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Docket No. 50-245

MEMORANDUM FOR: William T. Russell, Chief
Systematic Evaluation Program Branch
Division of Licensing

FROM: George Lear, Chief
Hydrologic and Geotechnical Engineering Branch
Division of Engineering

SUBJECT: ADDITIONAL INFORMATION REQUIRED FOR GEOTECHNICAL ENGINEERING REVIEW (TOPIC II-4F)

Plant Name: Millstone Nuclear Power Station, Unit 1
TAC Number: 41267
Responsible Branch: SEPB; T. Cheng, LPM

In order for us to complete our review of the licensee's submittal on SEP Topic II-4F, "Settlement of Foundations and Buried Equipment," dated April 28, 1981, we need additional information as shown in the attachment. The geotechnical engineering reviewer is Dr. Owen O. Thompson.

Original signed by George Lear

George Lear, Chief
Hydrologic and Geotechnical
Engineering Branch
Division of Engineering

cc: w/enclosure
J. Knight
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L. Heller
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DATE	12/7/81	12/6/81	12/8/81				

Subject: Additional Information Needed (SEP Topic II-4F)
Plant Name: Millstone Nuclear Power Station, Unit 1
TAC Number: 41267
Responsible Branch: SEPB; T. Cheng, LPM
Prepared by: Dr. Owen O. Thompson, HGEB, DE

Topic II-4.F. Settlement of Foundations and Buried Equipment

In order for the staff to be able to concur in the licensee's finding that "total and differential settlements are expected to be negligible", the bases for the licensee's conclusion must be presented in the Safety Assessment Report. We expect that the following information will meet this need:

1. Depths of principal structures below original and final grades i.e. elevations of structures, and original and final grades.

2. Approximate size of foundations and their spatial relationships to each other.

3. Approximate locations and elevations of safety-related pipelines and conduits.

4. Field explorations made at the site, such as summary details of the number, depth, spacing and sampling for test borings, and the type and quantity of geophysical explorations.

5. Summary of types and quantity of laboratory tests performed on soil and rock samples.

6. Summary of the properties of foundation soils and rock that were developed from field and laboratory investigations and used for design; including special attention to unusual or potentially detrimental characteristics such as weak zones in bedrock, expansive soils, loose (liquefiable) sands, etc.

7. Groundwater levels recorded, predicted groundwater level fluctuations and design groundwater level.

8. Brief discussion of dewatering before, during and after construction.

9. Identification of problems or unusual conditions encountered during excavating and backfilling, and the basis for concluding that such conditions were properly handled.

10. Details of safety-related backfill, including:

    source of backfill material

    locations where safety-related backfill was used

    summary of laboratory tests performed on backfill materials to define the material properties

    description of the backfill material and the backfill soil properties used in design (gradation, shear strength, classification etc).

    compaction criteria specified.

    bases for concluding that backfill was properly compacted (e.g. summary of field density test results, test fill results, inspection records, etc).

11. Summary of design magnitudes of foundation loads for static and dynamic loading conditions and comparison of these loads with allowable or ultimate bearing resistance of the supporting soils.

12. Brief description of the methods used to calculate the settlement of structures for static and dynamic loading conditions, including the predicted magnitudes of total and differential settlement.

13. Brief description of the methods used to calculate the predicted settlement of safety-related pipelines and conduits; i.e., the basis for concluding that such appurtenances will be safely supported during the Safe Shutdown Earthquake (SSE).

14. Brief description of analyses of liquefaction potential that were made for the site soils and the resultant settlement, or the justification for not performing liquefaction analyses.

15. Magnitudes of movements of foundation soils or structures that have been recorded during construction and operation of the plant.

16. Conclusion assessing the safety of the plant foundations and buried structures against excessive settlement and the bases for the conclusion.

In the Safety Assessment Report, reference to docketed information can be used to supplement the Report contents, but the Report, itself, must contain sufficient information to show that the bases for the licensee's conclusions are well-founded.