Georgia Power Company
333 Piedmont Avenue
Atlanta, Georgia 30308
Telephone 404 526-6526

Mailing Address
Post Office Box 4545
Atlanta, Georgia 30302

Georgia Power
the sc. ehem electric system

Power Generation Department

June 29, 1981

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2
CONTROL OF HEAVY LOADS

Gentlemen:

Georgia Power Company hereby submits the attached report and drawings for the six-month response to Section 2.1, "General Requirements For Overhead Handling Systems" as requested by your letter dated December 22, 1980.

Sincerely,

J. T. Beckham, Jr.
Vice President and General Manager
Nuclear Generation

JAE/mb

Attachments

xc: M. Manry
R. F. Rogers, III

A039
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SIX MONTH RESPONSE

TO THE

NRC LETTER DATED DECEMBER 22, 1980

ON

THE CONTROL OF HEAVY LOADS

June 18, 1981

This report addresses the six month response to section 2.1, enclosure (3) of the December 22, 1980 NRC letter: Control of Heavy Loads.

A complete systematic evaluation of all overhead load- handling systems in the reactor buildings, diesel generator building, water intake structure, and turbine buildings in the vicinity of the control building for both Units 1 and 2 of Edwin I. Hatch Nuclear Plant was undertaken to review areas in the plants where a load drop could result in damage to equipment required for safe shutdown or decay heat removal.

For the purpose of the review, each overhead load-handling system in the above mentioned areas was identified and its load path determined. The determination of the load path included a possible load swing of $\pm$ 5° prior to the load drop and an analysis of the floor penetration potential following a load drop. The load drop analysis was based on comparing the weight of an object to its impact dimension. The impact dimension is considered to be the least overall general dimension of an object. The weight vs impact dimension comparison establishes the criteria for determining the floor penetration potential of a dropped load. The maximum possible lifting heights (the distance from the monorail to the floor slab) for the majority of the load drops analyzed fell within the established limit. Those loads which have the potential to penetrate the floor slab have been limited to a maximum lift height such that floor penetration is not possible. These loads are identified in Table 2.

Using the pre-determined load path a system walkdown was performed to visually locate and identify all plant equipment in the load paths of all overhead handling systems accessible to inspection. The plant equipment identified included components, instruments, electrical panels, cable trays, and pipe. Each item of plant equipment was evaluated to determine if damage from a load drop could prevent achieving and maintaining a cold shutdown condition. For the overhead load-handling systems which were inaccessible to the walkdown inspection due to plant operation or high radiation,

design drawings were reviewed to determine if a load drop could potentially damage plant equipment essential to achieve and maintain cold shutdown. The walkdown included a general inspection of the above mentioned areas to assure that the design drawing accurately represent the as built condition of the plant.

The drywell was not walked down on either unit because the ECCS systems have a large enough capacity to mitigate the consequences of any damage caused by a load drop in the drywell.

The results of this evaluation are presented as response to each paragraph of Section 2.1, Enclosure 3.

Paragraph 2.1.1, Enclosure (3):

Report the results of your review of plant arrangements to identify all overhead handling systems form which a load drop may result in damage to any system required for plant shutdown or decay heat removal (taking no credit for any interlocks, techincal specifications, operating procedures, or detailed structural analysis).

Response:

The following overhead load-handling systems were determined to have the potential to damage equipment, essential to safe shutdown or decay heat removal, following a load drop:

TABLE 1

Item No.	Name	Location
1.	HNP-1 HPCI Pump and Turbine Hoist	HNP-1, reactor building, HPCI room
2.	HNP-1 RHR Pump and Core Spray Pump Hoist (NE)	HPN-1, reactor building, NE corner room
3.	HNP-1 RHR Heat Exchanger Hoist (NE)	HNP-1, reactor building, NE corner room
4.	HNP-1 RHR Pump and Core Spray Pump Hoist (SE)	HNP-1, reactor building, SE corner room
5.	HNP-1 RHR Heat Exchanger Hoist (SE)	HNP-1, reactor building, SE corner room
6.	HNP-1 Recirc. Motor MG Set "A" Hoist	HNP-1, reactor building el. 158'

TABLE 1 (continued)

Item No.	Name	Location
7.	HNP-1, Recirc. Motor MG Set "B" Hoist	HNP-1, reactor building, el. 158'
8.	HNP-2 CRD Pump and Hatch Hoist	HNP-2, reactor building, SW corner room, el. 130'.
9.	HNP-2 RCIC Pump, Turbine and Hatch Hoist	HNP-2, reactor building, NW corner room, el. 130'.
10.	HNP-2 Core Spray Pump "A" Hoist	HNP-2, reactor building, NE corner room, el. 130'.
11.	HNP-2 RHR Pump "A" Hoist	HNP-2, reactor building, NE corner room, el. 130'.
12.	HNP-2 RHR Pump "C" Hoist	HNP-2, reactor building, NE corner room, el. 130'.
13.	HNP-2 RHR Heat Exchanger "A" Hoist	HNP-2, reactor building, NE corner room, el. 130'.
14.	HNP-2 Core Spray Pump "B" Hoist	HNP-2, reactor building, SE corner room, el. 130'.
15.	HNP-2 RHR Pump "D" Hoist	HNP-2, reactor building, SE corner room, el. 130'.
16.	HNP-2 RHR Pump "B" Hoist	HNP-2, reactor building, SE corner room, el. 130'.
17.	HNP-2 RHR Heat Exchanger "B" Hoist	HNP-2, reactor building, SE corner room, el. 130'.
18.	HNP-2, HPCI Pump and Turbine Hoist	HNP-2, reactor building, HPCI room
19.	HNP-2, Recirc. Pump MG Set "A" Hoist	HNP-2, reactor building, el. 158'.
20.	HNP-2, Recirc. Pump MG Set "B" Hoist	HNP-2, reactor building, el. 158'.
21.	HNP-2, Chiller Unit "A" Hoist	HNP-2, reactor building, el. 158'.
22.	HNP-2, Chiller Unit "B" Hoist	HNP-2, reactor building, el. 158'.
23.	Diesel Generator "1A" Hoist	Diesel Generator Building
24.	Diesel Generator "1B" Hoist	Diesel Generator Building
25.	Diesel Generator "1C" Hoist	Diesel Generator Building
26.	Diesel Generator "2A" Hoist	Diesel Generator Building

TABLE 1 (continued)

Item No.	Name	Location
27.	Diesel Generator "2B" Hoist	Diesel Generator Building
28.	HNP-1, Turbine Building Overhead Crane	HNP-1 Turbine Building
29.	HNP-1 & 2 Water Intake Structure Mobile Crane	Water Intake Structure
30.	HNP-2 Turbine Building Overhead Crane	HNP-2 Turbine Building
31.	HNP-1 Reactor Building Overhead Crane	Reactor building, refueling floor
32.	HNP-1, Refueling Platform Monorail	Reactor building, refueling floor
33.	HNP-1 Spent Fuel Pool Jib Crane	Reactor building, refueling floor
34.	HNP-2 Reactor Building Overhead Crane	Reactor building, refueling floor
35.	HNP-2 Refueling Platform Monorail	Reactor building, refueling floor
36.	HNP-2 Spent Fuel Pool Jib Crane	Reactor building, refueling floor

Paragraph 2.1.2, Enclosure (3):

Justify the exclusion of any overhead handling system from the above category by verifying that there is sufficient physical separation form any load-impact point and any safety-related component to permit a determination by inspection that no heavy load drop can result in damage to any system or component required for plant shutdown or decay heat removal.

Response:

The following overhead load handling systems are excluded from the category of paragraph 2.1.1, enclosure(3). The analysis of each overhead handling system evaluated all plant equipment which could be potentially damaged following a load drop and determined there was no impact on safety due to the nature of the equipment located in the load path, sufficient physical separation from safety related equipment,

procedural limitation of lifting heights, or the use of redundant systems.

TABLE 2
Justification of Exclusion from
Para. 2.1.1, Enclosure (3)

Item No.	Name	
1.	HNP-1 HPCI Pump and Turbine Hoist	Major maintenance would not be undertaken when the system is required to be operational. In addition, redundant systems, the RCIC or ADS systems, could be used in the event of damage to HPCI components.
2.	HNP-1 RHR Pump and Core Spray Pump Hoist (NE)	Use of redundant systems
3.	HNP-1 RHR Heat Exchanger Hoist (NE)	Use of redundant systems
4.	HNP-1 RHR Pump and Core Spray Pump Hoist (SE)	Use of redundant systems
5.	HNP-1 RHR Heat Exchanger Hoist (SE)	Use of redundant systems
6.	HNP-1 Recirc. Motor MG Set "A" Hoist	Imposed lift height restrictions
7.	HNP-1 Recirc. Motor MG Set "B" Hoist	Imposed lift height restrictions
8.	HNP-2 CRD Pump and Hatch Hoist	No essential equipment located in load path
9.	HNP-2 RCIC Pump, Turbine and Hatch Hoist	No essential equipment located in load path
10.	HNP-2 Core Spray Pump "A" Hoist	Use of redundant systems
11.	HNP-2 RHR Pump "A" Hoist	Use of redundant systems
12.	HNP-2 RHR Pump "C" Hoist	Use of redundant systems
13.	HNP-2 RHR Heat Exchanger "A" Hoist	Use of redundant systems
14.	HNP-2 Core Spray Pump "B" Hoist	Use of redundant systems

TABLE 2 (continued)

Item No.	Name	Justification for exclusion from Para. 2.1.1, Enclosure (3)
15.	HNP-2 RHR Pump "D" Hoist	Use of redundant systems
16.	HNP-2 RHR Pump "B" Hoist	Use of redundant systems
17.	HNP-2 RHR Heat Exchanger "B" Hoist	Use of redundant systems
18.	HNP-2, HPCI Pump and Turbine Hoist	Major maintenance would not be undertaken when the system is required to be operational. In addition, redundant systems, the RCIC or ADS Systems, could be used in the event of damage to HPCI components.
19.	HNP-2, Recirc. Pump MG Set "A Hoist	Imposed lift height restrictions
20.	HNP-2, Recirc. Pump MG Set "B" Hoist	Imposed lift height restrictions
21.	HNP-2, Chiller Unit "A" Hoist	No impact on safe shutdown equipment.
22.	HNP-2, Chiller Unit "B" Hoist	No impact on safe shutdown equipment.
23.	Diesel Generator "1A" Hoist	Use of redundant systems
24.	Diesel Generator "1B" Hoist	Use of redundant systems
25.	Diesel Generator "1C" Hoist	Use of redundant systems
26.	Diesel Generator "2A" Hoist	Use of redundant systems
27.	Diesel Generator "2B" Hoist	Use of redundant systems
28.	HNP-1, Turbine Building Overhead Crane	The limited clearance between the top of the control building and the turbine building overhead crane will not permit transporting a load over the control building. Movement of the Control Building Ventilation and Air Conditioning Equipment will be controlled by adherence to our established safe load path (Fig. 2) and an operational procedure.
29.	HNP-1 & 2 Water Intake Structure Mobile Crane	Movement of plant equipment in this area will require the use of a mobile crane. Bechtel's evaluation of the plant equipment located in this area revealed that a load drop would have no impact on safe

TABLE 2 (continued)

Item No.	Name	Justification for exclusion from Para. 2.1.1, Enclosure (3)
		shutdown or decay heat removal due to sufficient physical separation complete with steel barriers from essential equipment and the use of redundant systems.
30.	HNP-2 Turbine Building Overhead Crane	The limited clearance between the top of the control building and the turbine building overhead crane will not permit transporting a load over the control building. Movement of the Control Building Ventilation and Air Conditioning Equipment will be controlled by adherence to our established safe load path (Fig. 2) and an operational procedure.
31.	HNP-1 Reactor Building Overhead Crane	HNP-1 Reactor Building Overhead Crane has been modified to be single-failure proof. Use of this crane will be controlled by strict administrative procedures and will follow established safe load paths. Refer to Fig.1. For further information, refer section 10.20.5 in the HNP-1 FSAR.
32.	HNP-1 Refueling Platform Monorail	No impact on safe shutdown equipment. Used to handle fuel assemblies between the fuel pool and the reactor vessel.
33.	HNP-1 Spent Fuel Pool Jib Crane	No impact on safe shutdown equipment. This 0.5 ton capacity crane is used to assist fuel assembly movement in the spent fuel pool.
34.	HNP-2 Reactor Building Overhead Crane	Use of this crane is procedurally restricted. It is not single-failure proof. It will not be used over any equipment required to reach and maintain cold shutdown.
35.	HNP-2 Refueling Platform Monorail	No impact on safe shutdown equipment. Used to handle fuel assemblies between the fuel pool and the reactor vessel.
36.	HNP-2 Spent Fuel Pool Jib Crane	No impact on safe shutdown equipment. This 0.5 ton capacity crane is used to assist fuel assembly movement in the spent fuel pool.
37.	HNP-1 MSIV "A" Hoist	Plant will be shutdown prior to maintenance in this area. A load drop would not impact on essential equipment for safe shutdown or decay heat removal. The redundant MSIV's will assure primary system integrity.

TABLE 2 (continued)

Item No.	Name	Justification for exclusion from Para. 2.1.1, Enclosure (3)
38.	HNP-1 MSIV "B" Hoist	Plant will be shutdown prior to maintenance in this area. A load drop would not impact on essential equipment for safe shutdown or decay heat removal. The redundant MSIV's will assure primary system integrity.
39.	HNP-1 MSIV "C" Hoist	Plant will be shutdown prior to maintenance in this area. A load drop would not impact on essential equipment for safe shutdown or decay heat removal. The redundant MSIV's will assure primary system integrity.
40.	HNP-1 MSIV "D" Hoist	Plant will be shutdown prior to maintenance in this area. A load drop would not impact on essential equipment for safe shutdown or decay heat removal. The redundant MSIV's will assure primary system integrity.
41.	HNP-2 RWCU Regen. Hx Trolley	Sufficient physical separation from load impact to essential safety related equipment.
42.	HNP-2 RWCU Non-reger. Hx Trolley	Sufficient physical separation from load impact to essential safety related equipment.
43.	HNP-2 Fuel Pool Cooling Hx Hoist	Sufficient physical separation from load impact to essential safety related equipment.
44.	HNP-2 CRD Repair Area Monorail	Sufficient physical separation from load impact to essential safety related equipment.
45.	HNP-1 CRD Repair Area Jib Crane Hoist	Sufficient physical separation from load impact to essential safety related equipment.
46.	HNP-2 MSIV Bridge Crane	Plant will be shutdown prior to maintenance in this area. A load drop would not impact on essential equipment for safe shutdown or decay heat removal. The redundant MSIV's will assure primary system integrity.

Paragraph 2.1.3, Enclosure (3)

With respect to the design and operation of heavy-load-handling systems in the reactor building and those load-handling systems identified in 2.1-1 above, provide your evaluation concerning compliance with the guidelines of NUREG 0612, Section 5.1.1. The following specific information should be included in your reply:

a. Drawings or sketches sufficient to clearly identify the location of safe load paths, spent fuel, and safety-related equipment.

b. A discussion of measures taken to ensure that load-handling operations remain within safe load paths, including procedures, if any for deviation from these paths.

c. A tabulation of heavy loads to be handled by each crane which includes the load identification, load weight, its designated lifting device, and verification that the handling of each load is governed by a written procedure containing, as a minimum, the information identified in NUREG 0612, Section 5.1.1(2).

d. Verification that lifting devices identified in 2.1.3-c, above, comply with the requirements of ANSI N14.6-1978, or ANSI B30.9-1971 as appropriate. For lifting devices where these standards, as supplemented by NUREG 0612, Section 5.1.1(4) or 5.1.1(5), are not met, describe any proposed alternatives and demonstrate their equivalency in terms of load-handling reliability.

e. Verification that ANSI B30.2-1976, Chapter 2-2, has been involved with respect to crane inspection, testing, and maintenance. Where any exception is taken to this standard, sufficient information should be provided to demonstrate the equivalency of proposed alternatives.

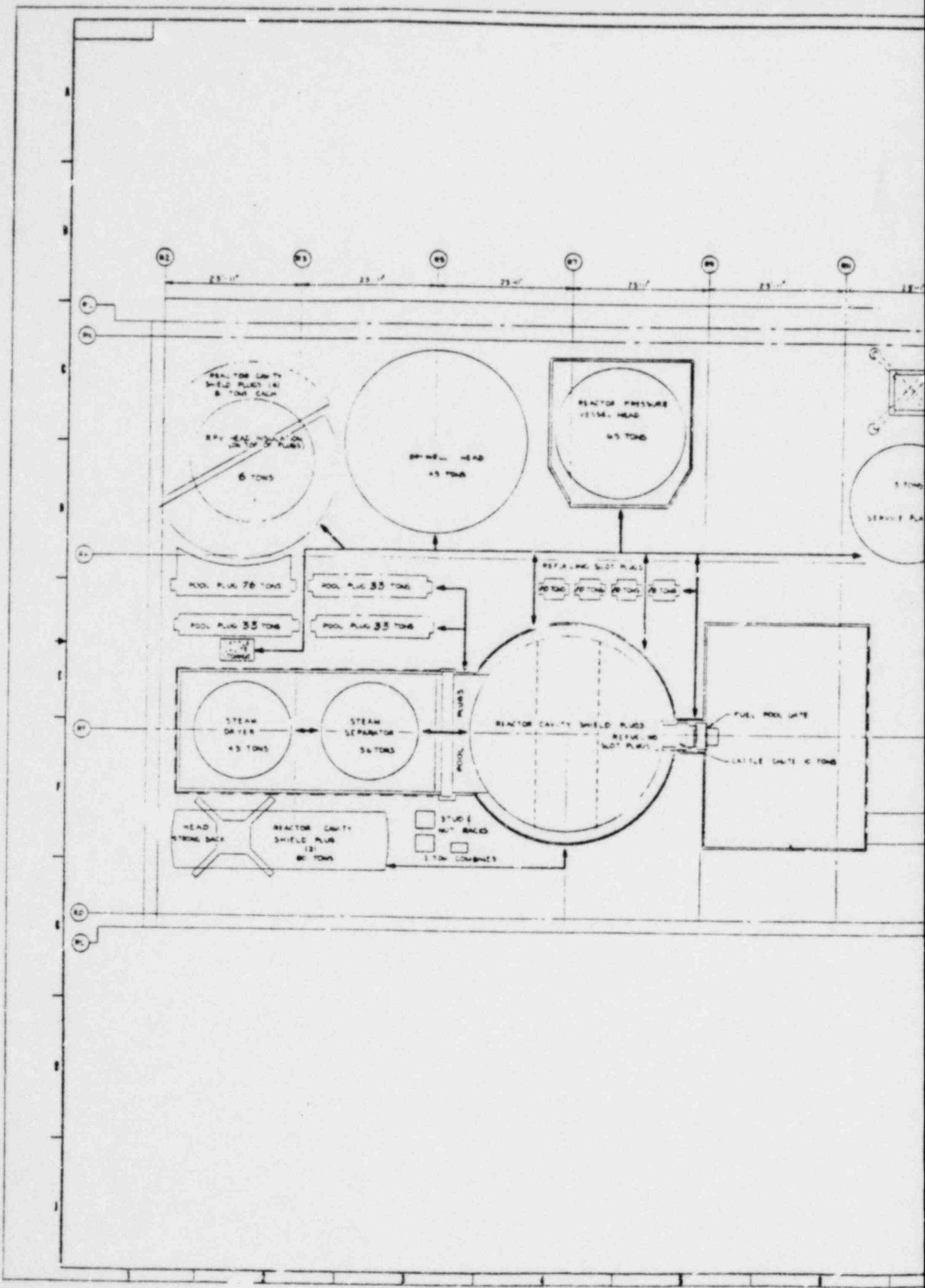
f. Verification that crane design complies with the guidelines of CMAA Specification 70- and Chapter 2-1 of ANSI B30.2-1976, including the demonstration of equivalency of actual design requirements for instances where specific compliance with these standards is not provided.

g. Exceptions, if any, taken to ANSI B30.2-1976 with respect to operator training, qualification, and conduct.

Response:

None of the overhead load handling systems analyzed in this report were determined to have an impact on plant equipment essential to achieve and maintain a cold shutdown condition. They are excluded from Para. 2.1.3, Enclosure (3) for one of the following reasons, as delineated in Table [illegible]

1. There is sufficient physical separation from the load impact area and the safe shutdown equipment.
2. The use of redundant RHR and/or Core Spray Systems.
3. The imposing of lift height restrictions on the Recir. Motor Generator Sets.
4. The use of a single-failure proof HNP-1 Reactor Building Overhead Crane.
5. The utilization of safe load paths and maintenance procedures.
6. The installation of electrical and mechanical interlocks.


6 TONS
POOL PLUG 78 TONS
POOL PLUG 33 TONS
POOL PLUG 33 TONS
POOL PLUG 33 TONS
STEAM DRYER 43 TONS
STEAM SEPARATOR 56 TONS
PLUGS
POOL
FUEL POOL GATE
CATTLE GATE 10 TONS
HEAD STRONG BACK
REACTOR CAVITY SHIELD PLUG (2) 80 TONS
3 TON COMBINES

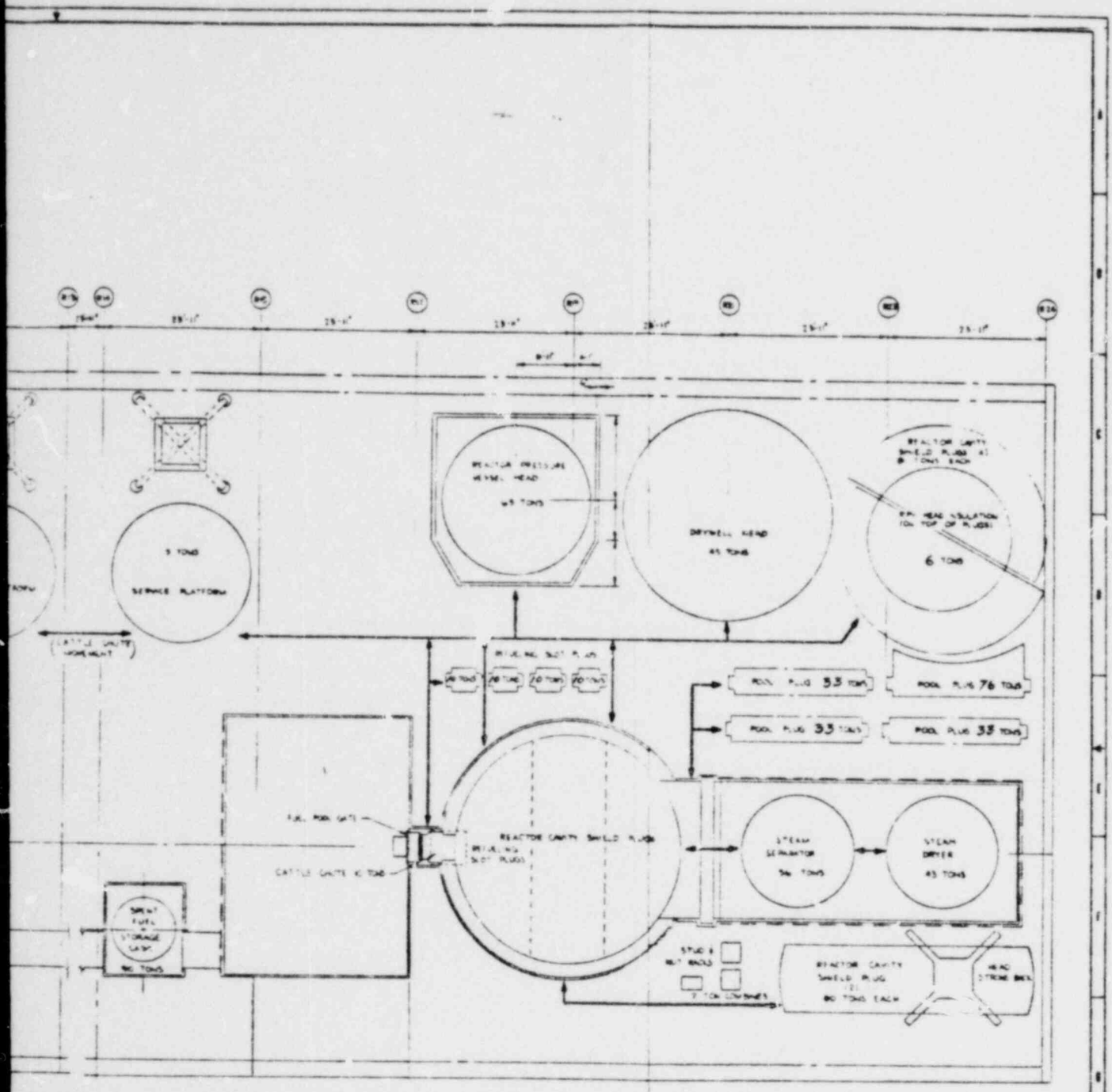


FIG. ONE

BECHTEL

SAN FRANCISCO GAITHERSBURG MARYLAND

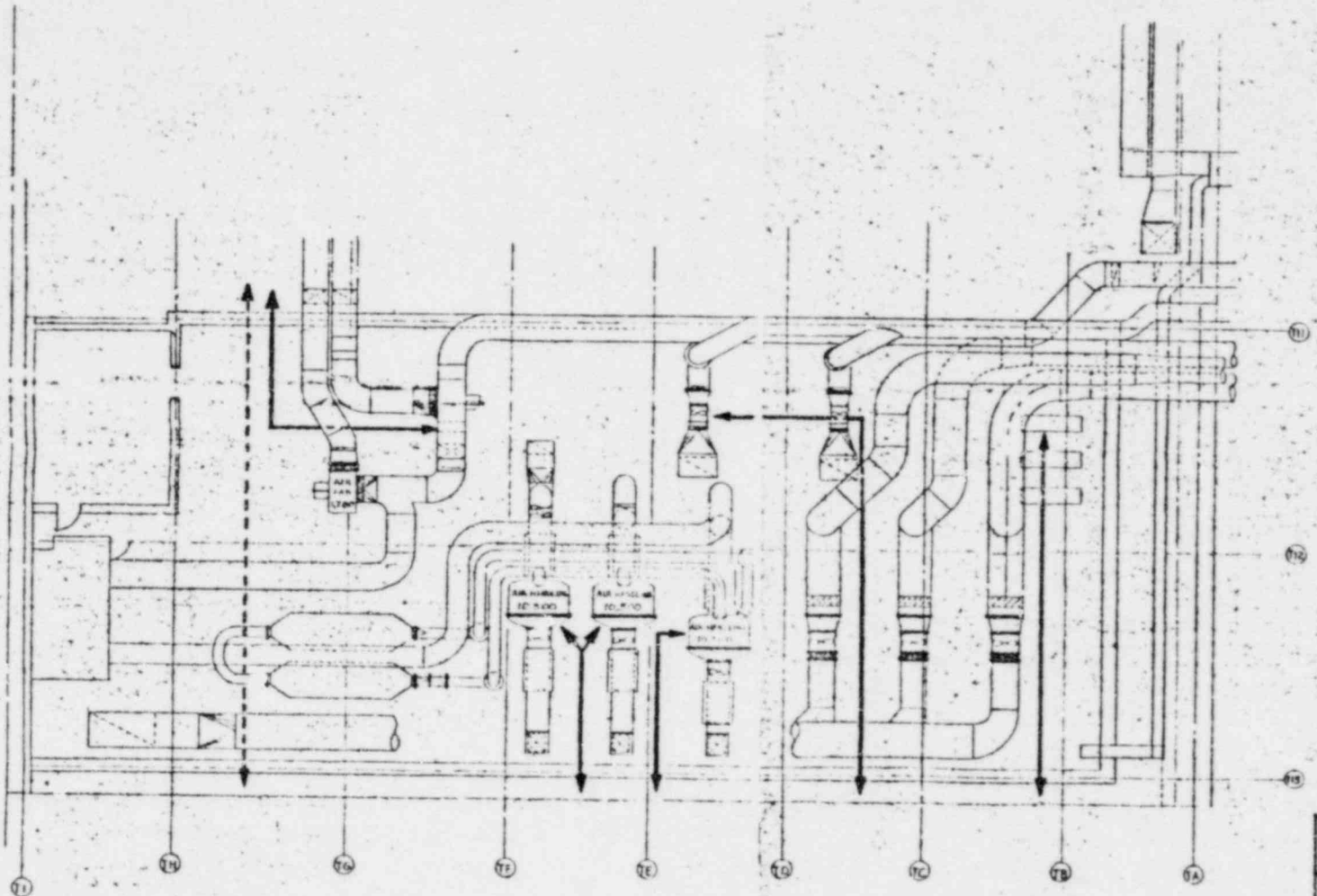
SOUTHERN SERVICES INC.

FOR

GEORGIA POWER CO. ATLANTA, GA.
GENERAL ENGINEERING DEPARTMENT

EDWIN I. HATCH NUCLEAR PLANT UNIT 1 & 2
REFUELING FLOOR HEAVY LOAD PATHS

SK-6133



GEORGIA POWER CO.

EDWIN I. HATCH NUCLEAR PLANT UNIT NO. 1

HEAVY LOAD PATHS FOR CONTROL ROOM ROOF

MADE BY LD | CHECKED [illegible] | APP'D [illegible]