ESD96269

Nebraska Public Power District

Cooper Nuclear Station

ENGINEERING

SELF ASSESSMENT

FOLLOW-UP

October 1996

ENGINEERING SELF ASSESSMENT FOLLOW-UP

1.0 INTRODUCTION

1.1 BACKGROUND

The Nebraska Public Power District Nuclear Power Group embarked on a three phase performance improvement plan in November 1994. Phase 1, completed February of 1995, involved activities necessary to restart Cooper Nuclear Station following a nine month shutdown under a Confirmatory Action Letter. Phase 2, completed June of 1995, included a complete reorganization of the Engineering Division and relocation of the corporate Nuclear Engineering Department to the site. Phase 3 is the long term performance improvement plan, scheduled for completion in 1997.

The "Engineering Division Reorganization Phase 3 Transition Plan" (Transition Plan), was developed as a part of the Phase 3 Performance Improvement Plan. Part A of the Transition Plan provided the focus for the Engineering Division from July 1, 1995 through February 28, 1996. The final activity in Part A of the Transition Plan directs the performance of an Engineering Self Assessment in February 1996.

The Engineering Self Assessment identified eight areas in which significant improvement in Engineering performance is needed, five causal factors that have been major contributors to less than desired performance, and three areas where improvements would enhance Engineering effectiveness.

The five (5) underlying causes of less than desired performance are:

- The Engineering management team has not clearly defined, communicated and reinforced roles, responsibilities and interfaces for engineers, supervisors and managers.
- The Engineering management team has not established clear expectations for supervisors and staff and is not holding them accountable for performance.
- The Engineering management team has not established effective lines of communication within Engineering and with external customers and support organizations.
- The Engineering managers and supervisors are not effectively prioritizing work, leading to ineffective use of resources and important tasks not being performed.
- The Engineering management team has not established effective integrated planning and scheduling of Engineering work.

The eight areas where Engineering performance is in need of significant improvement are:

- System Engineers are not performing the most important functions that must be the focus of their job responsibilities, including system problem identification and resolution, performance monitoring and trending, becoming the primary source of system knowledge, and providing oversight of system maintenance and surveillance testing.

- Engineering performance on operability assessments and safety evaluations needs improvement.
- Engineering performance in plant design and configuration control is inconsistent and in need of significant improvement.
- Plant design basis information is not readily accessible, design and licensing basis knowledge is limited and is not well integrated into plant processes.
- Engineers and supervisors (particularly in Plant Engineering) are expending significant time and resources on low value work activities.
- Many engineering programs are in need of significant attention to establish clear ownership, expectations, plans and performance monitoring.
- Management and supervision have not reinforced the need for attention to detail and greater consistency in the area of procedural compliance.
- The transition of findings and observations from the Diagnostic Self Assessment Team (SAT) and NRC Special Evaluation Team (SET) Reports to long term performance improvement plans is incomplete.

The three areas where improvements would facilitate and enhance Engineering effectiveness are:

- Many Engineering processes are unnecessarily cumbersome and time consuming.
- Training and qualification need to be enhanced in several specific areas, including: use of site and Engineering processes (how we do business), integrated and specific system knowledge (particularly for System Engineers), the number of qualified Reactor Engineers and the overall level of engineering certifications (system experts, SROs, SRO certification, STE qualification).
- Tools, resources and support in such areas as document availability and retrieval, databases, and design basis information need to be improved for more efficient use of engineer's time.

Focus groups were initiated to develop corrective actions for these findings. The products from these focus groups formed the basis for sixteen of the Engineering Action Plans.

1.2 OBJECTIVE

A follow-up to the Engineering Self Assessment was conducted to evaluate the effectiveness of the corrective actions that were implemented. The follow-up evaluated corrective actions for the 16 areas previously cited. The Engineering Action Plan owners, various engineers, engineering supervisors, and engineering customers were interviewed. Selected documents and performance indicators were also reviewed. In addition, plant walkdowns were performed of the Diesel and HPCI systems to provide assurance that the material condition of the plant had not degraded since the

walkdowns during the Engineering Self Assessment. The results of the follow-up will be used to adjust the Engineering Actions Plans, if necessary, to provide additional corrective actions or to refocus planned corrective actions.

1.3 ASSESSMENT

With respect to the objectives of the Engineering Self Assessment, the Follow-up Assessment Team has concluded that:

- Although some initial progress was made in improving engineering effectiveness immediately after the Engineering Self Assessment, very little progress was made for the past several months. Engineering management recognized this issue and delegated the responsibility for corrective action plans to designated plant engineers. However, there is a concern in the Engineering organization regarding the commitment of management, the availability of resources and the authority of the plan owners to implement these plans effectively. Engineering management must aggressively support and focus attention on implementation of these plans.

- The Engineering workload appears to exceed available resources. While some steps have been taken to prioritize work and better manage resources, Engineering Management has not been able to fully review integrated schedules and obtain additional temporary resources during the interval when improvements and corrective actions are scheduled for implementation.

- Improvements in communicating engineering roles, responsibilities and expectations have been made within the engineering organization. However, engineering customers did not directly provide input to these roles, responsibilities and expectations. Furthermore, the new roles, responsibilities and expectations for engineering have not been effectively communicated to other site organizations. The Engineering Action Plans for roles, responsibilities and expectations should be revised to obtain customer input. The roles, responsibilities and expectations should then be communicated throughout the site.

- Vertical communication within the engineering organization has improved, but horizontal communication between peers and between engineering and its customers still needs improvement. Feedback to customers on the status of engineering activities is weak. The managers and supervisors do not spend enough time coaching and providing guidance to subordinates. Management needs to devote more time to one-on-one and group meetings in which they set and reinforce expectations through coaching and leadership.

- System Engineering performance still does not meet expectations. The System Engineering Improvement Plan is still in draft form and has not been implemented. Although more time is spent in the field now than before the Engineering Self Assessment, the volume of emergent work is preventing the System Engineers from performing their primary responsibilities. Some groups within System Engineering have made an effort to improve, but other groups have made no substantial progress. Engineering Management has recently taken actions to improve System

Engineering performance. These actions are too recent to assess their effectiveness. Some information from the follow-up assessments suggests that morale in parts of engineering, and particularly in System Engineering, is still low.

- Procedure compliance and attention to detail continue to be a problem at CNS. This is not specifically an Engineering problem, however engineering management must continue to address this concern through reinforcement of expectations, coaching, and use of appropriate positive and negative consequences.

- The comprehensive actions planned for improving configuration management are a strength. The plan has support throughout site management. Training issues associated with implementation of the plan are also addressed. While significant progress has been made in this area, further improvements are dependent upon the availability of resources to implement the plan.

Although The Engineering Self Assessment was effective and thorough in the identification of performance problems and configuration management has take some important steps, Engineering has not been effective in resolving the problems identified here in. Continued management attention will be required to assure that the new Engineering Action Plans are effectively implemented.

2.0 METHODOLOGY

2.1 APPROACH

The Follow-up Team consisted of one senior staff engineer and three consultants. Interviews were conducted with the engineering action plan owners, a group of engineers, a group of engineering supervisors, a group of engineering customers and selected documents and performance indicators were reviewed as well.

The status of the action plans was discussed with each action plan owner. Owners were asked to describe the effectiveness of the corrective actions taken to date, their plans for any additional corrective actions, and their plans for developing performance indicators to monitor the effectiveness of the corrective actions.

In addition the Diesel Generator and HPCI systems were walked down to verify that the housekeeping issues that were identified and corrected during the Engineering Self Assessment had not reoccurred.

The follow-up focused on evaluating plan actions and other corrective actions for the eight areas in which significant improvement in Engineering performance was needed, the five causal factors that have been major contributors to less than desired performance, and the three areas where improvements would enhance Engineering effectiveness.

The assessment of individual areas are documented in Sections 3 and 4 of this report. The team discussed the results and identified the major findings that are summarized in Section 1.

2.3 TEAM COMPOSITION

The Engineering Self Assessment Follow-up Team consisted of:

A summary of the experience of the team members is included in Appendix A.

2.4 HANDLING OF ISSUES

At any time during the assessment, a Team Member could have identified an issue that appeared to be an item of noncompliance, an operability concern, a safety concern, a procedural violation or any other condition adverse to quality. These issues were promptly identified to the Assessment Team Leader and a Problem Identification Report was initiated for appropriate action in accordance with the Corrective Action Program.

The Self Assessment Follow-up resulted in 2 Problem Identification Reports being generated. Neither of the conditions identified affected plant operability.

2.5 BACKUP DOCUMENTATION

The Assessment Follow-up Team also maintained field notes documenting interview results, document reviews and system walkdowns. Copies of the field notes are available for review.

3.0 ASSESSMENT

3.1 ROLES AND RESPONSIBILITIES

3.1.1 Self-Assessment Issue Addressed:

The Engineering management team has not clearly defined, communicated and reinforced roles, responsibilities and interfaces for engineers, supervisors and managers. (Engineering Self Assessment, Finding 1)

3.1.2 Plan Objective(s):

With respect to "Cooper Nuclear Station (CNS) Station Engineering Division: Roles, Responsibilities and Relationships,"

- Provide wider distribution and communication of it,
- Make it a living document using input from all affected parties,

- Incorporate a responsible party index in it,
- Reinforce its applicability, and
- Ensure the adequacy and viability of this plan.

3.1.3 Completed Plan Actions:

Incorporation of a responsible party index

3.1.4 Incomplete Plan Actions:

- Distribution and periodic review of the "Cooper Nuclear Station (CNS) Station Engineering Division: Roles, Responsibilities and Relationships"
- Obtaining (on an ongoing basis) feedback on "Cooper Nuclear Station (CNS) Station Engineering Division: Roles, Responsibilities and Relationships"
- Obtaining signatures from groups in their respective areas of responsibility

3.1.5 Other Actions Taken:

Initial development, distribution, and periodic discussion (almost daily during period immediately following distribution).

3.1.6 Assessment:

Initial development and distribution of roles and responsibilities - This step has been **effective within Engineering groups** in improving understanding. Communication has been **ineffective outside of Engineering or among Engineering groups** in establishing a clear understanding, particularly among Engineering customers, of roles and responsibilities. Furthermore, Engineering customers were not asked for input to the roles and responsibilities. Additional steps are needed. Operators interviewed did use the list of assigned system engineers to seek help; however, they did not have knowledge, for example, of responsible engineering and technical program owners. In addition, communication outside of Engineering may reveal any gaps that might exist among departments.

Initial periodic discussion of roles and responsibilities - This approach, in which roles and responsibilities were discussed in supervisory groups daily or every other day until they all were covered, has been **effective** as assessed by the team and by individuals interviewed.

Incorporation of a responsible party index - This action (only recently completed) will be only marginally **effective**; it is more of a convenience or an administrative enhancement.

Planned follow-up review and feedback should be **effective**; however, the actions, expected results, and measures should be more clearly and explicitly stated. Some of the actions are not well-defined; accountability is not defined; and several actions are identified as "ongoing." These will be difficult to manage and to determine completion or effectiveness. In addition, other

means of reinforcement are needed. Some recommendations for additional reinforcement include one-on-one coaching between supervisors or managers and direct reports or peer forums (for example engineer work groups led by immediate supervisors) for learning and mutual accountability. The latter approach was suggested by comments from several different interviewees. The requirement for signatures is probably ineffective or only marginally effective. Roles and responsibilities should also be a part of the indoctrination program for new engineers.

3.1.7 Summary:

The initial actions taken and the plan are **effective**. However, the plan actions, expected results, accountabilities, and measures need to be strengthened. In addition, roles and responsibilities need to be communicated more effectively outside Engineering and among Engineering groups.

3.2 STANDARDS AND EXPECTATIONS

3.2.1 Self-Assessment Issue Addressed:

The Engineering management team has not established clear expectations for supervisors and staff and is not holding them accountable for performance. (Engineering Self Assessment, Finding 2)

3.2.2 Plan Objective(s):

Attain consistent levels of practice of the Engineering standards and expectations.

3.2.3 Completed Plan Actions:

- Form a focus group
- Identify changes to the current standards and expectations,

3.2.4 Incomplete Plan Actions:

- Decide on the most effective way promote behavior and culture change
- Create and issue a quarterly survey and summarize results
- Issue new standards and expectations and promote awareness
- Conduct and summarize quarterly survey
- Focus on standards and expectations during daily staff meetings

3.2.5 Other Actions Taken:

- Initial development, distribution, and periodic discussion (almost daily during period immediately following distribution) of standards and expectations
- Initial survey of engineering opinions of the original standards and expectations document

3.2.6 Assessment

Initial development, distribution, and reinforcement of the standards and expectations were **generally effective** and the survey provided some useful feedback.

The survey and this assessment identified some areas for necessary improvement:

- the standards and expectations document is too long and the presentation of the detailed discussions not conducive to engineers remembering and applying them;
- some elements of the document, for example the slogan at the bottom of each page, have generated negative reactions;
- many engineers surveyed believe they are meeting the expectations fully, yet this is not the view of managers and supervisors.

Engineering customers were not asked for input to the standards and expectations nor have the expectations been communicated effectively to Engineering customers so they understand and agree.

The *current focus group* formed under the current plan has been **more effective** because participation has been wider and more committed.

The *new organization of the Engineering standards and expectations*, which was developed by the focus group and which calls for grouping the expectations under five guiding principles, is an **effective** step. Even more effective would be some intermediate level of detail presenting the expectations in a way that could be easily comprehended and that could be supported by more detailed explanations (comparable to the current discussions of each expectation).

Some specific areas of expectations in which performance gaps may exist include

- status reporting of progress on issues,
- ownership on problems,
- communication in general, and
- developing and using plans.

As with roles and responsibilities, additional action steps will be needed to reinforce the standards and expectations effectively and to obtain the desired level of performance with respect to expectations. In this case, too, an approach based on peer interaction would be effective.

3.2.7 Summary

The initial actions taken and the plan have been **effective**. However, additional actions will be required in order to achieve high levels of performance.

3.3 ENGINEERING COMMUNICATION STRATEGY

3.3.1 Self-Assessment Issue Addressed:

Engineering Management team has not established effective lines of communication (both horizontal and vertical) within Engineering and with external customers and support organizations. (Reference Engineering Self Assessment, Finding 3)

3.3.2 Plan Objective(s):

The objective of this plan is to achieve effective internal and external communication in the Engineering Division.

3.3.3 Completed Plan Actions:

- Develop communication strategy with the NRC Senior Resident Inspector (SRI).
- Develop communication strategy with our Customers.
- Reinforce existing Standards and Expectations for Communications.
- System Engineers should be spending 50% of their time in the field.
- Appoint Engineering representative to attend daily scheduling meeting.
- Establish Engineering Customer Satisfaction Committee.
- Conduct periodic customer surveys.
- Regularly hold Engineering all hands meeting.
- Daily Manager/Supervisor meetings.
- Develop social activities for the engineering departments outside work area.

3.3.4 Incomplete Plan Actions:

- Train Engineering personnel on effective communication techniques/skills.
- Meetings and Training should be given at least one week advance notice.
- Plan-of-the-Day should give system engineer a week advance warning rather than 3 days warning.
- Develop a list of all engineering personnel that identifies their responsibilities.

3.3.5 Other Actions

None.

3.3.6 Assessment

Communications have improved significantly since the original self assessment was completed. Point of contact strategies were put in place for communication between the NRC Senior Resident Inspector and engineering, as well as between Maintenance and Operations (i.e. the

customer) and engineering. Based on focus group discussions, it appears that the point of contact approach is not always being followed as dictated by the customer strategy, but communications none the less are better.

Communications have been ineffective outside of engineering as exemplified by the fact that the engineering customers were not solicited for input in determining the Standards and Expectations for engineering, and the engineering customers do not always have a clear understanding of engineerings' Roles and Responsibilities. Additionally, operators interviewed during focus groups were knowledgeable of the assigned system engineer list, and used the list to seek help; however, they did not have knowledge of the responsible technical program owners.

Some team-building training has been accomplished, although, based on the focus group discussions, this training was not deemed to be very effective in terms of improving communications. Additional training in the area of communications and customer interfacing is planned to begin by year end.

Communication and reinforcement of the Standards and Expectations is achieved daily at the supervisor morning meetings. Each day a different standard or expectation is selected for discussion within the group. This is an effective approach.

The system engineers are spending a greater portion of their time in the field (approximately 20%). This has been deemed very effective by both the system engineers and the customers and has facilitated reconciliation of problems as they occur.

The appointment of_____ to represent engineering during the daily scheduling meeting has proven to be effective.

The goal of a weeks advance notice for meetings and the plan-of-the-day has not been realized.

A Customer Satisfaction committee has been formed to provide feedback to managers. Whether or how that feedback gets down to the staff is not known, although feedback between the managers and supervisors could occur during their daily meeting. Up to three customer surveys have been performed although no information was seen.

All-hands meetings occur monthly, and are deemed effective. The owner of the plan has suggested that at the meeting, each of the managers provide updates as to what their departments are doing. The team concurs with this recommendation as it will improve the organizations overall situational awareness and understanding of the issues.

Daily manager and supervisor meetings are taking place. In addition, a weekly meeting amongst the supervisors has just begun. These are very effective communication procedures, and should be reinforced by management.

Some social events have been conducted in the past. Based on our focus group discussions, it would appear that this type of activity is very important. With the demands imposed on CNS personnel, any activities which bring the staff closer together outside the work environment are going to result in better working relationships.

The list of engineering personnel and their responsibilities has not been completed, however, the request has been sent to the supervisors for information.

3.3.6 Summary

Much has been accomplished since the original assessment. All of the activities have been reasonably effective; however, Roles and Responsibilities, and Standards and Expectations need to be communicated more effectively outside of engineering. In addition, any lists which provide guidance to the customer as to who the engineering technical cognizant is should be well publicized and distributed.

3.4 PRIORITIZATION AND USE OF RESOURCES

3.4.1 Self-Assessment Issue Addressed:

Engineering managers and supervisors have not been effectively prioritizing work, leading to ineffective use of resources and important tasks not being performed. (Reference Engineering Self Assessment, Finding 4)

3.4.2 Plan Objective(s):

- Ensure Department Supervisors consistently reinforce to their engineering staff the need to apply the work prioritization standards specified in NPG Directive 4.12.
- Assist Department Supervisors in identifying the need for additional resources by use of the integrated planning and scheduling reports.
- Identify the effectiveness of the NPG work prioritization directive by performing an assessment of the plan.

3.4.3 Completed Plan Actions:

- Engineering Supervisor and/or designee should review each work activity assigned to their staff and ensure the activities are prioritized in accordance with the NPG Directive 4.12.

- Engineering Supervisor should review the integrated planning & work schedule reports and/or alternate work schedules for their staff and determine the resources needed to ensure that the work load for each section will average ≤ 22 man-days per month.

3.4.4 Incomplete Plan Actions:

- Representatives from the engineering organization will be solicited for suggestions on developing performance indicators to determine the effectiveness of the NPG directive 4.12 work prioritization plan.

- Review effectiveness of the Phase 3 work prioritization plan during the mini Engineering Self Assessment scheduled for end of September 1996 or early October 1996.

3.4.4 Other Actions:

None

3.4.5 Assessment:

A concerted effort has been made to implement the guidelines identified in the NPG Directive 4.12. In spite of the fact that training has been provided to the engineering staff, it is not clear that the Directives are being applied consistently, and supervisory review of the information is not always performed.

Based on focus group discussions with the engineers and the engineering supervisors, it would appear that approximately 40-50% of the workload results from "emergent" work. Independent of how consistently the directive is being applied, no prioritization scheme can be expected to achieve the desired results when that significant a portion of the workload is emergent. In general, although the Directive outlines an effective means for prioritizing work, because of the significant influence of emergent work at CNS, the Directive by itself remains ineffective in addressing the prioritization resource issue. Those processes which result in the creation of emergent work (i.e. PIR, etc.) should be reviewed with an eye toward reducing the formality associated with getting required information. This may reduce the demand on engineering to some extent.

The real key to successfully managing the effect of emergent work will involve a management commitment to the concerted use of group and department level integrated schedules recently prepared by the engineering groups. As a first step, it is imperative that the existing schedules be reviewed for completeness, consistency, and accuracy at the supervisory level. It would appear that this action has not been accomplished across the organization. Once this review has been accomplished, the integrated schedules can be rolled up to the department level for review by managers. At this point, it is anticipated that the essential information required to organize existing resources, and determine the requirements for additional resources will be available for management action.

A common theme of the Focus group discussions, was the need to free up the engineering managers to allow them the time to remove barriers for, coach, and mentor the supervisors. The managers are currently not very accessible.

3.4.6 Summary:

Much has been done to organize and prioritize backlog work activities. The Directive has been generally embraced by the engineering group but implementation is not always consistent between groups. Resource allocation cannot be managed by just prioritizing the activities. The affect of emergent work at CNS makes the issue of resource allocation a dynamic and difficult one to address. A combination of reviewing the PIR process and a management commitment to maintenance and use of the integrated schedule for resource allocation will be required. The integrated schedule must quickly evolve toward being the cornerstone of the approach for determining staffing requirements. The team views current scheduling activities as effective from the standpoint of schedule development, but ineffective from the standpoint of resource management. A stronger commitment and more attention at the supervisory and manager levels will be required to achieve the desired objectives.

3.5 INTEGRATED PLANNING AND SCHEDULING

3.5.1 Self-Assessment Issue Addressed:

The Engineering management team has not established effective integrated planning and scheduling of Engineering work. (Reference Engineering Self Assessment, Finding 5)

3.5.2 Plan Objective(s):

- **Primavera** produced schedules for all non-supervisory personnel.
- Time referenced manpower reporting, based on engineering man-hour estimates as applied to scheduled activities.
- Improve Engineering's working knowledge of **Primavera** and how it can be used.

3.5.3 Completed Plan Actions:

- Establish schedules for Plant, Design and Engineering Support.

3.5.4 Incomplete Plan Actions:

- Projects & Construction personnel provide training to Engineering personnel in the use of **Primavera**.

3.5.5 Other Actions:

None

3.5.6 Assessment:

A significant amount of work has been accomplished toward implementation of this plan over the last several months. Integrated schedules have been prepared for most groups of the Plant Engineering, Design Engineering and Engineering Support departments. The group plans are currently being rolled up into department plans.

The concept has been embraced by most of the engineering supervisors.

Training in the use of **Primavera** will be accomplished during group meetings. This training is just beginning and will be provided to all users.

The team has viewed this plan as the vehicle for preparing group and ultimately department level integrated schedules. From that perspective, the plan and its implementation have been effective.

However, an important objective of creating the schedules is to use them to determine staffing needs. This has not been accomplished effectively, and is discussed in more detail in Section 3.4, Prioritization and Use of Resources.

3.5.7 Summary:

Both implementation of this plan and the results achieved are effective. However but not enough progress has been made to achieve the desired results. Training is being handled on an ad-hoc basis. Effective preparation and use of the schedules requires that management invest the time up-front in formalized training. Full management support will be required to maintain focus on the scheduling effort, and reinforce the importance of accurate inputs.

3.6 SYSTEM ENGINEERING

3.6.1 Self-Assessment Issue Addressed:

System engineers are not performing the most important functions that must be the focus of their responsibilities. These include: 1)Being the System Expert for assigned systems, 2)Monitoring the health of assigned systems, and 3)Improving the performance and availability of assigned systems. (Engineering Self Assessment, Finding 6)

3.6.2 Plan Objective(s):

Review the present status of findings against System Engineering from the Engineering Self Assessment. Evaluate the items that are not complete. Present the problems that cannot be resolved inside of the System Engineering group to management. Develop a System Engineering Improvement Plan.

3.6.3 Completed Plan Actions:

- Obtain/compile list of findings from Engineering Self Assessment against System Engineering.
- Determine responsible parties for resolving each finding.

3.6.4 Incomplete Plan Actions:

- Identify unresolved findings.*
- Compile new list of unresolved findings.*
- Evaluate unresolved findings and turn over to Management or incorporate into the System Engineering Improvement Plan.
- Develop of System Engineering Improvement Plan.*
- Obtain buy-in from people affected.
- Turn over to Engineering Management items that cannot be resolved by System Engineering.
- Initiate System Engineering Improvement Plan.
- Periodically evaluate progress of Improvement Plan and adjust accordingly.
- Periodically prepare progress reports for Engineering Management.
- Prepare final evaluation of Improvement Plan.

(* Scheduled for completion prior to 9/30/96)

3.6.5. Other Actions Taken:

- System Engineers no longer involved in all front-end MWR reviews and eliminated from reviews on back-end.
- Resolution of NAIT's have been given to a contractor.
- System Engineers enrolled in BWR systems overview course.
- SE's enrolled in operator hot license classes for their systems.
- Established task force for trending and monitoring.
- Distributed information to show SE's how to obtain equipment data.
- Developing requirements for future data acquisition system for SE's.
- SE's trained in requirements of Maintenance Rule.

3.6.6 Assessment

System engineers are performing functions that should be performed by others or use processes that make inefficient use of their time. These include:

- Spending approximately 50% of their time on emergent issues,
- Using new programs that are still under development, and
- Information on system components and problems are not easily accessible to system engineers.

ENGINEERING SELF ASSESSMENT FOLLOW-UP

Incomplete findings from the Engineering Self Assessment (ESA) have been compiled. However, the System Engineering Improvement Plan is still in the hand-written draft stage and is slightly behind schedule.

As identified in the Action Plan, a training program associated with implementation of the Improvement Plan as identified in the Communication Requirements section is highly recommended.

A significant amount of Other Actions have been taken since the ESA to address the findings. All of these actions are judged to be potentially effective.

Feedback from individual SE's is that they have been unable to devote an appropriate amount of time to performing walkdowns and doing trending and monitoring of their systems. There has apparently been little change in this since the ESA. The majority of their time is still spent dealing with emergent work. There is a resource issue. This is particularly true of the reactor engineering area. In addition, there is an issue with morale that needs management attention. This issue is related to the feeling that the system engineers have with being overwhelmed.

Due to the importance of gaining significant improvement quickly in the System Engineering organization it is suggested that completion of remaining actions items from the ESA as identified in the Improvement Plan should be managed through periodic peer meetings. Purpose of meetings would be for responsible parties to provide status of their action items as contained in the Improvement Plan. These meetings would be attended by all responsible parties and their management. This peer review process could also be used to assist in completion of the remaining actions in the Action Plan for System Engineering.

The peer review process has been used effectively by previous management at CNS.

3.6.7 Summary

The overall assessment of this plan is that it is marginally effective with a suggestion to seriously consider implementation of the peer meetings concept to monitor development and implementation of the System Engineering Improvement Plan. Management must be focused on assisting in the completion and implementation of this Plan.

The new manager over the system engineering area has been positively interacting with management in his customer organizations recently.

There has been little overall progress in the improvement of the system engineering function at CNS in the last several years.

3.7 OPERABILITY ASSESSMENTS AND 10CFR50.59 EVALUATIONS

3.7.1 Self-Assessment Issue Addressed:

Engineering performance on operability assessments and 50.59 safety evaluations needs improvement. (Engineering Self Assessment, Finding 7)

3.7.2 Plan Objective(s):

Ensure Engineering personnel perform quality, accurate, and thorough operability assessments (OAs) and 10CFR50.59 evaluations (50.59s).

A number of immediate and subsequent actions have been taken to raise expectations, provide training, require supervisor evaluations or senior engineering review, increase certification requirements, and revise procedures. Additional actions are planned to ensure evaluations are being performed when required and that knowledge and training are sufficient to achieve high quality evaluations.

3.7.3 Completed Plan Actions:

- Interview individuals presently certified
- Transfer ownership of 50.59 evaluation procedures to Licensing

3.7.4 Incomplete Plan Actions:

- Review and ensure processes requiring them include 50.59 evaluations
- Certify individuals required to perform 50.59 evaluations
- Provide training or additional information as required, based on interviews

3.7.5 Other Actions Taken:

- Review a sample of operability assessments
- Issue a memo providing expectations for operability assessments
- Require supervisor or senior engineer review and approval of OAs and 50.59s
- Revise the drawing change notice and equipment safety classification processes to include requirements (as necessary) for 50.59s.
- Eliminate 50.59 challenge exam.
- Develop qualification guides for 50.59s.
- Add performance demonstration to certification requirements. Upgrade the Training Program Description
- Deliver upgraded training using a strong manager or supervisor as the principal instructor (previous Licensing manager, current Plant Engineering Manager)

3.7.6 Assessment

Interview of Certified Individuals - It is not clear from the format of the plan (the "additional corrective actions" don't line up very well with the Schedule section), but presumably the purpose of this action is to determine the effectiveness of actions taken to date in order to adjust the plan as necessary based on performance. This step has not been completed yet. This can be an **effective** step. The interview questions need to be constructed well in order to focus on performance gaps. Other input, such as SORC and Operations manager and supervisor feedback, problem identification reports, and other relevant performance data, should be reviewed for insight as well. Obviously, steps should be included in the plan to analyze and incorporate the results of the interviews (and other data).

Transfer of ownership of 50.59 evaluation process to Licensing - While the expertise of individuals in Licensing and the ability of Licensing to understand industry and regulatory trends are important, the safety evaluation process should be owned by Engineering, given that one of its key missions is to defend the design basis of the plant. The use of other individuals to support Engineering in the absence of sufficient expertise in the department can still be an effective way to upgrade the knowledge and performance of Engineering. Of course, in the long-term, Engineering should be the expert on the design basis and its application. The team assessment is that this will, in the long-term, prove to be an **ineffective** action.

Review and identify other activities which may require 50.59 evaluations - This is an **effective** and important step and perhaps should be accelerated and extended to other departments at the station, given the potential impact of omissions.

Certify individuals required to perform OAs and 50.59s - This is obviously an essential step. Interviews conducted as a part of this assessment revealed that an insufficient number of engineers are currently qualified to perform OAs and 50.59s. This seems to be an area requiring action in order to improve the efficiency of Engineering.

Provide licensing/design basis training and information - This can be an **effective** step, particularly in light of previous assessment results regarding availability and knowledge of this information.

Interviews indicated that performance in this area (availability, quality, thoroughness, and questioning) has improved somewhat. But additional improvement is needed. Two areas identified in interviews are: understanding the larger picture of overall plant safety (for example, the way in which a new maintenance procedure for instrumentation in a safety-related system may pose a potential safety question) and the availability and use of design basis information (for example, the recent questions and evaluation associated with Nuclear Boiler Instrumentation system level transmitters).

The assessment revealed that significantly more attention has been paid to improving the quality of 50.59s than of OAs. Apparently additional attention and actions are being brought to bear on this area; this will be an **effective** action to improve Engineering performance in support of plant operation.

Engineering and Operations should explore the approach used at other high-performance plants (NOP-19 at Waterford or the Follow-on Item Process at Monticello, for example) to establish a process by which Engineering deals with potential operability questions and presents them to Operations (the Shift Supervisor) promptly yet effectively.

One of the engineers in one of the focus groups pointed out that no refresher or requalification training exists for these qualifications and that it would be beneficial, particularly given the changing standards (at Cooper and in the industry).

The other actions identified in Section 5 above are generally assessed as **effective**, with the following recommendations. If Operations, which is Engineering's principal customer for this product was not consulted for input to the expectations in CENG968605 or if Operations was not informed of these expectations after they were approved, then steps should be taken to gain the input, agreement, and awareness of Operations. The purpose for the requirement for supervisor or senior engineer approval signatures is to control quality and, more importantly, to promote coaching and learning. This later objective should be made clear to senior managers and supervisors (at least some of the supervisors interviewed recognized this).

3.7.7 Summary:

The team assesses the plan as **effective** overall but strongly suggests incorporation of the recommendations and increased emphasis on OAs.

3.8 PLANT CONFIGURATION CONTROL AND DESIGN BASIS

3.8.1 Self-Assessment Issue Addressed:

Engineering performance in plant design and configuration control is inconsistent and in need of significant improvement. (Engineering Self Assessment, Finding 8)

3.8.2 Plan Objective(s):

- Improve the controls for maintaining plant configuration consistent with the design basis,
- Upgrade availability, accuracy, completeness, use, and control of design basis information,
- Resolve existing configuration control deficiencies, and
- Assess plant as-built condition and develop a position on the need for expanded scope

3.8.3 Completed Plan Actions:

- Modify and supplement CNS procedures to maintain Design Criteria Documents (DCDs)
- Develop and obtain approval for a Configuration Management (CM) Integrated Enhancement Plan
- Perform an assessment of information system (IS) usage, control and integration

3.8.4 Incomplete Plan Actions:

- Other DCD Development and Maintenance Actions
- Other Configuration Management Actions
- Other Configuration Control Actions

3.8.5 Other Actions Taken:

- Revise the drawing change (DCN) process (plan action partially completed; full completion not due until 12/31/96).

3.8.6 Assessment:

Modify and supplement the DCD maintenance procedures - The procedures have been modified and training is being conducted. The procedures and training were regarded by interviewees as **effective**. In particular, the training, which involved application of DCD information, was regarded as **very effective**. Multiple approaches to communicating about DCD use and maintenance were used; this is an **effective** approach. However, many people, particularly but not exclusively outside Engineering, still do not understand or fully accept the fact that the DCDs are now a formal part of the design basis and can be used as a primary source of design basis information. Additional and continuing communication and training can overcome this and result in realization of the full benefit of the investment made in the development of the DCDs. Some Engineering supervisors interviewed suggested providing information in the DCD training about the difference between the design and licensing bases and a possible future DCD enhancement--including a history of modifications to system designs.

Develop and obtain approval for a CM Integrated Enhancement Plan - A number of approaches used for the assessment and development of the CM plan are evaluated as **very effective**: use of experience at other stations, use of a station-specific assessment to determine Cooper's specific needs, the use of a CM Steering Committee and CM focus groups, specific steps taken to get input from key customers such as Operations, effectiveness reviews, getting commitments (signatures) to the plan from key managers, the use of periodic assessments to reinforce correct practices, and multiple and diverse communication about the program. Nevertheless, some working level employees and supervisors (particularly but not exclusively outside of Engineering)

still are not aware of the CM program. Continued communication using diverse media and methods will be needed to get appropriate levels of awareness and understanding throughout the organization. Particularly important will be a consistent understanding of various employees' roles with respect to configuration management.

Challenges and barriers to successful implementation identified by the plan owners pertain to the fact that line managers are ultimately accountable for program implementation and resource allocation, not the CM group. Nevertheless, the assessment team's judgement is that the current arrangement, in which the CM group provides focus and coordination but does not have total accountability or a large number of dedicated resources, is the most **effective** approach. However, Engineering management needs to provide an appropriate forum (perhaps the current weekly Engineering Department Action Plan review meetings) to establish and follow-up on manager and supervisor accountability for commitments to support the program.

The next important step for the CM program will be to get station-wide input to and agreement on the plan. A key issue raised by several managers and supervisors interviewed is the balance between scope, comprehensiveness, and sophistication of the program on the one hand and the cost, resource requirements, and consistency with Cooper operating philosophy on the other hand.

Perform an assessment of information system (IS) usage, control and integration - The assessment is in the process of being performed. One key **effective** result so far is a matrix of data fields versus databases produced from a database and information system inventory. It is too early to judge the effectiveness of other actions related to the IS assessment and plan development. One important observation is the need for a senior station manager to provide leadership for the station information management strategy. The importance of this element of Cooper management's strategy and the cross-department nature of the issues require this approach. While the scope of this managers sponsorship is broader than Engineering, it will be essential to the success of the IS plan. Eventually, a station-wide IS plan will be needed.

Revise the drawing change (DCN) process - A number of changes to the DCN process have been implemented and are viewed as **effective**: addressing pending design changes, independent design and as-built verification, use of a configuration check-list, identifying the requirement for 10CFR50.59 evaluations for "stand-alone" DCNs, and the new database (CDCN).

3.8.7 Summary:

Overall, the assessment of the actions in this plan is **very effective**. The complex nature of the challenges in this area will, nevertheless, require significant continuing management attention.

3.9 ACCESS TO DESIGN BASIS INFORMATION

3.9.1 Self-Assessment Issue Addressed:

Plant design basis information is not readily accessible and design and licensing basis knowledge is limited and not well integrated into Engineering. (Engineering Self Assessment, Finding 9)

3.9.2 Plan Objective(s):

Improve ability of engineering to access Design Basis Information.

3.9.3 Completed Plan Actions:

None.

3.9.4 Incomplete Plan Actions:

- Determine which items in ESA Finding #9 are relevant to this Action Plan.*
- Determine status of those items.*
- Determine if resources allocated for these items.
- Set milestones and monitor.
- Additional resources may be needed.
- Identified items will need to be worked per schedules.
- Set up monitoring prior to closure of action items to see if goals were met.
- Determine if plan can be completed by Refuel Outage 17.

(* Scheduled for completion prior to 9/30/96)

3.9.5. Other Actions Taken:

- DCD training has been conducted which included an exercise on accessing design information.
- Drawing control centers are being evaluated and upgraded.
- System Engineers have been given copies of DCD's for their systems.
- Information has been distributed on how to access equipment and other data.
- Design information has been relocated and categorized into the engineering library.

3.9.6 Assessment

This Action Plan appears to be more of a plan to develop a plan.

The problem statement is very broad and not specific to owner's opinion of problem to be solved. The actions list for this plan should be evaluated to identify actions that are really just plan owner's notes to himself. Clear actions should then be listed.

It is recommended that this Action Plan be coordinated with actions listed in the Configuration Management improvement plan.

A sample DCD was reviewed for availability of design basis information. Some clarification of the definitions of design basis, design criterion, design requirements, and licensing basis may be warranted in each DCD. Some formal training has been conducted in the past and materials from that training have been redistributed since the Engineering Self Assessment.

Availability of design basis information may be driving the number of Condition Reports that are issued. Since it is not easy in some cases to obtain enough information about the design basis, individuals are then forced to issue a CR.

A number of actions have been taken outside of this action plan to address this issue. These actions as a whole have been effective in addressing the issue associated with this action plan.

3.9.7 Summary

Very little has been completed on this action plan to date. It is difficult to judge potential effectiveness of this plan since some key parts of the plan should be reevaluated and clarified. (The plan reads more like the plan owner's notes to himself). Other option is to consider combining this plan with one of the other Action Plans, e.g. Configuration Management.

3.10 ELIMINATION OF LOW VALUE WORK

3.10.1 Self-Assessment Issue Addressed:

Engineers and Supervisors are spending significant time and resources on low value work activities. (Engineering Self Assessment, Finding 10)

3.10.2 Plan Objective(s):

Identify low value engineering processes and procedures and improve their effectiveness.

3.10.3 Completed Plan Actions:

- Capture low value activities identified during Phase III and Engineering Focus Group efforts.*
- Survey at least one representative from each engineering group for low value activities.*

(* Scheduled for completion prior to 9/30/96)

3.10.4 Incomplete Plan Actions:

- Prioritize list of activities using a group with a representative from each of Design, System Engineering, and Engineering Support.
- Eliminate top five ranked low value activities. Performed by a two person team.
- Communicate low value items to be eliminated back to engineering and customers.
- Evaluate the effectiveness of changes. Accomplished through survey of engineering and feedback from customers in work group coordinator meetings.
- Communicate progress weekly to appropriate supervisors and to management at owners meetings.
- Evaluate next set of five lowest value activities and continue process as allowed.

3.10.5 Other Actions Taken:

None.

3.10.6 Assessment:

Capture initial set of low value activities - The initial set of activities has been gathered. The list includes items from a number of CNS departments. This is an **effective** step. The list of activities should be captured in its own separate database.

Survey engineering groups - This action has not been completed. The Action Plan owner has contacted engineering groups but has not received much feedback. Engineering groups are to discuss and then forward ideas to owner. The owner has requested that ideas be submitted via a form, "Low Value Activities & Processes". It may be more productive for the owner to attend engineering meetings to assist in development of activities' lists. This can be an **effective** action.

Prioritize list and eliminate top five activities - These are the third and fourth actions in the plan. Plan calls for these actions to be completed in sections. It is recognized that prioritization will be somewhat subjective and a good cost/benefit analysis tool should be employed. Owner has indicated that contractors will be engaged to assist in the remaining actions. These can be **effective** steps.

Communicate items - The prioritized list of low value items will be communicated site wide for comment. This can be an **effective** step.

Evaluate the effectiveness of changes - Use of surveys is an excellent idea. Suggest surveying engineering customers in addition to engineering. This can be an **effective** step.

Continue process -Management input on subsequent items for elimination is an **effective** step.

The plan objective does not mention the actual elimination of low value work activities.

3.10.7 Summary

The overall assessment of this plan is effective.

3.11 ENGINEERING PROGRAMS IMPROVEMENT

3.11.1 Self-Assessment Issue Addressed:

Engineering programs are in need of significant attention to establish clear ownership, expectations, plans and performance monitoring. (Reference Engineering Self Assessment, Finding 11)

3.11.2 Plan Objective(s):

- Develop guidelines for the structure and content of engineering processes.
- Establishment of guidelines for the improvement and maintenance of engineering programs/processes
- Facilitate development of improvement plans and schedules for program/processes.

3.11.3 Completed Plan Actions:

- A focus group (FG) involving engineering personnel was assembled to identify a consolidated list of ongoing activities. A total of 60 activities were identified.
- Two Engineering Department Procedures (EDP 9, 10) were developed by the FG, to identify the criteria required to distinguish programs from other activities and the minimum information requirements for a CNS Engineering Program Document. These EDPs have been approved by the required plant management, and distributed.
- Screening of the 60 identified activities by application of EDP9, identified a definitive list of 14 programs for which owners have been assigned.

3.11.4 <u>Incomplete Plan Actions</u>:

- Compliance with EDP-10 for program documents.
- Development of guidelines for the control and consistent implementation of activities other than programs (i.e. processes) for which engineering is responsible. (Transferred to _____, Engineering Processes/Procedures, EDP 0.1N)
- Update the engineering Division Roles, Responsibility and Relationships document to include/identify programs/processes

3.11.5 Other Actions:

- By year end, discuss with each program owner the status of each program. Determine those projects which may require significant rework prior to their usage during the 1997 refueling outage. Those programs revealing significant issues should be identified to management for more immediate action, while the remainder will be accomplished by the schedule established by the Program Owner.

3.11.6 Assessment:

The process followed was effective in that a focus group approach was used, and interested parties were solicited to provide their opinions on what the criteria for selection programs ought to be.

The original identified schedule for completion of all activities was 12/31/97. Management recently revised the milestone for this activity to after the 1997 refueling outage. The risk with this approach is that if any of the programs required during the outage are in need of significant revision, that will not be known until it is too late. The plan owner identified a strategy which would minimize the risk of such an event happening, and is therefore included under **Other Actions**.

Effective 10/1/96, all of the non-program activities were transferred to _____ (Engineering Processes/Procedures, EDP 01.N) as they were deemed process related. Management must ensure that as a first step, the two affected plans are revised to reflect the transfer of ownership and revised scope. Subsequently, the Procedural Compliance plan owner should ensure that the non-program activities list is complete (reflects all programmatic issues addressed by the CNS site), and that each activity has an owner.

3.11.7 Summary:

The preliminary activities completed thus far have been effective; however, the activities of substance, such as development of program plans, have been deferred. Management must ensure that the transition of responsibility for the non-program activities is accomplished quickly and completely. Accordingly, the affected improvement plans (01.K and 01.N) should be revised quickly to reflect the transfer of ownership and scope changes.

3.12 PROCEDURE COMPLIANCE AND ATTENTION TO DETAIL

3.12.1 Self-Assessment Issue Addressed:

Management and Supervision must reinforce consistency in the area of procedural compliance. (Engineering Self Assessment, Finding 12)

3.12.2 Plan Objective(s):

To assist engineering in developing compliance with procedures and in developing complete engineering products.

3.12.3 Completed Plan Actions:

- Develop Engineering Management Standards and Expectations.*
- Perform ESP training.*
- Work stand down stressing procedural adherence.*
- Develop Directive 12 on "Requirements for the Use of Procedures".*
- Phase III Performance Improvement Plan with section on Procedure Use and Adherence developed.*

- Plant Access Training contains a section entitled "Procedure Compliance" implemented (continuing).*

(* Scheduled for completion prior to 9/30/96)

3.12.4 Incomplete Plan Actions:

- Ensure all Phase III Items associated with Procedure Use and Adherence are completed.
- Sensitize engineering personnel to commit themselves to 100% procedural compliance and attention to detail during monthly all hands meetings.
- CAP group to trend PIR's associated with procedural noncompliance by engineering. Data will show relationship with plant status, i.e. outage, power, etc.
- Training group to survey industry for appropriate training programs and incorporate as necessary.
- OER group to research applicable databases and EPRI on procedure compliance issues and report to Engineering Management and plan owner.
- Plan owner to revise plan as necessary.

3.12.5 Other Actions Taken:

None.

3.12.6 Assessment

This is a well written action plan with detailed schedule for actions included. Progress is being made on this issue. Real substantive progress is keyed by accurate trending and appropriate reinforcement through continuing training and other means. A review of other training programs on this issue should uncover some potentially useful programs. This training should be continuing. Also, including trending of Operability Assessments in addition to PIR's for procedure compliance and attention to detail should be considered.

Need to be careful of how 100% compliance with procedures is reinforced. Feedback from some engineers was that this was overemphasized in some previous training. These engineers considered it part of their normal job to strive for 100% compliance but they thought guaranteeing this would be difficult.

Recommend celebrating good findings by INPO, NRC, etc. on procedure compliance and attention to detail.

CNS Directive 12 on procedure compliance has been revised once which shows use.

3.12.7 Summary

Progress is being made on this action plan. The plan is well developed with schedules and owners assigned to actions. Continued progress is keyed to accurate trending and appropriate reinforcement.

In general, there continues to be a problem at CNS with procedure compliance and attention to detail. This was identified by the Corrective Action Program and resulted in the recent human performance training.

3.13 DIAGNOSTIC SELF-ASSESSMENT TEAM (SAT) AND NRC SPECIAL EVALUATION TEAM (SET) FINDINGS

3.13.1 Self-Assessment Issue Addressed:

The transition of the findings and observations from the Diagnostic Self Assessment Team (SAT) and NRC Special Evaluation Team (SET) Reports to long term performance improvement plans is incomplete. Several SAT and SET identified technical issues could not be found to be addressed in the Phase I, II, or III Performance Improvement Plans, or in any other plan. Also, some fundamental problems identified in Engineering, that were identified by the SAT and SET, appear to remain after a significant period of time, with no existing plan and schedule to resolve the concern. (Engineering Self Assessment, Finding 13)

3.13.2 Plan Objective(s):

- Identify and evaluate progress on all SAT and SET findings with Engineering Division responsibility,
- Identify and eliminate barriers to resolution of outstanding findings,
- Take steps to ensure that issues will not recur, and
- prepare a final closure report for each finding.

3.13.3 Completed Plan Actions:

None

3.13.4 Incomplete Plan Actions:

- Identify all Engineering findings
- Determine progress
- Assign accountability
- Develop resolution plans
- Prepare interim status report
- Close items and submit closure reports
- Prepare final a resolution report.

3.13.5 Other Actions Taken:

- Development of a DSAT closure strategy for all of Cooper Nuclear Station

3.13.6 Assessment:

A strategy has been developed for the station to ensure that key issues from the SAT report have been or will be addressed. The strategy involved a review of completed or planned actions that will address the approximately 22 DSAT issues. The review has been completed and revealed no significant gaps in "coverage" for the issues. In addition, station departments have been assigned accountability through the Corrective Action Program to insure that individual DSAT findings will be addressed.

Engineering's plan seems to be effective for the purpose intended. However, an interview with the owner revealed that no actions had yet been taken and that a revised plan is being developed. This is understandable since ownership of this plan, as with most of the other Action Plans, has only recently been transferred. This represents no immediate significant issue for this plan or most of the others. However, management attention and some effective forum (such as the weekly Action Plan review meetings) are essential to starting to make significant progress on the issues identified in the self-assessment. It will also provide an effective opportunity for the new plan owners and a larger set of Engineering employees to learn accountability, effective planning, and other behaviors essential to performance improvement.

Two issues identified in the SAT report and revisited in the self-assessment warrant additional attention. The SAT report identified the lack of clearly defined roles and responsibilities and effective implementation of expectations for Engineering and its impact on performance. The SAT report also identified the failure of System Engineering to perform important duties (in part due to the lack of clearly defined roles, responsibilities, and expectations). The current Action Plans and previous actions taken in the areas of roles and responsibilities (see Section 3.1) and standards and expectations (see Section 3.2) are or will be **effective** in addressing those issues. On the other hand, the assessment team is concerned that, unless significant and immediate management attention is focused on the continuing problem of system engineering performance and failure to perform the highest value activities, the actions taken will continue to be **ineffective** (see Section 3.6). Some different and more urgent steps appear necessary.

3.13.7 Summary:

Overall the plan is judged **effective**. The concern in the area of system engineering is discussed in Section 3.6.

3.14 ENGINEERING PROCESSES AND PROCEDURES

3.14.1 Self-Assessment Issue Addressed:

Many Engineering processes are unnecessarily cumbersome and time-consuming. (Engineering Self Assessment, Finding 14)

3.14.2 Plan Objectives:

Evaluate Engineering processes and procedures to identify minimum requirements for compliance and to determine the value of additional requirements or process steps and to examine procedures in order to understand interactions and requirements and their impact on process efficiency.

3.14.3 Completed Plan Actions:

None

3.14.4 Incomplete Plan Actions:

- Scope issue, identify department leads, and form team;
- Gather details and information;
- Form task team, develop detailed plan, and obtain contractor support; and
- Implement plan and address issues.

3.14.5 Other Actions Taken:

- Developed and implemented a redesigned modification process and
- Revised (but did not yet implement) the replacement component evaluation (RCE) process.

3.14.6 Assessment:

The specific processes for which findings were identified in the self-assessment included replacement component evaluations (RCE), outage scope changes, vendor manual changes, on-the-spot changes, and temporary modifications. The RCE process is being revised but the revised process has not been implemented yet. The outage scope change process has not been addressed yet. Several changes to the vendor manual change process have been developed and are being reviewed. Corrective actions for the finding related to the on-the-spot change process have been completed (although the plan owner is reviewing the actions taken to make sure they will effectively address the original concern). The modification process has been extensively revised

and is now a single integrated process that is substantially simplified. Some other changes to the modification process include the elimination of the minor modification process and revising the temporary modification process (including changes that would address the self-assessment finding associated with a temporary modification older than 6 months), modifying the independent design verification process, and changing status reporting. Additional changes to the modification processes being discussed relate to the assignment of responsibility for installation procedures; these may also be effective in the long-term; however, benefits will not result until changes are made to both the process and the capabilities of the organization writing the installation procedures. At face value these changes all appear to have the **potential to be effective**. However, because the changes are recent and because no prior measures are available and no current measures are being recorded, the effectiveness of these changes are and will be difficult to gauge. At least one station management "customer" interviewed reflected that he could not see any evidence yet of improvement in the effectiveness or efficiency of the process. One recommendation is to develop, as identified in the plan, measures for determining the effectiveness of any changes made to processes; this will also help to define the desired results from any additional process improvement efforts.

The action plan itself is written at a very high level and will require considerable additional effort by management, the plan owner, and probably more than one team to develop it into a working level plan. The area of process improvement can be very broad; it will be important for management to help focus it on some reasonable and practical goals consistent with Cooper operational strategy. Some additional initial steps, which were discussed with the plan owner, are:

- developing a broad vision or strategy for defining (probably in multiple stages) how any process improvements will change the way the organization will operate,
- reviewing and selecting, with help, input, and decisions from management, target potential areas for process improvement projects, and
- chartering teams with the appropriate capabilities (probably including outside resources) to initiate projects.

Development of an initial short-term strategy with modest goals that will require less comprehensive or sophisticated approaches can be started relatively quickly. Subsequently, after the organization gains experience, more comprehensive projects can be initiated. Designation of a more senior management sponsor for this plan may be important, particularly since changes of any significance will effect other organizations.

A number (approximately 60) of activities have been identified, in associated with Action Plan (AP) 10, Engineering Programs Improvement, as activities that are not categorized as Programs. Those activities need to be reviewed to insure that, where appropriate, ownership is assigned. The owner of this plan(AP 13) and AP 10 have agreed to include those activities in this plan (AP 13). The version of AP 13 reviewed did not include these activities and therefore needs to be revised.

3.14.6 Summary:

Assessment of the effectiveness of actions taken to date is difficult, given the lack of performance measures and the fact that most changes have not been implemented yet or (as in the case of the modification process) have only been recently implemented. The current plan is very high-level plan but, as far as it goes, is a **potentially effective** approach, with the implementation of some recommendations. Significant additional work will be required to develop a plan sufficiently detailed to support effective initiation and management of improvement projects. The effectiveness of activities in this area will depend on effectively prioritizing the processes to be redesigned and establishing a multiple-phase approach. This is a very challenging and broad plan area; the owner will need some strong sponsorship and support from management (and probably some expertise from outside the Cooper organization) in order to achieve significant results.

3.15 TRAINING

3.15.1 Self-Assessment Issue Addressed:

Training and qualification needs to be enhanced in several specific areas, including: use of site and Engineering processes (how we do business), integrated and specific system knowledge (particularly for System Engineers), the number of qualified Reactor Engineers and the overall level of engineering certifications (system experts, SRO's, SRO's certifications, and STE's). (Engineering Self Assessment, Finding 15)

3.15.2 Plan Objective(s):

Improvement in training issues as identified in Engineering Self Assessment.

3.15.3 Completed Plan Actions:

None.

3.15.4 Incomplete Plan Actions:

- Review all open engineering assessment items to assure capture by engineering focus group*
- Validate intent of Focus Review Group assignments and engineering assessment items.
- Include need of the training item in validation along with priority per CNS directive.
- Engineering Assessment and focus review group assignments pertaining to training shall be documented as being planned and scheduled. Verify action plan for each item.
- Ensure all action items are tracked and driven to closure.
- Provide schedule and status updates.
- Schedule required implementation with Training Coordinators.

- Activities after the outage may be required. A "Phased In" approach should be considered and implemented.
- Some training requirements have time frames past the outage.
- Verifiable documentation shall be available for the owner/designee to validate completion.
- Re-institute engineering training focus review group.
- Complete plans with assigned individual and new present owners as identified in 8/11 E-mail
- Conduct training.
- Document and verify results. Training completion shall be via the CTS database.

(* Scheduled for completion prior to 9/30/96)

3.15.5 Other Actions Taken:

- Training on use of DCD's conducted.
- Customer relations training conducted (video based).
- System Engineers enrolled in BWR systems overview course.
- SE's enrolled in operator hot license classes for their systems.

3.15.6 Assessment

Very little has been completed on this action plan to date. However, some training activities related to the more significant training issue from the ESA, i.e. system engineering training, has been partially addressed to date (see section 3.6.5 of this assessment).

It is suggested that the actions in this plan be reevaluated for some consolidation and focus on addressing the system engineering training issue. (Some actions read like owner's notes to himself.) Also, more schedule information is needed for actions in this plan.

3.15.7 Summary

Very little has been completed on this action plan to date. There is a need to ensure that this action plan is addressing the main training issue from the ESA, i.e. system engineering training.

3.16 TOOLS & RESOURCES

3.16.1 Self-Assessment Issue Addressed:

Tools, resources and support in such areas as document availability and retrieval, databases, and design basis information need to be improved for more efficient use of engineer's time. (Engineering Self Assessment, Finding 16)

3.16.2 Plan Objective(s):

ENGINEERING SELF ASSESSMENT FOLLOW-UP

The objective of the plan is to acquire and access available tools necessary for the Engineering Department to perform engineering functions.

3.16.3 Completed Plan Actions:

As of 9/30/96, the plan owner has completed a survey to determine the additional tools and resources required.

3.16.4 Incomplete Plan Actions:

CNS engineering personnel prepared Engineering Department Action Plan (01.P). Plan actions include:

- This assessment pertains to the Training action plan for follow-up to the Engineering Self Assessment. Improve access to documents
- Provide training on the computer regarding access to different databases and transferring information.
- Provide training on RONAN and PMIS.
- Increase System Engineer input to the PM program Pending
- Create databases for terminal boxes and cables, calculation cross references, and design change package status.
- Provide beneficial tools requested by engineers such as:

  Second drawing print machine in TSC
  BMI instrument
  Data logger
  Infrared temperature indicator
  35 MM camera
  VCR/Camcorder
  Additional software

3.16.5 Other Actions:

Some actions that were completed after the ESA are not reflected in the plan, e.g. Reactor Engineering has obtained the 3-D Monicore program, applicable DCDs were provided to the System Engineers for their systems, etc. Current issue tracking is in the Plan of the Day.

3.16.6 Assessment:

Several of the specific concerns identified in the Engineering Self Assessment are not addressed in this plan but are addressed in other plans such as Configuration Management, and access to Design Basis information.

3.16.7 Summary:

There has been little progress since the Engineering Self Assessment. Consequently there has been no effective corrective action since the Assessment. The proposed actions in the plan will help individual engineers be more efficient. However the plan should be revised to address the specific issues raised in the Engineering Self Assessment or at least cross reference the EDAP that is addressing the issue. The plan should identify the actions that have already been completed to provide a complete record of the corrective actions taken.

4.0 SYSTEM WALKDOWNS

4.1 DIESEL GENERATOR WALKDOWN

4.1.1 Self-Assessment Issue Addressed:

The Engineering Self Assessment performed by CNS in February of 1996 identified a number of housekeeping issues during the walkdown of the Diesel Generator rooms. Examples of issues include:

- Several oil leaks were noted in the DG Rooms,
- Ladders and tool boxes were not restrained.

4.1.2 Plan Objective(s):

These housekeeping issues were corrected at the time of the Self Assessment. The objective of the follow-up is to verify that housekeeping in the Diesel Generator rooms has been maintained.

4.1.3 Assessment:

A walkdown of these areas was performed during the follow-up to verify that the cleanliness of these rooms had been maintained. Both DG1 and DG2 were very clean and no loose equipment was observed. The following items were noted during the walkdown:

- A PTM 96-27 and 96-28 have been implemented in accordance with procedure 2.0.7 for the Muffler Bypass Valves. The PTMs and procedure 2.0.7 was reviewed. The PTMs were completed in accordance with the procedure. However the procedure does not require that all the engineering checklist in procedure 3.4.6 be completed. Consequently a PTM could change the plant configuration and affect other engineering programs. In this case the Muffler Bypass Valves are included in the IST Program. Since the valves are failed in the safe position, there is no impact for this PTM, but the potential exists that a change to the plant could be introduced and the appropriate changes to engineering programs would not be implemented (PIR S/N 2-07234).

- A lanyard was found in each pump room going into the sumps. The DG System Engineer

investigated and found that this condition had existed for many years. The lanyard is connected to a pig in the sump that is used to absorb any oil. The pig floats on the water and does not affect the operation of the sump pump. Although the sump does not have any safety related function, the presence of this device may be an unauthorized modification. A PIR was initiated for a follow-up investigation (PIR S/N 2-07235).

4.1.4 Summary

The cleanliness of the DG rooms is well maintained. The interface between Plant Temporary Modifications and Engineering Programs will be addressed separately.

4.2 HPCI WALKDOWN

4.2.1 Self-Assessment Issue Addressed:

The Engineering Self Assessment performed by CNS in February of 1996 identified a number of housekeeping issues during the walkdown of the HPCI room. Examples of issues include:

- Several oil leaks were noted in the HPCI Room,
- A spool piece in the HPCI room was inadequately restrained

4.2.2 Objective(s):

These housekeeping issues were corrected at the time of the Self Assessment. The objective of the follow-up is to verify that housekeeping in the HPCI room has been maintained.

4.2.3 Assessment:

A walkdown of the HPCI room was performed after site clean-up day to verify that the cleanliness had been maintained. The HPCI pump room was very clean and no loose equipment was observed.

4.2.4 Summary

The cleanliness of the HPCI room is well maintained.