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REVIEW OF CORPORATE AND SEQUOYAH CHEMISTRY PROGRAMS

Executive Summary

At the request of senior TVA Nuclear (TVAN) management a review of Corporate and Sequoyah (SQN) Chemistry programs has been performed. The review focused on determining why long-standing chemistry problems at SQN have not been corrected. It also identified areas where Corporate Chemistry support of the sites in solving problems could be improved. Results of the review are as follows:

- Instrumentation availability problems could have been alleviated by either upgrading the instrumentation via the Chemistry Upgrade Program (CUP) or by repair/maintenance of the existing instrumentation. The original CUP was overscoped and excessively expensive and was thus deferred from year to year. Existing instrumentation was not repaired due to a failure to develop an adequate implementation strategy and a failure to apply sufficient resources.
- The data analysis and trending issue was caused by clear management expectations not being consistently conveyed and enforced. Additionally, tools provided to Chemistry personnel for analysis and trending have not been adequate.
- Corporate Chemistry's role in resolving problems has not been consistent and at times was not well defined. Changing philosophy as to whether Corporate Chemistry was to primarily provide an oversight or support function prevented Corporate from focusing on plant problems.
- A contributing cause to the problems noted above is the high turnover of SQN and Corporate Chemistry managers during the last four years. Initiatives to address problems and communications of expectations have suffered as a result.

Two additional observations were made. They are:

- The difference in shift rotation between the Chemistry Shift Supervisors and the Radiochemlab Analysts is a barrier to effective communication and teamwork.

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- Departmental interface barriers between Chemistry and Operations and Maintenance are also causing communication and work coordination problems.

Actions to address long-standing problems were also reviewed. The plans are considered adequate with continued management support. More detail, evaluation of ongoing actions to address problems, and additional recommendations are set forth in the body of the report.

Background and Scope

The 1994 Corporate and SQN INPO evaluations resulted in several findings in the chemistry program area. These findings noted long-standing chemistry problems at SQN, including inoperable on-line monitors, ineffective data analysis and trending, and Corporate Chemistry's ineffectiveness in assisting SQN in resolving long-standing problems. The findings related to inoperable on-line monitors and data trending are repeat findings from the 1992 SQN INPO evaluation. All of these issues had previously been identified by TVA self-assessments, audits, and Nuclear safety Review Board assessments. In order to determine the causes of these issues and reserve recommendations to address them, TVAN senior management directed that a candid, detailed review of the Corporate and SQN chemistry programs be performed.

The objective of the review was to evaluate the history of recurring problems with the Corporate and SQN Chemistry Programs along with the conclusions of the most recent INPO evaluations, and to provide program improvement recommendations for consideration by Corporate and SQN management. The review assessed Corporate Chemistry and SQN Chemistry management's role in the failure to resolve previously identified problems and attempted to identify those areas where Corporate Chemistry support could be improved to assist the site in resolving its problems.

Methodology

The review was conducted by a five-member management team representing Corporate Nuclear Experience Review/Independent Safety Engineering, Corporate Chemistry, BFN Chemistry, and BFN Independent Review and Analysis. To allow the review team to place the current Chemistry program issues in the proper historical perspective, a timeline was developed which lists previous issues and findings associated with the program since 1988. This chronology included the results of assessments, audits, INPO evaluations and assist visits, NRC inspections, and data from the Corrective Action Program. The information was collected into major issue categories such as training, data

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evaluation/trending, instrumentation, and "closure." Results were provided to Corporate and SQN Chemistry management (RIMS L33 940831 809).

Interviews were conducted with both Corporate and SQN Chemistry management and employees. Approximately sixty hours of interviews were conducted by the team. The persons contacted during the review are listed on Attachment 1. The interviews were selected to approximate a vertical slice of the Corporate and SQN Chemistry organizations.

Results/Actions Taken

1. Instrumentation

Causes

As the SQN instruments age, the required maintenance frequency increases to maintain the same in-service availability. A significant percentage of instruments are obsolete to the point that repairs are difficult or cannot be made because parts are no longer available.

The Chemistry Upgrade Program (CUP) was developed to replace aging process instruments. However, it was difficult to fund because the initial scope was excessive and there was a lack of a multi-year implementation strategy. Additionally, site upper management experienced a high degree of turnover during this period, which disrupted the continuity of understanding and support for the program. Consequently, the program was deferred from year to year. The current scope and schedule for installation of CUP instrumentation were reviewed and are considered adequate.

Actions Being Taken

Two instrument technicians are currently assigned to work on Chemistry instrumentation. However, this support has been inconsistently applied. For example, recently these technicians were not the same personnel. This resulted in lost efficiency as the new technicians became familiar with the instrumentation.

Additional Recommendations

Ensure that instrument technician support is consistently applied to the upkeep of Chemistry instrumentation.

NOTE: During the August 23, 1994, debrief at SQN, the Corporate General Manager, Operations Services, took an action to discuss the use of Chemistry technicians in routine

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instrumentation maintenance with the Corporate Labor Relations Manager.

2. Data Analysis and Trending

Causes

Following the publication of the 1994 INPO evaluation finding in this area, detailed management expectations were distributed as night orders to the radiochem lab personnel. While all employees interviewed stated that it was clear to them that data evaluation and trending are part of their job function, they indicated that some aspects of management's expectations were not clear. Additionally, during conversations with the employees involved, dissatisfaction with the adequacy of the tools provided for this task was expressed. The primary criticism was related to excessive time required to obtain the necessary trending reports from the database. Inconsistent data analysis and trending resulted in instances of out-of-specification system chemistry, missed samples, and problems with laboratory QA/QC checks.

Each nuclear plant site is presently utilizing a computerized chemistry database management (CDM) system. All SQN lab personnel interviewed indicated that the performance of routine shift duties did not leave sufficient time for data trending. Chemistry personnel stated that sample data was routinely not entered into CDM until the end of the shift. This was validated by observations in the radiochem lab. A potential cause of the report generation backlog is the large amount of data being entered simultaneously at the end of the shift.

No standard CDM software is currently in use. Each site is currently employing software supplied by a different vendor and has expressed some dissatisfaction with the software. The Chemistry Managers have recognized the need to standardize the CDM software and a task is included in the Corporate Chemistry Task List.

Actions

A Quality Improvement Team (QIT) has been chartered to evaluate the long-term data management needs of the Corporate and plant chemistry organizations and to recommend a standardized CDM system which will meet these needs. The QIT is scheduled to complete its work by the end of this calendar year. Also, Chemistry Technical Support has recently developed a set of daily trend plots to assist Chemistry Operations in evaluating chemistry sample data. These plots provide a graphical display of all principal sample data collected on a frequency of one week or less for Units 1, 2, and common. The team observed the

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generation of these plots in the radiochem lab in approximately ten minutes for Unit 1 and common. The incorporation of this graphical information into the trending program should result in improved and more timely interpretation of data by the RLAs and Chemistry Shift Supervisors (CSSs).

Additional Recommendations

1. SQN Chemistry management should reinforce its requirements for data evaluation and trending with all affected personnel. Face-to-face meetings are recommended. Progress of the results of this reinforcement should be monitored and measured. Continue the inclusion of daily trend plots into the data evaluation and analysis program.
2. The CDM QIT schedule should be expedited.

NOTE: During the August 23, 1994, debriefing at SQN, the Acting Site Vice President directed that the schedule be expedited. A purchase specification for an upgraded CDM was to be complete by the end of September 1994.

3. Corporate Chemistry

Causes

Corporate Chemistry's role in resolving long-standing problems at SQN has not been well defined or consistent. A constantly changing philosophy between providing oversight or support has served as an impediment as Corporate focused mostly on oversight when support was what the site needed most. This was exacerbated by high management turnover.

Actions Being Taken

Interviews with both site and Corporate Chemistry personnel indicated that the Corporate focus has been properly focused on site support for the past six months. The primary means of monitoring this effort is the Chemistry Task List. The tasks and schedules on this list are reviewed on a regular basis and agreed to by Corporate and site Chemistry management.

Additional Recommendation

Continue the Chemistry Task List.

Other Observations

1. The SQN CSSs are currently assigned to twelve-hour rotating shifts while the Radiochem Lab Analysts (RLAs) are assigned to eight-hour rotating shifts. This arrangement limits the efficiency and teamwork of the shift group. Inconsistent management expectations are communicated to the RLAs. Other management functions are also impeded. For example, development of Personnel Performance Evaluations (PPE) and RLA training needs are difficult to evaluate due to the involvement of multiple supervisors. The most significant impact is on shift teamwork. When the personnel makeup of the shift changes, the group stability necessary to foster teambuilding is interrupted. While the cost savings associated with the twelve-hour CSS shift rotation are recognized, it is the consensus of the review team that the improvement in organizational effectiveness is overriding.

Additional Recommendation

Reevaluate the work schedule differential which presently exists between the CSSs and the RLAs.

2. Areas where interdepartmental interfaces were causing work coordination problems were identified. For example, Chemistry personnel transmit requests for various chemistry needs via a written Chemistry Deviation Notice (CDN) that is faxed to the control room. This inhibits communications. Operators don't know what priorities are for the individual CDNs, and Chemistry personnel are frustrated when delays are experienced in implementation. Another example of interface problems is in the planning of preventive maintenance. Although corrective maintenance is coordinated with Chemistry, preventive is not. Several instances were related to the team where instrument technicians attempted to perform preventive maintenance on equipment which was out of service or where the equipment was being utilized (e.g., on a unit in an outage).

Additional Recommendations

Review the need to use CDNs for Chemistry/Operations communications. Note that Browns Ferry uses CDNs on a much more limited basis. Implement a process to coordinate preventive maintenance between Chemistry and Maintenance.

NOTE: During the August 23, 1994, debriefing the SQN Radiological and Chemistry Manager indicated he was pursuing this.

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NOTE: During the August 23, 1994, debriefing, the SQN Acting Site Vice President requested a status meeting in 30 days. The SQN Manager, Radiological and Chemistry, agreed to coordinate the meeting. The Acting Site Vice President also requested the team to perform a follow-up review prior to the next INPO review. This will be added to the Nuclear Assurance and Licensing Integrated Review Schedule.

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Attachment 1

Persons Contacted

W. C. McArthur, Corporate Manager, Technical Programs
R. O. Grover, Corporate Chemistry Manager
G. L. Fiser, WBN Chemistry Project Manager
S. L. Harvey, SQN Chemistry Project Manager
E. S. Chandrasekaran, BFN Chemistry Project Manager
C. E. Kent, SQN Radiological And Chemistry Manager
G. L. Rich, SQN Chemistry Manager
D. E. Adams, II, SQN Chemistry Program Manager
R. E. Richie, Jr., SQN Chemistry Laboratory Supervisor
B. A. Fender, SQN Chemistry Technical Support manager
B. K. Cline, SQN Chemistry Shift Supervisor
J. D. Pierce, SQN Chemistry Shift Supervisor
H. L. Harris, SQN Chemistry Shift Supervisor
D. B. Nida, Radiochem lab Analyst
C. R. Wilhoite, Radiochem Lab Analyst
L. S. Putnam, Radiochem Lab Analyst
G. D. Taylor, SQN Chemist
J. P. Stewart, SQN Chemist
A. K. Barringer, SQN Chemist
J. S. Baumstark, SQN Plant Manager
D. E. Brock, SQN Maintenance and Modifications Manager
O. D. Hayes, SQN Operations Program Manager
W. R. Lagergren, SQN Projects Manager