

August 22, 1995

Mr. Robert W. Crisp, P.E., Director
Atlanta Regional Office
Federal Energy Regulatory Commission
Parkridge 85 North Building
3125 Presidential Parkway, Suite 300
Atlanta, Georgia 30340

Dear Mr. Crisp:

We received the draft report of the inspection completed by Mr. Robert Bryant of your staff, in the accompaniment of the U.S. Nuclear Regulatory Commission personnel at the McGuire Nuclear Station's Standby Nuclear Service Water Pond Dam, enclosed with your letter dated May 11, 1995. We have reviewed the draft and have enclosed a mark-up that contains our comments. Only those pages on which there were comments are enclosed for your use. Those pages enclosed with comments are as follow: 1, 2, 5, 7, 8, 9, 14, and 15. With the minor corrections and changes, the report can be issued in final form to NRC.

Once we receive the final report, we will transmit the report to the NRC licensee along with the issues that NRC expects the licensee to take action on. We will provide the Federal Energy Regulatory Commission (FERC) with a copy of that transmittal.

We are pleased with the cooperation and the progress we are making in the NRC dam safety program with FERC under the interagency agreement and look forward to additional inspections at other facilities.

Sincerely,

/s/

John T. Greeves
NRC Dam Safety Officer
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

cc w/o Encl: Mr. Gus Tjoumas
FERC HQ
Washington, DC

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D R A F T

OPERATION INSPECTION REPORT
for
THE NUCLEAR REGULATORY COMMISSION

Inspection by

THE FEDERAL ENERGY REGULATORY COMMISSION
Atlanta Regional Office

Date of inspection November 15, 1994

Dam (name) Standby Nuclear Service Water Pond Dam

Location McGuire Nuclear Station Mecklenburg North Carolina
(Facility) (County) (State)

NRC Licensed Project William B. McGuire Nuclear Station

Licensee Duke Power Company

Features of the Dam and Impoundment Inspected Embankment,
spillway, reservoir, and outlet channels

Inspected by Robert L. Bryant

Accompanied by Messrs. Robert Crisp and Donald Hyatt (FERC-ARO);
R. E. Shewmaker and Bob Rothman (NRC-HQ); George Maxwell (NRC Site
Resident); Mark Hunt and Bill Maynard (Duke Power Company)

Weather Clear, temperatures in the 70's (21°C)

Summary

This inspection revealed no conditions that might be considered an immediate threat to the safety and permanence of the project structures. However, Based on discussions with Nuclear Regulatory Commission (NRC) representatives and licensee employees, a review of available records, and observations made during the inspection, several recommendations for maintenance and inspection were made. Recommendations include expansion of the inspection and monitoring program. A complete list of recommendations is included in the text of the report.

it was observed that the wave ramp protection had not been completed during original construction.

original construction.

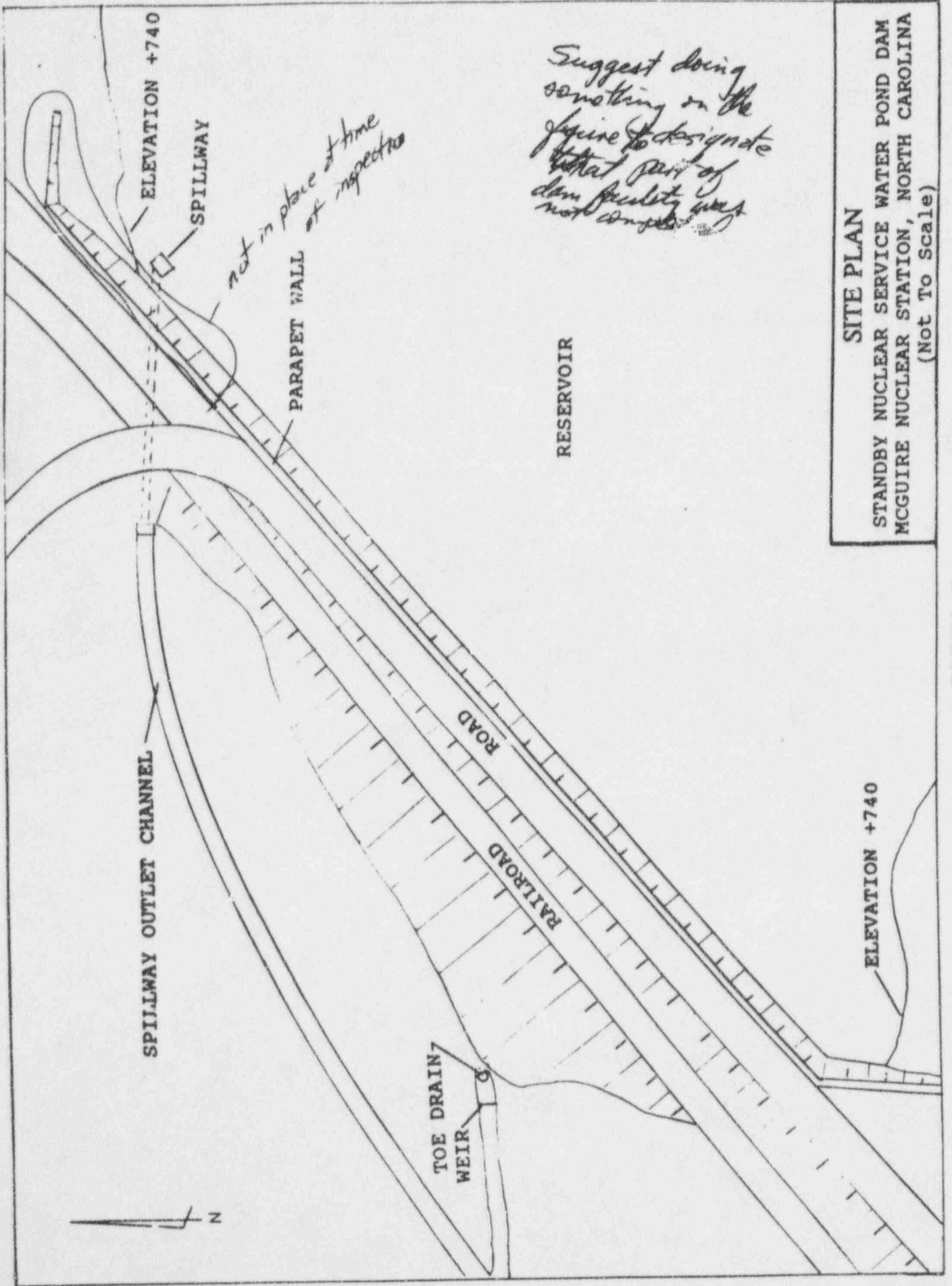
Submitted _____

Robert L. Bryant, P.E.

Project Description

The McGuire Nuclear Station Standby Nuclear Service Water (SNSW) pond was constructed to provide an adequate supply of water to dissipate waste heat rejected during a reactor unit loss of cooling accident and/or unit cooldown. The project is located approximately 17 miles (27 km) north-northeast^{west} of Charlotte, North Carolina. The site is about 0.75 miles (1.2 km) east of the Catawba River at the Cowans Ford dam. Overflow from the SNSW pond discharges into a wastewater pond immediately downstream of the dam. Overflow from the wastewater pond discharges into the Catawba River downstream of the Cowans Ford dam. McGuire Nuclear Station is operated by Duke Power Company. X

The SNSW pond was constructed by building a dam across a narrow valley, creating a lake of approximately 35 acres (0.14 km²) at the base of a 171 acre (0.69 km²) watershed (drainage area). The principal structures consist of a homogeneous earth fill dam (The earth fill is generally classified as silty or MH material.), drop inlet type spillway, cooling water intake, and inflow/recharge system. An entrance road to the nuclear plant follows the crest along the top of the dam. A railroad is supported by a berm across the downstream face of the dam. Table 1 lists the pertinent statistical data for the dam. Figure 1 is a plan view of the dam and major features ^{at the time of the inspection.} Figure 2 is a cross section view of the dam at its maximum height. X



SITE PLAN
 STANDBY NUCLEAR SERVICE WATER POND DAM
 MCGUIRE NUCLEAR STATION, NORTH CAROLINA
 (Not To Scale)

FIGURE 1

A. Safety of the Project.

1. Dams, Dikes, and Appurtenant Structures. All accessible areas of the dam, abutments, and spillway were inspected by walking. The reservoir and upstream slope were inspected by boat. No conditions were observed that might be considered an immediate threat to the safety and permanence of the project structures.

a. Standby Nuclear Service Water Pond Dam. The upstream slope of the dam is protected by large (approximate size 250 to 750 pound (115 to 340 kg)) dumped riprap (Photograph 1). The riprap surface created by dumping is very irregular and makes it difficult to detect any indication of movement of the upstream slope such as sliding, sloughing, or subsidence.

As-built drawings for the upstream slope specify a 1 foot (0.3 m) thickness of crusher run filter (stone) and a 2 feet (0.6 m) thickness of 3 to 24 inch (7 to 60 cm) stone as bedding material for the riprap. The drawings show the upper surface of the bedding material placed near the top of the parapet wall. Field observations indicated bedding material 2 to 3 feet (0.6 to 0.9 m) below the top of the wall. Either the material was placed at that level or some "beaching" or sloughing of the bedding material has occurred as the result of wave action. The purpose of the bedding material is to provide a filter between the riprap and the earth dam. Washing out of the bedding/filter material removes the protection between the earth dam and the riprap and can expose the earth fill to the forces of erosion. The ^{owner}~~contractor~~

X

should continue to monitor this zone to detect any signs of erosion of the earth fill.

The crest and roadway along the top of the dam appeared to be in good condition, with no indication of cracking or subsidence (Photograph 2). The parapet wall along the top of the dam also appeared to be in generally good condition with some minor cracking (Photographs 2 and 3). One parapet wall construction joint has opened approximately 0.75 inches (19 mm) on the downstream side. The open joint is located near the left abutment where the parapet wall changes direction (Photographs 5 and 6). Observations made during the inspection noted that the parapet wall ends abruptly near the right abutment and that the possibility exists for an "end run" during the probable maximum flood (PMF) ^{with the design wave runup conditions.} flood waters passing ^{Wind-driven} around the right end of the parapet wall could result in erosion and eventual failure of the downstream slope. X

The downstream slope appeared to be in good condition with a well established grass cover (Photographs 7 through 11) except for some rutting in several isolated areas. These ruts were apparently made by mowing equipment (Photograph 12). No indications of sliding, sloughing or subsidence of the downstream slope were observed. Two wet areas were observed downstream of the toe of the dam. The first was located between the toe and spillway outlet channel, just downstream of a wooded area (Photograph 15). The other was located in a flat area to the left (south) of the toe drain outlet channel (Photographs 16 and 21). According to the licensee's representatives, both areas are known to remain wet for

This condition can mask seepage that could be present.

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several days after a rain. Both areas can be reworked to improve drainage. Once the drainage is improved, the areas can be inspected for indications of seepage.

The toe drain system appeared to be functioning as designed (Photographs 17 and 18). Effluent from the drain outlet was clear and the flow volume was consistent with the historical record. No evidence of seepage was observed along the toe of the dam.

Records reviewed prior to the inspection indicate that a portion of the natural silty soils in the foundation became water softened during construction (foundation preparation) and had to be removed. A review of the as-built drawings revealed that the extent of the foundation soil removal and replacement were not documented on the drawings.

b. Spillway. The spillway is a reinforced concrete drop inlet structure located on the upstream slope near the right abutment (Photograph 13). Overflow passes into the structure and through a 54 inch (1.37 m) steel pipe to the downstream side of the dam. Water flows from the outlet structure (Photograph 14) down a concrete lined outlet channel (Photograph 15). The spillway, outlet structure, and outlet channel appeared to be stable and in good condition. The steel pipe was not inspected due to the volume of water passing through.

c. Abutments. The upstream abutments are protected by riprap and the downstream abutments have a well established grass cover. No seepage was observed during the inspection of the

Design/construction records are also maintained at the NRC-Headquarter offices in Washington, DC.

6. Emergency Action Plan. Since the SNSW pond dam is classified as a "Low" hazard dam, no emergency action plan is required.

4 | C. Environmental, Public Use, and Safety. No environmental, public use, or safety problems were noted during the inspection. The dam and reservoir are open to the public. Signs are posted to prohibit fishing from the dam. A boat launch area is located on the north shore of the reservoir. Existing public safety devices appear adequate and are properly maintained. No additional actions to protect life and property were required as a result of the inspection.

D. Matters of Commission Interest.

1. Additions, Betterments, Leases, Retirements, or Needed Extensions. Not Applicable.
2. Requiring Commission Action. Not Applicable.
3. Project Compliance. Not Applicable.
- For FERC internal reports/ actions*

D. Findings and Followup Actions. The inspection team observed no conditions that might adversely affect the immediate safety of the project. A meeting was held at the site on the morning of November 16, 1994 and the following observations and recommendations *that FERC will make to NRC* were discussed with NRC and DPC representatives:

- o A review of the project documents revealed that wet silts in the foundation were removed and replaced during construction. The as-built drawings should be updated to indicate the extent of removal and replacement.

- o The dumped rip rap on the upstream slope exhibits a ragged surface. We recommend rearranging the surface layer of the riprap to obtain a more uniform surface. This will make it easier to identify any movement of the upstream slope and will provide better protection for the bedding materials.
- o The parapet wall ends abruptly near the right abutment. Observations at the site and a review of available records failed to confirm that the PMF ^{with the maximum wave runup} would not overtop the dam in an "end run" around the end of the wall. The licensee should verify that crest elevations exceed the top of the parapet wall or the parapet wall should be extended to protect the right abutment. X
- o The construction joint in the parapet wall where the crest meets the left abutment has opened approximately 0.75 inches (1.9 cm). This crack should be monitored as part of the regular inspection program.
- o Wet areas downstream of the toe should be regraded to drain. Once surface water is removed, these areas can be inspected for seepage. Two wet areas were noted during the inspection; one was downstream of the trees between the spillway outlet channel and toe of the dam; the other was the flat area along the left (south) side of the toe drain outlet channel.