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September 28, 1982

In reply, please
refer to LAC-8624

DOCKET NO. 50-409

Director of Nuclear Reactor Regulation
ATTN: Mr. Dennis M. Crutchfield
Operating Reactors Branch #5
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
FIRE PROTECTION RULE 10 CFR 50.48

REFERENCE: (1) Letter, Crutchfield to Linder, dated May 10, 1982

Gentlemen:

Enclosed as Attachment 1 is Dairyland Power Cooperative's response to your staff's request for additional information on the rewrite of Section 8 of the Fire Protection Rule (Reference 1).

If you have any questions, please contact us.

Very truly yours,

DAIRYLAND POWER COOPERATIVE

Jameson Taylor
for Frank Linder, General Manager

FL:RMB:eme

Enclosures

cc: NRC Resident Inspector

A006

WP-2

ATTACHMENT 1

PART 1

NRC POSITION:

Identify those areas of the plant that will not meet the requirements of Section III.G.2 of Appendix R and, thus altemtaive shutdown will be provided or an exemption from the requirements of Section III.G.2 of Appendix R will be provided. Additionally provide a statement that all other areas of the plant are or will be in compliance with Section III.G.2 of Appendix R.

a. List the system(s) or portions thereof used to provide the shutdown capability with the loss of offsite power.

b. For those systems identified in "1a" for which alternative or dedicated shutdown capability must be provided, list the equipment and components of the normal shutdown system in the fire area and identify the functions of the circuits of the normal shutdown systm in the fire area (power to what equipment, control of what components and instrumentation). Describe the system(s) or portions thereof used to provide the alternative shutdown capability for the fire area and provide a table that lists the equipment and components of the alternative shutdown system for the fire area.

For each alternative system identify the function of the new circuits being provided. Identify the location (fire zone) of the alternative shutdown equipment and/or circuits that bypass the fire area and verify that the alternative shutdown equipment and/or circuits are separated from the fire area in accordance with Section III.G.2.

DPC RESPONSE:

Part 2 of this attachment lists all areas of the plant outside containment that conform to Section III.G.2 of Appendix R and also those that do not. For those areas not in conformance a list of electrical equipment used for normal safe shutdown is provided. Certain modifications have been proposed to enhance the shutdown capabilities from the Control Room. These modifications do not totally bring LACBWR in compliance with Section III.G.2 and certain exemptions are requested. In addition, a manual non-electrical safe shutdown method is described in detail in Part 4.

DPC RESPONSE:

Part 4 of this attachment describes a proven non-electrical method to provide safe shutdown and cooldown operations.

NRC POSITION:

d. *Verify that changes to safety systems will not degrade safety systems; (e.g., new isolation switches and control switches should meet design criteria and standards in the FSAR for electrical equipment in the system that the switch is to be installed; cabinets that the switches are to be mounted in should also meet the same criteria (FSAR) as other safety related cabinets and panels; to avoid inadvertent isolation from the control room, the isolation switches should be keylocked or alarmed in the control room if in the "local" or "isolated" position; periodic checks should be made to verify that the switch is in the proper position for normal operation; and a single transfer switch or other new device should not be a source of a failure which causes loss of redundant safety systems).*

DPC RESPONSE:

The proposed modifications will not involve any new electrical equipment. DPC will reroute certain cables to provide greater separation from existing cable routing. None of these changes will degrade the existing safety system.

NRC POSITION:

e. *Verify that licensee procedures have been or will be developed which describe the tasks to be performed to effect the shutdown method. Provide a summary of these procedures outlining operator actions.*

DPC RESPONSE:

The description of normal shutdown methods is described in Part 2 of this attachment. Part 4 explains an alternate non-electrical shutdown method. Enclosure 1 is a revised procedure emphasizing actions to be taken for shutdown outside control room in the event of an electrical fire threatening normal shutdown capability.

NRC POSITION:

f. Verify that the manpower required to perform the shutdown functions using the procedures of e. as well as to provide fire brigade members to fight the fire is available as required by the fire brigade technical specifications.

DPC RESPONSE:

The LACBWR Technical Specifications require a 5 member fire fighting team. This team is made up of 2 operations department personnel, 1 health physics technician and two or more security guards, as needed. Current minimum shift staffing would allow the remaining operators to man the alternate shutdown stations. Due to the small plant size and construction the Fire Fighting Team can respond to any fire area within 5 minutes of the announcement of the fire alarm.

NRC POSITION:

g. Provide a commitment to perform adequate acceptance tests of the alternative shutdown capability. These tests should verify that: equipment operates from the local control station when the transfer or isolation switch is placed in the "local" position and that the equipment cannot be operated from the control room; and that equipment operates from the control room but cannot be operated at the local control station when the transfer isolation switch is in the "remote" position.

DPC RESPONSE:

DPC maintains that demonstration of the alternate shutdown method described in Part 4 is not requried. Incident Report DPC-74-20 (Enclosure 5) recorded the actual event in which the method was developed and used.

NRC POSITION:

h. Provide Technical Specifications of the surveillance requirements and limiting conditions for operation for that equipment not already covered by existing Technical Specifications. For example, if new isolation and control switches are added to a shutdown system, the existing Technical Specification surveillance requirements should be supplemented to verify system/equipment functions from the alternate shutdown station at testing intervals consistent with the guidelines of Regulatory Guide 1.22 and IEEE 338. Credit may be taken for other existing tests using group overlap test concepts.

DPC RESPONSE:

The mechanical pressure and level gauges are calibrated routinely within the LACBWR Preventitive Maintenance Program. DPC maintains no additional surveillance is required and therefore changes to Technical Specifications are not required.

NRC POSITION:

i. For new equipment comprising the alternative shutdown capability, verify that the systems available are adequate to perform the necessary shutdown function. The functions required should be based on previous analyses, if possible (e.g., in the FSAR), such as a loss of normal AC power or shutdown on Group 1 isolation (BWR). The equipment required for the alternative capability should be the same or equivalent to that relied on in the above analysis.

DPC RESPONSE:

Since no new equipment is proposed, this action does not pertain to LACBWR.

NRC POSITION:

j. Verify that repair procedures for cold shutdown systems are developed and material for repairs is maintained on site. Provide a summary of these procedures and a list of the material needed for repairs.

DPC RESPONSE:

Although DPC would attempt to repair fire damage to vital equipment, adequate means are available to safely shutdown and cooldown the reactor that formalized procedures and dedicated repair material is not required at LACBWR.

ATTACHMENT 1

PART 2

The following buildings and areas contain systems or components outside of the Reactor Containment Building which are important to safe shutdown and, therefore, addressed in this analysis.

(1) Crib House

(2) 1B Diesel Generator Room

(3) Turbine Building

(4) Machine Shop

(5) Electrical Penetration Room

(6) Electrical Equipment Room

(7) Control Room

No other areas of the plant outside of the Reactor Containment Building contain systems which are important to safe shutdown. Therefore, the rest of the plant is in conformance with 10 CFR 50, Appendix R III.G.2.

Of the above listed areas, only the Crib House and the 1B Diesel Generator Room fully comply with III.G.2. The recently installed Emergency Service Water Supply System, (Reference 1) and accepted by NRC Letter (Reference 2) is fully redundant and independent of the two diesel High Pressure Service Water pumps located within the Crib House. The 1B Diesel Generator Building provides emergency power to vital plant equipment and is separated from the 1A Diesel Generator and other fire areas by a 3-hour fire rated barrier.

The remainder of the areas listed above do not fully comply with III.G.2. Therefore, Dairyland Power Cooperative will reroute certain cables to provide separation and enhance the safe shutdown capability from the Control Room. In addition, these modifications will eliminate the concern of hotshorts inadvertently opening the Manual Depressurization System valves and reduce the concerns of a malfunction at a High Low Pressure interface. These actions will permit LACBWR to comply with III.G.2. DPC will request exemption of the Control Room, Electrical Equipment Room, and Electrical Penetration Area. The specifics for these requests are included in this transmittal in the section describing the individual fire areas.

Turbine Building

The following systems or portions thereof located in the Turbine Building could be used to provide safe shutdown capability in conjunction with loss of off-site power (LOP).

1. Demineralized Water System (DMW)
2. Component Cooling Water System (CCW)
3. High Pressure Service Water Piping (HPSW)

The demineralized water system is used during normal shutdown as the preferred source of cooling water to the shell side of the Shutdown Condenser. The 1A and 1B demineralized water system pumps are located within the Turbine Building and could be subjected to damage by fire.

There are three alternatives available for the operator to conduct safe shutdown without the DMW system.

The primary alternative would use the installed redundant cooling water supplied by the HPSW system to the shell of the Shutdown Condenser.

A second alternative is provided by cross-connecting the HPSW and DMW system. The DMW system can be manually cross-connected to the HPSW system, if the DMW system pumps are disabled by fire.

A third means of providing safe shutdown would use the CCW system. The component cooling water system is used during normal shutdown to supply cooling water to the shell side of the decay heat removal system heat exchanger. The decay heat removal system is normally used below 470°F and to maintain cold shutdown once the reactor has reached cold shutdown. Lacking the CCW system, the operators would cool down to a temperature of 270°F to 300°F using the Shutdown Condenser System, and complete the cooldown and maintain the plant in cold shutdown through a feed and bleed process. Water could be fed into the reactor vessel from the Overhead Storage Tank through the Low Pressure Core Spray Valve or High Pressure Core Spray System. If all other methods fail an alternate source of water to the HPCS Pumps is HPSW. Water would be bled from the Reactor Vessel using gravity head to the Main Condenser using the Decay Heat Blowdown Valve.

With the reactor less than 358°F an additional source of water that could be fed into the reactor vessel is from the Mississippi River using the diesel-driven HPSW/ACS pumps through the LPCS system or Alternate Core Spray via manual operation of motor-operated ACS valve. The ACS motor operated valves have manual handwheels and can be operated locally in the Turbine Building. The HPSW system has water-filled piping and manual valves within the Turbine Building. It is not subject to open circuits, hot shorts, etc., and is, therefore, not further addressed herein.

ELECTRICAL EQUIPMENT ROOM, MACHINE SHOP, ELECTRICAL PENETRATION ROOM

Cabling for all the electrically operated or controlled safe shutdown systems in containment passes through the Electrical Equipment Room, Machine Shop, and Electrical Penetration Rooms. The list of systems or portions thereof which could be used to provide safe shutdown capability in conjunction with LOP is as follows:

Control Rod Drive System

Main Steam Isolation System

Decay Heat System

Shutdown Condenser System

Reactor Isolation System

High Pressure Core Spray System/Boron Inject

Alternate Core Spray System

Demineralized Water Transfer Pumps

Component Cooling Water System

Boron Inject System

No process equipment of these systems is located in the fire areas under consideration. Cabling components of these systems are listed in Reference 3, with specific rerouting of control cables for;

(1) Manual Depressurization Valve (AC)

(2) Manual Depressurization Valve (DC)

(3) One Scram Relay Solenoid Train, and

(4) One Shutdown Condenser Control Valve Train

The small Shutdown capability for a fire in the Electrical Equipment Room, Machine Shop, and Electrical Penetration Room is identical to that described for the Turbine Building.

Due to the original design of LACBWR these modifications do not provide total compliance with III.G.2 of Appendix R. By separating a redundant scram train, a shutdown condenser control valve train, and protecting the two MDS valves from hot shorts there will still exist common areas in which total separation of trains cannot be achieved. Cables of these systems are common in the Control Room, Electrical Equipment Room and Electrical Penetration Room.

Each area and resulting consequences will be discussed in the following.

Control Room

A. AREA DESCRIPTION (Enclosure 2)

1. CONSTRUCTION

a. WALLS

Zone 1C/9B - Turbine Hall to Control Room

This wall is constructed of one-foot thick solid concrete block. There is one fire door with a three-hour fire rating. Several conduits that pass through the wall are imbedded in concrete.

Zone 3C/9B - Office Area to Control Room - Electrical Equipment Room

This wall is constructed of 8-3/8-inch concrete block covered with 3/4 inch plaster on the control room side. There is one fire door with a 1-1/2-hour fire rating.

Zone 4C/9B - Stairwell to Control Room - Shift Supervisor's Office

This wall is constructed of 3-5/8-inch concrete block covered with 3/4-inch plaster on the Shift Supervisor's office side. The stairwell side is 4-inch glazed tile to one course under the false ceiling in the stairwell with the remaining wall construced of concrete block. The Shift Supervisor's Office has one wire reinforced plate glass window to the stairwell (window approximately 3'8" x 3'8").

b. CEILING AND FLOOR

Zone 9B/Roof - Ceiling of Control Room - Roof

The Control Room ceiling is constructed of 24-inch thick concrete.

Zone 9B/9A - Floor Control Room - Ceiling of Electrical Equipment Room

The floor of the Control Room is constructed of 6-inch thick concrete. Numerous penetrations are provided for control and instrument cables to run between the electrical equipment room and the control room. On the electrical equipment room side the cables are sprayed with flamastic.

2. CEILING HEIGHT

Ceiling height approximately 13 feet.

3. ROOM VOLUME

The rocm volume of the Control Room is approximately 20,403.5 ft^3.

4. VENTILATION

The Control Room HVAC System is located in the Electrical Equipment Room and usually maintains the are between 65°F - 75°F.

5. CONGESTION

The Control Room is a non-congested area.

B. FIRE HAZARD ANALYSIS

The Control Room has numerous electrical and electronic devices and cabling throughout.

DPC requests an exemption for the LACBWR Control Room from requirements of III.G.2, Appendix R for automatic fire suppression and cable separation requirement. This request is based on two factors. The Control Room contains circuits for all of the safety-related, nonsafety-related, and safe shutdown systems in the plant. The LACBWR Technical Specifications requires the Control Room to be continuously manned. Due to the relatively small size and easy access to Control Room panels combined with a very light fire loading and smoke detection system, smoke and/or fire would readily be detected and appropriate corrective action initiated. In operating modes 1, 2, and 3 the control room is manned with a minimum of 3 personnel (2 operators, 1 guard). In addition, the LACBWR Operating Manual has had in place for many years a procedure for shutdown outside Control Room. This procedure has been used and will be discussed in detail later in this submittal. Concerns expressed by your staff on inadvertent operation of the MDS valves due to a hot short which in turn may prevent access to the Containment Building would be greatly reduced by the planned rerouting of the cables from the penetration room to the Control Room.

ELECTRICAL EQUIPMENT ROOM

A. AREA DESCRIPTION (Enclosure 3)

1. CONSTRUCTION

a. WALLS

Zone 1B/9A - Turbine Hall to Electrical Equipment Room

This wall is constructed of concrete one foot thick. There is one double fire door with a three-hour rating. Two cable trays that are sealed with fiberglass insulation and flamastic penetrate the wall. There are also three conduits sealed with flamastic that penetrate the wall. The one remaining conduit penetration is embedded in concrete.

Zone 5/9A - Maintenance Area to Control Room - Electrical Equipment Room

This wall is constructed of 5-5/8 inch concrete block. Three cable trays that are sealed with fiberglass insulation and flamastic penetrate the wall. Five conduits and one mechanical pipe penetration pass through the wall. They will be sealed with concrete or some other suitable means of sealing. The one remaining conduit penetration is embedded in concrete.

Zone 3B/9A - Office Building (Instrument Shop) to Electrical Equipment Room

This wall is constructed of 5-5/8 inch concrete block. It has one fire door with a 1-1/2 hour fire rating. Three air ducts pass through the wall and are suitable sealed. These are fusable link fire dampers in these ducts. Two cable trays passing through the wall utilize fiberglass insulation and flamastic for sealing. There are five conduits and pipes passing through the wall that are embedded in concrete.

b. CEILING AND FLOOR

Zone 9A/9B - Ceiling of Electrical Equipment Room - Floor of Control Room

The ceiling is constructed of 6-inch thick concrete.

Numerous penetrations are provided for control and instrument cables to run between the electrical equipment room and the control room. On the electrical equipment room side the cables are sprayed with flamastic.

9A/5 - Floor of Electrical Equipment Room - Maintenance Area

The floor is constructed of 6 inch thick concrete. Four cable trays pass through the ceiling into the electrical equipment room. They are sealed with fiberglass insulation and flamastic on the electrical equipment room side. On the maintenance area side, the cable trays are enclosed in a concrete cable way with sheet metal doors for access. There is also one 4-inch floor drain that is concreted into the electrical equipment room floor/maintenance area ceiling.

2. CEILING HEIGHT

   Approximately 13 feet

3. ROOM VOLUME

   Approximately 13,072 ft^3

4. VENTILATION

   The Electrical Equipment Room is a well ventilated room from the Control Room air conditioning system.

5. CONGESTION

   The Electrical Equipment Room is slightly congested between the Generator plant and Reactor Plant batteries due to the installation of seismic restraints.

B. FIRE HAZARD ANALYSIS

Combustibles in the electrical equipment room include approximately 1500 lbs. of cable insulation that is coated with Flamastic 71A. This cable meets former ICEPA Standards S-19-81 and S-61-402 for flame spread and was installed before IEEE 383 became effective. This represents about 19.5×10^6 BTU or 18,000 BTU per square foot of the room.

The electrical equipment room also houses two separate banks of batteries.

DPC requests an exemption for the LACBWR Electrical Equipment Room from the requirement of III.G.2 Appendix R for the separation of cables and fire barrier requirement. In providing an alternate routing for the one scram train there will still remain two short (approximately 15 feet each) cable runs and the Reactor Relay Cabinet that are in close proximity to redundant cabling and equipment. DPC maintains that the rerouting of cables greatly minimizes the probability of the potential impact of a fire in this area and that the Alternate Shutdown Capability is available and not affected by a fire in this area. Additionally the room is protected by an engineered Halon fire suppression system. This suppression system uses six fire detection heads which are independent of the original fire detection system which uses seven ionization type detectors.

ELECTRICAL PENETRATION ROOM

A. AREA DESCRIPTION (Enclosure 4)

1. CONSTRUCTION

a. WALLS

Zone 6/7 - Electrical Penetration Room to 1B Emergency Diesel Generator Building and Switchgear Room

This wall is constructed of one foot thick concrete with one 8' by 8' area made up of solid concrete block backed by concrete on the 1B Emergency Diesel Generator Building Switchgear Room side to give the area a total thickness of one foot. There is one fire door with a three-hour fire rating. Two cable trays penetrate the wall with fiberglass insulation and flamastic for sealing. The cable tray penetrations on the Diesel Building side are "faced off" with a 1/2" steel plate. On the Electrical Penetration Room side, there is a sheet metal box built around the cable tray penetrations. There are two mechanical pipe penetrations through the wall that have been sealed with concrete.

Zone 1A/6 - Turbine Hall to Electrical Penetration Room

This wall is constructed of 2-foot thick concrete. There are several sealed pipe penetration through the wall.

Zone 5/6 - Maintenance Area to Electrical Penetration Room

This wall is constructed of one-foot thick concrete. There is one fire door with a three-hour fire rating. Three electric cable trays penetrate the wall. They are sealed with fiberglass insulation covered by flamastic material on the Electrical Penetration Room side. On the maintenance area side, the trays enter a concrete cable way that has sheet metal doors for access. There are three mechanical pipe penetrations that have been sealed with concrete or fire retardant sealing.

Zone 6/8 - Electrical Penetration Room to Reactor Containment Building

This wall consists of the steel containment building shell (1.16" thick). The electrical penetrations to the Containment Building pass through the containment shell in this area. They employ the MI type penetrations. All pipes through the containment building are welded to the containment building shell.

b. CEILING AND FLOOR

Zone 6/Roof - Electrical Penetration Ceiling - Roof

The ceiling of the Electrical Penetration Room is constructed of 24-inch concrete.

Zone 6/Floor - Elctrical Penetration Room Floor

The floor of the Electrical Penetration Room is constructed of 6 inch concrete.

2. CEILING HEIGHT

14.25 feet

3. ROOM VOLUME

The room volume of the Electrical Penetration Room is approximately 10,587.75 ft^3.

4. VENTILATION

There is no ventilation in the Electrical Penetration Room.

5. CONGESTION

The Electrical Penetration Room is a non-congested area.

B. FIRE HAZARD ANALYSIS

Combustibles in the electrical penetration are approximatley 600 lbs of cable insulation that is coated with Flamastic 71A. This cable meets former ICEPA Standards S-19-81 and S-61-402 for flame spread and was installed before IEEE 383 became effective. This represents about 7.8×10^6 BTU or 12,000 BTU per square foot of the room.

DPC requests exemption for the LACBWR Electrical Penetration Room from the requirements of III.G.2 Appendix R for cable separation. LACBWR design utilized one electrical penetration area. All power, control, and instrument cables for the reactor containment building are routed through six penetrations in this area. This request for exemption is based upon the low fire loading combined with a fire detection system and the minimal length of cable not meeting the separation criteria. The rerouting of several cables used for the MDS valves, Shutdown Condenser Controls and Scram Circuitry will still be run to the penetration area and not maintain the required separation distance. The proposed cable routing would proceed from the penetration area to the 1B Diesel Building via the shortest route (approximately 15 to 20 ft). To further support our request for exemption, a manual fire suppression system with open heads is installed above the electrical penetrations. This method of fire suppression was accepted by your staff in review and transmittal of Amendment 17 to the Provisional Operating License DPR-45 (Reference 4) The modifications and the availability of an Alternate Shutdown method should meet the intent of Appendix R.

ATTACHMENT 1

PART 3

CONTAINMENT BUILDING

A. AREA DESCRIPTION

1. CONSTRUCTION

a. General Description

The Containment Building (Enclosure 7) is a right circular cylinder with a hemispherical dome and semi-ellipsoidal bottom. It has an overall internal height of 144 ft and an inside diameter of 60 ft, and it extends 26 ft 6 in. below grade level. The shell thickness is 1.16 in., except for the upper hemispherical dome, which is 0.60 in. thick.

The building contains most of the equipment associated with the nuclear steam supply system, including the reactor vessel and biological shielding, the fuel element storage well, the forced-circulation pumps, the shutdown condenser, and process equipment of the reactor water purification system, decay heat cooling system, shield cooling system, seal injection system, emergency core spray system, boron injection system, and fuel element storage well cooling system.

Approximately 300 MI cables and 75 bulkhead conductors penetrate the containment shell. These are in the northwest quadrant of the shell on the grade floor. Pipe penetrations leave the containment vessel 1 to 10 ft below the grade level and enter either at the northwest quadrant into the pipe tunnel that runs to the turbine building, or on the east side into the tunnel connecting the turbine building, reactor building, stack, and the waste treatment and waste gas storage areas.

Excessive external pressure on the building is prevented by two vacuum breakers which start to open when the negative pressure within the building exceeds 0.3 psig.

A 42,000-gal storage tank in the dome of the containment building supplies water for the emergency core spray system and the building spray system. The piping connection to the emergency core spray system is on the botton of the tank. The connection to the spray headers of the building spray system is a standpipe within the tank; the top of the standpipe is sufficiently above the bottom of the tank to leave 15,000 gal of water for use in the emergency core spray system. The storage tank also provides water for use during refueling and during loading of the fuel element shipping cask.

b. Walls (Enclosure 8)

Zone 5/8 - Maintenance Area to Reactor Containment Building

This wall is constructed of 9-inch thick concrete along the main airlock and east side of 1A Diesel Room. The concrete is backed by the steel wall of the main airlock. The Southeast corner of 1A Diesel Room is made up of the Containment Shell (1.16 inch steel). There are no penetrations in this area.

Zone 6/8 - Electrical Penetration Room to Reactor Containment Building

This wall consists of the steel containment building shell (1.16" thick). The electrical penetrations to the Containment Building pass through the containment shell in this area. They employ the MI type penetrations. All pipes through the containment building are welded to the containment building shell.

2. Volume

The total free volume of the containment building is approximately 2.64×10^5 ft^2.

3. Ventilation

Two 30-ton air-conditioning units keep the containment building air temperature at or below 80°F. The units also have steam heating coils to provide heat to the building, in case a prolonged shutdown is necessary during the winter, and provide air circulation throughout the building. Each unit circulates approximately 12,000 cfm of air, of which approximately 6000 cfm is recirculated air and 6000 cfm is ventilation air from outside the containment building.

Air is exhausted from the building by means of an exhaust blower, which discharges approximately 6000 cfm through a pair of isolation dampers and through the containment shell penetration into the suction plenum side of the stack blowers. The exhaust air is pulled from both of the FCP cubicles through two filters located outside the pump cubicles and just upstream of the exhaust blower. The first filter is a coarse filter to remove large particles, and the last is a high-efficiency type filter. An automatic by-pass permits the exhaust blower to continue to circulate air from the pump cubicles whenever the containment isolation dampers are closed.

Ventilation air is admitted into the building through the containment penetration and a pair of isolation dampers, and then through duct work to the suction side of the blower of each air-conditioning unit.

In the event of an accident the containment building can be isolated with a maximum leakage of less than 0.1 percent of the contained volume per 24 hr at design pressure (52 psig).

4. Congestion

The containment building is a non-congested area.

B. Fire Hazard Analysis

Combustibles in the fire area include:

1. About 600 lbs of cable insulation. This cable meets former IPECA Standard S-19-81 or S-61-402. This cable is coated with Flammastic. This represents about 7.8×10^6 BTU or about 2760 BTU per square foot of the cross section area.

2. There remains two 15-gallon lube oil tanks associated with the forced circulation pumps located at the 633 ft level. An exemption has been granted (Enclosure 11) for this small quantity of lube oil. As a result of this exemption, 180 gallons of forced circulation pump coupling oil has been replaced with a non-flammable solution.

3. The ordinary combustibility including wood, paper, plastic, etc., includes only about 250 lbs. This represents approximately 2×10^6 BTU or 700 BTU per square foot.

This total heat load is minimum considering the massive construction of this structure.

CONTAINMENT BUILDING

The following systems or portions thereof are located in the Containment Building which could be used to provide safe shutdown capability in conjunction with a loss of off-site power (LOP).

(1) HPCS System

(2) HPSW to HPCS Valve

(3) HPSW to LPCS Valve

(4) LPCS Valve

(5) Shutdown Condenser System

(6) Control Rod Drive Mechanism

(7) Electrical Penetration Area Inside Containment

(8) Boron Inject System

(9) Manual Depressurization System

(10) Decay Heat Cooling System

The LACBWR Containment Building does not fully comply with 10 CFR 50, Appendix R, Section G.2. DPC has implemented numerous improvements to the fire detection and suppression systems in the past several years.

A fire header and four 3/4" hose stations were removed and replaced by a 3" standpipe with 1 1/2" hose stations at four different levels in containment. A new fire detection system was installed to quickly identify what area within the containment that had indicated the alarm. The fire loading within the building has been reduced by replacing Forced Circulation Pump Coupling Oil (180 gal) with a non-flammable oil.

Additional factors that enhance the fire detection and protection within the containment building include copper sheathed mineral insulated cable that supplies power to the HPCS motors, HPSW to HPCS solenoid valve, HPSW to LPCS solenoid Valve and MDS Valves. The Shutdown Condenser System will have its cabling inside containment replaced with MI cable. Although individual systems components are located in close proximity to each other, the cabling fans out from the penetration area to the systems within containment (Enclosure 9).

The Containment Building is equipped with a manual spray system with over 110 nozzles which was designed for reducing pressure and scrubbing free halogens from the atmosphere in the event of a major Loss of Coolant Accident. With the numerous spray heads within the Containment Building this system could be used for fire suppression. The manual spray can be operated from inside the containment building or from the control room via a valve extension located in the southeast corner behind the vertical panels. (Enclosure 10).

Due to the simple design and relatively small size of LACBWR the fire brigade can quickly (within 5 minutes) respond to the fire area. This is no exception for the Containment Building.

The roving operator is required to tour the containment building at least twice per shift. Abnormal conditions existing within the containment building could be detected by the operator during his routine tour.

Based on the aforementioned information, DPC requests an exemption for the Containment Building from the requirements of 10 CFR 50 Appendix R Section G.2 requiring 20 ft cable separation and automatic fire suppression. The multiple prevention, detection, and suppression methods combined with the basic design of LACBWR provide rapid detection and deployment of personnel to effectively combat a fire in the containment building prior to any major damage occurring. Relocating equipment to increase separation of redundant systems is not possible due to the physical design of the containment building.

ATTACHMENT 1

PART 4

SAFE SHUTDOWN CAPABILITY

The La Crosse BWR was not designed to prevent fire-induced failures of safe shutdown associated circuits and, hence, does not comply with current guidelines. However, its alternate shutdown mode utilizing nonelectrical components is advantageous when considering "Associated Circuits." Since the alternate shutdown mode is nonelectrical, it does not share a common power source with redundant equipment and, therefore, does not have to be electrically protected by coordinated circuit breakers. Since the alternate shutdown equipment is located inside the Reactor Building and at the Crib House, it does not share a common enclosure with redundant shutdown equipment.

However, there is equipment whose spurious operation would adversely affect the shutdown capability. If one were to postulate fire-induced hot shorts in the control cabling to certain high pressure/low pressure interfaces, safe shutdown could be prevented.

LACBWR has a highly reliable alternate capability for safely shutting down the reactor, maintaining hot shutdown, and quickly cooling down the reactor at a controlled rate. The most limiting method uses no electrical pumps, electrical controls or indication.

In the event that a fire in the Control Room, Electrical Equipment Room or Electrical Penetration Area caused a loss of reactor control from the Control Room, the operators at LACBWR are trained to perform the necessary control functions manually. Volume I of the LACBWR Operating Manual presently contains two procedures, Emergency Reactor Shutdown and Cooldown From Outside the Control Room, which provide the directions for maintaining the plant in a safe condition. Additional procedural guidance will be provided for controlling the plant in the event loss of reactor control from the Control Room is caused by a fire.

The specific operator actions required in the event one or more of these vital areas is lost will depend on what actions can be taken prior to evacuation of the Control Room or loss of control functions resulting from a massive cable failure. In the event of a serious fire in the Control Room requiring plant shutdown, licensed operators would scram the reactor manually, if the reactor had not already scrammed automatically, and operators would verify insertion of control rods prior to evacuation of the Control Room. In the Containment Building the the neutron level will be monitored with a portable instrument stored in the Containment Building to verify reactor shutdown in accordance with the procedure for Emergency Reactor Shutdown and Cooldown From Outside the Control Room. One operator will control reactor pressure (and also cooldown rate) by manually throttling the steam inlet valves to the Shutdown Condenser after locally failing the steam inlet control valves on the Shutdown Condenser. This is accomplished at the Shutdown Condenser Platform by valving out the air supply and venting the air regulator. Reactor pressure will be monitored at the Reactor Heise Gauge located on the Mezzanine Level of the Containment Building. Reactor cooldown rate will be monitored and recorded based on reactor pressure and the steam tables. Radio communication will be established with the second operator stationed at the Decay Heat Blowdown Valve and the nearby reactor water level gauge which is completely mechanical and not affected by any electrical fault. The local manual control for the MSIV will be placed in the shut position to prevent a highly unlikely hot short to occur to the dual solenoid valves. The combined actions of these operators will provide manual control of reactor water level, temperature and pressure.

If 480V AC power is not interrupted, numerous methods are available to provide makeup water as necessary to the reactor or shutdown condenser. Manual control of pump breakers outside the affected fire area for Demineralized Water Pumps, High Pressure Core Spray Pumps, and the Decay Heat Pump would be utilized. However, a loss of all AC power as a result of the posutlated fire would require use of one of two diesel driven High Pressure Service Water Pumps located in the Crib House that draw their suction from the Mississippi River. These pumps would start automatically on loss of header pressure due to loss of power to the electric HPSW pump and provide makeup cooling water to the Shutdown Condenser. As previously described, the ESWSS gasoline driven pumps could also supply water to the HPSW header. The reactor would not require makeup since the closed cooling loop utilizing the Shutdown Condenser would not cause a loss of inventory. The total shrink of primary coolant during plant cooldown from operating temperature to cold shutdown lowers reactor vessel water level by less than 9 inches.

The procedure detailing the safe shutdown from outside the Control Room has been part of the Operating Manual since 1975. Enclosure 6 provides a basic system interrelationship drawing and P&ID's of the major safe shutdown systems.

These procedures (Enclosure 1) will be modified and training completed by October 1, 1982 to emphasize operator action to overcome potential electrical faults as a result of a fire which may hamper the safe shutdown and cooldown of the reactor. Of particular concern is the potential for opening of Manual Depressurization System Valves due to a hot short, while the Shutdown Condenser is in operation. Opening of MDS valves due to a hot short will be minimized by the proposed rerouting of control cables from the penetration area through the 1B Diesel Generator Room and on the exterior Turbine Building wall and entering the Control Room thereby avoiding the major cable trays containing safe shutdown circuitry. In August 1974 an instrument bus fault occurred which caused a loss of instrumentation in the Control Room. This essentially rendered the Control Room inoperable. Incident Report DPC-74-20 (Enclosure 5) documents the actions taken by the operators. The reactor was operating at 96% power when the fault caused the scram. Two operators entered the containment building and controlled the reactor cooldown. One operator manned the steam inlet valve to the Shutdown Condenser and the second operator immediately manned the Decay Heat Blowdown Valve since the HPCS pumps were available to provide makeup. This method of operation was relied on for a period of 1 hour and 15 minutes when the instrument bus was restored. Water level and pressure were monitored with direct readout non-electrical equipment.

Makeup water for the shell side of the Shutdown Condenser and Component Cooling Water Coolers could be provided at all times since the Crib House complies with Appendix R, Section G.2. This would allow use of the Decay Heat System to attain cold shutdown as is done in a routine plant cooldown. Therefore, the plant could be maintained in hot shutdown for 72 hours and/or brought to a cold shutdown condition within the same 72 hour period, satisfying the requirements of Paragraph III.L of Appendix R to 10 CFR 50. Without electrical power cold shutdown can be obtained by using the shutdown condenser and a manual feed and bleed process within the 72 hour period.

SUMMARY

Dairyland Power Cooperative maintains that LACBWR will acceptably comply with 10 CFR 50, Appendix R, Section III.G when the proposed rerouting of control cables for the Manual Depressurization System, one train of the Scram Relay circuitry and Shutdown Condenser Controls is completed. DPC will provide additional emergency lighting to fully illuminate the access and egress routes to the shutdown control stations. These modifications will give additional time and assurance to conduct a safe shutdown and cooldown without off-site or on-site electrical power.

<u>REFERENCES</u>

1. Letter, Linder to Crutchfield, LAC-7355, dated February 2, 1981

2. Letter, Crutchfield to Linder, dated February 25, 1981

3. Letter, Linder to Ziemann, LAC-6740, dated January 17, 1980

4. Letter, Zieman to Linder, dated July 27, 1979

3.3.2 Complete Loss of Electrical Power

3.3.2.1 Symptoms.

(1) Reactor scram.

(2) Alarms on Panel "D."

(a) D7-1, "Reactor MCC 1A Voltage (Lo)."
(b) D7-2, "2400 V Bus 1A Voltage (Lo)."
(c) D7-3, "2400 V Bus 1B Voltage (Lo)."
(d) D7-4, "Turbine MCC 1A Voltage (Lo)."

3.3.2.2 Possible Causes.

(1) Station power failed to transfer, after a reactor scram, or generator lockout relays 86G1 or 86G1X tripping.

(2) Tie line relays 186F or 186F1 tripping followed by a scram.

(3) Loss of 69KV Bus.

3.3.2.3 Immediate Action.

(1) Follow "Scram Procedure," LACBWR Operating Manual, Volume I, Section 3.3.1, with the following exceptions:

(a) The reactor feed pump will not be running.
(b) The shutdown condenser may need to be used for pressure control since main condenser vacuum cannot be maintained.

(2) Ensure Emergency Diesel Generators 1A and 1B are supplying Essential Buses 1A and 1B.

(3) Ensure DC Emergency H_2 Seal Oil Pump and Emergency DC Bearing Oil Pump are running.

(4) Ensure that one HPSW Diesel Fire Pump starts when HPSW Header pressure drops to 60 psig.

(5) When control air pressure drops to 75 psig, ensure that the Backup Air Compressor starts.

(6) Maintain reactor water level with the High Pressure Core Spray Pumps.

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
L. Goodman	2/9/82	[signature]	2/9/82	[signature]	2/17/82

(7) Prior to steam pressure reaching 1000 psi, or vacuum reaching 19.5 inches Hg, place bypass keys for Reactor Building Steam Isolation Valve Not Full Open Scram Bypass Circuits 1 and 2, to "BYPASS," to prevent inadvertant shutdown condenser operation.

(8) Restart Component Cooling Water Pump.

3.3.2.4 <u>Subsequent Action</u>.

(1) Place the following control switches to stop, or pullout prior to restoring power:

(a) Condensate Pumps 1A and 1B, "PULLOUT."
(b) Reactor Feed Pump.
(c) LPSW Pumps 1A and 1B, "PULLOUT."
(d) Seal Inject Pump 1A "PULLOUT."
(e) Circulating Water Pumps.
(f) 1A and 1B FCP.

(2) Attempt to restore power as soon as possible.

(3) Refer to EPP-1, Table 4.1, to determine emergency action levels and notification.

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
L. Goodman	2/9/82	[signature]	2/19/82	[signature]	2/19/82

3.7 EMERGENCY REACTOR SHUTDOWN AND COOLDOWN FROM OUTSIDE CONTROL ROOM

Objective

To shut down and cool down the reactor plant when Control Room entry is not possible or if all vital control room instrumentation and/or control is lost. The starting steps in this procedure will depend on at what point the Control Room becomes inaccessible or incapable of controlling the reactor plant.

Prerequisites

Equipment necessary to perform this procedure are located as follows:

(1) Keys Necessary to Free Locked Valves are in the Shift Supervisor's Office.

(2) Handi-Talkies (KL9021):

(a) in the Control Room.
(b) one in the Maintenance Supervisor's Office.
(c) one in the Main Entry Emergency Radio Cabinet.
(d) those assigned to the Security Force.
(e) one in the Containment Building Grade Floor inside Main Airlock.
(f) one in the Change Room.

(3) A Graph showing the relationship between saturated water temperature and saturated steam pressure will be located at the Heise Gauge Station in the Containment Building.

Procedure

(1) Enter the Containment Building and initiate a full scram from the Containment Building "MANUAL" scram button.

NOTE: To determine reactor shutdown, use a portable neutron survey meter (stored on Containment Building Grade Floor) to measure neutron dose rate at the purification pump. Neutron dose operating at approximately 50 mr/hr and 0 mr/hr shutdown.

NOTE: If loss of control is due to fire in the Control Room, Electrical Equipment Room, or Electrical Penetration Area, open all 29 rod breakers on Reactor Building MCC1A to prevent inadvertent withdrawal of control rods due to a potential hot short.

(2) Observe local water level indicator located near the decay heat blowdown valve; maintain reactor water level in the positive end of the indicator by:

(a) Allowing the Reactor Feed Pump to operate in automatic level control.

NOTE: It may be necessary to manually trip the Reactor Feed Pump locally by opening the applicable 2400-volt breaker and operating the fast trip lever to prevent an excess water inventory in the reactor vessel.

(b) Taking manual control of the Emergency Core Spray Pumps at their breakers at the Essential Switchgear.

(c) Taking manual control of the Decay Heat Blowdown valve at the valve by handwheel operation.

(d) If reactor water level inventory is decreasing without makeup capability, shut the MSIV at the local control station by going to "CLOSE" on the HVA pilot valve.

(3) Control reactor pressure by throttling the manual steam inlet valves to the Shutdown Condenser (62-24-001 and 62-24-036), & locally failing the steam and condensate valves on the Shutdown Condenser. This is accomplished at t Shutdown Condenser Platform by valving out the air supply and venting the air regulator. Steaming to the Air Ejectors is also available until reactor pressure decreases to 1000 psi.

(4) Every 15 minutes during reactor cooldown, monitor and record the vessel water temperature as determined from reactor pressure Heise gage and the steam tables or graph.

(5) Establish a cooldown rate by slowly adjusting the position of the manual steam inlet valves to the shutdown condenser.

NOTE: Reactor vessel water temperature should not be reduced at a rate greater than 60°F/hr.

(6) If the reactor vessel water cools too rapidly, the following action can be taken as required, in the order listed below:

(a) Adjust the Shutdown Condenser manual steam inlet valves.

(b) Shut down the Air Ejector and "OPEN" the Vacuum Breaker Valve on the Main Condenser.

(7) At 1000 psi reactor pressure, ensure that the Reactor Building Steam Isolation Valve "SHUTS." If not, "CLOSE" it by manual operation of the HVA Pilot Valve.

(8) At reactor pressure of approximately 500 psi, "CLOSE" each "Feedwater Pump Discharge Stop" valve, (65-24-030 and 65-24-031), and manually trip the operating Reactor Feed Pump Breaker if not done in Step (2).

(9) When reactor water temperature is reduced to a point where Shutdown Condenser operation is ineffective or impractical, place the Decay Heat System in operation with maximum flow bypassing the cooler. This indicates approximately 29 psid on the local Decay Heat Pump d/p gage.

CAUTION: Do not place Decay Heat System in service with reactor pressure greater than 500 psi.

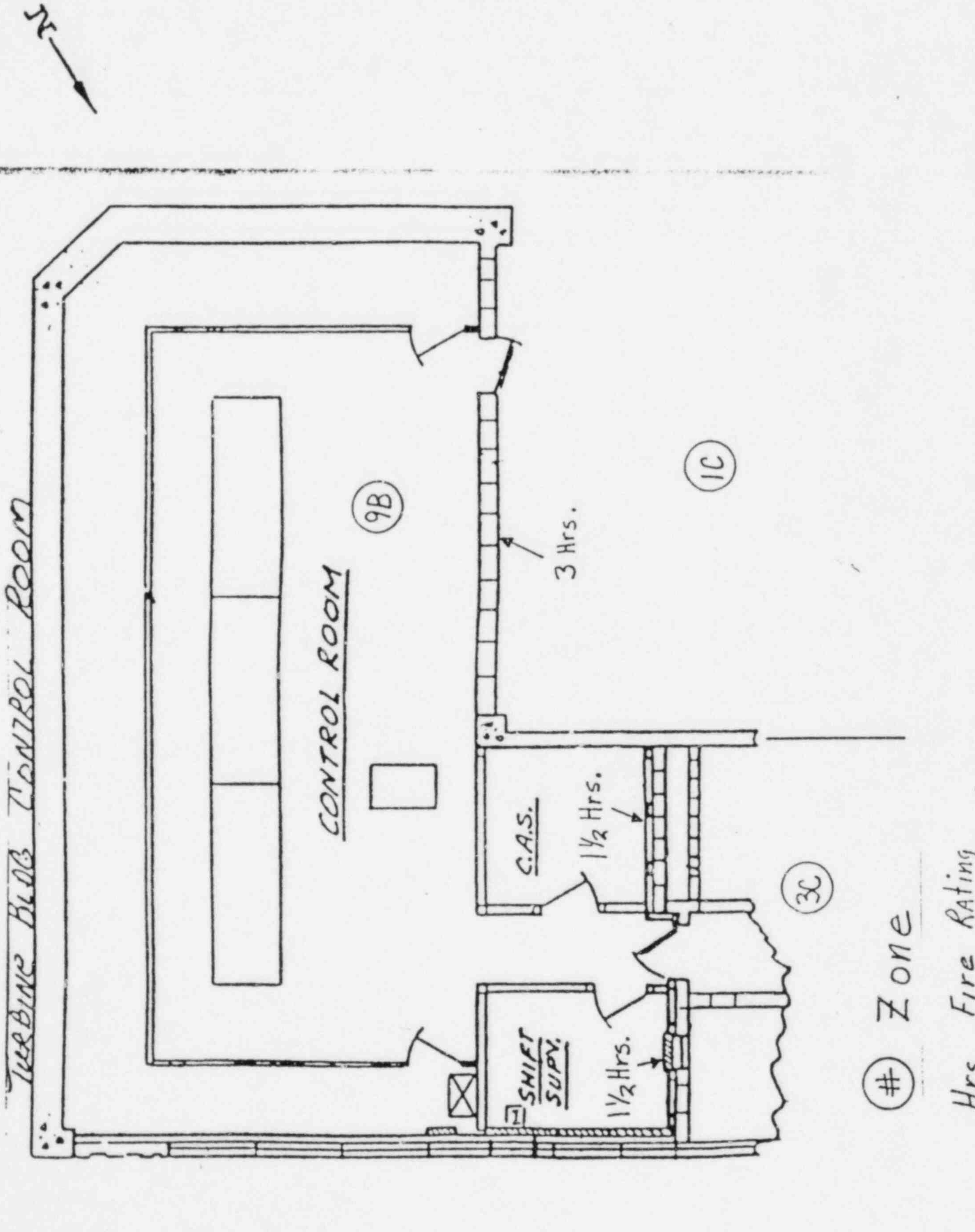
NOTE: If Decay Heat System is unavailable, a feed and bleed method can be used to bring the plant to cold shutdown. With pressure less than 30 psig and no motor or diesel driven pumps available, the LPCS valve from the OHST can be used to feed the reactor and blowdown to the main condenser via the Decay Heat Blowdown Valve.

(10) Continue to cool using the Decay Heat Cooler outlet and bypass valves to control the cooldown rate.

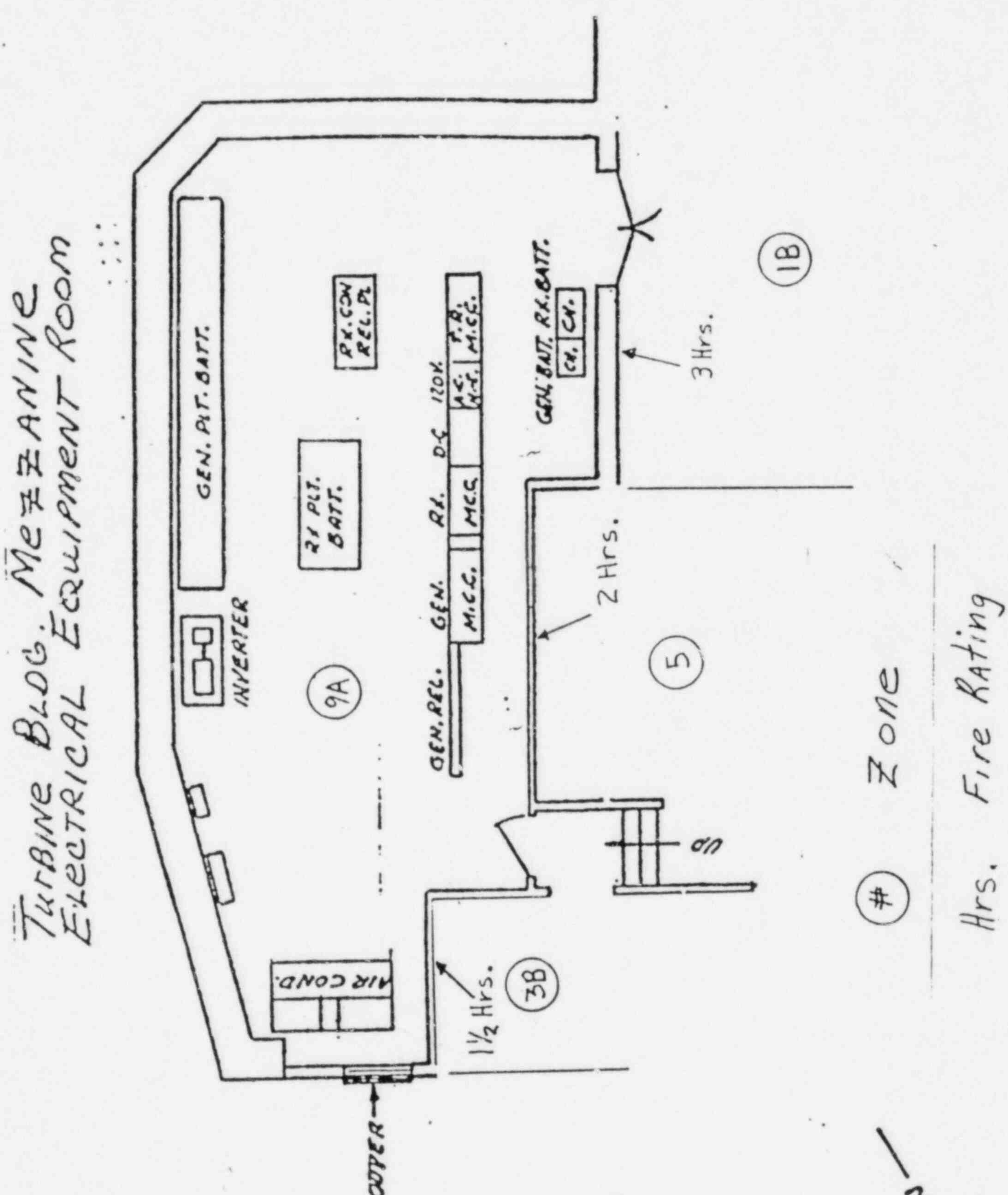
(11) When reactor pressure decreased to 20 psi, begin to "OPEN" vents on reactor head (54-24-003 and 54-24-004). They should be wide open at "0" psi reactor pressure.

NOTE: The reactor plant is now in a cold shutdown condition which can be maintained until Control Room accessibility is restored or other repairs completed.

ENCLOSURE 2

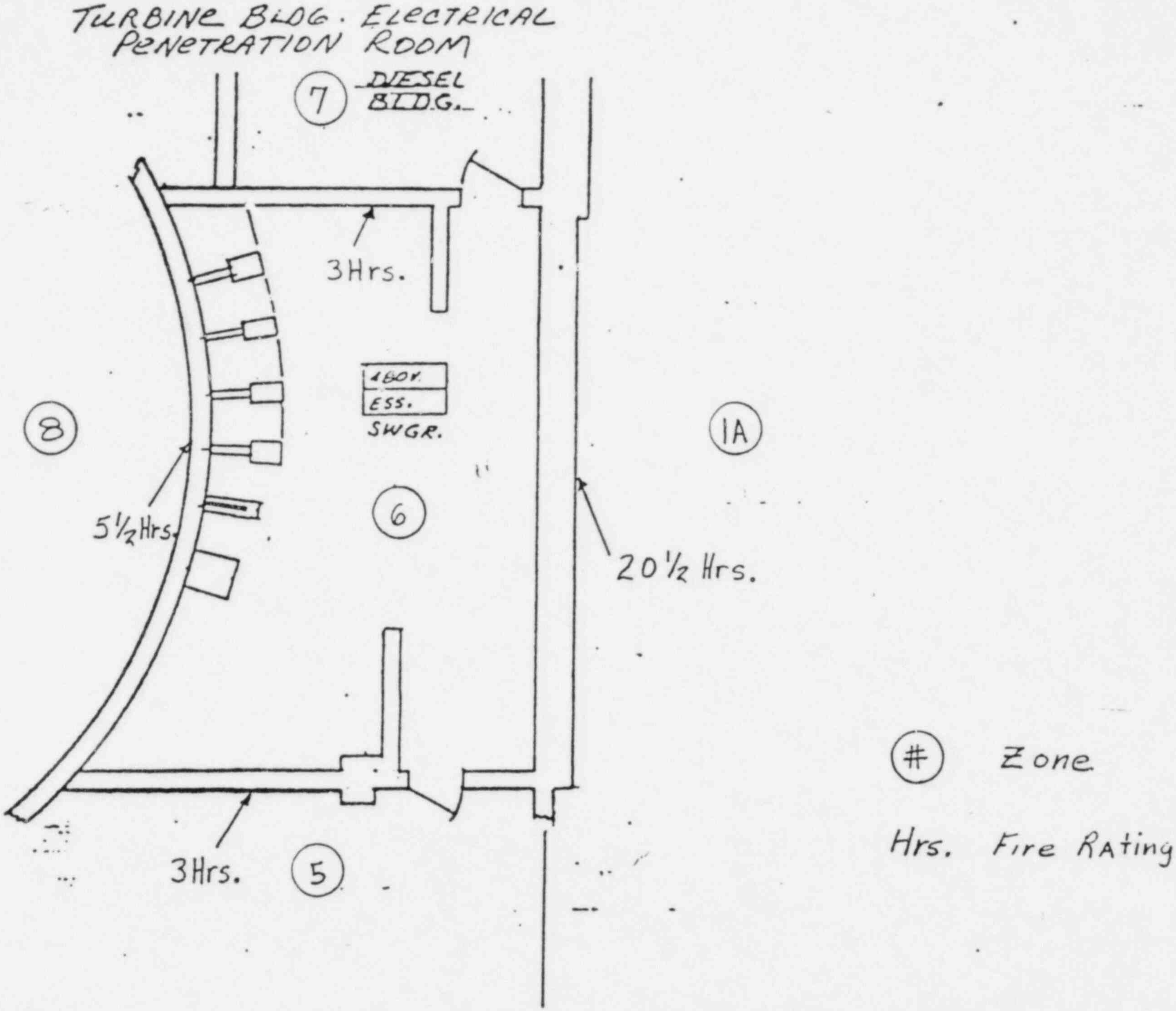

N
TURBINE BLDG CONTROL ROOM
CONTROL ROOM
9B
1C
3 Hrs.
C.A.S.
1½ Hrs.
3C
SHIFT SUPV.
1½ Hrs.
Zone
Hrs. Fire Rating

ENCLOSURE 3



Turbine Bldg. Mezzanine
Electrical Equipment Room
GEN. PLT. BATT.
INVERTER
21 PLT. BATT.
RX. CON REL. PL.
9A
GEN. REL.
GEN. M.C.C.
RX. M.C.C.
D.C.
120V. A.C. M.C.
T.B. M.C.C.
GEN. BATT. CH.
RX. BATT. CH.
AIR COND.
LOUVER
3 Hrs.
2 Hrs.
1½ Hrs.
1B
5
3B
UP
#
Zone
Hrs.
Fire Rating
N

ENCLOSURE 4


TURBINE BLDG. ELECTRICAL
PENETRATION ROOM
7
DIESEL
BLDG.
3Hrs.
480V.
ESS.
SWGR.
8
1A
6
5½Hrs.
20½ Hrs.
3Hrs.
5
Zone
Hrs. Fire Rating

LACBWR INCIDENT REPORT

1.0 Report No. DPC-74-20

2.0 Facility

La Crosse Boiling Water Reactor (LACBWR)

3.0 Date and Time of Incident

1453 August 28, 1974

4.0 Incident Subject

Unplanned Reactor Scram

5.0 Component that Failed

Sola Transformer in RL-1 Bus

6.0 Similar Occurrences

None

7.0 Operating Conditions at Time of Incident

Reactor operating at 96% power with generator connected to the DPC grid at 49 MWe gross.

8.0 Description of Incident

The reactor scrammed on Power Recirculation Flow Abnormal (Low Flow) due to failure of Sola Transformer on RL-1 bus. Other equipment affected by loss of Sola Transformer was Channel #2 water level indication at -30", loss of control on Shutdown Condenser steam valves, Seal Injection System, Decay Heat Blowdown Valve, Shield Cooling Flow Indication, Condenser Hot Well Level Indication, loss of power to Main Steam Rotoport Bypass Valve control.

Both FCP's tripped due to seal leak-off valves going shut. Seal water supply valves for CRD's and both FCP's failed open.

The Shutdown Condenser operated reducing reactor pressure from 1250 psig to 580 psig.

See attached list of items powered by RL-1 bus.

9.0 Immediate Evaluation, Corrective Action and Results

The time involved to determine exactly what caused was approximately 10 minutes. Immediate action was taken to replace failed Sola Transformer when cause of scram was determined. Power was restored to the RL-1 bus 1.25 hours after failure.

During the time power was off on RL-1 bus, an operator was stationed at Decay Heat Blowdown Valve for reactor level control and at the Shutdown Condenser for reactor pressure control. Communications was established with the control room.

The Shutdown Condenser was in operation for 14 minutes from time of scram.

When power was restored to RL-1 bus, normal reactor plant control was assumed. Corrective action was taken and reactor parameters were returned to normal for reactor shutdown (hot) conditions.

10.0 Permanent Corrective Action

Facility Change 74-26 completed provides a safety switch to permit transfer of supply power to an alternate source in the event of indicated transformer failure.

LACBWR Operations Memorandum No. DPC-53 was issued covering this transfer procedure. Further investigation of the failure, its causes and effects, is being conducted to provide sufficient detail for a formal Abnormal Occurrence Report.

R. E. Shimshak, LACBWR Superintendent

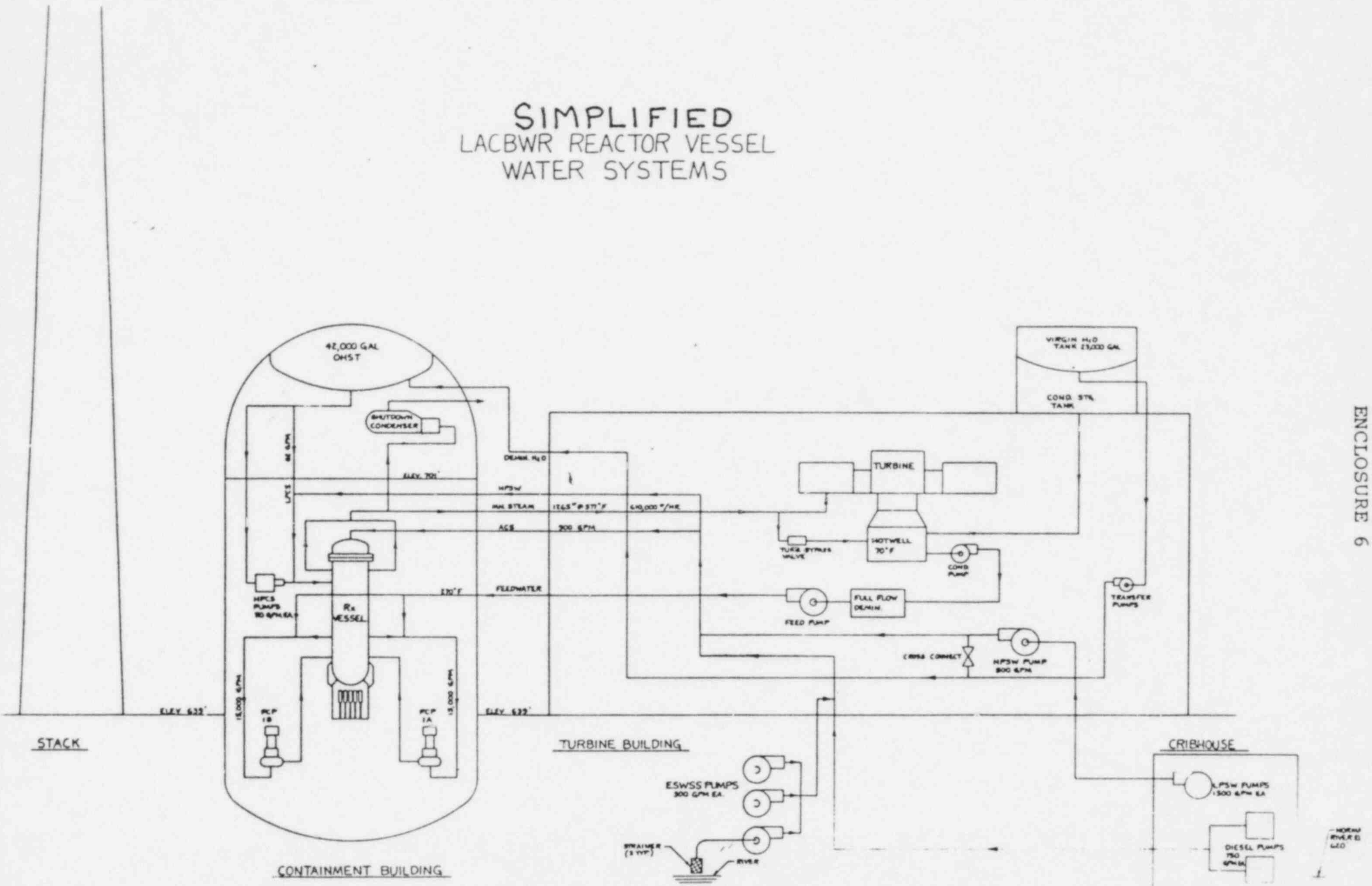
RES:af
Distribution:
SRC & ORC Members

F36	Decay heat to condenser controller (Dwg. 41-503 706)
C28	Feedwater to reactor controller (Dwg. 41-503 707)
C11-2	Reactor FWP 1B Hyd. Coup. Controller (Dwg. 41-503 707)
F21-1	Feedwater to reactor control (Dwg. 41-503 707)
C25a	Alarm Bldg. steam to recombiner (Dwg. 41-503 736)
C26B	Hi Alarm for waste gas compressor discharge pressure (Dwg. 41-503 736)
D16A	Alarm ejector after cooler to holdup tank (Dwg. 41-503 736)
D17A3	Alarm for 1B 12,000 gal. storage tank (Dwg. 41-503 736)
D17A4	Alarm for 1B 12,000 gal. storage tank (Dwg. 41-503 736)
D26A	Alarm for recombiner off-gas (Dwg. 41-503 736)
D27D&F	EMF to current converter for recombiner inlet and outlet temp. (Dwg. 41-503 736)
D27E	Alarm for recombiner inlet & outlet temp. (Dwg. 41-503 736)
C-8-C	Condensate flow from separator to No. 3 heater square root converter MG6 (Dwg. 41-503 730)
F41A	Alarm for mixed bed to regenerative cooler (Dwg. 41-503 736)
F47A	Alarm shield cooling pump (41-503 736)
C-11-1	Reactor feedwater pump 1A hyd. coupling (Dwg. 41-503 707)
F21-2	Reactor H_2O Level (Dwg. 41-503 707)
F53-1	Reactor recirculation pump 1A discharge valve (Dwg. 41-503 708)
F53-2	Reactor recirculation pump 1B discharge valve (Dwg. 41-503 708)
B51	Steam to S/D Cond. (Dwg. 41-503 708)

F58-3	Rod Drive Seal H_2O Flow (Dwg. 41-503 708)
F64-1 & F64-2	Aux. relay reactor recirc. pump 1A speed control (Dwg. 41-503 747)
F58-2	Recirc. pump bearing seal water 1B (41-503 708)
F58-1	Recirc. pump bearing seal water 1A (41-503 709)
55-44-301	Position indication dilution damper
50-42-401	H_2O Level #2 Transmitter
45-43-520	Cavity Monitor Recorder
B54-B	Milliamp relay main steam line reactor steam line (Dwg. 41-503 730)
90-42-602	Condensate storage (Dwg. 41-503 730)
	Seal injection bypass valves (Dwg. 41-503 703)
F7B1,2	Recirc. pump speed indicator (Dwg. 41-503 747)
F7D	FCP speed deviation alarm (Dwg. 41-503 748)
F8a	EMF converter for FCP temp. differential (Dwg. 41-503 747
F8B1, B2	Alarm differential temp. high reactor FCP 1B discharge (Dwg. 41-503 748)
B29b1, b2	Alarm cooling water at shutdown condenser (Dwg. 41-503 748)
C7e	Multiplier, divider steam to turbine (Dwg. 41-503 747)
C7f	Square root converter steam to turbine flow (Dwg. 41-503 748)
C7h	Square root converter feedwater to turbine flow (Dwg. 41-503 748)
B53c	Square root converter shutdown condenser to reactor (Dwg. 41-503 748)
F20b1,b2,b3,b4	Square root converter FCP flow (Dwg. 41-503 748)
F14b1, b2	EMF FCP discharge temperature (Dwg. 41-503 747)

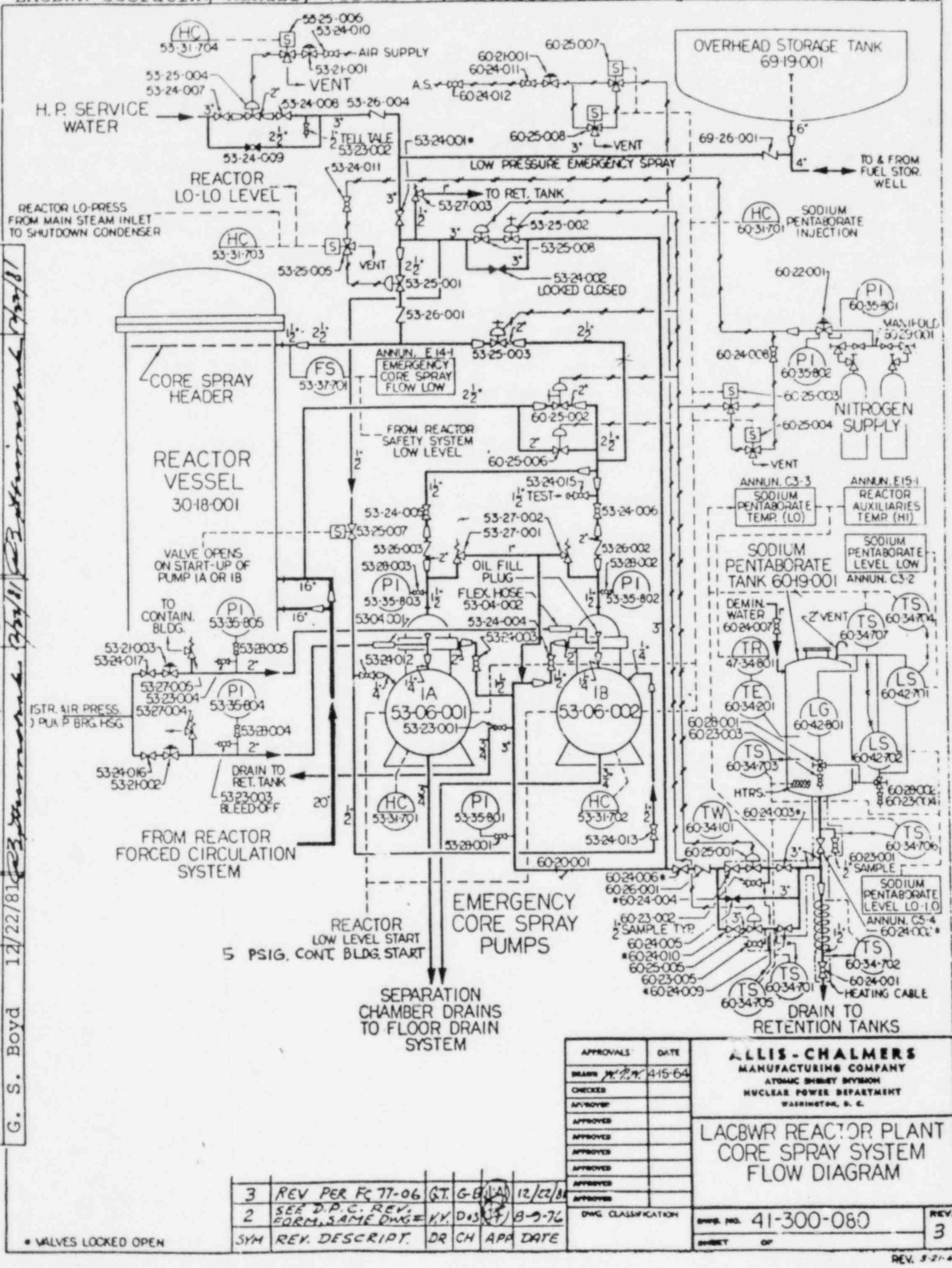
F583e	Lo lo alarm rod seal water flow (Dwg. 41-503 747)
F582d, 1d	Lo lo alarm bearing seal water flow (Dwg. 41-503 747)
F641, 2	Alarm FCP speed interlock (Dwg. 41-503 747)
F67a	Pressure transmitter (used with core spray valve) (Dwg. 41-503 747)
F58-3c	Square root converter rod drive seal water flow (Dwg. 41-503 748)
55-40-501	EMF converter for temperature off-gas (41-503 736)
D17-A-1	#1 12,000 storage tank hi pressure (41-503 809)
D17A-2	#2 12,000 storage tank hi pressure (41-503 809)
B32A	Main condenser level transmitter (41-503 826)
B24-1	IPR controller (Dwg. 41-503 694)
B24-2	Controller narrow range (Dwg. 41-503 694)
B24-3	Wide range controller (Dwg. 41-503 694)
C-3	Manual station, turbine rotoport bypass controller (Dwg. 41-503 696)
B53C	Square root converter shutdown condenser
B24C	Anti windup rel. hi turbine inlet steam initial pressure relay control (Dwg. 41-503 730)
D48a	DC Power Supply (Dwg. 41-503 736)

SIMPLIFIED
LACBWR REACTOR VESSEL WATER SYSTEMS

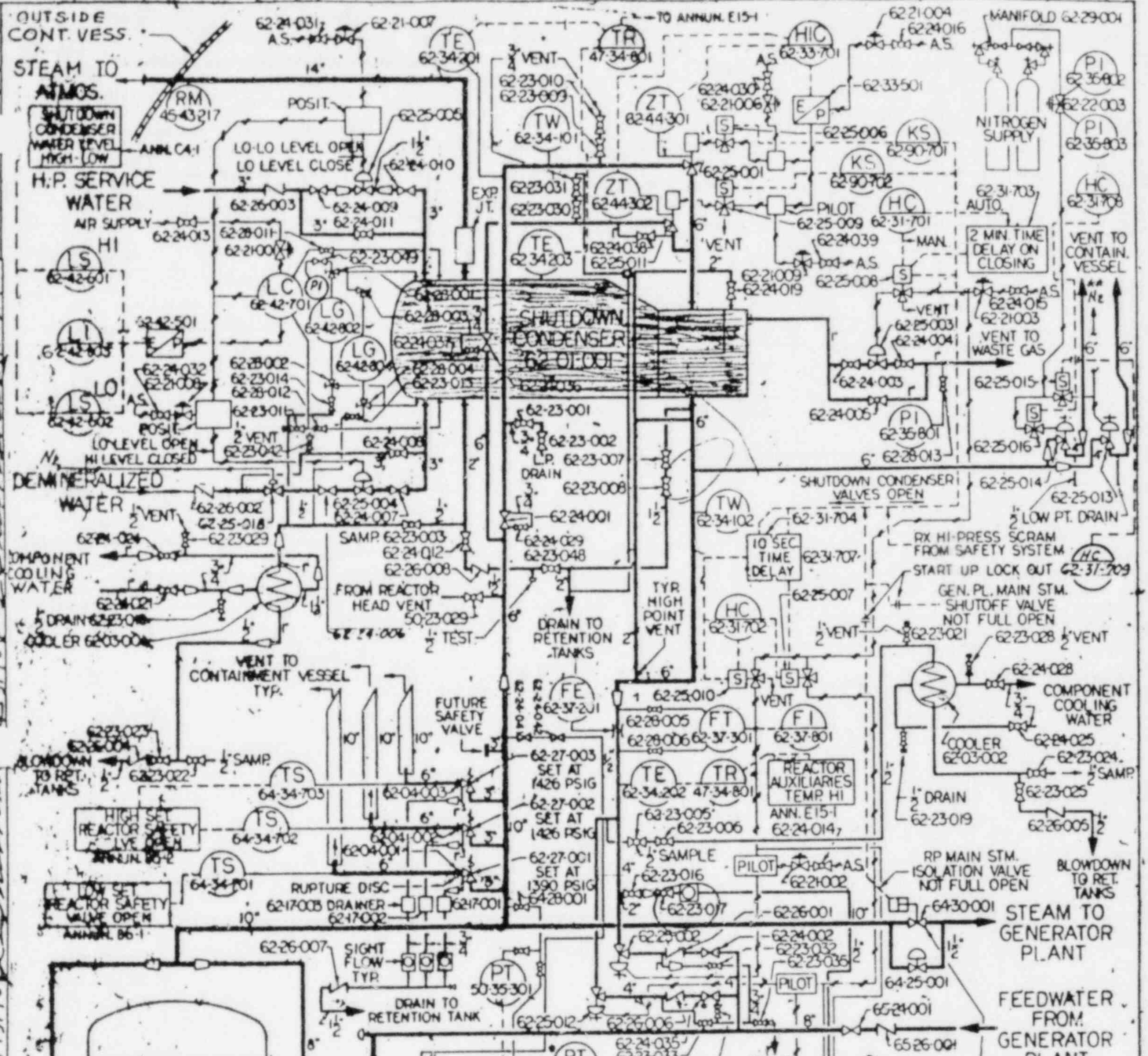


ENCLOSURE 6

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	12/22/81	[signature]	12/23/81	[signature]	12/23/81



Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
L. Ryberg	7/13/76		7/13/76		7/13/76



SHUTDOWN CONDENSER SYSTEM FLOW DIAGRAM

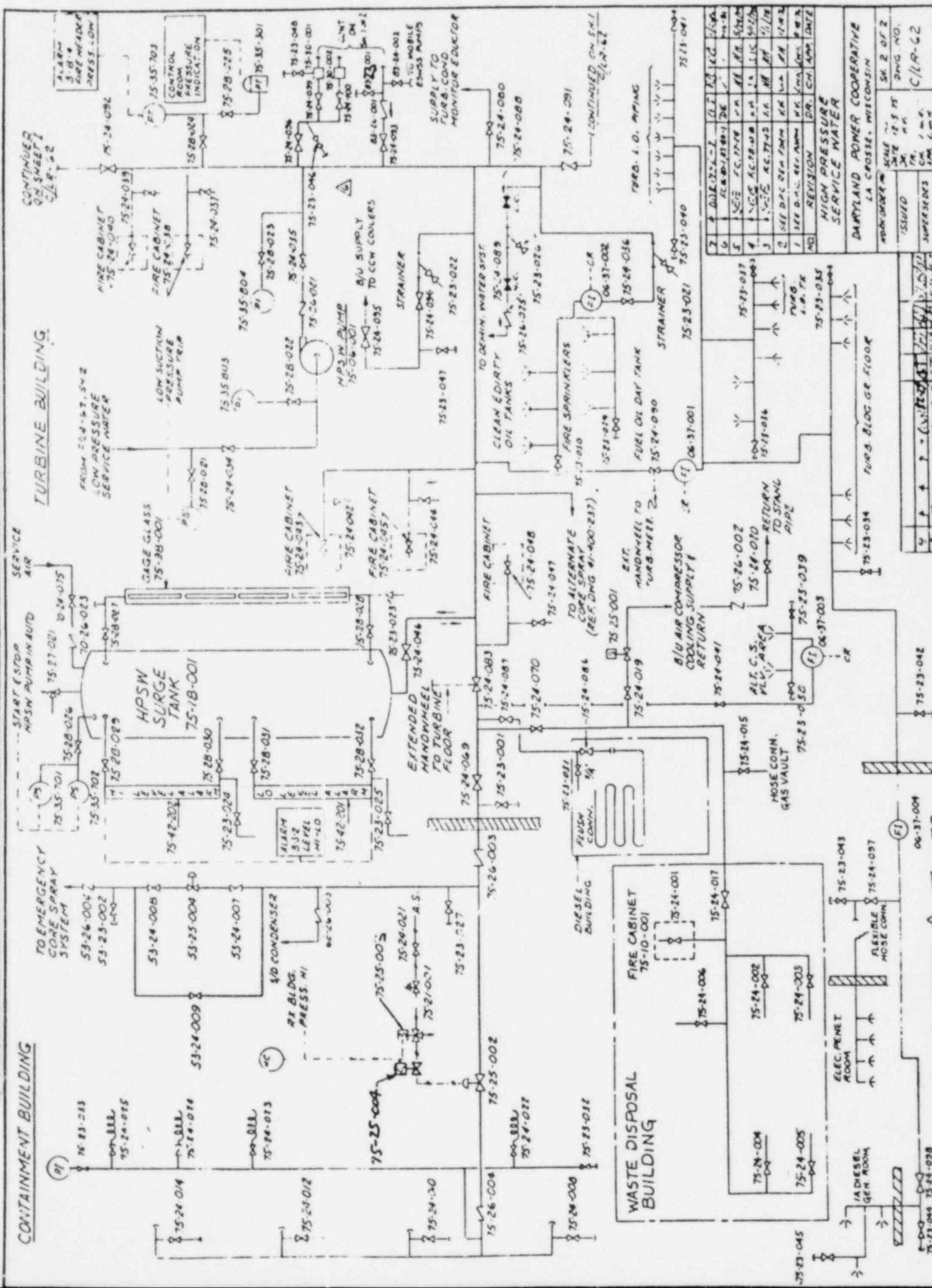
FIGURE 5.5

* N2 SUPPLY TO VLV 62-25-018
* PRESSURE TRANSMITTERS PROVIDED WITH REMOTE AMPLIFIERS.

LACBWR REACTOR PLANT
SHUTDOWN CONDENSER
SYSTEM FLOW DIAGRAM

DWG. NO. 41-300-084

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
R. J. Cota	5/29/82	[signature]	7/1/82	[signature]	7/16/82



Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
R. J. Cota	5/29/82	[signature]	7/16/82	[signature]	7/16/82

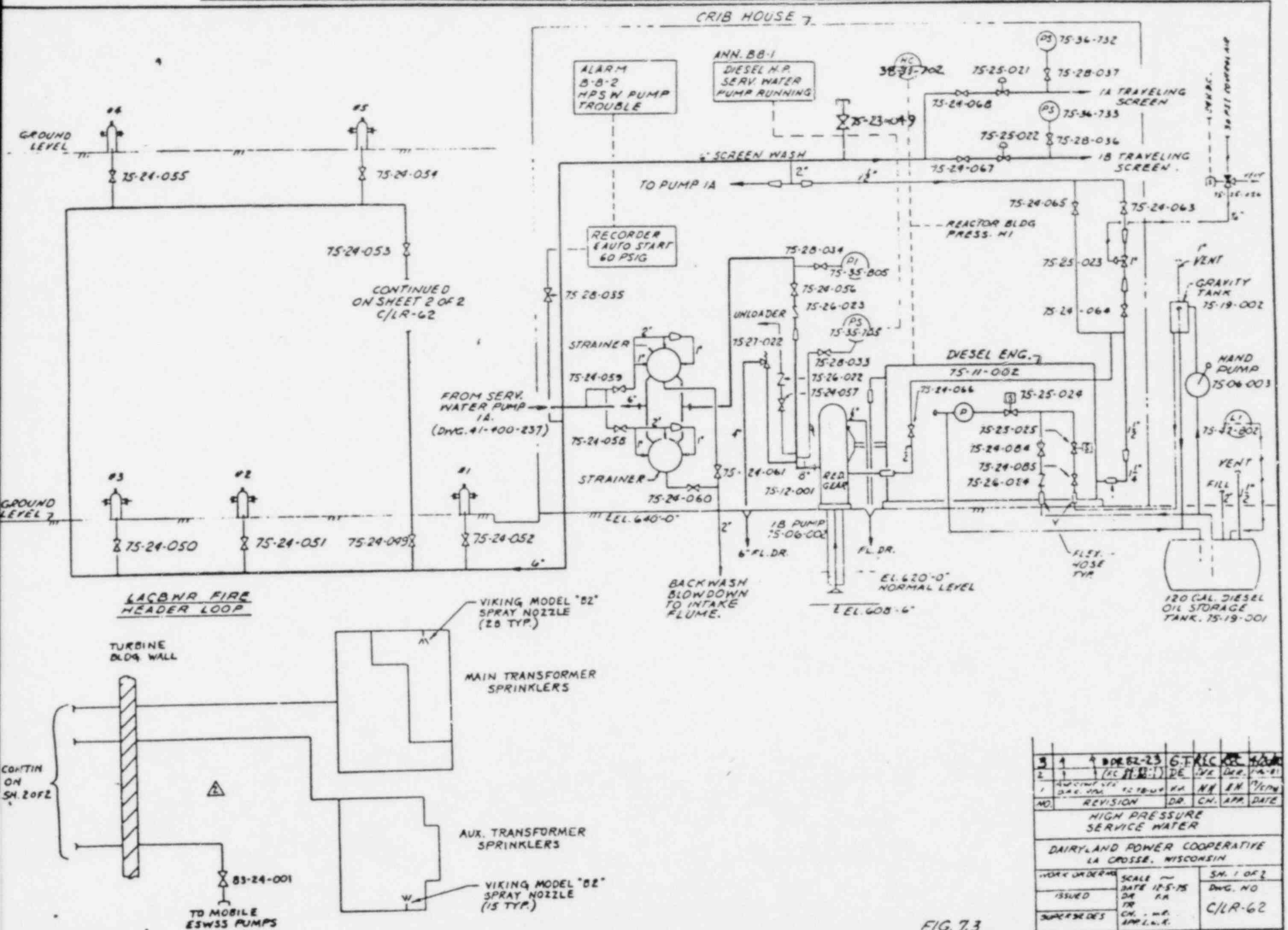
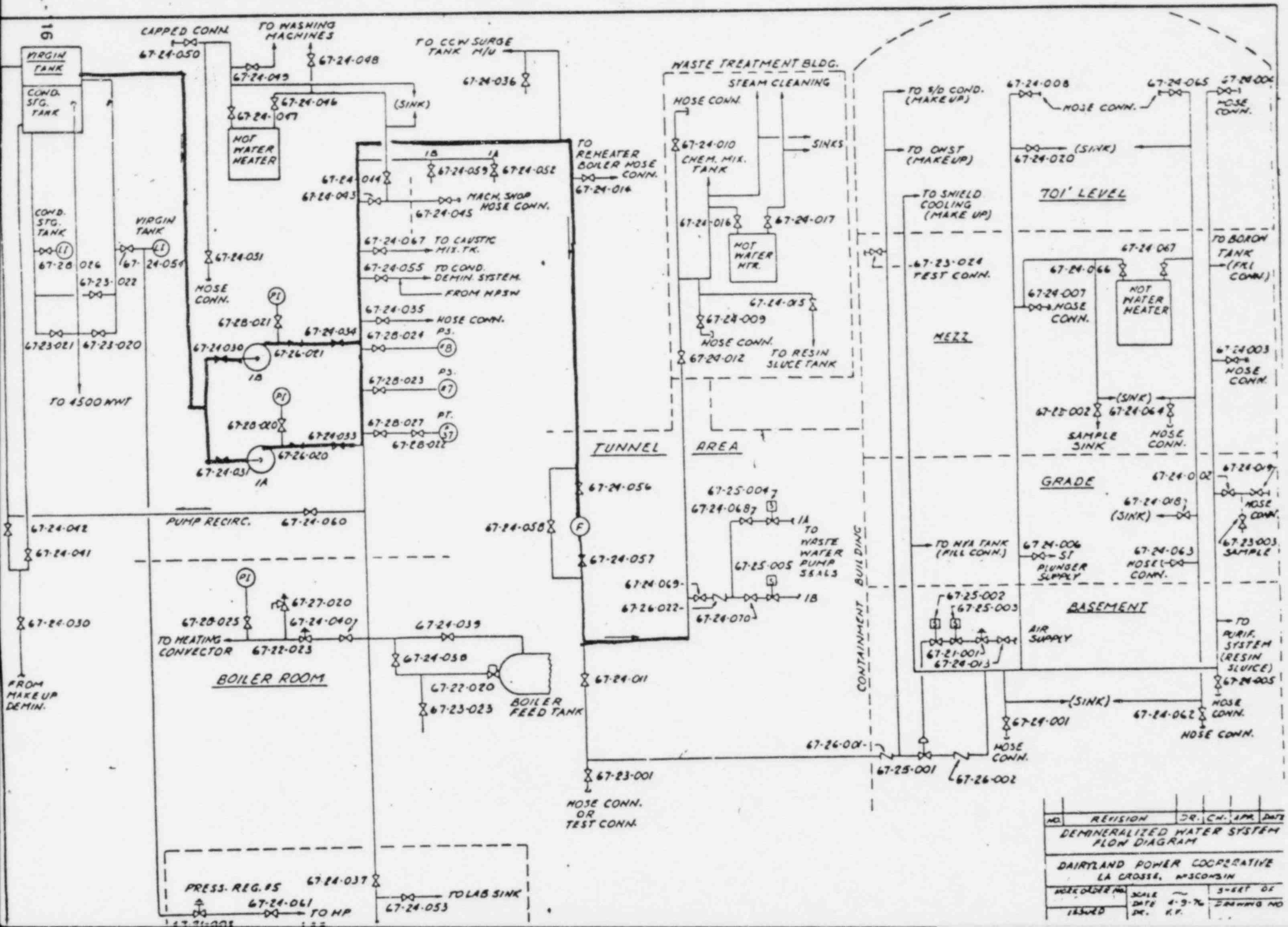


FIG. 7.3

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
Paul Moon	6/10/76		6/10/76		6/10/76

L-16



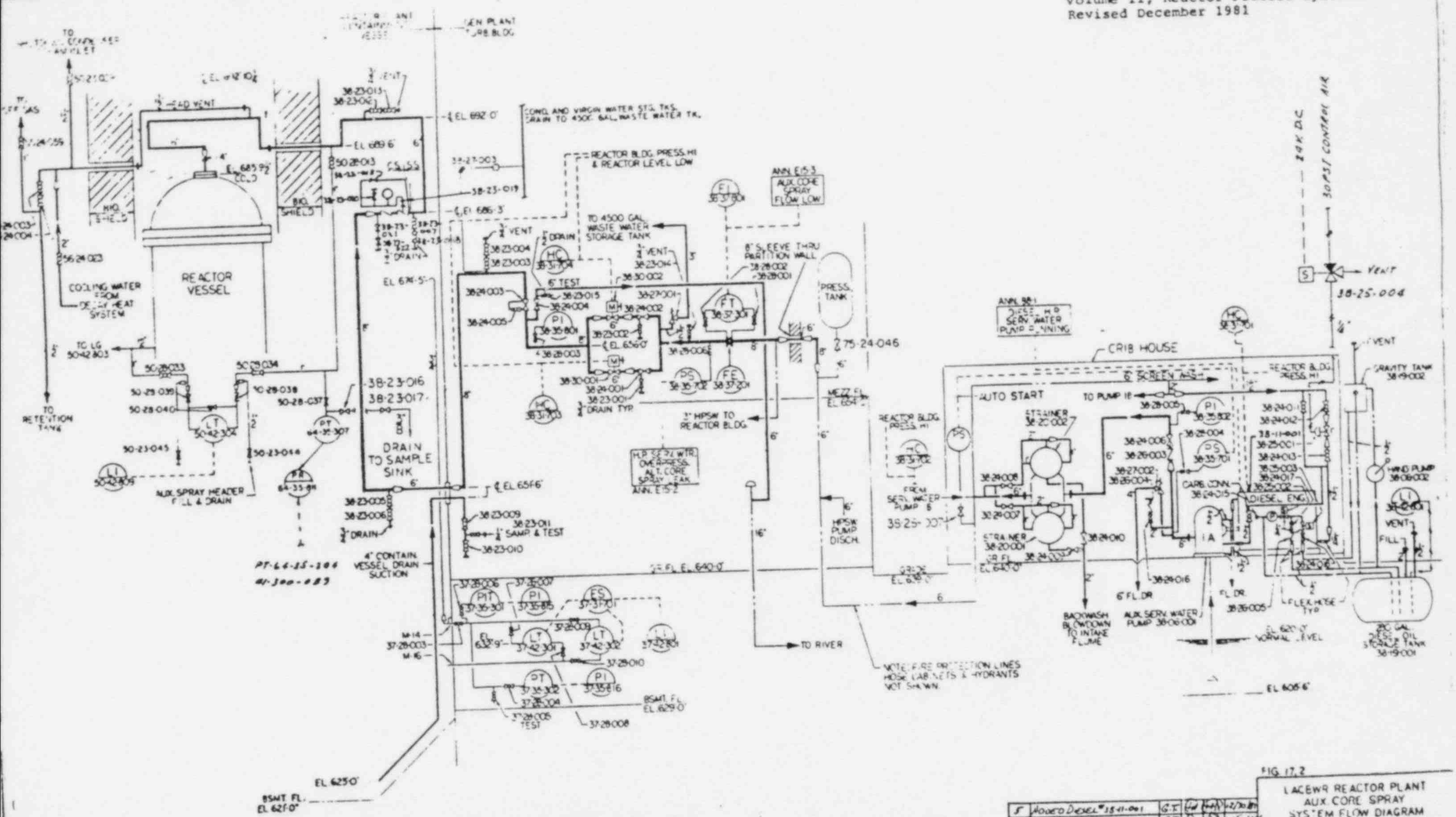


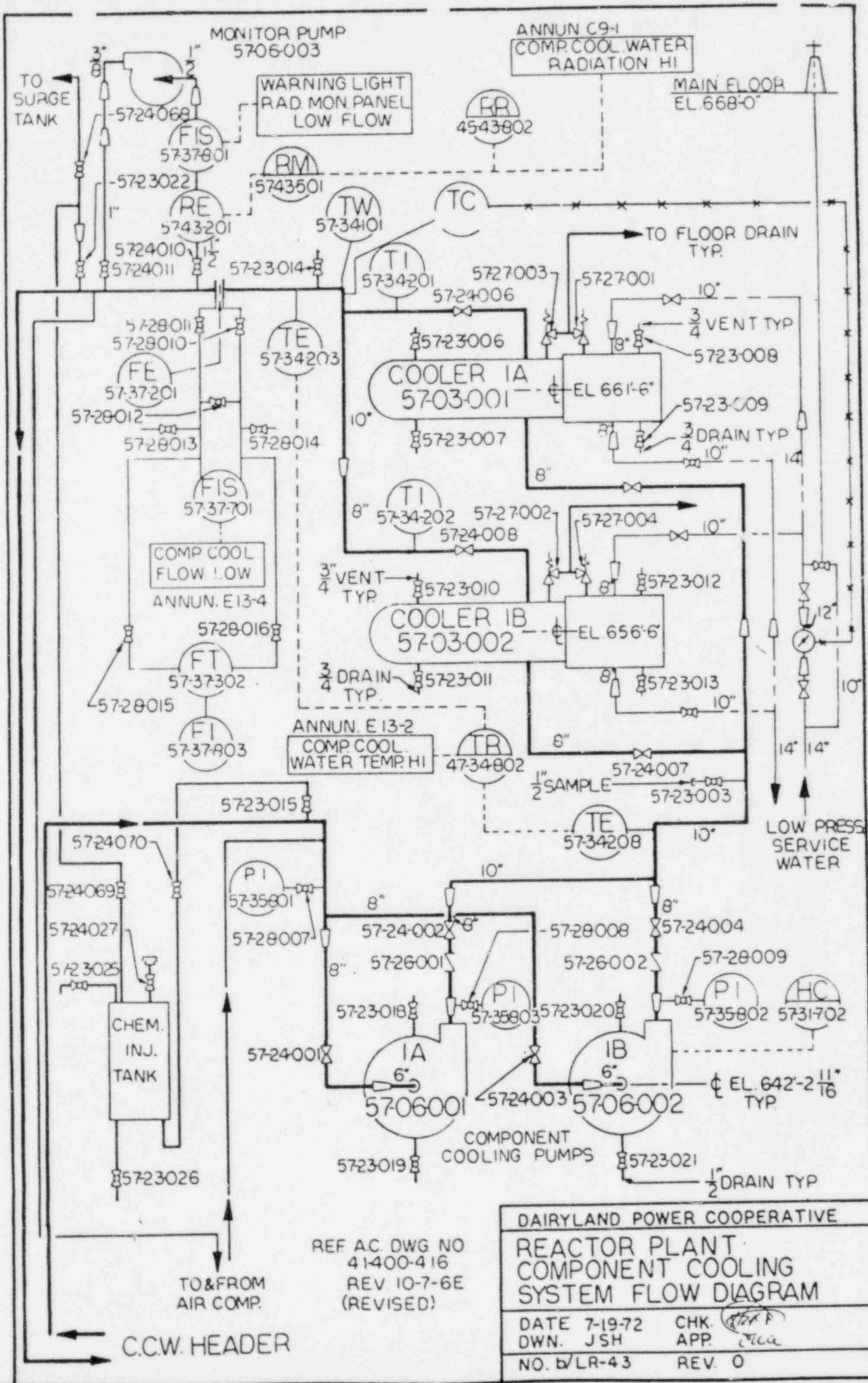
FIG. 17.2

LACBWR REACTOR PLANT
AUX. CORE SPRAY
SYSTEM FLOW DIAGRAM

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	12/22/81	[signature]	12/22/81	[signature]	12/23/81

REV	REVISION DESCRIPTION	BY	CK	APP	DATE
5	ADDED DIESEL 38-11-001	G.T.			
4	FC 38-81-2	G.T.			
3	FC 78-04	K.K.			
2		K.K.			2/4/72

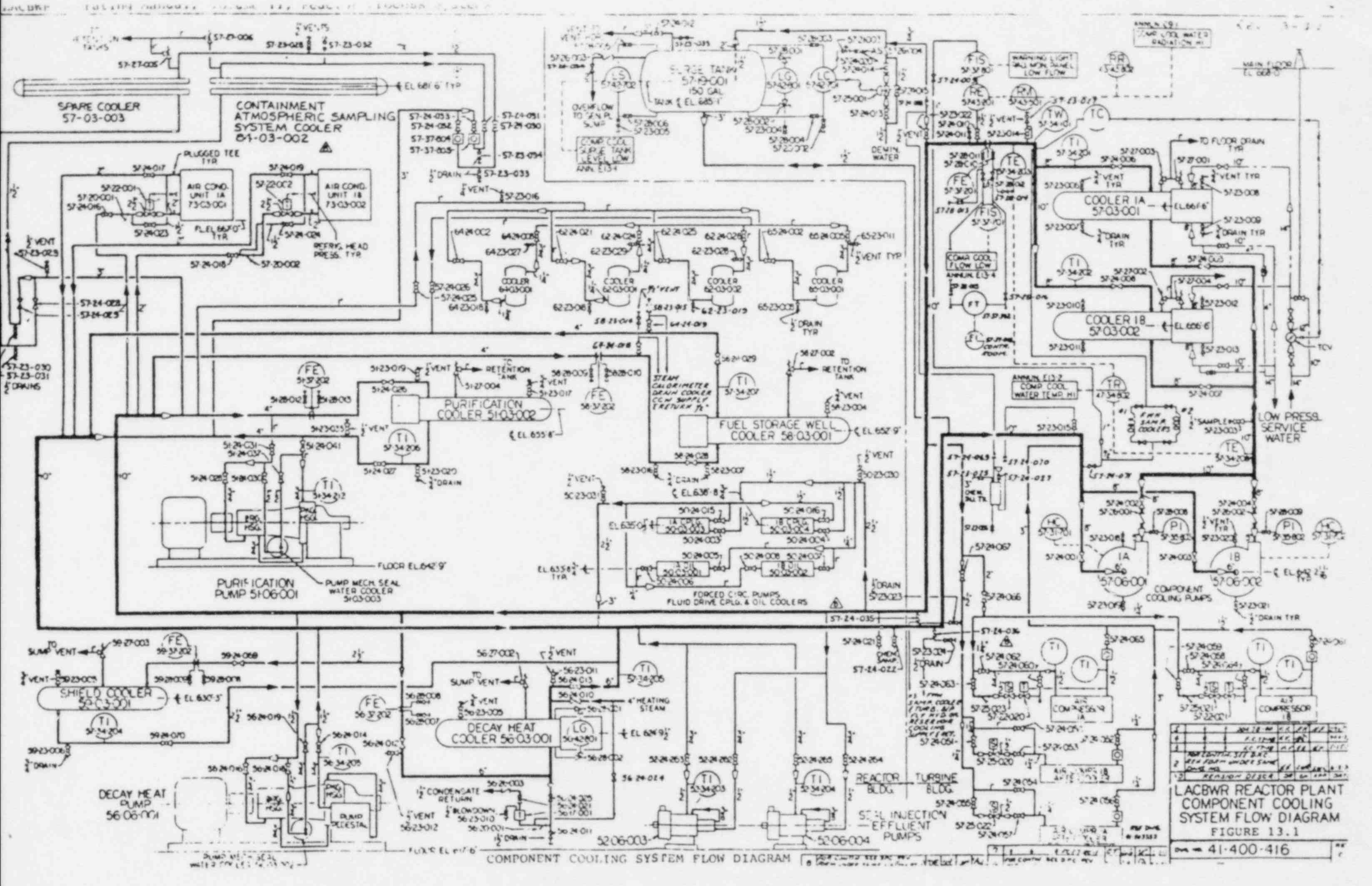
DWG. NO. 41-400-237 REV 5



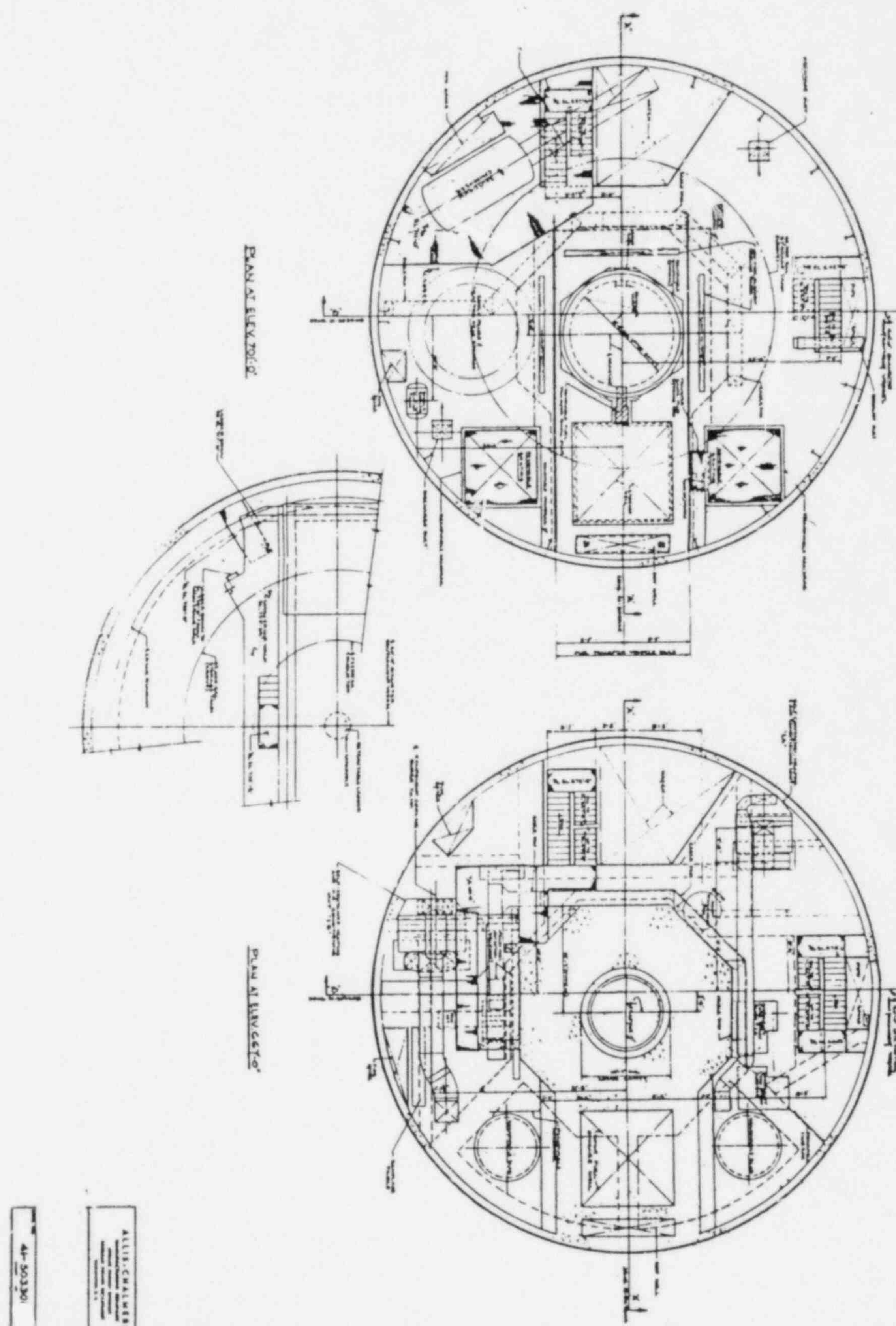
DAIRYLAND POWER COOPERATIVE

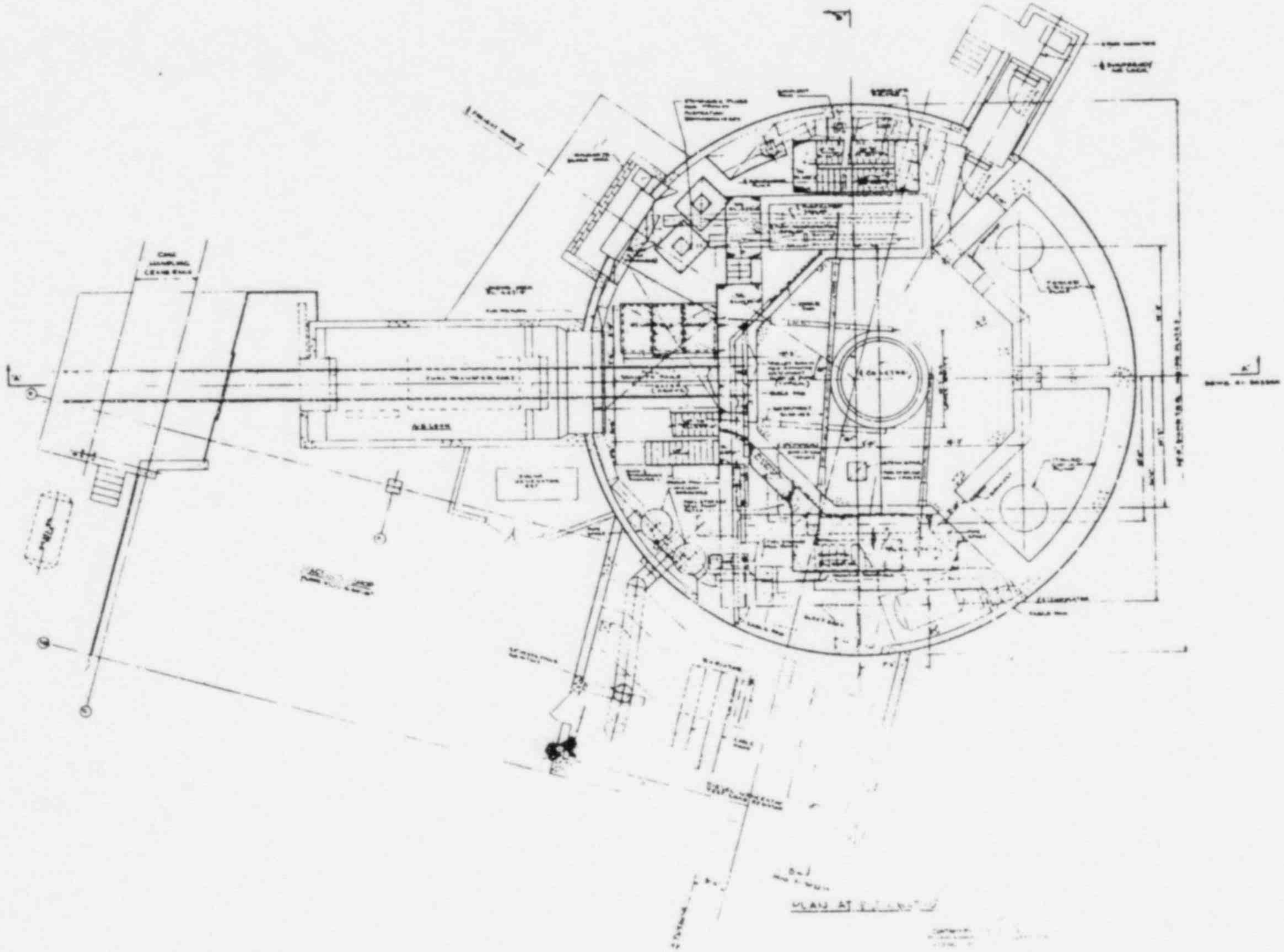
REACTOR PLANT COMPONENT COOLING SYSTEM FLOW DIAGRAM

DATE 7-19-72 CHK.
DWN. JSH APP.
NO. D/LR-43 REV. 0

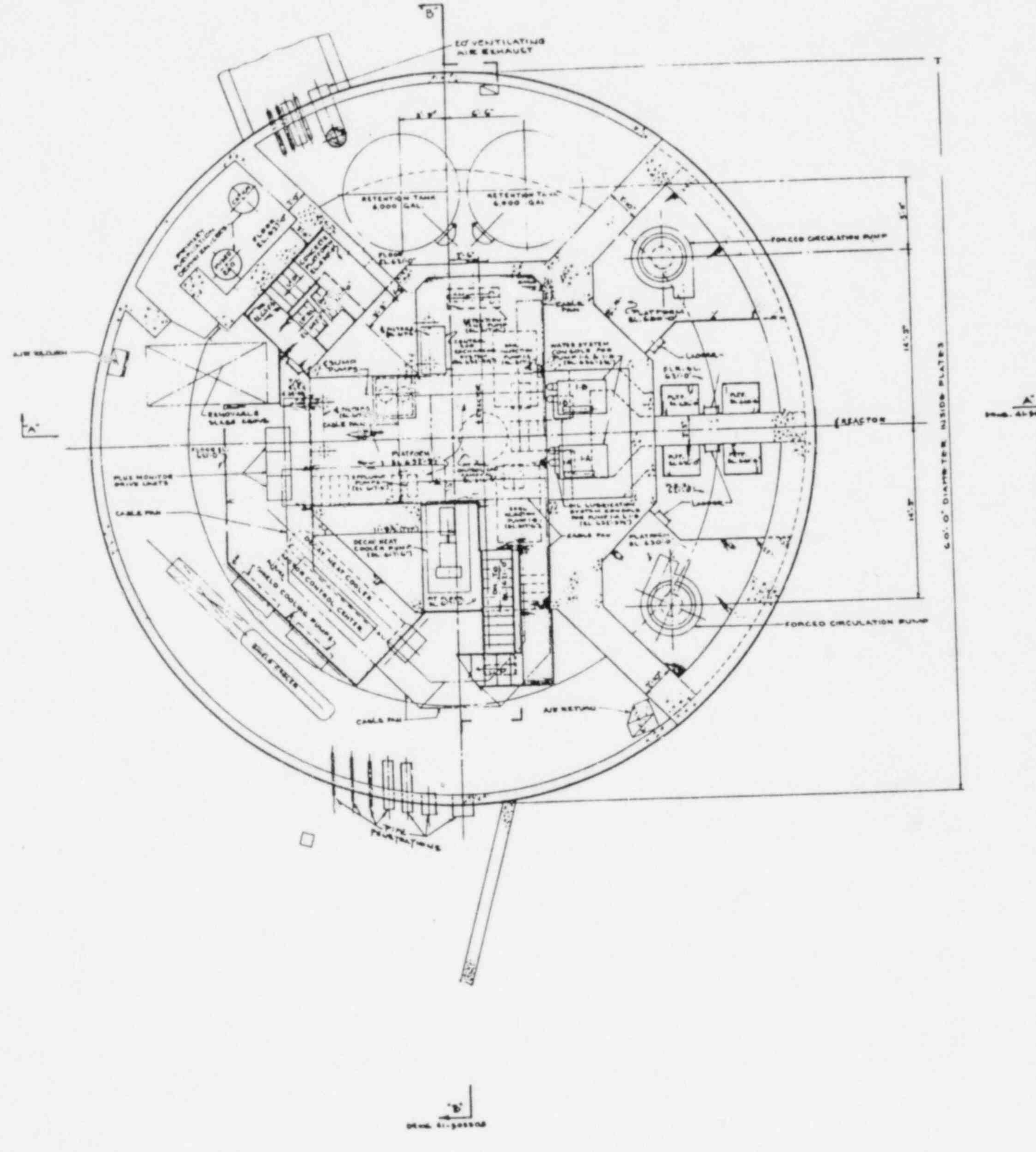

SPARE COOLER
57-03-003
CONTAINMENT
ATMOSPHERIC SAMPLING
SYSTEM COOLER
61-03-002
AIR COND. UNIT 1A 73-03-001
AIR COND. UNIT 1B 73-03-002
SURGE TANK
57-19-001
150 GAL
COMP. COOL SURGE TANK LEVEL LOW
COMP. COOL WATER RADIATION HI
WARNING LIGHT
COOLER 1A
57-03-001
COOLER 1B
57-03-002
COMP. COOL FLOW LOW
COMP. COOL WATER TEMP. HI
LOW PRESS. SERVICE WATER
TCV
COMPONENT COOLING PUMPS
57-06-001
57-06-002
PURIFICATION
COOLER 51-03-002
FUEL STORAGE WELL
COOLER 58-03-001
RETENTION TANK
STEAM CALORIMETER DRAIN COOLER CCW SUPPLY & RETURN
PURIFICATION
PUMP 51-06-001
PUMP MECH. SEAL WATER COOLER 51-03-003
FLOOR EL. 642' 9"
FORCED CIRC. PUMPS.
FLUID DRIVE CPLG. & OIL COOLERS
SHIELD COOLER
59-03-001
DECAY HEAT
COOLER 56-03-001
DECAY HEAT
PUMP
56-06-001
PUMP PEDESTAL
CONDENSATE RETURN
BLOWDOWN
4" HEATING STEAM
REACTOR BLDG.
TURBINE BLDG.
SEAL INJECTION
EFFLUENT
PUMPS
52-06-003
52-06-004
AIR COMPRESSOR 1A
AIR COMPRESSOR 1B
DEMIN. WATER
TO FLOOR DRAIN TYP.
MAIN FLOOR
COMPONENT COOLING SYSTEM FLOW DIAGRAM
LACBWR REACTOR PLANT
COMPONENT COOLING
SYSTEM FLOW DIAGRAM
FIGURE 13.1
41-400-416

<u>ENCLOSURE 7</u>

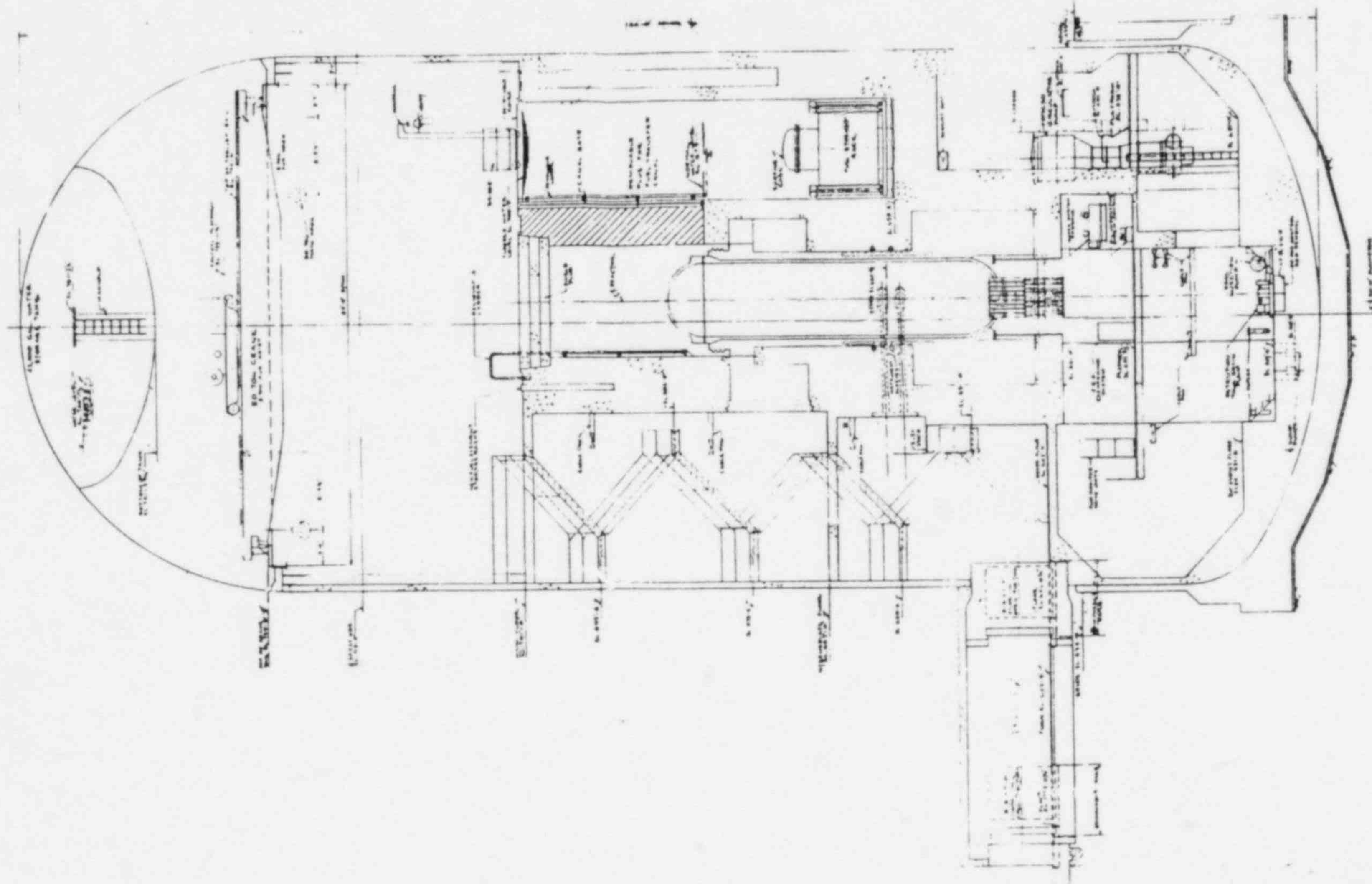




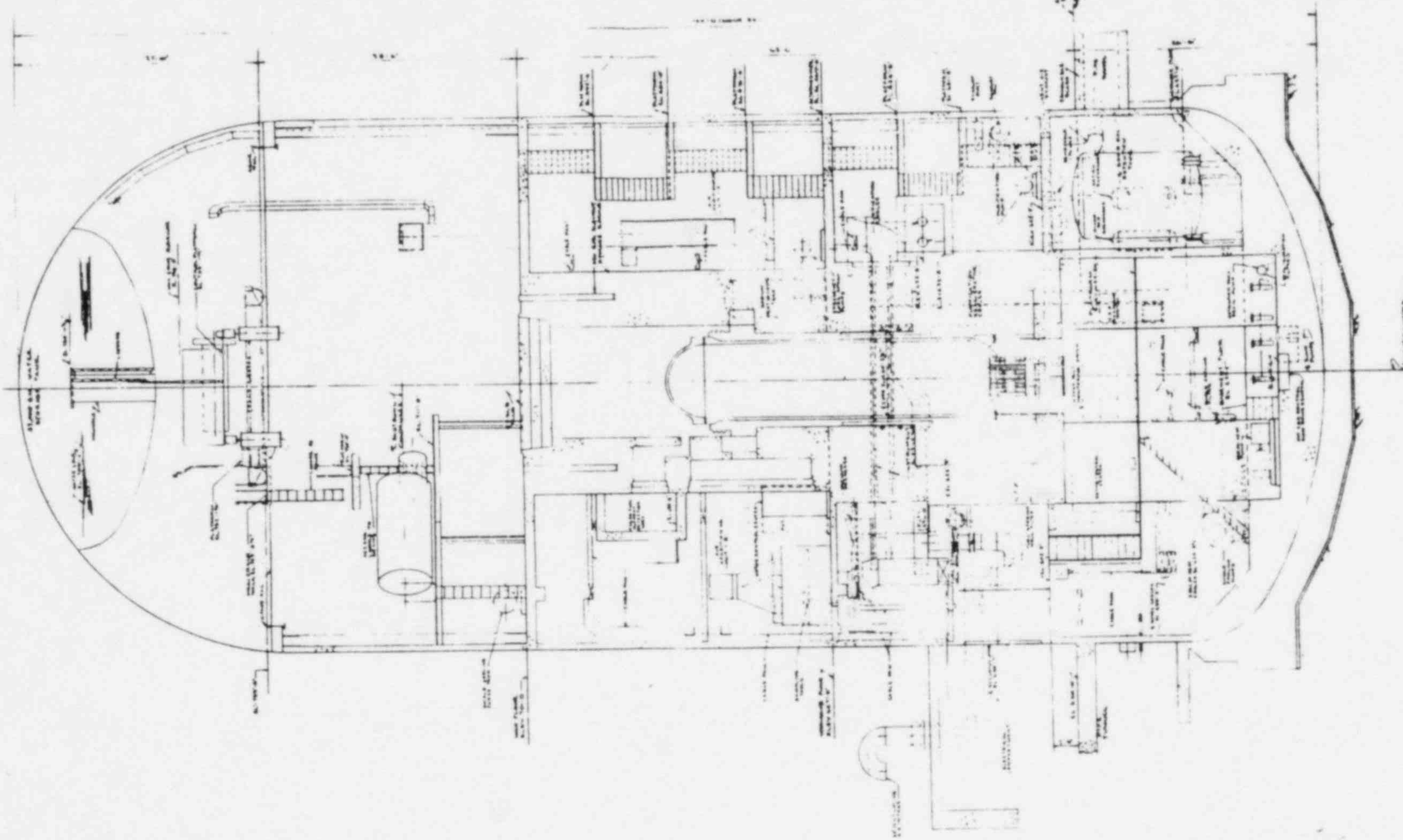
GENERAL ARRANGEMENT, GRADE FLOOR



GENERAL ARRANGEMENT, BASEMENT FLOOR

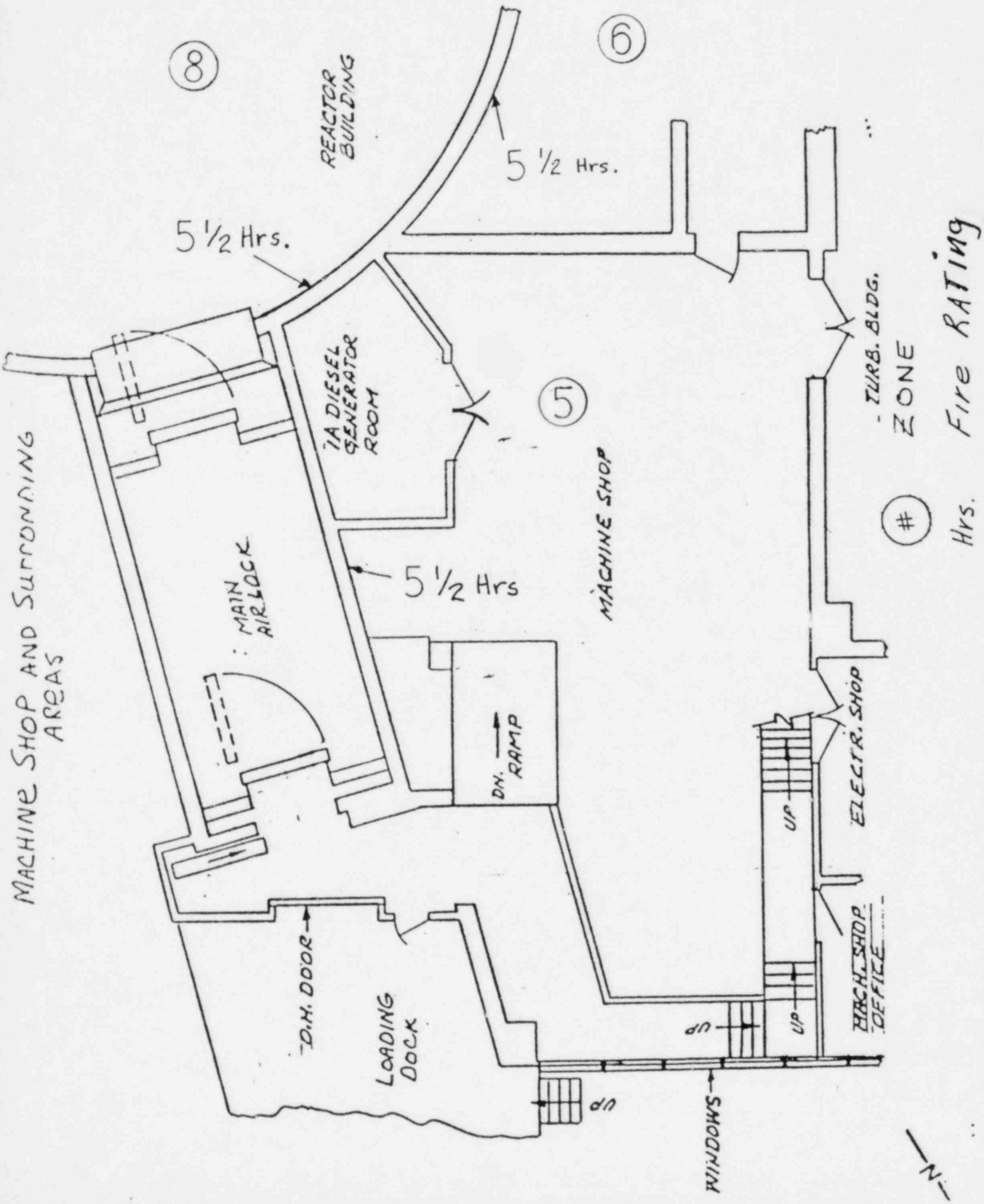


GENERAL ARRANGEMENT, SECTION A-A



GENERAL ARRANGEMENT SECTION B-B

ENCLOSURE 8


MACHINE SHOP AND SURROUNDING AREAS
8
6
5
REACTOR BUILDING
5 1/2 Hrs.
5 1/2 Hrs.
5 1/2 Hrs
1A DIESEL GENERATOR ROOM
MAIN AIRLOCK
MACHINE SHOP
TURB. BLDG.
DN. RAMP
ELECTR. SHOP
UP
UP
UP
UP
MACH. SHOP OFFICE
D.H. DOOR
LOADING DOCK
WINDOWS
N
ZONE
Hrs. Fire Rating

ENCLOSURE 9

COLOR KEY FOR CABLE RUNS

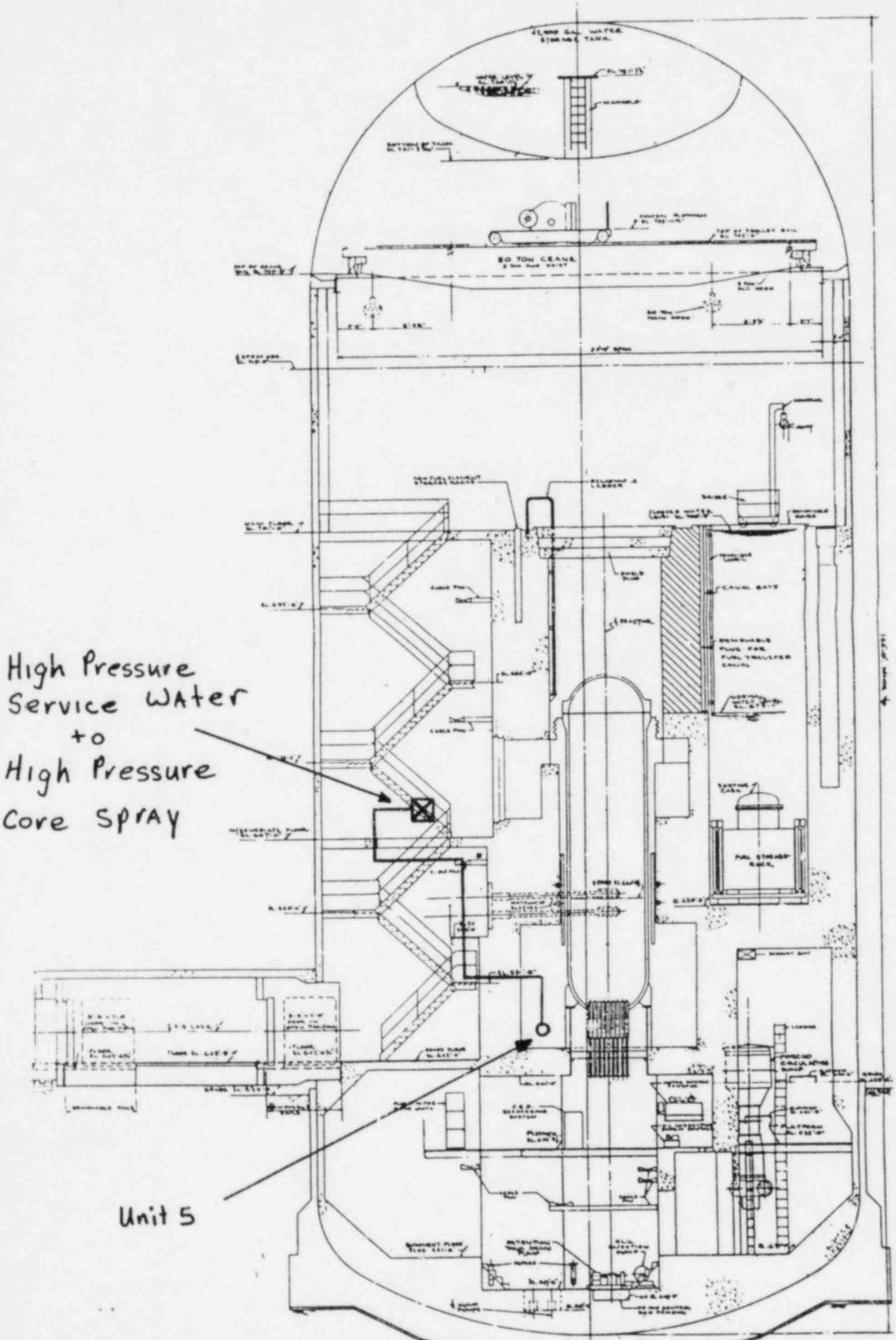
...HIGH PRESSURE SERVICE WATER TO HIGH PRESSURE CORE SPRAY

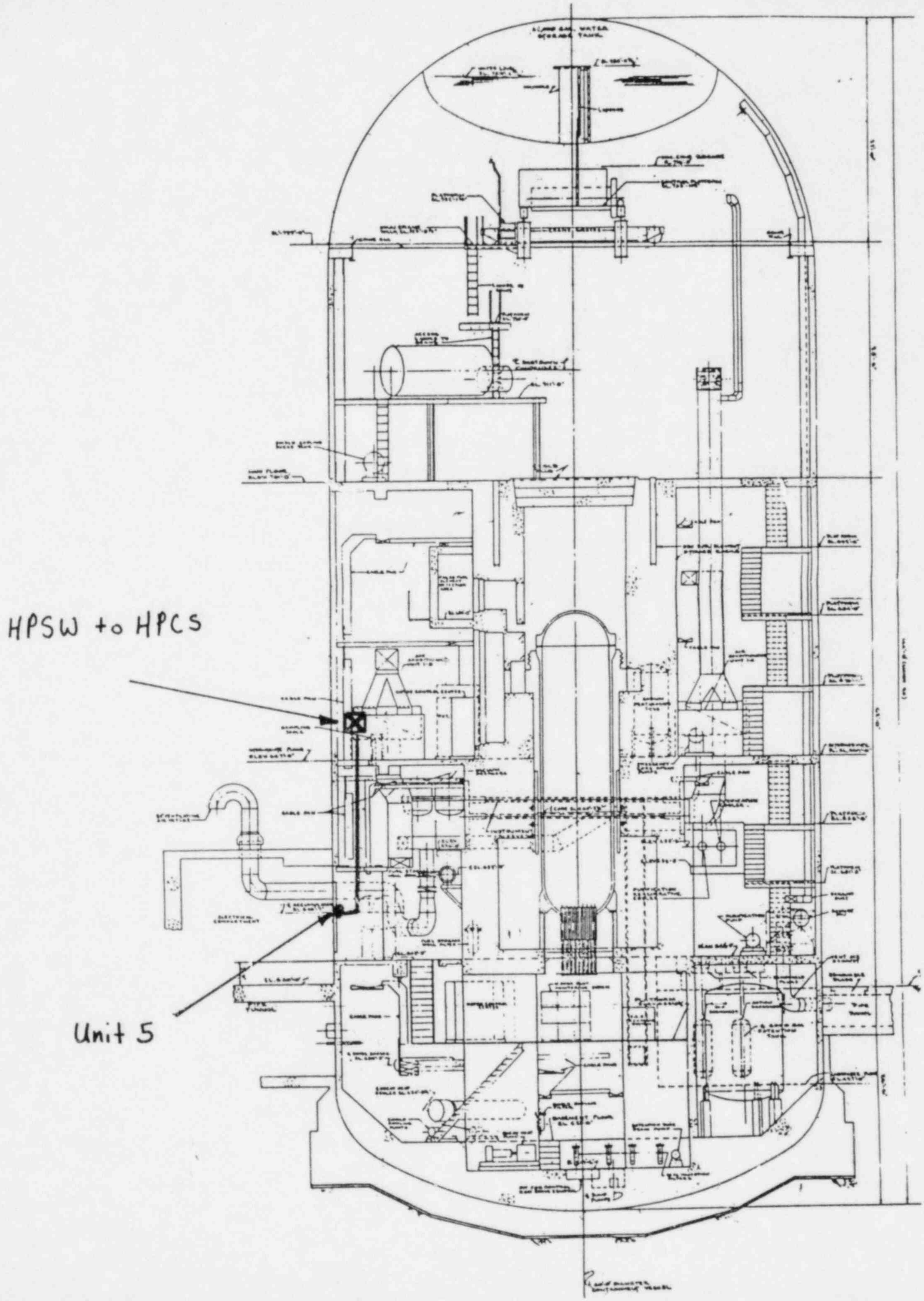
...OVERHEAD STORAGE TANK TO LOW PRESSURE CORE SPRAY

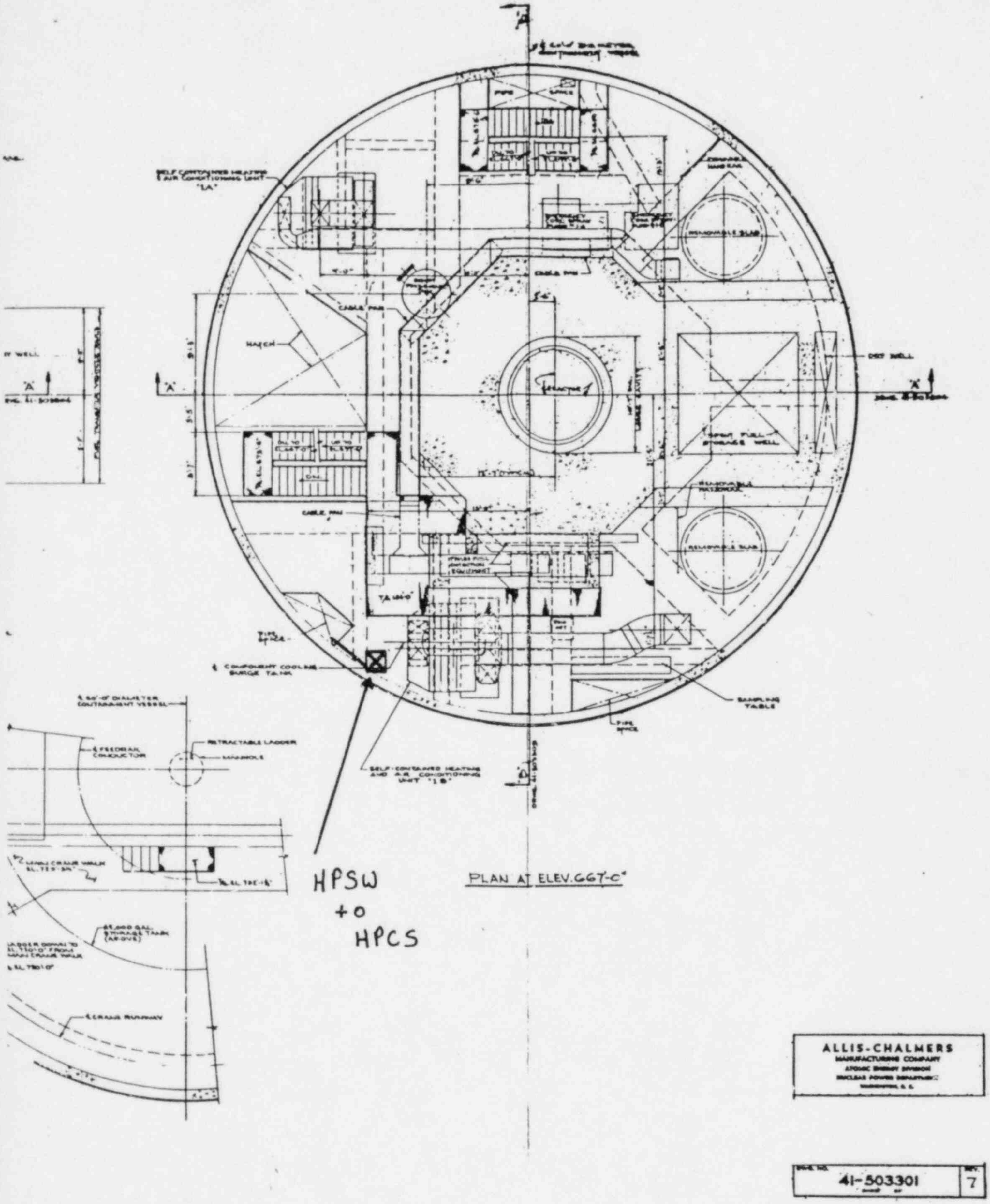
...HIGH PRESSURE CORE SPRAY MOTORS 1A & 1B

...CABLES TO SCRAM RELAYS

...MANUAL DEPRESSURIZATION SYSTEM / SHUTDOWN CONDENSER

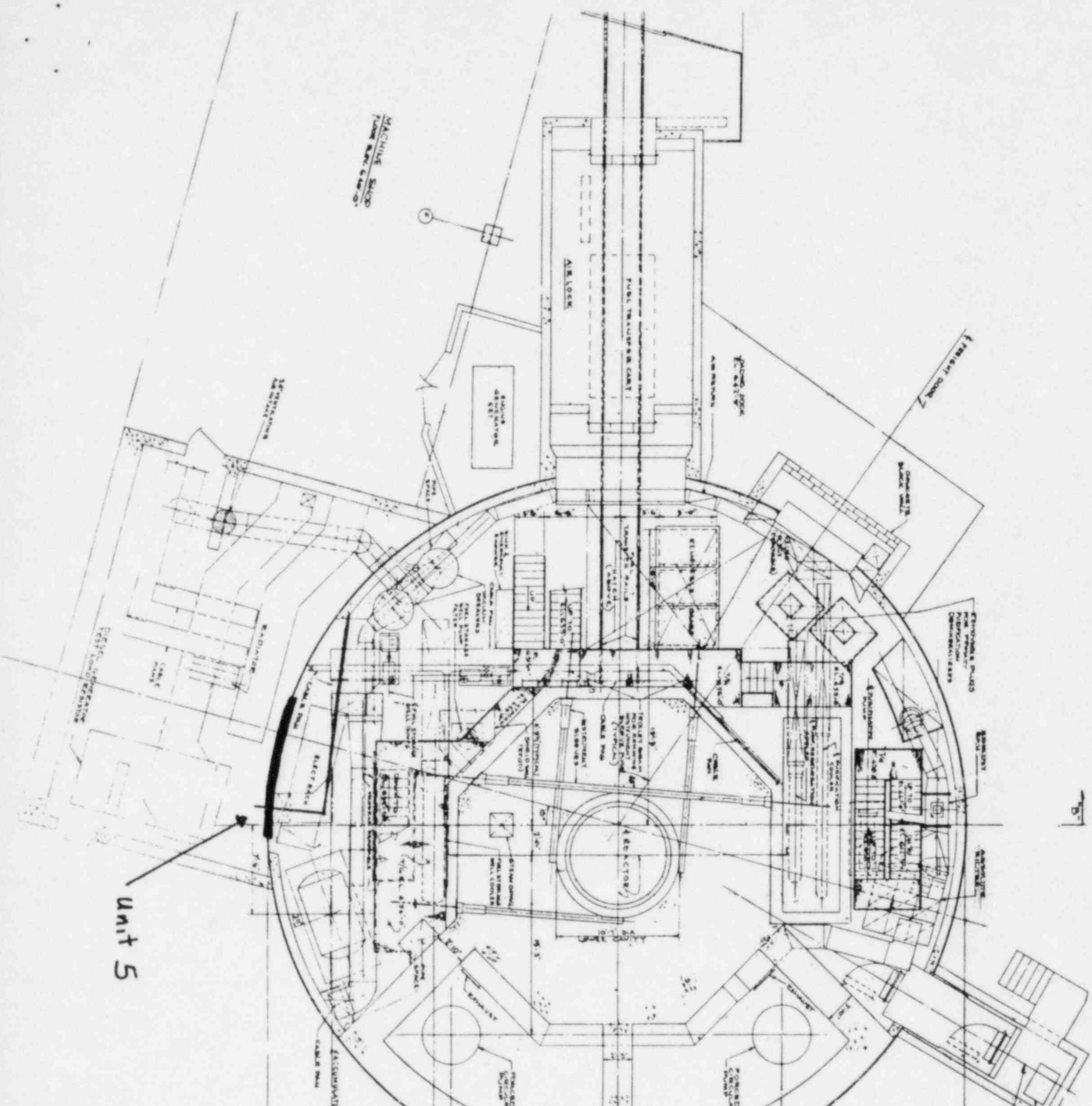

High Pressure Service WAter to High Pressure Core SPrAy
Unit 5
50 TON CRANE


HPSW to HPCS
Unit 5

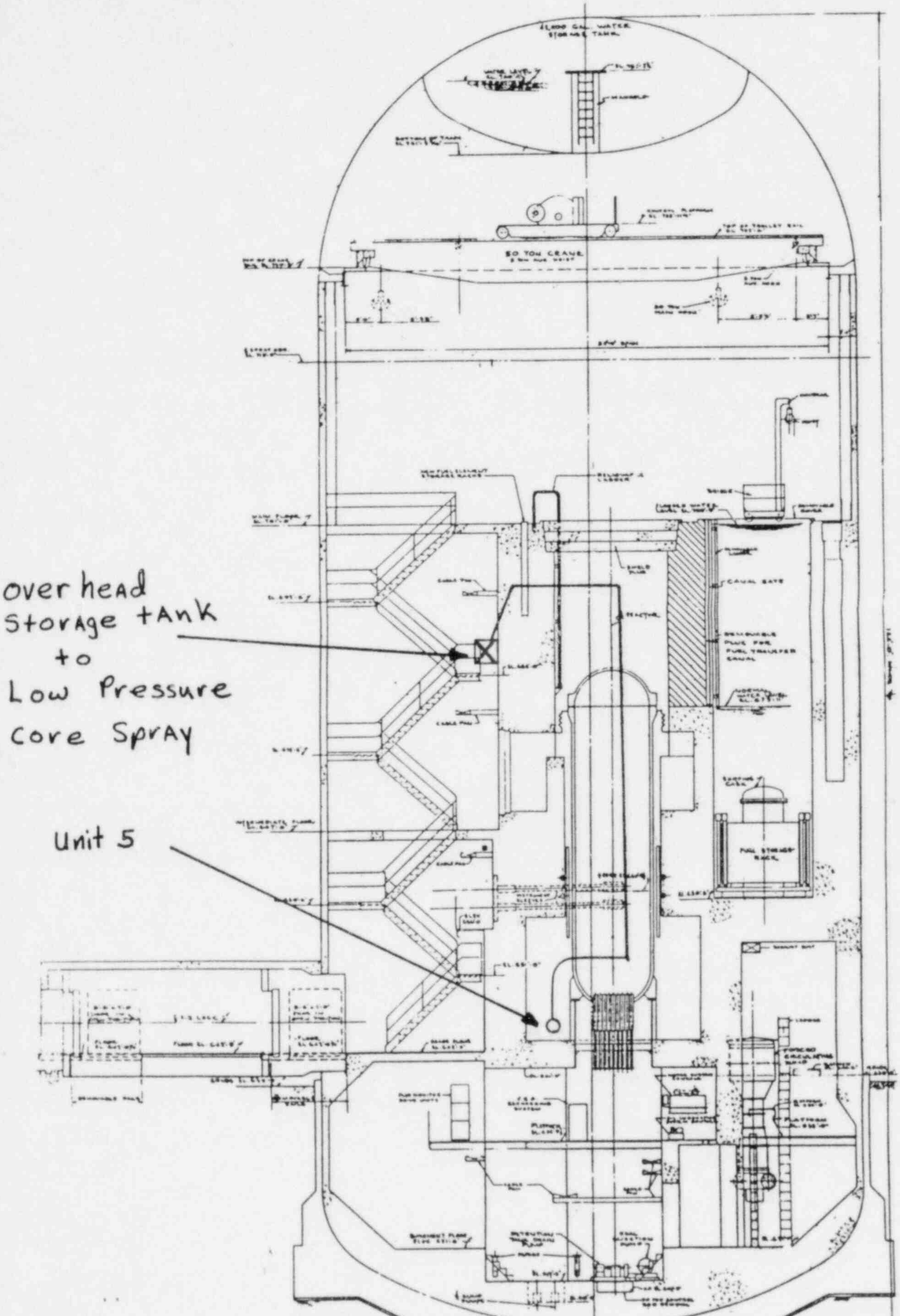


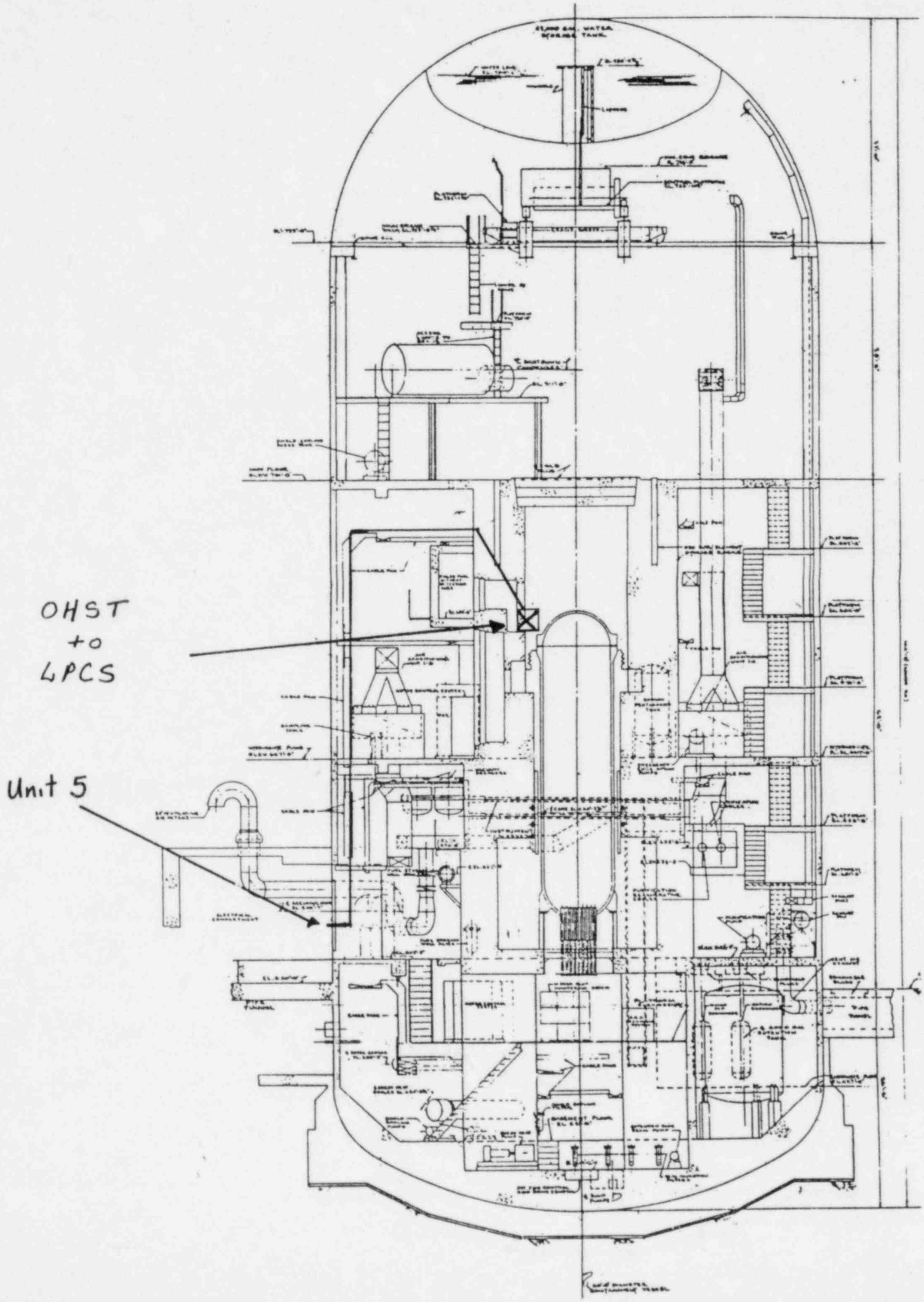
PLAN AT ELEV. 667'-0"
HPSW
to
HPCS
COMPONENT COOLING SURGE TANK
SELF-CONTAINED HEATING AND AIR CONDITIONING UNIT "1B"
SAMPLING TABLE
DRY WELL
HATCH
CABLE PAN
REMOVABLE SLAB
RETRACTABLE LADDER
MANHOLE
ALLIS-CHALMERS
MANUFACTURING COMPANY
41-503301
7

FIG. 6-1



Grade Floor
EL 642' 9"


overhead Storage tAnk to Low Pressure Core Spray
Unit 5
50 TON CRANE
CANAL GATE
FUEL STORAGE RACK


OHST
to
LPCS
Unit 5

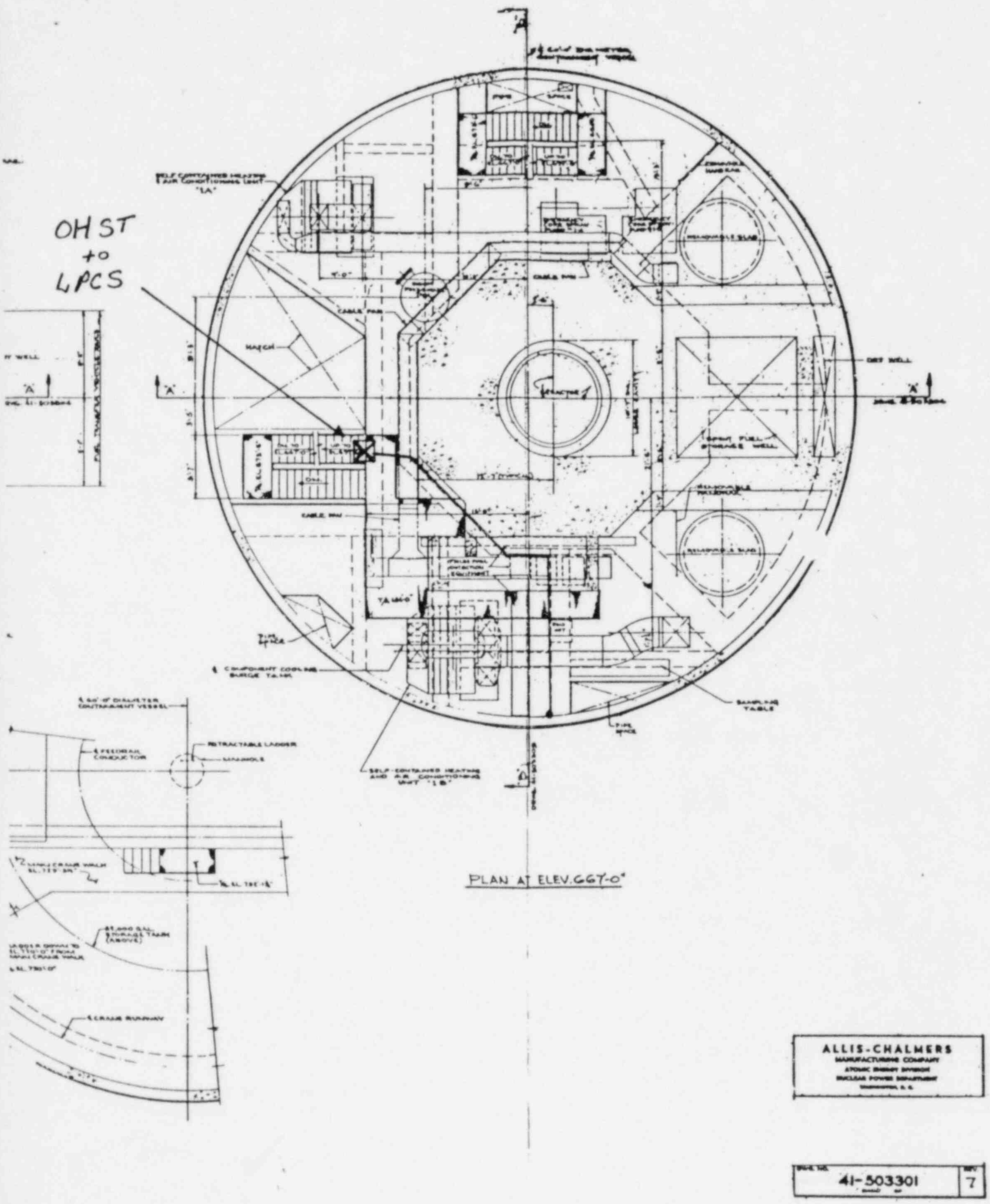
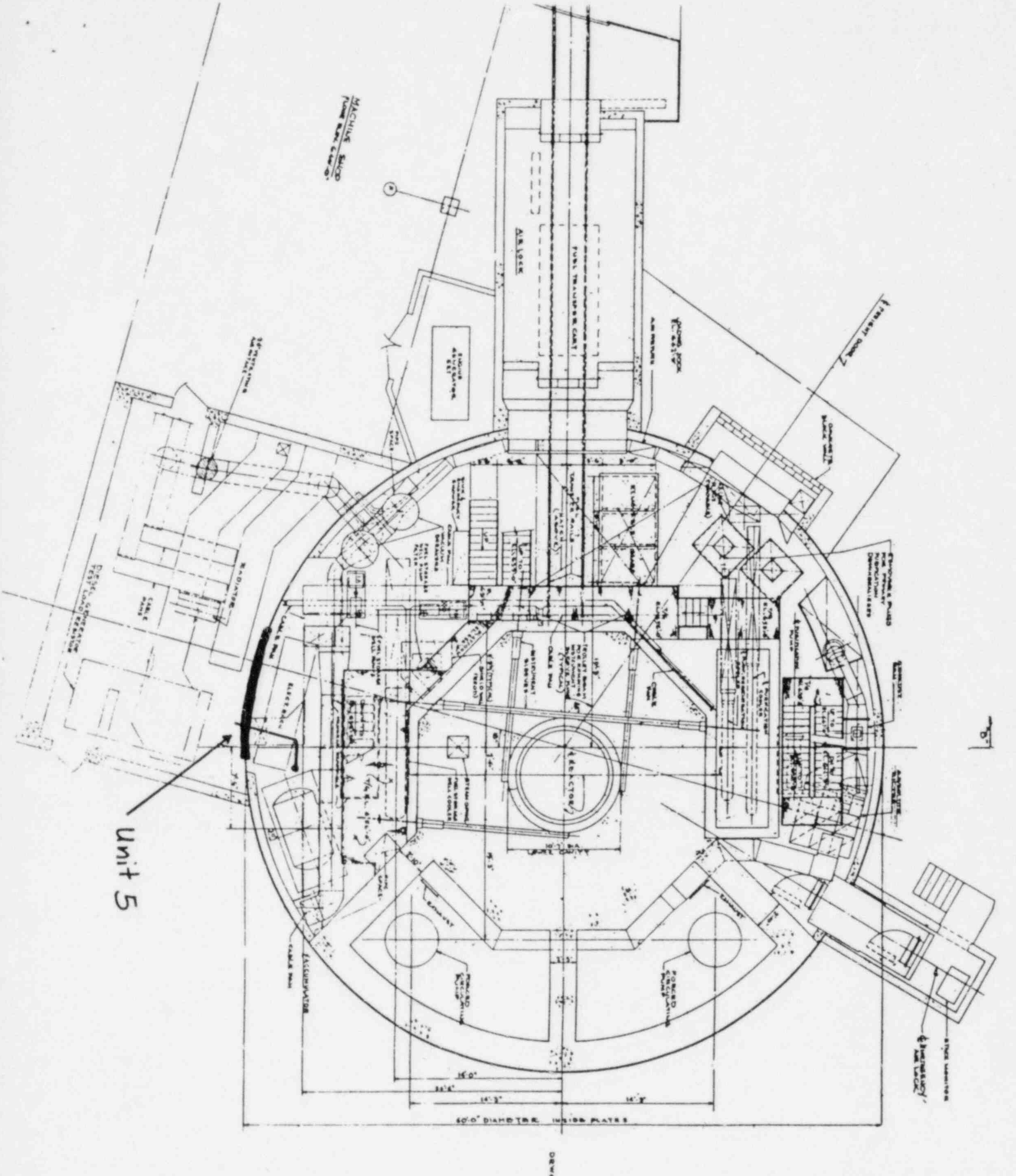
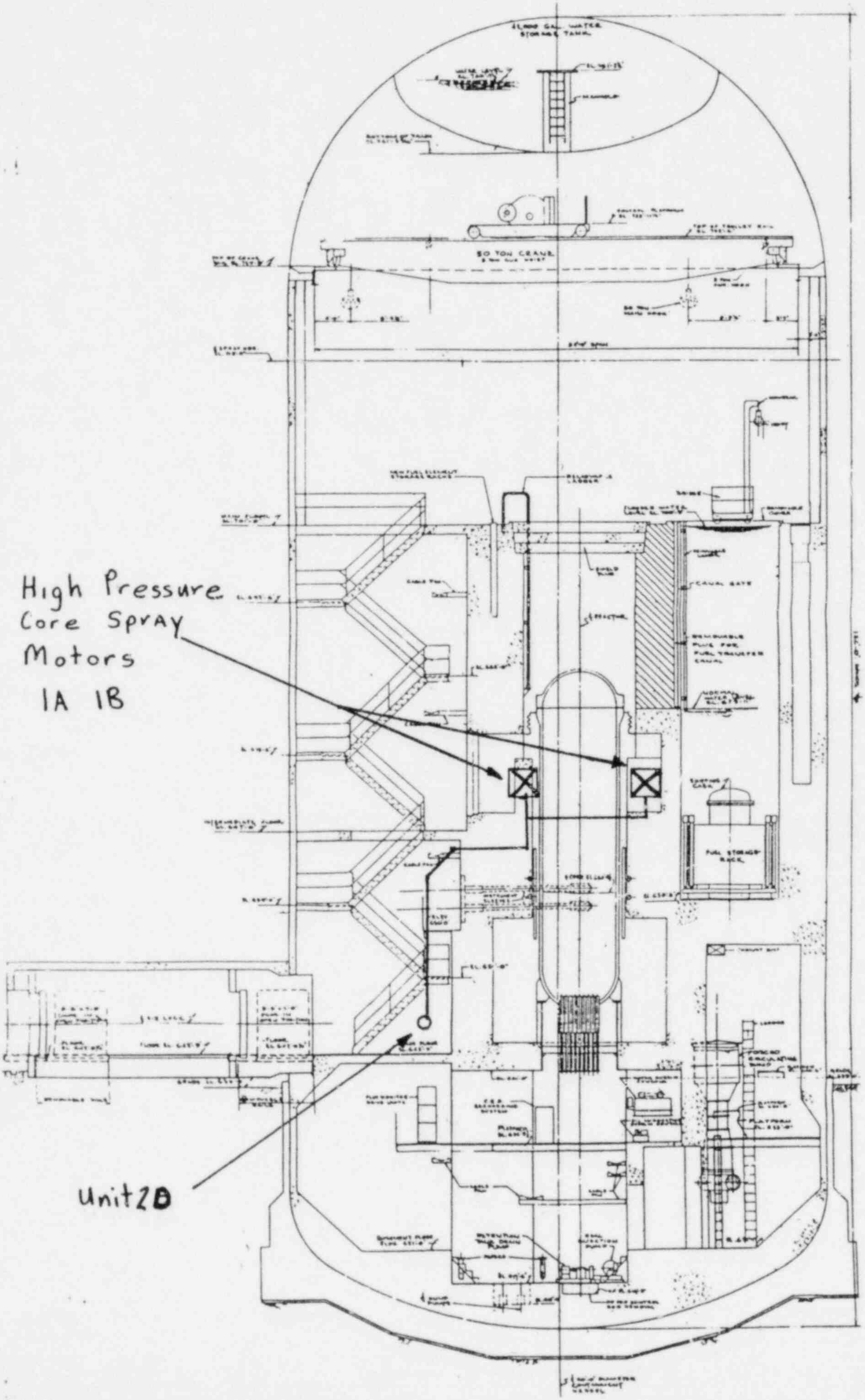
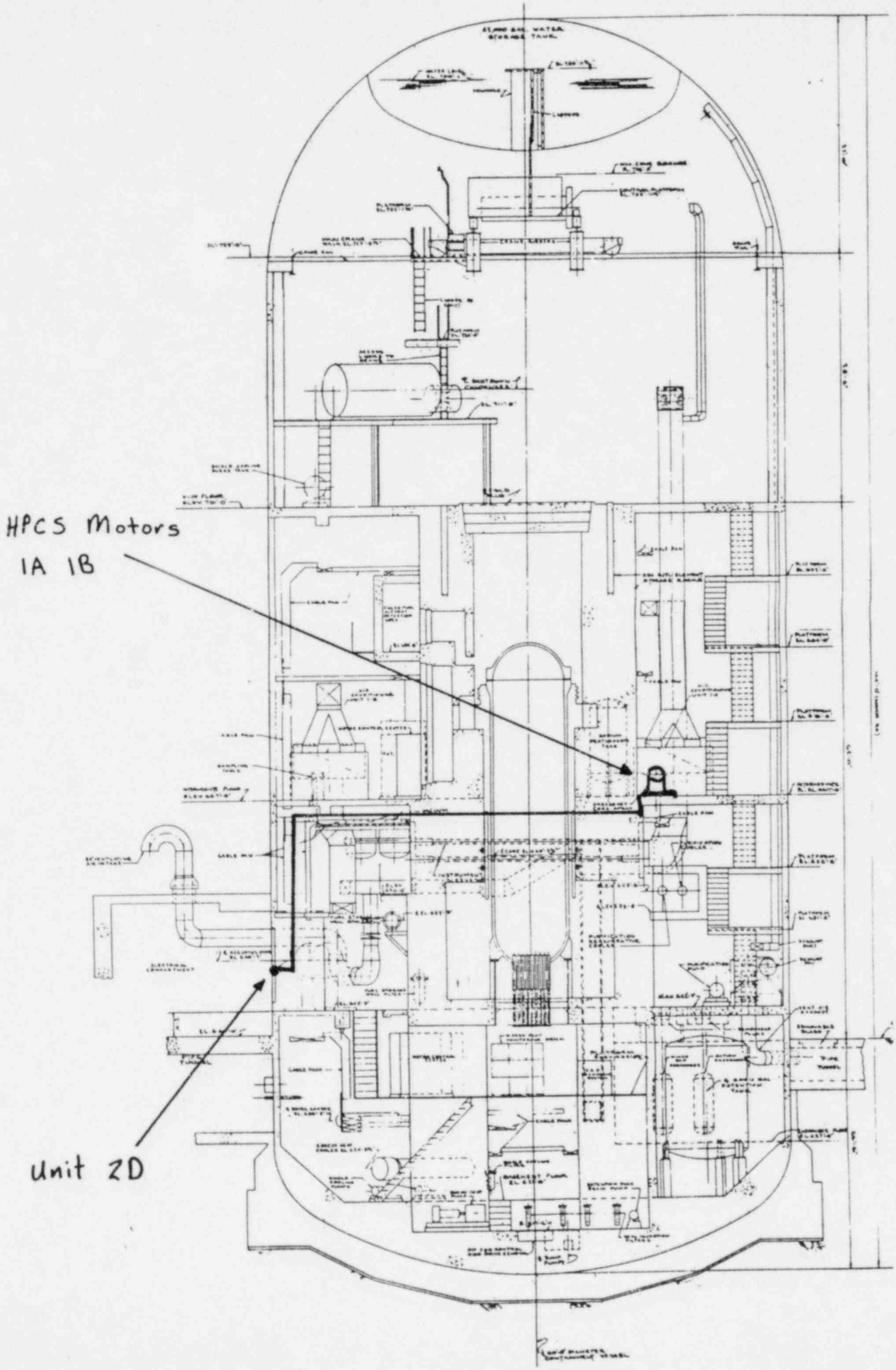

OHST
to
LPCS
SELF CONTAINED HEATING & AIR CONDITIONING UNIT "1A"
HATCH
CABLE PAN
DRY WELL
SPENT FUEL STORAGE WELL
REMOVABLE SLAB
REMOVABLE SLAB
COMPONENT COOLING SURGE TANK
PIPE SPACE
SAMPLING TABLE
PIPE SPACE
SELF-CONTAINED HEATING AND AIR CONDITIONING UNIT "1B"
RETRACTABLE LADDER
MANHOLE
CRANE RUNWAY
PLAN AT ELEV. 667-0"
ALLIS-CHALMERS
MANUFACTURING COMPANY
ATOMIC ENERGY DIVISION
NUCLEAR POWER DEPARTMENT
41-503301
7

FIG. 6-1

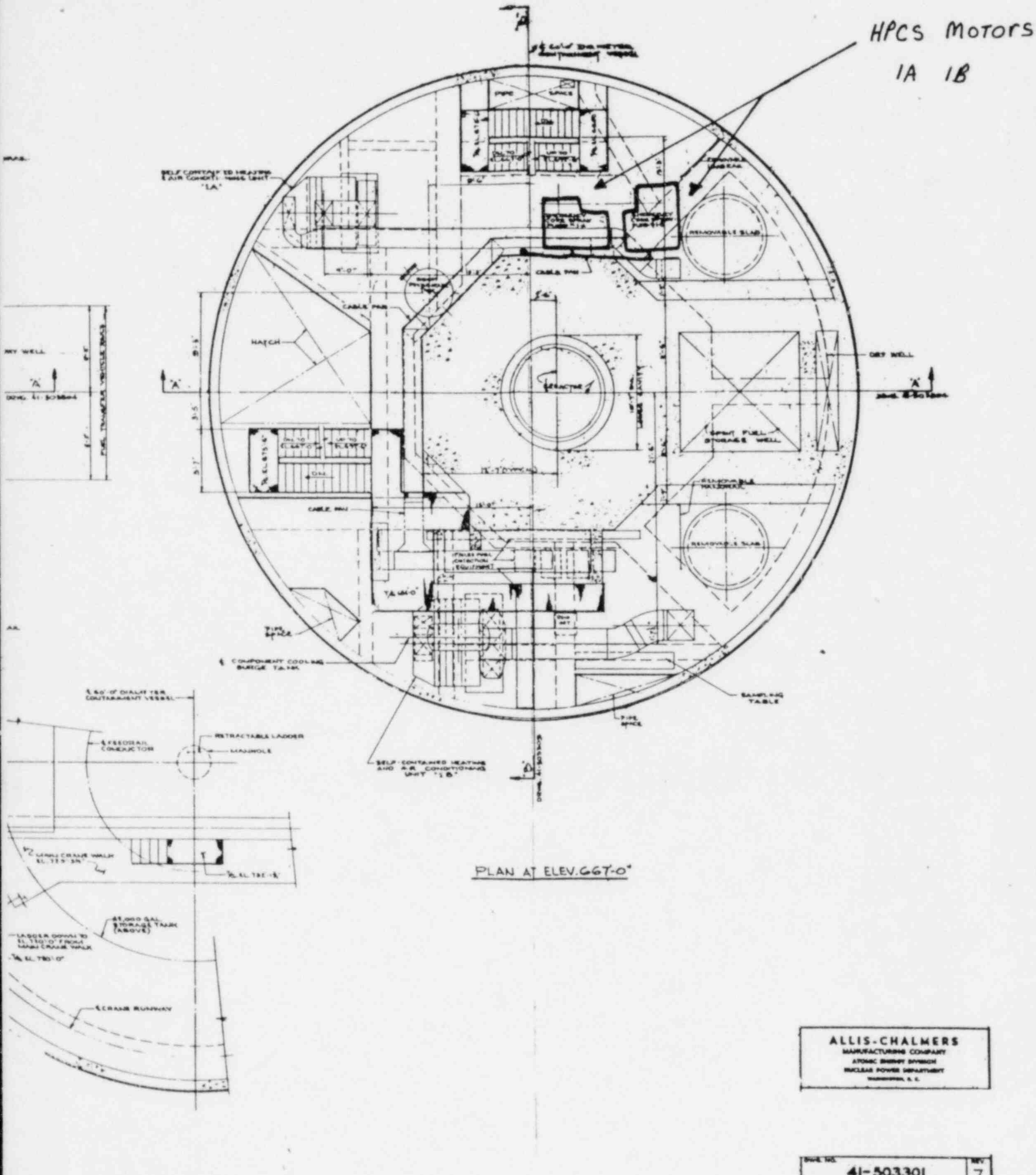


Grade Floor
EL 642'9"


50 TON CRANE
High Pressure
Core Spray
Motors
1A 1B
Unit2B



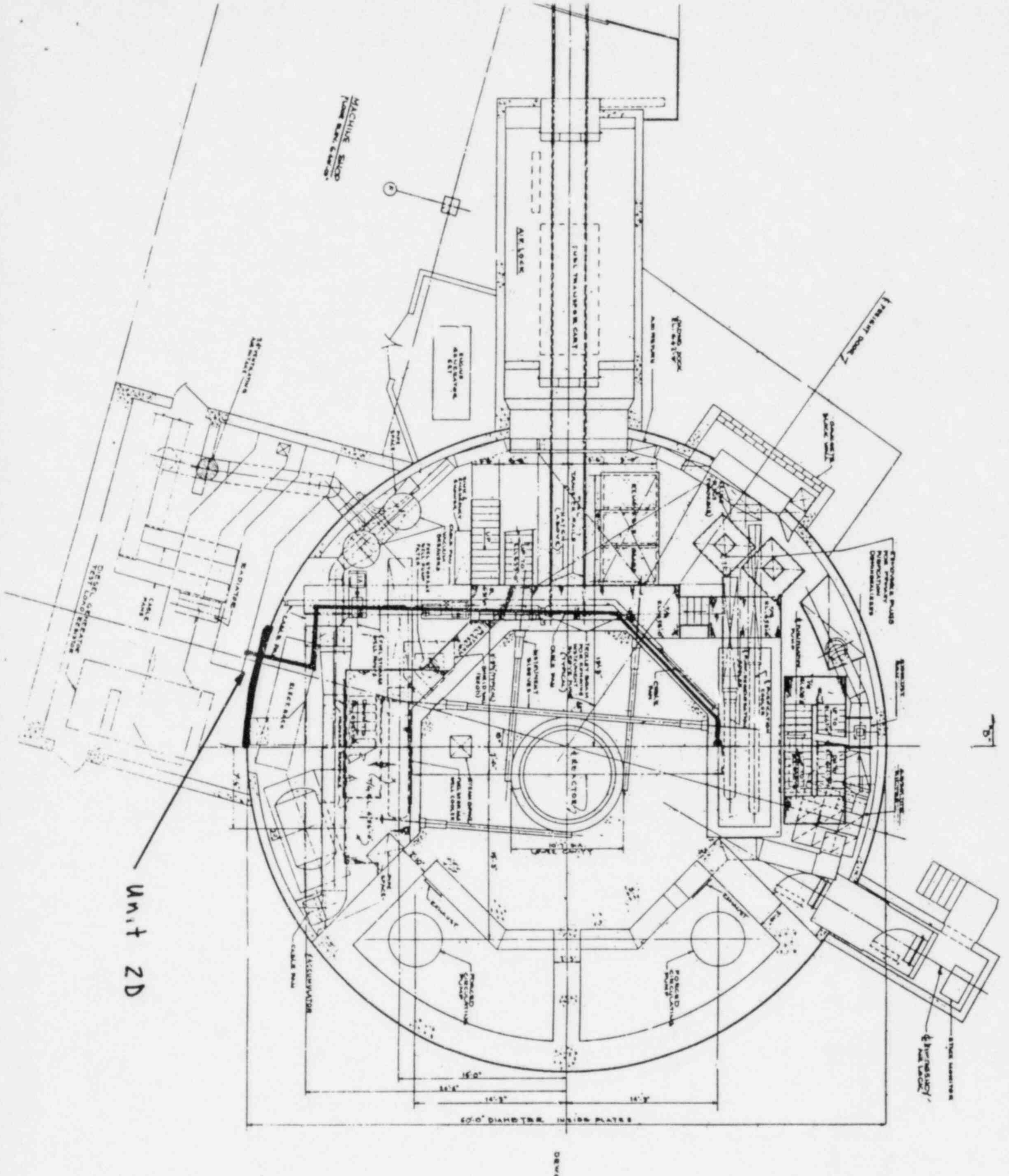
HPCS Motors
1A 1B
Unit 2D



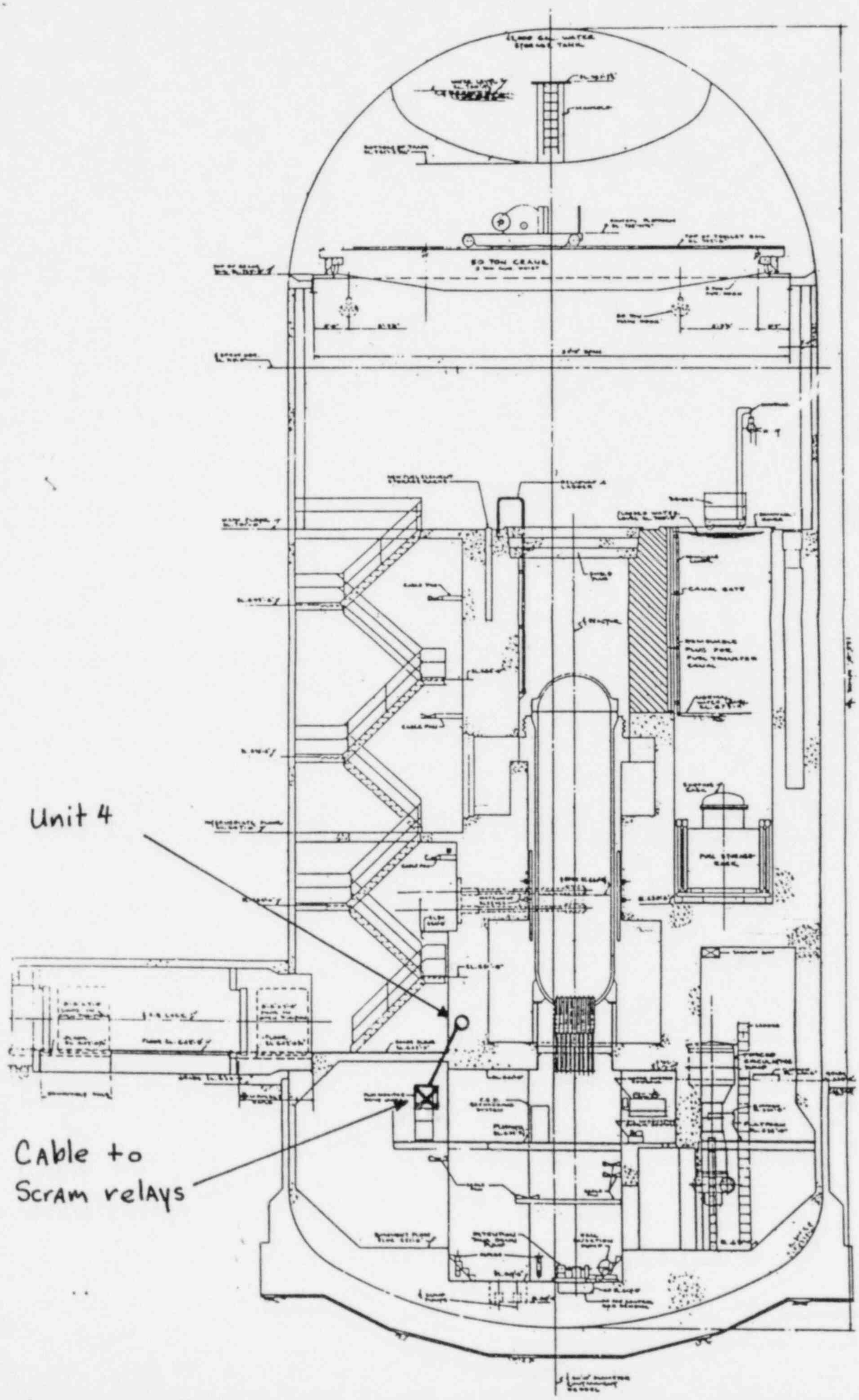
ALLIS-CHALMERS
MANUFACTURING COMPANY
ATOMIC ENERGY DIVISION
NUCLEAR POWER DEPARTMENT
WASHINGTON, D. C.

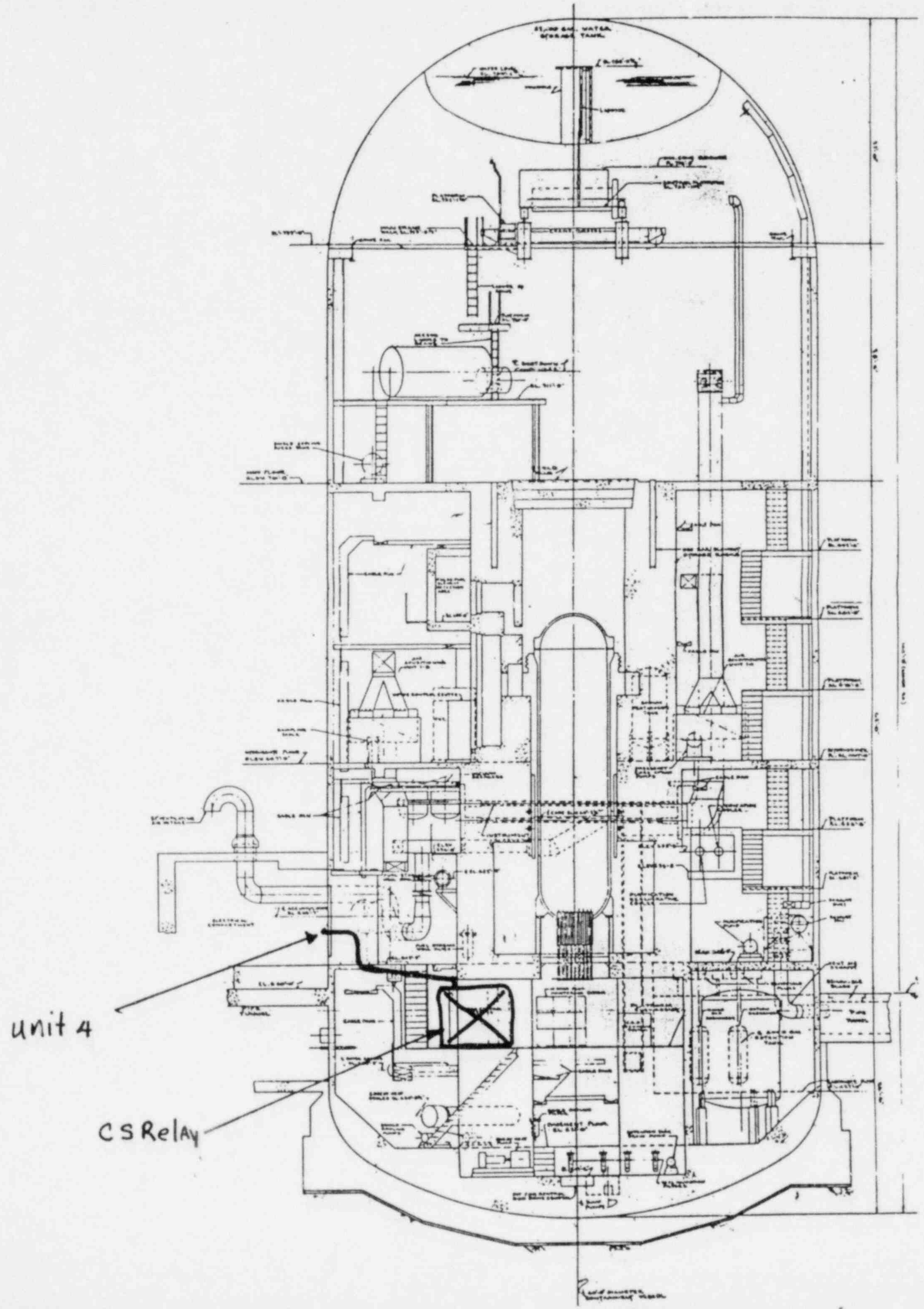
DWG. NO.	REV.
41-503301	7

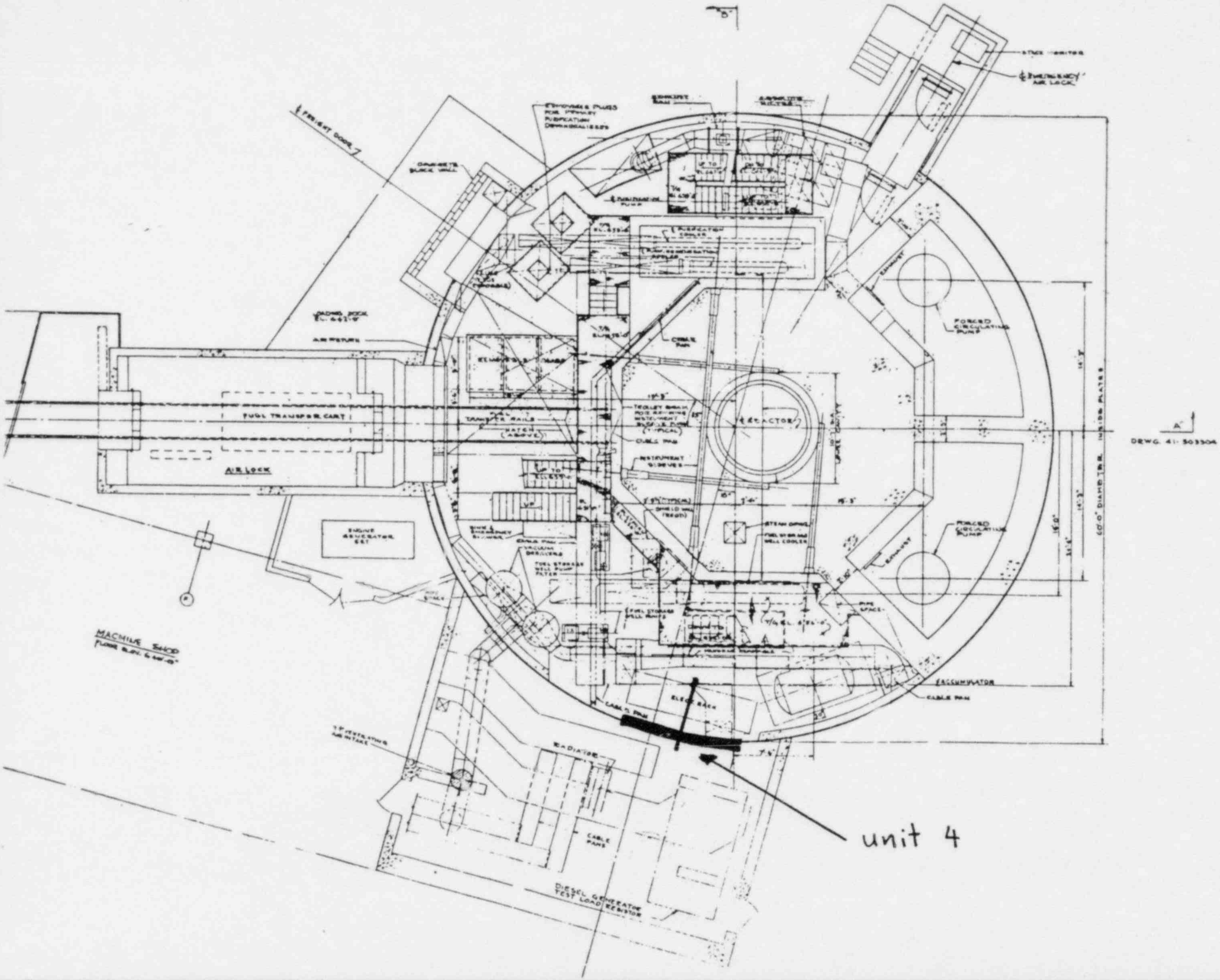
FIG. 6-1



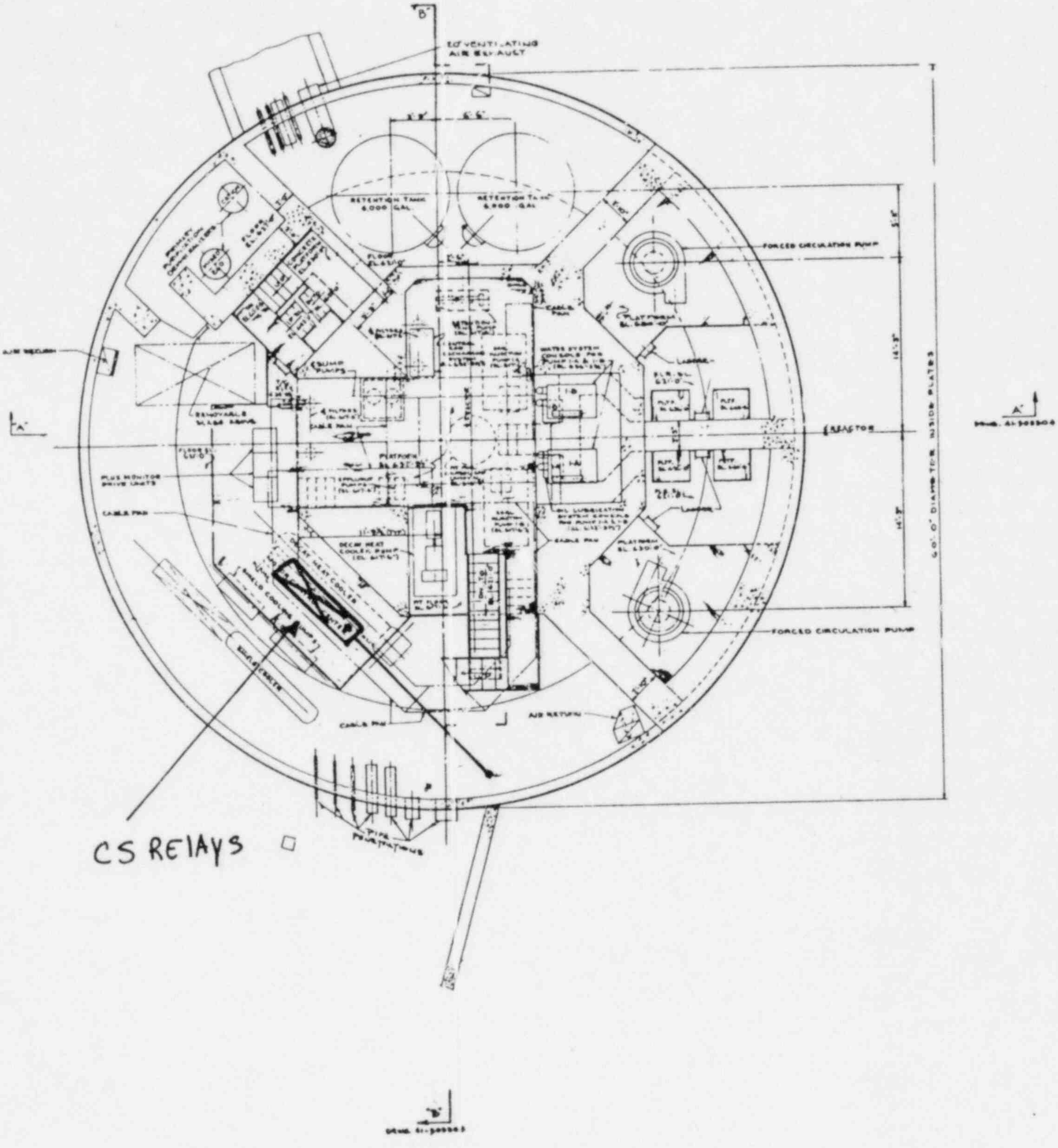
Grade Floor
EL 642' 9"


50 TON CRANE
Unit 4
Cable to
Scram relays


unit 4
CS Relay

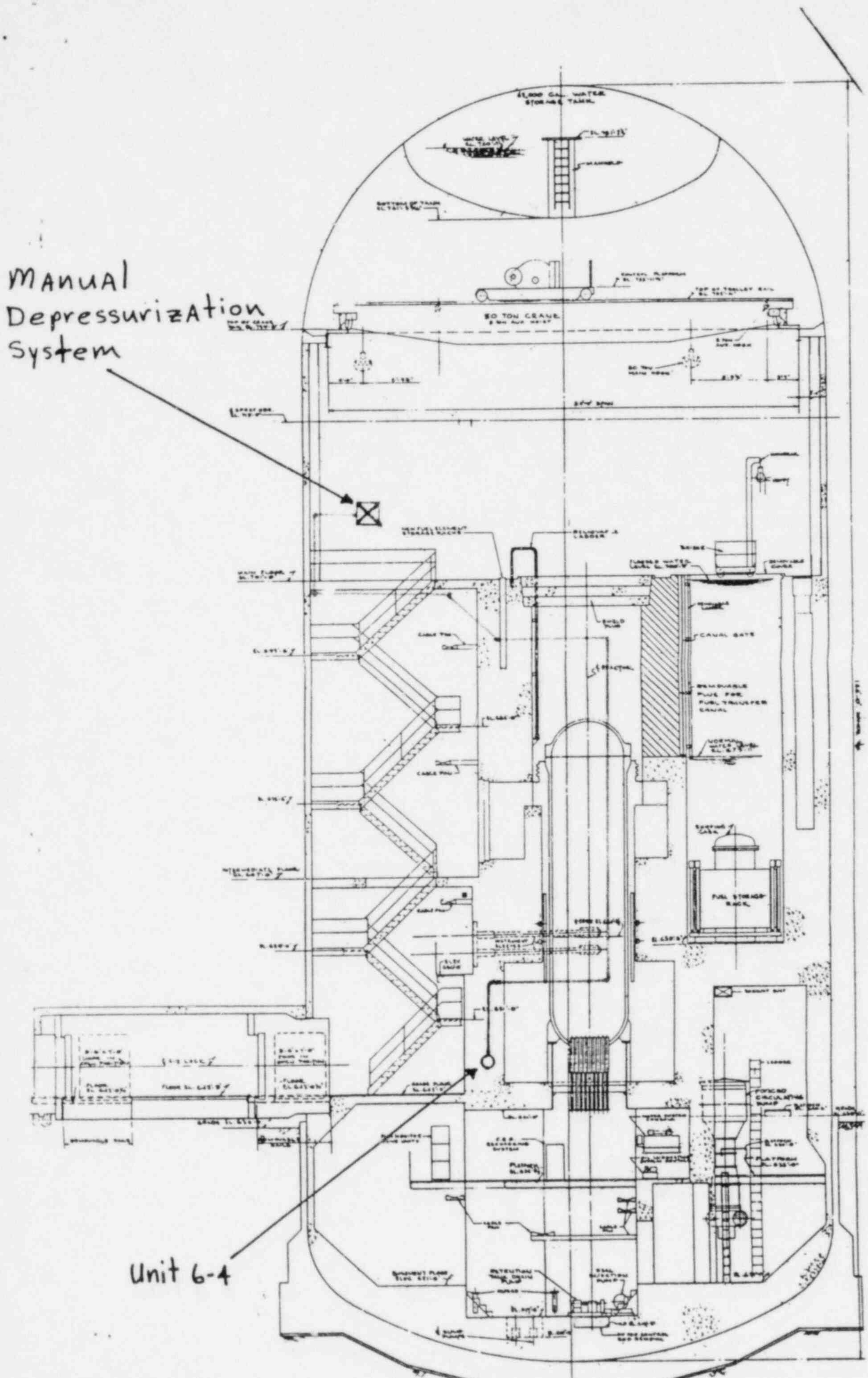


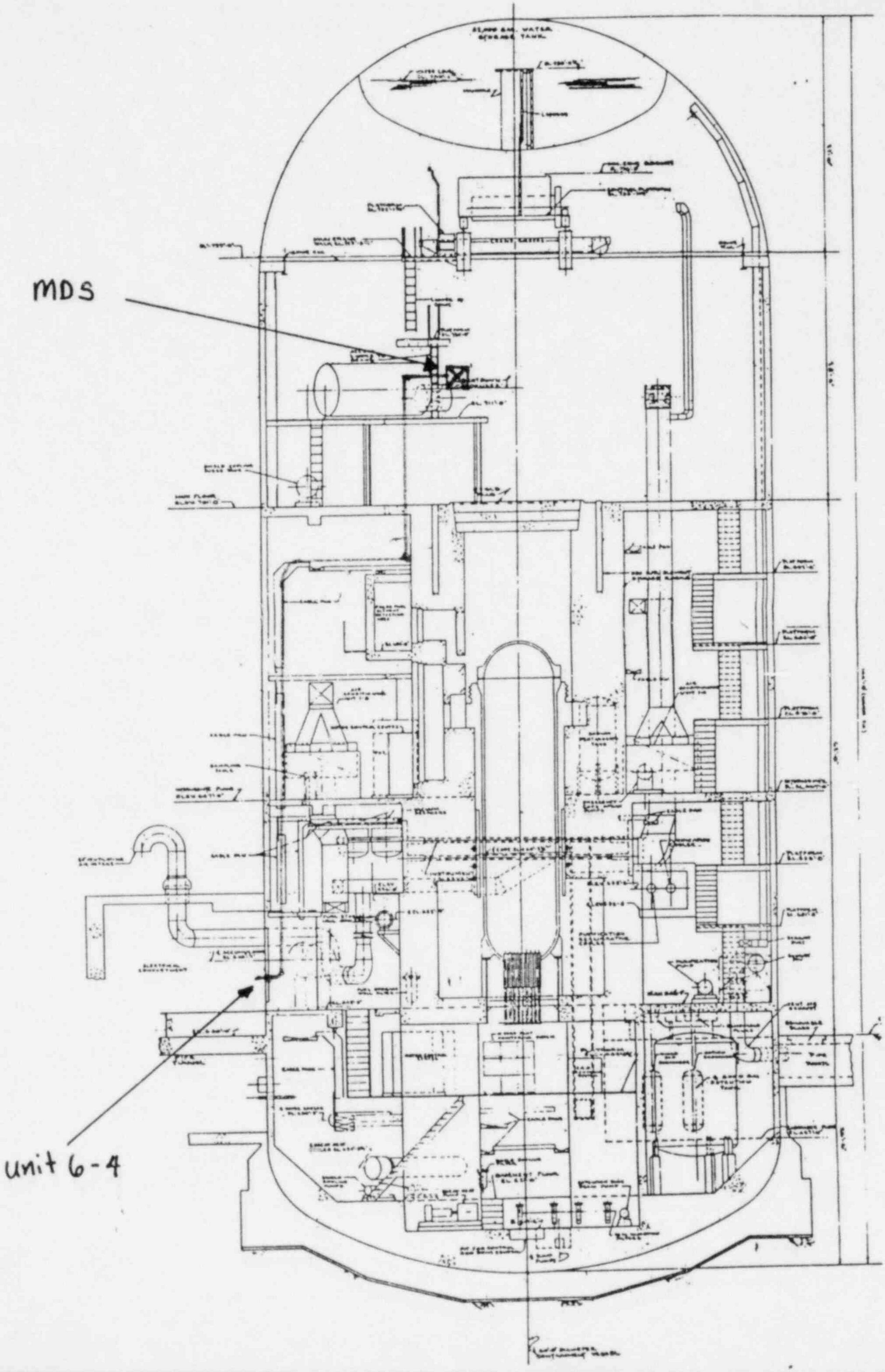
"B"
STACK MONITOR
℄ EMERGENCY AIR LOCK
REMOVABLE PLUGS FOR PRIMARY PURIFICATION DEMINERALIZERS
℄ FREIGHT DOOR
PURIFICATION PUMP
FORCED CIRCULATING PUMP
EXHAUST
REACTOR
FUEL TRANSFER CART
AIR LOCK
TRANSFER RAILS
HATCH (ABOVE)
CABLE PAN
INSTRUMENT SLEEVES
STEAM DRUMS
ENGINE GENERATOR SET
VACUUM BREAKERS
MACHINE SHOP
PIPE SPACE
ACCUMULATOR
CABLE PAN
ELECT. PACK
RADIATOR
CABLE PANS
DIESEL GENERATOR TEST LOAD RESISTOR
60'-0" DIAMETER INSIDE PLATES
"A"
DRWG. 41-50330A
unit 4

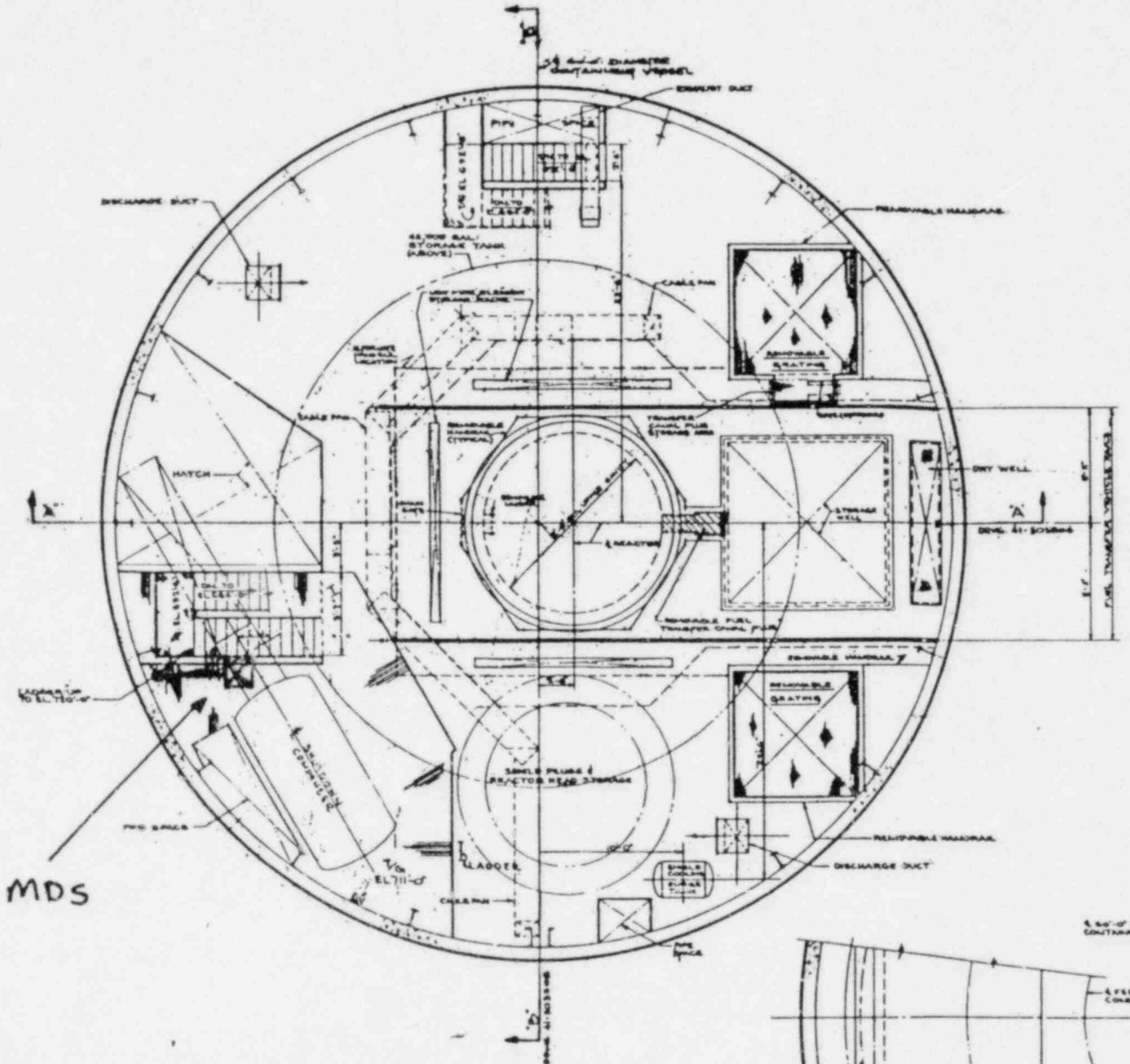


GENERAL ARRANGEMENT, BASEMENT FLOOR

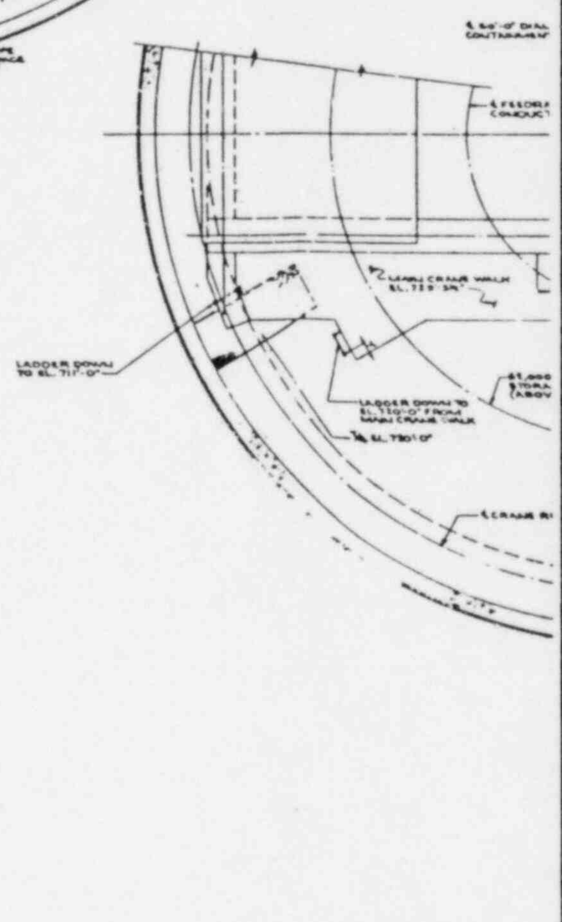
FIG. 6.3

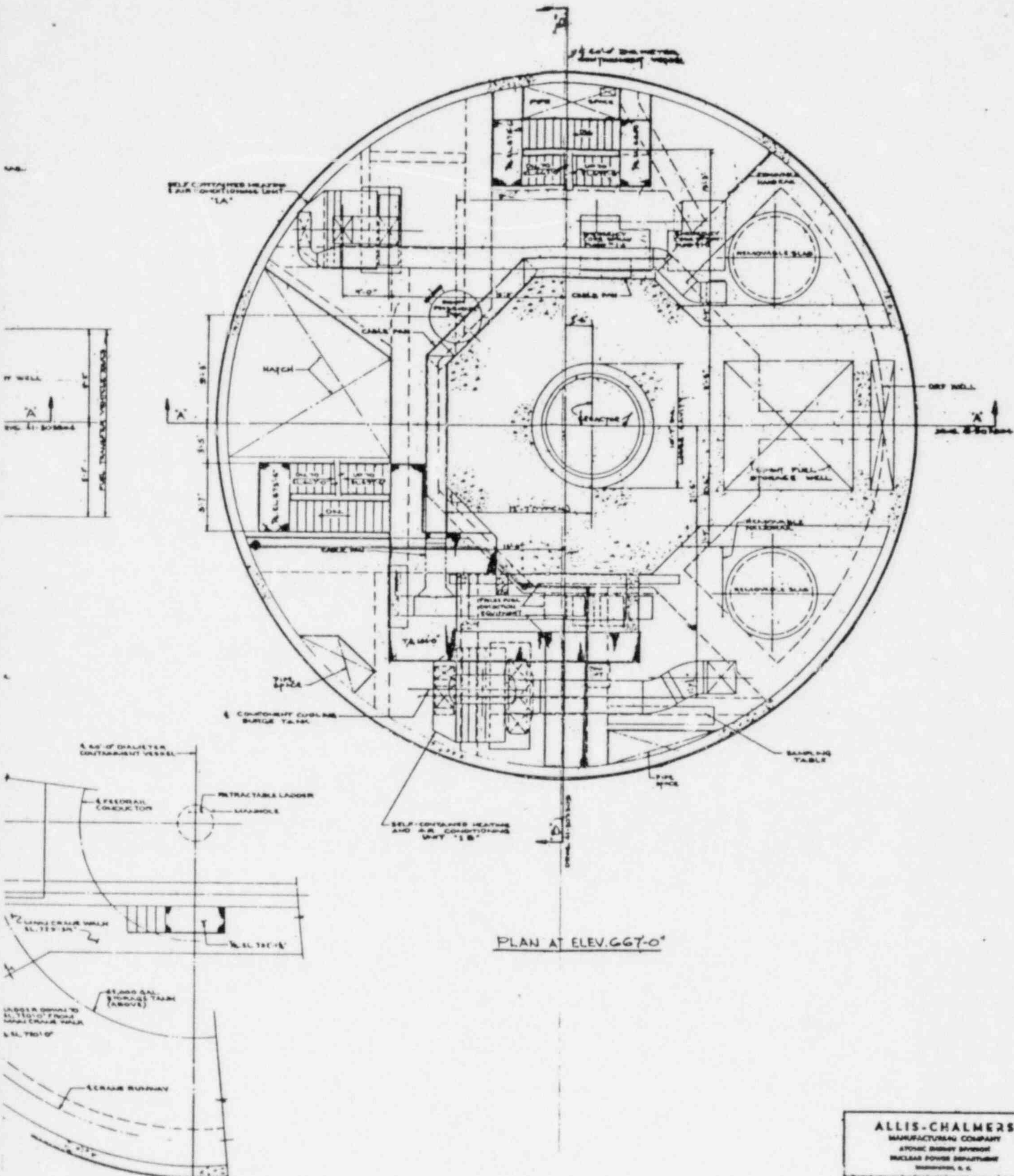

Manual Depressurization System
Unit 6-4
50 TON CRANE
CANAL GATE
REMOVABLE PLUG FOR FUEL TRANSFER CANAL
FUEL STORAGE RACK
FORCED CIRCULATING PUMP


MDS
unit 6-4



PLAN AT ELEV. 701'-0"

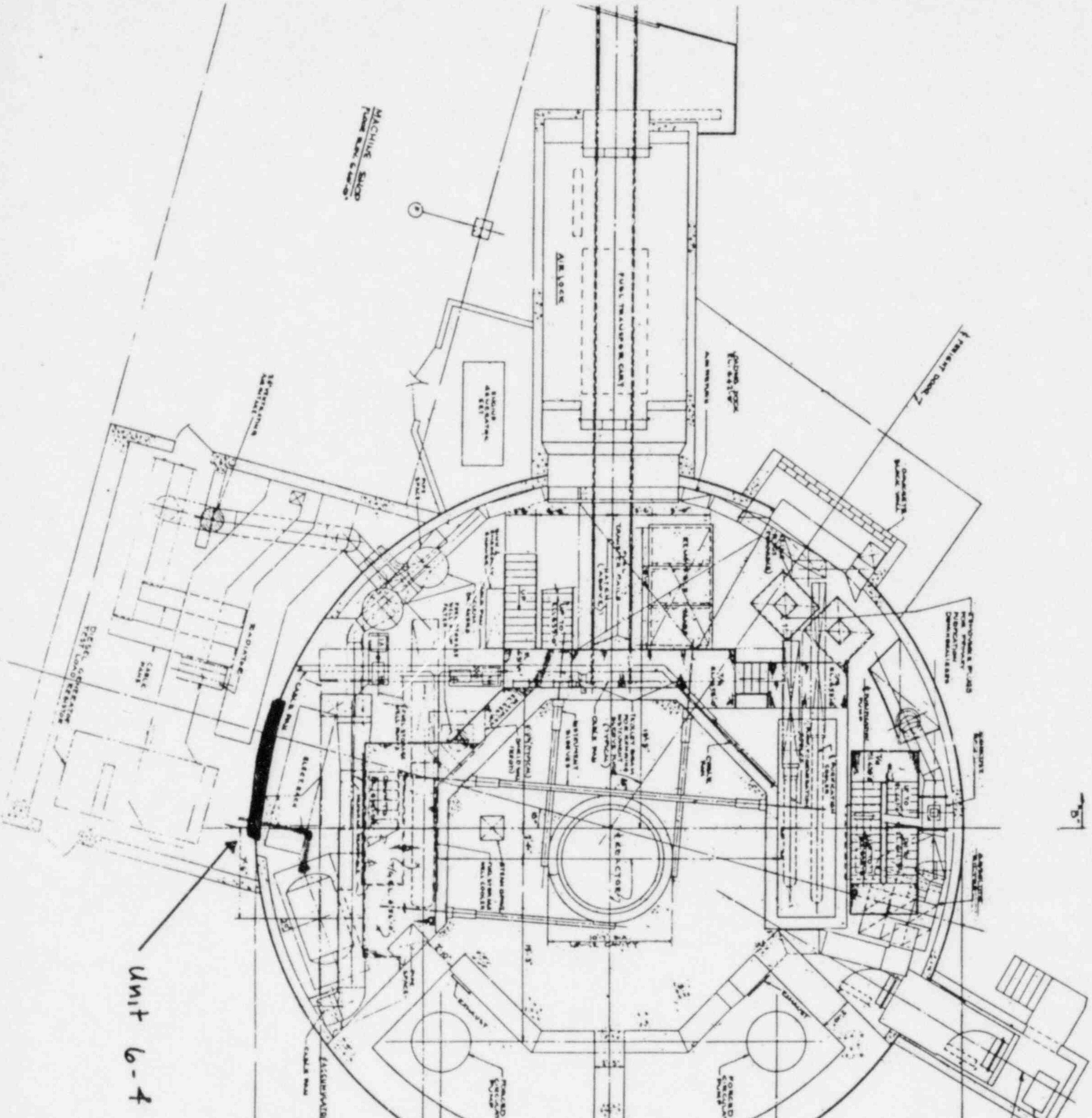




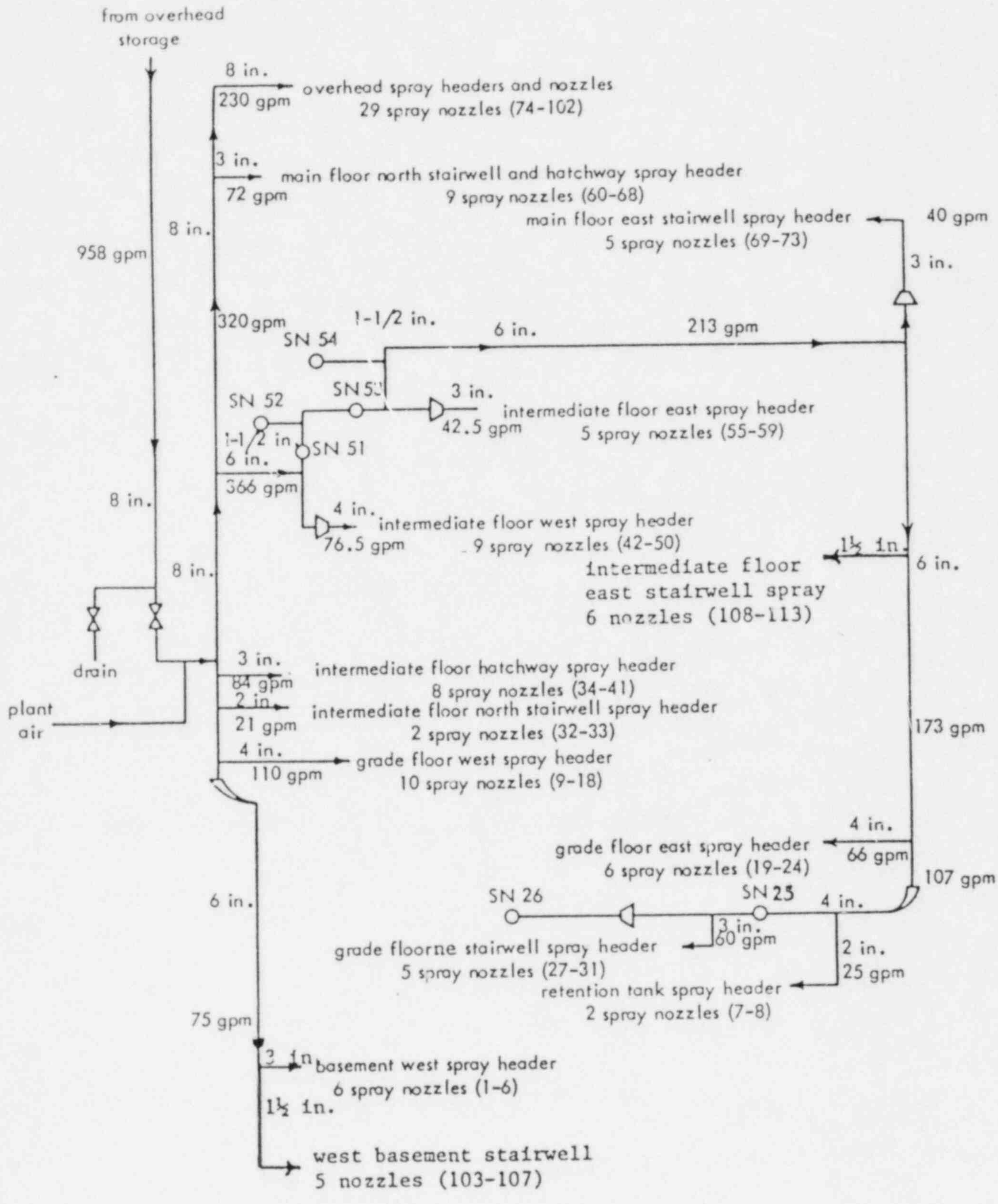
ALLIS-CHALMERS
MANUFACTURING COMPANY
ATOMIC ENERGY DIVISION
NUCLEAR POWER DEPARTMENT
WASHINGTON, D. C.

DWG. NO.	REV.
41-503301	7

FIG. 6-1



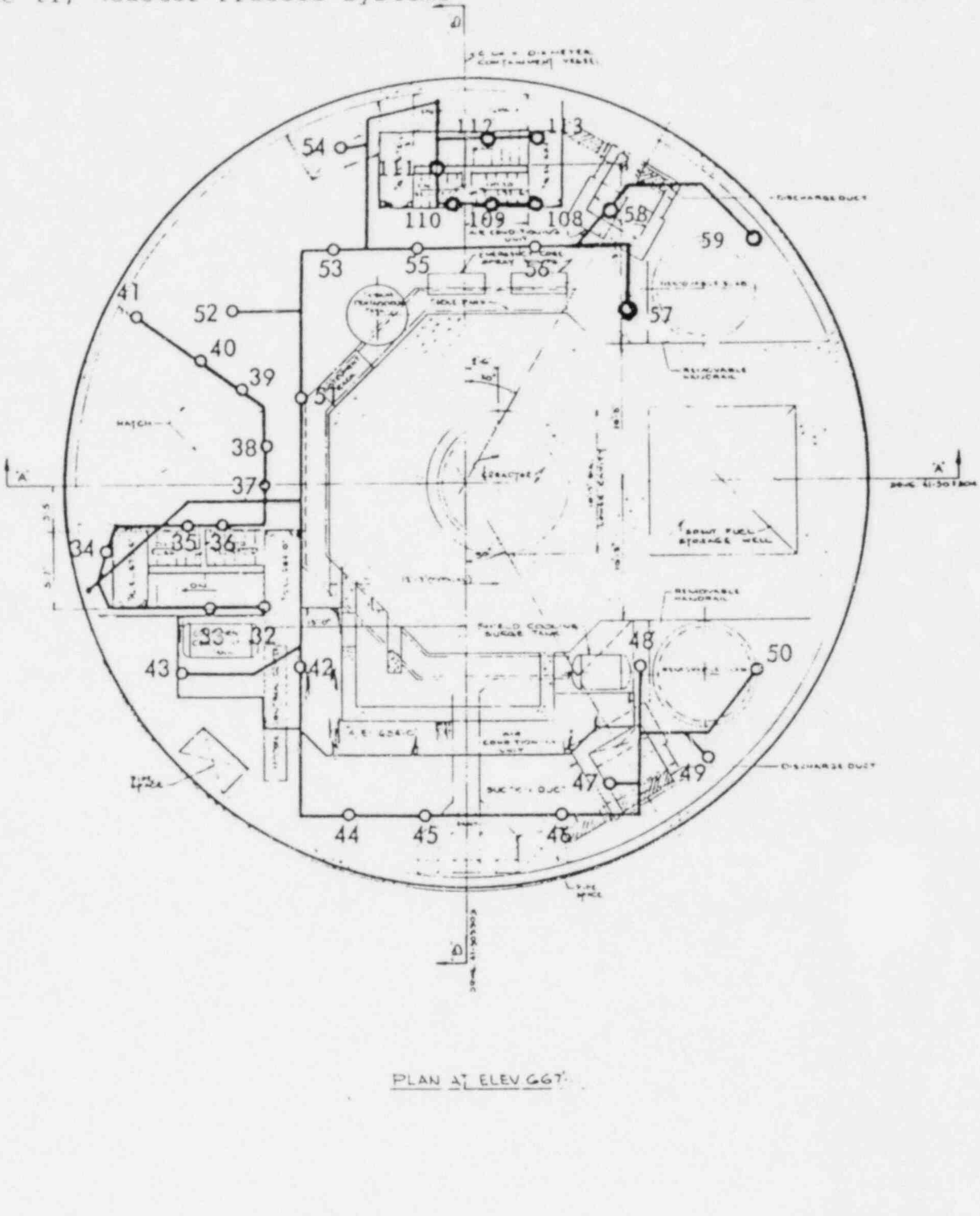
Grade Floor
El. 642' 9"



REACTOR BUILDING SPRAY SYSTEM FLOW DIAGRAM

FIG. 15.2

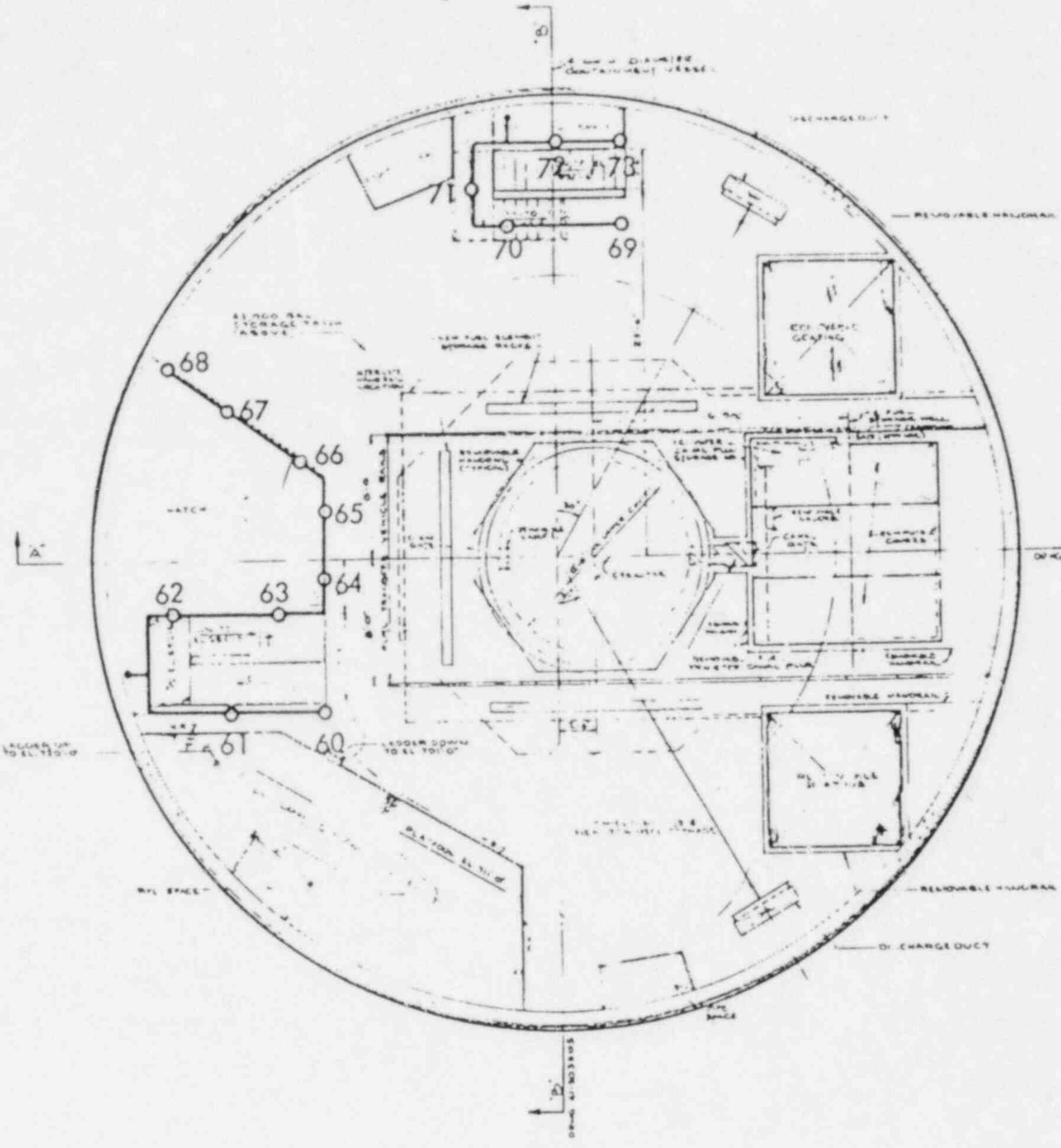
Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	10/16/77	[signature]	11/2/77	[signature]	11/2/77



Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	10/16/77	[illegible]	11/2/77	[illegible]	11/2/77

REACTOR BUILDING SPRAY NOZZLES ABOVE INTERMEDIATE FLOOR

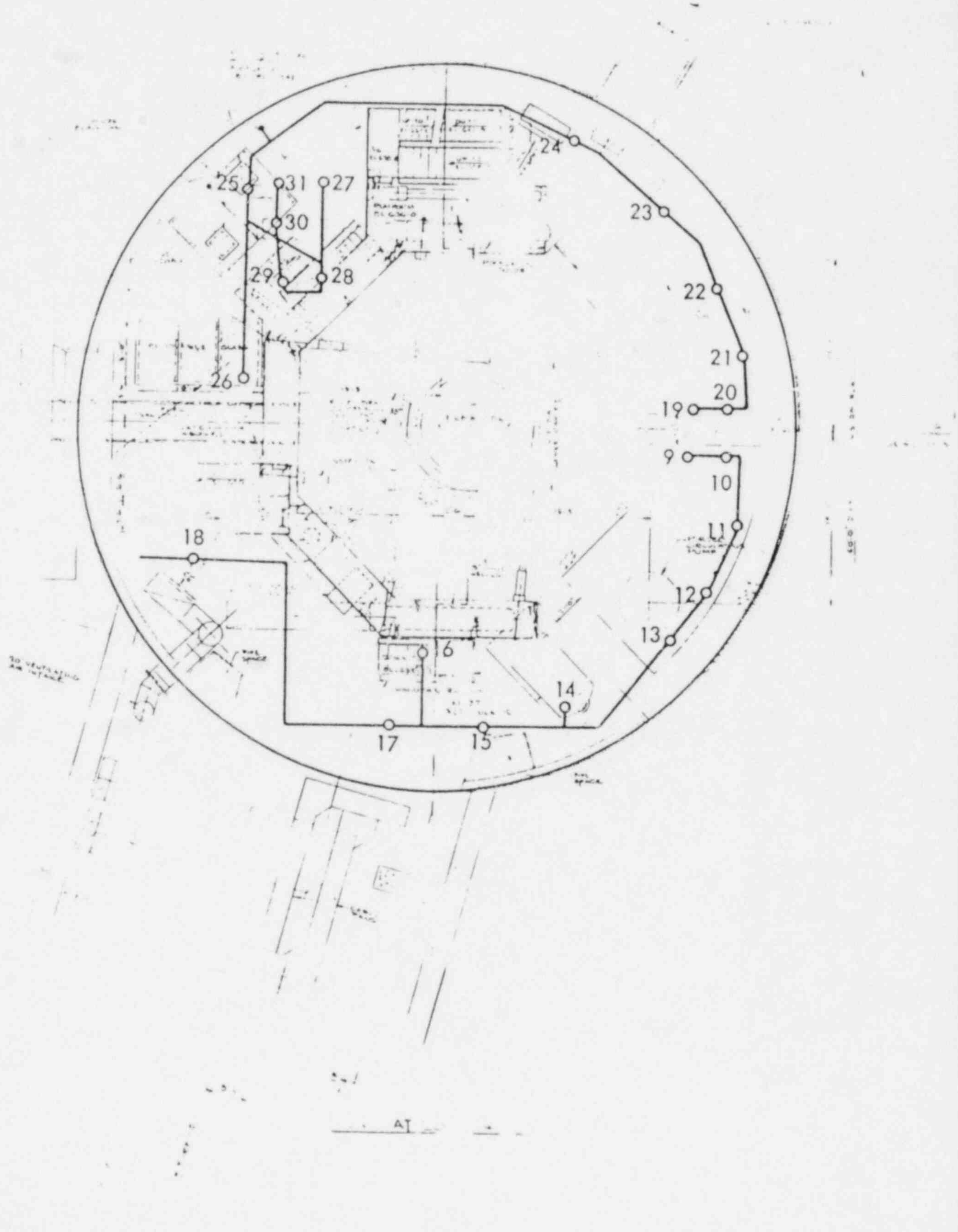
FIG. 15.3



Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	10/16/77	[signature]	11/2/77	[signature]	11/2/77

REACTOR BUILDING SPRAY NOZZLES ABOVE MAIN FLOOR

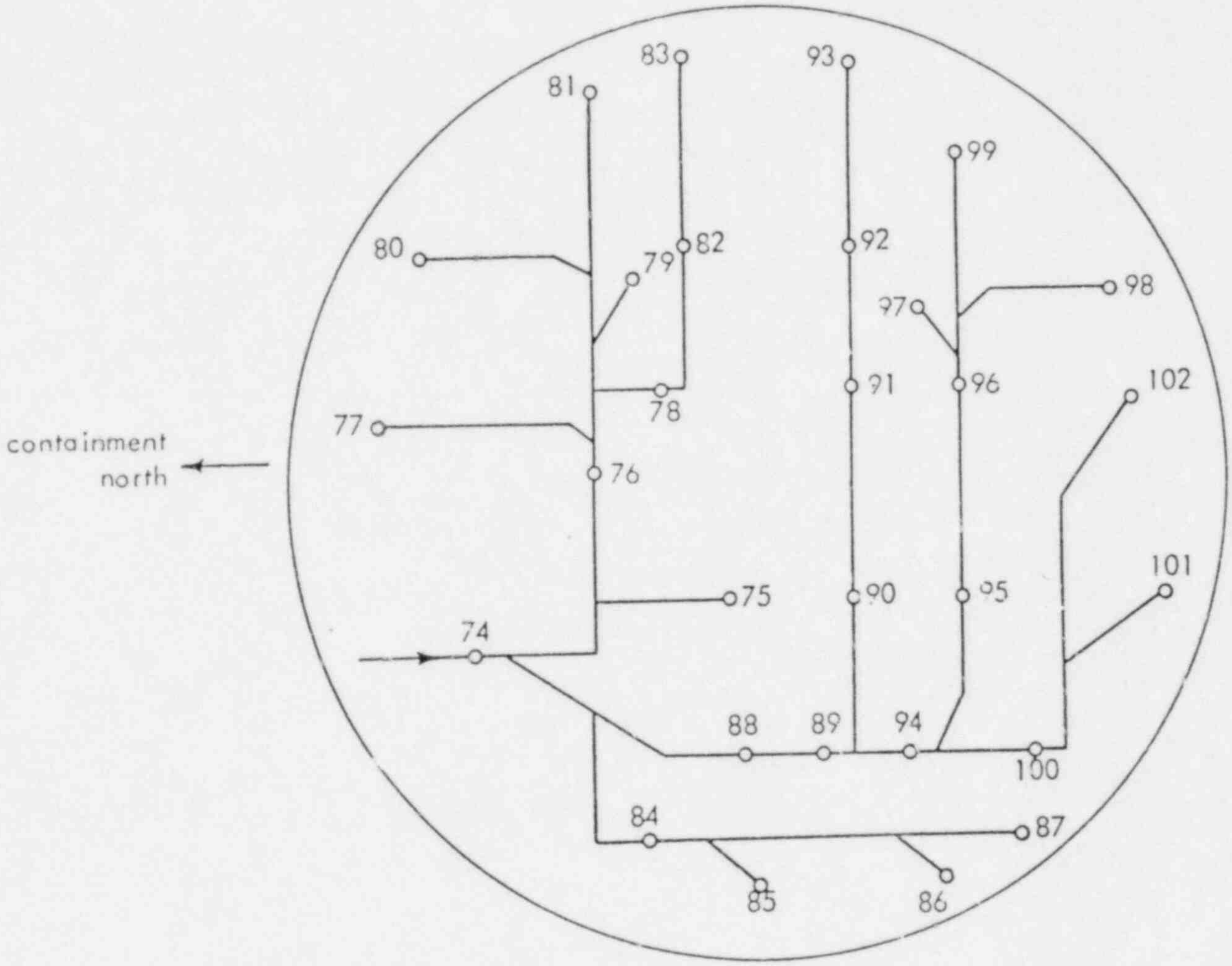
FIG. 15.4



Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	10/16/77	[illegible]	[illegible]/77	[illegible]	11/2/77

REACTOR BUILDING SPRAY NOZZLE LOCATIONS ABOVE GROUND FLOOR

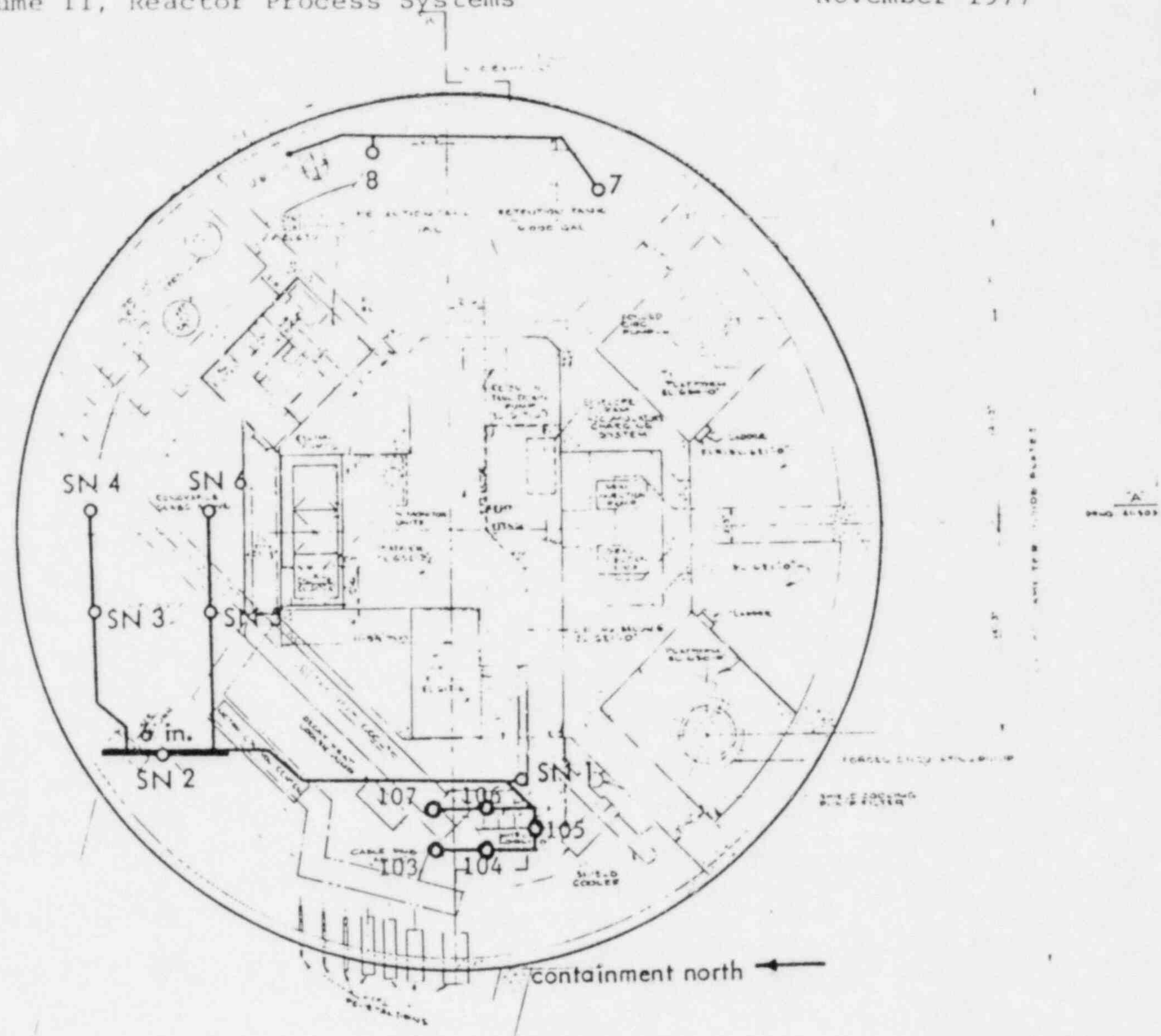
FIG. 15.5



REACTOR BUILDING SPRAY NOZZLE LOCATIONS IN DOME

FIG. 15.

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	10/16/77	[signature]	11/2/77	[signature]	11/2/77



REACTOR BUILDING SPRAY NOZZLE LOCATIONS ABOVE BASEMENT FLOOR

FIG. 15.7

Prepared or Revised By	Date	Oper. Rev. Com. Approval	Date	Safety Rev. Com. Approval	Date
G. S. Boyd	10/16/77	[illegible]	11/2/77	[illegible]	11/2/77

ENCLOSURE II

RECD MAR

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON D C 20555

March 1, 1982

Docket No. 50-409
LS05-82-03-002

MAR 1982

Mr. Frank Linder
General Manager
Dairyland Power Cooperative
2615 East Avenue South
LaCrosse, Wisconsin 54601

Dear Mr. Linder:

SUBJECT: LACROSSE BOILING WATER REACTOR (LACBWR) - FIRE PROTECTION EXEMPTION

The Commission has issued the enclosed Exemption from certain requirements of Section 50.48 and Appendix R to 10 CFR Part 50, in response to your letter dated March 19, 1981. This exemption, which is being forwarded to the Office of the Federal Register for publication, pertains to the requirement that the oil collection system for the reactor coolant pumps be designed, engineered, and installed so that there is reasonable assurance that the system will withstand the Safe Shutdown Earthquake.

Your request for exemption from the provisions of 10 CFR 50, Appendix R, Item III.A is under review and will be the subject of separate correspondence.

Sincerely,

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
Exemption

cc w/enclosure:
See next page

8203100380
PDR

UNITED STATES

NUCLEAR REGULATORY COMMISSION

In the Matter of Dairyland Power Cooperative (LaCrosse Boiling Water Reactor)	)))))	Docket No. 50-409

EXEMPTION

I.

The Dairyland Power Cooperative (Dairyland) is the holder of Provisional Operating License No. DPR-45 which authorizes operation of the LaCrosse Boiling Water Reactor (LACBWR), located in Vernon County, Wisconsin. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

II.

Section III.O of Appendix R to 10 CFR Part 50 requires that the reactor coolant pump (recirculation pump or forced circulation pump for boiling water reactors) be equipped with an oil collection system if the containment is not inerted during normal operation. Because LACBWR is not inerted during normal operation, under this provision an oil collection system is required. Section III.O of Appendix R specifies that the oil collection system shall be so designed, engineered, and installed that failure will not lead to fire during normal or design basis accidents and that there is reasonable assurance that the system will withstand the Safe Shutdown Earthquake (SSE).

8203100385

By letter dated March 19, 1981, Dairyland indicated that the installed drip shields do not provide adequate protection against all postulated lube oil leaks and further asserted that a seismically qualified oil collection system would not enhance fire protection safety at the LACBWR because alternative means to fulfill the stated objective of the Commission could be implemented. Accordingly, Dairyland requested an exemption from the requirements of Section III.O of Appendix R to 10 CFR Part 50.

The exemption request is based on the following: The recirculation pump coupling oil (90 gallons per pump) will be removed and replaced with a non-flammable glycol-water solution and the recirculation pump lubricating oil inventory remaining (15 gallons per pump) is so small that it could not cause a major fire at the pump location.

Based upon our evaluation, we conclude that Dairyland's alternative method for providing fire protection in the containment building is adequate and that Dairyland should, therefore, be granted an exemption from the specific requirements of Section III.O of Appendix R to 10 CFR Part 50, "Oil and Oil Collection Systems for Reactor Coolant Pumps".

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. Therefore, the Commission hereby approves the exemption request identified above, subject to the conditions that the recirculation pump coupling oil be removed and replaced with a non-flammable liquid.

The NRC staff has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4), an environmental impact statement or negative delcaration and environmental impact appraisal need not be prepared in connection with this action.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland,
this 1st day of March, 1982.