

July 06, 1982

Docket No. 50-155
LS05-82-07-005

Mr. David J. Vandewalle
Nuclear Licensing Administrator
Consumers Power Company
1945 W. Parnall Road
Jackson, Michigan 49201

Dear Mr. Vandewalle:

SUBJECT: SEP TOPIC II-4.D, STABILITY OF SLOPES
BIG ROCK POINT

Enclosed is a copy of our evaluation of Systematic Evaluation Program Topic II-4.D, "Stability of Slopes." This assessment compares your site condition, as described in the Docket and references, with the criteria currently used by the regulatory staff for licensing new facilities. Please inform us if your site condition differs from the licensing basis assumed in our assessment.

Our review of this topic is complete and this evaluation will be a basic input to the integrated safety assessment for your facility unless you identify changes needed to reflect the existing site condition at your facility. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic are modified before the integrated assessment is completed.

Sincerely,

Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing

SEOY
DSU USE(18)
ADD:
R. Scholl

Enclosure:
As stated

cc w/enclosure:
See next page

8207130442 820706
PDR ADDCK 05000155
P PDR

7/4/82

OFFICE	DL:SEPB TCheng:sah	DL:SEPB RSholl	DL:SEPB/SL RHermann	DL:SEPB/BC WRussell	DL:ORB #5/PM REmch	DL:ORB #5/BC DCrutchfield	DL:AD/SA GLainas
SURNAME	TCheng:sah	RSholl	RHermann	WRussell	REmch	DCrutchfield	GLainas
DATE	6/29/82	7/1/82	7/1/82	7/2/82	7/2/82	7/2/82	7/2/82

Mr. David J. Vandewalle

cc

Mr. Paul A. Perry, Secretary
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Judd L. Bacon, Esquire
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Joseph Gallo, Esquire
Isham, Lincoln & Beale
1120 Connecticut Avenue
Room 325
Washington, D. C. 20036

Peter W. Steketee, Esquire
505 Peoples Building
Grand Rapids, Michigan 49503

Alan S. Rosenthal, Esq., Chairman
Atomic Safety & Licensing Appeal Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. John O'Neill, II
Route 2, Box 44
Maple City, Michigan 49664

Mr. Jim E. Mills
Route 2, Box 108C
Charlevoix, Michigan 49720

Chairman
County Board of Supervisors
Charlevoix County
Charlevoix, Michigan 49720

Office of the Governor (2)
Room 1 - Capitol Building
Lansing, Michigan 48913

Herbert Semmel
Counsel for Christa Maria, et al.
Urban Law Institute
Antioch School of Law
2633 16th Street, NW
Washington, D. C. 20460

U. S. Environmental Protection
Agency
Federal Activities Branch
Region V Office
ATTN: Regional Radiation Representative
230 South Dearborn Street
Chicago, Illinois 60604

Peter B. Bloch, Chairman
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dr. Oscar H. Paris
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. Frederick J. Shon
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Big Rock Point Nuclear Power Plant
ATTN: ~~Mr.~~ C. J. Hartman
Plant Superintendent
Charlevoix, Michigan 49720

Christa-Maria
Route 2, Box 108C
Charlevoix, Michigan 49720

William J. Scanlon, Esquire
2034 Pauline Boulevard
Ann Arbor, Michigan 48103

Resident Inspector
Big Rock Point Plant
c/o U.S. NRC
RR #3, Box 600
Charlevoix, Michigan 49720

Hurst & Hanson
311 1/2 E. Mitchell
Petoskey, Michigan 49770

Mr. David J. Vandewalle

cc

Dr. John H. Buck
Atomic Safety and Licensing Appeal Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Ms. JoAnn Bier
204 Clinton Street
Charlevoix, Michigan 49720

Thomas S. Moore
Atomic Safety and Licensing Appeal Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

James G. Keppler, Regional Administrator
Nuclear Regulatory Commission, Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Systematic Evaluation Program Topic Assessment

Topic: II-4.D - Stability of Slopes

Plant Name: Big Rock Point Nuclear Power Plant (BRP)

Docket Number: 50-155

I. INTRODUCTION

This topic pertains to the Geotechnical Engineering review of the stability of all earth and rock slopes, both natural and man-made (cuts, fills, embankments, dams, etc.), whose failure, under any of the conditions to which they could be exposed during the life of the plant, could adversely affect the safety of the plant. The scope of the review embraces the following subjects which are evaluated using data developed by the applicant and information available from all sources: (1) slope characteristics; (2) design criteria and analyses; (3) results of field and laboratory tests; (4) excavation, backfill, and earthwork in slopes; (5) liquefaction potential affecting slopes; and (6) proposed instrumentation and performance monitoring.

II. REVIEW CRITERIA

The applicable rules and basic acceptance criteria pertinent to the review of this topic are:

1. 10 CFR Part 50, Appendix A

(a) General Design Criterion 1 - "Quality Standards and Records."

This criterion requires that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of

the safety functions to be performed. It also requires that appropriate records of the design, fabrication, erection, and testing of structures, systems, and components important to safety shall be maintained by or under the control of the nuclear power plant licensee throughout the life of the plant.

- (b) General Design Criterion 2 - "Design Bases for Protection Against Natural Phenomena." This criterion requires that safety-related portions of the system shall be designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions.
- (c) General Design Criterion 44 - "Cooling Water." This criterion requires that a system shall be provided with the safety function of transferring the combined heat load from structures, systems, and components important to safety to an ultimate heat sink under normal operating and accidental conditions.

2. 10 CFR Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants"

These criteria describe the nature of the investigation required to obtain the geologic and seismic data necessary to determine site suitability and identify geologic and seismic factors required to be taken into account in the siting and design of nuclear power plants.

3. Regulatory Guides

The following Regulatory Guides provide information, recommendations, and guidance and in general describe a basis acceptable to the staff that may be used to implement the requirements of the above described criteria.

- (a) Regulatory Guide 1.132, "Site Investigations for Foundations of Nuclear Power Plants." - This guide describes programs of site investigations related to geotechnical engineering aspects that would normally meet the needs for evaluating the safety of the site from the standpoint of the performance of foundation and earthworks under anticipated loading conditions including earthquakes in complying with 10 CFR, Part 100, Appendix A. It provides general guidance and recommendations for developing site-specific investigation programs as well as specific guidance for conducting subsurface investigations, the spacing and depth of borings, and sampling.

- (b) Regulatory Guide 1.138, "Laboratory Investigations of Soils for Engineering Analysis and Design of Nuclear Power Plants." - This guide describes laboratory investigations and testing practices acceptable for determining soil and rock properties and characteristics needed for engineering analysis and design for foundations and earthwork for nuclear power plants in complying with 10 CFR, Part 100 and 10 CFR, Part 100, Appendix A.

III. RELATED SAFETY TOPICS AND INTERFACES

Geotechnical Engineering aspects of settlement of structures and buried equipment are reviewed under Topic II-4.F. Other interface topics include II-4.F, "Dam Integrity"; II-3.C, "Safety-Related Water Supply (Ultimate Heat Sink)"; III-6, "Seismic Design Considerations"; XVI, "Technical Specifications"; III-3.C, "In-Service Inspection of Water Control Structures"; III-3.A, "Effects of High Water Level on Structures"; and IX-3, "Station Service and Cooling Water Systems."

IV. REVIEW GUIDELINES

In general, the review process was conducted in accordance with the procedures described in NUREG-0800 Standard Review Plan Section 2.5.5. The geotechnical engineering aspects of the design and as-constructed condition of slopes were reviewed and compared to current procedures and criteria and the safety significance of any differences was evaluated.

V. TOPIC EVALUATION

The Big Rock Point Nuclear Power plant (BRP) is located on the eastern shore of Lake Michigan, approximately 4 miles northeast of Charlevoix, Michigan. Figure 1, "Site Plan" shows the general layout of the plant. The plant grade is at elevation 592.5 ft (USGS datum) and the water level of the Lake Michigan varies between elevations 576.0 to 584.0 ft.

The generalized stratigraphy at the site is approximately 40 ft of overburden over limestone bedrock. The top of the overburden consists of a 7 to 10 ft thick, medium dense to dense sand, some gravel, varying amounts of silt and limestone chips. This is a glacial outwash deposit. This deposit is underlain by a 30 to 35 ft thick, very stiff sand with some clay, trace silt and gravel. This lower unit is a glacial till which overlies the limestone bedrock. The ground water table at the site is at the top of the till. A detailed description of the site conditions can be found in the Safety Evaluation Report for SEP Topic II-4.F, "Settlement of Structures and Buried Equipment at BRP plant".

The topography at the site varies from level to gently-sloping towards the lake. There are no man-made or natural slopes of any significance whose failure would effect the safety of the plant (References 1 and 2). This was confirmed by NRC staff during a site visit (Reference 3).

VI. CONCLUSIONS

The licensee has stated in his Safety Assessment Report (Reference 1), and the staff concurs, that there are no natural or man-made slopes at this site whose failure would effect either the safety of the plant or attaining a safe-shutdown of the plant. The staff concludes that slope stability is not a radiological safety concern at the BRP site.

VII. REFERENCES

- (1) Letter from R. Vincent of Consumers Power Company to D. Crutchfield of NRC, dated October 5, 1981, Subject: Big Rock Point Plant - SEP Topic II-4.D, Stability of Slopes.

- (2) Letter from R. Vincent of Consumers Power Company to D. Crutchfield of NRC, dated April 30, 1982, Subject: Systematic Evaluation Program - Request for Additional Information for Topics II-4.D and II-4.F.

- (3) Memo from B. Jagannath of NRC to G. Lear of NRC dated June 18, 1982, Subject: Site Visit to Big Rock Point Nuclear Power Plant on May 20, 1982.

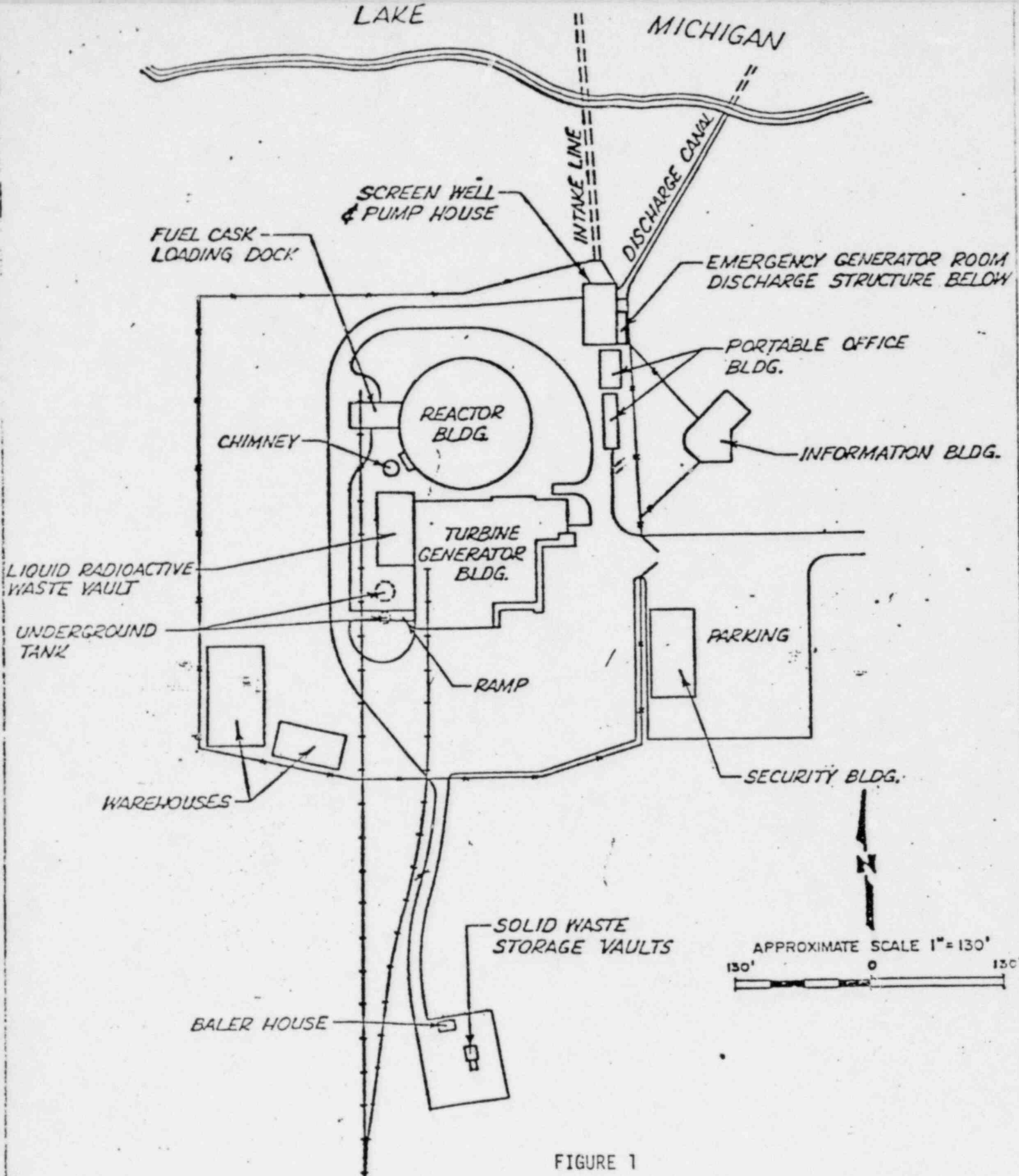


FIGURE 1
 SITE PLAN
 BIG ROCK POINT NUCLEAR POWER PLANT