INSPECTION PROCEDURE 95003

SUPPLEMENTAL INSPECTION FOR REPETITIVE DEGRADED CORNERSTONES, MULTIPLE DEGRADED CORNERSTONES, MULTIPLE YELLOW INPUTS OR ONE RED INPUT

PROGRAM APPLICABILITY: 2515, 2201

CORNERSTONES: ALL

INSPECTION BASIS: The NRC's revised inspection program includes three parts: baseline inspections; generic safety issues and special inspections; and supplemental inspections performed as a result of risk significant performance issues. The inspection program is designed to apply NRC inspection assets in an increasing manner when risk significant performance issues are identified, either by inspection findings evaluated using the significance determination process (SDP) or when performance indicator thresholds are exceeded. Accordingly, following the identification of an inspection finding categorized as risk significant (i.e., white, yellow, or red) via Table 2 of the SDP, or when a performance indicator exceeds the "licensee response band" threshold, the NRC regional office will perform supplemental inspection(s). The scope and breadth of these inspections will be based upon the guidance provided in the NRC's "Assessment Action Matrix" (or the NRC's Security Action Matrix in IMC 0320) and the Supplemental Inspection Selection Table (included in IMC 2515 Appendix B and IMC 2201 Appendix B).

This procedure provides the supplemental response for repetitive degraded cornerstones, multiple degraded cornerstones, multiple yellow inputs, or one red input to the Assessment Action Matrix. The intent of this procedure is to provide the NRC with supplemental information regarding licensee performance, as necessary to determine the breadth and depth of safety, organizational, and programmatic issues. As such, this procedure is more diagnostic than indicative, and includes reviews of programs and processes not inspected as part of the baseline inspection program. While the procedure does allow for focus to be applied to areas where performance issues have been previously identified, the procedure does require that some sample reviews be performed for all key attributes of the affected strategic performance areas. The rational behind this is that additional NRC assurance is required to ensure public health and safety, and security beyond that provided by the baseline inspection program and the performance indicators at those facilities where significant performance issues have been

identified. The results of this inspection will aid the NRC in deciding whether additional regulatory actions are necessary to assure public health and safety. These additional regulatory actions could include orders, confirmatory action letters, or additional supplemental inspections, as necessary to confirm that corrective actions to the identified performance concerns have been effective.

This procedure was developed with consideration of the following boundary conditions:

1. The NRC is performing the inspection, which involves a graded approach to assessing the licensee's safety culture. The scope of the inspection requirements related to safety culture will be based on the results of the validation of the licensee's third party safety culture assessment and root cause evaluation;

2. The procedure is not intended to be used for event response;

3. New issues identified by the team will be evaluated using the significance determination process during the course of the inspection; other process issues will be documented in the inspection report; and,

4. The procedure is intended to provide insight into the root and contributing causes of performance deficiencies, but is not intended to be a substitute for a more focused root cause analysis (or self assessment) of specific performance issues to be performed by the licensee or by a third party; and

5. In most cases the licensee has completed a root-cause, extent-of-cause, and extent-of-condition investigation(s) of the performance deficiencies which prompted this inspection and an independent third-party assessment of their safety culture before the NRC begins this inspection. In some cases NRC inspection of these activities can be deferred when warranted to accommodate a longer time required for the licensee to complete them. Flexibility is afforded to perform inspections and safety culture evaluations in parallel with the conduct of the licensee's root cause evaluation and third-party safety culture assessment. A third party assessment is conducted by individuals who are not employees of the plant or the utility operators of the plant.

95003-01 INSPECTION OBJECTIVES

01.01 To provide the NRC additional information to be used in deciding whether the continued operation of the facility is acceptable and whether additional regulatory actions are necessary to arrest declining plant performance.

01.02 To provide an independent assessment of the extent of risk significant issues to aid in the determination of whether an unacceptable margin of safety or security exists.

01.03 To independently assess the adequacy of the programs and processes used by the licensee to identify, evaluate, and correct performance issues.

01.04 To independently evaluate the adequacy of programs and processes in the affected strategic performance areas.

01.05 To provide insight into the overall root and contributing causes of identified performance deficiencies.

01.06 To determine if the NRC oversight process provided sufficient warning to significant reductions in safety.

01.07 *To evaluate the licensee's third-party safety culture assessment and conduct a graded assessment of the licensee's safety culture based on the results of the evaluation.* [C1]

95003-02 INSPECTION REQUIREMENTS

The intent of this procedure is to allow the NRC to obtain a comprehensive understanding of the depth and breadth of safety, organizational, and performance issues at facilities where data indicates the potential for serious performance degradation. Considerable leeway has been built into the procedure to allow it to be customized, to better reflect the specific nature of the previously identified performance issues.

This procedure was written with the assumption that supplemental inspections (either 95001 or 95002) have been conducted to evaluate the licensee's root cause, extent-of-cause, and extent-of-condition evaluations and associated corrective actions for "white" or greater performance indicators or inspection findings. If such supplemental inspections have not been conducted, the scope of this inspection should include inspection of the licensee's evaluation of those issues.

02.01 Strategic Performance Area(s) Identification.

a. Using the information contained in the Assessment Action Matrix, identify the strategic performance areas for which performance has significantly declined (e.g. Reactor Safety, Radiation Safety, or Safeguards). The scope of this inspection will generally include all key attributes of the degraded strategic performance areas. Specific inspection requirements pertaining to each strategic performance area are contained in Sections 02.03 - 02.06 of the procedure.

b. Inspection Requirements 02.02, and 02.07 - 02.12 should always be performed regardless of the strategic performance areas selected for review. Attachment 95003.01, "Additional Emergency Preparedness Cornerstone Inspection," to this procedure should be performed when Emergency Preparedness (EP) Cornerstone performance issues are a contributing factor to the reason this procedure is being implemented, e.g., the EP Cornerstone is degraded and Reactor Safety is the relevant strategic performance area. However, implementation of Attachment 95003.01 should be considered during the performance of all 95003 inspections. When Attachment 95003.01 is implemented it supplants the EP related inspection requirements contained in the body of this procedure. The use of an EP inspector from a different region (or headquarters) should be considered to assist in the performance of attachment 95003.01.

02.02 Review of Licensee Control Systems for Identifying, Assessing, and Correcting Performance Deficiencies. Once significant performance concerns have been identified in the Action Matrix, the NRC must ensure that licensee systems for identifying, assessing, and correcting performance deficiencies are sufficient to prevent further performance degradations. The following inspection requirements evaluate whether licensee programs are sufficient to prevent further declines in safety that could result in unsafe operation.

a. Determine whether licensee evaluations of, and corrective actions to, significant performance deficiencies have been sufficient to correct the deficiencies and prevent recurrence.

b. Evaluate the effectiveness of audits and assessments performed by the quality assurance group, line organizations, and external organizations. Focus on how the performance data is integrated with other data to arrest declining performance. This review should include the organization's response to EP related corrective actions identified as a result of actual events, exercises and drills.

c. Determine whether the process for allocating resources provides for appropriate consideration of safety and compliance, and whether appropriate consideration is given to the management of maintenance backlogs and correction of work-arounds.

d. Evaluate whether licensee performance goals are congruent with those corrective actions needed to address the documented performance issues.

e. By reviewing selected aspects of the employee concerns program and the results of surveys or other workplace environment evaluations, ensure that employees are not hesitant to raise safety concerns and that safety significant concerns entered into the employee concern program receive an appropriate level of attention.

f. Determine whether there is a mechanism for all members of the workforce to suggest improvements and explain their disagreements with technical resolutions of identified deficiencies. Determine whether there is a feedback mechanism in which the evaluation of deficiencies and follow-up corrective actions are reported back to the identifying workers.

g. Evaluate the effectiveness of the organization's use of industry information for previously documented performance issues.

02.03 Assessment of Performance in the Reactor Safety Strategic Performance Area (Initiating Events, Mitigation Systems, Barrier Integrity, and Emergency Preparedness Cornerstones).

a. Inspection Preparation

1. Develop an information base to allow the review of the effectiveness of corrective actions.

(a) Compile performance information from the licensee's corrective action program, audits, self-assessments, licensee event reports (LERs), and the inspection report record (both the inspection reports and the PIM) for the time period determined by the team manager. To the extent possible keeping in mind the needs of the inspection team, maximize the use of electronic data from the licensee and minimize the impact of the data request on the licensee.

(b) Review the compiled information and sort the issues by the key attributes listed below. Licensee corrective actions for the issues should be assessed as part of the following key attribute reviews.

2. Select a system(s) for focus using the plant specific individual plant evaluation (IPE) and issues identified as part of the performance information developed above.

3. Review inspection reports and critique findings from EP related event response and drills. Review a summary of recent EP corrective actions. Review recent changes to the Emergency Plan (Plan) changes. Review licensee analyses of corrective actions related to specific findings and general audits where available. Develop an inspection plan to address concerns identified as well as the inspection requirements.

4. Perform the following inspection requirements for each key attribute focusing on the selected system. While the inspectors should focus on the selected system, other systems and components may be reviewed as necessary to assess licensee performance for the following key attributes.

b. Key Attribute - Design. Inadequacies in the design, the as-built configuration, or the post- installation testing of plant modifications can cause initiating events, affect the capability and reliability of mitigating systems, and the margin of safety in barrier design. As plants age, their design basis may be misunderstood or forgotten such that an important design feature may be inadvertently removed or disabled as changes are made to the plant.

Independently assess the extent of risk significant design issues by performing the following inspection requirements. The review shall cover the as-built design features of the selected system to verify its capability to perform its intended functions with a sufficient margin of safety. Focus will be on system modifications rather than original system design. Information from this inspection will be used to assess the licensee's ability to maintain and operate the facility in accordance with the design basis.

1. Assess the effectiveness of corrective actions for deficiencies involving design.

2. Select several modifications to the system for review and determine if the system is capable of functioning as specified by the current design and licensing documents, regulatory requirements, and commitments for the facility.

3. Determine if the system is operated consistent with the design and licensing documents.

4. Evaluate the interfaces between engineering, plant operations, maintenance, and plant support groups.

c. Key Attribute - Human Performance. By nature of the design of nuclear power plants and the role of plant personnel in maintenance, testing and operation; human performance plays an important part in normal, off-normal and emergency operations. Human performance impacts each of the cornerstones and therefore should be considered across this entire inspection.

The team members reviewing this key attribute should coordinate their activities to ensure that the following inspection requirements are addressed:

1. Assess the effectiveness of corrective actions for identifying, evaluating, and correcting deficiencies involving human performance.

2. Review specific problem areas and issues identified by inspections to determine if concerns exist in the human performance cross-cutting area components as detailed in section 06.07 of Inspection Manual Chapter (IMC) 0305 “Operating Reactor Assessment Program.”

3. Conduct EP Emergency Response Organization Performance-Drills, in accordance with Inspection Procedure 82001, with a sampling of shift crews and management teams to assess their ability to implement the Emergency Plan.

d. Key Attribute - Procedure Quality. Inadequate procedures can cause initiating events by inducing plant personnel to take inappropriate actions during plant operations, maintenance, calibration, testing, or event response. Adequate procedures also assure proper functioning of mitigating systems during operation, maintenance, and testing. Emergency and abnormal operating procedures are also essential for mitigating system performance and assuring appropriate actions will be taken to preserve reactor coolant system (RCS) and containment integrity. To the extent that there are procedure deficiencies associated with the above noted activities, they should be identified as causes of problems in other key attributes.

Determine the technical adequacy of procedures by verifying that they are consistent with desired actions and modes of operation by completing the following inspection requirements.

1. Assess the effectiveness of corrective actions for deficiencies involving procedure quality.

2. Evaluate the quality of procedures and as applicable determine the adequacy of the procedure development and revision processes.

3. Review a sample of Emergency Plan Implementing Procedure (EPIPs) changes against the requirements of the Plan and corrective action assessments. Determine if the EPIP change process is adequate in correcting EPIP related deficiencies and maintaining Plan commitments in EPIP instructions.

e. Key Attribute - Equipment Performance. Equipment failure or degradation can cause initiating events during power operation and losses of decay heat removal during shutdowns. To limit challenges to safety functions due to equipment problems, licensees should have programs to achieve a high degree of availability and reliability of equipment that can cause initiating events. The availability and reliability of equipment is also critical to mitigating the impact of initiating events on plant safety. Strong preventive and corrective maintenance programs are an integral part of assuring equipment availability and reliability.

Determine that the licensee is adequately maintaining and testing the functional capability of risk significant systems and components by completing the following inspection requirements.

1. Assess the effectiveness of corrective actions for deficiencies involving equipment performance, including equipment designated for increased monitoring via implementation of the Maintenance Rule.

2. Determine if the licensee has effectively implemented programs for control and evaluation of surveillance testing, calibration, and post-maintenance testing.

3. Assess the operational performance of the selected safety system to verify its capability of performing the intended safety functions.

4. Review a sample of EP related equipment and facilities (including communications gear) against Plan commitments. Review the adequacy of the surveillance program to maintain equipment and facilities. Review the correction of deficiencies identified by the surveillance program.

5. Assess decision-making regarding longstanding equipment issues (i.e. whether conservative decisions were made and decisions supported long term equipment reliability)

6. For any unresolved long-term equipment issues, determine whether inadequate resources were a cause or contributed to any inappropriate delay in resolving those issues.

f. Key Attribute - Configuration Control. Loss of configuration control of risk-significant systems or equipment can lead to the initiation of a reactor transient and/or can compromise mitigation capability. Maintaining proper water chemistry in the RCS is essential to long term reliability of both the nuclear fuel and the RCS pressure boundary. Proper configuration control is necessary to maintain assurance that the RCS pressure boundary is maintained intact and monitored for degradation. Containment integrity depends on maintaining the configuration of penetrations and safety-related systems that need to respond following an accident. Also, maintaining the containment within its design limits ensure that it will be able to accommodate a design basis or severe accident.

Assess the licensee's ability to maintain risk-significant systems and the principle fission product barriers in configurations which support their safety functions by completing the following inspection requirements.

1. Assess the effectiveness of corrective actions for deficiencies involving configuration control.

2. Perform a walkdown of the selected system. In addition, if the selected system does not directly have a containment over-pressure safety function (such as containment spray), conduct an additional review of such a system.

(a) Independently verify that the selected safety system is in proper configuration through a system walkdown.

(b) Review temporary modifications to ensure proper installation in accordance with the design information.

3. Determine that the work control process uses risk appropriately during planning and scheduling of maintenance and surveillance testing activities and the control of emergent work.

4. Determine whether the primary and secondary chemistry control programs adequately control the quality of plant process water to ensure long-term integrity of the reactor coolant pressure boundary.

5. Assess the programs and controls (tracking systems) in place for maintaining knowledge of the configuration of the fission product barriers including: containment leakage monitoring and tracking, containment isolation device operability (valves, blank flanges), and reactor coolant leak-rate calculation and monitoring.

6. Review the results of the plant specific IPE relative to the system(s) selected. Determine if the IPE is being maintained to reflect actual system conditions regarding system capability and reliability.

g. Key Attribute - Emergency Response Organization Readiness. Implementation of the Emergency Response Plan is dependent on the readiness of the emergency response organization to respond to an emergency. In this usage, “readiness” means the ability of the licensee to activate timely Emergency Response Organization (ERO) augmentation of on shift personnel as necessary to implement the emergency plan. Self-assessments of readiness during drills and activation tests are used to identify areas for improvement. Self-assessment and corrective action resolution is critical to ERO readiness.

1. Assess the effectiveness of corrective actions for deficiencies involving ERO readiness.

2. Verify that adequate staffing is available on shift for emergencies.

3. Verify the capability to activate and staff the emergency response facilities and augment the response organization within the requirements of the licensee emergency response plan

4. Verify licensee ability to meet Emergency Plan goals for activation by implementing Inspection Procedure 71114.03, “Emergency Response Organization Augmentation.” If this inspection procedure has been implemented recently, the inspector may exercise judgment as to the need to implement the inspection procedure as part of the 95003 inspection effort. If Attachment 95003.01 is being implemented, there are additional requirements under this key attribute to consider.

02.04 Assessment of Performance in the Radiation Safety Strategic Performance Area - Occupational Radiation Safety.

a. Inspection Preparation

1. Develop an information base to allow review of the effectiveness of corrective actions.

2. Compile performance information from the licensee's corrective action program, audits, self-assessments, LERs, and the inspection report record (both the inspection reports and the PIM) for the designated time period.

3. Review the compiled information and sort the issues by the key attributes listed below.

4. Perform the following inspection requirements for each key attribute. Note that specific areas such as external and internal dosimetry are not specifically delineated and treated as key attributes, but should they need to be closely examined, the inspector should use the procedures listed in 2515 Appendix B for evaluating extent of condition.

b. Key Attribute - Program/Processes for Occupational Radiation Safety. The effective implementation of the required radiation protection (RP) program and implementing procedures contribute to proper control and minimization of occupational exposures. Programmatic deficiencies, inadequate procedures, and/or improper implementation have all resulted in significant, uncontrolled occupational exposures in excess of regulatory limits (both from internal and external radiation sources). Worker radiation exposure controls are governed by both administrative and physical controls which serve as protective barriers that prevent excessive, unintended exposures in high and very high radiation areas, and significantly contaminated and airborne areas. The facility's ALARA program focuses on ensuring that plant operations and maintenance activities are performed using planning, methods and procedures based to achieve occupational doses that are ALARA.

The team members reviewing these aspects of the key attribute should coordinate their activities to ensure that the following inspection requirements are addressed:

1. Assess the RP organization to ensure it is clearly defined (assignment of duties, authorities, and responsibilities); scope of program and the staffing are adequate.

2. Select several implementing procedures (from three or more programmatic areas - job controls/coverage, surveys, RWP issuance, etc.) and evaluate their technical adequacy. Focus on problem areas identified in previous inspections. Review the procedure development process and determine its adequacy.

3. Observe planned work activities in high radiation, high airborne, and/or highly contaminated areas and determine effectiveness of work planning, coordination, implementation and lessons learned.

4. Determine adequacy/implementation, with respect to ALARA, of the radiological source term controls and quality of related chemistry controls.

5. Determine adequacy/implementation, with respect to ALARA, of work planning and controls, focusing on outage maintenance periods.

6. Determine effectiveness and degree of management support and integration of ALARA into facility craft work units.

c. Key Attribute - Plant Facilities/Equipment & Instrumentation for Occupational Radiation Safety. To properly conduct adequate radiation monitoring and surveillance activities and to protect workers, the facility is required to maintain fixed and portable radiation survey equipment (for airborne and external hazards), respiratory protection, communication, temporary ventilation and shielding, and anti-contamination clothing. Routine calibration and maintenance of this equipment ensures its continued operability. If problems are identified during the inspection preparation or during the conduct of this team inspection, the team should pursue the inspection requirements below. The team members reviewing this aspect of the key attribute should coordinate their activities to ensure that the following inspection requirements are addressed:

1. Select several implementing procedures (from three or more programmatic areas - survey instrument calibration, self-contained breathing apparatus maintenance, etc.) and evaluate their technical adequacy. Focus on problem areas identified in previous inspections. Review the procedure development process and determine its adequacy.

2. Observe several planned equipment maintenance or calibration activities. If possible, focus on equipment used in high risk areas (high radiation or airborne areas, potential oxygen-deficient, immediately dangerous to life or health (IDLH) areas, etc.).

3. Determine level of management support in maintaining adequate equipment and support facilities.

4. Review any recommendations for plant improvements to support radiation safety and determine whether the decision based on these recommendations sufficiently supported radiation protection.

d. Key Attribute - Human Performance for Occupational Radiation Safety. Worker performance has an obvious, important impact on work activities in radiological areas. Two of the major components are health physics technician (HPT) and general radiation worker (crafts) groups. Human performance is impacted by several vital factors -- qualification and training. The selection, qualification and training requirements for facility personnel are generally governed by a commitment in the plant technical specifications (to a ANS standard). For HPTs and others, 10 CFR 50.120 (training rule) requires HPTs (including contractors) to be task qualified for their assigned normal and outage duties.

The team members reviewing this key attribute should coordinate their activities to ensure that the following inspection requirements are addressed:

1. Assess the effectiveness of identifying, evaluating, and correcting deficiencies involving human performance.

2. Review specific problem areas and issues identified by inspections to determine if concerns exist in the human performance cross-cutting area components as detailed in section 06.07 of Inspection Manual Chapter (IMC) 0305 "Operating Reactor Assessment Program."

02.05 Assessment of Performance in the Radiation Safety Strategic Performance Area - Public Radiation Safety (Radiological Effluent Monitoring, Radioactive Material Control, and Transportation of Radioactive Material).

a. Key Attribute - Plant Facilities / Equipment and Instrumentation for Public Radiation Safety. The improper installation, modification, maintenance, or calibration of radioactive effluent monitoring equipment, and associated radiochemistry laboratory equipment and meteorological system equipment can adversely affect licensee performance in achieving and demonstrating compliance with regulatory limits and ALARA design objectives for radioactive effluents. For transportation activities, shipping packages not prepared in accordance with their applicable design requirements increase the potential for unexpected exposure or loss of radioactive material which could result in uncontrolled and unnecessary exposure to members of the public. To prevent the inadvertent release of licensed radioactive material from the licensee's control requires the use of sensitive radiation survey equipment that is properly setup and calibrated.

   The team members reviewing this area should ensure the following requirements are addressed:

   1. Review the results of audits and appraisals performed for the designated time period. Review deficiency reports (also referred to as incident reports or condition reports) issued for the area being inspected.

   2. Perform a walkdown of the selected facility or equipment to assess its physical condition. Review any significant changes made by the licensee to the facilities or equipment that were not included in the prior inspection period.

   3. Determine the level of management support for the maintenance of facilities and equipment of the program.

b. Key Attribute - Program/Process for Public Radiation Safety. Procedures must be technically adequate and implemented appropriately to ensure the proper processing, control, and discharge of radioactive effluents into the environment. For transportation activities, procedural guidance is necessary for the proper evaluation of radioactive waste to determine the quantities and types of radioactive material present for the selection and preparation of shipping packages. Detailed procedures are required to conduct radiation surveys of the packaged radioactive waste to ensure that radiation levels are within regulatory limits. The performance of radiation surveys on equipment and material to be released from the licensee's facility requires appropriate policy and technical procedural guidance for handling and processing a wide variety of potentially contaminated materials.

   The team members should review the licensee's program documents and implementing procedures to ensure the following requirements are addressed:

1. Review the results of audits and appraisals performed for the designated time period. Review deficiency reports (also referred to as incident reports or condition reports) issued for the area being inspected.

2. Select several implementing procedures from the area being inspected and review for general quality (i.e., clearly written, contain specific actions, and contain data record sheets) and technical adequacy.

3. Review the licensee's program documents and implementing procedures for any recent significant changes in the area being inspected.

4. Review the records which resulted from the implementation of the selected procedures. Review them to determine if the procedure was correctly used.

c. Key Attribute - Human Performance for Public Radiation Safety. Human performance can directly affect radioactive waste processing, radioactive effluent processing, and transportation programs. It is important to ensure that plant workers are adequately trained and qualified to perform their job function. Periodic retraining is also needed to ensure that workers maintain their qualifications and are updated with new information and requirements.

The team members reviewing this key attribute should coordinate their activities to ensure that the following inspection requirements are addressed:

1. Assess the effectiveness of identifying, evaluating, and correcting deficiencies involving human performance.

2. Review specific problem areas and issues identified by inspections to determine if concerns exist in the human performance cross-cutting area components as detailed in section 06.07 of Inspection Manual Chapter (IMC) 0305 "Operating Reactor Assessment Program."

3. Observe the performance of activities described in the selected procedures. If the activities are not scheduled to be performed during the inspection time period, request that the activity be simulated so that worker performance and the adequacy of the procedure can generally be assessed.

4. Interview several personnel (i.e., technicians, engineers, health physicists, and supervisors) associated with the program to assess their level of knowledge about the program and procedures.

02.06 Assessment of Performance in the Safeguards Strategic Performance Area (Security Cornerstone).

a. Key Attribute—Physical Protection (PP). The objective of the physical protection program is to provide high assurance that the security systems and programs effectively protect against the design basis threat (DBT) and the loss or theft of special nuclear material (SNM). This area is based on defense in-depth strategies that are intended to provide protection against both internal and external threats by making effective use of all security equipment and security measures established to support the security of the facility and the implementation of the licensee's protective strategy. Other elements that are critical to the effective implementation of physical protection program are security officer training and qualifications, weapons testing and maintenance, equipment testing and maintenance, implementing procedures and the processes to maintain security-related records pertaining to these elements.

Verify that the licensee has established and maintains a physical protection program which includes systems, measures, and the necessary infrastructure to support the protection of the facility and the implementation of the protective strategy in accordance with the NRC-approved security plan, regulatory requirements, and any other applicable Commission requirements.

b. Key Attribute - Access Authorization (AA). The personnel screening process is the process used to verify trustworthiness and reliability of personnel prior to granting unescorted access to the protected area. A failure in the Access Authorization Program can compromise the licensee's ability to adequately protect against the insider threat of radiological sabotage.

   Assess the licensee's ability to implement the behavior observation portion of the personnel screening, insider mitigation program, and fitness for duty program.

   1. Verify that the licensee is identifying problems related to the access authorization program at an appropriate threshold and entering those problems into the corrective action program.

   2. Verify that the licensee has appropriately resolved the concerns and regulatory requirements for a selected sample of problems associated with AA.

   3. Verify whether issues identified are programmatic or specific to an individual.

c. Key Attribute - Access Control (Searches of personnel, materials, packages, and vehicles). The Access Control program's function is to prevent the introduction of contraband (i.e. firearms, explosives, incendiary devices) and unauthorized personnel into the plant that could aid in the attempt to commit radiological sabotage. The failure of the Access Control program could compromise required security measures in place that are required to protect vital and risk significant plant equipment and functions.

   1. Assess whether the licensee has effective access controls, and equipment in place designed and functioning as intended to detect and prevent the introduction of contraband or unauthorized personnel into the protected area that could be used to commit or aid in the act of sabotage.

   2. Verify that the access authorization process is properly used to ensure that only those personnel who have been properly screened are granted unescorted access to the protected and vital area. Verify that the licensee has procedures in place to establish, implement, and maintain a list of individuals who are authorized to have unescorted access to those vital areas during nonemergency conditions. Ensure procedures are in place and followed for denial or withdrawal of unescorted access and reinstatement, as appropriate.

d. Key Attribute - Response to Contingency Events (protection strategy, program design, and support elements). The purpose of the licensee's contingency response program is to provide high assurance that the licensee can protect identified target sets against the design basis threat and thus prevent core damage. The licensee should have developed a response strategy and the associated security response infrastructure necessary to maintain, update, and implement that strategy. The strategy's objective shall be to respond with sufficient

force that is properly armed and appropriately trained and within the appropriate time to protected positions to interdict and defeat the design basis threat in order to protect against radiological sabotage.

Verify that the licensee has established and maintains a contingency response program and the necessary infrastructure to support the performance of an adequate protective strategy.

e. Key Attribute - Response to Contingency Events (performance-based force-on-force exercises and target set evaluation). The licensee should be able to respond to contingency events with sufficient force that is properly armed and appropriately trained and within the appropriate time to defeat the design basis threat in order to protect against radiological sabotage.

   1. Verify through review of documents and discussions with the licensee that the licensee has appropriately identified its target sets and has a protective strategy associated to those target sets.

   2. Verify through the conduct of table-top drills and NRC evaluated exercises that for any selected target set, the licensee's protective strategy is adequate and it can protect against the design basis threat.

f. Key Attribute—Material Control and Accounting (MC&A). The basic objective of MC&A is to protect against the loss or misuse of special nuclear material (SNM), i.e., enriched uranium or plutonium. MC&A works in concert with physical protection to complete the Security Cornerstone with MC&A providing a record of the quantity and location of SNM at the facility, while physical protection protects the facility and the SNM located there. MC&A reduces the threat of loss or misuse in that it enables timely detection. Failure to maintain knowledge of the location of SNM significantly increases the risk of loss. This inspection is intended to assess the effectiveness of the licensee's program to keep records of and confirm the location of the SNM it is licensed to possess.

   Verify that the following aspects of the licensee's MC&A program are effective and accurate.

   1. Records. Verify, by interviewing licensee personnel and reviewing records, that activities involving both fuel and non-fuel (e.g., instruments) SNM are documented, that SNM transfer forms and physical inventory records are complete, and that any fuel failures and reconstitutions included documenting any changes to SNM content of the affected items (rods, pieces, etc.).

   2. Program and Procedures. By interviewing licensee personnel and reviewing procedures, determine if changes made to the licensee's procedures might affect SNM records. Verify that changes to procedures, if any, have not reduced the effectiveness of the MC&A program, and confirm that the changes were approved by management, SNM responsibilities were clearly identified, and personnel were trained on the new procedures.

   3. Physical Inventory.

(a) Verify that the licensee conducts a physical inventory at least every 12 months.

(b) By reviewing the latest inventory and interviewing licensee personnel, verify that the inventory includes both fuel and non-fuel SNM and that it involved physically observing the items inventoried.

(c) Confirm that the results of previous inventories were reconciled with the book inventory (as documented in the accounting records, including the spent fuel map) and that discrepancies, if any, were entered in the licensee's problem identification program for investigation and resolution.

(d) Verify by physical observation that fuel assemblies and containers with pieces of fuel rods and fuel are located where indicated by the MC&A records.

4. Reports. By interviewing licensee personnel, confirm that the licensee has made the required reports to the national Nuclear Materials Management and Safeguards System (NMMSS).

5. Resolution of Problems. Verify that the licensee is identifying issues related to MC&A and entering them in the corrective action program. Verify that the licensee has appropriately resolved a sample of MC&A issues, if any

g. Key Attribute - Security Plan Changes. The licensee's Security Plan is the licensee's plan for the physical protection at their site. An inadequate security plan can compromise the licensee's ability to protect against the design basis threat and be ineffective against acts of radiological sabotage. Changes to basic security measures could allow a direct reduction in the effectiveness of the physical protection measures that are vital to maintaining adequate physical protection.

1. Verify that changes made to the licensee's Security Plan do not reduce its effectiveness to prevent or mitigate an attack by the design basis threat or increase the likelihood of acts of radiological sabotage.

2. Verify that changes to the licensee's security procedures have not decreased the effectiveness of the previous plan, as required by 10 CFR Part 50.54(p).

02.07 Evaluate the Licensee's Third-Party Safety Culture Assessment.

The requirements in this section and the associated guidance in section 03.07 are to be implemented in evaluating the licensee's third-party safety culture assessment. At such time that an industry safety culture assessment methodology is developed and found to be acceptable by the NRC, the requirements and associated guidance in this section will be evaluated for potential revisions to address the use of such a methodology.

a. Inspection Preparation

1. Depending on the timing of the conduct of the licensee's third-party safety culture assessment with respect to the NRC's 95003 inspection, there may be opportunity for the NRC staff to engage with the licensee and the licensee's third-party safety culture assessors before initiation of their assessment. This is preferable as it allows the NRC lead safety culture assessor (SCA) and other SCAs, as designated by the lead SCA, to evaluate the third-party safety culture assessment methodology. The licensee and the third-party safety culture assessors then have the opportunity to react to NRC concerns and comments on the methodology in advance of its implementation, and to interact to be informed of the status of safety culture assessment activities. In these cases, engage the licensee and third-party safety culture assessors using the requirements in this section and the associated guidance in section 03.07. Monitor the safety culture assessment implementation and the identification of issues that arise to the extent possible.

   After the conduct of the third-party safety culture assessment, follow the requirements in section 02.08 and associated guidance in section 03.08 to determine the scope of NRC's graded safety culture assessment. It is important to note that, depending on the circumstances, engagement during the third-party safety culture assessment and the subsequent conduct of NRC's graded assessment activities may occur over several months and may need to begin before the inspection period where the entire inspection team is onsite.

2. The licensee may have conducted a recent (i.e., within the last six months) third-party safety culture assessment before the 95003 inspection was initiated. If the licensee chooses not to perform another third-party safety culture assessment, the lead SCA and the SCA subteam should use the inspection requirements in this section and the associated guidance in section 03.07 to evaluate the recent third-party safety culture assessment. If the licensee's most recent safety culture assessment was not performed recently (i.e., more than six months ago), the licensee would be expected to perform another safety culture assessment to obtain more current information on the site's safety culture.

3. The lead SCA should obtain documents and information needed to support evaluation of the licensee's third-party safety culture assessment from the licensee. The lead SCA should coordinate with the licensee to schedule interviews with the personnel who performed the assessment and licensee staff and managers responsible for implementing actions taken in response to the assessment.

4. Obtain information on any safety culture assessments conducted by the licensee within the past five years.

b. Evaluation

The lead SCA and the other SCAs, as assigned, should:

1. Review the documents relating to the licensee's third-party safety culture assessment conducted in response to being placed in the multiple/ repetitive degraded cornerstone column of the ROP Action Matrix to obtain a general understanding of how the assessment was conducted, what the assessment results were, and how the licensee responded.

2. Verify that the assessment was comprehensive, as follows:

   (a) The assessment addressed all functional groups within the licensee's organization, including, but not limited to, the functional groups that have a clear nexus to safe plant operations (e.g., operations, engineering, maintenance, security) and individuals from any contract organizations performing those functions;

   (b) The assessment included all levels of management responsible for overall safe operation of the plant(s), up to and including corporate senior management;

   (c) Sample sizes were sufficient to ensure that assessment results were representative of the populations and sub-populations addressed in the assessment; and

   (d) Information was collected relating to all of the safety culture components.

   Specifically note any safety culture component(s) where no information was collected within the scope of the licensee's assessment. If any safety culture components were not addressed, review any justifications for not assessing the specific component(s) of safety culture.

3. Review the methods used by the licensee's third-party safety culture assessment team to collect and analyze data for adequacy and appropriateness.

4. Verify that the licensee's third-party safety culture assessment team members were not employees of the plant or utility operator(s) of the plant. Review their qualifications to determine whether they were appropriately qualified to implement the tasks they performed and in conducting safety culture assessments overall.

5. Perform a detailed review of the results of the licensee's third-party safety culture assessment to determine whether:

   (a) The results drawn from the assessment were consistent with the data collected;

(b) The overall conclusions drawn from the assessment were consistent with the stated results; and

(c) If any substantial differences exist between results from the assessment and the results of similar assessments performed within the previous five years, the reason(s) for those differences are known and explained.

02.08 Determine Scope of and Plan for NRC Graded Safety Culture Assessment.

The lead SCA should:

a. Determine the scope of NRC's graded safety culture assessment, based on results of the evaluation of the licensee's third-party safety culture assessment in section 02.07, in consultation with the team leader, assistant team leader, Regional and program office management, and others as appropriate. Depending on the circumstances, the scope of the graded safety culture assessment may range from focusing on functional groups which the licensee's third-party assessment identified as having problems/weakness or insufficiently evaluated, or performing an assessment of specific safety culture components, to conducting an NRC independent safety culture assessment.

b. Determine the methods best suited for the graded safety culture assessment. Prepare the selected data collection tools, such as interview and focus group guides and behavioral observation checklists. Coordinate with the other inspection team members to determine how to obtain data from their focus areas to support the safety culture activities.

c. Identify the resource needs for conducting the graded safety culture assessment. Hold meetings with SCAs/inspectors to provide training, briefings, assignments, guidance, and other relevant information as needed. Establish a plan for communication and coordination among SCAs/inspectors during the conduct of the inspection to share data and other information.

d. Follow the guidance in section 1.i. in Attachment 95003.02 to develop and work with the licensee to disseminate a communication plan to site personnel regarding the NRC's specific graded assessment activities for their site.

02.09 Perform NRC's Graded Safety Culture Assessment.

The lead SCA and the other SCAs, as assigned, should:

a. Conduct the graded safety culture assessment based on the scope determined and using the tools developed from section 02.08.

b. Coordinate with the other inspection team members to gather insights on safety culture components that are part of their inspection focus areas. Participate in discussions with the team leader/assistant team leader/other inspection area leads to synthesize observations and insights and develop findings and conclusions. Interact with team members and group leads to assess the causes and contributors leading to the degraded performance in the affected SPA(s).

02.10 Performance Deficiency Cause Analysis.

Review and validate the licensee's root cause evaluation of the risk significant performance issue(s). Evaluate the causes of the performance deficiencies identified during the inspection.

02.11 NRC Assessment.

Compare the team's findings with previous performance indicator and inspection program data to determine whether sufficient warning was provided to identify a significant reduction in safety. Evaluate whether the NRC assessment process appropriately characterized licensee performance based on previous information. The findings from this inspection requirement will not be contained in the inspection report associated with this inspection, but should be documented in a separate report, co-addressed to the appropriate Regional Administrator and the Director of NRR.

02.12 Document Inspection Results.

Assess licensee performance in the affected Strategic Performance Area by considering the performance deficiencies, results of the inspections described above (including related observations and findings), and the need for any follow-up inspections. Document the inspection results in a single inspection report.

95003-03 INSPECTION GUIDANCE

General Guidance.

This procedure provides a framework for conducting a comprehensive assessment of licensee performance in affected strategic performance areas. As such, the procedure is broad in scope, but is designed to allow focus in certain areas where performance concerns have already been identified. While some inspection should be performed for each key attribute, certain inspection guidance is only applicable if problems are identified in that area.

In order to consolidate inspection activities, the team leader may decide to include a continuous main control room observation as part of the inspection. The results from the main control room continuous observation should satisfy several inspection requirements for the key attributes of configuration control, equipment performance, human performance, and procedure quality.

Consideration should be given to having a subteam of the inspection team members perform an inspection effort during a plant outage window. One situation when an outage inspection can be considered is when the finding(s) that resulted in the degraded cornerstone or their underlying cause(s) are related to outage activities and that cannot be assessed during non-outage periods. The goal of this inspection is to be able to evaluate how well the licensee controls outage activities, how well they control the shutdown risk, how well they operate the plant during shutdown and startup including the quality of the associated plant procedures, and how well the licensee implements plant modifications and maintenance activities.

The team leader should ensure that all team members receive "just in time" training on IP 95003 processes and methods. This training should focus on unique aspects of the 95003 inspection. Typical aspects to cover include: site performance issues, a debrief by the senior resident inspector including site specific terminology, interface aspects between the 95003 inspectors and SCAs, overview of the NRC's independent safety culture

assessment, and administrative details. To coordinate this training, team leaders should contact the Branch Chief of the Performance Assessment Branch of the Division of Inspection and Regional Support of the Office of Nuclear Reactor Regulation.

Team Staffing.

The inspection team shall be staffed with a team leader, primarily inspectors from other regional offices and/or headquarters and qualified SCAs. This provides sufficient diversity of talent and experience and knowledge, and also adds a degree of independence to the overall effort. The team leader selected to perform this inspection should have extensive experience in conducting NRC team inspections. Also, the inspection team should be staffed with an assistant team leader (ATL).

Duties and responsibilities for team members are as follows:

The team leader should ensure that an appropriate balance is maintained between determining the depth of previously identified issues and determining the breadth of performance issues within the strategic performance area. Additionally, the team leader should plan and manage the inspection and provide oversight for the safety culture assessment activities; including, coordinating all interfaces between the inspection team and licensee personnel, NRC management, and public officials.

The ATL duties and responsibilities should (1) mirror those of the team leader and (2) include the majority of the administrative tasks, and planning and managing safety culture assessment activities [in coordination with the lead SCA]. The 95003 inspection is a demanding effort, and the team leader should have flexibility to respond to emergent demands for briefing NRC management and public officials as well as maintaining overall cognizance of the inspection effort. An ATL would also aid in the freeing up valuable time for the team leader to effectively accomplish these duties.

It is also desirable to staff the inspection with at least one inspector who has detailed knowledge of the site/plant layout. Consideration should be given to using the assigned resident staff or another inspector who has recently served as a resident at the site. The SCAs with experience and/or specialized training in safety culture assessment assigned to the team will solely focus on the safety culture activities. The number of SCAs will depend on the scope of the NRC graded safety culture assessment activities.

At least one senior reactor analyst (SRA) should be assigned full time to the team. The SRA assigned to this team and other risk experts as appropriate should conduct a detailed assessment of the individual and collective risk associated with team's findings.

The use of contractor support should be considered for conducting aspects of the system design reviews, for help in reviewing the licensee's business and strategic plans, and for assistance in completing the safety culture assessment activities. The statement of work associated with contractor efforts should specifically include provisions for weekend travel for contractors as well as funding for review and concurrence on the final report.

A "team manager" should also be designated for the 95003 effort. Ideally, the team manager should be based in the sponsoring region and should be an SES-level manager. The role of the team manager is to coordinate important senior management briefings and interface with other Commission offices and external stakeholders as necessary during the conduct of the inspection. Additionally, the team manager is responsible for coordinating the acquisition of additional resources as necessary to support the overall effort.

Qualification Requirements for Safety Culture Assessors (SCAs)

The team leader should coordinate with the program office to identify the appropriate staff to function as the SCA subteam. It is important for the lead SCA to have formal training in the social/behavioral sciences and experience in conducting organizational assessment activities. Additionally, the lead SCA should have the ability to perform group lead functions, such as planning and directing activities, supervising the SCAs and other inspection team members, and communicating/coordinating with inspection team members/leads and internal/external stakeholders. In cases where staff meeting both of these criteria are not available, the use of a contractor who has the necessary education and experience background to perform the lead functions, with the exception of presenting official NRC positions, can be considered. In such cases, the contractor serves as the technical lead and should work with an NRC staff person who has leadership experience in a co-lead capacity for coordinating interfaces between inspection team and licensee personnel, NRC management, and public officials.

The lead SCA, in coordination with the team leader, should verify that the SCA subteam collectively has the appropriate credentials (e.g., through education and experience) that ensure knowledge, skills, and abilities in the following areas:

- Knowledge of appropriate methods for gathering safety culture data and their strengths and weaknesses, including: (1) individual and group interviews, (2) structured and unstructured interviews, (3) surveys, (4) behavioral observations and checklists, and (5) case studies;

- Ability to determine the applicability and likely usefulness of various data-gathering methods under different circumstances;

- Ability to implement the different methods correctly, including, but not limited to (1) conducting focus groups and interviews in a manner that elicits the desired information while reducing potential biases in the responses, (2) conducting reliable (i.e., repeatable) structured behavioral observations, and (3) collecting insights from written documentation and verbal communications;

- Knowledge of the requirements for developing, administering, and analyzing the results of surveys and questionnaires, including: (1) strengths and weaknesses of different item types (Likert, BARS, forced-choice, etc.); (2) requirements for administering a survey to reduce potential biases in the responses; (3) behavioral statistics and the appropriate methods, and their constraints, for analyzing survey data; and (4) statistical requirements for the different types of validity and reliability, and appropriate techniques to assess/measure/establish them;

- Knowledge of the rationale for a multiple-measures approach and ability to assess the limitations of a single-method safety culture assessment;

- Knowledge of statistical and conceptual constraints on determining appropriate sample sizes for each method;

- Knowledge of the alternatives for selecting samples for the assessment and the biases introduced by different sample selection strategies;

- Knowledge of theories and research in organizational and human behavior;

- Ability to integrate results from applying the different methods to arrive at defensible conclusions;

- Knowledge of the ROP and applicable inspection requirements and techniques; and

- Knowledge of theory and research in safety culture.

The background of the selected SCAs should be evaluated promptly by the lead SCA to identify any training needs. The selected SCAs should complete the identified training before participating in inspection activities.

Inspection Planning and Logistics.

The decision to perform this inspection is based on the action matrix. Based on the documented performance issues and the guidance contained in this procedure, the team leader should develop an outline for a customized inspection plan which should describe the overall scope of the inspection, team member assignments, scheduling information, etc. The team leader should then notify the licensee of the inspection dates and scope, and provide the licensee a list of requested documents that the team will need for its initial in-office review. Once the licensee has been notified, the licensee should formally acknowledge the readiness for the inspection and that the root cause analysis and the third party safety culture assessment are typically completed.

Prior to the start of the inspection, the team leader should also establish with the licensee an agreed upon method for tracking NRC information requests and potential issues (findings) that arise during the inspection. The NRC team should not provide written documentation to the licensee during the inspection, but rather, should ensure that both the team and the licensee have a common understanding of the developing issues, throughout the inspection. The joint use of a licensee developed and controlled issue tracking list is highly encouraged.

Depending upon the site-specific circumstances, flexibility is provided to implement this procedure in a number of different ways. The timing and scope of the inspection should be aligned with the NRC's understanding of the site performance issues. If a plant has transitioned into Multiple Repetitive/Degraded Cornerstone column in a gradual manner, the NRC will have a much clearer understanding of the plant issues and the timing of the inspection can await completion of the licensee root cause evaluations and safety culture assessments. For unique situations where a licensee has entered the Multiple Repetitive/Degraded Cornerstone column of the action matrix in a prompt manner resulting from a single Red finding, it may be prudent to schedule an early implementation of focused aspects of the IP95003 in order to diagnose the scope of the site issues in a timely manner.

Considerations include the benefit to conduct a sequential set of focused functional area inspections as part of the overall 95003 effort. This could include scheduling a sub-group to perform an inspection during a plant outage (rather that having the entire team on-site during the outage); and scheduling NRC safety culture assessment activities to engage with the licensee for the planning evolutions of the third-party safety culture assessment and to observe the conduct of the third party safety culture assessment. The team manager and team leader need to be aware of the potential that a number of discrete functional area inspections may dilute the effectiveness of the team. If the entire team is on-site concurrently, they can assess the plant performance in a more holistic manner. If the option is elected to conduct focused functional area inspections, one of the SCAs should accompany each inspection group to facilitate the integrated assessment of the team's observations and findings to the safety culture assessment activities perspective.

The team should prepare for the inspection at a location determined by the team leader. During this time, the team members should provide input into the inspection plan for their assigned areas and should provide input to a list of any other documentation that will be required for review on-site. All samples selected by team members for inspection focus shall be coordinated with and approved by the team leader as part of the inspection plan. This preparation phase of the inspection should normally last one to two weeks.

When the inspection is conducted with the full team, the on-site portion of the inspection should generally consist of two weeks on site, one or two weeks offsite, and a final week on-site. A final debrief should be provided to the licensee on the last day of the on-site inspection. A public exit meeting should be held approximately three weeks after completion of inspection. All team members should attend the final de-brief.

When planning for the inspection, to the extent possible, the graded safety culture assessment activities should be completed concurrent with the other parts of the inspection, for the following reasons:

a. As inspectors complete the subject inspections, they will be expected to compile observations that will be used in the graded safety culture assessment activities.

b. As safety culture assessment team members identify issues related to the subject inspections, the SCAs should inform the inspectors, so the inspectors may follow-up on those issues during their inspections.

c. As inspectors identify issues and make observations that have safety culture implications, the inspectors should inform the SCAs, so the SCAs may redirect or redeploy assessment resources to address those issues and/or incorporate those observations.

The team leader should therefore ensure that effective communication channels will exist between inspectors and SCAs responsible for completing the activities described above.

On a parallel path, identify documents to complete the assessment of the affected Strategic Performance Areas. If an evaluation of the Emergency Preparedness area will be performed using Attachment 95003.01, then also include the documents required to complete attachment 95003.01

Specific Guidance.

03.01 Strategic Performance Area(s) Identification. No additional guidance provided.

03.02 Review of Licensee Control Systems for Identifying, Assessing, and Correcting Performance Deficiencies.

a. The inspector should evaluate whether licensee evaluations into significant deficiencies are of a depth commensurate with the significance of the issue. Evaluations should ensure that the root and contributing causes of risk significant deficiencies are identified. Corrective actions should be taken to correct the immediate problems and to prevent recurrence. Include in the sample to be reviewed the licensee's evaluations associated with "white" or greater performance indicators and inspection findings that were not been previously inspected. Use the guidance contained in supplemental inspection procedure 95001 to help in evaluating the adequacy of the licensee's evaluations.

   To the extent possible, include in the sample licensee evaluations and assessments associated with programmatic performance issues and organization deficiencies, as well as those related to specific hardware issues. Consider the results of NRC's evaluation of licensee root causes performed during Inspection Procedure 71152 "Identification and Resolution of Problems".

b. Line organization, quality assurance, and external audits and assessments should be reviewed to determine whether the licensee has demonstrated the capability to identify performance issues before they result in actual events of undesired consequence. The findings of these audits and assessments should be integrated with more quantitative performance metrics and compared to those findings identified during this and other NRC inspections. Management systems should be in place to process and act upon this performance data as appropriate. The inspector should evaluate management's support to the audit and assessment process, as evidenced by staffing of the quality organization, responsiveness to audit and assessment findings, and contributions of the quality organization to improvements in licensee activities.

   With regard to EP related activities, Inspection Procedure 71114.05 "Correction of Emergency Preparedness Weaknesses and Deficiencies," contains guidance that may be useful in inspecting EP aspects of the PI&R program.

c. Processes for authorizing modifications and allocating resources for completing work should give adequate consideration to safety (risk) and the need for abiding by regulatory requirements. The authorization and allocation processes should provide for a manageable maintenance backlog and prevent the need for multiple work-arounds that could increase the likelihood of an initiating event or complicate accident mitigation.

d. The inspector should ensure that licensee performance goals are not in conflict with the actions needed to correct performance issues and are in alignment throughout the organization. To complete this requirement, a review should be performed of corporate, site, and organizational strategic plans, as well as other associated licensee documents.

e. Using the guidance contained in Inspection Procedure 40001, perform a limited review of the licensee's program for the resolution of employee concerns. In selecting samples for review, focus on those concerns and programs specifically

applicable to the strategic performance areas which are the subject of this inspection. The intent of this review is to determine: (1) whether weaknesses in the employee concerns program have contributed to previously identified performance deficiencies; (2) whether additional safety issues exist that have not been adequately captured by the corrective action program; and, (3) whether weaknesses in the employee concerns program have resulted in issues associated with the maintenance of a safety conscious work environment.

f. No specific guidance provided.

g. The team's review of licensee industry information programs should be limited to those problems that might have contributed to the previously identified performance concerns. Determine whether the licensee has adequately implemented actions as necessary to address the issue. For example, weaknesses in licensee programs to review and assess vendor information may have contributed to equipment problems.

03.03 Assessment of Performance in the Reactor Safety Strategic Performance Area.

a. Inspection Preparation

1. No specific guidance provided.

2. System Selection. During the planning process, the team leader should select a system(s) based on the plant IPE, past safety system functional inspections that may have already been performed on a system by the licensee or by other NRC teams, and through review of issues contained in the Assessment Action Matrix.

The team should select a number of electrical, mechanical, and instrumentation and control components for detailed review. The majority of these components should be from the principal system with the remainder from support systems which are necessary for successful operation of the principal system or from interfacing safety systems served by the principal system.

3. No specific guidance provided.

4. There are significant preparation activities associated with the review of the corrective actions program and the conduct of Performance-Drills. Guidance on those activities is given under the appropriate sections.

b. Key Attribute - Design

The design review portion of the inspection should be performed by inspectors (or contractors) with extensive nuclear plant design experience. It is also important that the inspectors performing the design review have a good understanding of integrated plant operations, maintenance, testing, and quality assurance so that they are able to relate their findings to the other areas being inspected.

The inspectors should focus their review on the system selected in paragraph 02.03.a.2. Specific supplemental inspection procedures are available for certain systems (e.g. service water, electrical, I/C) and should be considered as additional

guidance for evaluating their functional adequacy. Prior to evaluating the selected system, the inspectors should review the design basis documents such as calculations and analyses. The review should provide the inspectors an understanding of the functional requirements for each system and each active component throughout the range of required operating conditions, including accident and abnormal conditions. The intent is to focus on the risk significant aspects of design that could contribute to an increased frequency of initiating events, degradation of mitigation systems, or degradation of barrier integrity. The inspection is not intended to be a re-validation of the original system design.

In selecting a sample of modifications to the system to be reviewed, the inspectors should concentrate on those modifications with the potential to significantly alter the system design and functional capability. The sample should include modifications involving vendor supplied products or services where practicable, since the licensee's ability to oversee vendor supplied services is an important aspect of design control. Inspectors should consider expanding the sample of modifications, if significant problems are found. This expansion should consider other similar modifications and should not be limited to the initially selected system.

The following inspection guidance covers a comprehensive number of design areas. The inspectors should focus their review as necessary to best reflect previous performance deficiencies.

1. No specific guidance provided.

2. For the selected modifications:

   (a) Verify that the design and licensing input and output information has been properly controlled.

   (b) Check the adequacy of design calculations for the selected modifications and consider the following when evaluating the calculation design parameters of the following components:

      (1) For valves: What permissive interlocks are involved? What differential pressures will exist when the valve strokes? Will the valve be repositioned during the course of the event? What is the source of control and indication power? What control logic is involved? What manual actions are required to back up and restore a degraded function? Are the valves subject to pressure locking? Do the valves fail to their safety position? Are the valves addressed in emergency or abnormal operating procedures?

      (2) For pumps: What are the flow paths the pump will experience during accident scenarios? Do the flow paths change? What permissive interlock and control logic applies? How is the pump controlled during accident conditions? What manual actions are required to back up and restore a degraded function? What suction and discharge pressures can the pump be expected to experience during accident conditions? What is the motive power for the pump during all conditions? Do vendor data and

specifications support sustained operations at low and high flows?

(3) For instrumentation and automatic controls: What plant parameters are used as inputs to the initiation and control system? Is operator intervention required in certain scenarios? Are the range and accuracy of instrumentation adequate? What is the extent of surveillance and calibrations of such instrumentation? What are the power sources during blackout conditions?

(c) Compare the as-built design with the current design basis and the licensing requirements for the selected system and consider the following questions:

(1) Verify that the modification does not invalidate assumptions made as part of the original design and the accident analyses, including interfaces with supporting systems. For example, are service water flow capacities sufficient with the minimum number of pumps available under accident conditions? Are the voltage studies accurate and will the required motor operated valves (MOVs) and relays operate under end-of-life battery conditions and degraded grid voltages? Are fuses and thermal overloads properly sized? Are current dc loads within the capacity of the station batteries? Is the instrumentation adequate in range and accessibility for operations to control the system under normal and abnormal conditions? Are maintenance frequencies sufficient to maintain the equipment within the range of acceptable operating parameters such as motor operated valve friction factors? Are test results for the system consistent with the design assumptions?

(2) Does the modification invalidate design input parameters provided to accident analyses vendors?

(3) Have modified structures surrounding safety equipment, components, or structures been evaluated for seismic 2-over-1 considerations? Have modified equipment or components under the scope of 10 CFR 50.49 been thoroughly evaluated for environmental equipment qualification considerations such as temperature, radiation, and humidity?

(d) Verify whether the selected modifications have introduced an unreviewed safety question.

(e) For the selected system, review recent changes to maintenance procedures and operating procedures to confirm that the changes have not introduced new design parameters or changed current design

parameters. Confirm that any such design changes have been subjected to the formal design change process (e.g. 50.59 review).

Examples of potential inadvertent design changes follow:

(1) changing maintenance/surveillance procedures to tighten the packing on the main steam non-return check valves such that they are no longer free-swinging gravity-closing valves;

(2) changing emergency operating procedures to require that operators immediately throttle auxiliary feedwater following a reactor trip to prevent pump runout/failure that could otherwise occur during a main steam line break.

(f) Ensure that verification and validation of computer programs used for design and for monitoring of important safety features has been adequately accomplished.

3. Consistency between system design and operation.

(a) Verify that training programs are consistent with the current design.

(b) Verify that operator actions can be performed in the required time-frame to mitigate design basis events. Verify that any changes to operator actions resulting from system modification(s) have been subjected to a safety evaluation and are consistent with the UFSAR including the accident analyses.

(1) Was reliance on the operator actions approved by the NRC?

(2) Is there reasonable assurance that, under all anticipated circumstances (e.g. lighting, ambient temperature, radiation levels) operators can perform the actions within the times assumed in the accident analyses?

4. Evaluation of communications affecting design control.

(a) Assess the ability to communicate accurate information on the status of system modifications. Plant policies on updating design related material such as the UFSAR may not support timely documentation of changes to the system. Verify that provisions are in place and being followed to assure the accurate recording of the as-designed and as-built conditions during the interim period between modification implementation and incorporation into the plant design basis documents.

(b) Verify that operations involves engineering in determining the operability of degraded safety systems and components (SSC's).

(c) Verify that operations, engineering, maintenance, and affected plant support groups are involved in the evaluation and concurrence process for approving:

(1) performance of non-routine maintenance activities

(2) temporary modifications

(3) field change requests

(d) Review the licensee's control of vendor supplied services and products including the evaluation for technical adequacy and quality assurance. The licensee's evaluation and control of vendor supplied services and products should be multi-disciplinary in its approach, including operations, engineering, maintenance, and the affected plant support groups.

(e) Verify that self-revealing deficiencies and those identified by the licensee's vendor control process are properly communicated to the vendor.

c. Key Attribute - Human Performance.

1. Using data from the licensee's corrective action program, LERs, and audits, determine if human performance issues have contributed to performance issues. Evaluate the overall effectiveness of human performance corrective action commitments. Determine if the problems were reviewed by the appropriate level of management and prioritized according to their safety significance. Evaluate whether the corrective actions were technically correct and implemented in a timely manner.

2. Review the following human performance components, as related to the previously identified human performance issues.

(a) Work Control

(1) For operations, assess whether:

(aa) The turnover environment is adequate for clear communication;

(bb) On-coming operators are walking down panels with current operators or independently;

(cc) The turnover process is proceduralized and procedures are being followed;

(dd) Necessary plant status information is identified, and equipment/ operational problems are discussed in enough detail for the oncoming shift to understand. After turnovers, verify that the operators have sufficient knowledge of the plant conditions and activities in progress.

(ee) Review the licensee's administrative procedure for the shift supervisor's conduct and duties. Verify that shift command and control is maintained.

Inspectors should try to observe at least two different shifts, including a back-shift.

(2) For on-line maintenance work windows, complex surveillance and tests, verify that the activities are coordinated with the control room, the shift supervision is maintaining effective control of plant operations, and the control room is implementing the compensatory measures required by the risk/safety evaluation. Observe pre-evolution briefings and communication between operations and other disciplines to verify that effect on safety and risk is being considered.

(3) Review a number of scheduled and non-scheduled maintenance activities. Question the control room operators to determine their awareness of ongoing activities that could affect plant operations, and the priorities in resolving plant issues and equipment problems. The intent here is for the inspector to verify that control room personnel are appropriately aware of ongoing activities, such as maintenance, surveillance and testing, plant equipment taken out of service, and their impact on plant operation; and are implementing the necessary actions.

(4) Perform a tour of the plant and note indications of operator work-arounds or conditions that might require work-arounds including:

(aa) Unapproved job aids or marking;

(bb) Equipment that is not performing as designed;

(cc) The potential for adverse environmental condition(s), e.g., insulation removed from high energy lines, doors left open that are required for area isolation during a high energy line break in an adjacent area, and open doors that may render blowout panels and back-draft dampers inoperable.

(5) The inspector should review a sample of written logs and shift status reports or updates to verify that they:

(aa) Provide sufficient detail to allow a full understanding of operationally significant matters, including abnormal occurrences or test results and any compensatory measures taken;

(bb) Describe changes in plant or equipment status.

(6) Human-System Interfaces including work area design and environmental conditions.

(aa) Using the guidance contained in Inspection Procedure 71841, “Human Performance,” perform a review of identified problem areas.

(bb) As necessary, if specific problem areas are identified the inspector should:

(i) walk down several control panels to evaluate the size, shape, location, function or content of displays, controls, and alarms;

(ii) evaluate work areas for accessibility of equipment, equipment layout, emergency equipment location, including location of remote panels;

(iii) evaluate the impact of environmental conditions on human performance.

(7) An evaluation should be performed to assess whether communications between departments and licensee management provide information needed for continued safe plant operation. Included should be:

(aa) An evaluation of the responsiveness and timeliness to requests for assistance and problem resolution;

(bb) An evaluation as to whether other departments are aware of the extent and significance of deficiencies that cross-cut organizational boundaries.

(b) Decision-making - For identified areas of human performance problems, assess whether the following decision-making practices support human performance while observing control room and local operations and other work activities:

(1) The roles and authorities of personnel are clearly defined and understood.

(2) Operational decisions and their bases are communicated.

(3) Interdisciplinary input and reviews of safety-significant or risk-significant decisions are sought.

(4) Decision-making is systematic when personnel are faced with uncertain or unexpected plant conditions.

(5) Conservative assumptions are used and possible unintended consequences are considered.

(c) Work Practices - Assess whether personnel work practices support human performance.

(1) Observe operators perform evolutions, tests, and response to annunciators, if possible. Evaluate whether the evolution was performed in accordance with approved directives and night orders, if applicable. Directives and night orders are often issued by plant management, and disciplines such as chemistry, reactor engineering, and systems engineering.

(2) Observe routine activities of licensed and non-licensed personnel.

(aa) Verify that procedural requirements are being met and that procedures are implemented using the correct level of use (i.e. continuous, reference, etc.).

(bb) Determine whether deficiencies are resolved using the corrective action program rather than implementing their own work-arounds.

(cc) If possible, during evolutions, tests, and response to annunciators, determine whether operator actions or compensatory measures were required due to degraded equipment of plant conditions, resulting in an operator work-around.

(dd) Determine that human error prevention techniques, such as holding pre-job briefings, self and peer checking, and proper documentation of activities, are used commensurate with the risk of the assigned task, such that work activities are performed safely.

(ee) Determine that supervisory and management oversight of work activities, including contractors, is effective.

(ff) Determine that personnel do not proceed in the face of uncertainty or unexpected circumstances.

(gg) Determine whether these individuals are knowledgeable about the current status of SSCs and equipment performance and understand the impact of ongoing work activities.

(3) Assess the quality of communications by observing whether:

(aa) Communications are consistent with licensee procedures during the conduct of operations, maintenance and testing activities;

(bb) Instructions or information disseminated using the plant's phone and paging systems are clearly and concisely communicated;

(cc) Personnel inform the appropriate level of management of any abnormal conditions or significant changes in plant equipment and systems.

(4) TS and/or procedure prerequisites are satisfied before procedures are executed.

(5) Assess whether the operators exhibit attentiveness and are pro-active in assessing plant conditions that may indicate a safety concern;

(d) Resources - Assess that personnel, equipment, procedures, and other resources are available and adequate to assure nuclear safety.

(1) For identified areas of human performance problems, verify that training and personnel qualifications are adequate and appropriate for the level of work being performed.

(aa) If possible, observe classroom training and work in progress using the checklists of NUREG-1220, Training Review Criteria and Procedures, Rev.1.

(bb) Using the guidance in Inspection Procedure 41500, perform a limited review of training problem areas. If necessary, interview trainees, supervisors, and instructors using the IP 41500 guidance.

(2) In instances where previous performance issues were related to the use of excess overtime perform the following reviews.

(aa) Review the licensee's process for controlling overtime.

(bb) Interview personnel identified as having worked overtime to determine how management ensures that personnel are not assigned to safety related duties while in a fatigued condition.

(cc) Interview personnel involved in working hours in excess of those listed in the plant's technical specifications (with or without approval) to evaluate indications of recurrent/routine use of overtime.

(dd) Interview personnel involved in working hours in excess of those listed in the plant's technical specifications to determine whether they are willing to report whether they or others are fatigued.

(ee) Refer to IP 93002, "Managing Fatigue," for guidance on the requirements of 10 CFR 26, Subpart I – Managing Fatigue. Assess the need for performing a specific section of the

procedure based on previous performance issues related to fatigue management.

(3) If applicable, review the control room disabled annunciator logs. For selected safety-significant annunciators, question the operators as to why annunciators are in alarm conditions, what operator response was required by the procedure(s) and if taken, if continuously lit annunciator windows prevent annunciation of new alarm conditions, and why and how annunciators are removed from service. For control room and local annunciators that cause operator distractions, determine if a controlled process for their removal is in place that includes an assessment of operational impact, compensatory actions, authorization, and corrective actions for restoration. Also, review the alarm summary printout to determine if any significant alarms occurred that were not documented in the control room logs, and whether the operators were aware of and had taken appropriate action. Review of the alarm summary printout may lead to important operator performance indication during and after a transient.

(4) Review a sampling of work packages to verify that the documentation is complete, understandable, and accurate.

(5) If applicable, review inadequate equipment labeling.

(6) If applicable, review inadequate maintenance, surveillance, or operating procedures.

3. The guidance for observed Performance-Drills found in inspection Procedure 82001 Attachments 01 & 02 may be used to construct drill scenarios and evaluate performance.

(a) Evaluate Performance-Drills with a sample of off-duty shift crews, including the Shift Supervisor and appropriate support personnel. During the drill evaluate capability to (1) classify hypothetical conditions notify local authorities (3) perform dose calculations (4) recommend appropriate protective actions. This scope allows the assessment of licensee performance in all the RSPS. The inspection report should document licensee capability accordingly. The distinction between low significance mis-steps and the capability to implement the Plan to protect public health and safety should be clearly delineated.

(b) A small sample of significant changes to the licensee's emergency operating, abnormal operating, emergency response procedures and equipment can be examined and discussed with personnel to determine whether they are aware of the changes, understand them and have received training appropriate for their use.

(c) It should be noted that there is no intent to inspect the licensee’s ability to critique the performance-drills. The inspection is performed to verify the licensee’s ability to implement the Emergency Plan, not verify the

ability to critique drills as is done under the baseline inspection procedure. As such, poor performance should be documented as observations under "scope" in the EP section of the inspection report. Corrective action program identification numbers may be included in the report to facilitate verification of correction during future inspections.

d. Key Attribute - Procedure Quality.

1. Evaluate to what extent procedure quality has contributed to previously identified performance issues. In performing this evaluation, select a sample of procedures which reflect instances where problems with procedures have been documented in LERs, NRC inspection reports, or licensee assessments or audits. Focus on the technical adequacy of the procedures using the following guidance as applicable. Evaluate the licensee's actions to address the procedure inadequacies.

2. Development and review of procedures.

(a) When reviewing procedures, the inspector should assess the technical adequacy of the procedures and determine if the procedural steps will achieve required system performance for normal, abnormal, remote shutdown, and emergency conditions. The inspectors should determine if the system is operated in accordance with the system design.

(b) Determine whether the procedures will accomplish the activity within the design characteristics and regulatory requirements. During this evaluation, the review may include technical specifications, limiting condition for operation, UFSAR descriptions, vendor manuals, design information, piping and instrumentation drawings (P&IDs), and instrumentation and electrical wiring and control diagrams.

(c) Review maintenance procedures for technical adequacy. Determine if the procedures are sufficient to perform the maintenance task and provide for identification and evaluation of equipment and work deficiencies. Verify the use of quality verification holdpoints for independent verification of important attributes. Check the procedure content against the vendor manuals to verify that the procedure satisfies the vendor requirements for maintaining the equipment in proper working order. Verify that important vendor manuals are complete and up-to-date. Documents, such as vendor manuals, equipment operating and maintenance instructions, or approved drawings with acceptance criteria, may by reference be part of a procedure. If these documents are so used, the documents (or applicable portions) require the same level of review and approval as the procedure that references it.

(d) If the technical adequacy of procedures is a concern review the following.

(1) Review a sufficient number of procedures to provide assurance that the procedures (including checklists, and related forms) in the plant working files are current.

(2) Verify that personnel have the ability to reference an up-to-date and accurate copy of documents. This is necessary because the controlled drawings may not be revised, unless changes due to modifications are extensive. As an interim measure, some utilities have marked-up a controlled set of the control room documents to show the design changes. In such situations, the inspector should also verify that revisions of the controlled documents incorporating the marked-up changes are performed in a timely manner following the modification.

(3) Procedure changes should be in accordance with licensee processes and regulatory requirements. Verify the adequacy of all procedure changes which resulted from recent (within the last year) license change(s) or revision(s) to a technical specification.

(4) Verify procedure changes are in conformance to 10 CFR Part 50.59. This item applies only to changes to procedures which are described or summarized in the UFSAR, normally a small portion of the procedures in use at the facility. General guidance and contrasting examples relating to the procedure changes which can be made by the licensee are described in NRC Inspection Manual Part 9900, "Guidance on 10 CFR 50.59 -- Changes to Facilities, Procedures, and Tests (or Experiments)."

(5) Through discussions with personnel and a review of approved procedures, determine if skilled craft, engineering, and technical support personnel contribute to the development, review, and approval of procedures. Are special or complex procedures “dry run” and discussed prior to use?

(6) Incorporating accepted human factors principles about format and writing style into procedures increases the likelihood that the procedures will be easier to use and follow. Standards for format and writing style can usually be found in the licensee's writer's guide. Usability should be determined by evaluating the degree to which procedures follow the guidance outlined in the writer's guide.

(7) When a writer's guide is not available or if the writer's guide is in question, procedure usability can be determined by evaluating the elements of writing style, format, and organization described in Inspection Procedure 42700, “Plant Procedures.”

(e) Verify temporary procedures were properly approved and did not conflict with technical specifications requirements. Review a sample of temporary procedures and temporary procedure changes issued during the past year to determine that the approval and subsequent review requirements of the technical specifications are being followed. Determine whether the licensee has procedural limitations on how long a temporary procedure or a temporary procedure change can be in effect, and compare this with observed practices. Verify that unapproved “procedures” are not instituted by night orders, work orders, etc.

(f) Review the method by which the licensee incorporates temporary changes to emergency or significant event procedures. The method used should not be so complicated as to preclude proper and timely operator action during abnormal plant conditions. The NRC position concerning control of procedural adherence is described in NRC Inspection Manual Part 9900, "Technical Guidance, Operations -- Procedural Adherence."

(g) NRC Inspection Procedure (IP) 42001, "Emergency Operating Procedures," and the NUREGs referenced in it provide additional guidance for reviewing, developing, implementing, changing and maintaining emergency operating procedures. The team leader should consider adding an emergency preparedness specialist inspector to the team if a detailed review of emergency plan implementing procedures is to be conducted.

(h) Inspection Procedure 82001.05 contains guidance for the inspection of emergency plan implementing procedures.

3. No specific guidance provided.

e. Key Attribute - Equipment Performance.

1. Corrective actions

(a) Based on implementation of the maintenance rule, 10 CFR 50.65 "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants", the inspectors should evaluate the maintenance area by concentrating on performance examples that have shown to be a product of poor maintenance programs. Performance issues should be identified by the inspectors during the review of non-conformance reports, machinery history results, plant tours, observation of maintenance work activities, LER reviews, and NRC and licensee's assessments. Risk significant SSCs identified with poor performance should receive the highest priority. After identifying the performance issue, the inspectors should attempt to determine its cause and use this performance example as a means to establish issues in any of the maintenance related programs. The inspectors

should also see if the licensee appropriately implemented the maintenance rule in correcting the performance issue and whether the licensee is maintaining an appropriate balance between SSC availability and reliability.

(b) Examples of maintenance program issues include a relatively large maintenance work request backlog, related maintenance work not being accomplished in accordance with written administrative and procedural controls, and not identifying procedures for needed changes.

2. Programs and processes for testing

(a) Determine that effective methods have been implemented for review and evaluation of surveillance test/calibration data, including procedures for reporting deficiencies, failures, malfunctions, etc., identified during the tests/calibrations or inspections with required verification of operability.

(b) Review a sample of post-maintenance tests to ensure that the tests are adequate to ensure that the equipment has been returned to an operable configuration.

(c) Verify that the surveillance test procedure acceptance criteria are adequate to demonstrate continued operability.

(d) Verify that the licensee is effectively calibrating instruments that are important to safety. The Technical Specifications do not specify calibration requirements for some of these instruments, for example: boric acid tank temperature; discharge pressures for various engineered safety feature pumps; safety injection accumulator level and nitrogen cover gas pressure; cooling water flow to containment coolers; main steam isolation valve limit switches used to verify valve closure time and provide input to reactor protection system.

3. Operational performance of systems and components. Observe any maintenance or testing performed on the selected system while the inspection team is onsite.

(a) Walk through the system operating procedures and the system P&IDs. If any special equipment is required to perform these procedures, determine if the equipment is available and in good working order. Verify that the knowledge level of operators is adequate concerning equipment location and operation.

(b) Conduct interviews with licensee personnel to determine how the system is operated. Determine if system operation is consistent with the intended safety function.

(c) Determine if the environmental conditions assumed under accident conditions are adequate for remote operation of equipment, such as expected room temperature, emergency lighting, steam, radiation levels, etc.

(d) Review the maintenance program for the selected system to determine if the preventive maintenance (PM) requirements are adequate and comprehensive.

(e) Review applicable design documents, vendor manuals, generic communications (i.e., Bulletins, Information Notices, Generic Letters, and special studies) and verify that the licensee has integrated and implemented the applicable items into the maintenance program.

(f) Conduct interviews with personnel to determine what maintenance and modifications have been performed. Determine if the maintenance and modifications are consistent with the licensing basis.

(g) Determine if engineering input into maintenance activities is at an appropriate level to ensure safe and reliable plant operations.

(h) Verify that methods and responsibilities have been designated for performing functional testing of structures, systems, or components following maintenance work and/or prior to their being returned to service.

4. Inspection Procedure 82001 Attachment 4 contains guidance for the inspection of EP related equipment and facilities that may be useful.

5. Review records of decisions regarding actions to address long standing issues to determine whether the decisions appropriately and conservatively considered safety.

6. Review records of decisions regarding actions to address long standing issues to determine whether resource implications were appropriately considered and whether inadequate personnel, equipment, or procedures contributed to a delay in resolving the issue.

f. Key Attribute - Configuration Control.

1. Select a sample of the corrective action process/PIM issues related to configuration control and review the adequacy of the corrective actions implemented. Review all operability determinations that have been completed on the selected system.

2. System Walkdown

(a) For the selected system, obtain current drawings and review the associated operating procedures and UFSAR sections. Review the licensee's system lineup procedure, system design basis documents,

and determine whether the documents are consistent with the as-built configuration.

Compare system line-up procedures with drawings to ensure that they are consistent (e.g., valve positions, installation of blank flanges and caps).

(b) Review jumper, lifted lead, and other temporary modification logs. Determine (1) if an adequate technical review was performed before the plant modification was performed to ensure the absence of unreviewed safety questions, and (2) if plant drawings were updated, as needed, to reflect the change. The licensee's controls for limiting the duration of temporary modifications should be reviewed. Assess the role of the plant, system, and design engineering groups in the temporary modification process.

(c) Determine if accessible valves in the system flow path are in the correct positions by either visual observation of the valve; by flow indication; or by stem, local or remote position indication and that they are locked or sealed, if appropriate.

(d) Verify that valves do not exhibit excessive packing or boron leakage, missing hand-wheels or bent stems. Ensure that local and remote position indications are functional and indicate the same values. Remote manual operating devices should be functional.

(e) Verify that pump seals do not show signs of excessive leakage.

(f) Verify that cooling water is aligned to bearings and seals and that oil bubblers and bearings do not show signs of excessive leakage.

(g) Verify that power is available and correctly aligned, functional, and available for components that must activate on receipt of an initiation signal.

(h) Verify that major and support system components are correctly labeled, lubricated, cooled, and ventilated to ensure fulfillment of their functional requirements.

(i) Review system mechanical joints (packing, flanges, body to bonnet joint) leakage requirements and verify that known leakage is properly addressed and that observed leaks are accounted for.

(j) Determine if selected instrumentation, essential to system actuation, isolation, and performance, is correctly installed and functioning, correctly calibrated, and displaying indication consistent with expected values. Instrument elevations are consistent with design documents.

(k) Identify whether actual or potential adverse environmental condition(s) exist, and the adequacy of any compensatory measures.

(l) Identify whether components inspected for the system are consistent with the UFSAR description. Determine whether a 10 CFR 50.59 safety evaluation was performed for any items that differ from the UFSAR description.

(m) Identify additional equipment conditions and items that might degrade plant performance by verifying whether:

(1) Freeze protection, such as insulation, heaters, heat tracing, temperature monitoring, and other equipment, is installed and operational.

(2) Hangers and supports are in their proper positions, aligned correctly, and intact.

(3) No unauthorized ignition sources or flammable materials are present in the vicinity of the system being inspected.

(4) Cleanliness is being maintained.

(5) Temporary storage of material and equipment is in accordance with the licensee's seismic control procedures and does not interfere with equipment operations or operator actions.

3. Maintenance Work Control

(a) Determine the nature and extent of the licensee's backlog of corrective and preventive maintenance, especially concerning equipment of high safety significance. Assess the licensee's efforts to integrate preventive and corrective maintenance to minimize equipment unavailability.

(b) Assess the licensee's process for planning work, including the assessment of risk and the inclusion of new emergent work into the schedule. Review the licensee's policies with respect to schedule generation and the use of risk insight. Select several work packages on safety related equipment and determine how risk was factored into their scheduling. Assess whether the licensee evaluates possible interactions between components in service and those to be tested. Assess whether the need for planned contingencies, compensatory actions, and abort criteria were considered.

(1) What risk assessment tools are provided to the operators?

(2) What risk training has been given to the planning staff?

(3) Who has the absolute say in allowing work to progress?

(4) How is emergent work factored into previous risk evaluations?

(c) For the selected systems review the operating performance history and compare it with the assumed out-of-service times in the IPE. Ensure that the assumptions are conservative with respect to actual equipment performance.

(d) If warranted as a result of past performance deficiencies, select one or more safety system tag-outs for inspection. Determine if the tagout is adequate for the work to be accomplished. Verify in the plant that operators are thorough in tagging and isolation of plant equipment. Verify by observation that tags are properly hung and equipment has been placed in the designated position. Determine if equipment status changes and corresponding entry into or exit from technical specification action statements are appropriately documented.

(e) If warranted as a result of past performance deficiencies, determine if the licensee has adequate controls to ensure the independent verification of equipment status, particularly when equipment is returned to service.

(f) Verify that maintenance activities are coordinated with control room operations and that appropriate briefings and turnovers are held with control room operators.

(g) Equipment that is environmentally qualified should be identified as such prior to maintenance and sufficient controls should exist to ensure it is returned to that status upon reassembly.

(h) The inspectors should review the following: long-term (typically greater than six months) tagouts (caution and danger tags), disabled control room annunciators and instruments, control room deficiencies, operator work arounds and other equipment deficiency tracking systems to assess the significance of these conditions.

(i) If warranted as a result of past performance deficiencies, review the licensee's process for using rapid response maintenance teams.

(j) Verify that work control procedures have been established to require special authorization for activities involving welding, open flame, or other ignition sources and take cognizance of nearby flammable material, cable trays, or critical process equipment. Ensure that work control procedures have been established to require a firewatch, with capability for communication with the control room, if an activity identified above is to be performed in the proximity of flammable material, cable trays, or vital process equipment. Procedures should

address scaffold controls around safety, critical or operating equipment.

4. Chemistry Controls - limit reviews to primary and secondary chemistry which could degrade the RCS pressure boundary.

   (a) Review records of completed chemical analyses to determine if required analyses have been performed.

   (b) Review trends of recorded water quality data.

   (c) Assess corrective actions taken when chemical variables have exceeded the established levels or limits, including consideration of the timeliness of these actions.

   (d) Assess the effectiveness of measures taken to prevent the introduction of chemical contaminants into primary and secondary coolant water and to detect the presence of these contaminants.

   (e) Review licensee evaluations of parameter trends associated with steam generator leakage.

5. Fission Product Barrier Assessment

   (a) Observe a selected portion of the containment isolation lineup and independently verify whether valves, dampers and airlock doors are being properly controlled in accordance with the Technical Specifications.

   Select several components and independently verify that they are in their required positions. Where possible, confirm valve position indication by direct observation of valve mechanism. For valves that isolate on a containment isolation signal verify proper breaker position and availability of power supply. Also, for motor and air-operated valves, verify they are not mechanically blocked and power is available, unless it is required to be otherwise. Inspect piping and the associated test, vent and drain valves, if any, for possible leakage paths.

   (b) Assess the licensee's method of calculating the RCS leakrate.

   (c) Containment temperature and pressure monitoring - review the licensee's procedures for ensuring that the containment atmosphere and/or water space meets the design basis assumptions for average temperature and pressure.6. No specific guidance provided.

g. Key Attribute - Emergency Response Organization Readiness.

The guidance of Inspection Procedure 71114.03 is applicable and may be useful.

03.04 Assessment of Performance in the Radiation Safety Strategic Performance Area - Occupational Radiation Safety.

a. Inspection Preparation.

1. No specific guidance provided.

2. Look particularly for those audits and self-assessments that probe for programmatic weaknesses and assess the quality of the program. Look for trends indicative of programmatic weaknesses. Requirements for reviews and audits normally are contained in the technical specifications. Audit teams should include someone with experience or training commensurate with the scope, complexity, or special nature of the activities audited.

3. No specific guidance provided.

4. No specific guidance provided.

b. Key Attribute - Program/Processes for Occupational Radiation Safety

1. Each position within the RP organization should have its own position description with authorities and responsibilities clearly defined. For example, each health physics technician (HPT) should know what authority should be exercised to ensure the RP program can be effectively implemented (e.g., enforce the stoppage of work, adherence to procedures). The HPT and the crafts workers should all understand these responsibilities and authorities. The inspector should be sensitive to the designated radiation protection manager's position in the facilities reporting chain and level in the organization and how this affects the RPM's direct recourse to onsite station manager on problems with the conduct of the radiation protection program. The impact of any organizational change in the RPM position relative to its level should be examined and discussed with appropriate level of management.

   Determine if adequate HPT coverage is being provided during outages and normal backshift operations. Determine the extent of first-line supervision (foremen) presence in the field -- past lack of foremen having direct involvement at the onset of infrequent work activities in high radiation areas has contributed to serious mishaps and over exposures.

2. Evaluate to what extent procedure quality has contributed to previously identified performance issues. Select a sample of procedures where problems with procedures has been documented in LERs, NRC inspection reports, or licensee assessments or audits. Focus on the technical adequacy and completeness of the procedures using the following guidance as applicable.

(a) When reviewing the procedures, the inspector should determine if the procedural steps will achieve the required goal. The inspector should determine if the procedure is understood and used by the HPTs.

(b) Verify that the licensee has a workable system to ensure that the plant working files contain current procedures (including checklists and related forms).

(c) Procedure changes should be in accordance with licensee processes and regulatory requirements. Verify the adequacy of all changes (within the last year) in a selected area of concern (e.g., RWP issuance).

(d) Through discussions with personnel, determine if HPT and first line supervision contribute to the development, review and approval of procedures.

(e) Verify temporary procedures were properly approved and did not conflict with requirements, by review of a sample of recent temporary procedures and revisions to them.

(f) NRC Inspection Manual 9900 provides the NRC position on control of procedural adherence.

3. Effective radiation work practices include considerations of high and very high radiation areas and awareness of potential hazards (e.g., in diving operations, removing neutron-activated items from the reactor, and other non-routine and infrequent operations). See Regulatory Guide 8.38, " Control of Access to High and Very High Radiation Areas in Nuclear Power Plants" for further guidance on these problem areas. Based on current licensee work planning, select at least three jobs being performed in radiologically challenging areas. Whenever possible, select jobs in locked high radiation areas (with >1 rem planned job collective person-rem). Additionally, focus on work in Airborne radioactivity areas, with a special emphasis on areas were transuranic radionuclides may be present.

(a) Review all pertinent job requirements (RWP, work control procedures, etc.), attend job briefing, and observe infield work and judge compliance to above requirements.

(b) Determine if the job conditions were adequately communicated to the worker, by pre-work briefing and work site postings.

(c) Verify accuracy of required surveys, HPT job coverage is consistent with RWP requirements. Verify that worker dose monitoring is consistent with licensee and regulatory requirements. This should include the need for extremity and multi-badging for DDE. Improper uses of digital alarming dosimeters have resulted from (1) lack of training in their proper use, (2) use in high noise areas or under

protective clothing, which made the alarm inaudible, and (3) poor (or no) procedures for their use.

(d) Attend any post-job debriefing to capture any lessons learned discussion. Determine how (if) licensee incorporates applicable lessons learned into procedures, RWP process, etc.

(e) Review the diving procedure and determine if it meets of intent of Regulatory Guide 8.38, Appendices A and B. See Information Notice 97-68, “Loss of Control of Diver in a Spent Fuel Pool” for further guidance.

(f) Transuranics can be a potential airborne problem at plants with previous fuel performance problems (fuel leakers). See Information Notice 97-36, “Unplanned Intakes By Worker of Transuranic Airborne Radioactive Materials and External Exposure Due to Inadequate Control of Work”. Note that while a plant (with a history of fuel leakers) may not have seen significant evidence of transuranics for years (on loose-contamination smears or routine air samples), alpha contamination may be incorporated into a corrosion layer on the interior surfaces of system components that carry primary system fluids. When these interior surfaces have be perturbed (by mechanical actions like scabbling), high levels of transuranic airborne activities have resulted in significant, unplanned worker intakes.

(g) Review each planned special exposure to determine whether it meets the requirements of 10 CFR 20.1206. See Regulatory Guide 8.35, "Planned Special Exposures."

(h) Review a selected sample of the records of exposures of declared pregnant women to determine whether, in each case, the dose to the embryo/fetus meets of the requirements of 10 CFR 20.1208. See Regulatory Guide 8.36, "Radiation Dose to the Embryo Fetus."

4. Review the extent to which the licensee has implemented or assessed methods offering significant potential for reducing occupational radiation exposure by reducing out-of-core radiation sources/fields. The following techniques are reported to be available for reducing exposure [See the Electric Power Research Institute (EPRI) report TR-107991, "Radiation Field Control Manual - 1997 Revision," October 1997.]

(a) PWRs: Methods available now that can provide an immediate impact are (a) chemical decontamination together with a modified pH primary chemistry control program (2.2 ppm Li, pH 7.2- 7.4) and use of Zircalloy fuel grids, and (b) valve maintenance procedures to remove Co debris. Methods available now that will have a slower impact are (a) Zircalloy fuel grids without decontamination, (b) electropolishing of replacement steam generators, c) cobalt replacement guidelines and

NOREM valves, (d) use of low-cobalt Inconel 690 tubing for replacement steam generators.

(b) BWRs: Methods available now that can provide an immediate impact are (a) chemical decontamination together with (1) replacement of control blade pins and rollers and (2) zinc injection, (b) installation of cobalt-free feedwater control valves, and c) valve maintenance procedures to remove Co debris. [Note: The use of natural zinc injection has resulted in problems at some BWRs. The zinc-65 produced by neutron activation of zinc has caused higher radiation fields, higher volumes of radioactive waste, and in at least one case, surface contamination problems. As of October 1997, these problems are minimized by the use of depleted zinc. The industry is currently developing the most cost effective approach to zinc injection. Methods available now that will have a slower impact are (a) pins and rollers replacements and zinc injection without decontamination, (b) electropolishing/pre-conditioning replacement components, and (c) cobalt replacement guidelines. Methods showing promise are (a) replacement of in situ pins and rollers, and (b) NOREM cobalt-free hardfacings for valves.

The techniques above involve cobalt source reduction, preconditioning of out-of-core surfaces, control of crud transport (water chemistry control), and chemical decontamination.

Licensees should not be expected to implement a method for reducing out-of-core radiation sources/fields until the method has been fully tested and proven by a full-scale field demonstration in one or more nuclear power plants. The term "fully tested and proven" means that the technique has been fully scoped and reliable generic technical basis documentation is available for the licensees to evaluate the potential for their particular plant application.

5. The licensee should have an appropriate basis for establishing dose goals and objectives. Goals should be frequently monitored and actions taken as necessary when goals are exceeded. Goals should be set for the facility as a whole, for different divisions or groups within the facility, and for specific work activities.

Review work tasks to verify that pre- and post-job ALARA reviews were conducted. Determine whether the pre-job reviews adequately addressed the work to be performed, and whether lessons learned from post-job reviews are factored into future work/training. Ensure that the radiological significance of work performed under the direction of licensee vendors/contractors is adequately reviewed before the work is started. Review the method used to perform ALARA reviews of on-going work activities. These reviews should identify anomalies in the expected rate at which personnel exposure is being accumulated.

Compare, as a minimum, the licensee's total annual collective dose (person-rem) against their goals. Determine whether the licensee's collective doses are increasing or decreasing. Discuss with the licensee reasons for any trends and actions they are taking or have taken that impacted the trend. Determine whether the licensee is effective in identifying causes of higher than necessary doses and in effecting corrective actions. Determine whether the licensee reviews dose experience for specific jobs against available industry norms for similar jobs.

For plants planning their first outage, or for experienced plants performing significant tasks (e.g., 10-year in-service inspection) for the first time, determine the extent to which the outage experience of other similar plants is being used in the planning process. For plants that have experienced outages, determine the extent to which experience from, and lessons learned during, previous outages are being incorporated to improve performance. Approval of needed visits by radiation protection personnel to other sites to observe outage activities is a good indication of proper management support for ALARA.

6. Review the licensee's organizational structure for ALARA responsibilities. There should be a clear delineation of authority and responsibility, including dedicated ALARA staff adequate to implement the program on a daily basis as well as during outages. ALARA training that extends beyond the scope of General Employee Training for personnel such as radiation workers, is desirable for radiation protection technicians, and special maintenance teams. Professional development training should be available for the ALARA coordinator and related staff. To be most effective, mockup training should be reasonably realistic (e.g., including realistic temperature, humidity, and lighting) and address ALARA considerations.

   Discuss the ALARA program with several workers to determine whether they understand the program, understand their role in the program, and are actively involved in the program.

c. Key Attribute - Plant Facilities/Equipment & Instrumentation – Occupational Radiation Safety

1. No specific guidance

2. Select a variety of equipment and on-going maintenance to observe full calibration of beta/gamma survey instruments, as well as the daily source/response checks (or prior to use functional checks) for these instruments.

   Verify that the HPT or maintenance technician is familiar with the procedure governing the selected activity. Determine that the HPT is following the procedure, and discuss any deviations (and the reasons) from the procedure. Be aware of the facilities “art of the craft” position -- a level of skill and proficiency that is assumed (by the level of qualification). This position has a

impact on the level of detail of the procedures, and allows the HPT, etc. to perform certain tasks or actions without a procedure.

3. Ensure that the facility has an adequate supply of materials necessary to support current operations and emergent work/special outages. This includes anti-c's, respiratory protection, temporary shielding, temporary portable ventilation equipment, personal cooling devices (heat stress) and other needed equipment.

   Determine if the facility has adequate areas for personal and equipment decontamination, equipment maintenance and calibration (including spare parts).

   Discuss the budgetary process with the RPM and first line supervisors and examine and determine reasons for budget item disapprovals for selected (rejected items). Focus on those budget items that had been approved by the RPM, but not supported by upper management. Determine reasons for budget denials for major proposed items, and judge the impact on any identified program deficiencies.

. Identify plant areas that have become unusable as a result of an operational occurrence and licensee actions to control and recover such areas. (See SECY-89-326 dated 10/20/89 located at microfiche address 70038-056.)

4. Determine whether recommendations for plant improvement appropriately considered radiation safety. These considerations include whether: all potential impacts of the improvement on radiation safety were considered and incidents which negatively impacted radiation safety occurred after a decision not to incorporate the recommendation.

d. Key Attribute - Human Performance for Occupational Radiation Safety

The inspector should be aware that worker performance has an obvious, important impact on work activities in radiological areas. Two of the major components are health physics technicians (HPTs) and general radiation worker (crafts) groups. Human performance is impacted by several vital factors – qualification and training. Selection, qualification and training requirements for facility personnel are generally governed by a commitment in the plant technical specifications (to an ANS standard). For HPTs and others, 10CFR 50.120 (training rule) requires HPTs (including contractors) to be task qualified for their assigned normal and outage duties.

1. Using data from the licensee's corrective action program, LERs, and audits, determine if human performance issues have contributed to performance deficiencies. Evaluate the effectiveness of corrective actions by reviewing the corresponding commitments. Determine if the problems were reviewed by the appropriate level of management and prioritized according to their safety significance. Evaluate whether the corrective actions were technically correct, and developed and implemented in a timely manner.

2. Review the following components of human performance, as related to the previously identified human performance issues.

   (a) Work Control - If problem areas and issues were identified by inspections with respect to work control, including coordination and communication among activities; practices such as pre-job briefings, effective communications, and shift turnover; human-system interfaces, work area design, and environmental conditions, or minimization of work-around, then:

      (1) Determine if shift turnover time is sufficient, and that appropriate plant/work status/conditions are discussed. Determine if the radiation protection log (or night-orders) is governed by training or procedure, and whether it is a reliable and consistent tool for the HPTs. At the end of an inspection shift, attend a radiation protection HPT shift turnover and identify any weaknesses or deficiencies in the communication exchange. Discuss these with the on-shift management.

      (2) As necessary, if specific problems are identified in this area, the inspector should:

         (aa) Evaluate work areas for accessibility, equipment layout, emergency equipment location, power supplies for infield sampling, etc.

         (bb) Evaluate the impact (and means to compensate) for temperature extremes (heat stress), and other industrial hygiene hazards that might hamper radiation safety performance.

         (cc) Observe HPT interaction with crafts during development of RWP (on High Radiation area work, if possible).

         (dd) Determine how and when HPTs inform the appropriate level of management on any abnormal condition or significant changes in work environments.

         (ee) Evaluate the use of Engineering and Radiation Protection staff support during high risk (dose) work.

         (ff) Evaluate the impact (and means to compensate) for temperature extremes (heat stress), and other industrial hygiene hazards that might hamper radiation safety performance.

(3) Assess the quality of communications by observing HPT interaction with crafts during development of RWP (on High Radiation area work, if possible).

(b) Decision-making - If problem areas and issues were identified by inspections with respect to decision-making, then conduct observations of planning activities to determine whether decision-making involves contingency planning and use of conservative assumptions, and decisions are communicated to affected personnel. For identified areas of human performance problems, verify that the following decision-making practices support human performance while observing control room and local operations and other work activities:

(1) The roles and authorities of personnel are clearly defined and understood.

(2) Operational decisions and their bases are communicated.

(3) Interdisciplinary input and reviews of safety-significant or risk-significant decisions are sought.

(4) Decision-making is systematic when personnel are faced with uncertain or unexpected plant conditions.

(5) Conservative assumptions are used and possible unintended consequences are considered.

(c) Work Practices - If work practices, such as peer- and self-checking, procedural use and adherence, human error prevention techniques, or management and supervisory oversight, were identified as problem areas, then conduct in-field observations of work in radiological areas, and focus on HPT and worker performance relative to required RP work practices.

(1) Assess the quality of communications by determining how and when HPTs inform the appropriate level of management on any abnormal condition or significant changes in work environments.

(2) Evaluate the use of Engineering and Radiation Protection staff support during high risk (dose) work.

(3) Verify that TS and/or procedure prerequisites are satisfied before procedures are executed.

(4) Assess whether radiation protection technicians stop work due to radiological considerations when appropriate.

(d) Resources - If problem areas or issues were identified by inspections with respect to available resources such as sufficient trained and

qualified personnel to maintain work hours within limits, or tools and equipment, then:

(1) Review the licensee's overtime program and process to determine how management ensures that workers are not assigned safety related duties while in a fatigued condition. Interview workers to determine if they worked hours greater than specified in the technical specifications (with or without approval) to evaluate any repetitive nature that can lead to a degraded performance (See HPPOS #'s 024,173, and 253).

(2) Interview health physics technicians and other Radiation Protection staff that worked hours greater than the plant's technical specifications (with or without approval) to evaluate whether these personnel feel free to report whether they or others are fatigued.

(3) Refer to IP 93002, "Managing Fatigue," for guidance on the requirements of 10 CFR 26, Subpart I – Managing Fatigue. Assess the need for performing a specific section of the procedure based on previous performance issues related to fatigue management.

3. Experience, qualification, and training of radiation protection staff – Review the applicable experience, qualification and training of selected members of the licensee's (and its contractor's) RP organization.

(a) Review the licensee's program to provide training and periodic retraining to plant and contractor personnel on assigned duties and on safety significant changes to programs and procedures. Determine whether this training includes lessons learned from recent industry events and NRC communications (i.e., Information Notices, Generic Letters, Administrative Letters, etc.) and the proper use of human performance tools. By discussion with selected personnel, review of training lesson plans, and completed training records, determine if the requirements of 10 CFR Part 19.12 are met. If possible, observe portions of the general employee training (focus on the practical aspects of the training).

(b) Review applicable radiation protection worker qualification and training of selected members of other facility work units (including contractor employees).

(c) Interview several RP personnel, including first-line supervisors, professional RP staff, and the designated RP manager. Assess their level of knowledge about the program and applicable implementing procedures.

(d) Select individuals on the radiation protection staff and contractor personnel. By a review of applicable documentation, direct observation and discussion with the technicians, determine if they meet the training and qualification requirements of their assigned duties/position. Licensee administration technical specifications normally contain a specific commitment to an industry standard on personnel selection, training and qualification.

(e) For a selected sample of contractor health physics technicians (HPTs), review the actions taken by the licensee, in accordance with the training rule (10 CFR 50.120) to ensure that these individuals are task qualified to perform their assigned outage activities. The following general guidance exists concerning the10 CFR 50.120:

(1) The only radiation protection personnel covered by the new rule are "radiological protection technicians" (HPTs) who are employees of the power plant. No supervisory, managerial or technical staff are covered. Contractor HPTs are not covered unless they occupy regular positions performing independently within the licensee's organization. If short-term contractor HPTs (e.g., outage workers) are assigned to work independently, they must be qualified to perform their assigned tasks.

(2) The training rule covers qualification only in the sense of job task qualification, not qualification based on pre-selection criteria. Furthermore, successful completion of a training program required by the rule does not obviate the need to comply with other training or qualification requirements imposed by other regulations and/or license conditions.

By direct observation and discussion with HPTs providing job coverage, determine if they have knowledge of the job activities and radiological conditions to provide adequate coverage. In discussions with HPTs, focus on ensuring adequate knowledge of radiological hazards associated with plant systems [especially neutron-activated components such as traversing incore probes (TIPs), incore neutron detectors, and cabling, as discussed in Information Notice No. 88-63 and its Supplements 1 and 2, "High Radiation Hazards from Irradiated Incore Detectors and Cables"]. Interviews using event scenarios and role-playing (preferably in small groups) may be useful for assessing HPT knowledge and capabilities.

Review the licensee's method to provide training of permanent and contractor personnel on safety- significant changes in procedures and recent events. Emphasis should be on training provided to the increased work force required for the outage. Discuss with plant management and the RPM.

(f) Review training records and lesson plans, for a sampling of station and contractor crafts workers, to determine if the requirements of 10 CFR Part 19.12 are satisfied. If possible, observe portions of the general employee training (focus on the “hands-on portions” of the training).

4. Interviews should focus on identified program deficiencies, root causes, and action plans for improving performance. Discuss how improvements will be implemented -- what programmatic changes are needed, how these will be accomplished, etc.

03.05 Assessment of Performance in the Radiation Safety Strategic Performance Area - Public Radiation Safety (Radiological Effluent Monitoring, Radioactive Material Control, and Transportation of Radioactive Material).

a. Key Attribute - Plant Facilities / Equipment and Instrumentation for Pubic Radiation Safety

Perform an extensive tour of the facility which includes interviews with plant and contractor personnel to evaluate the adequacy of the plant facilities, equipment and instrumentation.

1. No specific guidance provided.

2. Evaluate the physical condition of the facilities, equipment and instrumentation. Determine if the facility is appropriate for its intended use and adverse conditions (i.e., radiation levels, temperature, lighting, industrial hygiene hazards, etc.) that may hamper the performance of the workers are minimized.

(a) Verify that equipment and instrumentation are operable, calibrated, source checked, and maintained as specified in the licensee’s procedures. Where appropriate, verify that the alarm/trip setpoints are correctly set to meet the requirements of the technical specifications or regulatory requirements.

(b) Review the licensee’s use of computers and software used to perform selected tasks. Review the licensee’s technical evaluation to ensure the software is appropriate for its intended use. Verify that the computer software has been verified and validated.

(c) Perform direct observation of the calibration of selected equipment and instruments. Verify that the proper materials, as specified in the procedure, are being used to perform the calibration. If radioactive sources are being used, are they properly transported, handled, used, controlled, and stored in accordance with approved plant procedures. Is the process in accordance with the plant’s ALARA program?

3. Verify that there is an adequate supply of spare parts and materials needed to maintain the equipment and instruments.

b. Key Attribute - Program / Process for Public Radiation Safety

For the assessment of procedures which implement the program being inspected, evaluate to what extent procedure quality has contributed to previously identified performance issues. In performing this evaluation, select a sample of procedures which reflect instances where problems with procedures have been documented in LERs, NRC inspection reports, or licensee assessments, audits or corrective action programs. The inspectors should focus on the technical adequacy of the procedures using the following guidance as applicable.

1. No specific guidance provided.

2. Review of procedures

(a) When reviewing the licensee's procedures, the inspector should assess the technical adequacy of the procedures and determine if the procedural steps will achieve the required result.

(b) Determine whether the procedures are consistent with the technical specifications, program documents, and regulatory requirements. During this evaluation, the review may include technical specifications, program documents, UFSAR descriptions, vendor manuals, design information, and instrumentation diagrams.

(c) If applicable, review maintenance procedures associated with the instrumentation and equipment being inspected for technical adequacy. Determine if the procedures are adequate to perform the maintenance task and provide for identification and evaluation of instruments and equipment and work deficiencies. If applicable, verify the use of quality verification holdpoints for independent verification of important attributes. Check the procedure content against the vendor manual to verify that the procedure satisfies the vendor requirements. Verify that the vendor manuals are complete and up-to-date. Documents, such as vendor manuals, equipment operating and maintenance instructions, or approved drawings with acceptance criteria, may by reference be part of a procedure. If these documents are so used, the documents (or applicable portions) require the same level of review and approval as the procedure that references it.

(d) Through discussions with personnel and a review of approved procedures, determine if radiation protection and technical support personnel contribute to the development, review, and approval of procedures. Determine if unique and/or complex high radiation work procedures are reviewed and approved by personnel responsible for work performance.

(e) Incorporating accepted human factors principles on format and writing style into procedures increases the likelihood that the procedures will be easier to use and follow. Standards for format and writing style can usually be found in the licensee's writer's guide. Usability should be

determined by evaluating the degree to which procedures follow the guidance outlined in the writer's guide.

(f) When a writer's guide is not available or if the writer's guide is in question, procedure usability can be determined by evaluating the elements of writing style, format, and organization described in Inspection Procedure 42700, "Plant Procedures."

(g) Verify temporary procedures were properly approved and did not conflict with technical specification requirements. Review a sample of temporary procedure changes issued during the past year to determine that the approval and subsequent review requirements of the technical specifications are being followed. Determine whether the licensee has procedural limitations on how long a temporary procedure or a temporary procedure change can be in effect, and compare this with observed practices.

3. If the technical adequacy of procedures is a concern, review the following.

(a) Review a sufficient number of procedures to provide assurance that the procedures (including checklists and related forms) in the plant working files are current.

(b) Verify that personnel have the ability to reference an up-to-date and accurate copy of documents. This is necessary because the controlled drawings may not be revised, unless changes due to modifications are extensive. As an interim measure, some utilities have marked-up a controlled set of documents to show the design changes. In such situations, the inspector should also verify that revisions of the controlled documents incorporating the marked-up changes are performed in a timely manner following the modification.

(c) Procedure changes should be in accordance with licensee processes and regulatory requirements. Verify the adequacy of all procedure changes which resulted from recent (within the last year) license change(s) or revision(s) to a technical specification or the top tier program document. Verify procedure changes are in conformance to 10 CFR Part 50.59. This item applies only to changes to procedures which are described or summarized in the UFSAR, normally a small portion of the procedures in use at the facility. General guidance and contrasting examples relating to the procedure changes which can be made by the licensee are described in NRC Inspection Manual Part 9900, "Guidance on 10 CFR 50.59 -- Changes to Facilities, Procedures, and Test (or Experiments)."

4. Review a selection of records produced from implementation of the procedures. Review the record file system to determine if the records are adequately filed and controlled in accordance with the procedure. Verify that

the records are legible and have the appropriate sign-offs as required by the procedure.

c. Key Attribute - Human Performance for Public Radiation Safety

1. Using data from the licensee's corrective action program, LERs, and audits, determine if human performance issues have contributed to performance issues. Evaluate the overall effectiveness of human performance corrective actions by reviewing the licensee's corrective action commitments. Determine if the problems were reviewed by the appropriate level of management and prioritized according to their safety significance. Evaluate whether the corrective actions were technically correct and implemented in a timely manner.

2. Review the following components of human performance, as related to the previously identified human performance issues.

(a) Work Control - Are assignments and technical information from management being effectively being communicated to the workers?

(b) Decision-making - For identified areas of human performance problems and while observing control room and local operations and other work activities, verify that the following decision-making practices support human performance:

(1) The roles and authorities of personnel are clearly defined and understood.

(2) TS and/or procedure prerequisites are satisfied before procedures are executed.

(3) Operational decisions and their bases are communicated.

(4) Interdisciplinary input and reviews of safety-significant or risk-significant decisions are sought.

(5) Decision-making is systematic when personnel are faced with uncertain or unexpected plant conditions.

(6) Conservative assumptions are used and possible unintended consequences are considered.

(c) Work Practices - Assess this area while observing the performance of procedures.

(d) Resources

(1) Review the licensee's program to provide training and periodic retraining to plant and contractor personnel on assigned duties

and on safety significant changes to programs and procedures. Determine whether this training includes lessons learned from recent industry events and NRC communications (i.e., Information Notices, Generic Letters, Administrative Letters, etc.) and the proper use of human performance tools. By discussion with selected personnel, review of training lesson plans, and completed training records, determine if the requirements of 10 CFR Part 19.12 are met. If possible, observe portions of the general employee training (focus on the practical aspects of the training).

(2) Review the licensee's overtime program and process to determine how management ensures that workers are not assigned safety related duties while in a fatigued condition. Interview workers to determine if they worked hours greater than specified in the technical specifications (with or without approval) to evaluate any repetitive nature that can lead to a degradation of performance.

(3) Refer to IP 93002, "Managing Fatigue," for guidance on the requirements of 10 CFR 26, Subpart I – Managing Fatigue. Assess the need for performing a specific section of the procedure based on previous performance issues related to fatigue management.

3. No specific guidance provided.

4. Interview several plant and contractor personnel (i.e., technicians, engineers, health physicists, and supervisors) associated with the program to assess their level of knowledge about the program and procedures and to determine their qualifications for the assigned position and duties. Evaluate training, experience, and qualifications by reviewing job documentation (usually specified in a licensee document), direct observation, and discussion with the individual.

03.06 Assessment of Performance in the Safeguards Strategic Performance Area.

a. Key Attribute – Physical Protection (PP)

1. Using IP 71130.04 " Equipment Performance Testing and Maintenance verify and assess whether the licensee's testing and maintenance program has been appropriately developed and is being effectively implemented in accordance with the NRC-approved security plan, regulatory requirements, and any other applicable Commission requirements to assure the functionality and reliability of all security equipment necessary for effective protection of the facility and for a rapid, capable response to a design basis threat (DBT) and other contingencies.

2. Using IP 71130.05 " Security Training" verify the licensee's implementation of its nuclear security training program in accordance with the NRC-approved training and qualification (T&Q) plan, regulatory requirements, and any other applicable Commission requirement.

3. Using IP 71130.09 "Owner Controlled Area Controls" verify and assess the licensee's OCA controls to ensure that they provide high assurance against the Design Basis Threat (DBT) in accordance with the NRC-approved security plan, regulatory requirements, and any other applicable Commission requirement.

b. Key Attribute - Access Authorization (AA)

1. Using data from the licensee's corrective action system, and Inspection Procedures IP 71130.01, "Access Authorization Program" and 71152, "Identification and Resolution of Problems," verify that the licensee is identifying problems, entering those problems into their correction action system at an appropriate threshold, and effecting corrective action to prevent recurrence.

2. Review current regulatory requirements on behavior observation and identify license procedures that were changed under 10 CFR Part 50.54(p). See IP 71130.01 for further guidance.

c. Key Attribute - Access Control

1. Using IP 71130.02, "Access Control (Search of Personnel, Materials, Packages, and Vehicles: Identification and Authorization)," review any open LER, safeguards log and any self-assessments associated with access control for follow up, if necessary.

2. Using IP 71130.02, perform 02.02 (b) through (j), or as warranted. Pay particular attention to (h) if the licensee has a process for granting access to plant equipment, including vital equipment to authorized personnel who have an identified need for such access. Verify that access authorization criteria established by the security plan and procedures is being adequately implemented. See IP 71130.02-02, Section 02.02(h) for further guidance.

d. Key Attribute - Response to Contingency Events (protection strategy, program design, and support elements)

1. Using IP 71130.03, "Response to Contingency Events," review the recorded description of the current response strategy and response plans to evaluate the effectiveness of the protective measures contained in a sample of those written response plans.

(a) Inspectors may request that the licensee perform table-top drills to assess and understand how the written strategy is effective and

ascertain if it is implemented as described. See IP 71130.03, for further inspection guidance.

(b) Conduct interviews and meet with the appropriate licensee managers to review the protective strategy and discuss any identified weakness in that strategy.

e. Key Attribute - Response to Contingency Events (performance-based force-on-force Exercises and Target Set Evaluation)

Using IP 71130.05, Response to Contingency Events (Force on Force Exercises and Target Set Evaluation), the inspectors should request that the licensee explain their target set analysis and conduct force-on-force evaluated exercises. See IP 71130.05 for guidance.

f. Key Attribute – Materials Controls and Accountability

Using IP 71130.11 " Material Control And Accounting" verify that the licensee has implemented and is maintaining an adequate and effective program to control and account for the SNM in its possession to ensure that the licensee can detect loss, theft, or diversion of SNM in a timely manner

g. Key Attribute - Security Plan Changes

Over a 2-year period, review and assess changes to the security plan and associated security procedures which appear to affect the ability of the safeguards program to prevent core damage. Determine if any changes decrease the effectiveness of the security plan or program, and if so, if those changes were reported to the NRC for approval prior to making the change. See IP 71130.04 for further inspection guidance.

03.07 Evaluate the Licensee's Third-Party Safety Culture Assessment.

This step focuses on evaluating the quality of the third-party safety culture assessment (e.g., the methods used, sampling strategies, team qualifications, and the use of safety culture assessment protocols that are acceptable to the NRC). At such time that an industry safety culture assessment methodology is developed and found to be acceptable by the NRC, the guidance in this section will be evaluated for potential revisions to address the use of such a methodology.

The assessment method(s) used by the licensee's third-party contractor should follow the professional standards and methodologies established for conducting organizational assessments which are similar to the licensee safety culture assessment. For example, if surveys are used, general survey techniques for ensuring the reliability and validity of the methodology and results should be followed (guidance for NRC evaluation of surveys can be found in Enclosure 95003.02-F). Using such methods provides NRC with some assurance of the validity and reliability of the results. In contrast, if the assessment does not follow such methods or meet such criteria that will be factored into the NRC's decision regarding the scope of the graded safety culture assessment.

a. Inspection Preparation

1. The lead SCA should begin interactions with the licensee as early as possible during the planning and conduct of the third-party safety culture assessment to gain an understanding of the assessment approach. Monitoring and observations should continue throughout the assessment to the extent possible. Care must be taken to minimize any potential effects of NRC's presence during assessment activities on participants' behavior and consequently the results. Generally it would not be appropriate to observe the conduct of the third-party assessment interviews or focus groups. However, it would be appropriate to review the planned third-party assessment focus group protocol in advance and interview/focus group notes and summary documents afterwards.

   Communicate frequently with the licensee to stay informed of the status of implementation activities (e.g., conduct of survey, analysis of results) and emerging issues. Be aware of how the licensee and/or the third-party personnel resolve these issues.

2. No specific guidance.

3. From the licensee, obtain the following:

   (a) Tools and instruments used to conduct the licensee's third-party safety culture assessment(s). These could include (but are not limited to) questionnaires, interview guides, or checklists, and the charter for the assessment(s).

   (b) Documents produced by the assessment team that conducted the licensee's most recent safety culture assessment. These could include (but are not limited to) an assessment plan, surveys, interview plans and reports, status memos, briefing notes, and interim and final reports.

   (c) Documents that characterize the licensee's response to the most recent safety culture assessment. These could include (but are not limited to) memoranda, meeting notes, corrective action program records, project plans, or other initiatives that were associated with or were initiated as a result of the assessment.

   (d) Names, qualifications, and contact information for the personnel who conducted the assessment.

   Note: If the tools, instruments, or related licensee documents are proprietary, handle them in accordance with standard NRC procedures for handling proprietary information.

4. Obtain any safety culture assessments conducted at the site within the past five years to look for trends, licensee actions to address issues raised by the assessments, and information regarding effectiveness of the actions taken to resolve the issue.

b. Evaluation

1. The licensee's terminology may differ from NRC terminology for the same application, e.g., the licensee may call safety culture components by other terms such as safety culture attributes or principles, but the concepts addressed should be similar.

2. Verification of comprehensiveness of licensee assessment

(a) It is important to verify that adequate samples of functional groups and organizational levels were assessed. That is, a safety culture assessment that focuses only on the functional groups who perform work that has a clear nexus to safe plant operations (e.g., operations, maintenance, engineering, security) but excludes individuals from other support groups or contract organizations will be incomplete. Functional groups, such as human resources, financial services, and some technical support organizations, and contractor groups often fulfill roles in the organization that are important in shaping the site's safety culture.

(b) Similar to the discussion in section 2.(a). above, a safety culture assessment that focuses only on some of the organizational levels may bias the results.

(c) A key question to answer about the licensee's third-party safety culture assessment is whether the sample sizes used were adequate to ensure that the findings and conclusions from the assessment were representative of the populations and subpopulations of interest.

(1) In general, if the licensee's assessment team administered a survey in-person to groups of licensee employees and contractors and their sampling plan was to obtain responses from all site personnel, the number of survey respondents should be about 80% of the site population.

(2) If the licensee's assessment plan was to administer the site survey by mail or electronically, the number of survey participants should typically fall between 60% and 70% of those who were asked to participate.

(3) If the survey results were based on lower percentages of the population than was identified in the licensee's sampling plan, then the licensee's assessment team should have collected and analyzed information to demonstrate that those who did

participate and those who did not were not systematically different in a way that could bias the results of the survey.

For example, if the survey systematically excluded everyone on the back shift, it is unlikely that the results would be valid. If there are inconsistencies in response rates among functional groups, i.e., certain group(s) exhibited lower participation rates, the licensee's assessment team should have taken actions to understand the reasons for the differences and the effect on the accuracy of the data.

Additional guidance related to appropriate sample sizes for individual and group interviews, structured behavioral observations, and event follow-up studies can be found in Enclosures 95003.02-C, 95003.02-D, and 95003.02-E, respectively.

(d) The safety culture components are detailed in section 06.07 of IMC 0305.

3. In determining whether the methods used by the third-party assessment team to collect and analyze the data were adequate and appropriate:

(a) Determine whether the licensee's third-party safety culture assessment contractor ensured, to the extent possible, that information obtained during the assessment was not attributable to individual participants in any reports of assessment results or in discussions with others who were not members of the assessment team.

(b) If the third-party safety culture assessment included interviews, then evaluate the interview questions, the plan by which interviewees were selected, and the interview techniques used by the assessment team. (For related guidance, see Enclosures 95003.02-B and 95003.02-C.)

(c) If the assessment included focus groups, then evaluate the questions used in the focus group meetings, the plan by which participants were selected, and techniques used to facilitate participation in the meetings. (For related guidance, see Enclosures 95003.02-B and 95003.02-C.)

(d) If the assessment included document reviews, then evaluate the assessment team's selection of documents and their review methodology.

(e) If the assessment included direct observations of meetings and/or work activities, then evaluate the assessment team's selection of meetings and activities to observe, the observers, and the observation methodology. If possible, observe similar meetings and/or work

activities, to place the assessment team's observations in proper context. (For related guidance, see Enclosures 95003.02-D.)

(f) If the assessment included a structured survey, then determine if acceptable survey practices were used. Evaluate the survey instrument used, a sampling of raw survey data including write-in comments (if available), survey results, and documentation that describes how the survey was developed and the methods used to administer it, and the statistical analyses applied to the survey data to determine if acceptable survey practices were followed. (For related guidance, see Enclosure 95003.02-F.)

(g) For each method used, determine whether the sample sizes were adequate to ensure that results from the method were representative.

(h) For each of the methods used, determine whether:

(1) any method was likely to introduce any systematic bias into the results;

(2) the methods were applied consistently; and

(3) if multiple methods were used, the third-party assessment team verified the consistency of the results obtained from the different tools and instruments.

(i) Do not consider normative data about other sites or other industries provided by the licensee's assessment of safety culture when developing insights about the third-party assessment, except if the licensee also provides detailed information to permit verification of the applicability of the normative data (e.g., nature of the norms, sample size and representativeness, procedures followed in obtaining the samples).

4. In determining whether the licensee's assessment team members were independent and qualified:

(a) Verify that the third-party assessment team did not include any members of the licensee's organization or utility operators of the plant (licensee team liaison and support activities are not team membership).

(b) Determine whether the assessment team members who designed the safety culture assessment and analyzed the results were qualified through education and/or experience. There should be members on the team who have knowledge in conducting safety culture /organizational assessment types of activities, particularly at nuclear facilities. If the assessment includes a survey, verify that the team

included members with survey design, administration, and analysis expertise.

(c) Determine whether the assessment team included members with knowledge in the technical areas and organizational issues being assessed.

5. Review the following items related to the licensee's third-party safety culture assessment results:

- A sample of the assessment team's interview or observation notes;
- Responses to survey items both at an overall level and by functional groups;
- Statistical analyses performed; and
- Responses from previous assessment activities, if similar techniques, such as the same or similar survey questions, were used, for comparison to current results.

Evaluate these items to determine the quality and accuracy of:

- The assessment team's interpretation of the data collected;
- Rollup or summaries in capturing issues and themes from the data; and
- The messages communicated to the licensee about the results.

If the third-party assessment team's follow-up investigation for any weaknesses in the safety culture components involved sensitive information about the behavior of an individual, and an NRC SCA/inspector must review that information or receives such information, the SCA/inspector shall protect the individual's identity and privacy to the extent possible. The NRC shall not disclose to licensee personnel any detailed information about the individual or the related events, but shall disclose only general conclusions about the thoroughness of the third-party assessment.

03.08 Determine Scope of and Plan for NRC's Graded Safety Culture Assessment.

a. The scope of NRC's graded safety culture assessment will be based on the results of the evaluation of the licensee's third-party safety culture assessment. The lead SCA will need to make this determination, in consultation with the appropriate team and Regional management. The scope will depend on factors such as the quality of the third-party safety culture assessment scope, methods, sampling, and analysis, and the qualifications of the third-party safety culture assessment team.

In some cases the timing of the third-party safety culture assessment and the initiation of the 95003 inspection may allow the staff to evaluate the adequacy of the third-party assessment methodology before its implementation. The team will communicate concerns to the licensee for their action as they determine to be appropriate. Based on the validity of the effort, by the licensee and/or third-party assessment team, to address NRC concerns, the NRC graded safety culture assessment can be adjusted accordingly.

1. The licensee's activities to communicate results of the assessment to various levels of management and staff should be evaluated to understand the messages being provided. Obtain documentation regarding the licensee's dissemination of the third-party safety culture assessment results (e.g., emails, newsletters, and briefing materials). Request any department/group specific information, including talking points if applicable, provided to managers and/or supervisors for their areas.

2. If the review conducted under 02.07 does not identify any weaknesses in the assessment methods, conclusions, or team qualifications, then the graded safety culture assessment should be focused on the licensee's response to the assessment results. For example, if the assessment identified problems in any safety culture component(s) or weaknesses in certain groups, then the licensee's response to those problems, to the extent they are available, should be evaluated. Depending on the timing of the inspection period, the licensee may not have made significant progress in developing or implementing corrective actions. In these cases, effectiveness of corrective actions may need to be evaluated during inspection follow-up activities. The lead SCA should discuss this with the team leader/assistant team leader and determine how best to conduct the evaluation.

3. If weaknesses are noted in portions of the assessment, the graded safety culture assessment should be adjusted to gather additional information in those areas. For example:

   (a) If there were functional groups that were not adequately covered in the assessment (e.g., either not included in the scope, or had low response rates), conduct appropriate activities (e.g., focus groups, interviews, observations) to evaluate if those groups have any weaknesses in safety culture components. For groups with low survey response rates, verify the third-party assessment team's conclusions about the reasons for the low participation and evaluate the licensee's response, such as the licensee conducting additional assessment activities.

   (b) If the assessment did not include certain organizational levels (e.g., of senior/corporate management), conduct appropriate activities (e.g., interviews and observations) to gain information on those level's effect on the site's safety culture, including any attitudes and behaviors that may be inconsistent with those described in the safety culture components.

   (c) If issues are identified with the sample sizes, conduct appropriate assessment activities (e.g., focus groups and interviews) with groups that were inadequately sampled to determine if there are issues the licensee's assessment did not identify.

   (d) If any of the safety culture components are determined to be inadequately assessed, conduct assessment activities to evaluate

those components using guidance from Enclosures 95003.02-A through F. Coordinate with the other inspection team members who may be focusing on related areas, particularly for components related to the SPA of identifying, assessing, and correcting performance deficiencies and the human performance key attribute.

4. If specific weaknesses or concerns are identified with the third-party safety culture assessment team's methods, conclusions, or qualifications, the graded safety culture assessment should be adjusted to gather additional information in those areas. Conduct limited assessment activities to evaluate whether the licensee's third-party assessment results are consistent with those gathered by NRC.

   (a) If there were issues noted regarding the use of certain methods except for surveys, see note below, NRC should independently conduct those activities. For example, if problems were identified with the conduct of focus groups or with interview techniques, NRC should conduct its own focus groups and interviews.

   Note: NRC does not conduct surveys. Therefore, for weaknesses identified in survey methodology, NRC will use other techniques (i.e., those described in Enclosures 95003.02-C through F) to evaluate the validity of the survey results.

   (b) The limited assessment should start with functional groups that have a clear nexus to safe plant operations (e.g., operations, engineering, maintenance) and/or those with known problems (e.g., through the third-party assessment or other means) and be expanded as needed.

   (c) Based on the results of the limited assessment, adjust the scope as appropriate. For example, if NRC's data validate results from the third-party safety culture assessment, then the focus of the graded assessment can be shifted to the licensee's response to the results, to the extent actions have been conducted or planned. However, if there are inconsistencies, the scope of the graded safety culture assessment should be broadened, such as including additional assessment methods and increasing the range of functional groups and/or safety culture components being targeted.

   (d) In planning the assessment activities, such as developing the tools and designating assignments, follow the guidance in section 1.b. from Attachment 95003.02 to ensure use of multiple methods/team members so that information is collected independently.

5. If substantial weaknesses are identified with the licensee's third-party safety culture assessment or NRC has low confidence in the validity of the licensee's results, the determination should be made whether the NRC should conduct an independent safety culture assessment in order to gain accurate insights on the contribution of weaknesses in safety culture

components to licensee performance. If an independent NRC safety culture assessment is determined to be needed, follow the guidance in Attachment 95003.02 to conduct the assessment.

b. Review Attachment 95003.02 regarding the conduct of NRC's independent safety culture assessments and Enclosures 95003.02-C through F regarding specific data collection methods. Apply the guidance as appropriate (based on the specifics of the case) in planning the graded safety culture assessment and developing the methods and tools. Be aware of overlaps between other inspection focus areas and the graded safety culture assessment activities (e.g., in certain safety culture components or functional groups), and use the data and insights from the other areas to the extent possible.

c. The lead SCA will provide resource needs to the team, Regional, and program office management. Depending on the focus of assessment activities, specific expertise, such as those possessed by Headquarters staff and/or contractors, may be necessary to conduct the graded safety culture assessment effectively. The level of resources will depend on the scope and can be affected by the size of the site. After resources are identified, the lead SCA will determine the assignment of activities based on the expertise and experience of the SCAs and other inspection team members and hold meetings/briefings as needed to communicate relevant information and assignments.

d. No specific guidance.

03.09 <u>Perform NRC's Graded Safety Culture Assessment</u>.

a. Follow the scope and implement the plan developed under section 02.08.

1. Evaluate the communications provided to various levels (e.g., management and staff) regarding the third-party safety culture assessment for accuracy to the assessment results. Consider asking participants in focus groups and interviews (if held) about information received in this area, and evaluate the effectiveness of the licensee's accuracy in conveying the intended information.

2. Evaluate the licensee's response to weaknesses identified in any safety culture components, to the extent they are available during the time of the inspection.

(a) Determine whether the licensee appropriately identified those weaknesses within their corrective action program.

In some cases, corrective actions may involve sensitive areas such as personnel actions or other matters that warrant confidentiality. These types of information may not be documented in any corrective action programs and must be solicited or inferred from discussions with licensee officials, such as Human Resource personnel or senior

management. The lead SCA should evaluate these circumstances and conduct activities to gather this information as needed. The lead SCA should determine the extent of involvement of and knowledge by other team members in these activities on a need-to-know basis.

(b) Determine whether the licensee's evaluations of those weaknesses were appropriate and the resulting planned corrective actions appear adequate for resolving those weaknesses.

The breadth and depth of corrective actions should be appropriate to produce the targeted changes in the organization's characteristics, attitudes, and behaviors that define the organization's safety culture. For a discussion on what these concepts involve, review the introduction section of Attachment 95003.02. Although short-term or limited scope actions such as training or personnel changes can have positive impacts, effective corrective actions for producing lasting changes in aspects of culture require a long-term focus. Discrete activities such as communications (e.g., stand-downs, publication of policies) and training sessions should be reinforced and evaluated for effectiveness. The licensee should have plans to monitor long-term progress and the capability and flexibility to make adjustments to corrective action plans as needed.

(c) Determine whether the licensee has made reasonable progress in implementing those actions.

In making this determination, consider the types of actions and the timeframe of the desired results. The licensee may implement some actions aimed at creating immediate changes or near term improvements and others focused on long term changes. It is important to note that some cultural changes may require timeframes of several years or longer to develop, depending on the circumstances. However, short term progress can be made and should be monitored. Depending on the timing of the inspection, evaluate the progress made based on the types of corrective actions and their intended effects.

(d) Depending on the circumstances, the licensee may not have made significant progress in developing or implementing corrective actions by the on-site inspection period, or the corrective actions in place may need additional time to facilitate the intended improvements. In these cases, the effectiveness of corrective actions will need to be evaluated during inspection follow-up activities at a later time. The lead SCA should discuss this with the team leader/assistant team leader and determine how to conduct the follow-up.

3. If a limited scope NRC safety culture assessment is conducted, determine whether the results of the licensee's overall assessment of safety culture, including the third-party and any other relevant activity, are consistent with

results obtained by the NRC assessment by answering the following questions:

- Are the results of NRC's data collection methods generally consistent with results of the licensee's methods?
- Do similar functional groups show differing results?
- Did either assessment identify weaknesses in particular safety culture components?
- Did the NRC SCAs reach the same general conclusions relative to the safety culture components?

If significant inconsistencies exist between the NRC's completed results and the licensee's overall results, then ask the licensee to determine the reason(s) for each inconsistency. This may require the licensee to perform additional assessment activities. In addition, consider increasing the scope of the NRC's assessment, including broadening the functional areas and/or increasing the depth to which applicable safety culture components are evaluated.

4. The lead SCA has the flexibility to propose adjustments to the scope of the graded safety culture assessment to the team leader/assistant team leader, based on factors such as insights from the data, similarities and discrepancies between NRC and licensee results, licensee response and actions, and other emerging issues. The lead SCA should keep the team leads fully apprised of potential changes and coordinate increases or decreases in the scope and the resources needed.

5. If an independent NRC safety culture assessment is determined to be needed, follow the detailed guidance in Attachment 95003.02 to conduct the assessment.

6. It is important to note that disclosure of any sensitive information received, reviewed, or collected by the NRC inspection team shall be limited to only those members who have a specific need-to-know for completing their inspection requirements. For example, although it may be necessary for an SCA/inspector to review case files from the licensee's employee concerns program, the SCA/inspector should report only the overall conclusions from the review to the remainder of the team.

b. Based on results from the licensee's third-party safety culture assessment and the NRC's graded safety culture assessment, follow the guidance in section 2.e. of Attachment 95003.02 in compiling the data. Determine whether any trends or themes in a particular safety culture component exist and work with the entire team to determine the contribution of weaknesses in safety culture component(s) to the findings being identified in the inspection and to the affected SPA(s).

03.10 Performance Deficiency Cause Analysis.

The purpose of the performance deficiency cause analysis is to provide a diagnosis of the principle causes for the decline in performance as well as a prognosis for future improvement. Using the results from this inspection, in conjunction with information obtained from the NRC's review of previous root cause analyses (validated by either IP95001 or IP95002) that may have been performed by the licensee or others, the team should group related apparent, root and contributing causes of the risk significant performance deficiencies using a structured approach. This analysis should also include or consider the existing ROP substantive crosscutting issues as well as new findings with cross-cutting aspects that are identified from this inspection. The team should integrate significant insights from the safety culture observations for this analysis. The outcome of this analysis should be the primary cause(s) of the decline in performance and a discussion of how the improvement / recovery plans will address these causes. The team (or at the minimum a representative from each functional area of the team) should participate in this analysis. It should be noted that this effort is not intended to be a substitute for a more focused root cause study or self-assessment by the licensee.

The senior reactor analyst should perform an assessment of the individual risk associated with the team's findings. The SRA may perform a collective risk assessment by summing or qualitatively assessing the risk impacts of multiple separate or independent findings that overlap in time to gain an understanding of the aggregated or collective risk profile. When performing the collective risk assessment, it is important to clearly ascertain the time history (appropriate identification of start and end dates) of each overlapping inspection finding to reach a proper result. Assessing the collective risk from the "roll-up" of multiple related, non-overlapping independent findings or of combining all of the findings identified during the inspection would produce an artificially high risk estimate leading to incorrect conclusions.

This information will be useful in evaluating the adequacy of licensee proposed corrective actions to the performance issues, and to aid in deciding if additional regulatory actions are warranted.

03.11 NRC Assessment.

Perform a limited review of the NRC's assessment and inspection process at the subject facility.

a. Should the results of this inspection indicate that a significant reduction in safety has occurred, compare the team's findings with current assessment data (both PIs and inspection findings) to determine if sufficient warning was provided. If the results of this inspection indicate that a significant reduction in safety has not occurred, compare the team's findings with the current assessment data to identify inconsistencies in the plant performance data.

b. Evaluate whether the NRC assessment process appropriately characterized licensee performance based upon the data that was provided. Evaluate for

example, whether inspection findings were appropriately screened using the Significance Determination Process (SDP) for risk significance, and was this data appropriately entered into the NRC action matrix.

03.12 Document Inspection Results.

Due to the diagnostic nature of this inspection, a thorough documentation of the team's observations, findings, and conclusions is required. Unlike the content of baseline inspection reports, this inspection report should contain sufficient observations and issue details to allow the development and support of the team's diagnostic conclusions. The observations and findings should support the assignment of the cross-cutting aspects to the team's findings, and the cross-cutting aspects or themes should support the diagnostic conclusions of the team. It is neither necessary nor desirable to report separately on every key inspection attribute. The report should focus primarily on the diagnostic conclusions and should logically and coherently support those conclusions. IMC 0612, "Power Reactor Inspection Report," guidance regarding the threshold to only document greater than minor findings is not applicable to this procedure. Although certain issues should be evaluated using the SDP, this may not be possible for many of the team's more programmatic conclusions.

Based upon insights derived from the performance deficiency causal analysis results (section 3.10) collectively performed by all of the team functional area groups, a cross-cutting aspect is evaluated in accordance with IMC0612 for findings identified by the team. The inspection report should document the information and analysis used to assign the cross-cutting aspect and should clearly explain how the selected cross-cutting aspect is applicable (i.e., was the most significant contributor) to the specific circumstances of the inspection issue.

In the inspection report, include the following information in the major sections:

a. Strategic Performance Area Assessment

1. Inspection Scope
   If only one SPA is degraded, then subdivide this section to address the appropriate key attribute(s) of the SPA. However, if more than one SPA is degraded, then first subdivide this section into SPAs, and then subdivide each SPA subsection further to address the appropriate key attribute(s) of the SPA.

   For the appropriate key attribute(s), describe the documents and records reviewed, personnel interviewed, walkdowns conducted, activities observed, etc., to satisfy the inspection requirements associated with the attribute.

2. Observations & Findings

   List important observations which are not findings but which support the assessment result. Also list and document in accordance with IMC 0612 any findings which were identified during this assessment.

3. Assessment Result

Document a summary assessment of licensee performance in each degraded SPA, with reference to the observations and findings which support the assessment.

b. PI&R Assessment

1. Inspection Scope

Describe the documents and records reviewed, personnel interviewed, walkdowns conducted, activities observed, etc., to complete this assessment.

2. Observations & Findings

List important observations regarding PI&R which are not findings but which support the assessment result. Also list and document in accordance with IMC 0612 any findings which were identified during this assessment.

3. Assessment Result

Describe the overall assessment of licensee performance in PI&R that is supported by the observations and findings revealed during this assessment. Ensure that the basis for this assessment is fully contained in the Inspection Scope and Observations & Findings sections.

c. Safety Culture Assessment Activities [C1]

1. Scope

Describe the third-party assessment evaluation conducted, such as the documents and records reviewed, personnel interviewed, activities observed, and the NRC team's engagement, if any, with the licensee and the third-party assessors during the conduct of the third-party safety culture assessment. In addition, describe the graded safety culture assessment activities conducted, such as focus groups, interviews, document reviews, and observations. Be sensitive about documenting only non-proprietary information related to the third-party safety culture assessment.

2. Observations & Findings

Document the aggregated results derived from the evaluation of the third-party safety culture assessment and the graded safety culture assessment. Include the results of the performance deficiency causal analysis, evaluation of the associated cross-cutting aspects assigned to the team's observations and findings, and consideration of accompanying insights from the SCAs/inspectors about the licensee's safety culture they obtained during the inspection process.

3. Assessment Result and Diagnostic Conclusions

Document a summary assessment from the safety culture assessment activities, highlighting significant weaknesses that are found to exist in any safety culture components or functional/organizational area. The weaknesses should be supported by the observations/ findings revealed during the inspection process and results from the licensee's third-party safety culture assessment, as applicable. Provide an evaluation of the licensee's response to the identified weaknesses of any safety culture components. If the team's assessment of a safety culture component has been documented in another section of the report (for example as part of the PI&R assessment documentation), that discussion can be referenced.

95003-04 RESOURCE ESTIMATE

The resource estimates provided are for direct inspection only, based on a three week on-site inspection. Not all areas will be performed during each inspection and the hours required to compete each area may be less for plants where previously identified performance issues were isolated. The hours required to complete each area could also be greater based on site-specific circumstances. For planning purposes, the ROP budgets 3000 hours (distributed among the four regions) to conduct one 95003 inspection per year. The resource estimates are not requirements and inspection staffing needs are based upon site-specific circumstances.

Position/Inspected Area	Manhours	
Team Leader	120	
Assistant Team Leader	120	
Licensee Control Systems	240	
Licensee's Safety Culture Assessment	120-160	
Safety Culture Assessment Activities	80-360	
Design	360	
Human Performance	120	
Procedures	120	
Equipment Performance	120	
Configuration Control	240	
EP without Attachment 95003.01	80	
EP with Attachment 95003.01*	160	
Occupational Radiation Safety	200	
Public Radiation Safety	60	
Safeguards	TBD	
Senior Reactor Analyst	0-120	
Review of Assessment Process	40	(not direct inspection)

* Including a remedial exercise in the scope of Attachment 95003.01 will require an additional 40 hours, resulting in a total of 200.

END

Attachment:

95003.01	Emergency Preparedness
95003.02	Guidance for Conducting a Full NRC Safety Culture Assessment
Attachment 1	Revision History For IP 95003

Attachment 1 – Revision History for IP 95003

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
C1	10/26/06 CN 06-031	Revised procedure to incorporate safety culture enhancements as required by the Safety Culture Initiative (ref: Staff Requirements - SECY-04-0111 - Recommended Staff Actions Regarding Agency Guidance In The Areas Of Safety Conscious Work Environment And Safety Culture.)	Yes	July 1, 2006	ML062980489
N/A	01/15/09 CN 09-002	Procedure revised to incorporate the results of the ROP safety culture lessons learned evaluation (reference SECY 06-0122). Changes made for ROP feedback forms 95003-1233, 95003-1234, 95003-1235, 95003-1261, 95003-1238.	No	N/A	ML083430521
N/A	11/09/09 CN 09-026	Added reference to IP 93002, “Managing Fatigue”	No	N/A	N/A