CAP-based *Employee - Demonstrated Awareness/Sensitivity* assessment (calculated using events and employee identified safety items); and a OnePagePlan-based *Management - Demonstrated Commitment* which tracks on-time completion of planned safety culture actions. These elements include leading, lagging and mixed indicators. The index was validated through past year data population and determined to be a robust indicator of overall safety performance.

[18] The NFS 2008 performance metrics are quantified either as goals or current values and are available for review at the NFS-Erwin site but are described here by the metric type.

- Departments reporting to the General Manager, Chief Nuclear Safety Officer, and the Vice President of Human Resources have 2008 Objectives related to improved safety culture and corresponding performance metrics. These flow down from the 2008 safety culture Objectives of the senior NFS executives and are tabulated by metric type in Table C-1 of Appendix C.
- Another significant safety culture performance metric is the progress toward completion or implementation of all planned responses to the ISCA. NFS will closely monitor the progress of the planned responses to the detailed recommendations of the 2007 ISCA. Monthly reviews of the "Crosswalk" status by the General Manager, Chief Nuclear Safety Officer, and the Vice President of Human Resources will assure focus on the goal and the sustainability of the program towards success. In addition to being in the Crosswalk each ISCA recommendation will be entered into the NFS corrective action program (PIRCS); this will provide visibility, point accountability, and tracking to completion. The monthly progress reviews by NFS senior management will include consideration for additional specific performance metrics, as needed.

In response to the ISCA Finding on "Performance indicators and metrics" (AFI-SA-02), NFS will conduct benchmarking activities to identify industry best practices for the design and implementation of additional site-wide metrics applicable to NFS-Erwin. The NFS General Manager and the Chief Nuclear Safety Officer will be assisted in this task by the NFS Director of Business Process Improvement. As identified such performance metrics will be inputted into the Safety Culture Strategic Plan.

4.6 ADDITIONAL ISCA

As agreed in the Confirmatory Order, NFS will have another independent safety culture assessment performed at approximately 24 months after the receipt of the 2007 ISCA report; therefore, NFS will schedule an additional independent safety culture assessment of the NFS- Erwin Site for about February, 2010. This does not preclude NFS from utilizing the 2007 SCUBA teams, or its individual members, if necessary to enhance NFS' near-term pursuit of safety culture improvements.

TABLE 3
2008 SAFETY CULTURE STRATEGIC PLAN – OBJECTIVES AND METRICS (BY TYPE)

Objective	Metric Type
Achieve positive feedback through public website and internal intranet	% Positive Feedback
Establish & decrease mean time to correct PIRCS items	Decrease in PIRCS Correction days
Establish mean time to complete event evaluation	Mean Time to Complete
Increase number of staff achieving professional development activities	Professional Development
Increase participation of managers in MBWA observations	Management by Walking Around (MBWA)
Increase Management By Walking Around recorded observations	Manager MBWA observations
Increase number of employee identified safety items (EISI)	Increase in EISI
Establish mean time between clock resets	Number of Clock Resets
Execute elements of infrastructure plan within schedule by quarter	Schedule Variance of Infrastructure Plan

5.0 REFERENCES

1. "Confirmatory Order for Program Improvements," issued by the NRC on February 21, 2007.

2. "Upgrades to the Safety Culture Implementation Plan for NFS," issued by the NRC on August 27, 2007.

3. "Reply to Fulfill Confirmatory Order, Section V, Paragraph 3.a," submitted by NFS on May 22, 2007.

4. "Modifications to NFS Erwin 2007 Independent Safety Culture Assessment Plan and Schedule," submitted by NFS on September 24, 2007.

5. "NRC Regulatory Issue Summary 2006-13, Information on the Changes Made to the Reactor Oversight Process to More Fully Address Safety Culture", RIS-013. NRC, July 31, 2006

6. "*NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report*," submitted by NFS' Safety Culture Board of Advisors, February 16, 2008

7. "*NFS-Erwin Site 2007 Independent Safety Culture Assessment Results Report, Special Topical Area: Nuclear Material Security*, (Confidential)" submitted by NFS' Safety Culture Board of Advisors, February 16, 2008.

6.0 APPENDICES

Appendix A	Policy Deployment and the One Page Plan at NFS
Appendix B	Description of the Crosswalk
Appendix C	2008 Safety Culture Strategic Plan – Departmental Objectives and Metric Type

APPENDIX A

Policy Deployment and the One Page Plan at NFS

Nuclear Fuel Services, Inc. initiated Policy Deployment (PD) during 2005. However, due to the work stoppage and other issues it was placed on hold. In late 2007 it was re-initiated using the One Page Plan format.

What is Policy Deployment:

Policy deployment (PD) creates a structure whereby strategic objectives, both short term (1-2 years) and long term (3-7 years), are aligned with the Vision and Mission of the organization. It is the responsibility of top management to define these objectives. Once these objectives have been identified, policy deployment means that each level of the organization not only knows what it has to do, but there is a written plan of how the objectives will be attained. Each level of the organization has the opportunity to provide input to the plan. The most knowledgeable front line workers are just as important as the top executives. In a well articulated plan, each employee knows what she or he needs to do, and how to meet the goals/objectives of his or her department. The department manager knows his or her role in meeting the objectives, and so forth up the chain of command. A mature company with PD will then create measures that will tell each level of the organization how it is doing. For example, the CEO may have 3 – 5 measures that are rather global (productivity, market share, financial indicators, etc.). The VPs may each have 3 – 5 measures for each of the CEO's measures.

One Page Plan: The One Page Planning and Performance System used at NFS is a proprietary web based[19] software tool that links planning, strategy, and accountability. Advantages:

- Every key manager has a plan.
- Uses easy to understand language; no complicated terms
- Integrates metrics performance and progress reporting to the plan
- Teaches systems and critical thinking
- Fosters organizational learning
- Clearly identifies excellent and poor performers
- Provides programmatic 360 degree accountability

The One Page Planning and Performance System features:

- Standardized template
- Linked performance reporting to each Objective
- Progress reporting to each Planned Action

Planning Process:

Top management (CEO) develops the first level plan in conjunction with other senior executives.

[19] May be accessed at www.onepageplans.com

Next the process is repeated with the CEO's direct reports. Once they have developed their One Page Plans, then an alignment meeting is held. This is to ensure nothing has been omitted, there is no duplication of effort, and everyone is working towards the same goal(s). Then each of the CEO's direct reports starts the process with each of their reports. Again, when they have completed their One Page Plans, they then have an alignment meeting.

Plan Elements:

- Vision: What the end state looks like, associated with a time. The NFS Safety Culture Vision is "Within the next four years all NFS employees will demonstrate excellence in every day safety resulting in an organizational Safety Culture recognized by stakeholders as a standard in the nuclear industry."
- Mission: This is a short statement advertising the mission. NFS Safety Culture mission is "Safety Strong: Every thought, every act, every time".
- Objectives: Objectives are short statements that quantify the end results of any work effort. The objectives can be measured, graphed and are instantly recognizable. They include well-defined targets with quantifiable elements. For each objective, the system contains Score Cards (metrics) that are developed and updated at least monthly.
- Strategies: Strategies provide a blueprint or roadmap for building and managing the company or planning element. Strategies set the direction, philosophy, values, and methodology for building and managing. They establish guidelines and boundaries for evaluating decisions.
- Action Plans: Action Plans define the actual work to be done, i.e., the specific actions the planning unit must take to implement Strategies and to achieve the Objectives. They include specific dates for accomplishment. The plans that are referred to will have the detail level necessary. The Action Plans are updated at least monthly, using Progress Reports.

Execution:

When the alignment meeting for each of the teams has been completed, then the monthly meetings start. These meetings are designed around the One Page Plans, and are intended to focus on the future. Fifteen percent of the meeting time is looking backward, focusing on reviewing the metrics, progress reports, exceptions to the One Page Plans; whereas, 85% of the meeting time is spent looking forward at any issues or opportunities.

APPENDIX B

Crosswalk Description

To provide both formality and ease to the monitoring of NFS' performance in response to the recommendations contained in the 2007 ISCA final report and its nuclear material security topical report, NFS has developed the attached tabulation entitled: "Comprehensive Improvement Initiative, 2007 Independent Safety Culture Report Findings/Recommendations," (the "Crosswalk.") The "Crosswalk" tabulation includes, by safety culture component and SCUBA Finding, each of the SCUBA recommendations contained in the ISCA final report and the nuclear material security topical report. The Crosswalk:

- Specifically identifies the Findings characterized by SCUBA as "most significant."
- Identifies, for each SCUBA recommendation, the priority assigned by NFS to consideration and implementation of that recommendation. The priority terminology is discussed in Section 4.3 above and included in the "Legend" of the Crosswalk.
- Points out, by reference, the close correspondence noted by SCUBA between some ISCA Findings.
- Identifies the page in ISCA that discusses the Finding/Recommendation.
- Identifies, by the initials, the NFS Manager assigned responsibility for consideration, planning, monitoring and successful completion of the actions in response to the SCUBA recommendation.
- Correlates to an identification designation in the Departments' annual "One Page" Plan or to a derivative NFS document.
- Provides a targeted start-completion period and a comment flag.

This Crosswalk will be periodically reviewed by the General Manager and NFS senior management and revised and augmented as necessary. The recommendations in the Crosswalk will be entered into the NFS Problem Identification, Resolution and correction System (PIRCS). The progress on the NFS responses to the Crosswalk items will be continually monitored by the NFS Plant Superintendent department and reported to the General Manager, the Vice President of Human Resources, and the Chief Nuclear Safety Officer at least monthly.

APPENDIX C

Departmental 2008 Safety Culture Performance Met

(As of May 14, 2008)

The NFS 2008 performance metrics are quantified either as goals or current values and are available for review at the NFS-Erwin site but are described here in Appendix C by the objective and the metric type.

TABLE C-1

2008 SAFETY CULTURE STRATEGIC PLAN – DEPARTMENTAL OBJECTIVES AND METRIC TYPE

(As of May 14, 2008)

Objective	Performance Metric Type
A. Safety and Regulatory Department	
Reduce NRC cited violations	Quarterly Number of Violations
Increase non-cited vs cited violations	Non-cited Violations
Increase NFSFACTS. communication updates	Number of Website Updates
Decrease number of Safety Dept. recordable accidents	Number Recordable Accidents
B. Plant Superintendent Department (PS)	
Increase self-assessment full participations	Participation (departments/month)
Increase Management By Walking Around	MBWA per Month
Increase SC commitment status reports	Number of Reports
Increase Human Performance training	HuP Training hours
Increase Top Ten List status reports	Number of Reports
C. Engineering Department	
Establish (improve) project cost/schedule performance baseline	To Be Developed with HuP
Reduce configuration mgmt events	Quarterly CM Deviations
Establish clock resets due to critical infrastructure failure	To Be Developed with HuP
Reduce clock resets for maintenance rework	Maintenance Rework (days)
D. Human Performance & Learning Department	
Increase the number of simplified, revised procedures	Number of simplified procedures
Increase number of employee identified safety items	Number EISI
Establish mean time between clock resets in implementing areas	To Be Developed with HuP
Decrease mean time to correct PIRCS items	PIRCS correction times

TABLE C-1

2008 SAFETY CULTURE STRATEGIC PLAN – DEPARTMENTAL OBJECTIVES AND METRIC TYPE

(As of May 14, 2008)

Objective	Performance Metric Type
Increase # of HuPEE conducted in place of apparent cause investigation	Number of HuPEEs
Increase open enrollment leadership development class offerings	Offerings per Quarter
E. Security Department	
Reduce Security Force Turnover	Guard Force Turnover
Reduce Reportable Safeguards Events	Number safeguards events
Establish Event Clock for Safety/Security Deficiencies	Time between deficiencies
Establish personal development activity per staff member annually	Annual activity per staff member
F. Nuclear Operations Projects	
Increase participation in MBWA	Frequency of MBWA
Implement Configuration Management Improvements in BPF	Performance accomplishment
Set expectation and Team responsibility for step change in procedural adherence	Clock Resets per Quarter
G. Additionally for Operations Departments (Fuel Production, D&D, and Analytical Services)	
Increase participation in MBWA	Frequency of MBWA
H. Quality Assurance Department	
Increase staff-targeted audits	Number of staff audits
Increase plant Special Work Permit/ Lock Out Tag Out /Major Work Request surveillance activities	Number of surveillances
Increase attendance at off-site NQA-1:2004 learning opportunities	Learning opportunities.
Increase # of extra-departmental QA Coordinators	# of extra-departmental QA Coordinators

TABLE C-1

2008 SAFETY CULTURE STRATEGIC PLAN – DEPARTMENTAL OBJECTIVES AND METRIC TYPE

(As of May 14, 2008)

Objective	Performance Metric Type
I. Human Resources/ Safety Culture Team	
Hold employee turnover to an acceptable annual rate	Turnover rate
Reduce number of grievances reaching Arbitration	Grievances to arbitration
Reduce mean time to fill personnel requisition	Recruiting time
Increase # of on-time completed Performance Evaluations	On-time evaluations
Increase # of Performance Appraisals w/ Leadership Development plan	Appraisals including leadership development
Increase number of BPI events with Union Leadership participation.	Number of participations

ATTACHMENT 1

Crosswalk for Comprehensive Improvement Initiative, 2007 Independent Safety Culture Report Findings/ Recommendations

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-DEC-01, (MS) Operational Decision Making	NFS-Erwin does not have a systematic, rigorous, and formalized system for making operational decisions when risk-significant or safety-significant issues arise. (p. 24)	Formally define the authority, roles and formal process steps for making operational decisions when issues involving safety and safe facility operations are under consideration. (p. 24)	H	RDW	OPP-RDW MET-E	Benchmark in Progress	SD-6/30/08 CD-9/30/08
		Develop and implement an Organizational Decision Making (ODM) process of the type utilized in the commercial nuclear industry. This process should include participation of both inter-disciplinary and multi-level reviewers to broaden the opportunity for employee involvement and input, ensure quality decision-making, and promote organizational sponsorship. (p. 24)	H	JWN	OPP-JWN MET-?		SD-4/08 CD-11/30/08
AFI-DEC-02, (MS) Communicate the bases for decisions	NFS does not adequately communicate the bases for decisions related to nuclear safety or safe facility operations to the work force. (p. 25)	Management adopt a proactive communications strategy to deliver timely and effective communications on the bases/reasons for decisions. (p. 25)	H	JWN	OPP-JWN MET-?	Part of ODM Process	SD-4/08 CD-11/30/08
ANA-DEC-01, (MS) Expectations for conservative decision-making	NFS-Erwin lacks an appropriate focus on conservatism when making decisions. Too frequently, operations focus has come to be interpreted as production focus. The basic premise for going forward with any safety-significant or risk-significant activity should be that it has been shown that it is safe to proceed as planned, rather than that it is acceptable to proceed unless it can be proven that it is unsafe to do so. (p. 25)	Management establish and enforce the expectation that clear and convincing evidence that a proposed action is safe and compliant will be required before approval is given to proceed. (p. 25)	H	TEL	OPP-TEL MET-?	NFS Con Ops	SD-6/30/08 CD-4/1/09

[1] **See attached crosswalk legend for acronym definitions and other details**

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-RES-01, (MS) Top Ten Lists	The NFS-Erwin organization has become accustomed to tolerating recurring equipment problems, operational burdens & work-arounds, degraded equipment conditions and degraded infrastructure issues. For the most part, these do not represent immediate challenges to nuclear safety per se, but there are a number of situations that represent challenges to industrial/personnel safety. Organizational tolerance of such degraded conditions and the corresponding message that is sent with respect to management values and standards represents (1) a deficiency with respect to industry standards and norms, (2) a challenge to be overcome in leadership's quest for excellence and, unless abated, (3) the potential for adverse carryover effects on the organization's nuclear safety culture. (p. 28)	Demonstrate higher management standards by focusing organizational attention and resources on resolving these conditions through the use of "top ten priority lists" in the following areas: • Operational burdens and work-arounds with nuclear safety implications • Operational burdens and work-arounds with industrial/personnel safety implications • Recurring equipment problems (p. 28)	VH	FCK	OPP-FCK MET-P		SD-5/5/08 CD-7/5/08
		Develop "on the shelf" resolutions for known degraded conditions such that they can be implemented as soon as the opportunity arises. (p. 28)	M	CEA	MET-?	Identification underway	SD-5/1/08 CD-9/30/08
						Plan to be developed	SD-9/30/08 CD-12/31/08
AFI-RES-02, (MS) Site Infrastructure Improvement Plan	In the past, insufficient financial resources have been applied to meet NFS-Erwin's facility infrastructure needs. The current physical condition of the facility is considered to be deficient when compared to industry standards and norms. (p. 29)	NFS provide funding and allocate resources to support implementation of the NFS-Erwin Infrastructure Improvement Plan in a timely and aggressive manner, with priority applied to those areas representing the highest operational and regulatory compliance risks. (p. 29)	H	CEA	Infrastructure Improvement Plan OPP-CEA MET-?	Plan	Complete
						2008 Budget	Complete
						2009 Budget	SD-2008 CD-6/30/08
						Program	SD-12/31/08 CD-12/31/09
AFI-RES-03	While it appears that NFS has sufficient engineering resources to	Inventory and prioritize the entire engineering work backlog. (p. 29)	M	CEA	OPP-CEA MET-?		SD-3/31/08 CD-6/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	support safe operations of its nuclear facilities, these resources are frequently diverted to support new business opportunities. This has contributed to significant engineering work backlogs, tolerance of degraded equipment conditions, delays in resolving recurring equipment problems and delays in addressing facility infrastructure improvement needs. (p. 29)	Develop and effectively implement a strategic approach to ensure the adequacy and sufficiency of engineering support resources, both internal and external. (p. 29) Provide support for resolving the HVAC issues. (p. E-2)	M	CEA	OPP-CEA MET-?		SD-3/31/08 CD-6/30/09
AFI-RES-04, (MS) Resource functions to meet higher standards of performance	NFS-Erwin must successfully address a number of staffing issues in order to ensure the effectiveness of key programs and processes, as well as to successfully implement the additional and/or augmented programs, processes and functions necessary to support NFS leadership's quest for excellence. Appropriately qualified and trained staff is needed in the areas identified below. In some cases, this additional staffing is needed to ensure that regulatory commitments and/or regulatory expectations are met. (This staffing issue is also reflected in SCUBA Team Findings AFI-CM-01 and -02.) (p. 29)	Corrective Action Program staffing needs to be augmented. There is inadequate staffing at the present time to ensure that root cause analyses, corrective actions, and tracking and trending activities are conducted in a timely and effective manner. (p. 29)	M	RAC	Budget Plan-09 MET-N	Approved and budgeted	SD-4/1/08 CD-6/30/09
		Industrial/Personnel Safety staffing needs to be increased to assure (1) that all applicable regulations are identified and effectively implemented and (2) that there is increased field presence to provide first-hand behavioral reinforcement of industrial safety standards and required practices (e.g., Lock-out/Tag-out). (p. 29)	VH	JHP	OPP-BMM MET-E (MBWA)	Two out of three positions filled	SD-4/25/08 CD-8/31/08
		The Configuration Management program needs to be adequately resourced to ensure that regulatory commitments are met on schedule and in a high quality manner. (p. 29)	VH	CEA	OPP-CEA MET-N	Using contractor support	SD-12/31/07 CD-9/30/08
		The current level of staffing of the Quality Assurance "compliance based" function is marginally adequate. (p. 30)	VH	JWN	MET-N	Staffing increased from 3 to 5	Complete
		Implementation of a proactive Employee Concerns Program will require a full-time personnel assignment. (p. 30)	H	JWN	OPP-JWN MET-P	Employee concerns program (ECP)	SD-2/08 CD-4/1/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Implementation of a "performance based" Nuclear Oversight function will require additional personnel to support a robust self- and independent assessment program. (p. 30)	VH	DBF	OPP-JWN MET-N	Organized and Staffed	Complete
		Implementation of other initiatives under the Safety Culture Improvement Plan will likely require the dedication of additional resources. (p. 30)	L	TEL	OPP-TEL MET-N	Continuous Review Monthly	SD-01/31/09 CD-12/31/11
		Evaluation of the adequacy of current Health Physics staffing in light of attrition. (p. E-2)	M	MCT	MET-N	All open positions are filled	Complete
		Evaluation of the adequacy of operations staffing in light of then-current high levels of overtime. (p. E-2)	M	RDW	OPP-RDW	Agreed, Requisitions initiated	Complete
ANA-RES-01	Although excessive overtime is not worked on an organization-wide basis, individual departments and employees occasionally have to work excessive amounts of overtime (multiple, repetitive 16-hour days) due to shipping and receipt workloads, seasonal vacation schedules, and unplanned leaves of absence. Recent efforts on the part of NFS executive leadership have been successful in mitigating this problem, but a permanent policy change is needed. (p. 30)	Establish an appropriate policy for working hours and overtime that addresses fitness-for-duty fatigue considerations. (p. 30)	L	JWP	MET-P	Overtime procedure revised But awaiting potential regulatory change	On hold
OFI-RES-01	The operational readiness of the Emergency Response Brigade (including both personnel and equipment) has not been recently evaluated by an external expert. (p. 30)	It is recommended that such an evaluation be performed. (p. 30)	L	JHP	MET-N	Complete assessment by 3rd party ERT	SD-1/1/10 CD-6/3010
						Prepare corrective action plan to address findings and recommend-ations	SD-6/30/10 CD-12/31/10

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
OFI-RES-02	The NFS-Erwin Maintenance organization has historically not reported directly to same organizational chain of command as the Operations organization. (p. 30)	It is recommended that the Maintenance organization report through the same organizational chain as the Operations organization. (p. 30)	M	TEL	OPP-TEL MET-N		SD-09/30/08 CD-12/31/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
ANA-WC-01	There is little or no Industrial Safety presence in these areas; thus, there is little reinforcement of safety requirements. This is particularly true for contractor activities outside the MAA, as demonstrated by the number and seriousness of contractor events documented in the PIRCS system. (p. 37)	Industrial Safety oversight of maintenance, project, and contractor activities needs to be increased. (p. 37)	H	JHP	OPP-BMM MET-?	Develop and implement performance plans for Ind. Safety Spec. for Insp./Surv. Program	SD-4/30/08 CD-6/30/08
						Assign Ind. Safety Spec. to Contractor oversight	SD-9/1/08 CD/3/31/09
OFI-WC-01	NFS does not have a comprehensive work management process/system to identify, prioritize, plan, schedule, manage risks and execute work. (p. 36)	NFS-Erwin should implement a comprehensive Work Management System to provide an integrated, organization-wide process for identifying and prioritizing issues, planning the required work and associated resources, and executing the work in a safe and error-free manner. Objectives of this initiative should include: (p. 37) • Improving equipment safety margin and reliability. (p. 37) • Increasing the rigor, formality and management oversight of the work order process. (p. 37) • Increasing organizational focus on reliability-centered maintenance. (p. 37) • Eliminating the backlog of degraded equipment facilities, equipment and processes, and the associated operator work-arounds. (p. 37)	M	MAD	MET-?	IS Sup. Needed	SD-2008 CD-9/30/09
		A benchmarking visit to the Westinghouse Columbia Fuel Fabrication Facility is recommended to start this effort. Interactions with INPO and manufacturing facilities having world-class maintenance programs are recommended as well. (p. 37)	M	MAD	MET-N	Westing-house visit complete	SD-2008 CD-12/31/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-1	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-WP-01, (MS) Comprehensive Human Performance Program	NFS-Erwin does not have a comprehensive Human Performance Program. As a result, employees are not trained or expected to recognize error-likely situations, or to apply tools that minimize the frequency and severity of events. (p. 42)	Designate a HuP manager and provide sufficient and appropriate resources ensure effective program implementation including: (p. 42) • Benchmark against "industry best" programs. (p. 42) • Align the organization and establish expectations. Support the program with the appropriate training. (p. 42) • Implement an effective management observation program to support the HuP Program. (p. 42) • Establish performance metrics with reinforcement and communication systems. (p. 42) • Frequently evaluate program effectiveness and make necessary adjustments. (p. 42) • Utilize INPO and a firm such as Aubrey Daniels International (ADI) to assist in the performance of evaluations, planning, and the development of reinforcement systems. (p. 47) • Redirect the management observation program. The near-term focus of this program should be on observing and coaching the behaviors and practices associated with nuclear, industrial, personal safety and procedure compliance. (p. 47) • Develop and implement (with INPO or ADI assistance) a training program for supervisors and managers on how to observe and reinforce proper behaviors for procedural compliance in the field and establish a team of supervisors and managers specifically tasked to conduct field observations focused on procedural compliance. (p. 47) • Schedule benchmarking visits to nuclear facilities that have struggled with procedural compliance problems, but have subsequently	H	NCK	OPP-NCK-08 MET-P	This is a large, long term initiative. Initial implementa-tion should complete by 12/30/09	SD-9/1/07 CD-12/31/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		become "best in class" in implementing Human Performance. (p. 47)					
AFI-WP-02, (MS) Procedural compliance	Procedural compliance is a significant problem at NFS-Erwin. The site has a history of NRC violations associated with procedural adherence deficiencies, and procedural non-compliance continues to an area for improvement. An immediate intervention with a proactive approach is necessary to address and correct this continuing problem. (p. 42)	Clearly communicate expectations and responsibilities to the organization along with the reasons for an immediate step-change in organizational focus on meeting procedural adherence expectations. (p. 42)	H	RDW / RAB	Con Ops		SD-6/30/08 CD-12/31/08
		Hold individuals, supervisors, and managers accountable for consistently meeting expectations for procedural adherence. (p. 42)	H	TEL	Con Ops		SD-6/30/08 CD-12/31/08
		Establish an oversight/observation program with a reinforcement plan specifically focused on procedural adherence. (p. 42)	H	NCK	OPP-NCK-08 MET-P		SD-2/26/08 CD-06/30/09
		Evaluate results of the initiative and adjust as necessary to reinforce strict procedural adherence. (p. 42)	M	NCK	OPP-NCK-09 MET-N		SD-6/30/09 CD-6/30/10
		Commit the appropriate resources to successfully effect a change in procedural adherence. (p. 42)	H	TEL	OPP-TEL MET-N	Initiated	Monthly Review
		Ensure that there is organization-wide ownership and accountability for procedural compliance. Managers and supervisors need to be assigned responsibility and ownership for procedural compliance in their area of responsibility (no exceptions). (p. 47)	VH	TEL	OPP-TEL MET-N	Con Ops	SD-06/30/08 CD-12/31/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-1	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Management must encourage the workforce to develop a questioning attitude. If someone is not sure if they are in compliance with existing procedures, they should stop and ask questions. Management and supervision must support and reinforce these traits to achieve the desired culture. (p. 47)	VH	TEL	Con Ops MET-N	Monthly Review and Execution	SD-6/30/08 CD-12/31/08
		Initiation of a change in procedural expectations is likely to increase demands for support functions. This will quickly quantify gaps in the procedures, training, qualifications and knowledge of standards and expectations. Management must be prepared to support these issues with technical, administrative, and training resources, as the site is likely to encounter a rash of questions and requests for procedure changes or letters of authorization (LOA) for temporary changes. (p. 47)	VH	TEL	OPP-TEL MET-N	Continual Review	Ongoing
		Reinforce classroom lessons on procedural use and reference. Establish expectations regarding the level of required procedural compliance (verbatim, step-by-step, in-hand, refer as needed, etc.) and identify such on all procedures. (p. 47)	H	NCK	OPP-NCK-08 MET-?	This is a large long-term project and will require addtl. time	SD-10/30/08 CD-12/31/10
		Union management should be apprised of the change necessary in procedural compliance expectations and performance, and afforded the opportunity to participate in plan development and implementation. (p. 48)	VH	GAT	Ltr. To Union leadership MET-N		SD-09/30/08 CD-10/31/08
		Contractor management must subscribe to the same standards and expectations as the balance of the site. (p. 48)	H	CEA	Safety mgmt. position added by construc-tion contractor		SD-3/31/08 CD-9/30/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-WP-03	The Lock-out/Tag-out practices at the NFS-Erwin site need to be strengthened in order to ensure employee safety. (p. 43)	Improve Lock-out/Tag-out program: • Eliminate the practice of not locking out energy sources in the immediate vicinity of work. (p. 43) • Develop and implement a work practice utilizing individually keyed system locks for system isolation. (p. 43) • Develop and implement a records system to identify all personnel working on an isolated system and any changes occurring with locks and tags. Any interim lock change should require documentation, a new tag identifying the individual applying the lock, and a revalidation of system integrity. (p. 43) • Formalize Lock-out/Tag-out communications, particularly at morning briefings and shift turnovers, so that all individuals working with the system are kept up-to-date on current work status and safety hazards. (p. 43)	M	JHP	MET-?	Obtain legal clarification regarding not locking out energy sources in immediate vicinity of work	SD-4/22/08 CD-9/30/08
						Incorporate requirements for use of single key lock sets in NFS-GH-36	SD-4/30/08 CD-7/31/08
						LOTO Review team will benchmark 3 facilities for review	SD-8/1/08 CD-6/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-CAP-01, (MS) Re-evaluate the scope of CAP	NFS-Erwin needs to clearly define the types of issues that are required to be processed through the CAP using PIRCS. PIRCS is not currently being used to record every issue or problem that is identified at the NFS-Erwin site. It is important for management to reestablish standards and expectations for the use of CAP/PIRCS. (p. 49)	Change to a more limited scope of applicability of the CAP to provide organizational focus on achieving excellence in performance with respect to safety-related programs, processes, procedures and equipment and with respect to regulatory commitments. (p. 49)	H	RAC		NFS has no plans to act on the rec.	NA
		Once sufficient performance improvement has been achieved for this initial scope of applicability, the coverage of the CAP could be expanded. (p. 49)	M	RAC		NFS has no plans to act on this rec.	NA
AFI-CAP-02, (MS) Remove barriers to problem identification and reporting	Several barriers to workforce participation in CAP/PIRCS issue identification exist that should be mitigated to the extent practicable. (p. 50)	Including a feature in PIRCS that would allow for Problem Report entry on an anonymous basis. (p. 50)	VH	RAC	PIRCS Revision Plan MET-P		SD-7/31/08 CD-12/31/08
		Increasing PIRCS training. (p. 50)	H	RAC	SAAL-Training MET-N		SD-6/30/08 CD-7/31/09
		Increase computer access/availability. (p. 50)	H	CRL	Three (3) computers to be located in B305 Lunchroom Lobby. One computer to be located in B350 Break Area.	B305 Lunchroom lobby requires installation of furnature. Computers ordered and received. Network and electrical already installed.	SD-5/31/08 CD-12/31/08
		Streamlining the process for providing feedback to Problem Report originators. The e-mail based system proposed is currently in beta testing. (p. 50)	VH	RAC			Complete
		Demonstrating that the CAP/PIRCS is effective in resolving identified problems (Refer to SCUBA Team Finding AFI-RES-01). (p. 50)	M	RAC	OPP-NCK-09 MET-?	Need info from Scuba Team	SD-6/30/09 CD-6/30/10
		Establishing a more proactive and visible alternate channel for raising potential safety issues or concerns (This issue is also addressed in SCUBA Team Finding AFI-ERC-01) (p. 50)	VH	JWN	OPP-JWN MET-P	Employee concerns program (ECP)	SD-2/08 CD-4/1/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-CAP-03, (MS) CAP effectiveness and quality	NFS-Erwin management must make a significant commitment to improving the timeliness and quality of both event investigations (Root Cause and Apparent Cause Analyses) and identified corrective actions. Investigations tend to seize on the first compliance failure and describe that failure as the cause. Process improvements to correct these shortcomings can best be achieved by a combination of improved training, full-time investigative personnel, and increased management oversight. Similarly, the quality, frequency, and ability to perform Common Cause Analyses needs to be improved. There is a tendency to produce corrective actions that lack a rigorous accountability trail (e.g., owner, due date, metrics) or that have limited potential to change behaviors that will prevent recurrence. Improvements in these areas will require management to commit additional full-time personnel to the CAP/PIRCS process. (This issue is also addressed in SCUBA Team Finding AFI-NOV-01.) (p. 50)	Assign additional personnel to support the Corrective Action Program Coordinator in the effective execution of the program. These individuals should serve as subject matter experts with responsibility for establishing liaison throughout the organization in order to ensure a high quality, responsive product. (p. 50)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-6/30/10
		Make improvement to Event Investigations: Expand the population of individuals who are qualified and experienced to serve as problem analysis team leaders. Too many individuals are qualified but not proficient and the site has not used formal training to spread the workload across the supervisory element. (p. 50)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10
		Improve the quality of Root Cause and Common Cause Analyses to ensure understanding of the underlying systemic conditions that created the opportunity for failure. (p. 50)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10
		Increase the number of common cause analyses conducted in response to trending data collected through routine PIRCS problem reports. Ensure that a common cause is, in fact, determined. (p. 50)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10
		Consolidate ownership and accountability for the quality and effectiveness of the CAP/PIRCS within the PIRCS Oversight Committee. (p. 51)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10
		Transfer the CAP/PIRCS functions currently being performed by the Safety and Safeguards Review Committee (SSRC) to the PIRCS Oversight Committee. (p. 51)	M	RAC	OPP-NCK-09 MET-N		SD-6/30/09 CD-12/31/10
		Improve the metrics used to measure the success of PIRCS, especially those that are quality related. Measures such as RCA quality, corrective action effectiveness, repetitive occurrence, rework, average age, relative number of each category of investigation, and total hours spent on analysis teams are examples of potentially useful additions. (p. 51)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Formalize the effectiveness review process to ensure that timely evaluations of corrective actions are conducted. (p. 51)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10
		Establish a quality review board to periodically perform a formal and comprehensive evaluation of CAP/PIRCS products, selected on the basis of risk and consequence. The quality of root cause analyses, apparent cause analyses, corrective action identification and implementation will benefit from the feedback obtained through this process. One of the by-products should be a clear tie between problem analysis and the promulgation of lessons learned. (p. 51)	M	RAC	OPP-NCK-09 MET-?		SD-6/30/09 CD-12/31/10
		Control the size of the backlog by establishing a low level of tolerance for overdue items. (NOTE: When the population of lingering CAP/PIRCS issues periodically reaches unacceptable levels, the solution has been to declare a day of site-wide focus to clear the backlog. This occurred twice in 2007 and was effective in reducing he numbers. However, it is reasonable to question the quality of products that are mass processed in a short time frame. The site needs to conduct an effectiveness review. (p. 51)	M	RAC	OPP-NCK-09 MET-E		SD-6/30/09 CD-12/31/10
AFI-CAP-04	NFS-Erwin needs to fully convert the commitment tracking process to the PIRCS system as intended. There are currently multiple processes. and unclear ownership for effectiveness of corrective	Develop a process to evaluate commitment closure that verifies completion and adequacy. The process should specify a committee or senior management review and should require more evidence of closure than a simple PIRCS entry. (p. 51)	M	RPD	MET-?	Process will be developed to evaluate commitment closure.	SD-09/30/08 CD-06/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	actions. This diffusion of responsibility provides the opportunity for administrative error and could lead to an inadvertent lapse in regulatory compliance. In addition, the current commitment approval process does not systematically evaluate the effectiveness of corrective actions taken and allows commitments to be closed when work is merely scheduled, not completed. (This issue is also reflected in SCUBA Team Finding AFI-RCC-01.) (p. 51)	Close the gaps between COMTRACK (the previous commitment tracking program) and PIRCS. The COMTRACK procedure is still used for commitment tracking guidance. If retained, this procedure needs to be updated to formally recognize PIRCS as the corrective action commitment tracking system and fully describe how this system is to function. If COMTRACK is not retained, a new procedure should be generated that does formalize the process and contains all of the pertinent information. (p. 51)	M	RPD	MET-N	ComTrack procedure inactive in Feb. 2008. New program/ procedure will be generated to formalize the use of PIRCS to track regulatory commit-ments.	SD-09/30/08 CD-06/30/09
		Consolidate responsibility for tracking all commitments under one owner. The primary tracking system (PIRCS) should be formalized and robust enough that an independent tracking system is not required. (p. 52)	M	RPD	MET-N	Responsibi-lity for tracking commit-ments in PIRCS will be clarified.	SD-09/30/08 CD-06/30/09
		Establish regular quality reviews of the commitment closure process by an independent review source (i.e., Quality Assurance). (p. 52)	M	RPD	MET-?	Independent reviews of the commitment closure process will be established.	SD-09/30/08 CD-06/30/09
		Eliminate the practice of allowing one commitment to be closed by another. The chain of control is easily lost and the generation of a new initiation date with each new commitment complicates the business of controlling the age of the backlog, ensuring timely closure, and tracking adequacy of the actions taken to resolve the issue. (p. 52)	M	RPD	MET-?	Commitment closure process and effectiveness reviews will be described in the tracking program.	SD-09/30/08 CD-06/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
ANA-CAP-01	ANA-CAP-01 NFS-Erwin needs to improve the implementation of PIRCS to take full advantage of the capabilities resident in the software. When problem reports are entered, the process should flow smoothly from problem identification to problem resolution. When oversight is required, PIRCS should be capable of providing effective search tools that overlap with other record-keeping systems -in particular the Configuration Management Program. This capability requires computerized aids to properly bin deficiencies, search tools to easily check for extent of condition, commitment tracking processes, and feedback systems to seamlessly provide status reports to the originator. (p. 52)	Develop a common cause trending methodology and capability. Common Cause Analyses performed to date are limited in number and have not been effective at identifying organizational attributes, which if corrected, would minimize or prevent future repeat events. This is primarily due to the lack of granularity of the cause codes available for use in binning and analyzing reported problems. (p. 52)	L	RAC	OPP-NCK-10 MET-?		SD-1/30/10 CD-6/30/11
		Develop a cause code to designate commitments in PIRCS for ease of search and report generation. (p. 52)	L	RAC	OPP-NCK-10 MET-?		SD-1/30/10 CD-6/30/11
		Establish an expectation for a physical, as well as digital, search of similar components (or procedures) for extent of condition problems. (p. 52)	L	RAC	OPP-NCK-10 MET-?		SD-1/30/10 CD-6/30/11
		Modify the PIRCS database to allow designation of discrepancies that can be attributed to configuration management issues. (p. 52)	H	RAC			Complete
		Blend the paper-based Letter of Authorization tracking system into the LINC software being used to populate the Configuration Management database. (p. 52)	M	RPS	MET-N	BPI event to provide direction	SD-8/31/08 CD-6/30/09
		Establish software linkage between problem reporting and work control. Maximo® has reportedly been designated as the software of choice for use with work control. Develop a transition plan that will mesh Maximo® with PIRCS to allow both to make coordinated progress in order to be able to cross-correlate problem reports with work orders. The current proposal for transition to Maximo® is the second quarter of 2008. (p. 52)	L	MAD	MET-?	Mainstar PIRCS link	SD-6/30/08 CD-12/31/08
						Maximo PIRCS link	SD-1/30/09 CD-12/31/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-OE-01	NFS-Erwin currently does not currently have a systematic, thorough and formal program/process in place for obtaining, evaluating and acting upon external operating experience. NFS-Erwin lacks a single point of accountability and ownership for the success of such a program/process. (p. 58)	Develop and implement an NFS-Erwin Operating Experience Program. The program should include guidance on objectives, process, management oversight, training and performance metrics. (p. 58)	L	RAC	OPP-NCK-09,10 MET-?	This is a large, long-term initiative	SD-1/30/09 CD-12/31/10
		Assign an appropriately qualified and experienced individual as the site OE lead. (p. 58)	M	NCK	OPP-NCK-09 MET-?		SD-6/30/09 CD-6/30/10
		Conduct benchmarking activities to identify industry best practices for the design and implementation of an OE Program that is applicable to NFS-Erwin. (p. 58)	M	RAC	OPP-NCK-09 MET-?	One visit completed	SD-6/30/09 CD-6/30/10
		Identify the potential sources of OE information applicable to NFS-Erwin. Sources related to a fuel-cycle facility include, but are not limited to: - NRC/Nuclear Material Safety & Safeguards Office - Nuclear Energy Institute (NEI) - Institute of Nuclear Power Operations (INPO)/World Association of Nuclear Operators (WANO) - Other fuel cycle facilities - Chemical industry facilities - Occupational Safety and Health Administration (OSHA) - Environmental Protection Agency (EPA) - Industry peer groups - Professional Societies - NFS-Erwin equipment vendors (p. 58)	L	RAC	OPP-NCK-10 MET-?		SD-1/30/10 CD-12/31/10
AFI-OE-02	NFS-Erwin currently does not have a systematic, thorough and formal program/process in place for obtaining, evaluating and acting upon internal operating experience. The SCUBA Team believes that NFS-Erwin will identify more	The same actions recommended in Finding AFI-OE-01 are applicable to the development and management of an internal OE program. NFS should jointly develop and manage the internal and external OE programs, to ensure comprehensive review of all pertinent Operating Experience information sources. (p. 59)	L	RAC	OPP-NCK-10 MET-?		SD-1/30/10 CD-12/31/10

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	useful operating experience information, at least in the near term, from internal performance history than it will from external sources. (p. 59)	Utilize the PIRCS system and the Corrective Action Program to identify and evaluate recurring events, such that opportunities to learn from internal operating experience are effectively captured and acted upon. (p. 59)	L	RAC	OPP-NCK-10 MET-?		SD-1/30/10 CD-12/31/10
OFI-OE-01		The SCUBA Team believes that NFS Erwin would benefit from a systematic, comprehensive evaluation and application of the lessons-learned from the BLEU Processing Facility Project to the Reliable Fuel Supply Project (from design through construction and operation). While it appears that this has occurred to some degree, there is no evidence of the use of a systematic and thorough approach. Such an approach could take place within the context of Operational Readiness Reviews for the RFS Project. (p. 59)	VH	RAB	RFS ORR	RFS Start-up successful	Complete

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-SA-01, (MS) Self-/independent assessment	In mid-2007, NFS instituted a formal Self-Assessment Program, which is documented in NFS-GH-945. This program primarily focuses on management field observations. Compared to nuclear power plant industry standards the scope of this Self-Assessment Program is somewhat limited in nature. Since this Program is in the early stages of implementation, it is premature to reach a conclusion as to its effectiveness. On the other hand, the SCUBA Team has concluded that there are a number of additional opportunities to enhance organizational effectiveness through increased emphasis on additional self-assessment and external assessment activities. (p. 64)	Develop and implement a multi-year, integrated self-assessment plan that: • Includes a combination of compliance-based audits (which are focused on compliance with regulatory and customer requirements) and performance-based assessments (which are designed to evaluate the effectiveness of programs, processes and functions as compared to industry standards and best practices). • Includes an appropriate mix of external assessments and/or industry peer participation on NFS performance-based self-assessments to ensure that NFS-Erwin keeps abreast of evolving industry standards and best practices. • Includes forward-looking elements designed to self-identify potential fragilities in organizational effectiveness and performance. • Is sufficiently flexible to address unanticipated or emerging performance assessment needs. • Is managed and coordinated by a specifically assigned individual who serves as a single point of accountability and ownership for the success of the integrated plan. (The most likely candidate for this role would be the newly-appointed NFS Chief Nuclear Safety Officer.) (p. 64)	H	JWN	OPP-JWN MET-P	Corporate Compliance Program	SD-1/2/08 CD-9/15/08
		Conduct benchmarking activities to identify industry best practices for the design and implementation of the integrated self-assessment plan. (p. 64)	H	JWN	OPP-JWN MET-P	Corporate Compliance Program	SD-1/2/08 CD-9/15/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Enhance the current Self-Assessment Program by including a program element focused on periodic (e.g., semi-annual) comprehensive self-assessments of organizational performance and effectiveness conducted by line organizations. Conduct a formal, collegial management team review of these self-assessments at the completion of each assessment period. (p. 64)	H	JWN	OPP-JWN MET-P	Corporate Compliance Program	SD-1/2/08 CD-9/15/08
		Conduct benchmarking activities to identify industry best practices for the design and implementation of periodic (e.g., semi-annual) comprehensive self-assessments of organizational performance and effectiveness performed by line organizations. This issue is further addressed in SCUBA Team Finding AFI-CLE-01. (p. 64)	M	FCK	OPP-FCK 09	Revision to SA Plan	SD-6/30/09 CD-6/30/10
		Continue to enhance the effectiveness of management field observations (i.e., "Management by Walking Around") by providing training to participants on standards and expectations for the conduct of their observations, as well as on the standards and behaviors that they are expected to reinforce in the field. (p. 64)	M	SLS	SAAL-Training MET-?		SD-6/30/09 CD-6/30/10
		Train managers in program and process self-assessment methods, using external facilitators with demonstrated competence. (p. 65)	M	SLS	SAAL-Training MET-?	Will evaluate use of external facilitators	SD-6/30/09 CD-6/30/10
		Include "demonstrated effectiveness in conducting self-assessment activities" as a performance measure in the annual performance evaluations of NFS managers and supervisors. (p. 65)	M	BAL	PEP	Monitor MBWA Metrics	SD-3/31/09 CD-Continually
AFI-SA-02, (MS) Performance indicators and metrics	NFS-Erwin currently does not currently have a comprehensive, formal program/process in place to effectively utilize performance metrics for evaluating and addressing weaknesses in organizational effectiveness and	Assign an appropriately qualified and experienced individual as the lead (i.e., ownership and accountability) for the development and implementation of an NFS-Erwin site-wide performance metrics system, including metrics relevant to nuclear safety, nuclear safety culture and security. (p. 65)	H	KBS	MET-P		SD-6/15/08 CD-6/30/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	organizational performance. NFS-Erwin lacks a single point of accountability and ownership for the success of such a program/process. (p. 65)	Conduct benchmarking activities to identify industry best practices for the design and implementation of a site-wide metrics system that is applicable to NFS-Erwin. (p. 65)	M	KBS	MET-?		SD-9/30/08 CD-12/15/08
		Include, as applicable, metrics associated with the implementation of NFS performance and cultural improvement initiatives. (p. 65)	M	KBS	MET-?		SD-1/1/09 CD-6/1/09
		Conduct a formal, collegial management team review of site-wide performance metrics on a monthly basis. This issue is further addressed in SCUBA Team Finding AFI-CLE-02. (p. 65)	H	TEL	OPP-TEL		Continual

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-ERC-01, (MS) Employee Concerns Program	The alternate path for raising concerns at NFS-Erwin needs to be enhanced. The SCUBA Team recommends establishing a more visible, independent, proactive and effective alternative path for raising potential NSC/SCWE issues or concerns. (p. 69)	In this regard, the SCUBA Team recommends developing and implementing an Employee Concerns Program (ECP), such as those deployed in the commercial nuclear power plant industry, with a dedicated ECP Representative reporting directly to the NFS Chief Nuclear Safety Officer. This reporting chain provides an alternate path that is completely outside line management, thereby establishing its independence. (p. 69) (Includes Security SEC-05)	H	JWN	OPP-JWN MET-P	Employee concerns program (ECP)	SD-2/08 CD-4/1/09
ANA-ERC-01	Deployment of the NFS Safety and Compliance Conscious Work Environment (SCCWE) Policy has not yet fully achieved the desired goal of a completely free reporting environment. In this regard, NFS should develop and implement a program to improve the SCCWE at the NFS-Erwin Site (p. 69)	Develop and implement a communication plan around SCCWE expectations (p. 69)	H	RDW	OPP-RDW MET-P	Draft Complete	SD-2008 CD-7/31/08
		Establish and reinforce SCCWE expectations for management and supervision. Include behavioral expectations in performance evaluations that management and supervision are obligated and expected to: - Encourage and welcome the identification of potential safety issues, regardless of the potential impact of the concerns. - Be responsive to potential safety issues identified by the workforce, including providing feedback on the status of evaluation and resolution of identified issues. (p. 69)	M	BAL	PEP MET-P	Perf. Competancy Metric to be developed	SD-12/31/08 CD-3/31/09
		Provide feedback (e.g., through PIRCS and the ECP) to employees regarding safety-related issues that they have raised. (p. 69) (ECP only)	VH	JWN	OPP-JWN MET-P	Employee concerns program (ECP)	SD-2/08 CD-4/1/09
		Demonstrate that validated safety concerns will be addressed in a timely and effective manner. (p. 69)	L	JWN			SD-9/1/09 CD-5/30/11
		Develop and implement a Differing Professional Opinion process to facilitate the impartial resolution of disagreements on technical matters. (p. 69)	M	JWN			SD-4/1/09 CD-6/30/10
		Work with Union Representatives to resolve shop floor issues that influence the environment for raising safety concerns. (p. 69)	M	GAT			SD-2008 CD-6/30/10

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Revise SCCWE policies (NFS-MGT-04-006 REV 01 and NFS-MGT-05-007 REV 2) to include requirements for contractor compliance and metrics that will be used to track compliance. (p. 69)	VH	JWN	OPP-JWN MET-?		SD-9/1/08 (Est.) CD-12/31/08
		Bring contractors into the environment on an active basis; currently there is no oversight of contractor SCCWE. (p. 69)	VH	JWN	OPP-JWN MET-N		SD-9/1/08 (Est.) CD-12/31/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-1	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-PDM-01	NFS-Erwin should reinforce its "Zero Tolerance" policy for harassment, intimidation, retaliation and discrimination (HIRD) through a more formal and proactive approach. (p. 75)	Establish an independent Employee Concerns Program (ECP) as per SCUBA Team Finding AFI-ERC-01. Adjust SCWE policies and procedures accordingly. This program should investigate HIRD issues. (p. 75)	H	JWN	OPP-JWN MET-P	Employee concerns program (ECP)	SD-2/08 CD-4/1/09
		Establish and reinforce behavioral expectations for supervision and management: - Increase awareness of the potential for negative perceptions of their actions and reactions. - Coordinate with the Employee Concerns Program Manager and the Human Resources Manager when faced with personnel actions that have the potential to create a chilling effect. - Include HIRD-related behavioral expectations in individual performance evaluations. - Incorporate mitigation strategies into major changes as appropriate. (p. 75)	M	DMB	2009 OPP DMB MET-?	2009 PEP Competency and Training	SD-3/31/09 CD-6/30/09
		Develop and implement a Potential Chilling Effect Oversight Process - Perform a periodic review of management actions to verify that they are consistent with the prevention of HIRD. Take corrective actions as appropriate. - Review controversial changes and decisions so as to identify and prevent any systematic perceptions of HIRD. (p. 76)	H	JWN	OPP-JWN MET-?	Part of ODM Process	SD-4/08 CD-11/30/08
		Ensure that the NFS Discipline Policy (revision pending) includes guidance on how to recognize and mitigate potentially chilling events. (p. 76)	M	GAT	MET-N	"Balance of error" system being considered; benchmarking initiated	SD-4/29/08 CD-6/30/09
		Revise NFS-HR-04-001-A, REV 2 to increase the degree of rigor and formality of this procedure: - The document does not address retaliation or intimidation. - It is a general guideline and does not specifically tie its prohibitions to the raising of nuclear safety concerns. - There is no requirement for training identified in	M	DMB	2009 OPP-DMB MET-?	New Metric will be developed	SD-9/30/09 CD-6/30/10

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		the procedure; training on this component is not imbedded in initial/continuing training. - There is no requirement for collecting and trending data to determine whether or not the policy expectations are being met. - Responsibility for ensuring procedure compliance is not clearly defined. - The document does not mention the confidential alternate reporting path available through the company's General Counsel. (p. 76)					

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations
Page 25 of 48

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-ACC-01, (MS) Questioning attitude	Management has not consistently demonstrated and promoted a questioning attitude in that there is an embedded reluctance to raise safety-related concerns that impact production or key organizational objectives (a form of self-censorship). This is, in part, due to the perception that the burden of proof rests with the individual that raises an issue or concern. (p. 79)	Executive leadership needs to clearly communicate and reinforce the desired organizational behavior that all employees, especially management, are expected to demonstrate a questioning attitude. (p. 79)	VH	TEL	Con Ops MET-?		SD-6/30/08 CD-12/31/08
		This requirement should be part of every employee's annual performance objectives and appraisal. (p. 79)	H	BAL	PEP MET-P	New metric being developed	SD-12/31/08 CD-5/31/08
		Apply "Principles for a Strong Nuclear Safety Culture" (INPO Document) (p. G-4)	M	NCK	OPP-NCK-09 MET-N		SD-6/30/09 CD-6/30/10
AFI-ACC-02	Management ownership and accountability for regulatory commitments is lacking in that commitments are not consistently executed in a high quality or timely manner, and documented corrective action effectiveness reviews are rarely performed. (p. 80)	Implement and institutionalize individual management ownership and accountability for regulatory commitments to assure regulatory commitments are fully implemented and effective on a long-term basis. (p. 80)	VH	JWN	OPP-JWN MET-P	Part of Regulatory Formality Improve-ment Plan	SD-5/15/08 CD-Continuous
		These requirements should be implemented through a formal performance management/appraisal process. (p. 80)	H	BAL	PEP MET-?	Quality timeliness of corrective actions	SD-12/31/08 CD-5/31/09
AFI-ACC-03 (MS) Management must model high-accountability behaviors	Management does not consistently model high-accountability behaviors. For example, the newly-created initiative, "Management by Walking Around" only has a 60-70% participation rate after being in force for approximately six months. Management's failure to consistently follow all procedures undercuts organizational and individual accountability (p. 80)	Establish a zero-tolerance environment for management deviation from procedures – including administrative procedures. (p. 80)	H	TEL	Con Ops MET-?		SD-6/30/08 CD-12/31/08
		This should be implemented through a formal performance management/appraisal process. (p. 80)	M	BAL	PEP	Accounta-bility to commit-ments	SD-12/31/08 CD-5/31/09
AFI-ACC-04, (MS) Institutionalize single points of accountability	Single-point accountability is not an institutionalized organizational practice. As a result, lines of accountability can become unclear (accountability by all is accountability by none). (p. 80)	Institutionalize use of single-point accountability for key organizational functions, objectives and initiatives. (p. 80)	VH	TEL		To be discussed with SCUBA	
		Document and enforce these accountabilities through a formal performance management / appraisal process. (p. 80)	H	BAL		To be discussed with SCUBA	

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-ACC-05, (MS) Institutionalize a personnel performance management process	NFS executive leadership has not institutionalized a formal performance management process. Performance agreements are not routinely required of managers, supervisors, or salaried personnel, and formal performance appraisals are not performed. This results in a lack of organizational and individual alignment with, and progress toward, key safety-related improvement initiatives. Furthermore, management does not consistently or regularly interact with employees to reinforce desired behaviors and performance expectations. (p. 80)	Develop a living strategic plan for safety and compliance. This vehicle must establish an organization-wide standard of excellence, to which all personnel are held accountable.	VH	TEL	OPP-TEL	Deployed	Implemented
		Develop and implement a formal performance management system. This system should be utilized to directly tie individual performance objectives to leadership's vision, strategic plan, and objectives. (p. 80)	VH	DMB	OPP-BAL PEP	Deployed	Implemented
		Significantly increase management interaction with employees for the specific purpose of communicating and reinforcing safety and compliance standards and expectations. These interactions should (1) include regular reinforcement of performance objectives established through the performance management system; and (2) incorporate a much greater presence on the shop floor by both line and support group management. (p. 81)	H	RDW	OPP-TEL MET-E	MBWA	Complete

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-CLE-01, (MS) Benchmarking	NFS has developed a frame of reference that is based primarily upon its own experience as opposed to one based upon current nuclear industry standards and best practices. This is largely due to organizational insularity, which appears to have developed as a result of the organization's sense of the uniqueness of its operations. (p. 86)	Industry benchmarking is needed to enhance overall organizational effectiveness and to address the existing organizational frame of reference issue. NFS should establish and implement a strategic, multi-year approach for conducting benchmarking activities at commercial nuclear power plants, other nuclear fuel cycle facilities and chemical industry facilities. A single point of accountability and ownership should be assigned for the success of this strategic benchmarking program. (p. 86)	M	JWN	OPP-JWN MET-P	Corporate Compliance Program	SD-1/2/08 CD-9/15/08
		Scheduling INPO Assist Visits, participating on external industry assessments and engaging external peers as participants in NFS-Erwin internal assessments will further enhance the development of a current, industry-based frame of reference. (p. 86)	M	JWN	OPP-JWN MET-P	Corporate Compliance Program	SD-1/2/08 CD-9/15/08
		Management must adopt and enforce a regulatory standard of excellence where minimum levels of compliance are not considered to be acceptable. (p. 86)	H	TEL	Con Ops MET-?		SD-6/30/08 CD-12/31/08
		Management must create an environment where proactive self-criticism becomes the norm and where management holds itself, as well as the balance of the workforce, accountable for complying with all operational and administrative procedures. (p. 86)	VH	TEL	Con Ops PEP MET-?		SD-6/30/08 CD-12/31/08
AFI-CLE-02, (MS) Drive performance improvement by goal setting and management reviews	NFS-Erwin does not have a formal goal-setting process and an associated systematic review process to drive improvements in organizational performance across the site. The nuclear industry standard is to convene periodic meetings of all functional managers and to conduct a collegial review of performance using second tier performance	Conduct periodic management review meetings. Designate functional managers as the representatives for their organizations to discuss current levels of organizational performance, challenges and solutions, progress on organizational performance improvement initiatives and other activities to close gaps to excellence. (p. 86)	VH	TEL	OPP-TEL MET-?	Continual	Deployed
		Establish challenging goals and progress curves. Develop performance indicators and metrics that are based on industry best practices. (p. 87)	H	DBF / TEL	OPP-TEL MET-P	Continual	Deployed

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	indicators as metrics. The goal of such reviews is to identify and address performance gaps in support of continuous organizational improvement. (p. 86)						
AFI-CLE-03	Leadership skills at NFS-Erwin have been suborned to technical competence and there is no current training program to address this gap. (p. 87)	NFS needs to create and sustain a leadership development program for its supervisors and managers. Both soft skills and management development training are needed in order to improve human performance. The intent of the program should be to align the organization, motivate the leadership team, and achieve the vision of excellence. (p. 87)	M	SLS	OPP-NCK-08,09 MET-P		SD-1/30/08 CD-6/30/10
		The executive leadership team should perform a critical assessment of the current management/supervisor team to ensure there is reinforcing sponsorship for and alignment with NFS's safety culture programs and initiatives. (p. 87)	M	TEL	360°Eval.	With outside expert	SD-10/31/07 CD-04/30/08
ANA-CLE-01	See recommendation	Increased emphasis should be placed on soliciting and acting on ideas and suggestions from the workforce to resolve problems and to continuously improve performance. (p. 87)	L	RDW	OPP-RDW MET-E	MBWA	Complete
		This should be appropriately reflected in the performance evaluation expectations for supervisors and managers. (p. 87)	L	BAL	2009 PEP		SD-12/31/08 CD-3/31/09
OFI-CLE-01	There are aspects of the NFS-Erwin training program that represent opportunities for improvement. The site's performance is considered to be acceptable when compared to industry best standards, but this is a noteworthy candidate for continuous improvement. (This training issue is also reflected in SCUBA Team Findings OFI-SP-	Establish a Curriculum Review Committee and Training Review Council to mirror industry best practices. These forums would provide a collegial review of training requirements and match them with adequate resources on a site-wide basis. Perform industry benchmarking in this area. (p. 87)	L	SLS		Do not plan to change current review process	N/A
		Conduct a comprehensive review of all aspects of formal training (an INPO assist visit could be beneficial in this regard). (p. 87)	L	SLS	SAAL-Training MET-N		SD-6/30/10 CD-6/30/11
		Implement a basic site qualification process to	L	SLS	SAAL-Training		SD-6/30/10 CD-6/30/11

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	01 and AFI-CM-03.) (p. 87)	establish a fundamental level of understanding of all aspects of the work at NFS-Erwin. The curriculum could serve as the foundation for a continuing training program and would facilitate the transfer of information and lessons among work groups. (p. 87)			MET-N		
		Administer instructional methods training to Subject Matter Experts in order to standardize the quality of Toolbox training sessions. (p. 87)	L	SLS	SAAL-Training MET-N		SD-6/30/10 CD-6/30/11
		Develop classroom skills training for "occasional" instructors, to enhance the quality of the product. (p. 87)	L	SLS	SAAL-Training MET-N		SD-6/30/10 CD-6/30/11
		Train managers and selected supervisors in program self-assessment skills, using outside facilitators with demonstrated competence in this area. (p. 88)(Repeat from AFI-SA-01)				Repeat	
		Develop instructors skilled in Configuration Management, dedicated to teaching the details of configuration management to system users and subject matter experts. (p. 88)	L	RPS		Add to Safety Refresher and New Hire Orientation	SD-2008 CD-6/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-OCM-01	NFS Erwin does not have a formal organizational change management program. Changes are not formally reviewed for potential safety or resource implications. Major changes are not consistently or effectively communicated throughout the organization. This safety culture component does not meet regulatory expectations, and is considered to be deficient when compared to industry standards. (p. 91)	Formalize a process to evaluate and manage the safety-related impacts of organizational change. (p. 91) • Assign individual accountability and responsibility for the Organizational Change Management process and the conduct of the associated reviews, including the approval process. (The SCUBA Team recommends that the NFS General Manager have official responsibility for the program with implementation support from the Safety/Regulatory function.) (p. 91) • The process should include development of formal communication plans appropriate to the scope of the change. (p. 92) • Significant changes should be reviewed by the Safety Culture Leadership Team prior to implementation. (p. 92) • Union management should be incorporated into the change management process when appropriate. The process should include the preparation of key stakeholders and sponsors to prevent any potential chilling effects of the proposed change. (p. 92)	H	JWN	OPP-JWN MET-?	Part of ODM Process	SD-4/08 CD-11/30/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-SP-01, (MS) Reinforce "Safety Strong"	There is a need to reinforce workforce understanding of NFS safety policies through enhanced communications and training. Objectives should include ensuring that the workforce (1) understands the underlying concepts associated with NFS safety policies and (2) appreciates how their day-to-day work activities relate to proper application of these underlying concepts. (p. 94)	Systematic use of "daily safety message" discussions at all Site meetings, including daily briefings by supervisors and shift turnovers. Multiple (5 to 10) discussion themes/topics should be developed in advance for each of the 13 principles used in the "Safety Strong" concept, thereby creating a matrix of themes/topics for use (on a rotational basis) in daily safety messages across the Site. (p. 94)	H	RDW	OPP-RDW Internal Comm. Plan	Draft Complete	SD-2007 CD-8/31/08
		Systematic use of periodic (i.e., weekly) General Manager messages focused on individual principles of the "Safety Strong" concept, including providing examples of recent events, decisions, etc. that demonstrate and reinforce the proper application of NFS standards and expectations with respect to "Safety Strong," as a means to reinforce the importance of safety. (p. 94)	H	RDW	OPP-RDW Internal Comm. Plan	Draft Complete	SD-2007 CD-8/31/08
		Incorporation of specific training on the thirteen principles of "Safety Strong" and on the SCCWE that is designed to bring these concepts alive to the NFS-Erwin workforce. As a minimum, such training should be included in the GET curriculum and in the annual GET refresher training curriculum. (p. 94)	H	SLS	SAAL-Training MET-N		SD-2008 CD-6/30/09
		Timely communication on the bases/reasons for key decisions that could potentially be interpreted by the workforce as compromising nuclear safety as top priority, as a means of demonstrating that organizational decisions and actions are consistent with safety policies. (p. 95)	H	JWN	OPP-JWN MET-?	Part of ODM Process	SD-4/08 CD-11/30/08
OFI-SP-01	At the present time, knowledge and understanding of the NFS-Erwin licensing bases (including the Integrated Safety Analysis) and how they are reflected in operational procedures, safety limits, etc. resides primarily with	Spreading such knowledge and understanding across the NFS-Erwin organization through training would serve to strengthen the organization's overall Safety Culture. (p. 95)	L	SLS	SAAL-Training MET-?		SD-6/30/10 CD-6/30/11

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	personnel in the NFS-Erwin Safety and Regulatory organization. (p. 95)						
ANA-LOC-01	The workforce survey identified a number of organizations which were outliers from either a Nuclear Safety Culture (NCS) or Safety Conscious Working Environment (SCWE) perspective, indicating a potential need for management to take action in either the near-term or immediate future. These prompted the need for the SCUBA Team to conduct personnel interviews to identify the underlying issues which led to the low survey ratings. (p. 104)	BLEU Complex Operations (NFS Only): NFS and AREVA Management should meet and develop solutions to the communication problems that currently exist between AREVA management and the NFS employees at the BLEU Complex. Details are provided in the Confidential BLEU Complex Outlier Organization Report. (p. 104)	H	JWN	OPP-JWN MET-N		SD-7/1/08 (Est.) CD-9/26/08
		Analytical Services: Near term management intervention is required to resolve work-related and strike-related environmental issues in the Analytical Services organization. Details are provided in the Confidential Analytical Services Outlier Organization Report. (p. 104)	H	JWN	OPP-JWN MET-N		SD-7/1/08 (Est.) CD-9/26/08
		Health Physics Monitoring & Nuclear Measurements: The current radiation protection program, and the associated ALARA principles, needs to be explained to the senior Radiation Technicians (RT); the RTs should explain the program to the balance of the workforce. RTs should also take part in work planning and pre-job briefs. Details are provided in the Confidential Health Physics Monitoring & Nuclear Measurements Outlier Organization Report. (p. 104)	H	JWN	OPP-JWN MET-N		SD-7/1/08 (Est.) CD-9/26/08
		Transportation & Waste Management: An overtime policy needs to be developed that ensures worker hours are reasonable. The material condition of the Waste Water facility needs to be improved and workarounds corrected. Details are provided in the Confidential Transportation & Waste Management Outlier Organization Report. (p. 104)	H	JWN	OPP-JWN MET-N		SD-7/1/08 (Est.) CD-9/26/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

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GOV-01-55-04
ACF-08-0127

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-NOV-01 (See Results Report Attachment A)	As demonstrated by the responses to these three specific NOVs, the use of root cause analysis by NFS does not meet commercial nuclear power plant industry best practices. Investigations tend to focus on the compliance failure itself and describe that failure as the cause. There is insufficient pursuit of the "whys" that would enhance understanding of the underlying human performance or systemic process failures that contributed to the event. Accordingly, there is a tendency to produce corrective actions that have limited potential to address the underlying causes or to effectively change behaviors. There is also a tendency to produce corrective actions that lack a rigorous accountability trail (owner, due date, metrics, etc). (This problem identification and resolution issue is also reflected in SCUBA Team Finding AFI-CAP-03.) (p. A-1)	Benchmark the commercial nuclear power plant industry's use of root cause analysis, particularly for events involving human performance. (p. A-1)	L	NCK	OPP-NCK-10 MET-?		SD-1/1/10 CD-6/30/11
		Improve the quality of root cause analysis to ensure identification of underlying systemic conditions that create the opportunity for failure, particularly for events involving human performance. (p. A-1)	M	NCK	OPP-NCK-09 MET-?		SD-6/30/09 CD-6/30/10
		Ensure that robust, high-accountability corrective actions are developed and implemented for events leading to regulatory compliance issues. (p. A-1)	M	BMM		Need additional information from SCUBA Team	To be discussed with SCUBA Team

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-RCC-01 (See Results Report Attachment B)	The NFS-Erwin standards for closure of regulatory commitments do not meet commercial nuclear power plant industry best practices. Closure should only be signed off when work is actually completed. Oversight and approval of commitment closure is somewhat subjective, relying on individual judgment and is not subjected to review and approval by a committee or by senior management. The current commitment management process does not require an evaluation of the effectiveness of corrective actions that have been taken to meet commitments. The current process also lacks a regular, systematic, independent third party (i.e., Quality Assurance) review. (This commitment tracking issue is also reflected in SCUBA Team Finding AFI-CAP-02.) (p. B-1)	Revise commitment closure guidelines to include a prohibition against closing commitments to a scheduled event or task; that is, the work required to meet the intent of the commitment must be completed. (p. B-1)	M	RPD	MET-N	Guidelines for commitment closure will be described in the tracking program and/or procedure.	SD-09/30/08 CD-06/30/09
		Develop a process to evaluate commitment closure that verifies completion and adequacy. This process should specify a committee or panel review prior to closure. (p. B-2)	M	RPD	MET-?	Process will be developed to evaluate commitment closure.	SD-09/30/08 CD-06/30/09
		Engage senior management in the closure approval process. (p. B-2)	M	RPD	MET-N	Senior management will approve the closure process that is developed.	SD-09/30/08 CD-06/30/09
		Revise commitment closure guidelines to include an effectiveness review, unless clearly not warranted. (p. B-2)	M	RPD	MET-N	Commitment closure process and effectiveness reviews will be developed in the tracking program and/or procedure.	SD-09/30/08 CD-06/30/09
		Establish periodic quality reviews of commitment closure process by an independent review source (i.e., Quality Assurance). (p. B-2)	M	RPD	MET-?	Independent reviews of the commitment closure process will be established.	SD-09/30/08 CD-06/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
AFI-CM-01 (See Results Report Attachment C)	Currently there are inadequate resources assigned to ensure that CM Program improvements will be completed in accordance with the schedules specified in regulatory commitments. Initial short-term commitments have been extended in time, but the long-range goal of complete conversion of all affected systems by the end of 2010 is in jeopardy. Staffing levels need to be substantially augmented beyond the two individuals currently assigned. (This staffing issue is also reflected in SCUBA Team Finding AFI-RES-04.) (p. C-2)	Establish ownership of the CM Program as a major project. Currently, it is not well defined. The Oversight Committee meets weekly; the Steering Committee meets sporadically. Place clear responsibility and accountability with one individual, possibly the CM Steering Committee Leader. Use milestone accomplishment dates as the basis for resource requests. The individuals assigned to complete this effort should be dedicated to the task, or at least assigned minimal responsibilities elsewhere. (p. C-2)	H	RPS	MET-N	Change Control Board to be established	SD-5/12/08 CD-8/29/08
		Additional resources must be allocated and/or a revised time-line calculated to ensure that regulatory commitments can realistically be met. The CM database needs to be populated with information from the U-A1 bowl wash procedure and U-Metal process. Meeting these NRC commitments, originally scheduled for the second and third calendar quarters of 2007, respectively, will be a challenge. Based on estimates provided by NFS personnel, 26.3 man-years of effort will be required to complete all tasks associated with CM conversion. There four additional personnel currently requested to support this project will not be sufficient to complete the work in the remaining three years allotted. The alternative is to request NRC concurrence to adjust the project schedule on the basis of risk and consequence. (p. C-2)	H	RPS	MET-N	Per submitted schedule, Will provide resource loaded schedule as data becomes available	SD-9/30/08 CD-6/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Critically monitor the "cross-walk" technique for integrating existing procedures and processes into the framework of draft NFS-GH-901. Specifically, the Engineering Change Request and Engineering Change Notice processes need to be aligned shortly after the draft version is approved. The present April 2008 due date presents a challenge to full incorporation of the BPF Facility by the end of 2008. Currently, there are administrative disconnects that need to be closed although many of the subordinate procedures have been reviewed and aligned with the new CM process. (p. C-2)	H	RPS	MET-N	Enterprise change request process starts 05/12/08	SD-2008 CD-11/15/08
		Assign responsibility for evaluating and maintaining the design margin, as represented in the design documents and as-built conditions. The CM Manager has acknowledged this requirement as a primary function of the CM effort. NFS must establish a plan of action for each of the affected systems, structures, and components selected for inclusion in the database. (p. C-2)	M	RPS	Not in current plan	Benefit cost study needed	To be discussed with SCUBA Team
		Designate CM Coordinators within each department or organizational group that has a major role in the process. These individuals should assist and be held accountable for constancy of purpose and should mitigate the natural tendency to alter the program to fit individual preferences. (p. C-3)	H	RPS	MET-N	Dependent on release of CM specialists	SD-6/30/08 CD-6/30/09
		Revise the draft NFS-GH-901 to ensure that suggested practices are mandated. For example, a safety review should be required whenever a modification change is submitted. Currently, the verbiage states, "safety review, when applicable." Such checks should not be optional. (p. C-3)	H	RPS	MET-N		SD-6/30/08 CD10/15/08
AFI-CM-02	NFS has not formalized the process for reviewing the progress of the conversion to a centralized CM database nor is a timeline for proactive oversight included in the	Modify the PIRCS database to allow designation of discrepancies that can be attributed to configuration management issues. This change will allow for better trending and lessons learned processes. (p. C-3) (Repeat from ANA-CAP-01)				Repeat	

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	project plan. Such reviews must be conducted in a timely manner in order to protect the design margin from errors being introduced as well as to reduce the potential for costly rework. (This staffing issue is also reflected in SCUBA Team Finding AFI-RES-04.) (p. C-3)	Accelerate the timetable for the next biennial audit of the CM Program to occur in the first calendar quarter after NFS-GH-901 is approved and the first pilot procedure and prototype process are entered into the LINC software. This will provide an early opportunity to identify strengths and weaknesses before significant additional effort is expended. (p. C-3)	M	MWS	2008 Quality Assurance Audit Schedule	2 audits scheduled	SD-4/28/08 CD-10/31/08
		Conduct a self-assessment of the CM Program. (p. C-3)	H	RPS		Ongoing	Complete
		The LINC software provides the capability for tracking outstanding Letters of Authorization (LOA), which temporarily authorize procedure modifications. The site should take the opportunity to establish criteria for maintaining these temporary changes and use the new tracking tool to reduce the population. (p. C-3)	H	RPS	OPP-CEA	May BPI project	SD-5/1/08 CD-8/15/08
		Correct the behaviors that led to a QA audit finding that biennial walkdowns to verify the accuracy of Process and Instrumentation Drawings (P&ID) were completed late. This problem with schedule compliance should be corrected to ensure that the entry of each system in the LINC database is checked in order to ensure a match between design documentation and the as-built condition. (p. C-3)	H	CEA	OPP-CEA MET-?		SD-3/31/08 CD-12/31/08

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Audit the LOA process. The tracking system should be computerized to improve the record keeping for these temporary documents that can have significant impact on system operation and design. Currently, the master LOA logbook is maintained by the Quality Control Department in accordance with NFS-RM-008. Each organization generates LOAs, categorized by Sales Number, using a hand-written index. Although the standard lifetime of an LOA is 90 days, that expectation is not enforced. Other LOAs appear never to have been issued and some are still assigned to individuals who are no longer employed at NFS-Erwin. (p. C-3)	M	MWS	2008 Quality Assurance Audit Schedule	Audit # QA-08-03 Includes audit of LOA process	SD-3/5/08 CD-4/22/08
AFI-CM-03	Although all employees have received introductory training on the CM process, it is necessary to conduct additional training in order to saturate the site with the requisite level of knowledge to make configuration management an integral part of the daily routine. Specialized skills need to be taught to a significant part of the workforce in an aggressive manner during the coming year. (This training issue is also reflected in SCUBA Team Finding OFI-CLE-01.) (p. C-4)	All employees must be trained on those specifics of the CM Program needed to do their job. General employee training was completed in November 2007 but it will be necessary to follow up with specialty training for individual groups, tailored to meet their particular needs. In this regard, the CM Manager has acknowledged the need to develop roles and responsibilities and then designate subject matter experts; this has not been completed to date. (p. C-4)	M	RPS	MET-N	Ongoing	Complete
		Increase the population of individuals qualified to review safety scenarios during the configuration change process per NFS-GH-55. The site currently has one person qualified to perform the "What If' analysis and none qualified to perform the "Hazop" analysis.	H	JKW	MET-N	Ongoing	SD-6/30/08 CD-6/30/09
		Additionally, there is not a requirement to include operators in the ISA analysis process as OSHA suggests. Their inclusion would improve the product and better align NFS-Erwin with practices across the nuclear and chemical industry. (p. C-4)	H	JKW	MET-N		SD-12/31/08 CD-6/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
IP-1 (See Results Report Attachment E)	In August 2007, the SCUBA Team became aware of an imminent NFS reorganization that was primarily related to the creation of the General Manager (GM) position and the associated realignment of the reporting relationship for certain NFS-Erwin organizations and organizational functions. By this point in time, the SCUBA Team had concluded that it would be recommending that NFS: (p. E-1)	Adopt an approach to Nuclear Oversight that included both "compliance-based" and "performance-based" oversight and assessment activities. (p. E-1) ***Repeat – See AFI-SA-01***				Repeat	N/A
		Create a new senior management position to serve as the leader of the Nuclear Oversight function with that position/function reporting directly to the NFS Chief Executive Officer (CEO). (p. E-1) ***Complete – New position has been filled***		DBF			Complete
IP-2	In August 2007, the SCUBA Team became aware of the lack of an NFS policy on Fitness for Duty (FFD) fatigue considerations. (p. E-1)	Development of an overtime policy that appropriately addressed FFD fatigue considerations. (p. E-1) ***Repeat – See ANA-RES-01***				Repeat	N/A
IP-3	In August 2007, the SCUBA Team developed concerns regarding project management and control over the new Reliable Fuel Supply (RFS) project and found that those concerns were shared by a spectrum of NFS-Erwin staff. (p. E-1)	The individual assigned overall project management responsibility for the RFS project be relieved of other concurrent responsibilities. (p. E-1) ***RFS Project is complete***		TEL			Complete
IP-4	In September 2007, NFS management informed the SCUBA Team that they were reopening consideration of the 2008 budget and requested SCUBA Team input on any likely SCUBA Team recommendations that would have potential resource-related implications. The SCUBA Team responded to that request in telephone conversations and in a	Establishment of an Employee Concerns Program. (p. E-1) ***Repeat – See AFI-ERC-01***				Repeat	N/A
		Augmentation of resources supporting the implementation of the NFS-Erwin Corrective Action Program. (p. E-1) ***Repeat – See AFI-RES-04***				Repeat	N/A
		Augmentation of resources supporting the implementation of the NFS-Erwin Industrial/Personnel Safety Program. (p. E-2) ***Repeat – See AFI-RES-04***				Repeat	N/A

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
	meeting with the NFS GM. The recommendations discussed included the following: (p. E-1)	Augmentation of resources to implement the "compliance-based" Quality Assurance organization and addition of resources to implement a "performance-based" Nuclear Oversight function. (p. E-2) ***Repeat – See AFI-RES-04***				Repeat	N/A
		Augmentation of engineering resources to ensure increased availability of process and project engineers. (p. E-2) ***Repeat – See AFI-RES-04***				Repeat	N/A
		Hiring a qualified leader for the NFS Human Performance Program. (p. E-2) ***Complete – See AFI-WP-01***		TEL			Complete
		Allocation of resources necessary for the implementation of a supervisor/manager leadership training program. (p. E-2) ***Repeat – See AFI-RES-04***				Repeat	N/A
		Evaluation of the adequacy of current Health Physics staffing in light of attrition. (p. E-2) ***Moved to AFI-RES-04***				AFI-RES-04	N/A
		Evaluation of the adequacy of operations staffing in light of then-current high levels of overtime. (p. E-2) ***Moved to AFI-RES-04***				AFI-RES-04	N/A
		Evaluation of augmenting engineering resources, including but not limited to providing support for resolution of HVAC issues. (p. E-2) ***Repeat – See AFI-RES-03 (Added "HVAC Issue")***				Repeat	N/A
		Increase the focus of recruiting activities to fill currently open positions. (p. E-2) ***Open positions have been filled***		DMB			Complete
		Conduct an inventory of currently exiting operator burdens/work-arounds and other degraded conditions, and dedicate resources to aggressively work them off. (p. E-2) ***Repeat – See OFI-WC-01***				Repeat	N/A

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
		Evaluate the readiness (personnel and material) of the NFS Fire Brigade. (p. E-2) ***Repeat – See OFI-RES-01***				Repeat	N/A
		Evaluate working conditions at the NFS firing range. (p. E-2) ***Repeat – See SEC-03***				Repeat	N/A
		Assign ownership and accountability to a single person for design and coordination of the implementation of an NFS Operating Experience Program. (p. E-2) ***Repeat – See AFI-OE-01***				Repeat	N/A
		Evaluate and address the reasons underlying high levels of attrition in Security. (p. E-2) ***Moved to SEC-12***				SEC-12	N/A
		Evaluate changing the Maintenance organization's reporting relationship from Engineering to Operations. (p. E-2) ***Repeat – See OFI-RES-02***				Repeat	N/A

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
OFI-REF-01 (See Results Report Attachment G)		The SCUBA Team recommends that NFS-Erwin consider the following sources of information as helpful reference material that will assist the Site as the leadership team addresses the Findings offered in the SCUBA Team's Independent Safety Culture Assessment. (p. G-1)	VH	JWN	MET-N		SD-7/1/08 (Est.) CD-7/15/08
OFI-REF-02 (See Results Report Attachment G)	See AFI-DEC-01-003	A benchmarking trip to a nuclear utility, recommended as exemplary by INPO, is recommended after the operational decision-making tool has been put in place at NFS-Erwin. (p. G-1)	M	JWN	MET-N		SD-3/1/08 (Plan) CD-7/15/09
OFI-REF-03 (See Results Report Attachment G)	See AFI-CAP-03	It is recommended that NFS-Erwin refresh the quality of its team leaders by conducting initial and refresher training for potential analysts, using the services of one of the companies that provide such training to nuclear utilities. (p. G-2)	M	RAC	OPP-NCK-08,09 MET-N	One class completed	SD-1/1/08 CD-6/30/10

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
SEC-01, Resources	See Classified Supplement to Results Report ("Special Topic Area: Nuclear Material Security")	Allocate sufficient dedicated security resources in a timely manner (i.e., Replace CAS, SAS, Radio System)	M	MSW	Capital Budget Plan. No metrics at this time	Capital Funding expected by 2011. Impending NRC Order could impact.	CD-2011
		Replace Off-Site Secuirity Training Facility	M	MSW			SD-2008 CD-12/31/10
SEC-02, Weapons		Be prepared to immediately implement automatic weapons and use of deadly force policies when authorized	M	MSW	OPP-MSW Metrics not planned.		
SEC-03, SAS and Offsite Safety		Evaluate and correct potential OSHA violations in SAS and Off-site facility	VH	JHP		Complete Installation of VESDA Fire Detec. System	SD-3/25/08 CD-8/31/08
						Conduct Comp. Ind. Safety insp. of Off-Site Security Fac.	SD-5/30/08 CD-6/30/08
SEC-04, Policy Changes		Continue recent guard force hiring and assignment policy changes	H	MSW	MG weekly status report. Metrics already establishe d		Now-4th qtr 2008 CD-12/08
SEC-05, ECP for Security		Establish an Employee Concerns Program for Security, including guard force (Included in AFI-ERC-01)				AFI-ERC-01	N/A
SEC-06, Inattentiveness		Closely monitor potential guard force inattentiveness	H	MSW	NFS-SEC-P-02 (security officer attentive-ness policy)		CD-1/1/08 Complete
SEC-07, Professional Development		Establish professional development program for Security	M	MSW	OPP-MSW/KD W		SD-2008 CD-12/31/08 CD-Continuous
		Establish professional development program for MC&A	M	CLB	Being esta-blished		SD-9/30/08 CD-6/30/09

Crosswalk for Comprehensive Improvement Initiative
2007 Independent Safety Culture Report Findings/Recommendations

Tracking Number / Name-[1]	Finding	Recommendation	Priority	Responsible Manager	Action Plan	Comments	Status
SEC-08, Event Reporting		Continue security event reporting enhancements	M	MSW	OPP-MSW Metrics already established		SD-2008 CD-9/30/08 Continuous
SEC-09, Security CAP		Continue inclusion of security in the Corrective Action Program	M	MSW	OPP-MWS Metrics unplanned		SD-2008 CD-9/30/08 CD-Continous
SEC-10, MC&A Succession		Develop and implement succession plan for MC&A Department	H	CLB	Matrix developed		SD-2008 CD-12/31/08
SEC-11, MC&A Team Working		Improve communications and team work between MC&A and other departments	H	CLB	Reviewed comment		SD-4/30/08 CD-6/30/09
SEC-12 (IP-4)		Evaluate and address the reasons underlying high levels of attrition in Security. (p. E-2)	H	MSW	MG Weekly Status Report. Metrics established		SD-2008 CD-12/31/08
		NFS needs to evaluate its policy on guards that repeatedly experience difficulty during firearms training as the transistion to an all armed guardhouse is implemented	H	MSW	Training policy SEC-TRN-07-N015 Metrics already in place.	Complete	CD-4/07

Crosswalk Legend

Tracking Number

AFI	Area for Improvement
ANA	Area in Need of Attention
OFI	Opportunity for Improvement
DEC	Decision Making
RES	Resources
WC	Work Control
WP	Work Practices
CAP	Corrective Action Program
OE	Operating Experience
SA	Self and Independent Assessments
ERC	Environment for Raising Concerns
PDM	Preventing, Detecting and Mitigating Perceptions of Retaliation
ACC	Accountability
CLE	Continuous Learning Environment
OCM	Organizational Change Management
SP	Safety Policies
LOC	Based on Workforce Survey Results
NOV	Notice of Violation
CM	Configuration Management
IP	In-Process
REF	References
SEC	Security and MC&A
MS	Most Significant Findings (per SCUBA team)

Finding

SCUBA Results Report page number and NFS PIRCS Problem Number are included.

Recommendation

SCUBA Results Report page number and NFS PIRCS Corrective Action number are included.

Crosswalk Legend

NFS Priority

The NFS Comprehensive Safety Culture Improvement Initiative includes assigned priorities to the NFS actions in response to the SCUBA recommendations. The NFS actions are to be considered, planned, initiated and completed in accordance with the following criteria.

-VERY HIGH (**VH**) – successful action may have a significant impact on improved Configuration Management and/or Procedural Compliance Programs. Also, the action may be a needed precursor or facilitator to other VH or H actions. Actions, to which NFS has assigned a VH priority, are to be initiated by June 30, if not already underway, and are to have a targeted completion or implementation in 2008, if practical.

-HIGH (**H**) - successful action may have some impact on improved Configuration Management and/or Procedural Compliance or significant impact in improvement in another Safety Culture component at NFS. Actions, to which NFS has assigned an H priority, are to be initiated within 6 months with a targeted completion or implementation by mid-2009.

-MODERATE (**M**) – successful action have little impact on improved Configuration Management and/or Procedural Compliance but may have some impact on improvements in the other Safety Culture components at NFS. Actions, to which NFS has assigned an M priority, are to have the planning completed by mid-2009; initiated in 2009; and, completed or implemented by mid-2010.

-LOW (**L**) – Has either a lesser impact in improving Safety Culture components at NFS or might require resources that are better utilized on other safety culture improvement actions. Actions, to which NFS has assigned an L priority, are to be considered in 2009; initiated (if appropriate) in 2010, and completed or implemented (if pursued) by the Spring 2011.

Crosswalk Legend

Responsible Managers

Initials/Name	Title
BALanders	Director Compensation & Benefits
BMMoore	VP Safety & Regulatory
CEAthon	VP Applied Technology
CLBrown	Materials Manager
CRLowe	Information Services Director
DBFerguson	President & CEO
DMBuck	VP Human Resources
FCKerns	Plant Superintendent Manager
GATipton	Director Labor Relations
JHParker	Industrial Safety Manager
JKWheeler	Licensing and ISA Manager
JWNagy	VP & Chief Nuclear Safety Officer
JWPugh	Director Operations Support
KBSchutt	Director Business Process Improvement
MADotson	Construction & Maintenance Service Manager
MCTester	Radiation Control Senior Manager
MSWarren	Corporate Security Director
MWShope	Quality Assurance Manager
NCKenner	Director Human Performance & Learning
RABond	Senior Project Director
RACrowe	CAP Manager
RDWise	VP Fuel Production
RPDroke	Licensing & Compliance Director
RPStorey	Configuration Management Manager
RVBishop	Employment Programs Manager
SLSanders	Training Manager
TELindstrom	General Manager

Crosswalk Legend

Action Plan

OPP	One Page Plan (followed by initials of Plan Owner)
ODM	Organizational Readiness Review
ORR	Operational Readiness Review
MET-?	Metrics undetermined; will be considered during monthly review
MET-E	Metrics established
MET-P	Metrics planned
MET-N	Metrics not planned
SP	Strategic Plan (followed by department and year)
SAAL	Self-Assessment Action List

Comments

BPI	Business Process Improvement
Con Ops	Conduct of Operations document
MBWA	Management By Walking Around
PEP	Performance Evaluation Program
RFS	Reliable Fuel Supply

Status

SD	Start Date
RSD	Revised Start Date
CD	Completion or Implementation Date
RCD	Revised Completion or Implementation Date
OS	On Schedule
BS	Behind Schedule
N/A	Not Applicable