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## INSPECTION PROCEDURE 90003

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### CONSTRUCTION MULTIPLE/ REPETITIVE DEGRADED CORNERSTONE COLUMN INSPECTIONS

PROGRAM APPLICABILITY: 2505

#### 90003-01 INSPECTION OBJECTIVES

01.01 To provide the NRC additional information to be used in deciding whether the continued construction activities of the licensed facility is acceptable and whether additional regulatory actions are necessary to change and correct declining performance.

01.02 To provide an independent assessment of the extent of degradation in the quality of construction to aid in the determination of whether an unacceptable margin of safety construction exists.

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

01.04 To independently evaluate the adequacy of programs and processes in the affected construction inspection areas.

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

01.06 To determine if the NRC oversight process provided sufficient warning to significant reductions in the quality of construction in accordance with the license.

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.

#### 90003-02 INSPECTION REQUIREMENTS

The intent of this procedure is to allow the NRC to obtain a comprehensive understanding of the depth and breadth of quality of construction, organizational, and construction performance issues at facilities where data indicates the potential for serious degradation in the quality of construction in accordance with the approved design. Considerable leeway has been built into the procedure to allow it to be

customized, to better reflect the specific nature of the previously identified construction issues.

This procedure was written with the assumption that supplemental inspections (either Inspection Procedure (IP) 90001 or IP 90002) have been conducted to evaluate the licensee's root cause, extent-of-cause, and extent-of-condition evaluations and associated corrective actions for greater-than-minor 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 Identification of Construction-Inspection Areas Affected.

- a. Using the information contained in the Construction Action Matrix, identify the construction inspection areas for which performance has significantly declined. The scope of this inspection will generally include attributes of the degraded construction inspection area(s). Specific inspection requirements pertaining to each construction inspection area are contained in Sections 02.03 of the procedure.
- b. Inspection Requirements 02.02, and 02.04 - 02.09 should always be performed regardless of which construction inspection area was selected for review. Emergency Preparedness and Safeguards are areas of limited scope during construction. Both of these areas have ITAACs designated and are considered part of the operational programs. As it pertains to this procedure they will be considered when their ITAACs have been impacted or when deficiencies have been identified with their implementation as part of IMC 2504.

02.02 Review of Licensee Control of System, Structures and Components (SSC) for Identifying, Assessing, and Correcting Construction Performance Deficiencies. Once significant construction deficiency concerns have been identified in the Construction Action Matrix, the NRC must ensure that licensee control of SSCs for identifying, assessing, and correcting deficiencies are sufficient to prevent further construction performance degradations. The following inspection requirements evaluate whether licensee programs are sufficient to prevent further declines in the quality of construction that could result in a plant not being built in accordance with the approved design.

- a. Determine whether licensee evaluations of, and corrective actions to, significant construction 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, different construction 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 construction experience data (e.g. events, information notices, previous issues in other areas of construction, etc.)
- c. Determine whether the process for allocating resources provides for appropriate consideration of safety, quality of construction and regulatory compliance, and

whether appropriate consideration is given to the management of ITAAC maintenance, design change backlogs and work-around corrections.

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

02.03 Assessment of Performance in the Construction Area - (Design/Engineering, Procurement/Fabrication, Construction/Installation, Inspection/Testing)

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 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 an area of construction or work process (i.e. piping, cabling, concrete, module installation, testing, etc.) for focus using the issues identified as part of the performance information developed above.
- 3. Perform the following inspection requirements for each key attribute focusing on the area of construction with consideration of the applicable work process. While the inspectors should focus on the selected areas,

other construction activity areas may be reviewed as necessary to assess licensee performance for the following key attributes.

- b. Key Attribute – Design/Engineering. Inadequacies in the design, the as-built configuration, or design change process can cause SSCs to be in nonconformance with the approved design, which if uncorrected could affect the design function or the margin of design safety of the respective safety SSC(s).

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 SSC to verify it is meeting the design specifications. Focus will be on both original SSC design and SSC changes completed through the change control process. Information from this inspection will be used to assess the licensee's ability to build and maintain proper configuration for fuel load of the plant in accordance with the design basis.

1. Assess the effectiveness of corrective actions for deficiencies involving design.
  2. Select several design changes to the SSC for review and determine if the SSC is capable of meeting the design function specified by the current design and licensing documents, regulatory requirements, and commitments for the facility.
  3. Evaluate the interfaces between management, engineering, quality assurance, ITAAC maintenance, vendors and plant support groups.
- c. Key Attribute – Procurement/Fabrication. An inadequate process for procuring and fabricating components in accordance with the design can result in the plant being constructed in a manner that can impact the safety features of the design. Adequate procedures, peer reviews and audits can assure proper functioning of the processes in place to conduct these activities. To the extent that might be applicable deficiencies associated with the above noted activities, they should be identified as possible causes of problems in other key attributes.

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

1. Assess the effectiveness of corrective actions for deficiencies identified in the procedures, procurement documents or fabrication records.
2. Evaluate the quality of procedures for the development of procurement or fabrications documents and as applicable determine the document adequacy and revision processes.
3. Review a sample of procurement or fabrication changes against the requirements of the licensed design and corrective actions resulting from licensee assessments. Determine if the procedure revision process is

adequate in correcting identified deficiencies and maintaining the requirements set in the plant design.

- d. Key Attribute – Construction/Installation. Improper implementation of instructions, procedures, work packages and design drawings can result in a degradation of construction quality. Poor construction quality can be identified by assessing the effectiveness of the different work processes in place by the licensee. Work process should have established programs for identifying problems, an effective corrective action program, and a change procedure process. These programs should be capable of addressing adverse impacts on the ITAAC, design changes, procedure revisions, and effective communication between the work processes. Communications between the work processes should ensure each group is informed of lessons learned, impacts to their construction area due to work being done by other construction groups, design or procedure changes that could impact their area, and proper turnover of construction activities when a vendor has completed its contract.

Determine that the licensee is constructing and adequately supervising contracted work on the plant in accordance with the approved design by completing the following inspection requirements.

1. Assess the effectiveness of corrective actions for deficiencies impacting construction activities like ITAAC, design changes, procedure revisions, drawings, and work processes practices including the consideration of lessons learned from the licensee construction experience program.
2. Determine if the licensee has effectively implemented programs for document control and evaluation of construction equipment calibration, installation testing (if applicable), and ITAAC testing when instructed by the procedure.
3. Review a sample of quality assurance records applicable to the work process being inspected (i.e. electrical, piping, concrete, module installation, etc.) to determine licensee's quality assurance program effectiveness. An example of documents for review are completed work orders, drawings used for pipe and valve installation, components and specifications in a procedure should match the design specifications, that procedures or installation instructions being used have been officially released by the licensee, and that the proper level of management is providing oversight over each work process task.
4. Assess decision-making process for identification of problems with the design, a procedure, installation instructions, ability to meet the ITAAC requirements, and that the licensee is correctly identifying conditions adverse to quality per the established criteria; not because issues could be easily and readily resolved within the work process (i.e. whether conservative decisions were made, the CAP was effectively used, and decisions supported the proper construction of the plant in accordance with the design). Ensure the licensee's stop-work order process can be

implemented without hindrance from management or poorly established thresholds.

5. For any unresolved construction or ITAAC issues, determine whether inadequate resources were a cause or contributed to any inappropriate delay in resolving those issues.
- e. Key Attribute – Inspection/Testing. Inadequate oversight of completed construction activities and test effectiveness reassurance can lead to inadequate completion of ITAACs, and SSCs in the plant not constructed in accordance with the approved design. Ensuring SSCs are installed and maintained in proper configuration, as well as being capable to perform satisfactorily in service, should be the priority of an effective inspection and testing program. Proper inspection of construction activities is necessary to maintain assurance that the different work processes are completing their tasks in accordance with procedures and site policy, and provides the means for licensee to monitor and correct any degradation in performance by the vast number of vendors on site. The tests developed should ensure SSC and ITAACs are being constructed and installed in accordance with design and that they effectively meet the acceptance criteria. The quality assurance organization should keep records of the inspection/tests including documentation of actions taken when problems with construction were identified.

Assess the licensee's ability to inspect construction activities and properly test SSC being completed by the different work processes organizations by completing the following inspection requirements.

1. Assess the effectiveness of corrective actions for deficiencies involving findings identified during inspections or for test results not meeting the acceptance criteria.
2. Observe the licensee during an inspection or test of the selected construction activity or request the licensee to perform a mock activity or to explain what would be the requirement/actions to complete the selected task.
3. Determine that the procedures and documentation being used to conduct inspection and tests meet the inspection and test program requirements specified in IP 35007.
4. Determine how the scope of the inspection and the test's instructions meet the acceptance criteria for the selected SSC and what actions are required when the results deviate from expected results.
5. Assess how the inspection and test programs effectively communicate findings among the applicable work processes and through the different levels of management. Ensure that final documentation of ITAACs include all of the findings and their resolution not just the record that the inspection or test was successfully passed.

6. Ensure the ITAAC maintenance program in place is adequately keeping the ITAAC in configuration and capable of meeting the acceptance criteria. Review any documents or actions designated by the licensee as provisions to maintain the ITAAC that could be found in either of these programs: quality assurance, corrective action, design and configuration control, and construction programs.

#### 02.04 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 90003 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 90003 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 unacceptable performance column of the cROP Construction 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 construction activities (e.g., quality assurance, engineering, work processes) 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 construction site or an operator(s) of an operating plant at the same site. 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.

#### 02.05 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.

#### 02.06 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 area.

#### 02.07 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.

#### 02.08 NRC Assessment.

Compare the team's findings with previous inspection program data to determine whether sufficient warning was provided to identify a significant reduction in the quality of construction. 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 NRO.

#### 02.09 Document Inspection Results.

Assess licensee construction programs performance in the affected construction 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.

## 90003-03 INSPECTION GUIDANCE

### General Guidance.

This procedure provides a framework for conducting a comprehensive assessment of licensee performance in affected area of construction. 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.

The team leader should ensure that all team members receive "just in time" training on IP 90003 processes and methods. This training should focus on unique aspects of the 90003 inspection. Typical aspects to cover include: construction site issues, a debrief by the senior resident inspector including site specific terminology, interface aspects between the 90003 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 Construction Assessment, Enforcement and Allegation Branch of the Division of Construction Inspection and Operational Programs of the Office of New Reactors.

### 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 selected construction 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 90003 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 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 plant design. 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.

The use of headquarters technical staff or contractor support should be considered for conducting aspects of the SSC 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 the 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 90003 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 is 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 cROP 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 construction 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 construction site has transitioned into the Unacceptable Performance column in a gradual manner, the NRC will have a much clearer understanding of the site 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 Unacceptable Performance column of the construction action matrix in a prompt manner resulting from a single severity level I or Red finding, it may be prudent to schedule an early implementation of focused aspects of the IP90003 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 construction area inspections as part of the overall 90003 effort. This could include scheduling a sub-group to perform an inspection before the completion of the root cause 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 construction area inspections may dilute the effectiveness of the team. If the entire team is on-site concurrently, they can assess the construction site performance in a more holistic manner. If the option is elected to conduct focused construction 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, and if appropriate one week offsite with

the final week being onsite. 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 Construction Areas.

### Specific Guidance.

03.01 Identification of Construction-Inspection Areas Affected. No additional guidance provided.

03.02 Review of Licensee Control SSCs for Identifying, Assessing, and Correcting Construction 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 inspection finding and inspection findings that were not been previously inspected. Use the guidance contained in supplemental IP 90001 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 SSC issues. Consider the results of NRC's evaluation of licensee root causes performed as part of Appendix 16 to IP 35007, "Inspection Guide for Criterion XVI - Corrective Action"

- b. Line organization, quality assurance, and external audits and assessments should be reviewed to determine whether the licensee has demonstrated the capability to identify construction performance issues before they result in actual degradation in the quality of construction. 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 SSCs should be in place to process and act upon this 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.
- c. Processes for authorizing changes and allocating resources for completing work should give adequate consideration to the impact on the design features of the affected SSC and the need for abiding by regulatory requirements. The authorization and allocation processes should provide for a manageable construction backlog and prevent the need for multiple work-arounds that could increase the likelihood of deviating from the design requirements.
- d. The inspector should ensure that licensee performance goals are not in conflict with the actions needed to correct construction 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 IP 40001, "Resolution of Employee Concerns," 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 construction 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 deficiencies; (2) whether additional construction quality 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 construction quality 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 the installation of SSC not meeting the design requirements.

### 03.03 Assessment of Performance in the Construction Areas.

#### a. Inspection Preparation

1. No specific guidance provided.
2. SSC Selection. During the planning process, the team leader should select a SSC based on the plant construction schedule, past construction inspections that may have already been performed on a SSC by the licensee or by other NRC teams, and through review of issues contained in the Construction Action Matrix.

The team should select the applicable number of electrical, mechanical, and instrumentation and control SSC for detailed review. The majority of these SSC should be from the applicable ITAAC or ITAAC family when applicable or any other SSC which are necessary for successful operation of the SSC area being inspected.

3. No specific guidance provided.

#### b. Key Attribute – Design/Engineering

The design/engineering review portion of the inspection should be performed by inspectors (or technical staff/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, construction activity, 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 area selected in paragraph 02.03.a.2. Appendix 3 and 16 of IP 35007 should be considered as additional guidance for evaluating the impact of design and engineering to the area of construction selected. Prior to evaluating the selected area or specific SSC, 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 SSC. The intent is to focus on the quality aspects of proper design and engineering action that could contribute to the degradation of construction quality. The inspection is not intended to be a re-validation of the original design.

In selecting a sample of design changes to be reviewed, the inspectors should concentrate on those changes with the potential to significantly alter the SSC design or the ITAAC. The sample should include changes 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 changes, if significant problems are found. This expansion should consider other similar changes and should not be limited to the initially selected SSC.

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 design changes:
  - (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 changes. As an example an inspector could consider the following when evaluating the calculation design parameters of the following components:
    - (1) For valves: Where interlocks changed? Are there new differential pressures for when the valve strokes? What is the source of control and indication power? Was there an impact on the control logic? Did the specified manual actions required to back up and restore a degraded function changed? Could the change subject to the valves to possible pressure locking? Are the valves addressed in emergency or abnormal operating procedures?
    - (2) For pumps: Did the flow paths the pump will experience during accident scenarios change? Where there changes to the permissive interlock and control logic? What suction and discharge pressures can the pump are expected to experience during accident conditions with the new design? Do vendor data and specifications support the new parameters of the design?
  - (c) Compare the as-built design with the current design basis and the licensing requirements for the selected SSC and consider the following questions:
    - (1) Verify that the changes do not invalidate assumptions made as part of the original design and the accident analyses, including interfaces with supporting SSCs. 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? Are test results for the SSC consistent with the design assumptions?

- (2) Do the changes 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? Has 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 changes have introduced an unreviewed safety question.
  - (e) For the selected SSC, review that the changes have not introduced new design parameters that could adversely impact the developed maintenance procedures and operating procedures. Confirm that any such design changes have been subjected to the formal design change process in accordance with 10 CFR 52.
  - (f) Ensure that verification and validation of computer programs used for design and engineering calculations has been adequately accomplished.
3. Evaluation of communications affecting design control.
- (a) Assess the ability to communicate accurate information on the status of SSC changes. Plant policies on updating design related material may not support timely documentation of changes to the SSC. 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 changes implementation and incorporation into the plant design basis documents.
  - (b) Verify that applicable management, engineering, quality assurance, ITAAC maintenance, vendors and affected work process groups are involved in the evaluation and concurrence process for approving:
    - (1) performance of non-routine maintenance activities
    - (2) temporary changes
    - (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.
- (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 – Procurement/Fabrication.

1. Evaluate to what extent procedure, procurement or fabrication document quality has contributed to previously identified construction issues. In performing this evaluation, select a sample of documents which reflect instances where problems with a procedure, procurement or fabrication specification have been documented in the licensee's reporting system (i.e. LER), NRC inspection reports, or licensee assessments or audits. Focus on the technical adequacy of the documents using the following guidance as applicable. Evaluate the licensee's actions to address the identified inadequacies. Refer to Appendices 4, 7, 13 and 15 of IP 35007 for further guidance.
2. Development and review of procedures, procurement or fabrication documents.
  - (a) When reviewing any of the documents, the inspector should assess their technical adequacy and determine if the procedural steps or information being communicated in procurement documents will ensure SSC meet their design specifications.
  - (b) Determine whether the procedures will accomplish the creation of procurement and fabrication documents that will ensure the design characteristics and regulatory requirements are met. During this evaluation, the review may include technical specifications, limiting condition for delivery, vendor manuals, design information, piping and instrumentation drawings (P&IDs), and instrumentation and electrical wiring and control diagrams.
  - (c) Review receipt documentation to assess the licensee's effectiveness to ensure SSC received meets the design requirements. Determine if the procedures allows for the identification and evaluation of SSC deficiencies. Verify the use of quality verification of important attributes. Verify that important vendor manuals are complete and up-to-date. Verify that vendor manuals, equipment operating and maintenance instructions, or approved drawings with acceptance criteria that may have been received as part of the SSC delivery are captured in the licensee's document control process.

- (d) If the technical adequacy of the selected sample is a concern review the following.
  - (1) Verify that personnel have the ability to reference an up-to-date and accurate copy of procedures or procurement documents. This is necessary because design changes may not be reflected immediately in the documentation upon completion of the design review. In such situations, the inspector should verify that design changes are captured in a timely manner following the changes in the procurement system.
  - (2) Through discussions with personnel and review of procurement documents determine if the appropriate staff verifies and approves the design specifications in the procurement and fabrication documents.
- 3. Procurement or fabrication changes should be in accordance with licensee processes and regulatory requirements. Verify the adequacy of all changes incorporated in the procurement or fabrication documents which resulted from recent design change.
- d. Key Attribute – Construction/Installation.
  - 1. Corrective actions
    - (a) Review a sample of corrective action generated by the applicable work process and determine if the problems were reviewed by the appropriate level of management, prioritized according to their safety significance, and if impact on the construction work process due to an ITAAC, design change, procedure revision or expired drawing was correctly evaluated. Evaluate whether the corrective actions were technically correct and implemented in a timely manner. Appendix 16 of IP 35007 provides guidance on determining how the licensee has implemented its corrective action program.
    - (b) Examples of corrective action issues include a relatively large backlog, related work not being accomplished in accordance with stipulated corrective actions, and not identifying the proper documents affected and in need of changes (i.e. procedures, installation requirement sheets, verification points, procurement documents).
  - 2. Review a sample of installation tests, calibration records, documentation of partially completed ITAAC (if required by procedure), and either procedure or instruction being used by the work processes to verify how they are being controlled and how they are meeting the design requirements.

3. Observe any work performed on the selected SSC by the work process group while the inspection team is onsite or review any applicable quality record (i.e. completed work packages, partially completed ITAAC, SSC turnover documentation by a vendor, etc.)
  - (a) Walk through the SSC installation procedure and the SSC pipe and instrumentation drawings. Verify that the knowledge level of personnel performing construction activities is adequate concerning the significance and requirements specifically needed for the activity.
  - (b) Conduct interviews with licensee personnel to determine how the SSC being installed or construction activity meets the requirements of the design. Determine if SSC installation or construction is consistent with the design.
  - (c) Determine if there are any external impacts to the work process (environment, overcrowded work area, other work processes, management support, etc.) that are or could be affecting the effective completion of construction activities.
  - (d) Conduct interviews with licensee, work process and vendor personnel to determine what changes have been performed. Determine if the changes are consistent with the licensing basis.
  - (e) Determine if engineering input into construction “in-process” activities is at an appropriate level to ensure plant is constructed in accordance with design.
  - (h) Verify that methods and responsibilities have been designated for closing a work package.
4. Review records of decisions regarding actions to address long standing issues (i.e. CAP, deferred design changes, issues raised by employees) to determine whether the decisions appropriately and conservatively considered safety and the quality of construction.
5. 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.

Refer to Appendices 5, 6, 8, 9, and 17, of IP 35007 for further guidance.

e. Key Attribute – Inspection/Testing.

1. Select a sample of the corrective action process issues related to inspection/testing and review the adequacy of the corrective actions implemented. Review all construction determinations that have been completed on the selected SSC.
2. SSC Inspection or Test Walkdown
  - (a) For the selected SSC, obtain current drawings and review the associated inspection or test procedures. Review the licensee's SSC design basis documents and determine whether the inspection is adequately reviewing the as-built configuration with the design parameters and whether the test procedure is properly challenging the acceptance criteria.

Ensure licensee is verifying the inspection and test procedures with current drawings to ensure that they are consistent with design (e.g., valve positions, installation of blank flanges and caps).

- (b) Review temporary and permanent changes logs. Determine (1) if an adequate technical review was performed before the design changes was performed to ensure accepted test results are adequate, and (2) if plant drawings were updated to reflect the change that licensee inspection scope also reflect the revised construction activity. The licensee's controls for limiting the duration of temporary changes due to inspection or test results should be reviewed and verified that the changes do not require a design change submittal to NRC in accordance with 10 CFR 52. Assess the role of licensee and vendor management, construction quality, and design engineering groups in the temporary changes process.
  - (c) Whenever possible request that the licensee explains to the inspector how they complete the inspection requirements for visual and technical objectives (i.e. ask to show how the inspector determine the SSC 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).

Refer to Appendices 10, 11, 12, and 14 of IP 35007 for further guidance.

03.04 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 vendor 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 that perform work that has a clear nexus to the quality of construction (e.g., quality assurance, engineering, ITAAC, work process) 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 vendor 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 vendors 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 different in a way that could bias the results of the survey.

For example, if the survey 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 IMC 0613.
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 vendor 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.

### 03.05 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 90003 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 02.04 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.
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 the quality of construction (e.g., quality assurance, engineering, ITAAC, work process) 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 vendors, 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.

#### 03.06 Perform NRC's Graded Safety Culture Assessment.

- a. Follow the scope and implement the plan developed under section 02.06.

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).

### 03.07 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 IP 90001 or IP 90002) 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 cROP construction substantive crosscutting issues as well as new findings with safety culture 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.

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.

### 03.08 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 construction quality has occurred, compare the team's findings with current assessment data to determine if sufficient warning was provided. If the results of this inspection indicate that a significant reduction in construction quality 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 a significance determination process for risk significance, and was this data appropriately entered into the NRC construction action matrix.

### 03.09 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 construction safety culture aspects to the team's findings, and the safety culture aspects 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 0613, "Documenting 10 CFR Part 52 Construction and Test Inspections", guidance regarding the threshold to only document greater than minor findings is not applicable to this procedure. Although certain issues should be evaluated using a significance determination process, 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 3.07) collectively performed by all of the team functional area groups, a safety culture aspect is evaluated in accordance with IMC 0613 for findings identified by the team. The inspection report should document the information and analysis used to assign the safety culture aspect and should clearly explain how the selected safety culture 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. Construction Area
  1. Inspection Scope

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 0613 any findings which were identified during this assessment.

3. Assessment Result

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

b. CAP 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 CAP which are not findings but which support the assessment result. Also list and document in accordance with IMC 0613 any findings which were identified during this assessment.

3. Assessment Result

Describe the overall assessment of licensee performance in CAP 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

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 safety culture 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 CAP 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 complete each area may be less for construction sites 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 cROP budgets 1280 hours to conduct one IP 90003 inspection per year. The resource estimates are not requirements and inspection staffing needs are based upon site-specific circumstances.

<u>Position/Inspected Area</u>	<u>Manhours</u>
Team Leader.....	120
Assistant Team Leader .....	120
Licensee's Safety Culture Assessment .....	120-160
Safety Culture Assessment Activities .....	80-360
Design/Engineering .....	120
Procurement/Fabrication .....	120
Construction/Installation .....	120
Inspection/Testing .....	120
Review of Assessment Process .....	40 (not direct inspection)

## 90003-5      PROCEDURE COMPLETION

Meeting the inspection objectives defined in Section 90003-01 of this IP will constitute competition. Refer to IMC 2505 for additional regulatory actions and considerations.

## 90003-6      REFERENCES

IMC 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)"

IMC 2504, "Construction Inspection Program - Inspection of Construction and Operational Programs"

IMC 2505, "Periodic Assessment of Construction Inspection Program Results"

IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document"

IMC 0613, "Documenting 10 CFR Part 52 Construction and Test Inspections"

IP 35007, "Quality Assurance Program Implementation During Construction and Pre-Construction Activities"

IP 40001, "Resolution of Employee Concerns"

IP 71841, "Human Performance"

IP 82001.05, "Procedure Quality"

IP 90001, "Construction Regulatory Response Column Inspections"

IP 90002, "Construction Degraded Response Column Inspections"

10 CFR 52, Section VIII of Appendix A through D, "Processes for Changes and Departures"

END

Attachment:

95003.02	Guidance for Conducting a Full NRC Safety Culture Assessment
Attachment 1	Revision History for IP 90003

Attachment 1 – Revision History for IP 90003

Commitment Tracking Number	Issue Date & Accession Number	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	02/09/12 CN 12-001 ML11340A021	Initial Issue.	Yes	N/A	ML11340A019