

NRC INSPECTION MANUAL

IIPB

INSPECTION PROCEDURE 45051

GEOTECHNICAL/FOUNDATION ACTIVITIES PROCEDURE REVIEW

PROGRAM APPLICABILITY: 2501

45051-01 INSPECTION OBJECTIVES

01.01 To determine whether the technical requirements for geotechnical/foundation exploration for an early site permit (ESP) have been adequately addressed for specifications, drawings, and work procedures, and whether an established system of management control is adequate.

01.02 To determine whether instructions, and procedures for geotechnical/foundation activities have been established by the applicant, and whether these documents are consistent with the QA elements described in the NRC ESP Review Standard (RS) 002, Section 17.1.1, "Early Site Permit Quality Assurance Controls."

45051-02 INSPECTION REQUIREMENTS

02.01 For each onsite organization with QA/QC responsibilities relative to geotechnical/foundation activities, complete the inspection to determine if the QA/QC elements conform to the criteria in NRC's QA review standard.

02.02 Review the specifications related to geotechnical activities and ascertain whether the specified technical requirements conform to the NRC's ESP QA review standard.

02.03 Determine whether procedures in the following areas are compatible with the QA program and prescribe methods to meet the geotechnical site exploration specifications, where applicable.

- a. Surveying
- b. Soil testing (e.g., standard penetration tests, cone penetrometer tests, bearing tests and others as appropriate)
- c. Instrumentation
- d. Testing (including subsurface exploration)
- e. Inspection
- f. Engineering direction

02.04 Verify that personnel associated with geotechnical/foundation activities are qualified to perform their assigned work.

02.05 Observe work in progress and verify that work is performed in accordance with appropriate and adequate procedures.

02.06 Review any calculations to assure that they properly translate the test data into soil and foundation parameters.

02.07 Conduct additional inspections for any findings or deviations identified in previous inspections, especially if they impact the soundness of the applicant's QA/QC program in regard to geotechnical/foundation activities.

45051-03 INSPECTION GUIDANCE

General Guidance

The inspector will review documents being used onsite. Most of this review can be completed during inspection preparation after these procedures have been obtained.

Findings from these activities should assess each element as satisfactory, unresolved and requiring resolution, or requiring correction. Geotechnical/foundation activities will also be reviewed with respect to consistency with standard industry practices for the successful completion of the activities. When significant inadequacies identified in the specifications or procedures indicate weakness within the preparing organization, the inspector will inform appropriate NRC management. The issue should be addressed at the appropriate level of the potential applicant's management.

QA/QC procedures must provide for effective inspections which will ensure that work is performed in accordance with specification requirements. QA audits should identify procedural inadequacies and the root cause of repetitive nonconforming conditions. Inspections should require verification of specified controls and should not be accomplished merely by surveillance. Laboratory and field testing procedures must provide for verification of correct material usage and correct selection of reference standards, and should prohibit discretionary selection of inspection and testing parameters on the part of inspectors. Results of testing should be reviewed by qualified personnel and

a determination of acceptability of the results made. Surface and subsurface site exploration procedures must reference any inspection holdpoints and must also address the authority of the quality assurance staff in charge to stop work.

Specific Guidance

03.01 QA Program. Verify that a QA/QC program has been established (including plans, procedures, and schedule), covering the collection of data for safety-related work and control functions in the area of geotechnical/foundation activities. The potential ESP applicant is responsible to implement or have implemented the QA program in accordance with the NRC's review standard. The inspector must determine if this program is implemented in an adequate and timely manner for the site exploration work in progress. The aggregate of plans, lists, checklists, and procedures form the QA manual and QA implementing procedures/work procedures.

45051-04 REFERENCES

Regulatory Guide 1.132, "Site Investigation for Foundations of Nuclear Power Plants." This regulatory guide is being revised as Draft Regulatory Guide 1101.

Regulatory Guide 1.138, "Laboratory Investigation of Soils for Engineering Analysis and Design of Nuclear Power Plants." This regulatory guide is being revised as Draft Regulatory Guide 1109.

Draft Regulatory Guide 1105," Procedures and Criteria for Assessing Seismic Soil Liquefaction at Nuclear Power Plant Sites."

ANSI/ASME N45.2.20," Supplementary Quality Assurance Requirements for Subsurface Investigations for Nuclear Power Plants."

U.S. Army Corps of Engineers, "Soil Sampling", Engineer Manual (EM) 1110-2-1907.

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