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June 8, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 and 50-446
FINAL RESPONSE TO NUREG-0612

Dear Mr. Youngblood:

Enclosed are forty (40) copies of our final response to NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants".

If you have questions, please call.

Sincerely,

H. C. Schmidt

RWH:tls
Enclosures

B030
1/40

bcc: S. B. Burwell - w/o attachment
T. L. Chan
E. D. Sylvester
R. D. Calder
J. C. Kuykendall
R. A. Jones
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CPSES FINAL RESPONSE TO NUREG-0612
"CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS"

JUNE 1983

CPSES FINAL RESPONSE TO NUREG-0612
"CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS"

JUNE 1983

Background

In a letter dated December 22, 1980, the NRC requested applicants for operating licenses to submit a report documenting their compliance with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." Specifically, Enclosure 3 (Sections 2.1 through 2.4) was to be addressed. Texas Utilities Generating Company (TUGCO) provided the response to this enclosure, as applicable to the Comanche Peak Steam Electric Station (CPSES), on March 1, 1982. EG&G Idaho, Inc. was contracted by the NRC to evaluate the CPSES response. On May 20, 1982, the NRC provided TUGCO with the EG&G comments.

Introduction

This submittal provides the complete response to the NRC request for information and specifies CPSES compliance with Sections 5.1.2, 5.1.3, and 5.1.5 of NUREG-0612. These sections of NUREG-0612 provide guidelines concerning the design and operation of load handling systems in the vicinity of stored spent fuel, the reactor core, and equipment and components required for safe shutdown or decay heat removal.

Attachment A of this submittal provides the CPSES revised response to Enclosure 3 of NRC letter dated December 22, 1980. Attachment B provides the CPSES response to comments generated by EG&G Idaho, Inc. as listed in NRC letter dated May 20, 1982. Attachment C provides CPSES plant specific data and summary of regulatory positions for the fuel building overhead crane.

It should be noted that Unit 1 and Unit 2 layouts are approximately mirror images and that load handling modifications and restrictions applicable to Unit 1 are also applicable to Unit 2.

ATTACHMENT A

CPSES RESPONSE (REV. 1) TO
ENCLOSURE 3 OF NRC LETTER
DATED DECEMBER 22, 1980

LOAD HANDLING SYSTEMS

A.1 INTRODUCTION

The term "heavy load" as used in this attachment is defined as greater than the weight of a fuel assembly with control rods plus the weight of a spent fuel tool which totals approximately 2150 pounds.

A.2 RESPONSE TO NUREG-0612

The following sections quote NUREG-0612 guidelines and provide the CPSES response.

A.2.1 GENERAL REQUIREMENTS FOR OVERHEAD HANDLING SYSTEMS

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

RESPONSE:

The overhead handling systems at CPSES from which a heavy load drop could result in damage to systems required for plant shutdown or decay heat removal are summarized in Table A-1. Also listed in Table A-1 are all cranes which are capable of carrying heavy loads in or near spent fuel storage areas.

2. "Justify the exclusion of any overhead handling systems from the above category by verifying that there is sufficient physical separation from 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:

Table A-2 lists the overhead handling systems at CPSES which maintain sufficient physical separation from systems required for plant shutdown or decay heat removal to prevent damage to these systems, as determined by visual inspection. Therefore, these overhead handling systems have been excluded from the category of load handling systems listed in Table A-1.

Location of Unit 1 and common monorails are shown in the figures listed below for each crane or hoist excluded:

a.	Drumming Storage Area Crane CPX-MEMCDS-01	Figure A-12
b.	Maintenance Building Bridge Crane CPX-MESCMB-01	No Figure
c.	Turbine Building Gantry Crane CP1-MESCTC-01	Figure A-3
d.	Circulating Water Intake Structure Gantry Crane CPX-MESCCW-01	No Figure
e.	Equipment Hatch Door Hoist CP1-MEMHCH-41	Figure A-8
f.	Waste Gas Compressor Hoist CPX-MEMHCH-05	Figure A-18
g.	Positive Displacement Charging Pump Hoist CP1-MEMHCH-03	Figure A-17

RESPONSE:

Table A-2 lists the overhead handling systems at CPSES which maintain sufficient physical separation from systems required for plant shutdown or decay heat removal to prevent damage to these systems, as determined by visual inspection. Therefore, these overhead handling systems have been excluded from the category of load handling systems listed in Table A-1.

Location of Unit 1 and common monorails are shown in the figures listed below for each crane or hoist excluded:

a.	Drumming Storage Area Crane CPX-MEMCDS-01	Figure A-12
b.	Maintenance Building Bridge Crane CPX-MESCMB-01	No Figure
c.	Turbine Building Gantry Crane CP1-MESCTC-01	Figure A-3
d.	Circulating Water Intake Structure Gantry Crane CPX-MESCCW-01	No Figure
e.	Equipment Hatch Door Hoist CP1-MEMHCH-41	Figure A-8
f.	Waste Gas Compressor Hoist CPX-MEMHCH-05	Figure A-18
g.	Positive Displacement Charging Pump Hoist CP1-MEMHCH-03	Figure A-17

h.	H_2 Recombiner Hoist CPX-MEMHCH-07	Figure A-18
i.	Letdown Chiller Package Hoist CP1-MEMHCH-05	Figure A-19
j.	H&V Chiller Hoist (near H-A Line) CPX-MEMHCH-09	Figure A-20
k.	H&V Chiller Hoist (near J-A Line) CPX-MEMHCH-10	Figure A-20
l.	Letdown HX and Seal Water HX Hoist CP1-MEMHCH-15	Figure A-6
m.	Condenser Vacuum Pump Hoist CP1-MEMHCH-25	Figure A-1
n.	TBCW Pump Hoist CPX-MEMHCH-11	Figure A-1
o.	Heater Drain Pump Hoist CP1-MEMHCH-28	Figure A-1
p.	Control Fluid Tank Hoist CP1-MEMHCH-29	Figure A-1
q.	Personnel Lock Hoist CP1-MEMHCH-30	Figure A-7
r.	Reactor Vessel Stud Hoist CP1-MEMHJC-01	Figure A-10

s.	Steam Generator Feed Water Pump and Turbine Driver Crane CP1-MEMHOC-01	Figure A-2
t.	Equipment Hatch Hoist @ 790'-6" CP1-MEMHCH-45	Figure A-5
u.	Equipment Hatch Hoist @ 810'-6" CP1-MEMHCH-46	Figure A-6
v.	Equipment Hatch Hoist @ 873'-6" CPX-MEMHCH-52	Figure A-20
w.	Equipment Hatch Hoist @ 886'-6" CPX-MEMHCH-53	Figure A-20
x.	Misc. Equipment Hoist CPX-MEMHCH-54	No Figure
y.	Misc. Equipment Hoist CPX-MEMHCH-55	No Figure
z.	Dry Waste Compactor Hoist CPX-MEMHCH-56	Figure A-12
aa.	Chlorine Containers Hoist CPX-MEMHCH-57	No Figure
bb.	Chlorine Containers Hoist CPX-MEMHCH-58	No Figure
cc.	Aux. Steam Condensate Cooler Hoist CPX-MEMHCH-60	Figure A-16

dd.	Containment Equipment Hatch Hoist CPX-MEMHCH-67, 68	No Figure
ee.	Wall Puller for Letdown HX CP1-MEMHLH-01	No Figure
ff.	Demineralizers Hoist CPX-MEMHWR-05	Figure A-19
gg.	Radial Arm Stud Tensioner Hoist TBX-FHHCAH-01	No Figure
hh.	Miscellaneous Equipment Hoist CP1-MEMHCH-64	Figure A-8

3. "With respect to the design and operation of heavy-load-handling systems in the containment and the spent-fuel pool area and those load-handling system 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 (Comments 3(a) through 3(g)) should be included in your reply."

RESPONSE:

Our evaluation of compliance with NUREG-0612 concerning heavy load handling systems at CPSES is presented in the responses to the specific requests for information (Comments 3(a) through 3(g)) listed below.

Comment 3(a):

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

Response 3(a):

"Safe load areas" (areas serviced by a particular crane in which a load drop will not result in damage to shutdown or decay heat removal equipment or spent fuel) have been identified where applicable for the cranes listed in Table A-1. Equipment handled by these cranes will be transported whenever possible within the identified safe load areas.

"Safe load paths" will also be identified and established for loads handled outside safe load areas prior to initial fuel load to ensure the safe operation of the crane during maintenance and normal operation of the plant.

Each crane listed in Table A-1 is described below with a discussion of the safe load area along with referenced drawings to identify their location within the plant.

a. Fuel Building Overhead Crane - (CPX-MESCFC-01)

This crane is shown in Figure A-15 along with the safe load area illustrated by the shaded region. Although this crane does not travel directly over the spent fuel pools, a safe load area has been defined outside the spent fuel pool areas. The safe load area includes the fuel receipt and inspection area, the shipping cask receipt and decontamination area, and new fuel storage area. Load drop analyses have been performed for these areas to assure that in the event of a cask drop, the structural integrity of the floor will be maintained and no damage may result to any safety related equipment.

b. Containment Auxiliary Upper Crane - (CP1&2-MESCCA-01)

This crane and its associated safe load areas are shown in Figure A-10. The area serviced by this crane includes the

reactor vessel and therefore the potential exists for a heavy load drop into the vessel. As a result, the safe load area is defined outside of the reactor vessel area as indicated by the shaded area in Figure A-10.

c. Containment Polar Crane - (CP1&2-MESCCP-01)

The area in the containment building serviced by this crane, along with its safe load area, is shown in Figure A-11A and A-11B. The Polar Crane essentially travels the entire diameter of the Containment Building above elevation 905' and has the potential for heavy load drops over the reactor vessel, steam generators, reactor coolant pumps and piping, main steam lines, and the temporary containment fuel storage area. Therefore, during hot shutdown the safe load areas have been defined outside of these areas as shown in Figure A-11A. The safe load areas during cold shutdown for this crane are shown in Figure A-11B. When fuel is not being stored in the containment fuel storage area, this crane can safely traverse this area with a heavy load. Load drop analyses have been performed for the entire operating floor to assure that in the event of a heavy load drop the floor will remain intact.

d. Containment Fuel Handling Bridge Crane - (CP1&2-MESCCF-01)

This crane is primarily designed for lifting a fuel assembly and components and the associated handling tool (2150 lbs). These loads are excluded from consideration as "heavy loads" as defined in NUREG-0612 and therefore safe load areas are not required.

e. Refueling Machine (TBX-FHSCMC-01 & TCX-FHSCMC-01)

This crane is shown in Figure A-8. The manipulator mast of this crane is specifically designed to handle fuel assemblies and therefore does not handle "heavy loads" as defined. The auxiliary hoist of this crane services the refueling cavity during refueling. Loads will be limited to 2150 lbs.

f. Containment Access Rotating Platform Hoists - (CP1&2-MESCRP-01)

This hoist has the same safe load areas as the Containment Polar crane as shown in Figure A-4, A-11A, and A-11B due to its location and travel range.

g. Service Water Intake Structure Crane - (CPX-MESCSW-01)

This crane is shown on Figure A-21 along with the safe load areas. Since most of the equipment serviced by this crane is safety related Service Water pumps, pump motor, and piping, only small portions of the intake structure can be considered as safe load areas as illustrated in the shaded areas in Figure A-21.

h. Fuel Handling Bridge Crane - (TBX-FHSCFB-01)

This crane is shown on Figure A-14. The crane is primarily designed to handle a fuel assembly and components with its associated handling tool and therefore does not carry "heavy loads" as defined. No safe load areas are therefore required.

i. Reactor Coolant Pumps Hoist - (CP1&2-MEMHCH-42)

This hoist is attached to the Containment Polar Crane main hook during reactor coolant pump maintenance operations; therefore,

the safe load areas are the same as for the Polar Crane in Figure A-11A and A-11B.

For the remaining hoists listed in Table A-1, the establishment of safe load areas is not applicable since the hoists generally travel along a single monorail which allows the hoist to follow only one possible path. Locations of the Unit 1 and common monorails with respect to plant shutdown equipment, decay heat removal equipment, or spent fuel storage areas are shown in the figures listed below for each hoist identified in Table A-1.

a.	Moderating HX and Letdown HX Hoist (CP1-MEMHCH-16)	Figure A-7
b.	Component Cooling Water Pump Hoist (CPX-MEMHCH-01)	Figure A-17
c.	Safety Related Chiller Hoist (CP1-MEMHCH-04, 04A)	Figure A-16
d.	Centrifugal Charging Pump Hoist (CP1-MEMHCH-01, 02)	Figure A-17
e.	Auxiliary Feedwater Pump Hoist Electric - (CP1-MEMHCH-13, 14)	Figure A-5
f.	Auxiliary Feedwater Pump Hoist Turbine - (CP1-MEMHCH-12)	Figure A-5
g.	Auxiliary Filter Hoist (CPX-MEMHWR-04)	Figure A-19
h.	Diesel Generator Hoist (CP1-MEMHCH-37, 38)	Figure A-6

i.	Spent Fuel Pool HX Hoist (CPX-MEMHCH-69, 70)	Figure A-13
j.	Service Water Traveling Screen Hoist (CPX-MEMHCH-12) and Jib Crane (CPX-SWEHSG-01)	Figure A-22
k.	Residual Heat Removal and Containment Spray HX Hoist (CP1-MEMHCH-47, 59)	Figure A-7
l.	Main Steam Safety Valve Hoist (CP1-MEMHCH-48, 49, 50, 51)	Figure A-9
m.	Service Water Intake Stop Gate Hoist (CPX-MEMHCH-61)	Figure A-21
n.	Auxiliary Filter Hoist (CPX-MEMHWR-04A)	Figure A-1
o.	Miscellaneous Hoist (CPX-MEMHCH-72)	Figure A-13
p.	Residual Heat Removal Pump Hoist (CP1-MEMHCH-08)	Figure A-5

Comment 3(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.

Response 3(b):

Through the use of administrative controls, heavy loads will be transported whenever possible within "safe load areas" established in respone to Comment 3(a) above. The "safe load areas" will be clearly identified for each crane by a combination of placards, procedures, and/or marked off areas near plant shutdown and decay heat removal equipment or where spent fuel is stored.

However, for some heavy loads, it may be necessary to operate outside the "safe load areas" and transport the heavy load over or near plant shutdown or decay heat removal equipment or spent fuel. In this event, special precautions, procedures, and/or instructions will be utilized with the purpose of minimizing the risk of a heavy load drop in these areas. The procedures will consist of a combination of load drop prevention measures such as a list of required equipment, inspections, acceptance criteria for the movement of the load, sequence of steps, etc. "Safe load paths" will also be established with the purpose of transporting equipment over safe shutdown or decay heat removal equipment or spent fuel via the safest and shortest route to the nearest "safe load area". The equipment will then be transported within the "safe load area" to its final destination.

The "safe load paths" will be clearly defined in the load handling procedures and/or instructions that will be written for loads handled over safety equipment or spent fuel. As stated in response to Comment 3(a), "safe load paths" will be defined before initial fuel load operations.

Comment 3(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 such load is governed by a written procedure containing, as a minimum, the information identified in NUREG-0612, Section 5.1.1(2).

Response 3(c):

Table A-4 lists the cranes and hoists identified in Table A-1 including the major loads projected to be lifted by each load handling system. Also included is the approximate weight of each of the loads identified. As stated in the response to Comment 3(b), special precautions, procedures, and/or instructions will be utilized when handling these loads over or near safe shutdown equipment, decay heat removal equipment, or spent fuel storage areas.

Comment 3(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 5.1.5(5) are not met, describe any proposed alternatives and demonstrate their equivalency in terms of load-handling reliability.

Response 3(d):

Lifting devices for the loads identified in response to Comment 3(c) above will comply with ANSI B30.9-1971 where applicable. Although a special lifting device for a spent fuel shipping container weighing 10,000 pounds or more has not yet been procured, ANSI N14.6-1978 and NUREG-0612 Guidelines for special lifting devices will be invoked when this device is obtained. Although it is anticipated at this time that the standards for the lifting devices will be met, it may later be determined that alternatives

to the standard are required. In that event, written notification will be made to the Nuclear Regulatory Commission describing the alternatives and their equivalency in terms of load handling reliability.

Reactor vessel head and reactor internals lifting rigs meet the intent of ANSI N14.6-1978 and NUREG-0612 for design, fabrication, assembly and operation. The analysis for these devices is provided in Reference [2].

Comment 3(e):

Verification that ANSI B30.2-1976, Chapter 2-2, has been invoked 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.

Response 3(e):

ANSI B30.2-1976, Chapter 2-2, will be invoked with respect to crane inspection, testing, and maintenance.

With respect to Section 2-2.1.1.1 of ANSI B30.2-1976, cranes located within Containment will be inspected per the required visual inspection schedule only during the periods of crane operation (generally during refuelings and cold shutdowns). This is necessary because periodic inspections during power operations are impractical due to high radiation levels in Containment. No other exceptions to the standard are anticipated at this time; however, if it is later determined that exceptions are required, written notification will be made to the Nuclear Regulatory Commission.

Comment 3(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.

Response 3(f):

Table A-3 lists the load handling systems identified in Table A-1 and the applicable codes and standards as specified in the CPSES Equipment Purchase Specifications. In all cases, the crane design complies with the guidelines of CMAA Specification 70 and Chapter 2-1 of ANSI B30.2-1967 and all hoists are designed in accordance with the requirements of ANSI B30.16-1973.

Comment 3(g):

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

Response 3(g):

No exceptions to ANSI B30.2-1976 with respect to operator training, qualifications, and conduct are anticipated at this time; however, if it is later determined that exceptions are required, written notification will be made to the Nuclear Regulatory Commission.

A.2.2 SPECIFIC REQUIREMENTS FOR OVERHEAD HANDLING SYSTEMS IN THE VICINITY OF FUEL STORAGE POOLS

The following load handling systems are located in the vicinity of the spent fuel storage area:

- Fuel Building Overhead Crane (CPX-MESCFC-01)
- Fuel Handling Bridge Crane (TBX-FHSCFB-01)

1. "Identify by name, type, capacity, and equipment designator, any cranes physically capable (i.e., ignoring interlocks, moveable mechanical stops, or operating procedures) of carrying loads which could, if dropped, land or fall into the spent fuel pool."

RESPONSE:

Equipment Name:	Fuel Building Overhead Crane
Type:	Overhead
Capacity:	Main Hoist - 130 Tons
	Auxiliary Hoist - 17 Tons
	Auxiliary Hoist - 5 Tons
Equipment I. D. No:	CPX-MESCFC-01
Note:	This crane does not travel directly over the spent fuel pools, however, loads can be traversed within 15 feet of the pools.

2. "Justify the exclusion of any cranes in this area from the above category by verifying that they are incapable of carrying heavy

loads or are permanently prevented from movement of the hook centerline closer than 15 feet to the pool boundary, or by providing a suitable analysis demonstrating that for any failure mode, no heavy load can fall into the fuel-storage pool."

RESPONSE:

Fuel Handling Bridge Crane (TBX-FHSCFB-01) is excluded from the above category since this equipment is primarily designed for handling a single fuel assembly within the spent fuel pools, refueling canal, and cask handling pit. In addition, lift-limiting features are provided for the fuel handling bridge crane to ensure that spent fuel assemblies are not lifted above the safe shielding depth provided by the water in the transfer canal, wet cask loading pit, and spent fuel pools.

3. "Identify any cranes listed in 2.2-1, above, which you have evaluated as having sufficient design features to make the likelihood of a load drop extremely small for all loads to be carried and the basis for this evaluation (i.e., complete compliance with NUREG-0612, Section 5.1.6 or partial compliance supplemented by suitable alternative or additional design features). For each crane so evaluated, provide the load-handling system (i.e., crane-load combination) information specified in Attachment 1."

RESPONSE:

Fuel Building Overhead Crane (CPX-MESCFC-01) - The Fuel Building Overhead Crane consists of three separate hoists: The main hoist (130 ton capacity) and two auxiliary hoists (17 ton and 5 ton capacities).

The fuel building overhead crane is the primary means of transporting nuclear fuel in and out of the fuel handling area of

the fuel building. Its range includes the spent fuel cask loading area, the new storage pit, the cask handling area, the new fuel receiving area, and the railroad loading and unloading area. The crane is designed as a traveling bridge crane with a single trolley and is provided with a cab and radio control station. The crane's main hoist has been equipped with single-failure-proof features. The special features incorporated into the design of the main hoisting system of the crane precludes a load drop accident by preventing a load drop in the event of a single failure in the hoisting or braking system. Detailed information regarding the design of the fuel building overhead crane's compliance with single-failure-proof provisions of Regulatory Guide 1.104 "Single-Failure-Proof Overhead Crane Handling System for Nuclear Power Plants" (Draft 3, Rev. 1, Oct. 78), may be found in the generic topical report entitled "Ederer's Nuclear Safety Related X-Sam Cranes" EDR-1(P)-A and its Non-proprietary version EDR-1(NP)-A. See FSAR Sections 9.1.4.2.3 and 9.1.4.3 for supplemental information.

The two auxiliary hoists are used to handle new fuel assemblies and other miscellaneous loads. Neither of these hoists can physically travel any closer than 6'3" from the nearest spent fuel pool, which should be sufficient clearance to prevent load drops into the pools. To help insure this, any spent fuel cask will be handled exclusively by the main hoist.

A drawing of the location of the Fuel Building Overhead Crane with the safe load area is shown on Figure A-15. The limits of the safe load area on the 860' elevation are bounded by the closest point that any of the hoists can physically access the spent fuel pool; 6'9" for the No. 1 spent fuel pool and 9'6" for the No. 2 spent fuel pool.

4. "For the crane identified in 2.2-1, above, not categorized according to 2.2-3, demonstrate that the criteria of NUREG-0612, Section 5.1, are satisfied. Compliance with Criterion IV will be demonstrated in response to Section 2.4 of this request. With respect to Criteria I through III, provide a discussion of your evaluation of crane operation in the spent fuel area and your determination of compliance. This response should include the following information for each crane...."

RESPONSE:

This is not applicable to CPSES.

A.2.3 SPECIFIC REQUIREMENTS OF OVERHEAD HANDLING SYSTEMS OPERATING IN THE CONTAINMENT

The following load handling systems are located in the Containment Building (in the vicinity of the reactor core):

- Containment Polar Cranes (CP1 & 2 -MESCCP-01)
- Containment Auxiliary Upper Cranes (CP1 & 2 -MESCCA-01)
- Reactor Coolant Pump Hoists (CP1 & 2 -MEMHCH-42)
- Containment Fuel Handling Bridge Cranes (CP1 & 2 - MESCCF-01)
- Refueling Machines (TBX-FHSCMC-01 and TCX-FHSCMC-01)
- Containment Dome Access Rotating Platform Hoists (CP1 & 2 -MESCRP-01)

1. "Identify by name, type, capacity, and equipment designator, any cranes physically capable (i.e., taking no credit for any interlocks or operating procedures) of carrying heavy loads over the reactor vessels."

RESPONSE:

a.	Equipment Name:	Containment Polar Crane
	Type:	Single Trolley Traveling Bridge Crane
	Capacity:	Main Hook 175 Tons Auxiliary Hook 20 Tons
	Equipment I.D. No:	CP 1 & 2-MESCCP-01
b.	Equipment Name:	Containment Auxiliary Upper Crane
	Type:	Gantry
	Capacity:	5 Tons
	Equipment I.D. No.:	CP 1 & 2-MESCCA-01
c.	Equipment Name.	Reactor Coolant Pump Hoist
	Type:	Electric Hoist
	Capacity:	45 Tons
	Equipment I.D. No.:	CP 1 & 2-MEMHCH-42

d. Equipment Name: Containment Access Rotating Platform Hoists

Type: NA

Capacity: 1 Ton

Equipment I.D. No.: CP 1 & 2-MESCRP-01

2. "Justify the exclusion of any cranes in this area from the category by verifying that they are incapable of carrying "heavy loads," or are permanently prevented from the movement of any load either directly over the reactor vessel or to such a location where in the event of any load-handling-system failure, the load may land in or on the reactor vessel."

RESPONSE:

a. Containment Fuel Handling Bridge Crane
(CP1 & 2-MESCCP-01)

This crane is used for handling fuel assemblies and components within the containment by means of a long-handled tool suspended from the hoist. The hoist travel range and tool length are designed to limit the maximum lift of a fuel assembly to a safe shielding depth. In addition, the following design safety features are provided:

1) The fuel handling bridge crane controls are interlocked to prevent simultaneous operation of the bridge drive and hoist.

2) Bridge drive operation is prevented except when the hoist is in full up position.

3) Restraining bars are provided on each truck to prevent the bridge from overturning.

The heaviest load to be handled by this crane is approximately 2150 lbs. This load is not considered a "heavy load" as defined.

b. Refueling Machine (TBX-FHSCMCC-01 & TCX-FHSCMC-01)

The containment building refueling machine is used for lifting a fuel assembly during refueling and transporting it between the reactor vessel and the containment fuel transfer area. This equipment is provided with electrical interlocks and limit switches on the bridge and trolley drives to prevent damage to fuel assemblies. The winch is also provided with limit switches to prevent a fuel assembly from being raised above a safe shielding depth. In an emergency, the bridge, trolley, and winch can be operated manually using the handwheel on the motor shaft. The containment building refueling machine is also equipped with a 1-1/2 ton hoist. This hoist is used during the inspection of a control rod drive shaft. This load is excluded from consideration as a "heavy load" as defined. The maximum load to be lifted by this hoist over the reactor vessel will be administratively limited to 2150 pounds.

3. "Identify any cranes listed in 2.3-1, above, which you have evaluated as having sufficient design features to make the likelihood of a load drop extremely small for all loads to be carried and the basis for this evaluation (i.e., complete compliance with NUREG-0612, Section 5.1.6, or partial compliance supplemented by suitable alternative or additional design features). For each crane so evaluated, provide the load-handling-system (i.e., crane-load-combination) information specified in Attachment 1.

RESPONSE:

Containment Polar Crane (CP 1 & 2-MESCCP-01) is a single trolley traveling bridge crane rotating on a single rail circular track and is provided with cab and radio control stations.

The Containment Polar Crane was used during the plant construction phase for lifts up to 475 tons (for handling the reactor vessel and steam generators) prior to its intended normal service.

The use of the crane during the construction phase does not imply any nuclear safety related condition.

During refueling or maintenance operations, the Containment Polar Crane handles a maximum non-critical load of 175 tons. The heaviest load expected to be lifted is the reactor vessel head assembly. Various accident cases (i.e., dropping a reactor vessel head assembly in the refueling cavity) were analyzed (Ref. 3) to determine consequences. The analysis of each situation showed that the integrity of the fuel cladding, and reactor vessel nozzles and core cooling capability would be maintained. Due to the seismic design of the Containment Polar Crane, its structural integrity is sustained and its wheels are not dislodged from the track during an SSE.

The conclusions of reactor vessel head drop analysis indicated that the Containment Polar Crane did not need to be provided with single failure protection. However, to avoid placing undue restrictions on routine crane operations in the containment building, the Containment Polar Cranes' main hoists have been equipped with single-failure-proof features. A detailed analysis of the features of the Containment Polar Crane has been made against the guidelines of NUREG-0554 "Single-Failure-Proof Cranes for Nuclear Power Plants." This analysis indicates that although the Containment

Polar Crane was built prior to issuance of NUREG-0554, it is in essential compliance with NUREG-0554. There are some minor differences between the main hoist and the requirements of NUREG-0554. These differences are described in detail in Table A-7 and Reference 1. The special safety features incorporated into the design of the main hoisting system of the Containment Polar Crane precludes a load drop accident by preventing a load drop in the event of a single failure in the hoisting or braking systems. Detailed information on the lifting fixtures' compliance with ANSI N14.6-1978 and NUREG-0612 is provided in Reference 2. See FSAR Sections 9.1.4.2.3 and 9.1.4.3 for supplemental information.

4. "For cranes identified in 2.3-1 above, not categorized according to 2.3-3 demonstrate that the evaluation criteria of NUREG-0612, Section 5.1, are satisfied. Compliance with Criterion IV will be demonstrated in your response to Section 2.4 of this request. With respect to Criteria I through III, provide a discussion of your evaluation of crane operation in the containment and your determination of compliance. This response should include the following information for each crane."

RESPONSE:

Cranes and hoists identified in Section A.2.3.1, not included in A.2.3.3, are discussed here. The discussion includes all the measures that are provided for each load handling system to assure safe handling of heavy loads. The specific methods to be used for each load handling system are as follows:

a) Containment Auxiliary Upper Crane (CP 1 & 2-MESCCA-01) - Figure A-10 depicts the safe load area for operating the auxiliary upper crane during cold shutdown or refueling. The area covered by this crane includes most of the reactor refueling cavity area and, therefore, the potential exists for

a heavy load drop into the reactor vessel when the vessel head is removed. This crane can safely traverse its entire load handling area when the vessel head is set on the reactor vessel and is shown as a safe load area on Figure A-10. However, to preclude a potential load drop into the vessel, the safe load area for this crane, as shown in the shaded safe load area in Figure A-10 will be reduced when the vessel head is removed.

Mechanical stops will be utilized during reactor vessel head removal to physically prevent this crane from traversing over the open reactor vessel. Administrative controls addressing the installation and removal of the mechanical stops will be included in the reactor vessel head removal and installation procedure.

b) Reactor Coolant Pump Hoist (CP 1 & 2-MEMHCH-42) - This hoist is an auxiliary hoist which is attached to the Polar Crane main hook when lifting the reactor coolant pump and motor out of the steam generator compartments up to the 905' elevation in the Containment Building. To preclude the failure of this hoist from preventing decay heat removal or damaging spent fuel, the following administrative controls will be implemented:

1) This hoist will be used only during cold shutdown and refueling modes when lifting the reactor coolant pump and motor. In these modes, the steam generators are not used for decay heat removal which, in this case, will be provided by the Residual Heat Removal (RHR) System. If a load drop occurred in a steam generator compartment and damaged the reactor coolant system piping in that compartment, core cooling could still be maintained by use of the separate and redundant RHR loop.

2) Specific load paths will be developed for each reactor coolant pump and motor removal and will not allow the load to traverse over or near the reactor vessel.

3) Specific instructions will be developed to insure that the reactor coolant pump and motor are properly rigged and transported safely to its designated lay-down area.

The above conditions and instructions will be incorporated in the load handling procedure written for the use of this hoist.

c) Containment Access Rotating Platform Hoist (CP1 & 2-MESCRP-01) This one ton hoist is used for lifting miscellaneous tools up to the Containment Access Rotating Platform and to the Polar Crane. Interlocks to restrict the use of this crane only within the safe load areas defined on Figure A-11A and A-11B are not feasible, therefore, administrative controls will be utilized which will restrict the use of this hoist only within the safe load areas. This will insure that an accidental load drop will not damage safe shutdown equipment or spent fuel.

A.2.4 SPECIFIC REQUIREMENTS FOR OVERHEAD HANDLING SYSTEM OPERATING IN PLANT AREA CONTAINING EQUIPMENT REQUIRED FOR REACTOR SHUTDOWN CORE DECAY HEAT REMOVAL, OR SPENT FUEL POOL COOLING

The following is a list of the load handling systems from Table A-1 not included in Section A.2.2 or A.2.3 above.

a. Service water intake structure crane (CPX-MESCWS-01)

b. Safety related chiller hoists (CP 1 & 2-MEMHCH-04, 04A)

c. Moderating HX and letdown chiller HX hoists (CP 1 & 2-MEMHCH-16)

d. Component cooling water pump hoist (CPX-MEMHCH-01)

e. Centrifugal charging pump hoists (CP 1 & 2-MEMHCH-01, 02)

f. Auxiliary feedwater pump hoists (CP 1 & 2-MEMHCH-13, 14) (Electric motor driven pump)

g. Auxiliary feedwater pump hoists (CP 1 & 2-MEMHCH-12) (Turbine driven pump)

h. Diesel generator (piston) hoists (CP 1 & 2-MEMHCH-37, 38)

i. Spent Fuel pool HX hoists (CPX-MEMHCH-69, 70)

j. Residual heat removal HX and containment spray HX hoists (CP 1 & 2-MEMHCH-47, 59)

k. Main steam safety valves hoists (CP 1 & 2-MEMHCH-48, 49, 50, 51)

l. Service water intake stop gate hoists (CPX-MEMHCH-61)

m. Service water traveling screen hoist (CPX-MEMHCH-12)

n. Auxiliary filter hoist (CPX-MEMHWR-04, 04A)

o. Miscellaneous hoist (CPX-MEMHCH-72)

p. Residual heat removal pump hoists (CP 1 & 2-MEMHCH-08, 09)

1. "Identify any cranes listed in 2.1-1, above, which you have evaluated as having sufficient design features to make the likelihood of a load drop extremely small for all loads to be carried and the basis for this evaluation (i.e., complete compliance with NUREG-0612, Section 5.1.6, or partial compliance

supplemented by suitable alternative or additional design features). For each crane so evaluated, provide the load-handling system (i.e., crane-load-combination) information specified in Attachment 1."

RESPONSE:

a. Safety Related Chiller Hoist - (CP1&2-MEMHCH-04A)

This single-failure-proof hoist is being procured to replace the existing hoist so as to prevent or mitigate the consequences of a heavy load drop. This new hoist is designed, and fabricated in accordance to the generic topical report entitled "Ederer's Nuclear Safety Related X-Sam Cranes" EDR-1(P)-A.

b. Auxiliary Filter Hoist (CPX-MEMHWR-04A)

This hoist, in conjuction with the existing hoist (CPX-MEMHWR-04), is used during the removal and transfer of radioactive filter elements from their respective filter cells to the drumming station. A single-failure-proof hoist is being procured for handling the transfer cask from El. 852'-6" to the drumming station at El. 810'-6". This hoist is designed and fabricated in accordance to the generic topical report EDR-1(P)-A.

2. "For any cranes identified in 2.1-1 not designated as single-failure-proof in 2.4-1, a comprehensive hazard evaluation should be provided which includes the following information..."

RESPONSE:

Hoists and cranes identified in Table A-1 which operate over safe shutdown or decay heat removal equipment not addressed in Section A.2.2 and A.2.3 of this report, are presented in Table A-6. This table addresses each applicable overhead handling system with a description of the anticipated loads and impact areas. Also listed is the safety related equipment affected by each load handling system and load with the approximate elevation and the hazard elimination category. The weights of the loads are provided in Table A-4.

Most of the hoists listed are used for service on redundant, horizontal, physically separated safety related equipment required for safe shutdown and decay heat removal such that a load drop on one safety train will not preclude the operation of the operable redundant safety train.

The following describes the basis for the exclusion of the hoists listed in Table A-6.

a. Service Water Intake Structure (SWIS) Crane - (CPX-MESCSW-01)

Service water intake structure crane is an overhead I-Beam crane used to install and maintain the service water pumps, fire pumps and associated piping and equipment inside the service water structure during the maintenance operation of the pumps.

The Station Service Water (SSW) System consists of two separate and independent full-capacity, safety related trains. Safety-related trains are redundant in that the components supplied by one train are sufficient to perform the minimum required safety function. Service water pumps inside the pump

house are physically separated from each other by reinforced concrete walls. The SWIS crane is required to handle occasional non-critical loads and operate during normal operation of the plant.

The safety related equipment which may be affected by the movement of loads with this crane is the service water pumps and associated piping. Because of the physical separation and the cross connections between both the train and unit, a load drop from the SWIS crane will not preclude safe shutdown through the use of the redundant SSW pump.

A detailed load drop analysis is shown in Table A-5. Case 3 represents the worst case, assuming pump 1B is inoperable and needs to be repaired. During maintenance operation of this pump, the SWIS crane is used to lift the pump motor over Train "1A", "2B", and "2A" equipment to the open bay laydown area, (see Figure A-21). During this crane operation, it is postulated that the motor is dropped because of crane or rigging device failure and damages Train "1A" pump and piping. As the result of this postulated accident, both pumps for Unit 1 are inoperable. By opening the Unit 1/Unit 2 cross connect valve (XSW-006), Unit 1 safety-related equipment cooling requirements can be maintained by pump 2A with 1B piping and Unit 2 safety-related equipment cooling requirements will be maintained by pump 2B and 2B piping. Therefore, a load drop from this crane will not prevent the redundant service water pump from performing its safety function. (See Figure A-23 for simplified flow diagram). In addition, during maintenance operation of miscellaneous equipment in this building, special precautions, procedures, and/or instructions will be utilized with the purpose of minimizing the risk of a heavy load drop in this area.

b. Safety Related Chiller Hoist - (CP1 & 2-MEMHCH-04)

The safety related chiller hoist is used for handling the cooler heat exchanger, chilled water circulation pump, pump motor, and associated piping and equipment in Room No. 115A and B of the Auxiliary Building.

The safety chilled water system is designed to remove heat rejected by engineered safety feature pump motors and electrical switchgear. Administrative controls and speical precautions will be taken when using this hoist prior to its replacement with the single failure proof hoist described in Section A.2.4.1.a above.

c. Moderating and Letdown Chiller Heat Exchanger Hoist (CP1 & 2-MEMHCH-16)

The safety related equipment, which may be affected by the movement of loads with this hoist, is a small section of Class 1E (Train A) cable tray which is used for auxiliary feedwater and component cooling water motor operated valves. Since all of the cables are for TRAIN A only, TRAIN B equipment will be available to perform the safety fuctions should a load drop damage the cables in the tray.

It should be noted that this hoist does not travel directly over the cable tray. Considering the remote possibility that a load could accidentally swing out and damage the cable tray, the redundant tray would still be available. Therefore, operation of the hoist will not preclude safe shutdown of the reactor following a load drop.

d. Component Cooling Water Pump Hoists (CPX-MEMHCH-01)

Unit 1 and Unit 2 are equipped with redundant Component Cooling Water (CCW) systems consisting of two trains per unit. Each CCW train is located in a separate room and serviced with a separate hoist that can only traverse that particular CCW train. Therefore, due to horizontal physical separation, it is not possible for a load drop of one CCW pump hoist to preclude the operation of the redundant CCW train.

A load drop analysis has been performed and the result indicates that there will be no consequential damage to the floor directly below the monorail.

e. Centrifugal Charging Pump (CCP) Hoists (CP1 & 2-MEMHCH-01, 02)

Each centrifugal charging pump hoist services one centrifugal charging pump (CCP). There are two redundant 100% capacity CCP's per unit, each physically and electrically separated in different rooms.

Due to the physical separation and redundancy of the CCP safety trains, a load drop from one hoist would not preclude safe shutdown of the reactor.

A load drop analysis has been performed and the result indicates that there will be no consequential damage to the floor directly below the monorail.

f. Auxiliary Feedwater Pump Hoists (electric motor driven pump) (CP1 & 2-MEMHCH-13, 14)

These hoists service each of the electric motor driven auxiliary feedwater pumps. If a load drop were to occur over one of these feedwater pumps, the redundant 100% capacity turbine driven auxiliary feedwater pump would be available to supply the required feedwater since this pump is physically separated in a different room.

g. Auxiliary Feedwater Pump Hoist (turbine driven pump) - (CP1 & 2-MEMHCH-2)

This hoist services only the turbine driven auxiliary feedwater pump. If a load drop were to occur above this pump and result in damage, the separate and redundant motor driven auxiliary feedwater pumps would be available to supply the required feedwater for decay heat removal.

h. Diesel Generator (Piston) Hoist (CP1 & 2-MEMHCH-37, 38)

Eac hoist services an area directly above each of the two 100% capacity redundant diesel generators. Since each diesel generator and associated hoist are located in different rooms and, therefore, physically and electrically separated, a load drop from one hoist would not preclude the use of the redundant diesel generator to provide emergency power if required.

i. Spent Fuel Pool Heat Exchanger Hoist (CPX-MEMHCH-69, 70)

The safety-related equipment for TRAIN A and TRAIN B spent fuel pool cooling systems are located in separate rooms and serviced by separate Spent Fuel Pool Heat Exchanger Hoists. The hoists are positioned above the train which it services and can only

traverse above that particular train. Therefore, due to physical separation, it is not possible for a load drop from one Spent Fuel Pool Heat Exchanger Hoist to preclude the operation of the other train.

j. Residual Heat Removal (RHR) Heat Exchanger and Containment Spray (CS) Heat Exchanger Hoists - (CP1 & 2-MEMHCH-47, 59)

There are two RHR and CS Heat Exchanger hoists per unit with each hoist servicing one RHR and CS Heat Exchanger. Each of the two safety trains of RHR and CS Heat Exchangers are physically separated from the other train. Therefore, due to sufficient physical separation and redundancy of the systems, the operation of these hoists will not preclude safe shutdown or decay heat removal should a load drop occur and damage result to safety equipment.

k. Main Steam Safety Valves Hoists - (CP1 & 2-MEMHCH-48, 49, 50, 51)

The primary function of these hoists is to remove and install main steam safety valves from each main steam line. There is one hoist per main steam line. The installation and removal of the safety valves will be performed while the unit is on residual heat removal, and therefore, a load drop would not adversely effect continued decay heat removal.

However during safety valve testing, the hoist may be used to lift testing equipment over the valves. In the unlikely event a load drop causes a main steam line break, safe shutdown and decay heat removal could be achieved via the use of the other three steam generators (if the steam generators were being used for reactor heat removal). This steam break accident scenario is bounded by the main steam line rupture analysis presented in the CPSES FSAR Section 15.1.

l. Service Water Intake Stop Gate Hoist - (CPX-MEMHCH-61)

The Service Water Intake Stop Gate Hoist is used for removal and installation of the service water pump compartment stop gates. The remote possibility exists for a load drop of the Service Water Intake Stop Gate Hoist to affect the operation of one service water pump (one pump per train) by damaging the pump shaft casing. However, since TRAIN A and TRAIN B compartments of the service water intake structure are physically separated by a concrete wall, a load drop on one train of the service water intake will not preclude the operation of the redundant service water train.

m. Service Water Traveling Screen Hoist (CPX-MEMHCH-12 and Jib Crane (CPX-SWEHSG-01)

These hoists are used for handling the service water traveling screens and stop gates during maintenance operations (see Figure A-22). A load drop from this hoist would not impact any safety-related equipment.

A load drop analysis has been performed for the screens and stop gates and the result indicates that there will be no consequential damage to the floor directly below the monorail and jib crane.

n. Auxiliary Filter Hoist (CPX-MEMHWR-04)

This hoist is used for handling miscellaneous spent filters and the transfer cask. Figure A-19 shows the travel range for the hoist. Until the single failure proof hoist described in Section A.2.4.1.b is installed, this hoist will cover the entire monorail area. Special precautions will be taken when handling any heavy load over the equipment hatch area. By

inspection, there is no safety related safe shutdown equipment directly below this hoist's permanent service area. Load handling procedures will be established to ensure that any load drop will not result in a safety concern.

o. Miscellaneous Hoist - (CPX-MEMHCH-72)

This hoist is used for handling the spent fuel pool cooling system isolation valves during maintenance operations (see Figure A-13). In the event of a load drop and damage to one train, the separate and redundant train would be available to supply the required cooling for decay heat removal.

p. Residual Heat Removal Pump Hoist - (CP1-MEMHCH-08)

This hoist is designed for use during maintenance on each of the RHR pumps. The RHR pumps provide decay heat removal capabilities during cold shutdown and refueling modes. There are two redundant 100% capacity RHR pumps per unit, each located in a separate room with its associated monorail. The hoist will be used for maintenance when the associated RHR pump is removed from service. Since the redundant train is still available, a load drop from one monorail will not prevent the RHR system from performing its safety function.

A.3 CONCLUSIONS

Based on our evaluation of heavy load handling systems at the CPSES facility, it is concluded that, in accordance with the provisions of NUREG-0612, all heavy load handling systems will have adequate design safety features to prevent or mitigate the consequences of postulated accidental load drops.

To further assure the safe handling of heavy loads at CPSES, the following measures will be provided for all load handling equipment specified in Sections A.2.2, A.2.3 and A.2.4 of this attachment.

1. Safe laydown areas, safe load areas, and/or safe load paths will be provided as discussed in this attachment prior to initial fuel load operations to ensure safe operation of the cranes during maintenance activities.

2. To preclude rolling (if dropped) and to reduce floor impact, all heavy loads will be carried at the lowest practical height above the operating floor or other components and structures along the path of travel.

3. Load handling procedures for applicable cranes, and periodic inspection and testing of the cranes, as previously stated in Section A.2.1 of this attachment (Response (3e)), will be utilized.

This attachment, in conjuction with the results of the polar crane single-failure-proof analysis (Reference 1) and reactor vessel head and reactor internals lifting devices analysis (Reference 2) constitutes our final response to Mr. Darrell G. Eisenhut's letter dated December 22, 1980.

A.4 REFERENCES

1. Holloran & Associates, "Evaluation of the Comanche Peak Steam Electric Station Containment Building Polar Cranes' Compliance with NUREG-0554 Requirements," Revision 1, 12-15-82.

2. H. H. Sandner, "Evaluation of the Acceptability of the Reactor Vessel Head Lift Rig, Reactor Vessel Internals Lift Rig, Load Cell, and Load Cell Linkage to the Requirements of NUREG-0612," WCAP-10156, October 1982.

3. D. W. Alexander, R. Shakely and D. F. Dudek, "Reactor Vessel Head Drop Analyses," WCAP-9198, January 1978.

CPSES
TABLE A-1
(Sheet 1 of 3)

OVERHEAD LOAD HANDLING SYSTEMS WITH POTENTIAL FOR LOAD DROP ON SPENT FUEL OR SYSTEMS REQUIRED FOR PLANT SHUTDOWN OR DECAY HEAT REMOVAL

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Equipment and/or Piping Along The Load Path
1. Fuel building overhead crane.	CPX-MESCFC-01	Fuel Bldg.	Above 860"	130-17-5	Spent fuel pool cooling piping. Spent fuel transfer area.
2. Containment auxiliary upper cranes.	CP1-MESCCA-01 CP1-MESCCA-01	Containment Bldg.	905'-9"	5	Reactor vessel.
3. Containment polar cranes.	CP1-MESCCP-01 CP2-MESCCP-01	Containment Bldg.	950'-7"	175-20	Reactor vessel. Steam generator. Reactor coolant pumps. Reactor coolant piping.
4. Moderating Heat Exchanger (HX) and letdown chiller HX hoist.	CP1-MEMHCH-16 CP2-MEMHCH-16	Safeguards Bldg.	831'-6"	2	Train "A" electrical tray (cabling for Auxiliary Feedwater System, Component Cooling Water (CCW) System Motor operated valves) located near the monorail.
5. Component Cooling Water (CCW) pump hoist.	CPX-MEMHCH-01	Auxiliary Bldg.	810'-6"	4	CCW pump and associated piping
6. Safety related chiller hoist (Single-Failure-Proof).	CP1-MEMHCH-04A CP2-MEMHCH-04A	Auxiliary Bldg.	778'	3	CCW piping connected to the chiller. Train "A" Chiller Unit. Train "B" Chiller Unit.
7. Centrifugal charging pumps hoist.	CP1-MEMHCH-01, 02 CP2-MEMHCH-01, 02	Auxiliary Bldg.	810'-6"	4	Centrifugal charging pump and associated piping and valves.
8. Containment fuel handling bridge crane.	CP1-MESCCF-01 CP2-MESCCF-01	Containment Bldg.	Above 860'	1	Containment fuel transfer area and fuel rack.

CPSES
TABLE A-1
(Sheet 2 of 3)

OVERHEAD LOAD HANDLING SYSTEMS WITH POTENTIAL FOR LOAD DROP ON SPENT FUEL OR SYSTEMS REQUIRED FOR PLANT SHUTDOWN OR DECAY HEAT REMOVAL

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Equipment and/or Piping Along The Load Path
9. Auxiliary feedwater pump hoist (electric driven pump).	CP1-MEMHCH-13, 14 CP2-MEMHCH-13, 14	Safeguards Bldg.	790'-6"	4	Motor driven auxiliary feedwater pumps, piping and valves.
10. Auxiliary feedwater pump hoist (turbine driven pump).	CP1-MEMHCH-12 CP2-MEMHCH-12	Safeguards Bldg.	790'-6"	3	Turbine driven auxiliary feedwater pump, piping and valves.
11. Auxiliary filter hoist.	CPX-MEMHWR-04	Auxiliary Bldg.	852'-6"	8	Miscellaneous filters.
12. Reactor coolant pumps hoist.	CP1-MEMHCH-42 CP2-MEMHCH-42	Containment Bldg.	905'-9"	45 Upgraded to 45 tons per DCA-9035	Same as polar crane. See Note 1.
13. Diesel generator (piston) hoist.	CP1-MEMHCH-37, 38 CP2-MEMHCH-37, 38	Safeguards Bldg.	810'-6"	1	Diesel generator and its associated piping and instrumentation.
14. Spent fuel pool HX hoist.	CPX-MEMHCH-69, 70	Fuel Bldg.	838'-9"	8	Spent fuel pool heat exchangers, piping and valves.
15. Service water traveling screen hoist and jib crane.	CPX-MEMHCH-12 CPX-SWEHSG-01	Outside of service water structure	838'	20 3	Traveling screens and stop gates.
16. Residual heat removal (RHR) HX and Containment Spray System (CSS) HX hoist.	CP1-MEMHCH-47, 59 CP2-MEMHCH-47, 59	Safeguards Bldg.	831'-6"	10	RHR & CSS heat exchanger and its associated piping and valves.
17. Main steam safety valves hoist.	CP1-MEMHCH-48,49,50,51 CP2-MEMHCH-48,49,50,51	Safeguards Bldg.	880'-6"	1	Main steam safety valves.
18. Service water intake structure crane.	CPX-MESCSW-01	Service water structure	Above 796'	7 1/2	Service water pumps and its associated piping and valves.
19. Containment dome access rotating platform hoist.	CP1-MESCRP-01 CP2-MESCRP-02	Containment Bldg.	1000'	1	Reactor vessel. Fuel storage rack. Steam generator. Reactor coolant pumps. Reactor coolant piping.

CPSES
TABLE A-1
(Sheet 3 of 3)

OVERHEAD LOAD HANDLING SYSTEMS WITH POTENTIAL FOR LOAD DROP ON SPENT FUEL OR SYSTEMS REQUIRED FOR PLANT SHUTDOWN OR DECAY HEAT REMOVAL

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Equipment and/or Piping Along The Load Path
20. Fuel handling bridge crane (Fuel Bldg.).	TBX-FHSCFB-01	Fuel Bldg.	Above 860'	2	Spent fuel pool. Refueling canal. New fuel storage pit.
21. Refueling machine (Containment Bldg.).	TBX-FHSCMC-01 TCX-FHSCMC-01	Containment Bldg.	Above 860'	2	Reactor vessel. Containment fuel transfer area.
22. Service water intake stop gate hoist.	CPX-MEMHCH-61	Service water intake structure	789'-9"	8	Service water pumps.
23. Auxiliary filter hoist (Single-Failure-Proof).	CPX-MEMHWR-04A	Auxiliary Bldg.	852'-6"	8	Service water piping, misc. filters.
24. Miscellaneous hoist.	CPX-MEMHCH-72	Fuel Bldg.	838'-9"	2	Spent fuel pool cooling pump inlet isolation valve.
25. Residual heat removal pump hoist	CP1-MEMHCH-08 CP2-MEMHCH-09	Safeguards Bldg.	773'	3	RHR pump and its associated piping.

NOTE: 1. Reactor Coolant Pumps Hoist is attached to the Polar Crane Hooks during the maintenance operation of the Reactor Coolant Pump.

CPSES
TABLE A-2
(Sheet 1 of 3)

OVERHEAD LOAD HANDLING SYSTEMS
CRANES AND HOISTS WHICH DO NOT REQUIRE ADDITIONAL REVIEW AND EVALUATION

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Separation Criteria (Note 1)
1. Dumming storage area crane.	CPX-MESCDS-01	Fuel Bldg.	831'	17	B
2. Maintenance Bldg. bridge crane.	CPX-MESCMB-01	Maintenance Bldg.	810'	25	A
3. Turbine Bldg. gantry crane.	CP1-MESCTC-01 CP2-MESCTC-01	Turbine Bldg.	830'	Main hoist - 210 Aux. hoist - 50	A
4. Circulating water intake structure gantry crane.	CPX-MESCCW-01	Circulating water intake structure	810'	Main hoist: Inside span - 25 Outside span - 12 Aux. Hoist: 5	A
5. Equipment hatch door hoist.	CP1-MEMHCH-41	Containment Bldg.	832'-6" @ 223 degrees	10	C
6. Waste gas compressor hoist.	CPX-MEMHCH-05	Auxiliary Bldg.	831'-6"	1	C
7. Positive displacement charging pump hoist.	CP1-MEMHCH-03 CP2-MEMHCH-03	Auxiliary Bldg.	810'-6"	6	C
8. H_2 Recombiner hoist.	CPX-MEMHCH-07	Auxiliary Bldg.	831'-6"	1	C
9. Letdown chiller package hoist.	CP1-MEMHCH-05 CP2-MEMHCH-05	Auxiliary Bldg.	852'-6"	2	C
10. Heating & Ventilation chiller hoist.	CPX-MEMHCH-09	Auxiliary Bldg.	873'-6"	6	A
11. Heating & Ventilation chiller hoist.	CPX-MEMHCH-10	Auxiliary Bldg.	873'-6"	1	A
12. Letdown HX and seal water HX hoist.	CP1-MEMHCH-15 CP2-MEMHCH-15	Safeguards Bldg.	810'-6"	1 1/2	C
13. Condenser vacuum pumps hoist.	CP1-MEMHCH-25 CP2-MEMHCH-25	Turbine Bldg.	778'	4	A

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TABLE A-2
(Sheet 2 of 3)

OVERHEAD LOAD HANDLING SYSTEMS
CRANES AND HOISTS WHICH DO NOT REQUIRE ADDITIONAL REVIEW AND EVALUATION

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Separation Criteria (Note 1)
14. Turbine plant cooling water pump hoist.	CPX-MEMHCH-11	Turbine Bldg.	778'	6	A
15. Heater drain pump hoist.	CP1-MEMHCH-28 CP2-MEMHCH-28	Turbine Bldg.	778'	4	A
16. Control fluid tank hoist.	CP1-MEMHCH-29 CP2-MEMHCH-29	Turbine Bldg.	778'	3	A
17. Personnel lock hoist.	CP1-MEMHCH-30	Safeguards Bldg.	831'-6" @ 317 degrees	2	C
18. Reactor vessel studs hoist.	CP1-MEMHJC-01 CP2-MEMHJC-01	Containment Bldg.	905'-9"	1/2	A
19. Steam generator feedwater pump and turbine driver crane.	CP1-MEMHOC-01 CP2-MEMHOC-01	Turbine Bldg.	803'	10	A
20. Equipment hatch hoist @ 790'-6" for misc. equipment.	CP1-MEMHCH-45 CP2-MEMHCH-45	Safeguards Bldg.	790'-6"	4	A
21. Equipment hatch hoist @ 810'-6" for misc. equipment.	CP1-MEMHCH-46 CP2-MEMHCH-46	Safeguards Bldg.	810'-6"	4	A
22. Equipment hatch hoist @ 873'-6" for misc. ventilation equipment.	CPX-MEMHCH-52	Auxiliary Bldg.	873'-6"	1	A
23. Equipment hatch hoist @ 886'-6" for misc. ventilation equipment.	CPX-MEMHCH-53	Auxiliary Bldg.	886'-6"	1	A
24. Misc. equipment hoist.	CPX-MEMHCH-54	Unit 2, Turbine Bldg.	810'	2	A
25. Misc. equipment hoist.	CPX-MEMHCH-55	Unit 2, Turbine Bldg.	810'	1/4	A
26. Dry waste compactor hoist.	CPX-MEMHCH-56	Fuel Bldg.	810'-6"	2	A
27. Chlorine containers hoist.	CPX-MEMHCH-57	Service water chlorination bldg.	823'-9"	2	A
28. Chlorine containers hoist.	CPX-MEMHCH-58	Circ. water chlorination bldg.	809'-6"	2	A

CPSES
TABLE A-2
(Sheet 3 of 3)

OVERHEAD LOAD HANDLING SYSTEMS
CRANES AND HOISTS WHICH DO NOT REQUIRE ADDITIONAL REVIEW AND EVALUATION

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Separation Criteria (Note 1)
29. Auxiliary steam condensate cooler hoist.	CPX-MEMHCH-60	Auxiliary Bldg.	778'	1	A
30. Containment equipment hatch hoist.	CPX-MEMHCH-67 CPX-MEMHCH-68	Outside containment		25	A
31. Wall puller for letdown HX, moderating HX.	CP1-MEMHLH-01 CP2-MEMHLH-01	Safeguards Bldg.	810'-6" & 831'-6"	3/4	C
32. Demineralizers hoist.	CPX-MEMHWR-05	Auxiliary Bldg.	852'-6"	8	C
33. Radial arm stud tensioner hoists.	TBX-FHHCAH-01 TCX-FHHCAH-01	Containment Bldg.	Below 860'	2	D
34. Miscellaneous equipment hoist.	CP1-MEMHCH-64 CP2-MEMHCH-64	Safeguards Bldg.	852'-6"	3	A

Note 1: Separation criteria used is as follows:
A - No safety related equipment located in, under, or near the load path.
B - Safety related equipment separated by barriers which have been analyzed for load drop.
C - Equipment in, under, or near load path is not required for safe shutdown or decay removal.
D - Load handling equipment not used except in safe shutdown and equipment, in, under, or near load path is not required for decay heat removal.

CPSES
TABLE A-3
(Sheet 1 of 3)

OVERHEAD LOAD HANDLING SYSTEMS
APPLICABLE CODE AND STANDARDS

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Code and Standards
1. Fuel Building overhead crane.	CPX-MESCFC-01	Fuel Bldg.	Above 860'	130-17-5	Crane Manufacturers Association of America (CMAA) Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
2. Containment auxiliary upper cranes.	CP1-MESCCA-01 CP2-MESCCA-01	Containment Bldg.	905'-6"	5	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
3. Containment polar cranes.	CP1-MESCCP-01 CP2-MESCCP-01	Containment Bldg.	950'-7"	175-20	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
4. Moderating HX and letdown chiller HX hoist.	CP1-MEMHCH-16 CP2-MEMHCH-16	Safeguards Bldg.	831'-6"	2	ANSI B30.16-1973
5. Component cooling water pump hoist.	CPX-MEMHCH-01	Auxiliary Bldg.	810'-6"	4	ANSI B30.16-1973
6. Safety related chiller hoist (Single-Failure-Proof).	CP1-MEMHCH-04A CP2-MEMHCH-04A	Auxiliary Bldg.	778'	3	CMAA Spec. No. 70 and ANSI B30.16-1973
7. Centrifugal charging pumps hoist.	CP1-MEMHCH-01, 02 CP2-MEMHCH-01, 02	Auxiliary Bldg.	810'-6"	4	ANSI B30.16-1973
8. Containment fuel handling bridge crane.	CP1-MESCCF-01 CP2-MESCCF-01	Containment Bldg.	Above 860'	1	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
9. Auxiliary feedwater pump hoist (electric motor driven pump).	CP1-MEMHCH-13, 14 CP2-MEMHCH-13, 14	Safeguards Bldg.	790'-6"	4	ANSI B30.16-1973
10. Auxiliary feedwater pump hoist (turbine driven pump).	CP1-MEMHCH-12 CP2-MEMHCH-12	Safeguards Bldg.	790'-6"	3	ANSI B30.16-1973

CPSES
TABLE A-3
(Sheet 2 of 3)

OVERHEAD LOAD HANDLING SYSTEMS
APPLICABLE CODE AND STANDARDS

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Code and Standards
11. Auxiliary filter hoist.	CPX-MEMHWR-04	Auxiliary Bldg.	852'-6"	8	ANSI B30.16-1973
12. Reactor coolant pumps hoist.	CP1-MEMHCH-42 CP2-MEMHCH-42	Containment Bldg.	905'-9"	45	ANSI B30.16-1973
13. Diesel generator (piston) hoist.	CP1-MEMHCH-37, 38 CP2-MEMHCH-37, 38	Safeguards Bldg.	810'6"	1	ANSI B30.16-1973
14. Spent fuel pool HX hoist.	CPX-MEMHCH-43, 44	Fuel Bldg.	838'-9"	8	ANSI B30.16-1973
15. Service water traveling screen hoist and jib crane.	CPX-MEMHCH-12 CPX-SWEHSG-01	Outside of service water intake structure	838'	20 3	ANSI B30.16-1973 ANSI B30.16-1973
16. Residual heat removal HX and Containment Spray System hoist.	CP1-MEMHCH-47, 59	Safeguards Bldg	831'-6"	10	ANSI B30.16-1973
17. Main steam safety valves hoist.	CP1-MEMHCH-48,49,50,51 CP2-MEMHCH-48,49,50,51	Safeguards Bldg.	880'-6"	1	ANSI B30.16-1973
18. Service water intake structure crane.	CPX-MESCSW-01	Service water intake structure	Above 796'	7 1/2	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
19. Containment dome access rotating platform hoist.	CP1-MESCRP-01 CP2-MESCRP-01	Containment Bldg.	1000'	1	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
20. Fuel handling bridge crane (Fuel Bldg.).	TBX-FHSCFB-01	Fuel Bldg.	Above 860'	2	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
21. Refueling machine (Containment Bldg.).	TBX-FHSCMC-01 TCX-FHSCMC-01	Containment Bldg.	Above 860'	2	CMAA Spec. No. 70 and ANSI B30.2-1967, Chapter 2-1.
22. Service water intake stop gate hoist.	CPX-MEMHCH-61	Service water intake structure	789'-9"	8	ANSI B30.16-1973
23. Auxiliary filter hoist (Single-Failure-Proof).	CPX-MEMHWR-04A	Auxiliary Bldg.	852'-6"	8	CMAA Spec. No. 70 and ANSI B30.16-1973

CPSES
TABLE A-3
(Sheet 3 of 3)

OVERHEAD LOAD HANDLING SYSTEMS
APPLICABLE CODE AND STANDARDS

Crane/Hoist Name	Crane/Hoist I.D. No.	Location	Elevation	Capacity (Tons)	Code and Standards
24. Miscellaneous hoist.	CPX-MEMHCH-72	Fuel Bldg.	838'-9"	2	ANSI B30.16-1973
25. Residual heat removal pump hoist.	CP1-MEMHCH-08 CP2-MEMHCH-09	Safeguards Bldg.	773'	3	ANSI B30.16-1973

CPSES
TABLE A-4
(Sheet 1 of 5)

OVERHEAR LOAD HANDLING SYSTEM
PROJECTED LOADS AND WEIGHTS

CRANE/HOIST EQUIPMENT	I.D. NUMBER	LOCATION	ELEVATION	PROJECTED LOADS	APPROX. LOAD WTS.	ANTICIPATED LIFTING DEVICES*
1. Fuel building overhead crane.	CPX-MESCFC-01	Fuel Bldg.	860'	A. Spent Fuel Cask	220,000 lbs.	SLD
				B. New Fuel Assembly and Handling Tool	2,088 lbs.	NR
				C. New Fuel Shipment Cask	7,000 lbs.	S
				D. Fuel Transfer Canal Stop Gates	12,000 lbs.	S
2. Containment auxiliary upper crane.	CP1-MESCCA-01 CP2-MESCCA-01	Containment	905'	A. Reactor Vessel Stud Tensioning Device	4,000 lbs.	S
				B. Reactor Vessel Stud Transport Baskets (full)	6,200 lbs.	S
				C. Reactor Vessel Studs	570 lbs.	S
				D. Control Rod Drive Ventilation Ducts	1,000 lbs.	S
3. Containment polar crane.	CP1-MESCCP-01 CP2-MESCCP-01	Containment	950'	A. Reactor Vessel Head Assembly plus Rig Assembly plus Load Cell Linkage and Contingencies	336,218 lbs.	SLD
				B. Reactor Upper Internals	132,000 lbs.	SLD
				C. Reactor Lower Internals plus Lifting Rig plus Load Cell Linkage and Contingencies	290,000 lbs.	SLD
				- Internals Lifting Rig	18,350 lbs.	NR
				- Reactor Lower Internals	260,000 lbs.	SLD
				- Load Cell and Load Cell Linkage	2,930 lbs.	NR
				D. Reactor Coolant Pumps		
				- Pump Internals and Hoist	60,480 lbs.	S
				- Pump Impeller and Hoist	52,880 lbs.	S
				- Rotating Element and Hoist	12,880 lbs.	S
				- Pump Motor, Lifting Rig and Hoist	89,986 lbs.	S
				- Motor Stator and Hoist	53,283 lbs.	S
				- Motor Rotor and Hoist	36,764 lbs.	S
				- Fly Wheel and Hoist	21,405 lbs.	S
				- Air Cooler and Hoist	7,280 lbs.	S
				E. Reactor Coolant Pump Motor Stand and Hoist	16,280 lbs.	S
				F. Fuel Storage Area Stop Gate	12,000 lbs.	S

CPSES
TABLE A-4
(Sheet 2 of 5)

OVERHEAR LOAD HANDLING SYSTEM
PROJECTED LOADS AND WEIGHTS

CRANE/HOIST EQUIPMENT	I.D. NUMBER	LOCATION	ELEVATION	PROJECTED LOADS	APPROX. LOAD WTS.	ANTICIPATED LIFTING DEVICES*
4. Moderating Heat Exchanger (HX) and letdown chiller HX hoist.	CP1-MEMHCH-16 CP2-MEMHCH-16	Safeguards Bldg.	831'	A. Moderating HX Channel Head	268 lbs.	S
				B. Moderating HX Tube Bundle	1,515 lbs.	S
				C. Moderating HX Shell	2,558 lbs.	S
				D. Letdown Chiller HX Channel Head	357 lbs.	S
				E. Letdown Chiller HX Tube Bundle	1,357 lbs.	S
				F. Letdown Chiller HX Shell	1,905 lbs.	S
5. Component cooling water pump hoist.	CPX-MEMHCH-01	Auxiliary Bldg.	810'	A. Component Cooling Water Pump	6,500 lbs.	S
				B. Component Cooling Water Pump Base	3,300 lbs.	S
				C. Component Cooling Water Pump Motor	7,500 lbs.	SB
				D. Valves - 24"	1,040 lbs.	S
				E. Emergency Fan/Coil Unit Motor	200 lbs.	S
6. Safety related chiller hoist.	CP1-MEMHCH-04A CP2-MEMHCH-04A	Auxiliary Bldg.	778'	A. Cooler HX Tube Bundle	1,500 lbs.	S
				B. Condenser HX Tube Bundle	1,500 lbs.	S
				C. Chilled Water Circulating Pump	210 lbs.	S
				D. Chilled Water Pump Motor	546 lbs.	S
				E. Potential Transformers	1,500 lbs.	S
7. Centrifugal charging pump hoist.	CP1-MEMHCH-01,02 CP2-MEMHCH-01,02	Auxiliary Bldg.	810'	A. Centrifugal Charging Pump (CCP) (Total)	7,500 lbs.	S
				B. CCP Gear Assembly	2,700 lbs.	S
				C. CCP Motor (Total)	5,830 lbs.	SB
				D. CCP Motor Rotor	1,760 lbs.	S
				E. Lube Oil Cooler (Shell)	260 lbs.	S
				F. Emergency Fan/Coil Unit Motor	140 lbs.	S
8. Containment fuel handling bridge.	CP1-MESCCF-01 CP2-MESCCF-01	Containment Bldg.	860'	A. Fuel Assembly and Lifting Tool	2,088 lbs.	NR
9. Auxiliary feedwater pump hoist (Motor driven).	CP1-MEMHCH-13,14 CP2-MEMHCH-13,14	Safeguards Bldg.	790'	A. Auxiliary Feedwater Pump	4,000 lbs.	S
				B. Auxiliary Feedwater Pump Motor	7,100 lbs.	SB
				C. Auxiliary Feedwater Pump Rotor	1,224 lbs.	S
				D. Auxiliary Feedwater Pump Casing	1,200 lbs.	S

CPSES
TABLE A-4
(Sheet 3 of 5)

OVERHEAR LOAD HANDLING SYSTEM
PROJECTED LOADS AND WEIGHTS

CRANE/HOIST EQUIPMENT	I.D. NUMBER	LOCATION	ELEVATION	PROJECTED LOADS	APPROX. LOAD WTS.	ANTICIPATED LIFTING DEVICES*
10. Auxiliary feedwater pump hoist (Turbine Driven).	CP1-MEMHCH-12 CP2-MEMHCH-12	Safeguards Bldg.	790'	A. Auxiliary Feedwater Pump	4,000 lbs.	S
				B. Turbine Driver	2,800 lbs.	SB
				C. Auxiliary Feedwater Pump Rotor	1,150 lbs.	S
				D. Auxiliary Feedwater Pump Casing	1,300 lbs.	S
11. Auxiliary filter hoist.	CPX-MEMHWR-04	Auxiliary Bldg.	852'-6"	A. Miscellaneous Filter	20 lbs.	N/A
				B. Spent Filter Cask	10,000 lbs.	S
				C. Concrete Floor Plug	12,875 lbs.	S
12. Reactor coolant pump hoist.	CP1-MEMHCH-42 CP2-MEMHCH-42	Containment Bldg.	905'	A. Reactor Coolant Pump Internals	55,200 lbs.	S
				1. Pump Stator	47,600 lbs.	S
				2. Pump Rotating Element	7,600 lbs.	S
				B. Reactor Coolant Pump Motor and Lifting Rig	84,706 lbs.	SB
				1. Stator	48,003 lbs.	S
				2. Rotor	31,484 lbs.	S
				3. Flywheel	16,125 lbs.	S
				4. Motor Air Coolers	7,000 lbs.	S
				C. Reactor Coolant Pump Motor Stand	10,435 lbs.	S
13. Diesel generator (Piston) hoist.	CP1-MEMHCH-37,38 CP2-MEMHCH-37,38	Safeguards Bldg.	810'	A. Various Piping and Structural Components on or near Diesel Generator Set	2,000 lbs.	S
14. Spent fuel pool heat exchanger hoist.	CPX-MEMHCH-69,70	Fuel Bldg.	838'	A. Spent Fuel Cooling Pump	2,500 lbs.	S
				B. Spent Fuel Cooling Motor	2,100 lbs.	S
				C. Spent Fuel Heat Exchanger		
				1. Shell	7,600 lbs.	SB
				2. Tube Bundle	7,400 lbs.	SB
				D. Concrete Floor Plugs	8,985 lbs.	S
15. Service water traveling screen hoist and jib crane.	CPX-MEMHCH-12 CPX-SWEHSG-01	Service Water Intake Structure	838'	A. Miscellaneous Parts, Trays, Chains, Housing, Chain Guides (Max.)	3,500 lbs.	SB
				B. Traveling Screen Unit	21,500 lbs.	SB
				C. Stop Gates	4,500 lbs.	SB

CPSES
TABLE A-4
(Sheet 4 of 5)

OVERHEAR LOAD HANDLING SYSTEM
PROJECTED LOADS AND WEIGHTS

CRANE/HOIST EQUIPMENT	I.D. NUMBER	LOCATION	ELEVATION	PROJECTED LOADS	APPROX. LOAD WTS.	ANTICIPATED LIFTING DEVICES*
16. Residual heat removal and containment spray system HX hoist.	CP1-MEMHCH-47,59 CP2-MEMHCH-47,59	Safeguards Bldg.	831'	A. Containment Spray Heat Exchanger		
				1. Shell Body	7,300 lbs.	SB
				2. Tube Bundle	17,000 lbs.	SB
				B. RHR Heat Exchanger		
				1. Shell Body	7,750 lbs.	SB
				2. Tube Bundle	16,600 lbs.	SB
				C. Compartment Concrete Floor Plugs	11,045 lbs.	S
				D. Containment Spray System HX Support Beam	580 lbs.	S
				E. Miscellaneous Valves	200 lbs.	S
17. Main steam safety valves hoist.	CP1-MEMHCH-48,49 50, 51 CP2-MEMHCH-48,49 50, 51	Safeguards Bldg.	880'	A. Main Steam Safety Valves	1,550 lbs.	S
18. Service water intake structure crane.	CPX-MESCWS-01	Service Water Intake Structure	796'	A. Service Water Pump Motor	9,700 lbs.	S
				B. Fire Pump Jockey Pump	525 lbs.	S
				C. Fire Pump Jockey Pump Motor	235 lbs.	S
				D. Fire Pump Diesel Driven Pump	4,730 lbs.	S
				E. Fire Pump Diesel Driven Pump Driver	3,450 lbs.	SB
				F. Fire Pump Diesel Driven Pump Gear	1,450 lbs.	S
				G. Fire Pump Diesel Coupling	181 lbs.	S
				H. Fire Pump (Electric Driven) Pump	4,730 lbs.	S
				I. Fire Pump (Electric Driven) Motor	4,800 lbs.	S
19. Containment dome access rotating platform hoist.	CP1-MESCRP-01 CP2-MESCRP-01	Containment Bldg.	1000'	A. Miscellaneous Tools	200 lbs.	S
				B. Welding Equipment	300 lbs.	S
20. Fuel handling bridge crane (Fuel bldg.).	TBX-FHSCFB-01	Fuel Bldg.	860'	A. Fuel Assembly and Tool	2,088 lbs.	NR
				B. Underwater Lighting Fixture	300 lbs.	NR
21. Refueling machine (Containment bldg.).	TBX-FHSCMC-01 TCX-FHSCMC-01	Containment Bldg.	860'	A. Fuel Assembly, Rod Control Cluster & Gripper	1,854 lbs.	NR
				B. Control Rod Drive Shaft & Handling Fixture	336 lbs.	NR

CPSES
TABLE A-4
(Sheet 5 of 5)

OVERHEAR LOAD HANDLING SYSTEM
PROJECTED LOADS AND WEIGHTS

CRANE/HOIST EQUIPMENT	I.D. NUMBER	LOCATION	ELEVATION	PROJECTED LOADS	APPROX. LOAD WTS.	ANTICIPATED LIFTING DEVICES*
22. Service water intake stop gate hoist.	CPX-MEMHCH-61	Service Water Intake Structure	789'-9"	A. Service Water Pump Compartment Stop Gates	12,400 lbs.	S
23. Auxiliary filter hoist (Single-Failure-Proof).	CPX-MEMHWR-04A	Auxiliary Bldg.	852'-6"	A. Miscellaneous Filter B. Spent Filter Cask C. Concrete Floor Plug	20 lbs. 10,000 lbs. 12,875 lbs.	NR S S
24. Miscellaneous hoist.	CPX-MEMHCH-72	Fuel Bldg.	838'-9"	A. Spent Fuel Pool Cooling Pump Inlet Isolation Valve.	2,500 lbs.	S
25. Residual heat removal pump hoists.	CP1-MEMHCH-08 CP2-MEMHCH-09	Safeguards Bldg.	773'	A. RHR Pump.	6,000 lbs.	S

*LIFTING DEVICE SYMBOLS

S - Sling or Cable Arrangement
SB - Sling and Spreader Bar Arrangement
SLD - Special Lifting Device
NR - None Required

CPSES

TABLE A-5

SWIS CRANE LOAD DROP ANALYSIS

SSWS COMPONENTS (1)	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9
Train 1A:									
Pump (CP1-SWAPSW-01)	I	I	D	O	O	O	O	O	O
Piping	N/A	N/A	D	O	O	D	D	O	D
Cross-Connect Valve (XSW-008)	C	C	C	C	C	O (2)	C	C	C
Isolation Valve (1HV-4286)	N/A	N/A	N/A	O	O	C	C	O	C
Train 1B:									
Pump (CP1-SWAPSW-02)	O	O	I	I	I	I	O	O	O
Piping	O	O	O	N/A	N/A	O	O	O	O
Cross-Connect Valve (XSW-007)	C	C	O (2)	C	C	O (2)	C	O (2)	C
Isolation Valve (1HV-4287)	O	O	O	N/A	N/A	O	O	C	O
Unit 1/2									
Cross Connect Valve (XSW-006)	C	C	O (2)	C	C	C	C	O (2)	C
Train 2A:									
Pump	O	D	O	O	D	O	I	D	O
Piping	O	D	O	O	D	D	N/A	D	D
Cross-Connect Valve (XSW-0028)	C	C	O (2)	C	C	C	C	C	O (2)
Isolation Valve (2HV-4286)	O	N/A	C	O	N/A	C	N/A	N/A	C
Train 2B:									
Pump	D	O	O	D	O	O	O	I	I
Piping	D	O	O	D	O	O	O	O	O
Cross-Connect Valve (XSW-0029)	C	C	C	C	C	C	C	O (2)	O (2)
Isolation Valve (2HV-4287)	N/A	O	O	N/A	O	O	O	O	O
SSWS Train in service:									
Unit 1	1B	1B	2A pump w/ 1B piping	1A	1A	1A pump w/ 1B piping	1B	1A	1B
Unit 2	2A	2B	2B	2A	2B	2B	2B	1B pump w/ 2B piping	2A pump w/ 2B piping

LEGEND: I-Inoperable
O-Operable or Open
C-Closed
D-Damaged due to load drop

(1) Operator action required to open "cross-connect" valves and to close isolation valves.

(2) Manual operated valve.

CPSES
TABLE A-6
(Sheet 1 of 18)

CPSES Load/Impact Area Matrix

Crane: Service Water Intake Structure Crane

Tag. No.: CPX-MESCSW-01

IMPACT AREA (description)	Area within the pump compartments		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Service water pumps and motors	Service water pumps and motors	810'-6"	Note D

CPSES
TABLE A-6
(Sheet 2 of 18)

CPSES Load/Impact Area Matrix

Crane: Safety Related Chiller Hoist (S-F-P)

Tag. No.: CP1 & 2-MEMHCH-04A

IMPACT AREA (description)	Area directly below the Monorail. This includes both "Train A" and "Train B" Safety Chillers. Rooms 115A and 115B.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Cooler HX. Tube Bundle	Safety Chiller Package - "Train A" and "Train B"	738'	Note A
Condenser HX. Tube Bundle	"	"	"
Chilled Water Circ. Pump	"	"	"
Chilled Water Circ. Pump Motor	"	"	"
Potential Transformers	"	"	"

CPSES
TABLE A-6
(Sheet 3 of 18)

CPSES Load/Impact Area Matrix

Crane: Moderating and Letdown Chiller Heat Exchanger Hoist

Tag. No.: CP 1 & 2-MEMHCH-16

IMPACT AREA (description)	Electrical cable tray, "Train A", located near end of hoist monorail. Safeguards building Rooms 93 and 99.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Moderating Heat Exchanger Channel Head	"Train A" cables for Aux. Feedwater Component Cooling Water Motor Operated Valves	831'	Note B
Moderating Heat Exchanger Tube Bundle	"	"	"
Moderating Heat Exchanger Shell	"	"	"
Letdown Chiller HX. Channel Head	"	"	"
Letdown Chiller HX Tube Bundle	"	"	"
Letdown Chiller HX Shell	"	"	"

CPSES
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(Sheet 4 of 18)

CPSES Load/Impact Area Matrix

Crane: Component Cooling Water Pump

Tag. No.: CPX-MEMHCH-01

IMPACT AREA (description)	Area directly below each Component Cooling Water Pump Hoist. Auxiliary Building Rooms 204, 205, 196, 197.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Component Cooling Water Pump	Component Cooling Water Piping	810'-6"	Note B and Note C
Component Cooling Pump Base	"	"	"
Component Cooling Water Pump Motor	Component Cooling Water Pump and Piping	"	"
Valves - 24 in.	Component Cooling Water Pump, Motor, and Piping	"	"
Emergency Fan/ Coil Unit Motor	"	"	"

CPSES
TABLE A-6
(Sheet 5 of 18)
CPSES Load/Impact Area Matrix

Crane: Centrifugal Charging Pumps Hoist

Tag. No.: CP 1 & 2-MEMHCH-01, 02

IMPACT AREA (description)	Area directly below each Centrifugal Chargin Pump Hoist. Auxiliary Building Rooms 194, 195, 200 and 201.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Centrifugal Charging Pump (CCP)	Chemical Volume and Control System (CVCS) Piping and Valves	810'-6"	Note B & C
CCP Gear Assembly	"	"	"
CCP Motor	"	"	"
CCP Motor Rotor	"	"	"
Lube Oil Cooler (Shell)	"	"	"

CPSES
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(Sheet 6 of 18)

CPSES Load/Impact Area Matrix

Crane: Auxiliary Feedwater Pump Hoist (electric motor driven pump)

Tag. No.: CP 1 & 2-MEMHCH-13, 14

IMPACT AREA (description)	Area directly below each electric motor driven Auxiliary Feedwater Pump Hoist. Safeguard Building Rooms 72 and 73.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Auxiliary Feedwater Pump	Auxiliary Feedwater Piping	790'-6"	Note B
Auxiliary Feedwater Pump Motor	"	"	"
Auxiliary Feedwater Pump Rotor	"	"	"
Auxiliary Feedwater Pump Upper Casing	"	"	"

CPSES
TABLE A-6
(Sheet 7 of 18)

CPSES Load/Impact Area Matrix

Crane: Auxiliary Feedwater Pump Hoist (turbine driven pump)

Tag. No.: CP 1 & 2-MEMHCH-12

IMPACT AREA (description)	Area directly below each turbine driven Auxiliary Feedwater Pump Hoist. Safeguard Building Room 74.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Auxiliary Feedwater Pump	Auxiliary Feedwater Piping	790'-6"	Note B
Turbine Driver	"	"	"
Auxiliary Feedwater Pump Rotor	"	"	"
Auxiliary Feedwater Pump Casing	"	"	"

CPSES
TABLE A-6
(Sheet 8 of 18)

CPSES Load/Impact Area Matrix

Crane: Diesel Generator (Piston) Hoist

Tag. No.: CP 1 & 2 MEMHCH-37, 38

IMPACT AREA (description)	Area directly below Diesel Generator Hoists. Safeguards Building Rooms 84 and 85.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Various Diesel Generator Parts and Components	Diesel Generator	810'-6"	Note B

CPSES
TABLE A-6
(Sheet 9 of 18)

CPSES Load/Impact Area Matrix

Crane: Spent Fuel Pool Heat Exchanger Hoists

Tag. No.: CPX-MEMHCH-69,70

IMPACT AREA (description)	Area directly below Spent Fuel Pool Heat Exchanger Hoist Fuel Building Rooms 240 and 240 A.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Spent Fuel Cooling Pump	Spent Fuel Pool Heat Exchanger and Piping	810'-6"	Note B
Spent Fuel Cooling Motor	Spent Fuel Pool Heat Exchanger and Piping	"	"
Spent Fuel Heat Exchange 1. Shell 2. Tube Bundle	Spent Fuel Pool Heat Exchange, Pump, and Piping	"	"
Concrete Floor Plugs	Spent Fuel Pool Heat Exchange, Pump, and Pipings	"	"

CPSES
TABLE A-6
(Sheet 10 of 18)

CPSES Load/Impact Area Matrix

Crane: Residual Heat Removal Heat Exchanger and Containment Spray System Heat Exchanger Hoist
Tag. No.: CP 1 & 2-MEMHCH-47, 59

IMPACT AREA (description)	Area directly below load path of Residual Heat Removal (RHR) and Containment Spray Heat Exchanger Hoists. Rooms 68 and 69.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Containment Spray Hoist 1. Shell Body 2. Tube Bundle	RHR Heat Exchanger and Piping	790'-10"	Note B
RHR Hoist 1. Shell Body 2. Tube Bundle	RHR Piping	790'-10"	"
Compartment Concrete Floor Plugs	RHR Heat Exchanger and	790'-10"	"

CPSES
TABLE A-6
(Sheet 11 of 18)

CPSES Load/Impact Area Matrix

Crane: Main Steam Safety Valves Hoist

Tag. No.: CP 1 & 2-MEMHCH-48, 49, 50, 51

IMPACT AREA (description)	Area directly below the Main Steam Safety Valves Hoist. Safeguards Building Room 109.		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Main Steam Safety Valves	Main Steam Safety Valves	873'-6"	Note B

CPSES
TABLE A-6
(Sheet 12 of 18)

CPSES Load/Impact Area Matrix

Crane: Service Water Intake Stop Gate Hoist

Tag. No.: CPX-MEMHCH-61

IMPACT AREA (description)	Area directly below the Service Water Intake Stop Gate Hoist. Room 274 (lower elevation of Service Water Structure)		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Service Water Pump Compartment Stop Gates	Service Water Pump Shaft	755'	Note B

CPSES
TABLE A-6
(Sheet 13 of 18)

CPSES Load/Impact Area Matrix

Crane: Service Water Traveling Screen Hoist and JIB Crane

Tag. No.: CPX-MEMHCH-12 and CPX-SWEHSG-01

IMPACT AREA (description)	Area directly below Service Water Traveling Screen Hoist		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Misc. Parts, Trays, Chains Etc.	Service Water Traveling Screens	810'-6"	Note B and Note C

CPSES
TABLE A-6
(Sheet 14 of 18)

CPSES Load/Impact Area Matrix

Crane: Auxiliary Filter Hoist (S-F-P)

Tag. No.: CPX-MEMHWR-04A

IMPACT AREA (description)	Area directly below the open hatch at el. 852'-6". This area is located at elevation 810'-6". (This hoist services only the east side of Room 234).		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Spent Filter Transfer Cask (App. wt. 5 ton)	Unit 1 & 2 Train "A" and Train "B" Service Water Inlet/ Discharge Piping	785'-6" of Auxiliary Bldg.	Note A

CPSES
TABLE A-6
(Sheet 15 of 18)

CPSES Load/Impact Area Matrix

Crane: Auxiliary Filter Hoist

Tag. No.: CPX-MEMHWR-04

IMPACT AREA (description)	Area directly below the monorail. (This hoist services only the west side and south side of Room 234).		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Spent Filter Transfer Cask (App. wt. 5 ton)	Radioactive filters cavity is directly below the monorail	852'-6"	Note C

CPSES
TABLE A-6
(Sheet 16 of 18)

CPSES Load/Impact Area Matrix

Crane: Residual heat removal pump hoists

Tag. No.: CP1 & 2 - MEMHCH-08, 09

IMPACT AREA (description)	Area directly below the monorail (Rm 264)		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
RHR pump and its associated piping	Train "A" and Train "B" equipment	773'	Note B

CPSES
TABLE A-6
(Sheet 17 of 18)

CPSES Load/Impact Area Matrix

Crane: Miscellaneous Hoist

Tag. No.: CPX-MEMHCH-72

IMPACT AREA (description)	Area directly below the monorail (Rm 264)		
LOADS	SAFETY-RELATED EQUIPMENT	ELEVATION	HAZARD ELIMINATION CATEGORY
Spent fuel pool Cooling pump Inlet isolation valve	Train "A" and Train "B" spent fuel pool cooling piping	838'-9"	Note B

Notes for Hazard Elimination Category

Note A: Single-failure-proof hoist is provided for handling of heavy loads.

Note B: System redundancy and horizontal physical separation precludes loss of the system's capability to perform it safety-related function following the load drop in this area.

Note C: Load drop analysis was performed and resulted in no design change to the plant structure.

Note D: See load drop analysis shown in Table A-5 and discussed on page A-22.

CPSES

TABLE A-7
(Sheet 1 of 6)

SUMMARY OF PRIMARY DIFFERENCES BETWEEN
CONTAINMENT POLAR CRANES AND
NUREG-0554 RECOMMENDATIONS

NUREG-0554 Recommendation	Analysis Report Item (Note 1)	Difference
"2.4 Material Properties ". . . In order to ensure resistance to brittle fracture, materials for structural members essential to structural integrity should be tested in accordance with the following impact test requirements. Either drop weight test per ASTM E-208 or Charpy tests per ASTM A-370 may be used for impact testing. "The minimum operating temperature based on the drop weight test should be obtained by the following procedures in paragraph NC-2300 of Section III of the ASME Code. The minimum operating temperature based on the Charpy V-notch impact test should be obtained by following the procedures in paragraph ND-2300 of Section III of the ASME Code. "These toughness recommendations were developed at a time when typical material section thickness for crane girders was a maximum of 51 mm (2 in). However, later information indicates that material thickness of 102 mm (4 in) or more may be needed for some applications. The rules for ASME Code Class 3 charpy testing do not make any adjustments	2.4.1 2.4.2	All critical structural members of CPSES Polar Cranes were fabricated with ASTM A-36 or equivalent (ASTM A-572, GR B). The crane structural members were proportioned to give comparable design factors. Because the minimum operating temperature in the Containment Building is 50°F, the crane manufacturer (KRANCO) does not anticipate any brittle fracture to occur on the crane structural members. Therefore, neither drop weight tests nor Charpy V-Notch impact testing was required by the Specification.

TABLE A-7
(Sheet 2 of 6)

SUMMARY OF PRIMARY DIFFERENCES BETWEEN
CONTAINMENT POLAR CRANES AND
NUREG-0554 RECOMMENDATIONS

NUREG-0554 Recommendation	Analysis Report Item (Note 1)	Difference
for thicknesses greater than 64 mm (2 1/2 in), and for this reason it is felt that the NC-2300 and ND-2300 requirements give equivalent requirements only for the smaller thicknesses. "For thicknesses over 64 mm (2 1/2 in), it is recommended that the NC-2300 requirements be used exclusively."		
"2.4 Material Properties ". . . However, it may be impractical to perform a toughness test for cranes that have progressed too far in the manufacturering sequence or for cranes already built and operating. Such cranes should therefore be tested by subjecting the crane to a test lift at the lowest anticipated operating temperature. It is desirable to include the crane manufacturer in the planning of the test. . . . "As an alternative to the above recommendations, the crane and lifting fixtures for cranes already fabricated or operating may be subjected to a cold proof test consisting of a single dummy load test as follows: Metal temperature of the structural members essential to the structural integrity of	2.4.4	See the response to Analysis Report Items 2.4.1 and 2.4.2 above. It should be noted that during construction the crane received a 499 ton load test at ambient temperature.

SUMMARY OF PRIMARY DIFFERENCES BETWEEN
CONTAINMENT POLAR CRANES AND
NUREG-0554 RECOMMENDATIONS

NUREG-0554 Recommendation	Analysis Report Item (Note 1)	Difference
the crane handling system should be at or below the minimum operating temperature. The corresponding dummy load should be equal to 1.25 times the MCL. If the desired minimum operating temperature cannot be achieved during the test, the minimum operating temperature should be that of the test until the crane is retested at a lower temperature. The cold proof test should be followed by a nondestructive examination of welds whose failure could result in the drop of a critical load. The nondestructive examination of critical areas should be repeated at 4-year intervals or less."		
"2.8 Welding Procedures "Problems with welding of low-alloy steels can occur if the base metal temperature is not properly controlled during . . . the postweld heat treatment	2.8.2	The Specification did not require postweld heat-treatment (stress-relief) for structural weldments. According to the crane manufacturer (Kranco), postweld heat-treatment was not performed due to the very large member size, which was beyond the size of available furnance equipment at the time. Also, the design stress limit of structural assemblies per CMAA No. 70 takes into account the effect of additional stress from welding without thermal stress relieving. The purpose of any thermal stress relieving performed on crane components is to relieve any induced stresses prior to subsequent machining operations to prevent distortion, misalignment, etc., which could occur if the component is not stress relieved.

CPSES

TABLE A-7
(Sheet 4 of 6)

SUMMARY OF PRIMARY DIFFERENCES BETWEEN
CONTAINMENT POLAR CRANES AND
NUREG-0554 RECOMMENDATIONS

NUREG-0554 Recommendation	Analysis Report Item (Note 1)	Difference
". . . postweld heat-treatment (stress-relief) temperatures for all weldments should be specified in the weld procedure. "Welds described in the recommendations of Section 2.6 should be post weld heat treated in accordance with Subarticle 3.9 of AWS D1.1, "Structural Welding Code."		
"4.3 Head and Load Blocks ". . . A 200% static-type load test should be performed for each load-attaching hook."	4.3.5	The dual load path hook received a 499 ton load test prior to construction use of the crane. The load equalizing system assured that each load path equally shared the load. Therefore, each load path was statically loaded to 249.5 tons, which corresponds to a 167% static-type load test.
". . . Measurements of the geometic configuration of the hooks should be made before and after the test . . ."	4.3.6	Measurement of the geometric configuration of the hooks were not made before and after the load test. Based upon the substantial over design inherent in the hooks, it is not considered necessary to retest them just to verify that their geometric configuration does not change before and after the test.
". . . The load blocks should be nondestructively examined by surface and volumetric techniques."	4.3.9 4.3.10	According to the crane manufacturer (Kranco), the upper block support was magnetic particle inspected. Based

CPSES

TABLE A-7
(Sheet 5 of 6)

SUMMARY OF PRIMARY DIFFERENCES BETWEEN
CONTAINMENT POLAR CRANES AND
NUREG-0554 RECOMMENDATIONS

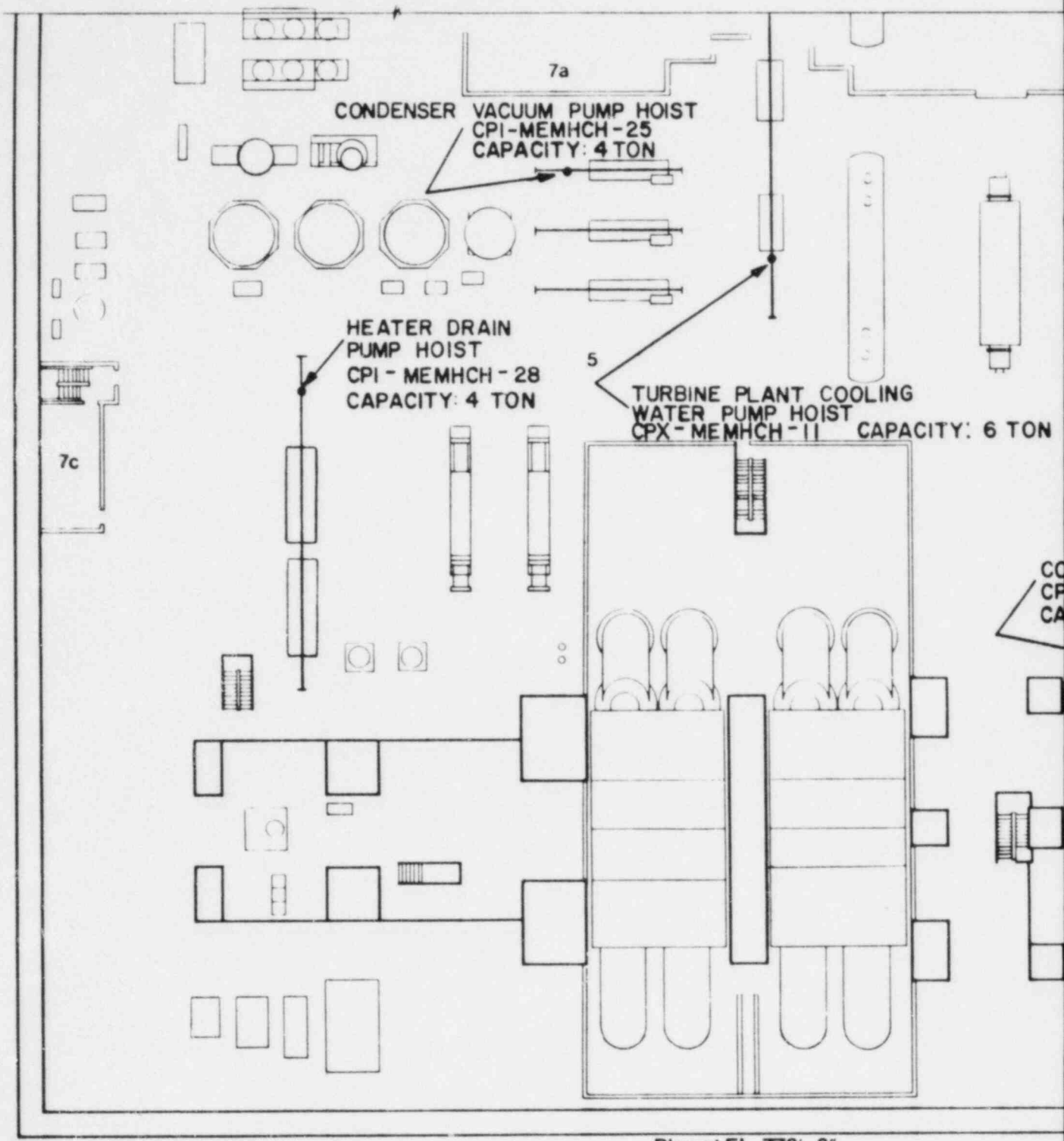
NUREG-0554 Recommendation	Analysis Report Item (Note 1)	Difference
		upon the conservatism in the design of the load block, no further nondestructive inspection of it is considered necessary.
"5.1 Braking Capacity ". . . To avoid the possibility of drive motor over-torque within the control system, the maximum torque capability of the driving motor and gear reducer for trolley motion and bridge motion of the overhead bridge crane should not exceed the capability of the gear train and brakes to stop the trolley or bridge from the maximum speed with the DRL attached." ". . . holding brakes should be rated at 100% of maximum drive torque that can be developed at the point of application.	5.1.4 5.1.7	The Specification requires the bridge brakes to have torque ratings equal to CMMA #70 requirements, as a minimum, and that they be capable of stopping the crane within a distance of 5 feet when it is traveling at maximum speed with the rated load and the trolley is at maximum distance from the center of the span. CMAA #70 requires brake torque ratings from 50 to 100% of drive motor torque, depending upon the crane configuration.

CPSES

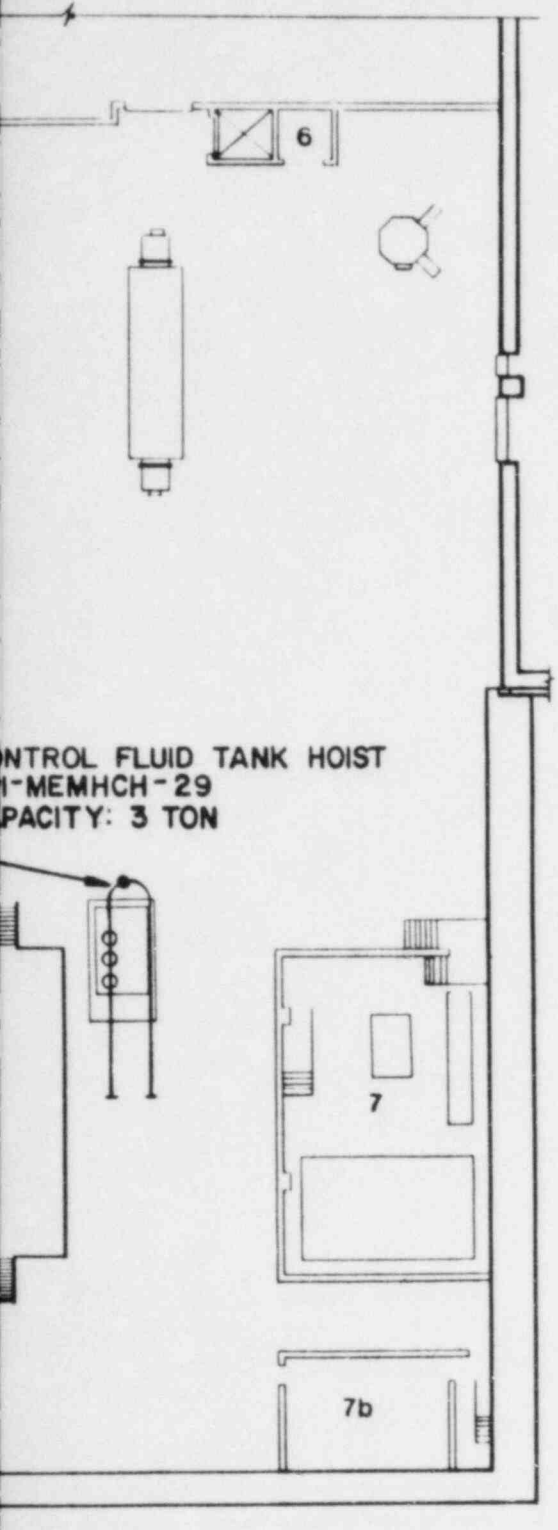
TABLE A-7
(Sheet 6 of 6)

SUMMARY OF PRIMARY DIFFERENCES BETWEEN
CONTAINMENT POLAR CRANES AND
NUREG-0554 RECOMMENDATIONS

NOTE 1: Meta Services, "Evaluation of the CPSES Containment Building Polar Cranes' Compliance with NUREG-0554 Requirements", Revision 1, dated December 15, 1982.



Plan at EL. 778'–0"
(Basement Floor Plan)



Plan at Elevation 778'-0"

Rm.#	Rm. Name
5	Turbine Area
6	Machine Room
7	Oil Room
7a	Water Treatment Area
7b	Fire Protection Valve Room
7c	Fire Protection Valve Room

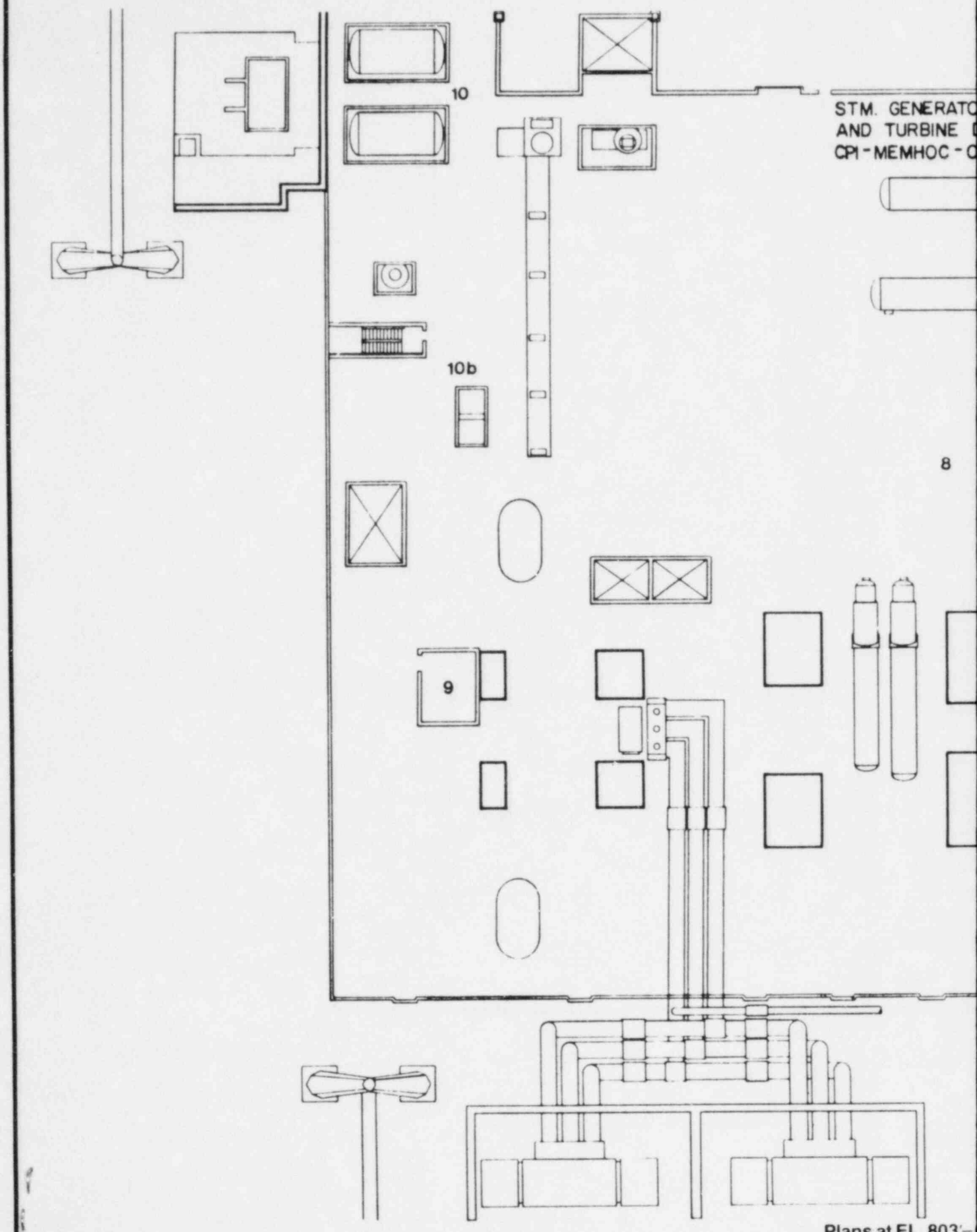
Also Available On Aperture Card

COMANCHE PEAK S.E.S.

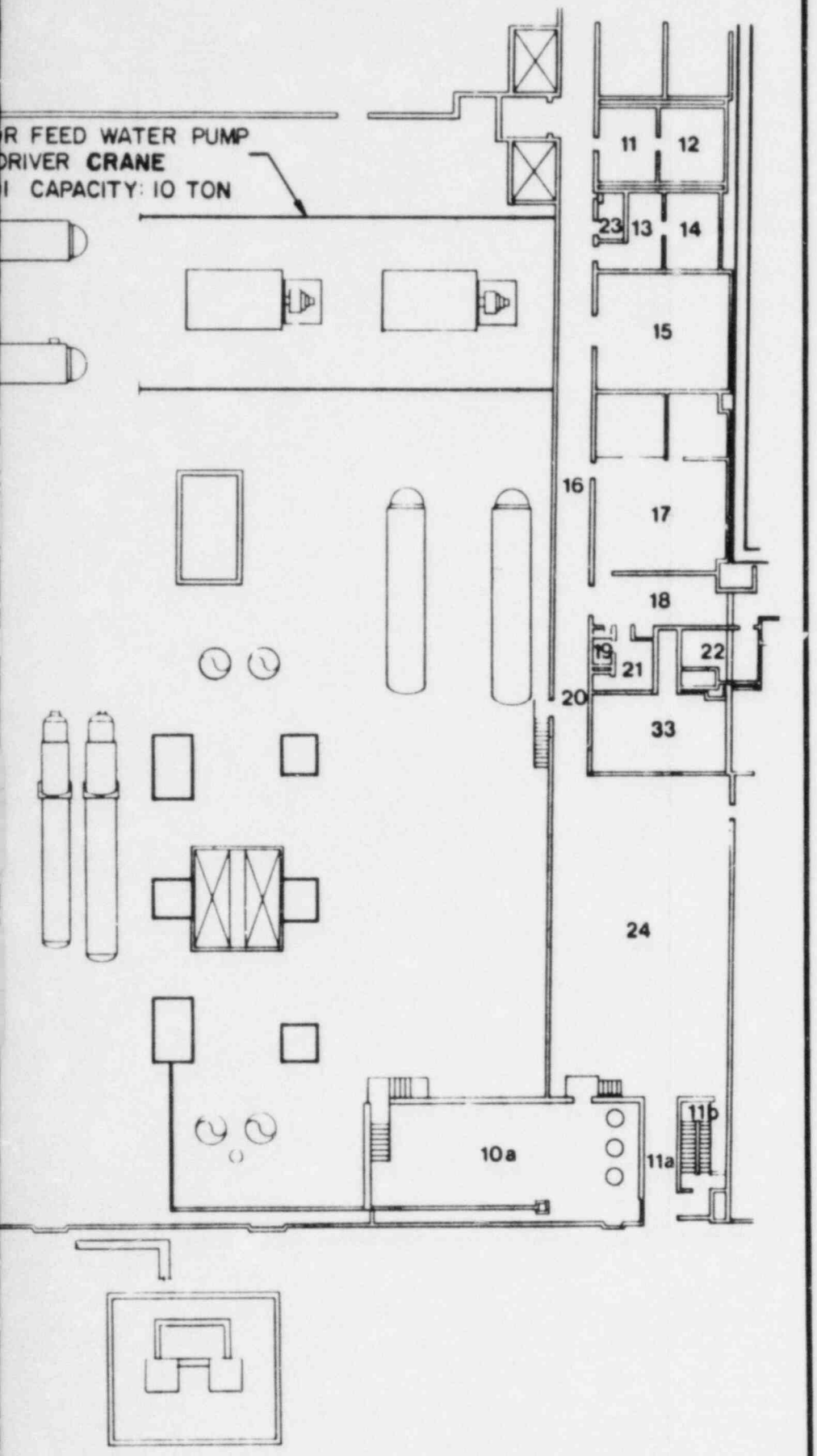
UNITS 1 and 2

TURBINE BUILDING
MISCELLANEOUS HOIST

FIGURE A-1



Plans at EL. 803'–
(Mezzanine Floor Plan)



0" & 810'-6"

Plans at EL. 803'-0" & EL. 810'-6"

Rm.#	Rm. Name
8	Turbine Area
9	TVR Room
10	Acid and Caustic Tank Area
10a	Lube Oil Reservoir Room
10b	Stair No. T-2
11a	Entry Area
11b	Stair No. T-1
11	Lavatory
12	Toilet Room
13	Drying Room
14	Shower Room
15	Locker Area
16	Corridor
17	Health Physicist Office
18	Corridor
19	Toilet Room
20	Closet
21	First Aid Room
22	Personnel Decontamination Room
23	Janitor Room
24	Open Area
33	Dressing Area

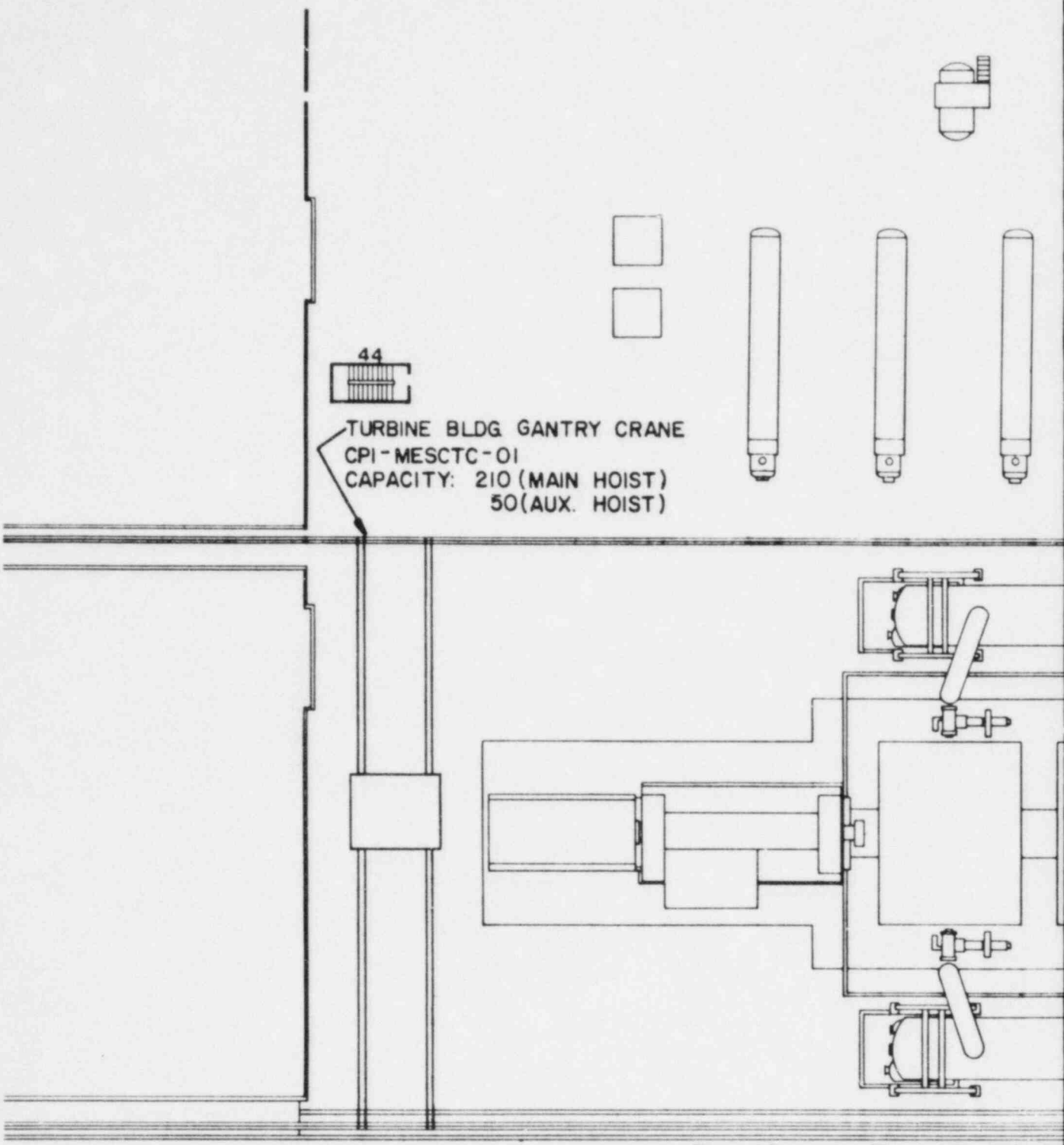
Also Available On Aperture Card

COMANCHE PEAK S.E.S.

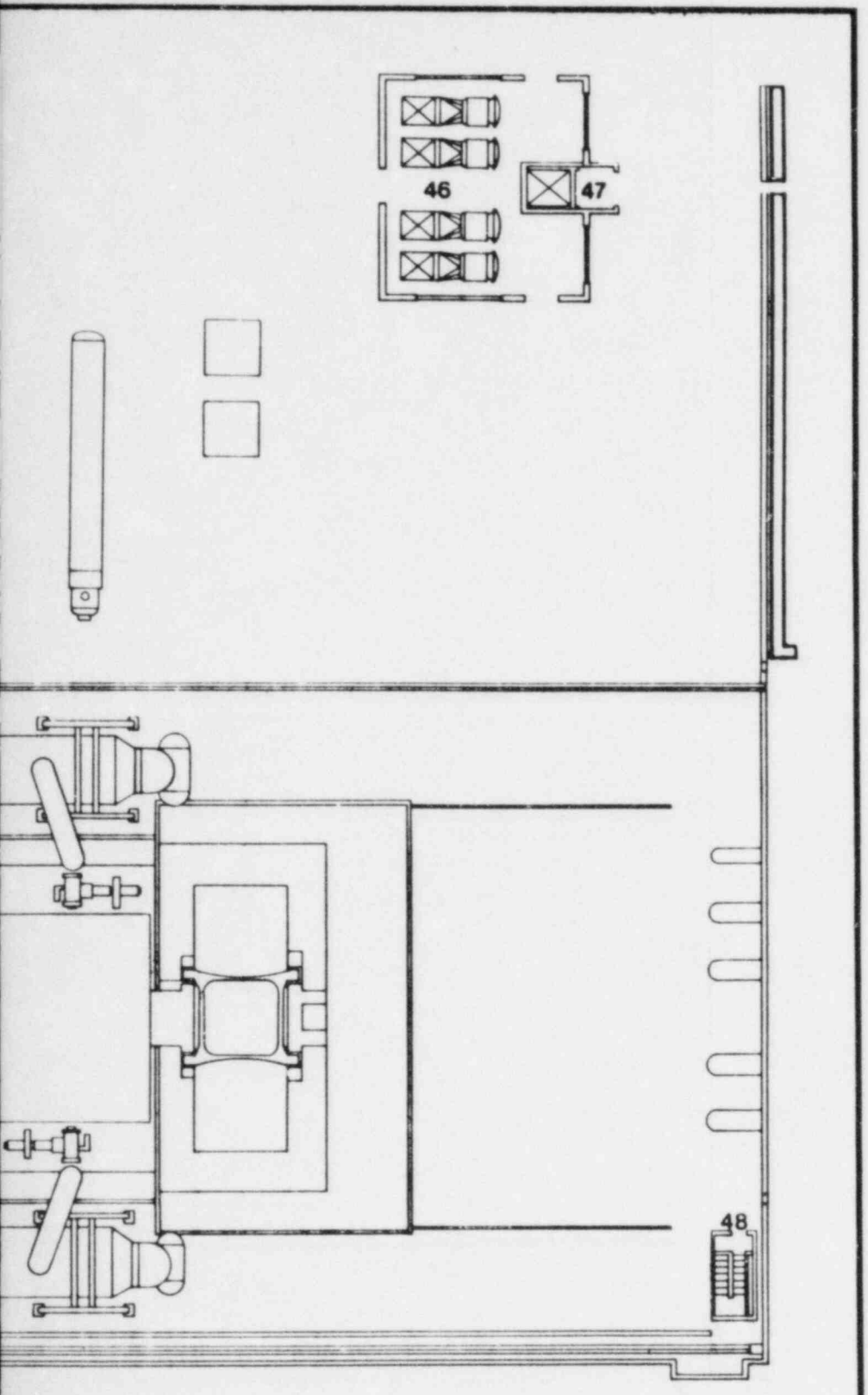
UNITS 1 and 2

TURBINE BUILDING
MISCELLANEOUS CRANE

FIGURE A-2



Plan of Operating Floor at EL. 830'-0"



Plan of Operating Floor at Elevation 830'-0"

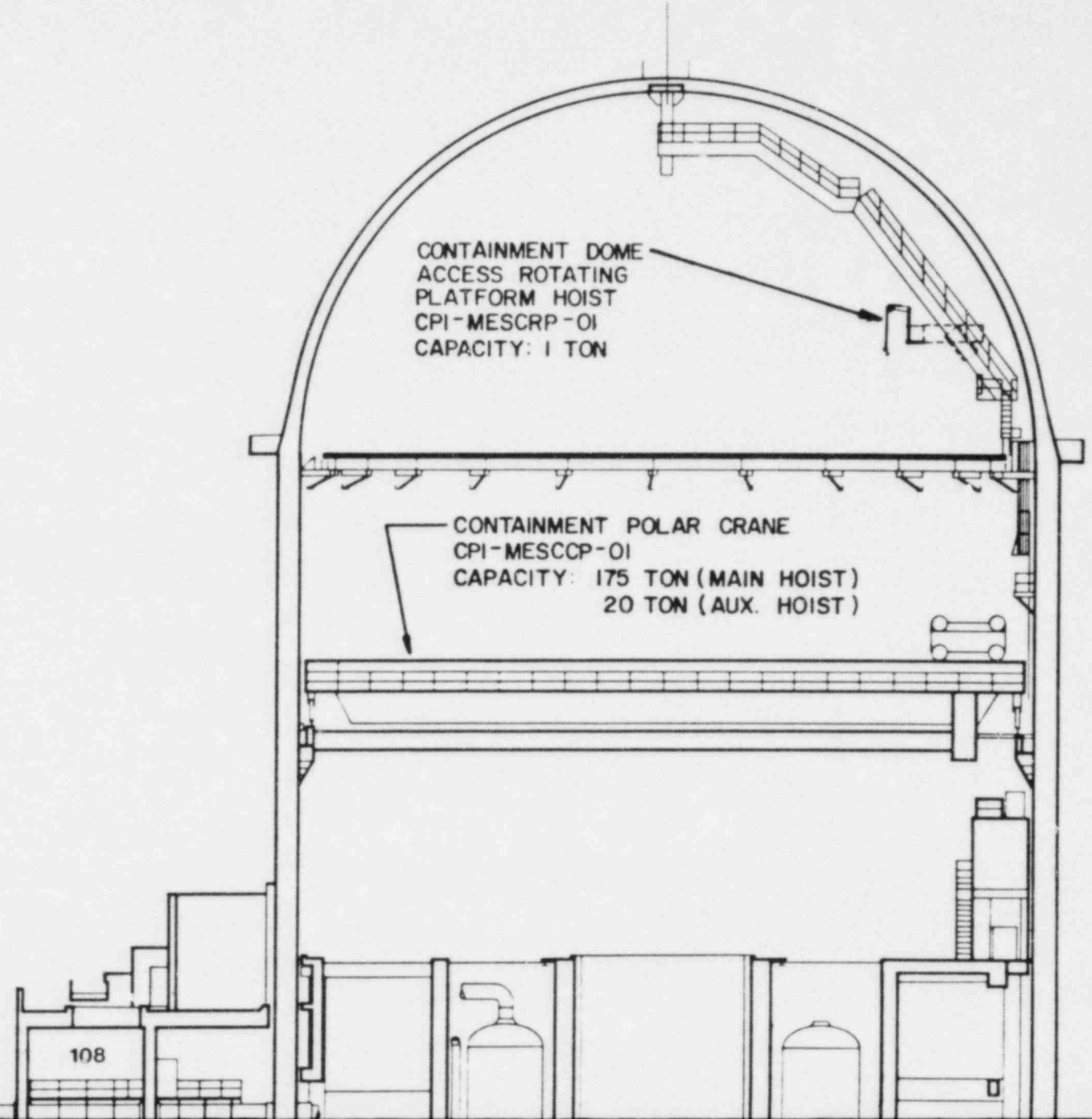
Rm.#	Rm. Name
44	Stair No. T-2
46	Ventilation Air Intake Room
47	Vestibule
48	Stair No. T-1

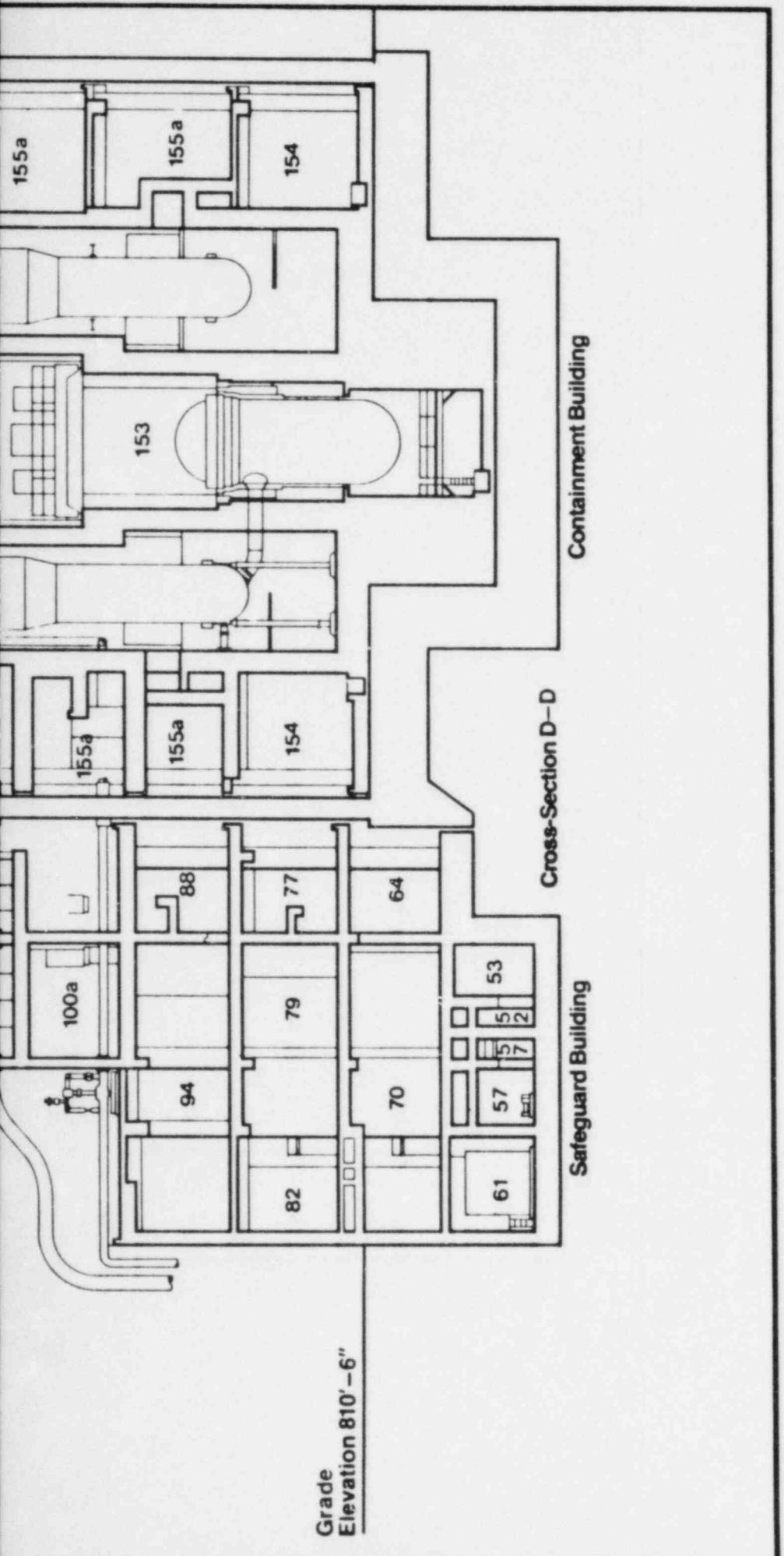
COMANCHE PEAK S.E.S.

UNITS 1 and 2

TURBINE BUILDING
TURB. BLDG. GANTRY CRANE

FIGURE A-3



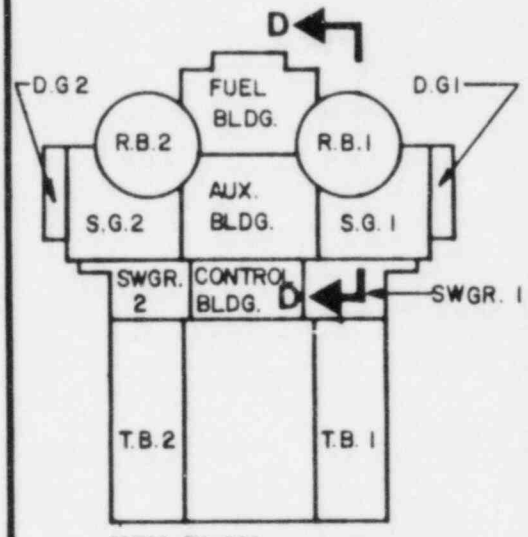


Safeguard Building

Rm.#	Rm. Name
53	RHR Pump Room
57	Floor Drain Tank Pump Room
61	Floor Drain Tank Room
64	Chemical Additive Tank Room
70	Corridor
77	Radioactive Penetration Area
79	Corridor
82	Corridor
88	Piping Penetration Area
94	Corridor
100a	Feed Water Penetration Area
108	Main Steam Penetration Area

Containment Building

153	Reactor Cavity
154	Ground Floor Level
155a	Floor Levels



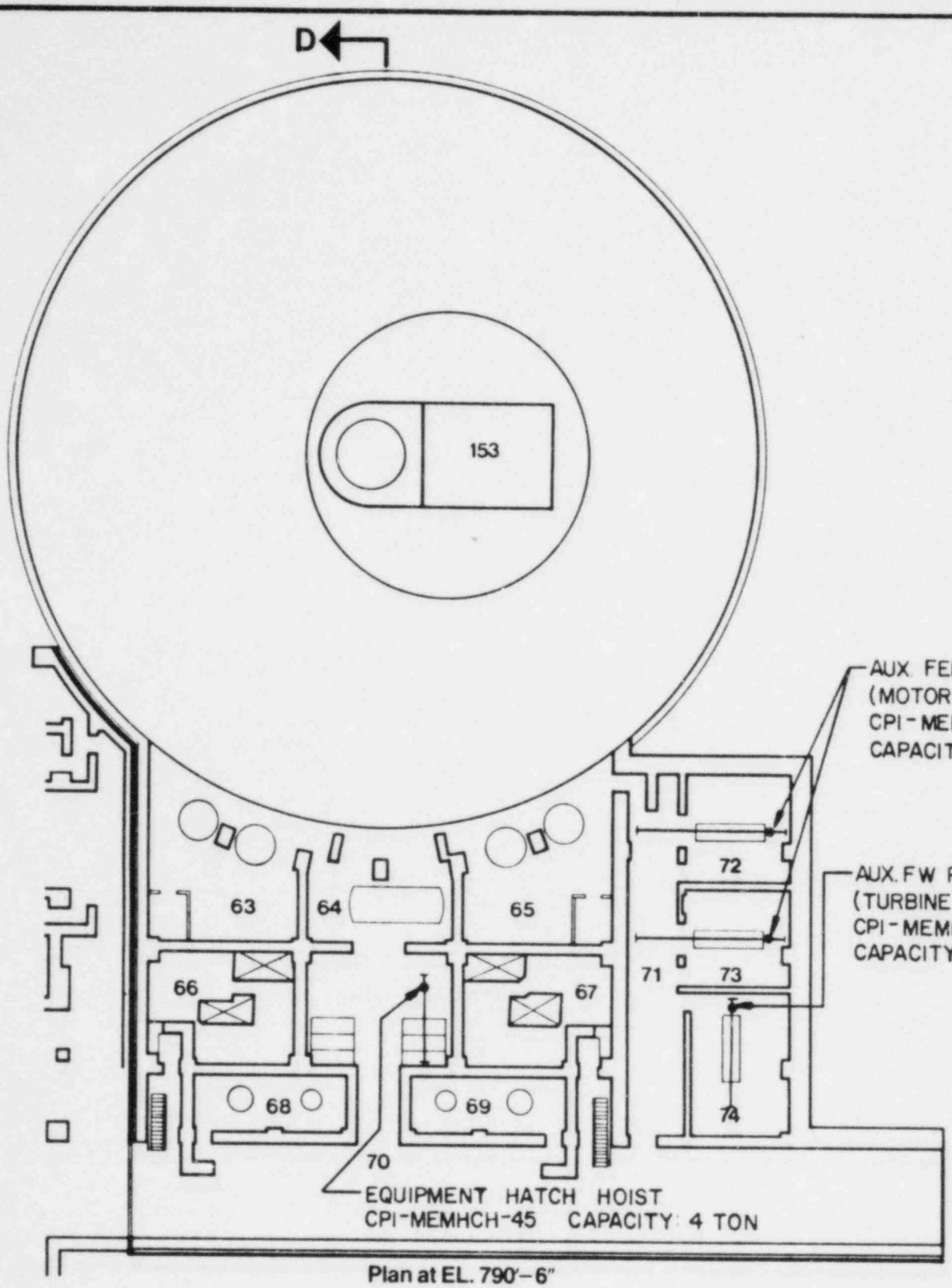
KEY PLAN

COMANCHE PEAK S.E.S.

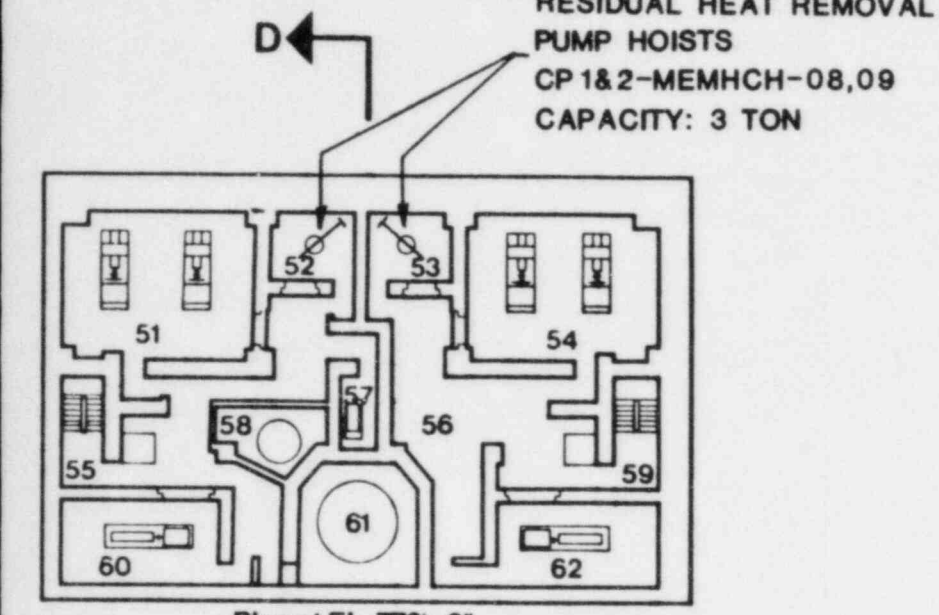
UNITS 1 and 2

CONT. & SAFEGUARD BLDG. POLAR CRANE AND ROTATING PLATFORM HOIST

FIGURE A-4

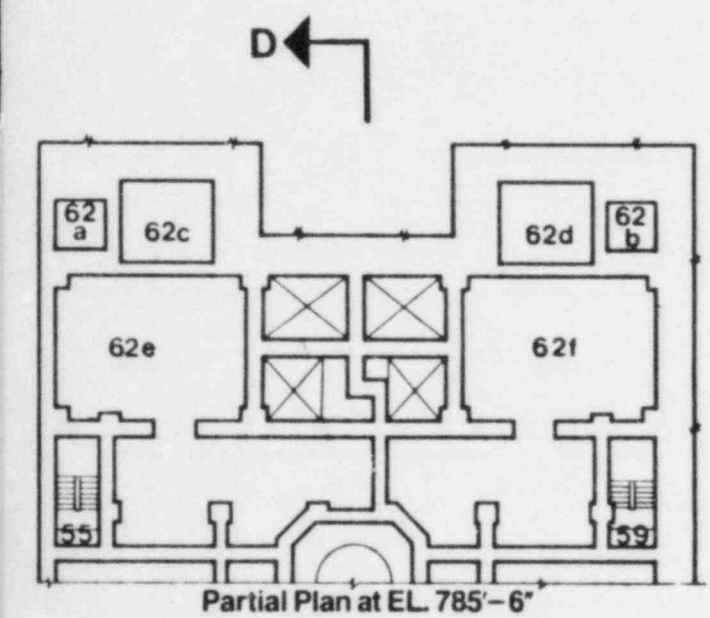


Plan at EL. 790'-6"

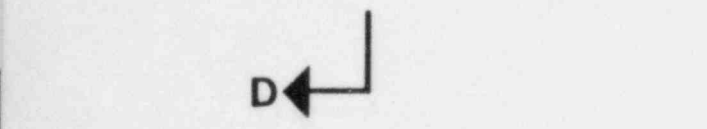


Plan at EL. 773'-0"

PUMP HOIST



Partial Plan at EL. 785'-6"



Primary Plant – Unit 1 Containment & Safeguard Buildings
Plan at Elevation 790'-6"

Rm.#	Rm. Name
63	Valve Isolation Tank Room
64	Chemical Additive Tank Room
65	Valve Isolation Tank Room
66	Valve Room
67	Valve Room
68	RHR & Containment Spray Heat Exchanger Room
69	RHR & Containment Spray Heat Exchanger Room
70	Corridor
71	Corridor
72	Motor Driven Auxiliary Feedwater Pump Room
73	Motor Driven Auxiliary Feedwater Pump Room
74	Turbine Driven Auxiliary Feedwater Pump Room
153	Reactor Cavity

Primary Plant – Unit 1 Containment & Safeguard Buildings
Plan at Elevation 773'-0"

51	Containment Spray Pump Room
52	RHR Pump Room
53	RHR Pump Room
54	Containment Spray Pump Room
55	Stairwell
56	Corridor
57	Floor Drain Tank Pump Room
58	C.C.W. Drain Tank Room
59	Stairwell
60	Safety Injection Pump Room
61	Floor Drain Tank Room
62	Safety Injection Pump Room

Primary Plant – Unit 1 Containment & Safeguard Buildings
Partial Plan at EL. 785'-6"

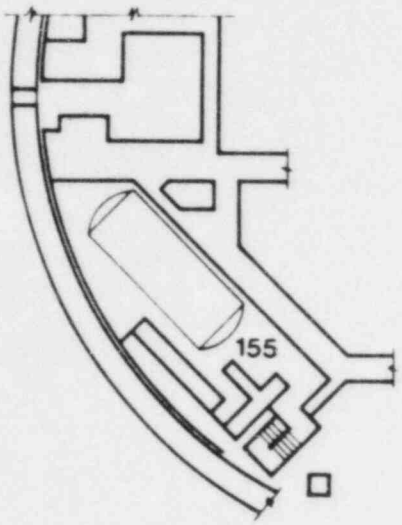
63a	Electrical Chase
62b	Electrical Chase
62c	Pipe Trench
62d	Pipe Trench
62e	Radioactive Pipe Tunnel
62f	Radioactive Pipe Tunnel

COMANCHE PEAK S.E.S.

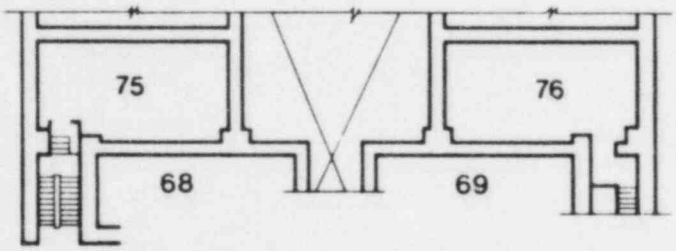
UNITS 1 and 2

CONT. & SAFEGUARD BLDG.
MISCELLANEOUS HOIST

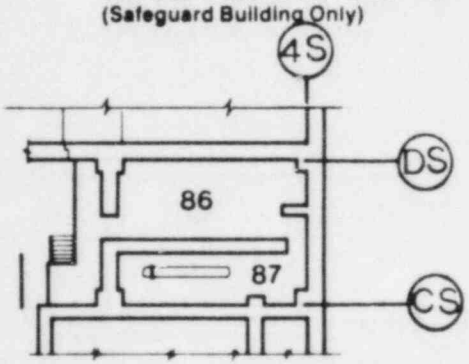
FIGURE A-5



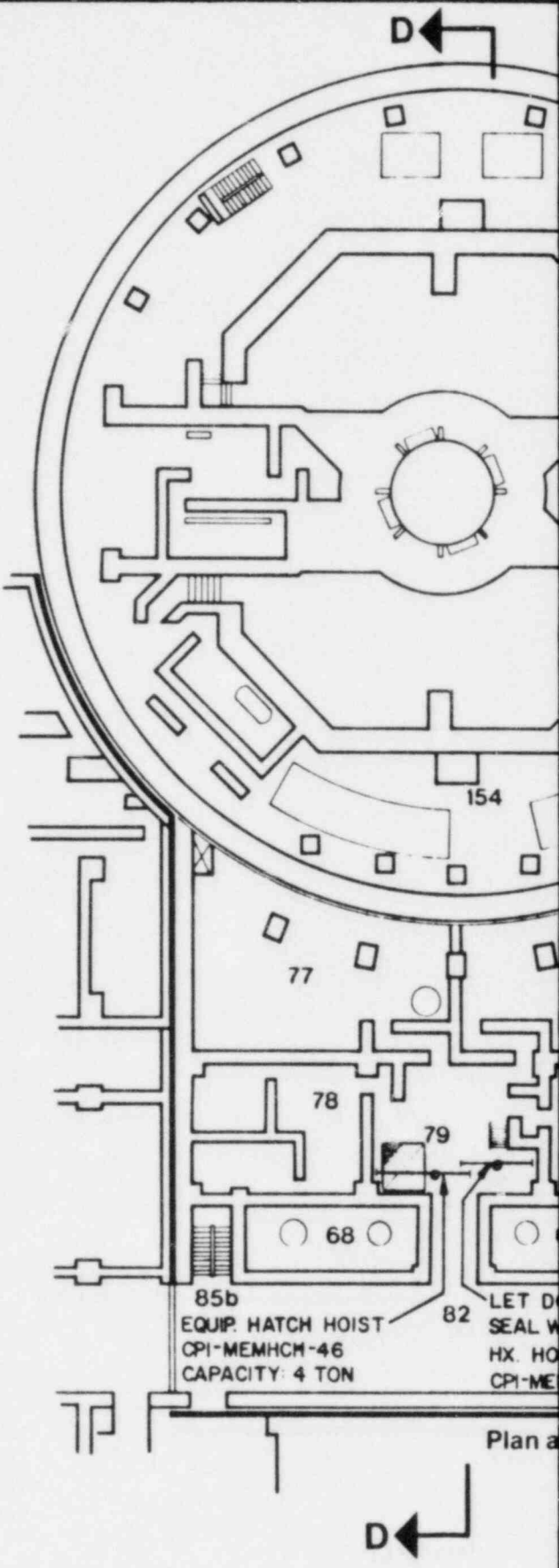
Partial Plan at EL. 822'–9"
(Containment Building Only)

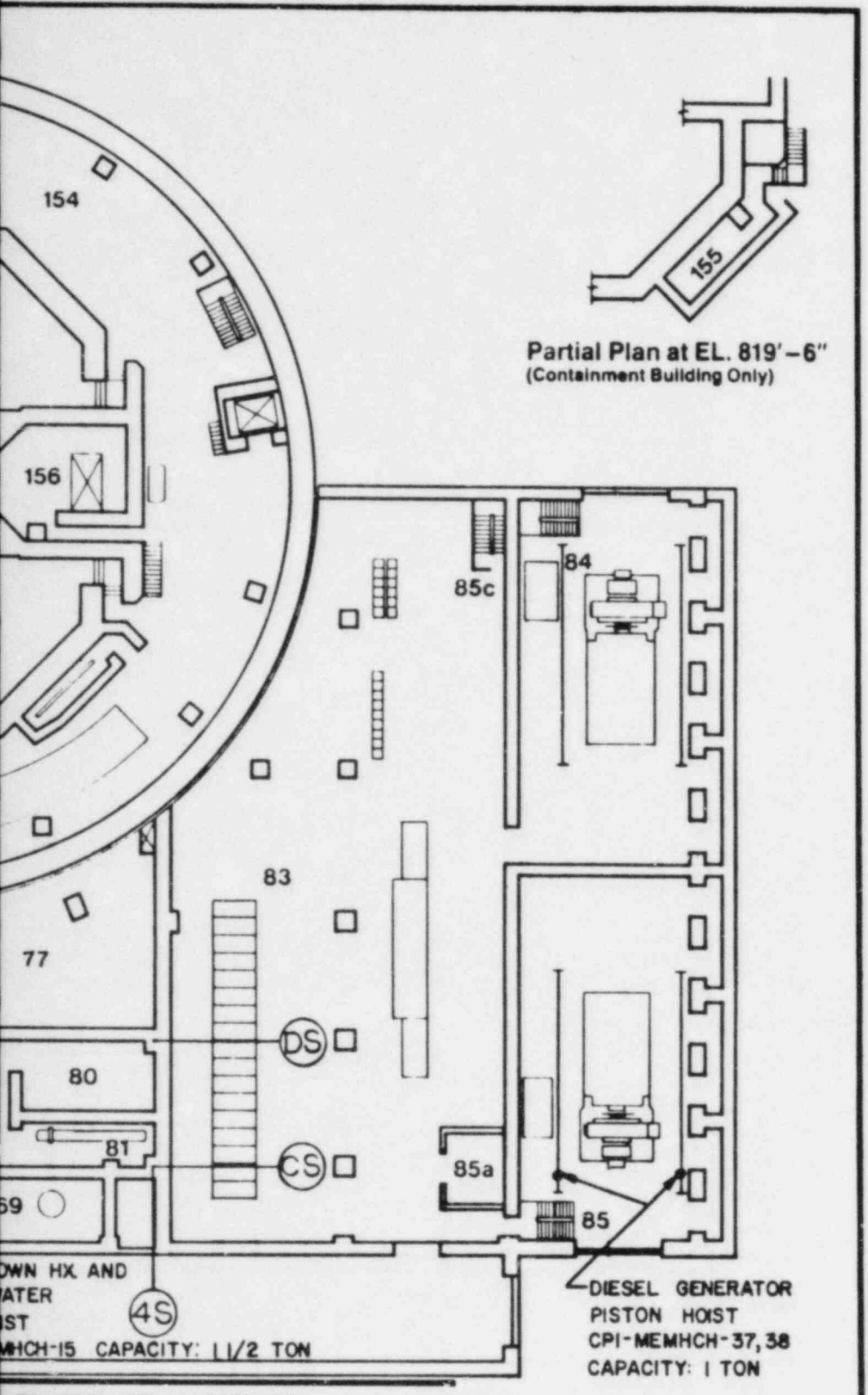


Partial Plan at EL. 800'–6"
(Safeguard Building Only)



Partial Plan at EL. 821'–0"
(Safeguard Building Only)





Partial Plan at EL. 819'-6"
(Containment Building Only)

t EL. 808'-0" and 810'-6"

Plan at Elevations 808'-0" & 810'-6"

Rm.#	Rm. Name
68	RHR & Containment Spray Heat Exchanger Room
69	RHR & Containment Spray Heat Exchanger Room
77	Radioactive Penetration Area
78	Sample Room
79	Corridor
80	Valve Room
81	Letdown Heat Exchanger Room
82	Corridor
83	Electrical Equipment Area
84	Diesel Generator Room
85	Diesel Generator Room
85a	H&V Equipment Room
85b	Stair No. S-1
85c	Stair No. S-5
154	Corridor
156	Incore Instrumentation Area

Partial Plan at Elevation 821'-0"

86	Valve Operating Room
87	Seal Water Heat Exchanger Room

Partial Plan at Elevation 800'-6"

75	Valve Operating Room
76	Valve Operating Room

Partial Plan at Elevations 822'-9" & 819'-6"

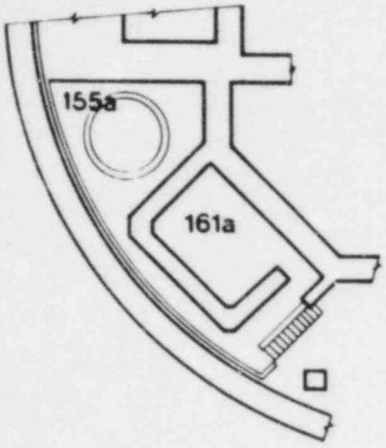
155	Valve Room

COMANCHE PEAK S.E.S.

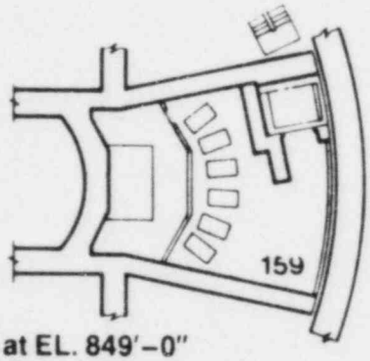
UNITS 1 and 2

CONT. & SAFEGUARD BLDG.
MISCELLANEOUS HOISTS

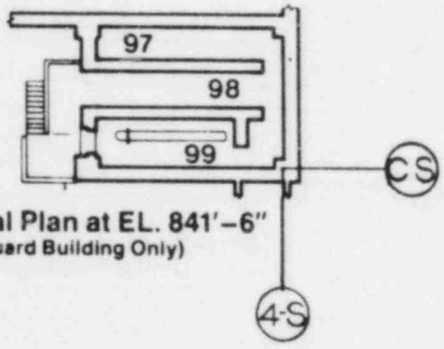
FIGURE A-6



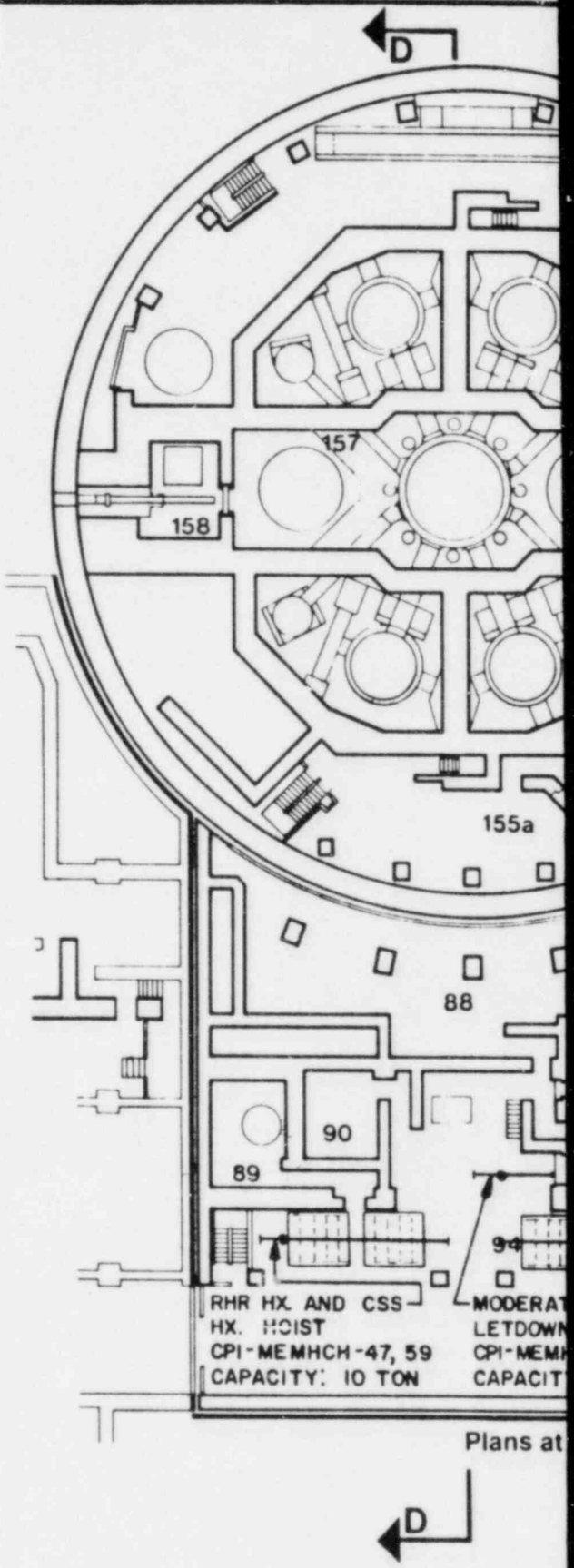
Partial Plan at EL. 842'–0"
(Containment Building Only)



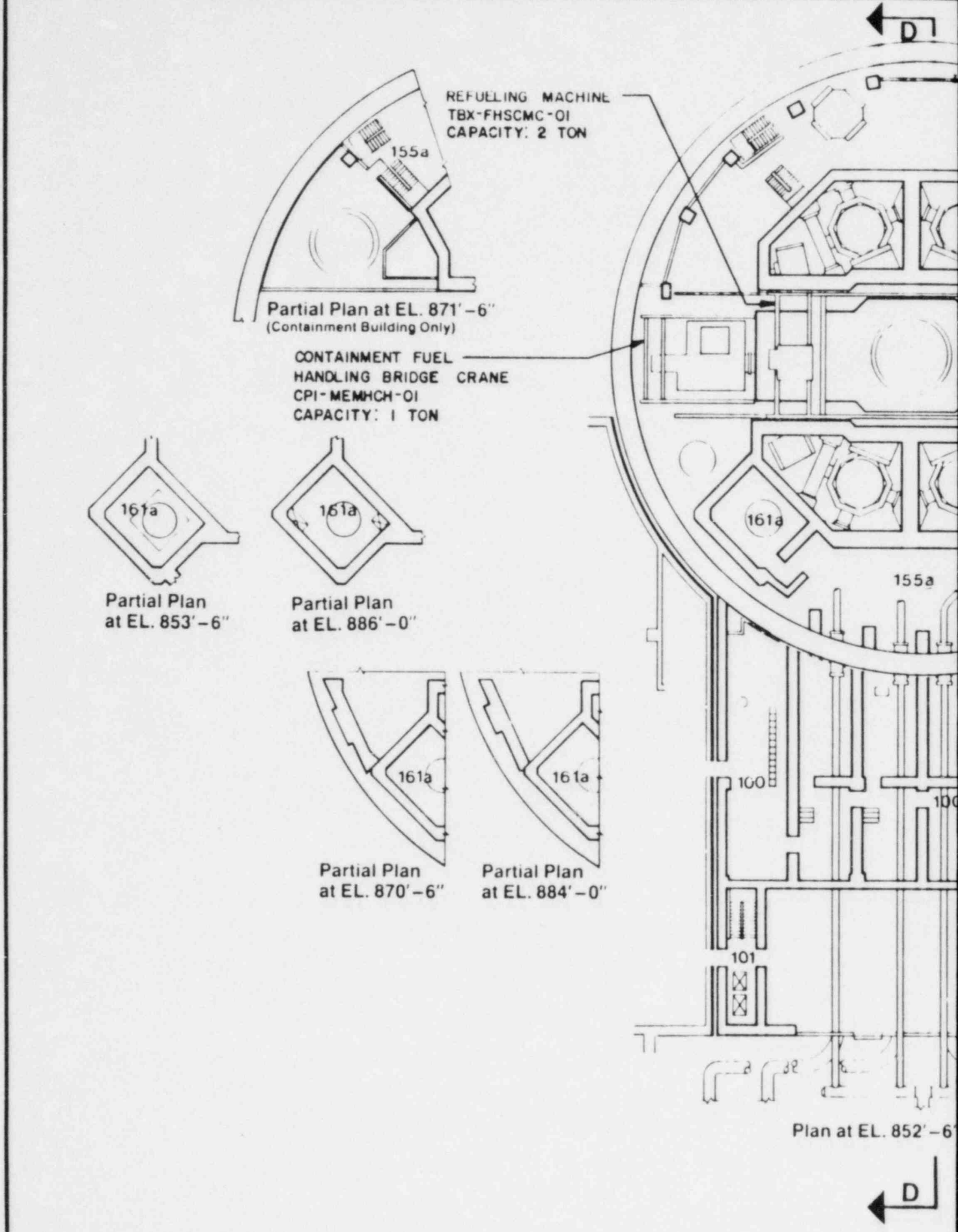
Partial Plan at EL. 849'–0"
(Containment Building Only)

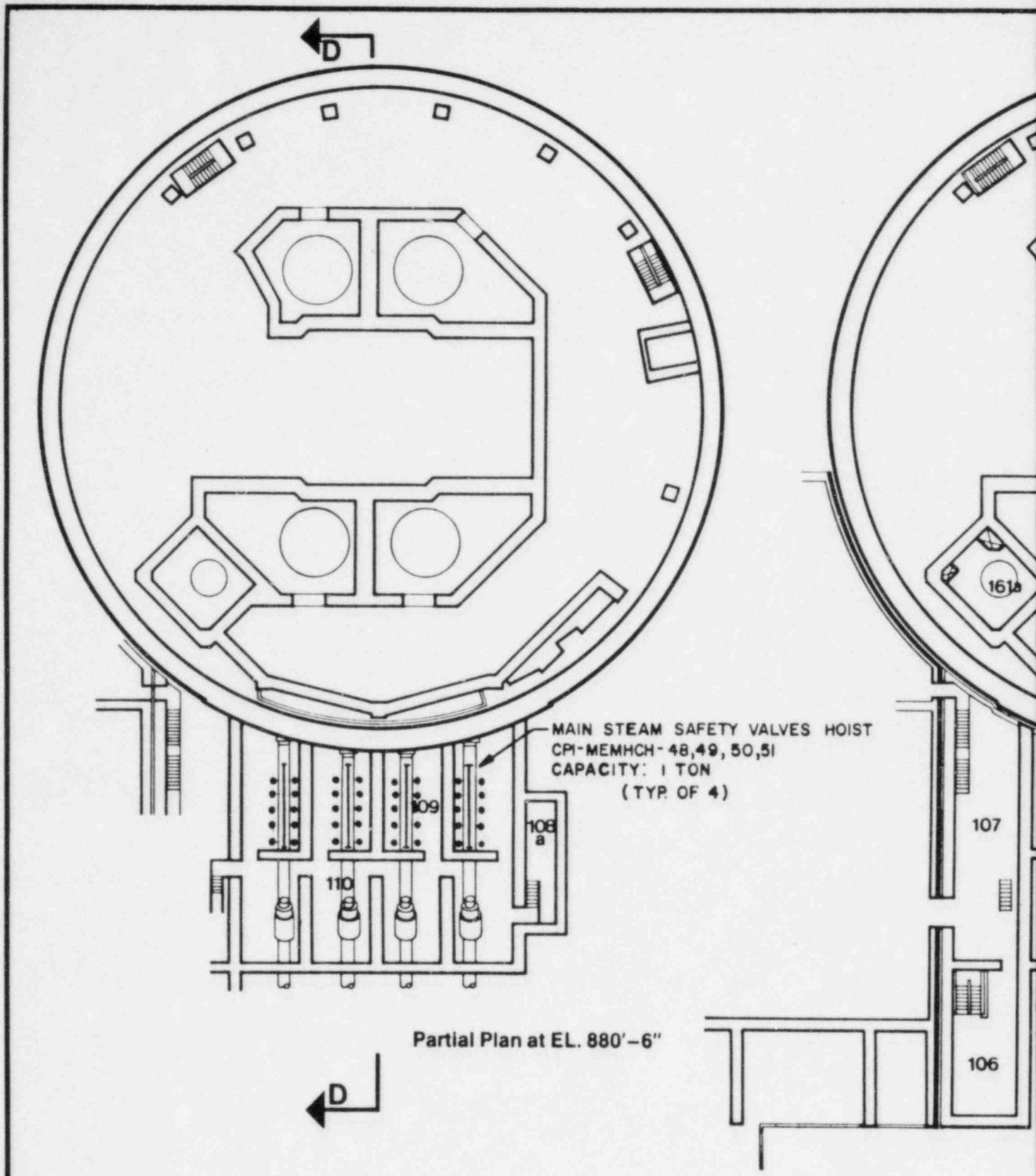


Partial Plan at EL. 841'–6"
(Safeguard Building Only)

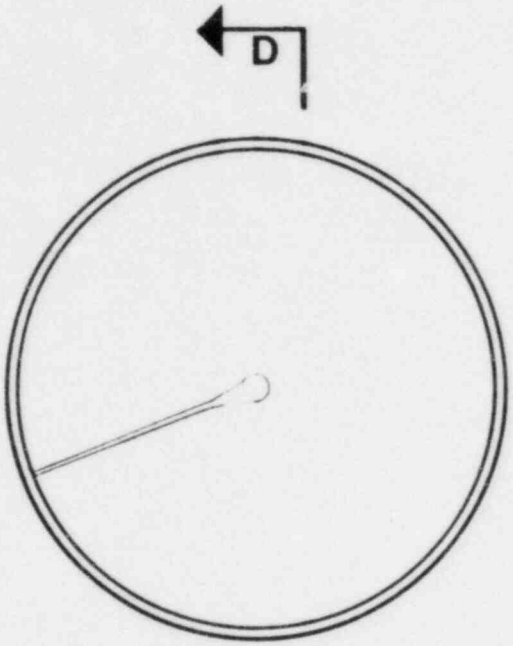


Plans at

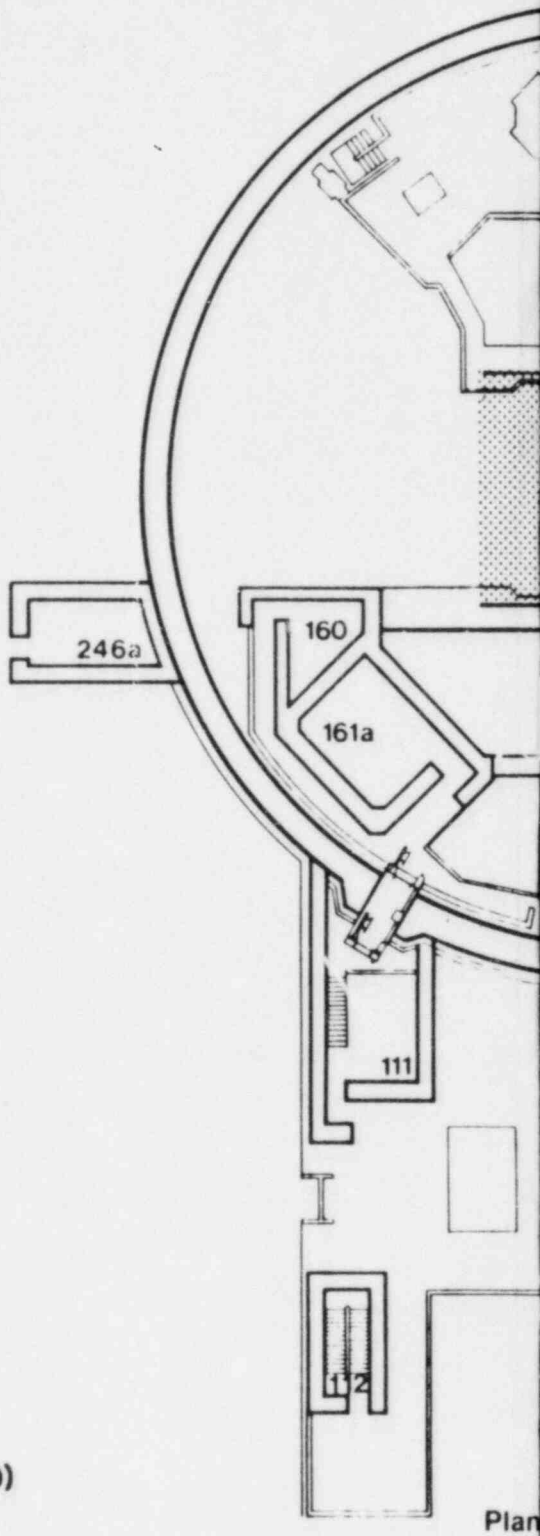

D
REFUELLING MACHINE
TBX-FHSCMC-01
CAPACITY: 2 TON
155a
Partial Plan at EL. 871'-6"
(Containment Building Only)
CONTAINMENT FUEL
HANDLING BRIDGE CRANE
CPI-MEMHCH-01
CAPACITY: 1 TON
161a
Partial Plan
at EL. 853'-6"
161a
Partial Plan
at EL. 886'-0"
161a
Partial Plan
at EL. 870'-6"
161a
Partial Plan
at EL. 884'-0"
161a
155a
100
101
Plan at EL. 852'-6
D



Partial Plan at EL. 880'-6"



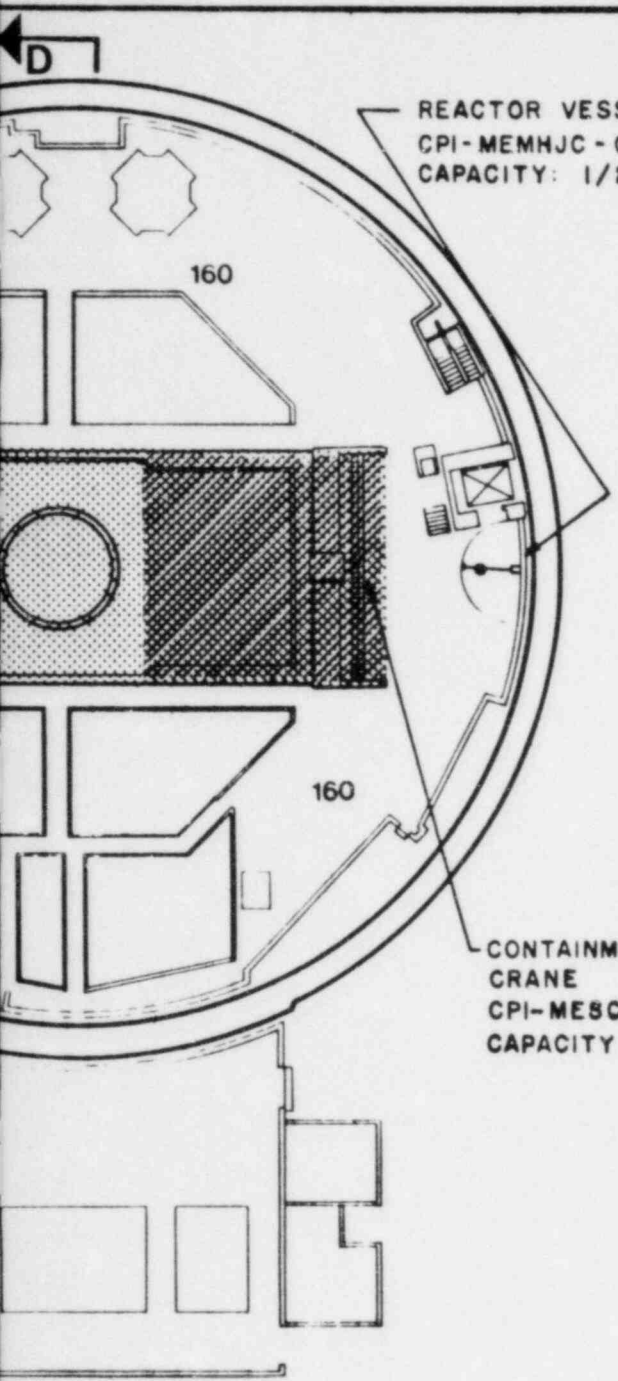
Plan of Containment Dome Platform
at EL. 1000'–6"



Plan

AUX. UPPER CRANE
SAFE LOAD AREA
(WITH REACTOR VESSEL HEAD INSTALLED)

AUX. UPPER CRANE
SAFE LOAD AREA
(WITH REACTOR VESSEL HEAD REMOVED)



s at EL. 905'-9" & 896'-4"

Plans at Elevations 905'-9", 896'-4" & 1000'-6"

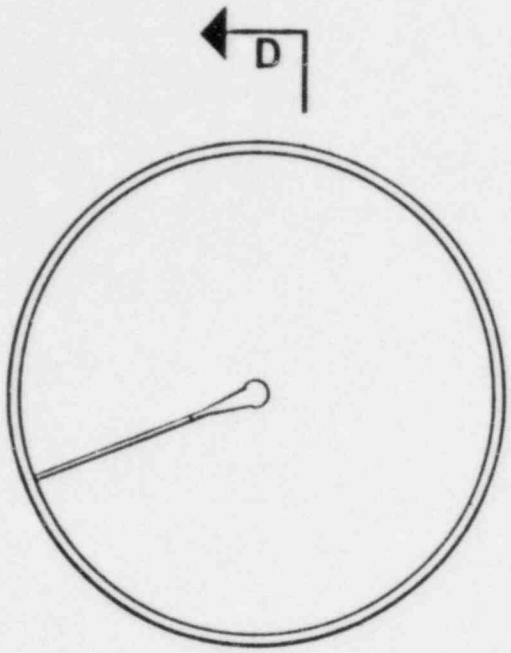
Rm.#	Rm. Name
111	Emergency Airlock Access
112	Stair No. 8-1
160	Operating Room
160	Valve Room
161a	Pressurizer Compartment
246a	Penthouse

COMANCHE PEAK S.E.S.

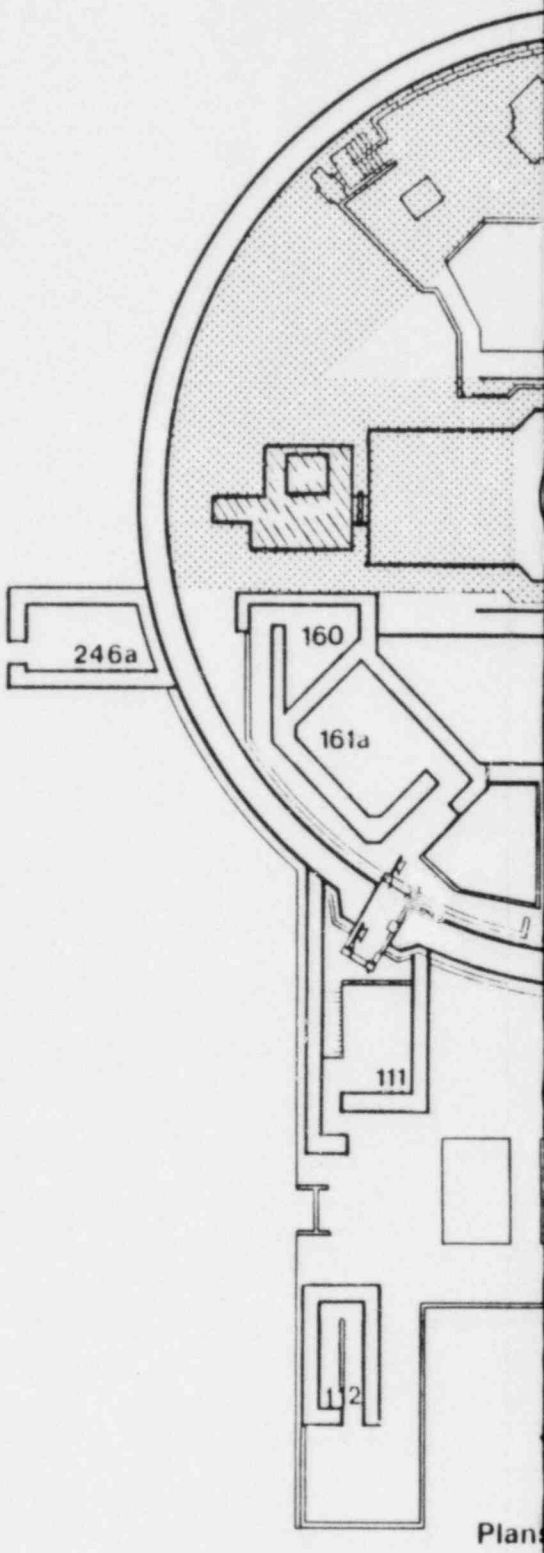
UNITS 1 and 2

CONT. & SAFEGUARD BLDG.
CONT. AUX. UPPER CRANE
AND VESSEL STUDS HOIST

FIGURE A-10



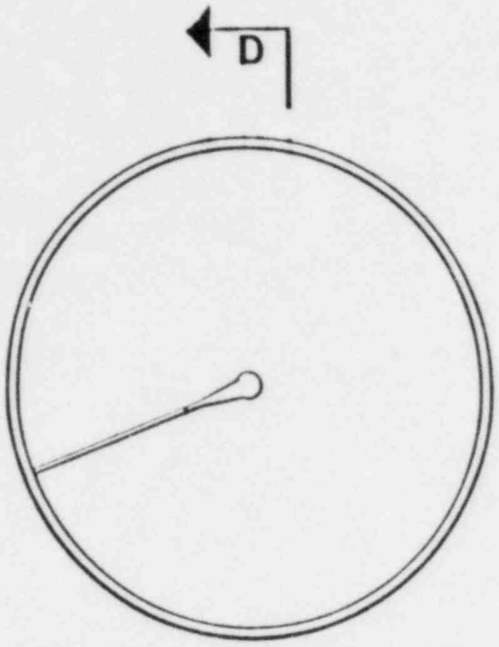
Plan of Containment Dome Platform
at EL. 1000'–6"



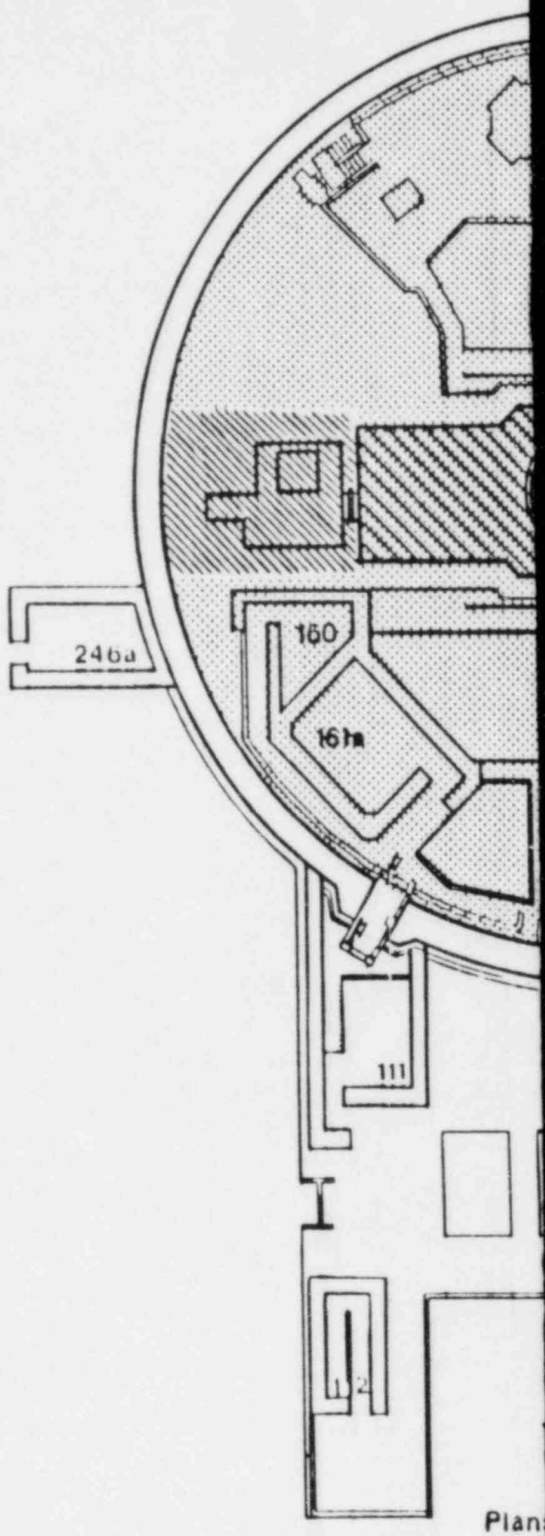
Plan

POLAR CRANE AND CONTAINMENT ACCESS ROTATING PLATFORM HOIST SAFE LOAD AREA.

SAFE LOAD AREA ONLY WHEN SPENT FUEL IS NOT STORED IN THIS AREA.



Plan of Containment Dome Platform
at EL. 1000'-6"

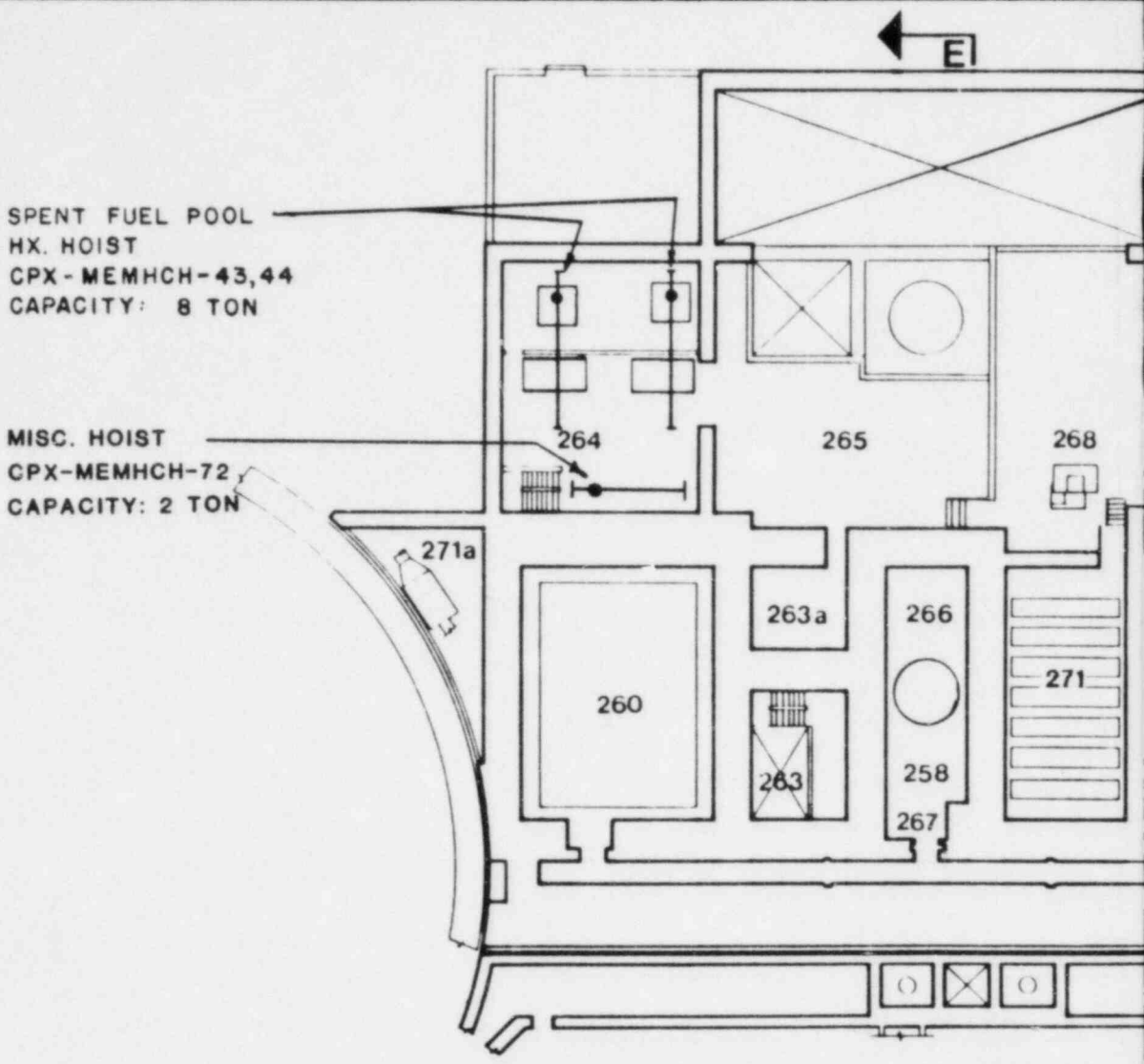


Plan

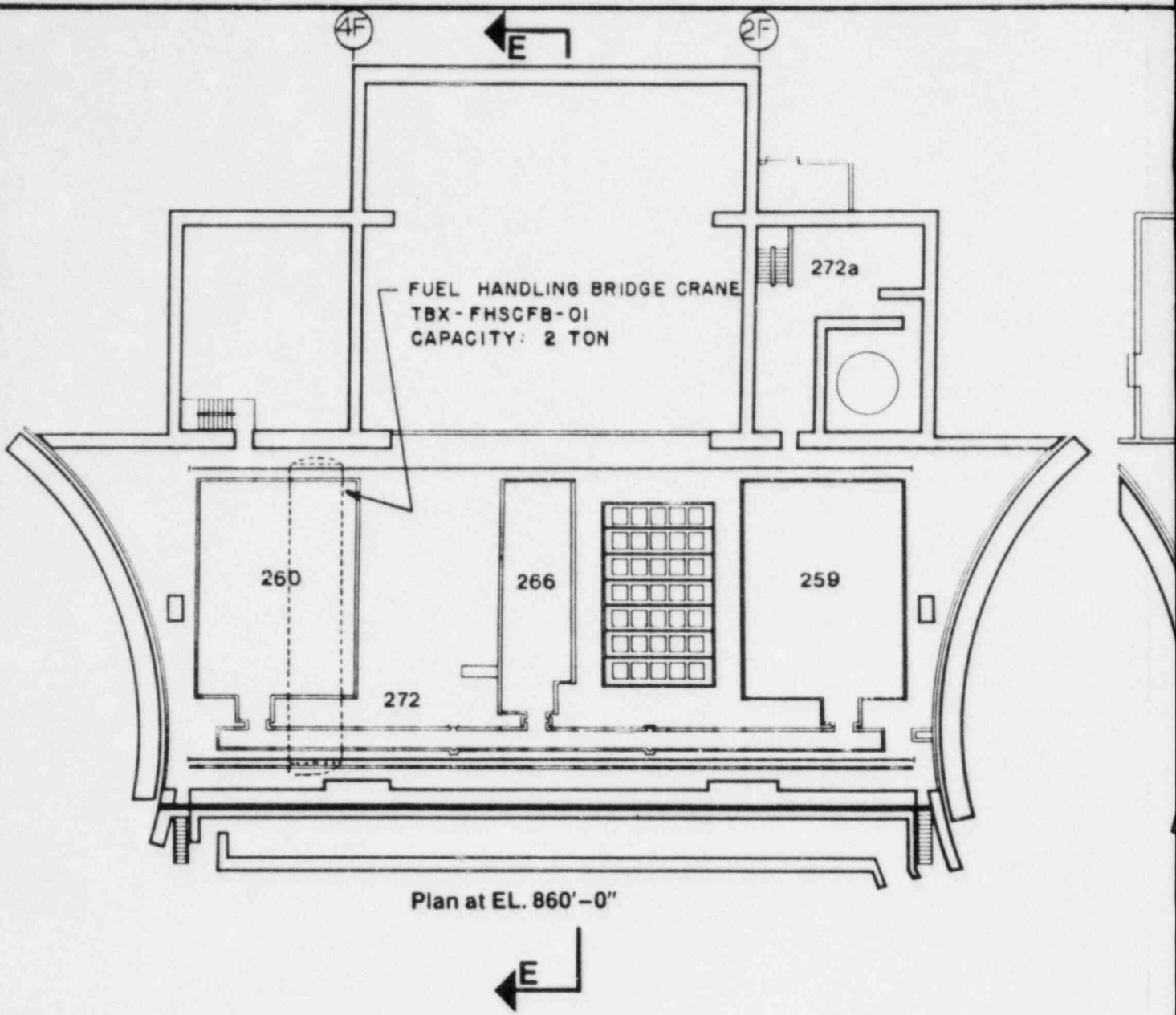
POLAR CRANE AND CONTAINMENT ACCESS ROTATING PLATFORM HOIST SAFE LOAD AREA.

SAFE LOAD AREA ONLY WHEN REACTOR VESSEL HEAD IS INSTALLED.

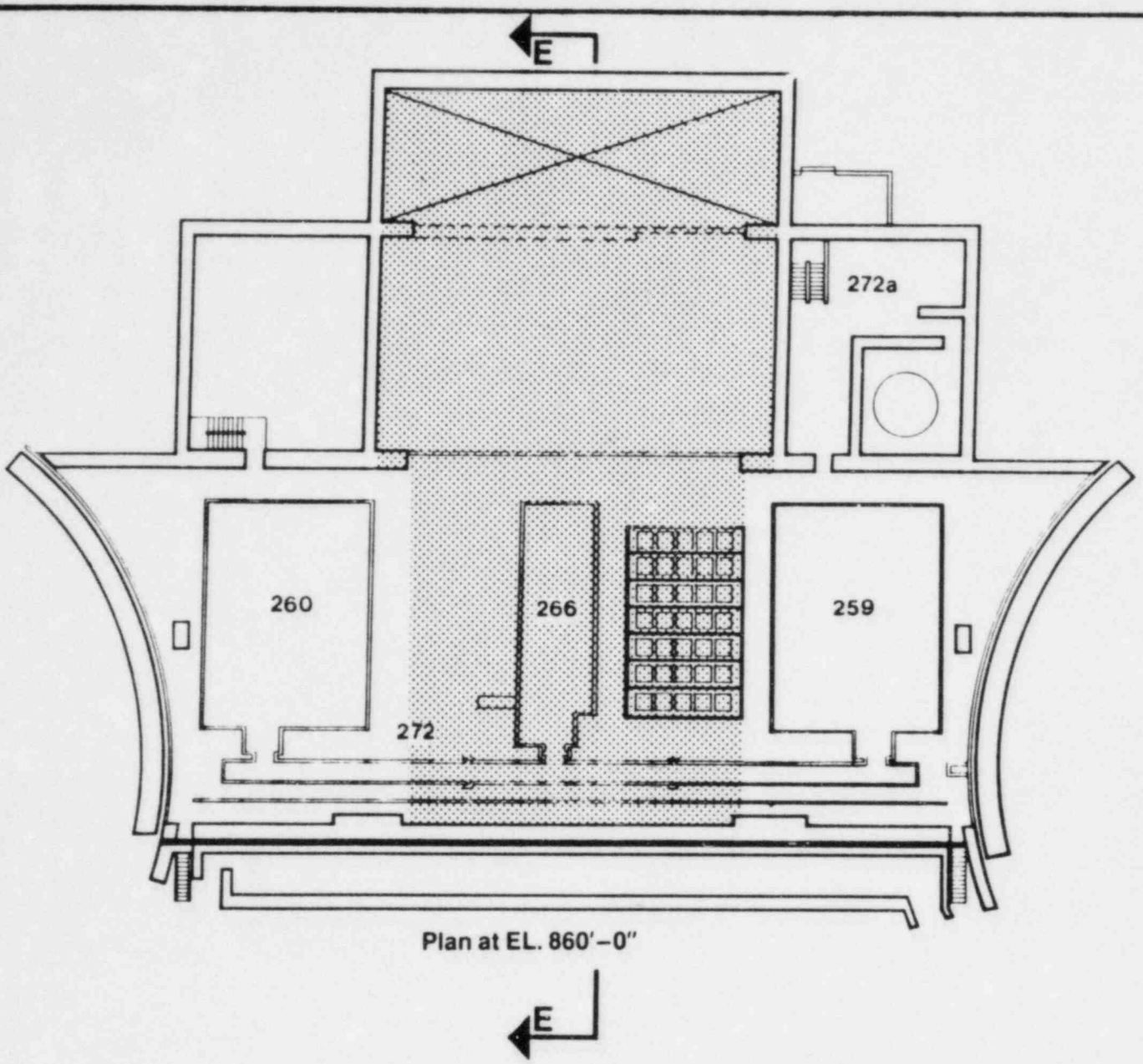
SAFE LOAD AREA ONLY WHEN SPENT FUEL IS NOT STORED IN THIS AREA.



Plan at EL. 838'-9" & 841'-0"

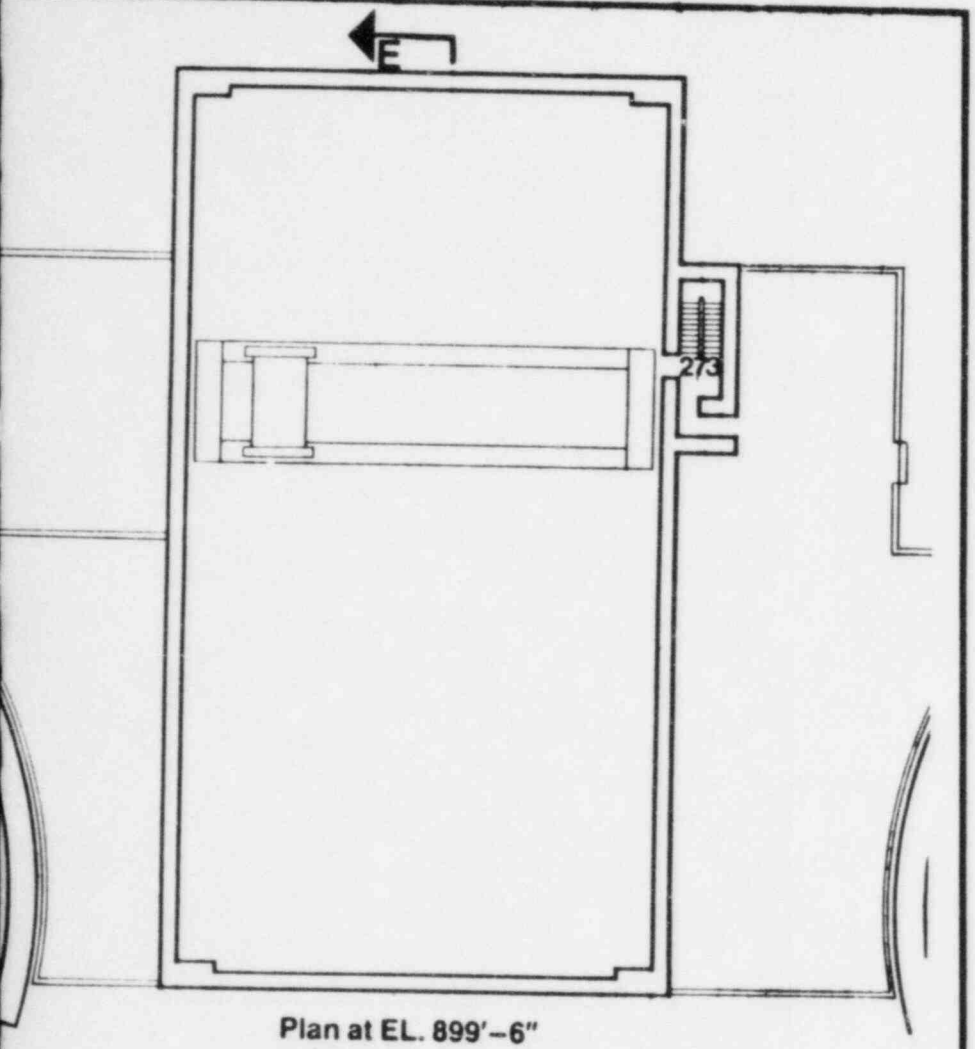


Plan at EL. 860'-0"



Plan at EL. 860'–0"

FUEL BUILDING OVERHEAD CRANE
SAFE LOAD AREA.



Plan at EL. 899'–6"

Plan at Elevation 860'–0"

Rm.#	Rm. Name
259	Spent Fuel Pool No. 1
260	Spent Fuel Pool No. 2
266	Wet Cask Loading Area
272	Operating Floor Level
272a	Open Space

Plan at Elevation 899'–6"

273	Stair No. F–2

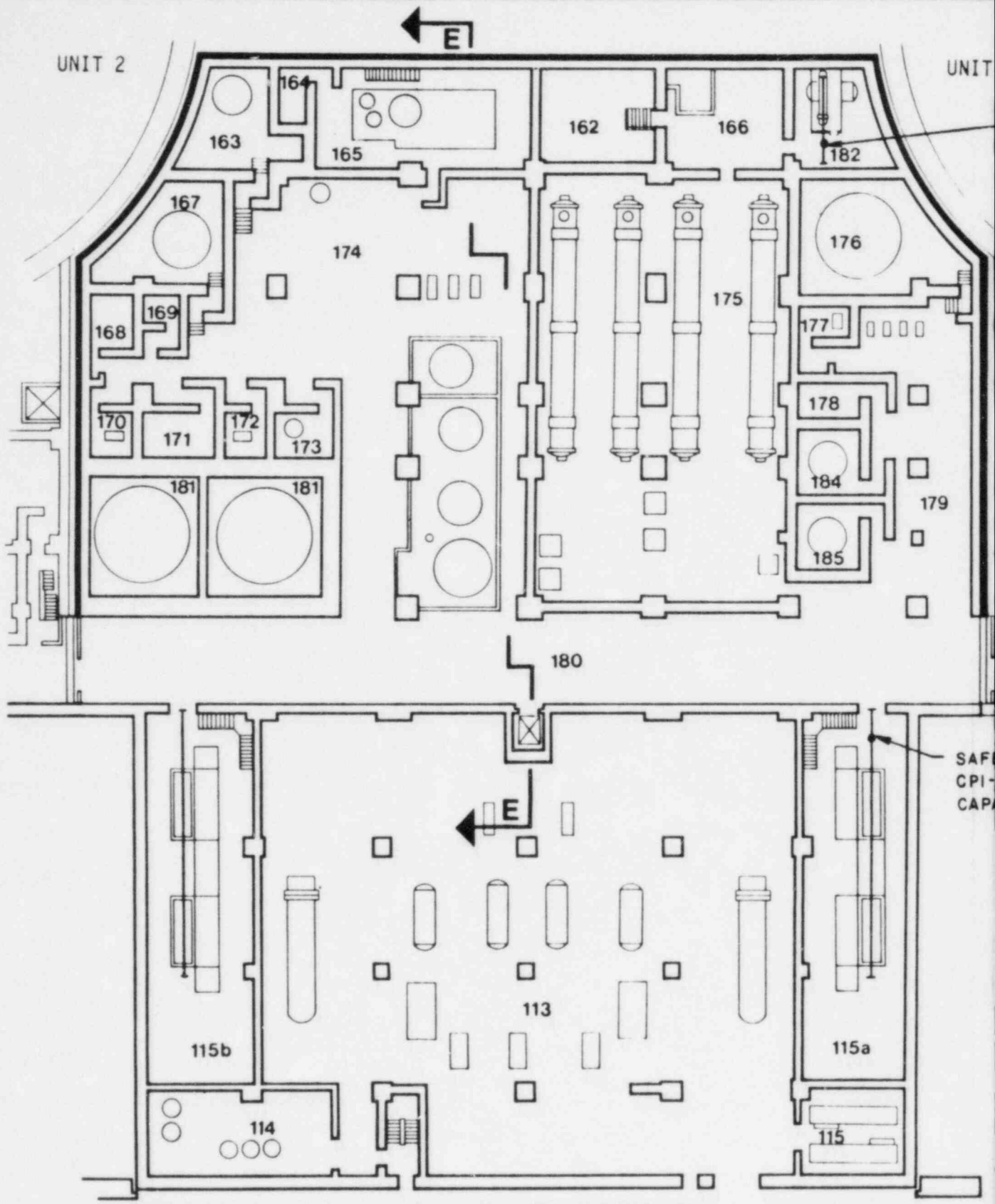
COMANCHE PEAK S.E.S.

UNITS 1 and 2

FUEL BUILDING
FUEL BLDG. OVERHEAD CRANE
SAFE LOAD AREA

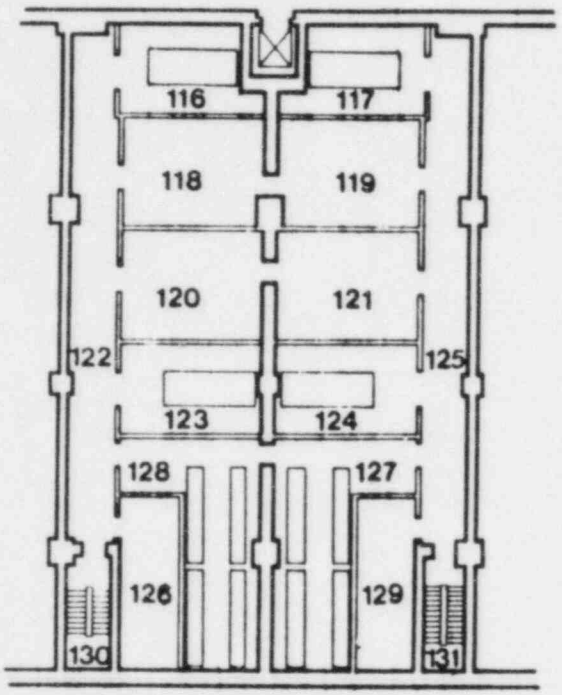
FIGURE A-15

8304130176-



Plan at EL. 778'-0" & 790'-6"

AUX. STEAM CONDENSATE COOLER HOIST
CPX.- MEMHCH - 60
CAPACITY · 1 TON



Partial Plan at EL. 792'–0"

TY RELATED CHILLER HOIST
MEMHCH - 04A
ACITY · 3 TON

Plan at Elevations 778'–0" & 790'–6"

Rm.#	Rm. Name
114	Chemical Feed Equipment & Chemical Storage Room
115	Secondary Sampling Room
115a	Chiller Equipment Area
115b	Chiller Equipment Area
162	Valve and Piping Area
163	Blowdown Spent Resin Storage Tank Room
164	Blowdown Spent Resin Sluice Pump Room
165	Reverse Osmosis Package Room
166	Valve and Piping Area
167	Waste Hold-Up Tank Room
168	Valve Room
169	Waste Evaporator Feed Pump Room
170	Recycle Evaporator Feed Pump (No. 2) Room
171	Valve Room
172	Recycle Evaporator Feed Pump (No. 1) Room
173	Chemical Drain Tank Room
174	Laundry Hold Up Area
175	Component Cooling Water Heat Exchanger Room
176	Floor Drain Tank Room
177	Floor Drain Tank Pump Room
178	Waste Monitor Tank Pump Room
179	Corridor
180	Corridor
181	Recycle Hold-Up Tank Room
182	Auxiliary Steam Drain Tank Equipment Room
184	Waste Monitor Tank No. 1 Room
185	Waste Monitor Tank No. 2 Room

Partial Plan at EL. 792'–0"

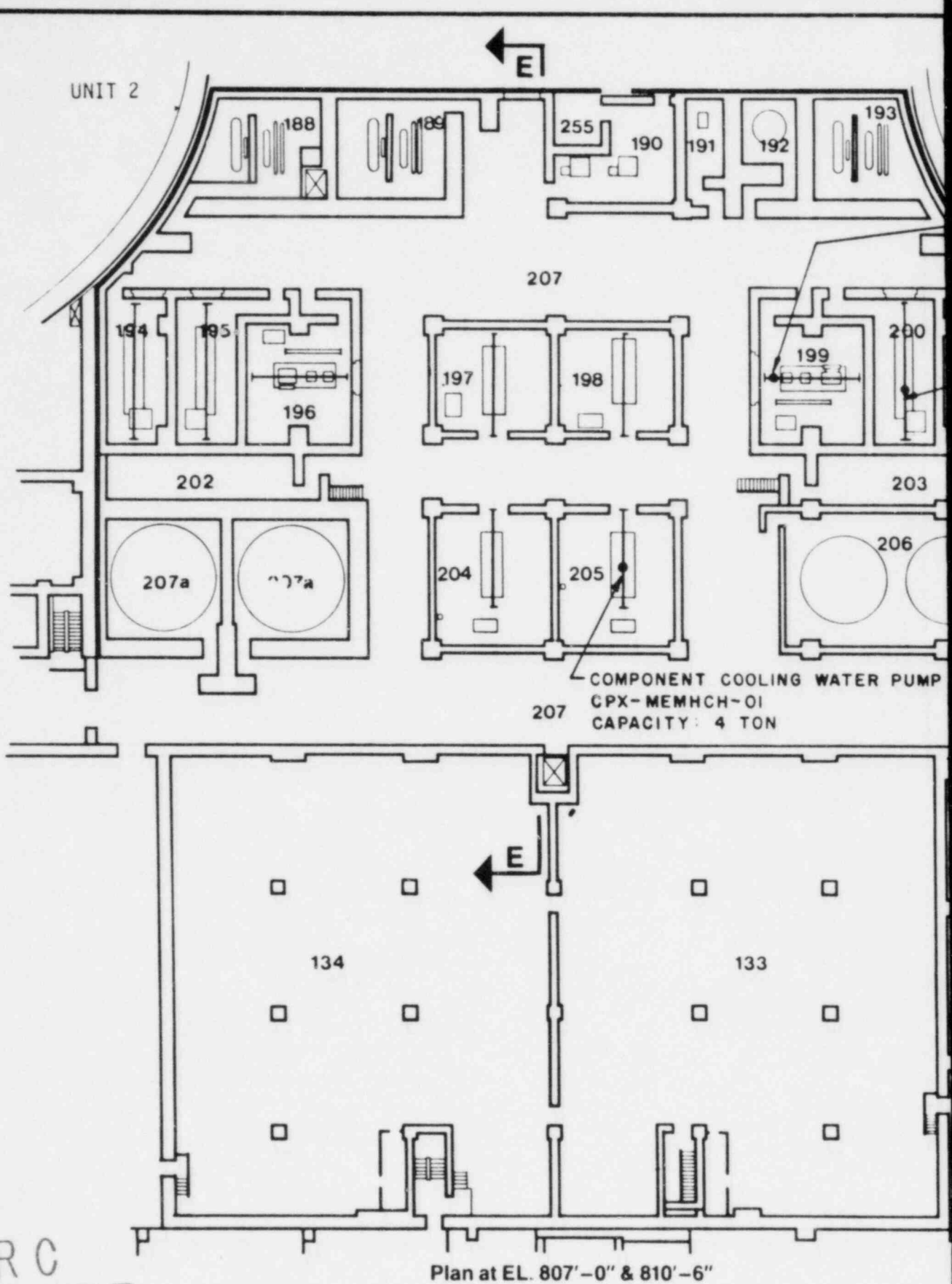
116	Battery Room #2–2
117	Battery Room #1–2
118	UPS & Distribution Rooms,
119	Train 'B'
120	UPS & Distribution Rooms,
121	Train 'A'
122	Corridor
123	Battery Room #2–1
124	Battery Room #1–1
125	Corridor
126	UPS & Distribution Rooms
127	Battery Room #1–3
128	Battery Room #2–3
129	Train 'C'
130.131	Stairways

COMANCHE PEAK S.E.S.

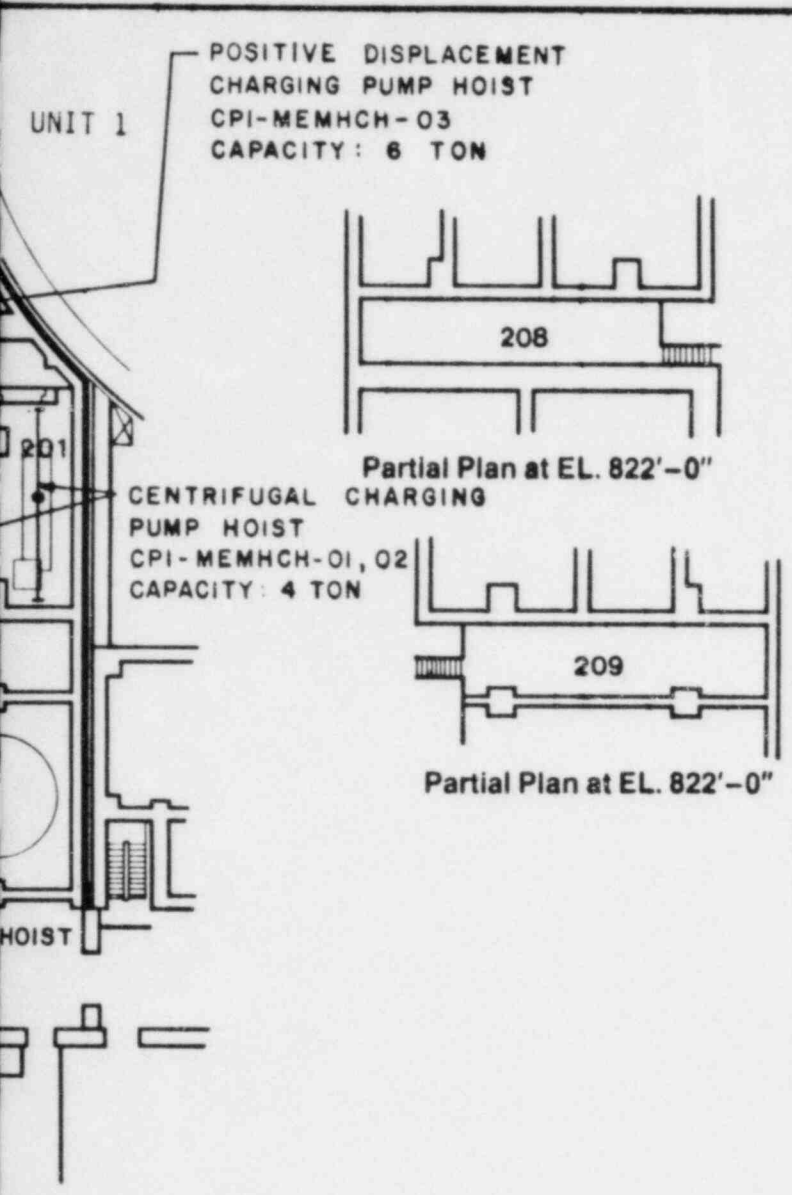
UNITS 1 and 2

AUXILIARY & CONTROL BLDG.
MISCELLANEOUS HOISTS

FIGURE A–16



Plan at EL. 807'-0" & 810'-6"



Plan at Elevations 807'-0" & 810'-6"

Rm.#	Rm. Name
133	Cable Room
134	Cable Room
134a	Stair No. EC-1
134b	Stair No. EC-2
188	Floor Drain Waste Evap. Package Room
189	Waste Evaporator Room
190	Waste Evaporator Control Room
191	Spent Resin Sluice Pump Room
192	Spent Resin Storage Tank Room
193	Boron Recycle Evaporator Package Room
194	Centrifugal Charging Pump Room
195	Centrifugal Charging Pump Room
196	Positive Displacement Charging Pump Room
197	Component Cooling Water Pump Room
198	Component Cooling Water
199	Positive Displacement Charging Pump Room
200	Centrifugal Charging Pump Room
201	Centrifugal Charging Pump Room
202	Valve Room
203	Valve Room
204	Component Cooling Water Pump Room
205	Component Cooling Water Pump Room
206	Boric Acid Storage Tank Room
207	Corridor
207a	Recycle Hold-Up Tank Room
255	Filter Drop Area

Partial Plan at Elevation 822'-0"
208 Operating Valve Room

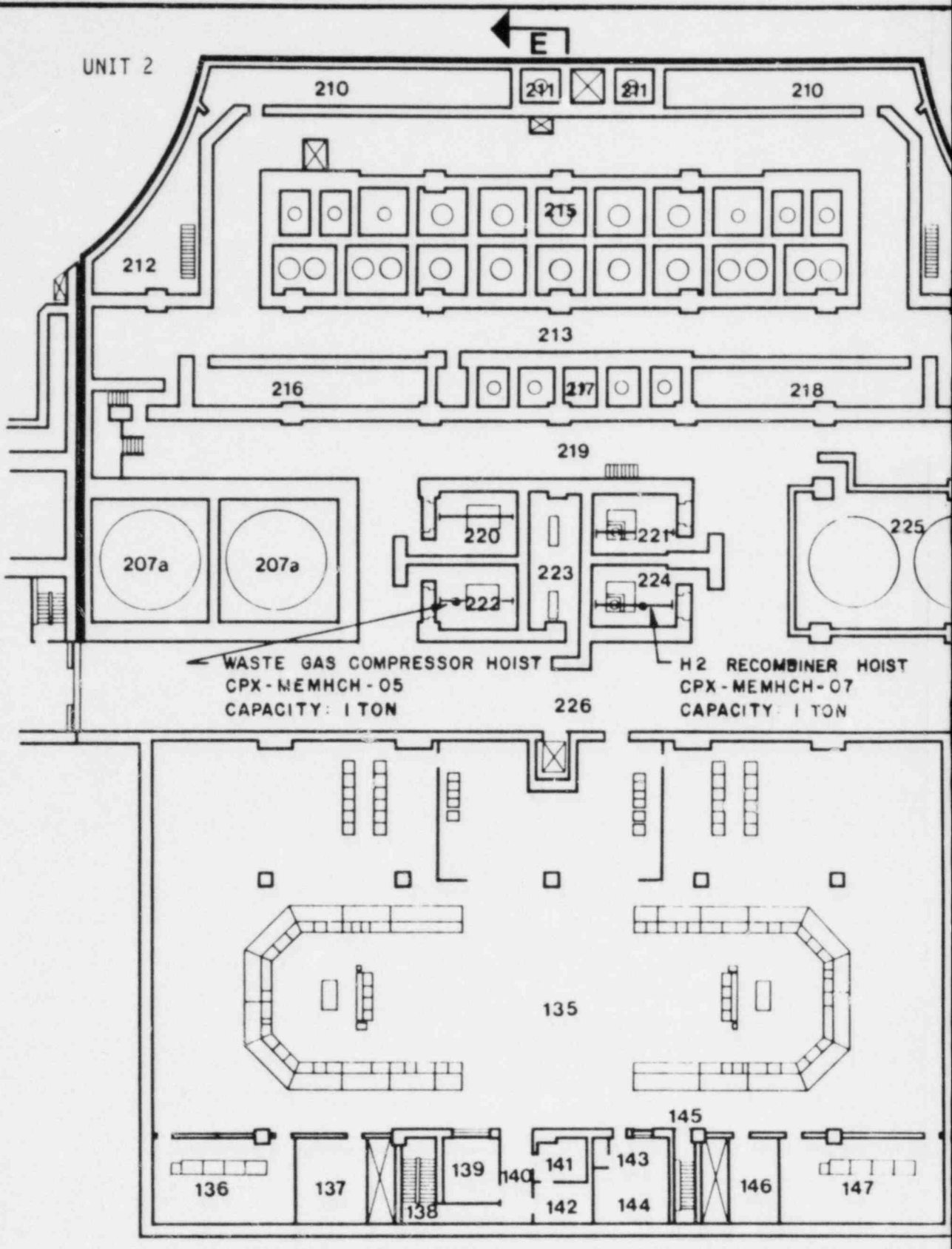
Partial Plan at Elevation 822'-0"
209 Operating Valve Room

COMANCHE PEAK S.E.S.

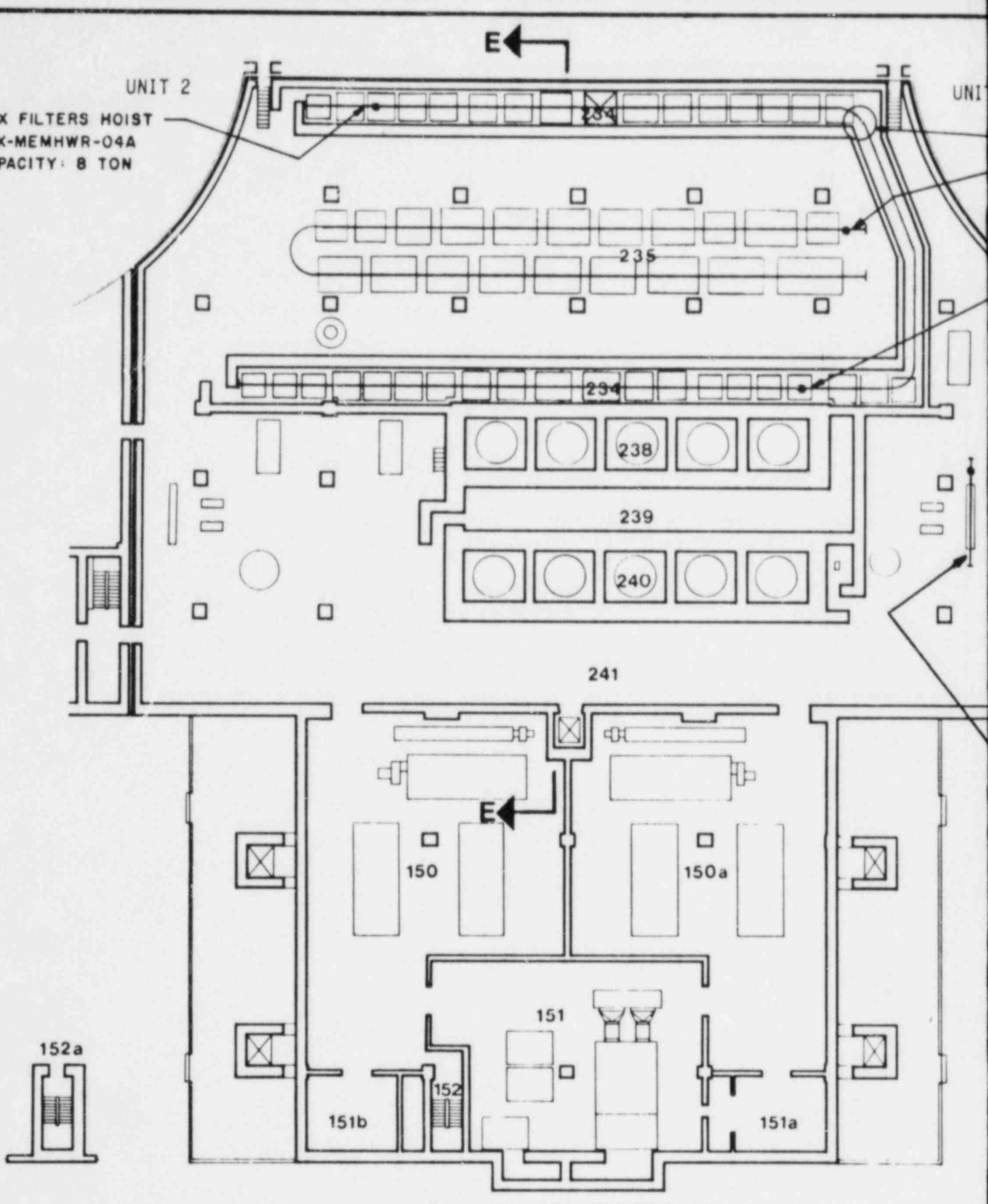
UNITS 1 and 2

AUXILIARY & CONTROL BLDG.
MISCELLANEOUS HOISTS

FIGURE A-17



Plan at EL. 830'–0" & 831'–6"



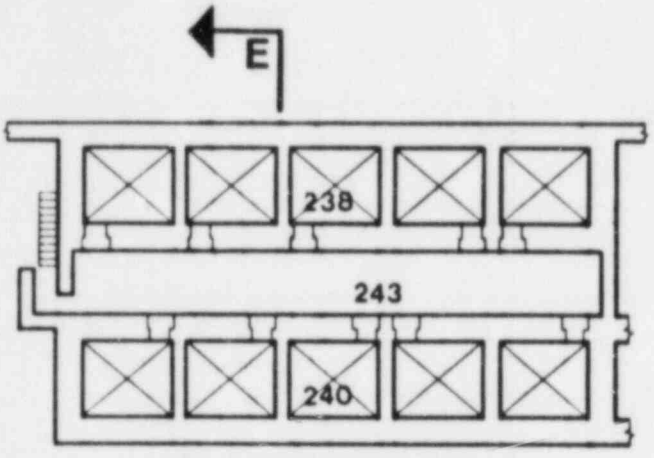
Plans at EL. 852'-6" & 854'-4"

1

LOAD LAYDOWN AREA

DEMINERALIZERS HOIST
CPX-MEMHWR-05
CAPACITY: 8 TON

AUX FILTERS HOIST
CPX-MEMHWR-04
CAPACITY: 8 TON



Partial Plan at EL. 862'-6"

E

LETDOWN CHILLER PACKAGE HOIST
CPI-MEMHCH-05
CAPACITY: 2 TON

Plan at Elevations 852'-6" & 854'-4"

Rm.#	Rm. Name
150	Mechanical Equipment Room
150a	Mechanical Equipment Room
151	Mechanical Equipment Room
151a	Mechanical Equipment Room
151b	Mechanical Equipment Room
152	Stair No. EC-2
152a	Stair No. EC-2
234	Monorail Corridor
235	Valve Operating Area
238	Gas Decay Tanks' Compartment
239	Valve Room
240	Gas Decay Tanks' Compartment
241	Corridor
242	Gas Decay Tanks Drain Pump Room

Partial Plan at Elevation 862'-6"

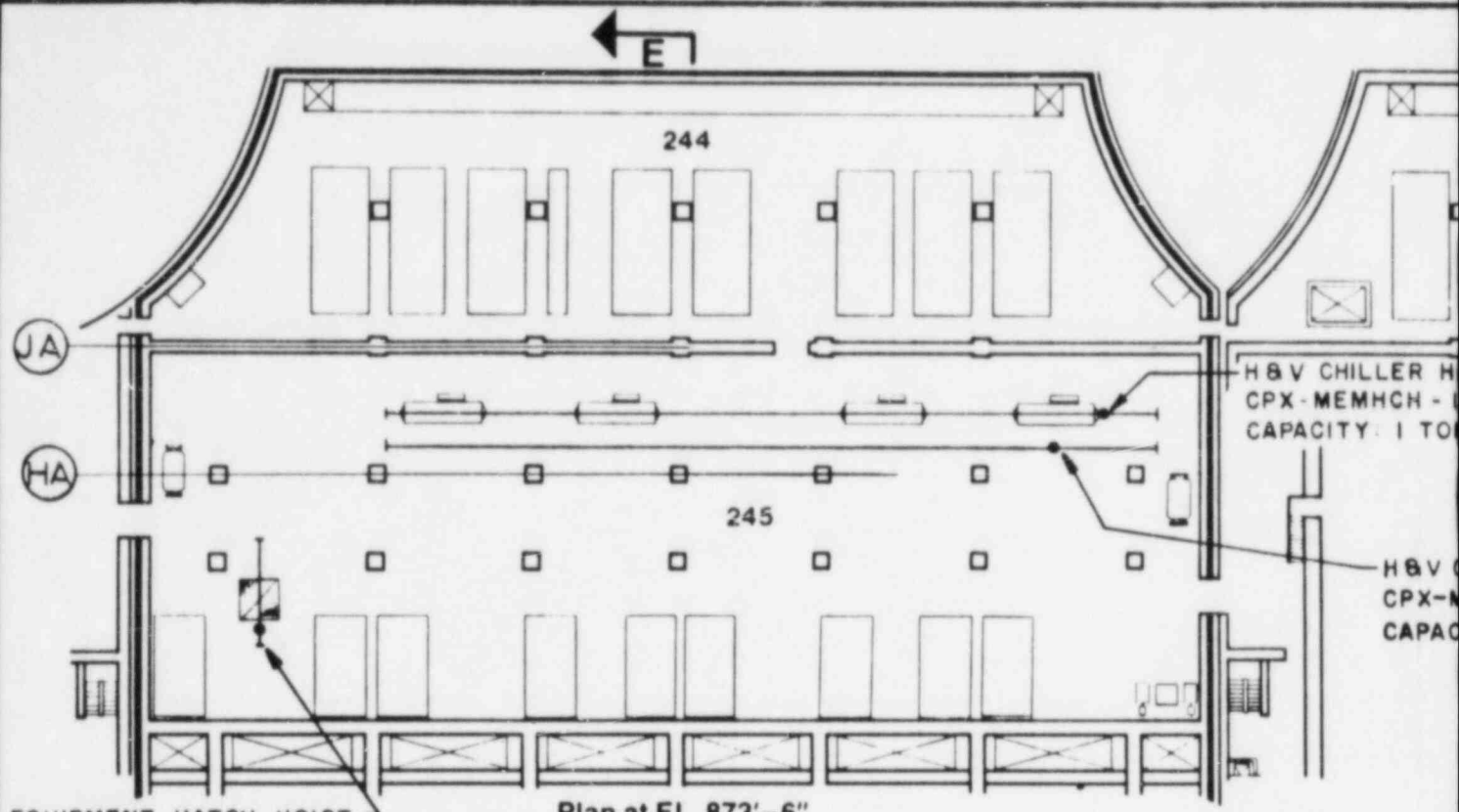
Rm.#	Rm. Name
243	Valve Operating Room

COMANCHE PEAK S.E.S.

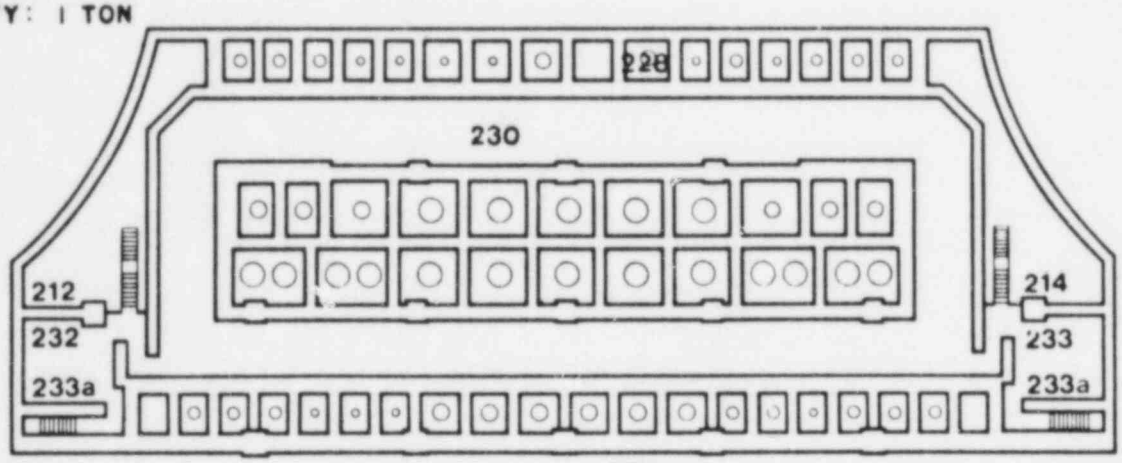
UNITS 1 and 2

AUXILIARY & CONTROL BLDG.
MISCELLANEOUS HOISTS

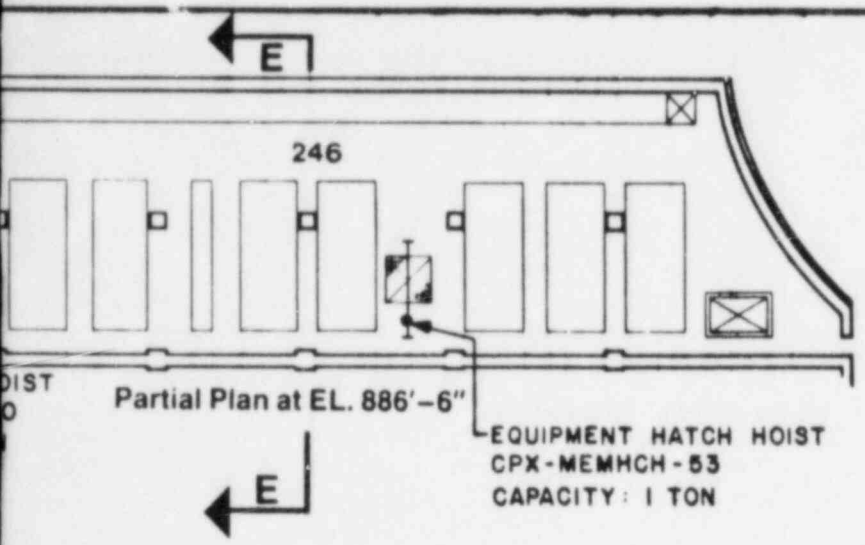
FIGURE A-19



Plan at EL. 873'-6"



Partial Plan at EL. 842'-0"



HILLER HOIST
EMHCH-09
ITY: 6 TON

Partial Plan at Elevation 842'-0"

Rm.#	Rm. Name
212	Piping Area
214	Piping Area
228	Filters
230	Valve and Pipe Gallery
231	Filters
232	Open Area
233	Open Area
233a	Stair No. A-12 and No. A-13

Plan at Elevation 873'-6"

244	Mechanical Equipment Room
245	Mechanical Equipment Room

Partial Plan at Elevation 888'-6"

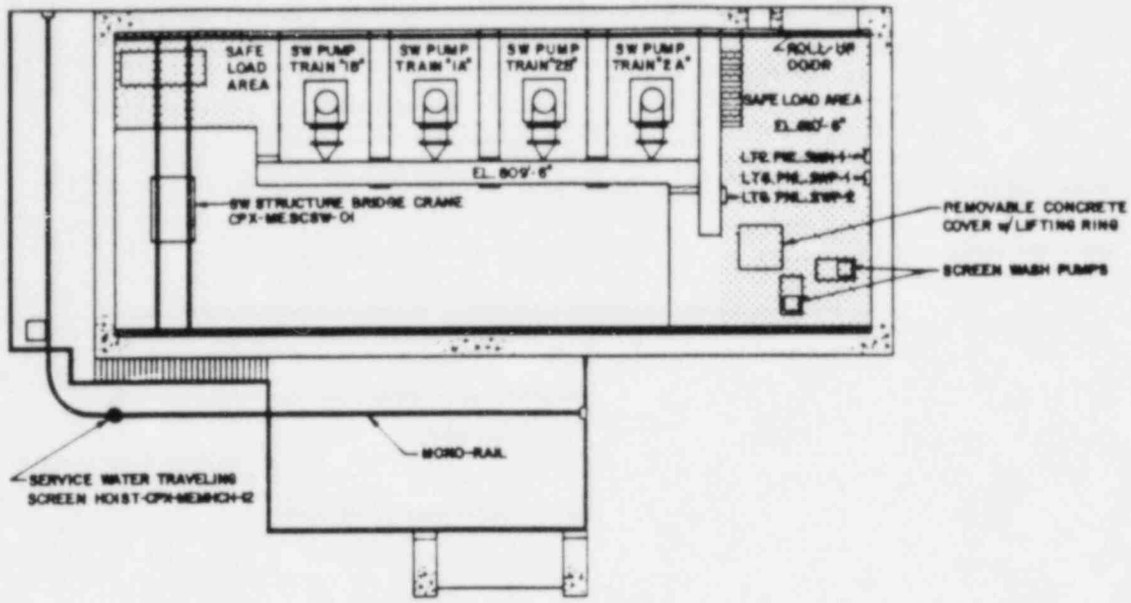
246	Mechanical Equipment Room

COMANCHE PEAK S.E.S.

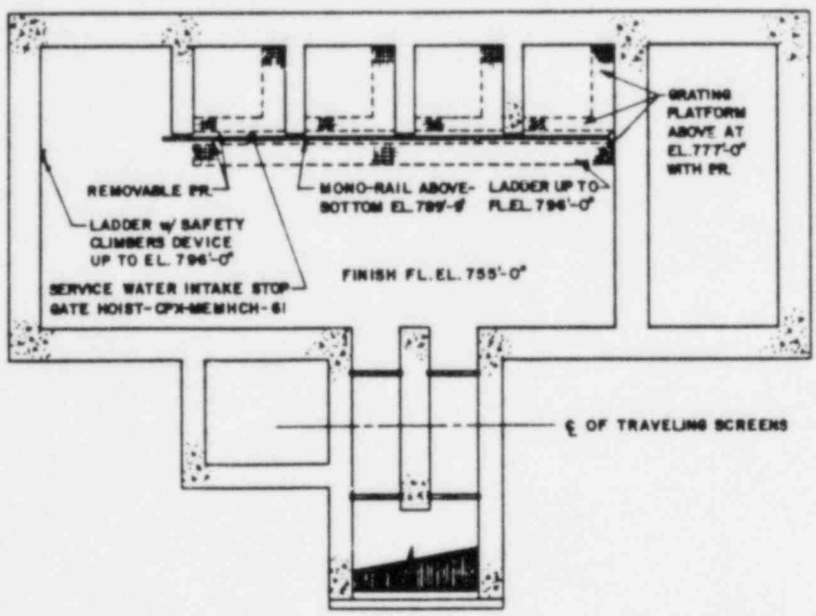
UNITS 1 and 2

AUXILIARY & CONTROL BLDG.
MISCELLANEOUS HOISTS

FIGURE A-20



PLAN AT ELEVATION 810'-6"



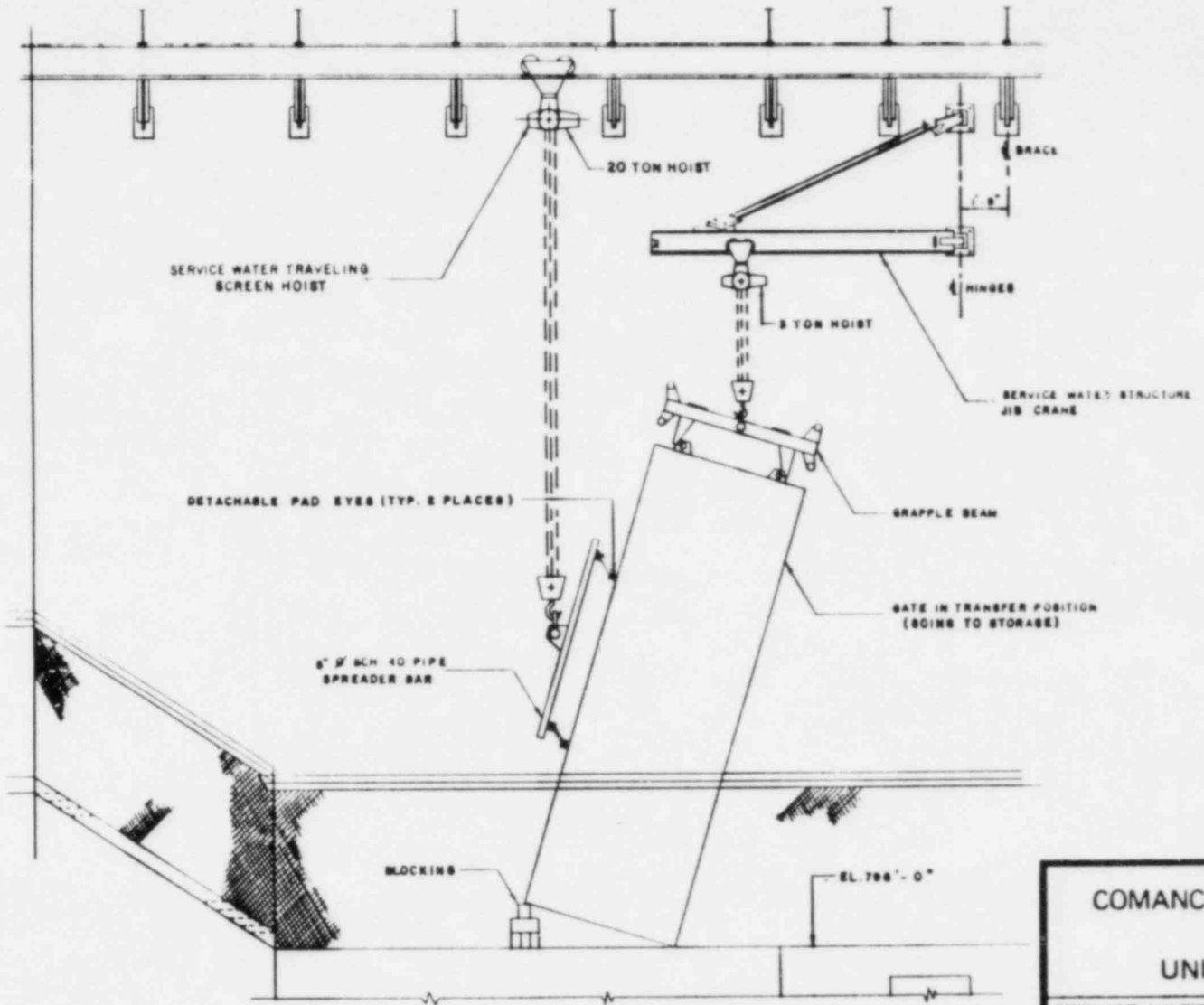
PLAN AT ELEVATION 755'-0"

COMANCHE PEAK S.E.S.

UNITS 1 and 2

SERVICE WATER INTAKE STRUCTURE BRIDGE CRANE AND SAFE LOAD AREAS

FIGURE A-21

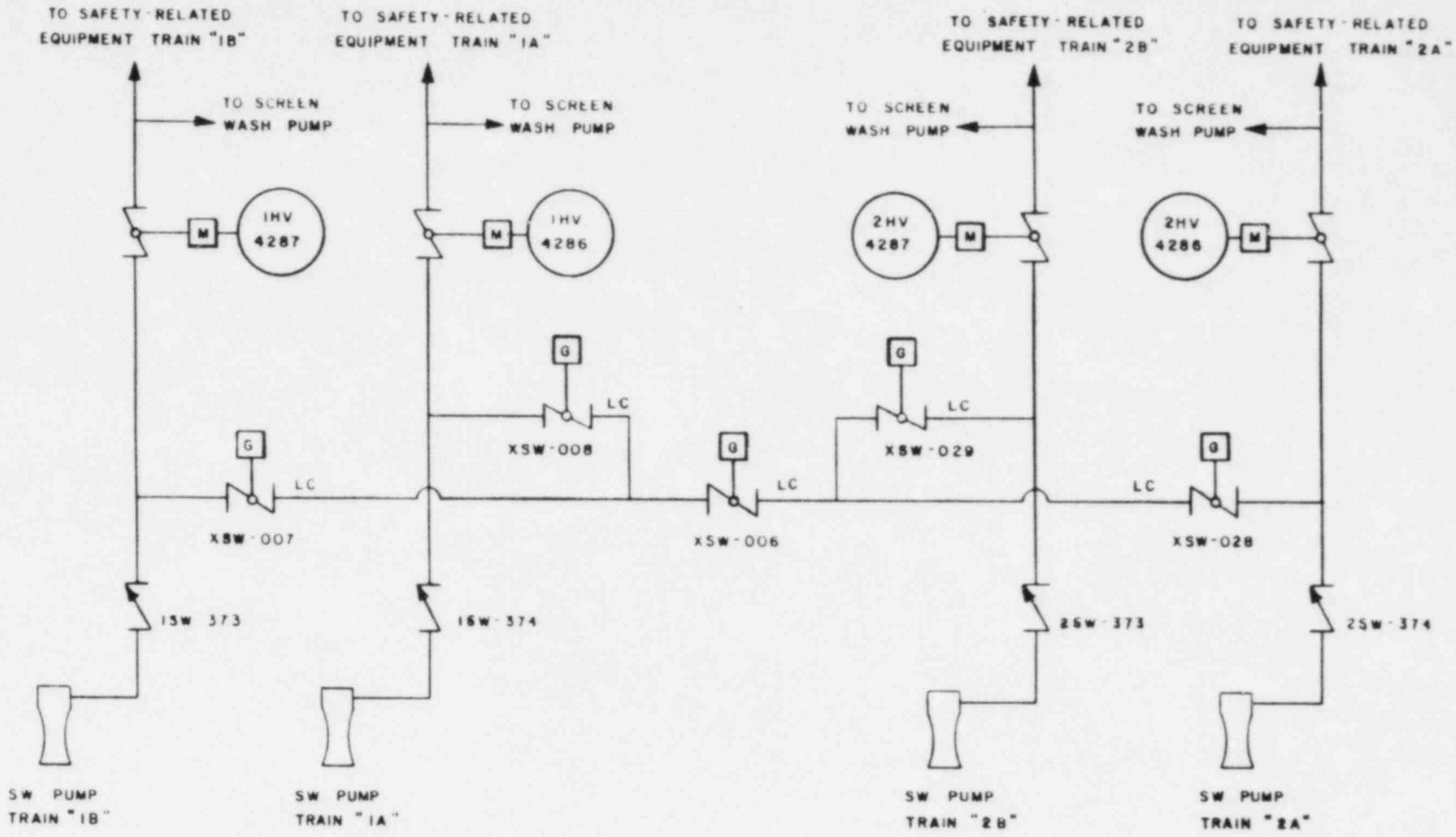


COMANCHE PEAK S E S

UNITS 1 and 2

SERVICE WATER INTAKE STRUCTURE
SERVICE WATER TRAVELING SCREEN
HOIST & STRUCTURE JIB CRANE

FIGURE A-22



COMANCHE PEAK S E S

UNITS 1 and 2

STATION SERVICE WATER SYSTEM
SIMPLIFIED FLOW DIAGRAM

FIGURE A - 23

ATTACHMENT B

CPSES RESPONSE TO COMMENTS GENERATED
BY EG&G IDAHO, INC. CONCERNING
THE CPSES LOAD HANDLING SYSTEMS

RESPONSE TO NRC COMMENTS DATED MAY 20, 1982 (REF. 1)

Section 2.2.1

EG&G Evaluation: The lack of detailed "separation criteria" and other information such as drawings showing the relationship between crane coverage and location of safety equipment make evaluation of the licensee's statement difficult.

TUGCO Response: A review of the CPSES plant arrangement has verified physical horizontal separation of Train A and Train B components. All Train A related components, system piping and electrical supplies are located in a separate room or compartment from Train B equipment and its associated components (see Attachment A, Section A.2.1.2 and Table A-2).

Section 2.3.1

EG&G Evaluation: The licensee's response states that "safe load areas" have been developed for each crane, where applicable. However, "safe load paths" for each heavy load have not yet been established.

EG&G feels that the idea of "safe load areas" is only partially sound. An extremely large load, if dropped, may have sufficient momentum to penetrate structural barriers that would contain a smaller "heavy load". Thus a marked "safe load area" may induce a false sense of security. The licensee should take steps to ensure that marked safety zones clearly indicate the maximum applicable safe load. For overly large heavy loads, specific load paths should be marked across the safe zones.

The licensee has not indicated that safe load paths will be marked on equipment layout drawings, as specified in the guideline. The licensee has also failed to indicate that deviations from defined paths will require written alternatives approved by the plant safety review committee.

Since the development of safe load paths is not complete, a more thorough evaluation is not possible at this time.

TUGCO Response: Load drop calculations were utilized to establish safe load areas in the containment and the fuel building. These calculations demonstrated that no plant design changes were required.

Section 2.3.1 (continued)

In addition, all loads to be carried in these safe load areas will be maintained at the minimum practical height above the operating floor. All loads outside these safe load areas will be taken via the safest and shortest route to the safe load area. The load will then be transported within the safe load area to its final destination.

All "safe load areas" and "safe load paths" will be identified by drawing.

Safe load paths will be defined in the CPSES maintenance procedure as attachments to load handling procedures. Procedures will be approved and handled in accordance with CPSES station procedures, as directed by the Station Operation Review Committee. Deviation from this maintenance procedure or load path will be handled in accordance with procedures governing deviation or revisions of safety related procedures, as directed by the Station Operation Review Committee.

Section 2.3.1 (continued)

In addition, all loads to be carried in these safe load areas will be maintained at the minimum practical height above the operating floor. All loads outside these safe load areas will be taken via the safest and shortest route to the safe load area. The load will then be transported within the safe load area to its final destination.

All "safe load areas" and "safe load paths" will be identified by drawing.

Safe load paths will be defined in the CPSES maintenance procedure as attachments to load handling procedures. Procedures will be approved and handled in accordance with CPSES station procedures, as directed by the Station Operation Review Committee. Deviation from this maintenance procedure or load path will be handled in accordance with procedures governing deviation or revisions of safety related procedures, as directed by the Station Operation Review Committee.

Section 2.3.2

EG&G Evaluation: The license has stated that procedures are being developed for loads carried outside of "safe load areas". The substance of these procedures are consistent with the requirements of NUREG-0612. These procedures should be extended to include overlarge loads carried in "safe load areas". The procedures should be available for possible NRC review prior to plant operation.

TUGCO Response: For some heavy loads, it may be necessary to operate outside the safe load area and transport the load over or near plant shutdown or decay heat removal equipment or spent fuel. For these loads and all oversize loads, special precautions or procedures will be utilized with the purpose of minimizing the risk of a heavy load drop in these areas. The procedure will consist of load drop prevention measures, such as a list of required equipment, inspection, acceptance criteria for the movement of the load, sequence of steps, etc. These procedures will be available for NRC review.

Section 2.3.3

EG&G Evaluation: The licensee's statement contains insufficient information to determine compliance. The statement infers that procedures governing operator training, etc., are not complete at this time. Sufficient information would be provided by verifying the implementation of such procedures.

TUGCO Response: Crane operators will be trained, qualified, and will conduct themselves in accordance with Chapter 2-3 of ANSI B30.2-1976 "Overhead and Gantry Cranes".

Procedures governing crane operator training qualifications and conduct will be available for NRC review prior to fuel load.

Section 2.3.4

EG&G Evaluation: Guideline 4 states that all special lifting devices involved with heavy load lifts will comply with ANSI N14.6-1978, not just those devices used to handle spent fuel shipping containers. A review of the lifting device and heavy load lists provided by the licensee indicates that the criteria of Guideline 4 should be met for at least the following devices:

(1) Spent Fuel Cask Lifting Device;

(2) Reactor Vessel Head Lifting Rig;

(3) Reactor Internals Lifting Rig;

(4) Failed Fuel Assembly Lifting Tool.

EG&G has included item (4) above as we feel that a failed assembly is a special case not exempted by the definition of a "heavy load" contained in NUREG-0612, Section 1.2.

The criteria of Guideline 4 is more restrictive than that of ANSI N14.6 in that dynamic loads must be considered. Thus the licensee should ensure that ANSI N14.6, Section 3.2.1.1 is properly appended when applied to the special lifting devices covered by the guideline.

The licensee should take all reasonable steps to ensure that item (1) above, when procured, meets the appended requirements of ANSI N14.6 as NRC approval of exceptions to required criteria is not insured.

Section 2.3.4 (continued)

TUGCO Response: (1) As stated in our report, the lifting device for spent fuel shipping casks has not yet been procured. ANSI N14.6-1978 and the criteria of Guideline 4 in NUREG-0612 will be invoked when this lifting device is obtained.

(2), (3) A report, WCAP-10156 (Ref. 2), by Westinghouse on reviewing the designs of Comanche Peak Reactor Vessel Internals and Reactor Vessel Head Lifting Rigs to determine the acceptability of these devices to meet the criteria of NUREG-0612 and ANSI N14.6-1978 has been completed. In conclusion, these rigs meet the intent of mentioned NUREG and ANSI standard for design, fabrication, assembly and operation, but do not meet all the specific load verification testing. The proposed alternate testing was included in Section 6 of WCAP-10156.

(4) The failed fuel assembly lifting tool has been deleted from Table 4 of Reference 3 because our review indicated that this tool is not required.

Section 2.3.5

EG&G Evaluation: The licensee has only addressed ANSI B30.9 in the reply. Guideline 5 is more restrictive than ANSI B30.9 as the marking procedure is appended and the rated working load must be factored to account for dynamic effects.

TUGCO Response: Lifting devices that are not specially designed for use with heavy loads, as defined by NUREG-0612, will comply with the guidelines of ANSI B30.9-1971. A visual inspection will be made of a sling prior to use and a documented periodic visual inspection will be performed on at least a yearly basis.

Sling ratings will be identified on the sling in terms of the static load, which produces the maximum static and dynamic load; (i.e., load x .005 x hoist speed + maximum static load). Where this restricts slings to use on only certain cranes, the slings will be clearly marked as to the cranes with which they may be used.

Section 2.3.6

EG&G Evaluation: The licensee's statement indicates that measures consistent with the requirements of Guideline 6 will be invoked. EG&G assumes that these measures will be implemented prior to fuel handling at the facility. Procedures, inspection records, and other documentation should be retained and available for possible NRC review.

TUGCO Response: ANSI B30.2-1976, Chapter 2-2, will be invoked with respect to crane inspections, test and maintenance.

With respect to Section 2-2.1.1.1 of ANSI B30.2, cranes located within containment will be inspected every scheduled refueling outage in accordance with the requirements of ANSI B30.2. This is necessary because periodic inspections during power operations are impractical due to high radiation levels in containment.

These measures will be implemented prior to fuel handling. Procedures and inspection records will be retained and available for NRC review.

Section 2.3.7

EG&G Evaluation: EG&G has performed a cursory review of both CMAA 70-1975 and ANSI B30.2-1976, Chapter 2-1. It is our belief that conformance to CMAA-70 does not give sufficient coverage of all topics contained in Chapter 2-1 of ANSI B30.2. The actual design of the cranes in question may meet the criteria of Chapter 2-1 as many of the criteria are based on sound engineering and safey practices; however, the licensee has supplied insufficient information to make this determination.

The licensee's exemption of crane 22, the Fuel Building Fuel Handling Bridge Crane, is questioned by EG&G. The licensee has supplied the weight of "fuel assembly and lifting tool" for the Containment Fuel Handling Bridge Crane as 1,700 lbs. We have adopted this value as the minimum weight of a heavy load at the plant (see Section 2.1). The largest load listed by the licensee for crane 22 is a "failed fuel assembly and lifting tool" at 3,000 lbs. We feel that this failed fuel assembly is not equivalent to the "spent fuel assembly" used in the definition of "heavy load" (NUREG-0612, Section 1.2), based on the information given. If the licensee wishes to continue to pursue an exemption for crane 22, we suggest that a more thorough argument be supplied.

Based on the load information provided, EG&G feels that the Containment Fuel Handling Bridge Crane (crane 8), the Main Steam Safety Valves Hoist (crane 19) and the Containment Dome Access Rotating Platform Hoist (crane 21) may qualify for exemption to this

Section 2.3.7 (continued)

guideline based on the magnitude or loads carried and the "heavy load" definitions. The licensee may wish to address exemption for these cranes.

Review of the load weights and crane capacity ratings provided by the licensee reveals two cranes with listed loads heavier than the listed capacity. The RHR Pump Hoist (crane 10) has a capacity of 40 tons indicated with a maximum load (RCP Pump and Lifting Rig) of 43.7 tons. In addition, six other cranes (numbers 9, 13, 15, 16, 17, and 24) have maximum loads equal to the rated capacity. The licensee needs to explain the apparent discrepancy concerning capacity ratings on cranes 10 and 14. EG&G feels that cranes 9, 13, 15, 16, 17, and 24 may also be underrated when dynamic load effects are considered although we presently have insufficient information to support (or disprove) this position.

TUGCO Response: The term "heavy load" is defined in NUREG-0612 as a load whose weight is greater than the combined weight of a single spent fuel assembly and its handling tool. For CPSES, this weight is approximately 2,150 lbs.

Table 3 of Reference 3 has been revised to indicate that the design of load handling equipment complies with CMAA-70-1975 and ANSI B30.2-1967, as specified in the equipment specification. (See Attachment A, Table A-3).

Table 4 of Reference 3 has been corrected to eliminate the discrepancies concerning rated capacity of cranes (numbers 22, 9, 10, 13, 15, 16, 17, and 24 of Reference 3) and their maximum loads. (See Attachment A, Table A-4).

References

1. May 20, 1982 letter from B. J. Youngblood (Nuclear Regulatory Commission) to R. J. Gary (Texas Utilities Generating Company) providing the draft technical evaluation report (by EG&G Idaho, Inc., dated March 1982) of the CPSES response to Enclosure 3 of NRC letter dated December 22, 1980.

2. H. H. Sandner, "Evaluation of the Acceptability of the Reactor Vessel Head Lift Rig, Reactor Vessel Internals Lift Rig, Load Cell, and Load Cell Linkage to the Requirements of NUREG-0612", WCAP-10156, October 1982.

3. CPSES Response (March 1982) to Enclosure 3 of NRC Letter dated December 22, 1980.

ATTACHMENT C

CPSES PLANT SPECIFIC DATA AND
SUMMARY OF REGULATORY POSITIONS
FOR THE FUEL BUILDING
OVERHEAD CRANE

CPSES

TABLE C-1
(Sheet 1 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section		Information to be Provided		Specific Crane Data
C.1.a	III.C (C.1.a)	1.	The actual crane duty classification of the crane specified by the applicant.	1.	The crane has a Class A-1 crane duty classification in accordance with CMAA Specification #70.
C.1.b	III.C (C.1.b)	1.	The minimum operating temperature of the crane specified by the applicant.	1.	The crane was designed and fabricated for a minimum operating temperature of 40 degrees F.
C.2.b	III.C (C.2.b) III.E.4	1.	The maximum extent of load motion and the peak kinetic energy of the load following a drive train failure.	1.	The crane was designed such that the maximum load motion following a drive train failure is less than 1 foot and the maximum kinetic energy of the load is less than that resulting from 1 inch of free fall of the maximum critical load.
		2.	Provisions for actuating the Emergency Drum Brake prior to traversing with the load, when required to accommodate the load motion following a drive train failure.	2.	Provisions for automatically actuating the Emergency Drum Brake prior to traversing with the load are not required since the maximum amount of load motion and kinetic energy can be accomodated by the facility design.

TABLE C-1
(Sheet 2 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section		Information to be Provided		Specific Crane Data
C.3.e	III.C (C.3.e)	1.	The maximum cable loading following a wire rope failure in terms of the acceptance criteria established in Section III.C (C.3.e.)	1.	The maximum cable loading following a wire rope failure is about 80% of the maximum allowed by the acceptance criteria established in Section III.C (C.3.e).
C.3.f	--	1.	Maximum fleet angle.	1.	3 1/2 degrees.
		2.	Number of reverse bends	2.	None
		3.	Sheave diameter	3.	Per CMAA Specification #70
C.3.h	III.C (C.3.h) III.E.11	1.	The maximum extent of motion and peak kinetic energy of the load following a single wire rope failure.	1.	The crane was designed such that the maximum load motion following a single wire rope failure is less than one foot and the maximum kinetic energy of the load is less than that resulting from one inch of free fall of the maximum critical load.
C.3.i	III.C (C.3.i)	1.	The type of load control system specified by the applicant.	1.	The crane has a 5-speed Ederer regulated eddy current control system.
		2.	Whether interlocks are recommended by Regulatory Guide 1.13 to prevent trolley and bridge movements while	2.	The crane will not be used to lift fuel elements from the reactor core or spent fuel racks. Therefore,

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(Sheet 3 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section		Information to be Provided		Specific Crane Data
			fuel elements are being lifted and whether they are provided for this application.		interlocks to prevent trolley and bridge movements while hoisting are not provided.
C.3.j	III.C (C.3.j)	1.	The maximum cable and machinery loading that would result in the event of a high speed two blocking, assuming a control system malfunction that would allow the full breakdown torque of the motor to be applied to the drive motor shaft.	1.	The Energy Absorbing Torque Limiter (EATL) was designed such that the maximum machinery load, which would result in the event of a high speed two blocking that allows the full breakdown torque of the motor to be applied to the drive shaft, will not exceed twice the design rated loading. In addition, the EATL design does not allow the maximum cable loading to exceed the acceptance criteria established in Section III.C (C.3.e) during the above described two blocking.
		2.	Means of preventing two blocking of auxiliary hoist, if provided.	2.	The auxiliary and cantilever hoists have two independent travel limit switches to prevent two blocking.
C.3.k	III.C (C.3.k)	1.	Type of drum safety support provided.	1.	As shown in figure C-1, the drum safety support, which is the same on both ends of the drum, complies with C.3.k of the Regulatory Guide, in that it will limit the drop of the

TABLE C-1
(Sheet 4 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section	Information to be Provided	Specific Crane Data
			drum and thereby prevent it from disengaging its holding brake system should the drum shaft or bearing fail or fracture. However, this design does not have the extra safety hub shown in figure III.D.4 of EDR-1, since the crane was designed and manufacturered prior to its approval.
C.3.o	--	1. Type of hoist drive to provide incremental motion.	1. Five speed magnetic
C.3.p	--	1. Maximum trolley speed.	1. 50 FPM
		2. Maximum bridge speed.	2. 50 FPM
		3. Type of overspeed protection for the trolley and bridge drives.	3. Both the trolley and bridge drives are powered by AC motors that can inherently not overspeed, since their maximum speed is limited by the 60 HZ line frequency. Therefore, overspeed sensors that actuate the trolley and bridge drive brakes have not been provided.
C.3.q	--	1. Control station location.	1. Operator's cab mounted on the bridge.

TABLE C-1
(Sheet 5 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section	Information to be Provided	Specific Crane Data
--	II.D.1	1. The type of Emergency Drum Brake used, including type of release mechanism.	1. The crane has a tandem pneumatically released drum brake.
		2. The relative location of the Emergency Drum Brake.	2. The Emergency Drum Brake engages the wire rope drum.
		3. Emergency Drum Brake Capacity.	3. The Emergency Drum Brake has a minimum capacity of 130% of that required to hold the design rated load.
--	III.D.2	1. Number of friction surfaces in EATL.	1. The EATL has 21 friction surfaces.
		2. EATL Torque Setting.	2. The specified EATL torque setting is approximately 130% of the design rated load.
--	III.D.3	1. Type of Failure Detection System.	1. The Electronic Failure Detection System was ordered prior to the NRC comment that led to the EDR-1 commitment to qualify and test Electronic Failure Detection Systems in accordance with IEEE Standard 323, "Standard for Qualifying Class 1 Equipment for Nuclear Power Generating Stations." The Failure Detection

TABLE C-1
(Sheet 6 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section		Information to be Provided		Specific Crane Data
					Systems manufactured since the Comanche Peak Fuel Building Crane are of the mechanical type. Therefore, an Electronic Failure Detection System has never been qualified and tested in accordance with IEEE Standard 323.
--	III.D.5		Type of Hydraulic Load Equalization System.	1.	The Hydraulic Load Equalization System includes both features described in this section.
--	III.D.6	1.	Type of hook.	1.	The crane has a single load path hook.
		2.	Hook design load.	2.	The hook design load is 130 tons with a 10:1 factor of safety on ultimate.
		3.	Hook test load.	3.	The test load for the hook was 260 tons.
--	III.F.1	1.	Design rated load.	1.	130 Tons
		2.	Maximum critical load rating.	2.	130 Tons
		3.	Trolley weight (net).	3.	Less than 118,000 lbs. (including hook)

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TABLE C-1
(Sheet 7 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

Regulatory Position	Ederer Topical Report Section	Information to be Provided	Specific Crane Data
		4. Trolley weight (with load).	4. 378,000 lbs.
		5. Hook lift.	5. 77'
		6. Number of wire rope drums.	6. 1
		7. Number of parts of wire rope.	7. 2 ropes with 8 parts each
		8. Drum size (pitch diameter).	8. 35"
		9. Wire rope diameter.	9. 1 1/4"
		10. Wire rope type.	10. 6x37 class IWRC
		11. Wire rope material.	11. Stainless steel.
		12. Wire rope breaking strength.	12. 146,000 pounds.
		13. Wire rope yield strength.	13. 116,800 pounds.
		14. Wire rope reserve strength.	14. 64%
		15. No. wire ropes.	15. 2

TABLE C-1
(Sheet 8 of 8)

FUEL BUILDING OVERHEAD CRANE DATA (NOTE 1)

NOTE 1: Completes Appendix B of Generic Licensing Topical Report EDR-1(P)-A, Revision 2 dated February 15, 1980 and EDR-1(NP)-A, Revision 2 dated February 15, 1980, "Nuclear Safety Related eXtra-Safety And Monitoring (X-SAM) Cranes."

NOTE 2: Regulatory Guide 1.104 (Revision 1, Draft 3), October 1978.

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TABLE C-2
(Sheet 1 of 7)

SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

Regulatory Position (Note 2)	Ederer Topical Report Section (Note 1)		Information to be Provided		Specific Crane Data
--	C.1.b(1)	1.	The extent of venting of closed box sections.	1.	Closed box sections are not vented since the fuel building that houses the crane is not pressurized.
C.1.b(3) C.1.b(4) C.4.d	III.C (C.1.b(3)) III.C (C.1.b(4)) III.C (C.4.d)	1.	The nondestructive and cold proof testing to be performed on existing structural members for which satisfactory impact test data is not available.	1.	Satisfactory impact data is available for the existing structural members.
C.1.c	III.C (C.1.c)	1.	The extent the crane's structures, which are not being replaced, are capable of meeting the seismic requirements of Regulatory Guide 1.29.	1.	The crane's structures were originally designed and analyzed by Ederer to meet Reg. Guide 1.29.
C.1.d	III.C (C.1.d)	1.	The extent welds joints in the crane's structures, which are not being replaced, were nondestructively examined, and	1.	Comparable nondestructive examinations to those identified in Section III.C(C.1.d) and Appendix A of the Topical Report were performed when the crane was manufactured, with the exception that the sheave forgings were not magnetic particle inspected. This inspection is not

TABLE C-2
(Sheet 2 of 7)

SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

Regulatory Position (Note 2)	Ederer Topical Report Section (Note 1)	Information to be Provided	Specific Crane Data
			considered mandatory by Ederer, nor is it required by either NUREG-0612 or Regulatory Guide 1.104. Furthermore, the X-SAM system protected the crane from overloads during construction usage.
		2. The extent the base material, at joints susceptible to lamellar tearing, was nondestructively examined.	2. The weld joint geometries used in the existing bridge structure are not considered to be susceptible to lamellar tearing.
C.1.e	III.C (C.1.e)	1. The extent the crane's structures, which are not being replaced, are capable of withstanding the fatigue effects of cyclic loading from previous and projected usage, including any construction usage.	1. The crane was designed in accordance with the provisions of Topical Report Section III.C(C.1.e).
C.1.f	III.C (C.1.f)	1. The extent the crane's structures, which are not being replaced, were post-weld heat-treated in accordance with Subarticle 3.9 of AWS D1.1, "Structural Welding Code."	1. The crane was manufactured in accordance with the provisions of Topical Report Section III.C(C.1.f).

TABLE C-2
(Sheet 3 of 7)

SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

Regulatory Position (Note 2)	Ederer Topical Report Section (Note 1)	Information to be Provided	Specific Crane Data
C.2.b	III.C(C.2.b) III.E.4	1. Provisions for accommodating the load motion and kinetic energy following a drive train failure when the load is being traversed and when it is being raised or lowered.	1. Administrative procedures will be used to assure that a minimum of 1 foot of clearance is maintained between the load and surfaces that cannot withstand the kinetic energy associated with 1 inch of free fall of the load involved. The surfaces, which will support the load, are designed to withstand a minimum of 1 inch of free fall of the load involved.
C.2.c	III.C (C.2.c)	1. Location of safe laydown areas for use in the event repairs to the crane are required that cannot be made with the load suspended.	1. Figure C-2 shows the laydown areas that can be used in the event that repairs to the crane are required that cannot be made with the load suspended.
C.2.d	III.C (C.2.d)	1. Size of replacement components that can be brought into the building for repair of the crane without having to break its integrity.	1. The replacement trolley components will be brought in through the Fuel Building roll-up door, which means that any trolley component can be brought in to the fuel building if needed for crane repairs.

TABLE C-2
(Sheet 4 of 7)

SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

Regulatory Position (Note 2)	Ederer Topical Report Section (Note 1)		Information to be Provided		Specific Crane Data
		2.	Location of area where repair work can be accomplished on the crane without affecting the safe shut-down capability of the reactor.	2.	Repair work, involving heavy lifts by non-single failure proof equipment, can be safely accomplished on the crane when it is positioned over the areas shown in Figure C-2. There are no nuclear safety restrictions on crane repairs that do not involve handling heavy components.
		3.	Any limitations on reactor operations that would result from crane repairs.	3.	There are no limitations on reactor operations that would result from crane repairs.
C.3.b	III.C (C.3.b)	1.	The design margin and type of lifting devices that are attached to the hook to carry critical loads.	1.	Each lifting device attached to the hook to carry critical loads will support a load three times the load (static and dynamic) being handled without permanent deformation.
C.3.t	III.C (C.3.t)	1.	The extent construction requirements for the crane's structures, which will not be replaced, are more severe than those for permanent plant service.	1.	The construction requirements for the cranes were the same as for permanent plant service.

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TABLE C-2
(Sheet 5 of 7)

SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

Regulatory Position (Note 2)	Ederer Topical Report Section (Note 1)	Information to be Provided	Specific Crane Data
		2. The modifications, and inspections to be accomplished on the crane following construction use, which was more severe than those for permanent plant service.	2. No special modifications or inspections are required to convert the crane from construction use to permanent plant service, since the requirements are the same.
C.3.u	--	1. The extent of installation and operating instructions.	1. The installation and operating instructions have been updated by Ederer to fully comply with the requirements of Section C.3.u of Regulatory Guide 1.104 and Section 7.1 and 9 of NUREG-0612.
C.4.a C.4.b C.4.c C.4.d	--	1. The extent of assembly checkout, test procedures, load testing and rated load marking of the crane.	1. Prior to handling critical loads the crane will be given a complete assembly and operational checkout by Ederer, and then given a no load test of all motions in accordance with updated procedures provided by Ederer. A 125% static load test and a 100% performance test will also be performed at this time in accordance with updated test procedures provided by Ederer. A two blocking test was performed by Ederer prior to delivery of the

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TABLE C-2
(Sheet 6 of 7)

SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

Regulatory Position (Note 2)	Ederer Topical Report Section (Note 1)	Information to be Provided	Specific Crane Data
			crane per Topical Report EDR-1. The maximum Critical Load is plainly marked on each side of the crane.
C.5.d	III.C (C.5.a)	1. The extent the procurement documents for the crane's structures, which will not be replaced, required the crane manufacturer to provide a quality assurance program consistent with the pertinent provisions of Regulatory Guide 1.28.	1. The procurement documents for the crane invoked ANSI N45.2-71.

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TABLE C-2
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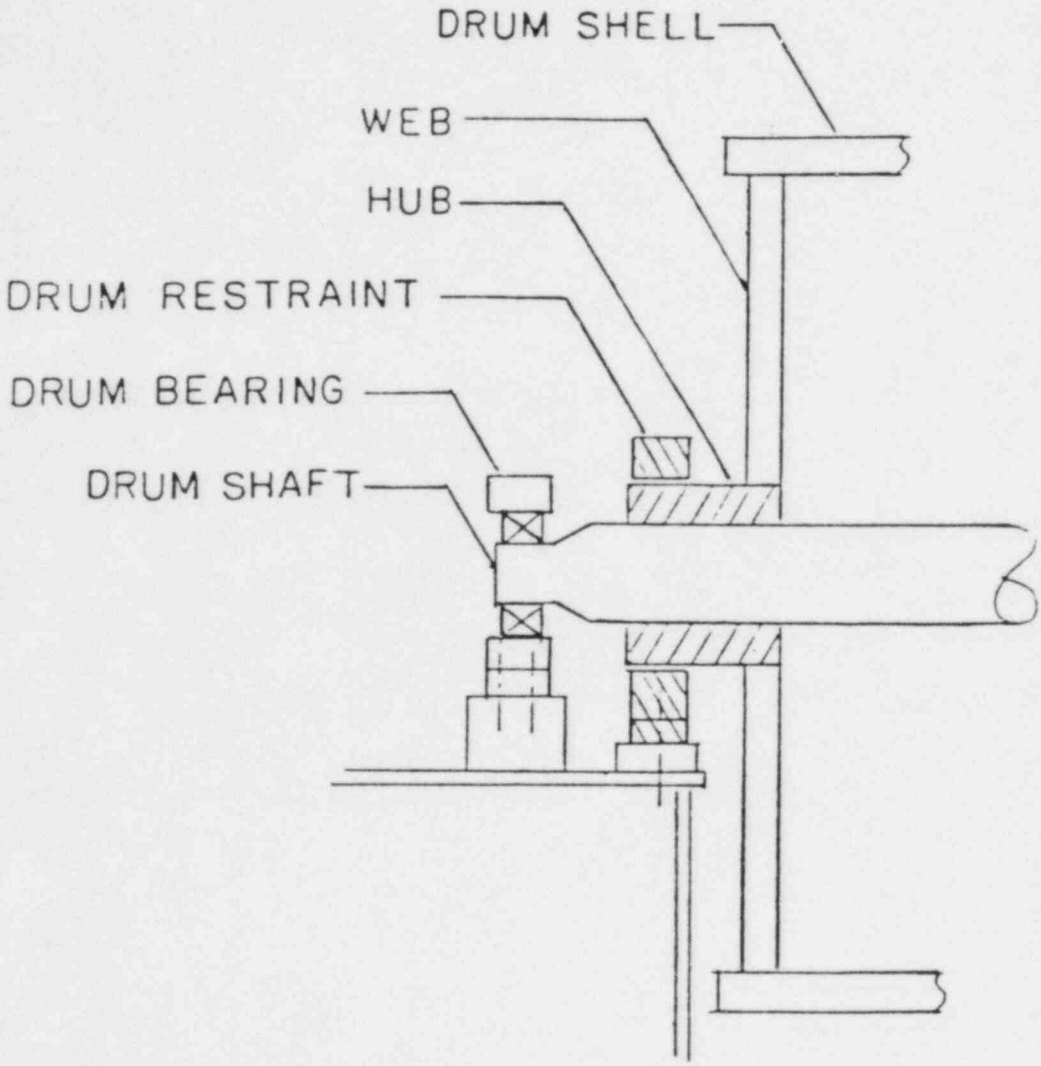
SUMMARY OF REGULATORY POSITIONS TO BE
ADDRESSED BY THE APPLICANT
FOR COMANCHE PEAK STATION FUEL BUILDING OVERHEAD CRANE

NOTE 1: Completes Appendix C of Generic Licensing Topical Report EDR-1(P)-A, Revison 2 dated February 15, 1980 and EDR-1(NP)-A, Revision 2 dated February 15, 1980, "Nuclear Safety Related eXtra-Safety And Monitoring (X-SAM) Cranes".

NOTE 2: Regulatory Guide 1.104 (Revision 1, Draft 3), October 1978.

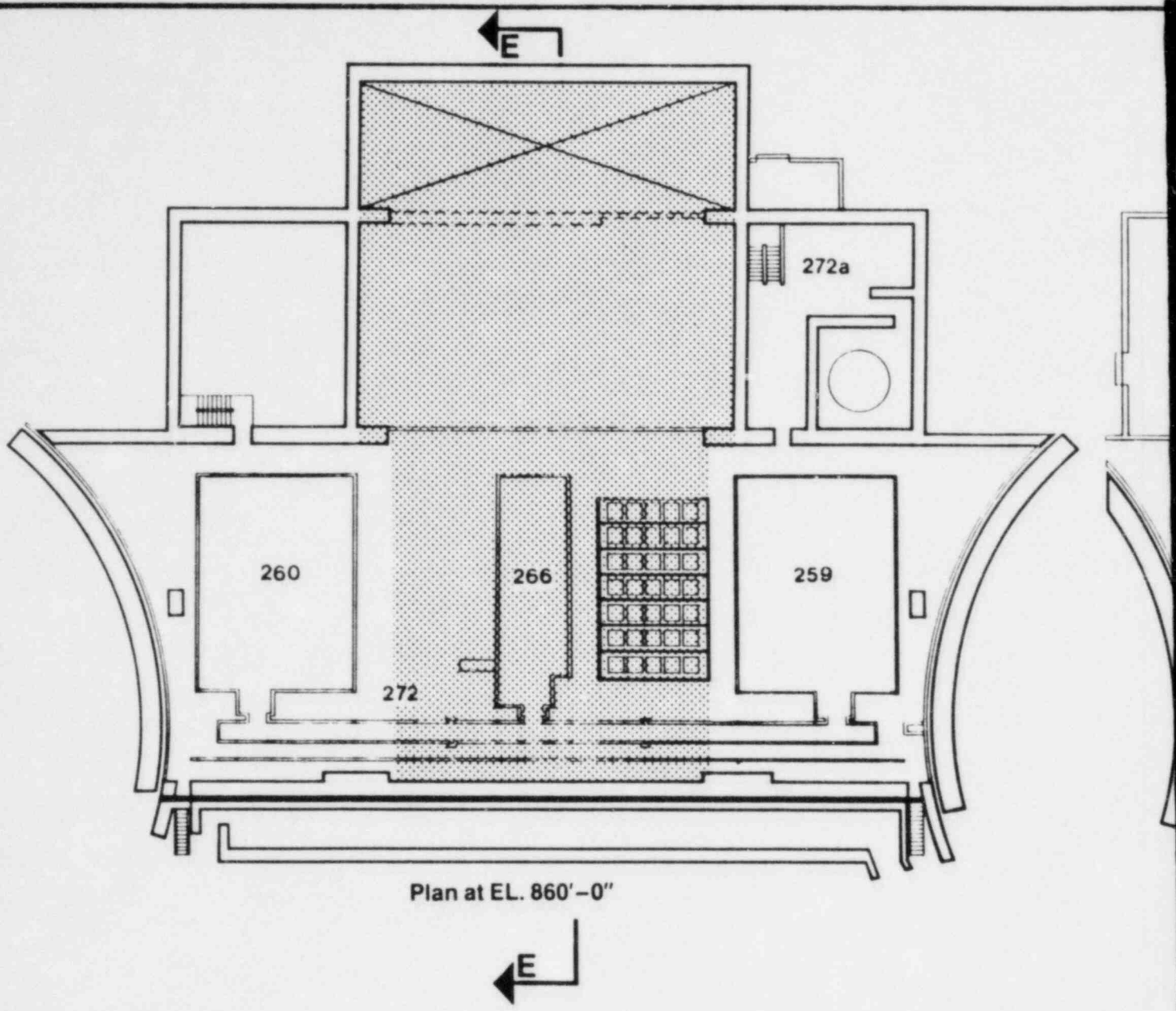


COMANCHE PEAK S.E.S.

UNITS 1 and 2

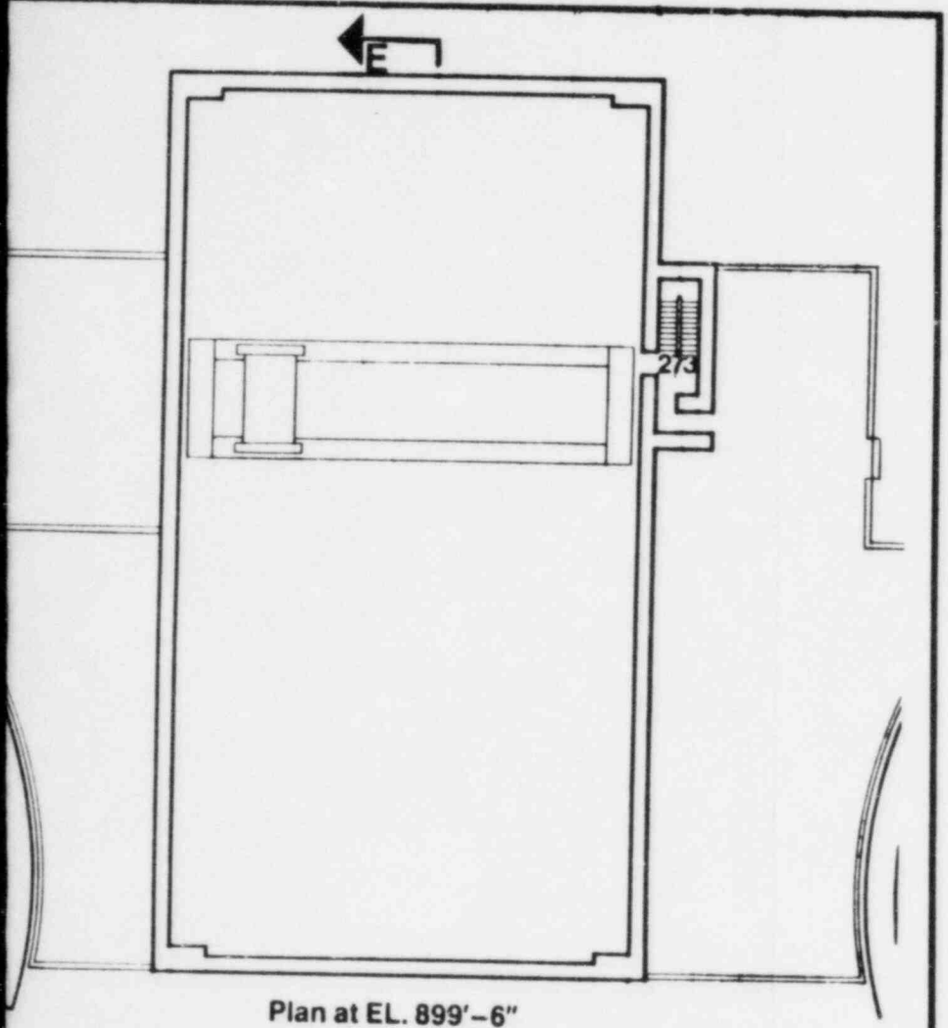
DRUM SAFETY SUPPORT STRUCTURE

FIGURE C-1



Plan at EL. 860'–0"

FUEL BUILDING OVERHEAD CRANE
SAFE LOAD AREA.



Plan at EL. 899'–6"

Plan at Elevation 860'–0"

Rm.#	Rm. Name
259	Spent Fuel Pool No. 1
260	Spent Fuel Pool No. 2
266	Wet Cask Loading Area
272	Operating Floor Level
272a	Open Space

Plan at Elevation 899'–6"

273	Stair No. F–2

COMANCHE PEAK S.E.S.

UNITS 1 and 2

FUEL BUILDING
FUEL BLDG. OVERHEAD CRANE
SAFE LOAD AREA

FIGURE C-2