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SAFE SHUTDOWN - FIRE STUDY

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I. INTRODUCTION

This report identifies various means of bringing the plant to and maintaining the plant at a safe shutdown condition during and after a fire in a fire area. The analysis assumes all equipment in the fire area fails in the worst direction. The pressure boundary integrity of a valve, pump casing, pipe, or tank is assumed not to be affected by the fire. The containment purge system and containment cooling system are not necessary for plant cooldown and not addressed in this analysis.

Since this analysis assumes all equipment and cables within a fire area fail as a result of the fire a separate cable separation analysis is not required.

Abbreviations

RC System	-	Reactor Coolant System
RHR System	-	Residual Heat Removal System
RWST	-	Refueling Water Storage Tank
PORV	-	Power Operated Relief Valve
AVT	-	All Volital Treatment
S.I.	-	Safety Injection
RMW	-	Reactor Makeup Water

II. FIRE AREAS

The entire plant has been divided into fire areas. Each building is assumed to be a separate fire area because they are separated by fire barriers or distance. Each floor within a building was examined individually and in many cases broken up into smaller fire areas within the floor zone. In general, these areas were broken out along walls or column lines and were primarily designed to ease the gathering of data as to the contents of a given area. The fire areas are illustrated in the attached drawings.

In general, fire barriers or space is used to maintain separation between fire areas. Cable trays that go from one fire area to another may require fire stops to prevent fire from spreading from one area to the adjacent area. Other "fixed" combustible sources are not credible proliferation agents due to containment (oils, charcoal, wood, paper, etc.). Excessive transient combustibles will require a fire watch to be posted during the interim time period that the transient is present.

III. METHOD OF ANALYSIS

The information from all plant circuit schedules was placed in a computer file. This information initially included the connected equipment and cable tray and conduit, but not physical location. The file was then supplemented with the physical location of the cable trays and conduit, and coded to indicate the associated fire zones. At this point it was possible for the computer to identify all systems and equipment which would potentially be affected by a fire in any particular fire zone.

A systems analysis was then performed to determine the complement of equipment normally available to bring the plant to a safe (cold) shutdown condition. The equipment complement was then compared with the list of equipment which could potentially be affected by a fire in each zone. The equipment that could potentially be lost was then reviewed with respect to the consequences of actual fire effects. Conservative assumptions were made for fire induced effects on the circuits. Effects due to shorts, opens, and impressed voltages equal to the highest voltage carried in the tray system where evaluated and the "worst case" used for the analysis.

The system level consequences of these circuit effects were then evaluated on a "worst case" basis. It was assumed that all active components (MOVs, solenoid op-valves, circuit breakers, etc) could fail in any position (state), or spuriously change state due to the fire. No credit was taken for physical separation within the fire zone although in many cases the physical separation exceeds the requirements of IEEE-384. Shutdown methods for each fire zone were then developed based on this analysis and recommendations for system functional modifications made. These methods and functional recommendations are presented in Section V.

A specific set of equipment hardware modifications was then proposed to implement the recommended functional modifications. These are presented in Section VI.

As work proceeds on specific systems, additional approaches to resolve some of these problems may be found on a case by case basis.

IV. GENERAL SHUTDOWN METHODS

The following is a series of shutdown and cooldown methods that can be used at Ginna Station to achieve cold shutdown. These methods may be modified in Section V when applied to a specific fire area.

Normal Shutdown and Cooldown Off Site Power Available

Turbine load and reactor power are reduced at a prescribed rate automatically dependent upon the rate selected on the E-H governor control. Normal boron addition may take place before and during load reduction. At 50 MW of generator load, the main feedwater valves are closed, one feedwater pump is removed from service, and the feedwater valve bypass valves are used for feedwater control. As generator load is removed, steam dump to the condenser is initiated and the "hot standby" condition is achieved.

If a faster power decrease is desired the reactor may be manually tripped. If the steam dump controller is set on auto, automatic steam dump will occur. If the steam dump controller is set on manual, steam pressure will be regulated. At this time all control rods are fully inserted, the turbine governor and throttle valves are closed, and the main feedwater valves are open. Soon (5 minutes) after reactor trip, hot shutdown conditions are achieved.

At this point normal boration and makeup can be performed dependent upon final RC system condition to be achieved.

To initiate cooldown, the amount of steam dump to the condenser is increased. Steam dump to the condenser is maintained until air ejector can no longer maintain condenser vacuum (approximately 350°F) and then atmospheric steam dump is initiated. As the volume of reactor coolant shrinks due to temperature decrease, automatic makeup to the system is provided by the pressurizer level control of the charging and makeup system.

The RHR system is aligned and started to recirculate through the RWST. Upon verification that the boron concentration of the RHR system is compatible to the RC system the RHR system is stopped. When the RC system reaches 360 psi and 350°F, the RHR system is pressurized to the pressure of the RC system through HCV-133 at a slow rate. The RHR system is then aligned for normal cooldown to the RC system, and the RHR pumps started while the RC system pressure is maintained by sprays and heaters. As the cooldown continues, the pressurizer is slowly filled to the solid condition at which time pressure control is assumed by PCV-135 and the RC pumps may be taken out of service. Charging pump flow is slowly reduced as cooldown continues to insure pressure of the RCS is maintained at 360 psi by PCV-135. Just prior to achieving 150°F the reactor coolant pumps are taken out

of service. Auxiliary feedwater pumps are used to maintain steam generator level. The remainder of the cooldown is performed and maintained with the RHR system. Anytime after the RC pumps are taken out, the charging pumps can be taken out and RC system pressure reduced to atmospheric.

Normal Shutdown and Cooldown
Off Site Power Not Available

Loss of off site power is assumed to occur simultaneous with plant trip, the diesels and turbine driven auxiliary feedwater pumps will start automatically. The diesels automatically tie to the 480v class 1E buses energizing the component cooling water, service water, and motor driven auxiliary feedwater pumps. Bus 13 is manually tied to Bus 14 and bus 15 manually tied to 16 to provide power for the air compressors. Other loads such as the charging pumps and containment fan coolers are manually energized if necessary. Heat removal will be accomplished by the secondary system utilizing the atmospheric power operated relief valves (PORV's). Steam generator level is maintained by the auxiliary feedwater pumps or standby auxiliary feedwater pumps. As decay heat decreases all auxiliary feedwater pumps are not needed and are removed from service at operator discretion. Primary system volume is maintained by the charging flow and letdown rate. Pressure control of the primary system is provided by auxiliary spray and pressurizer heaters. Cooldown is initiated by manipulation of the steam relief rate. The primary system is cooled to 360 psi and 350°F at which time the RHR system is put into operation as described above. The RHR system is utilized to achieve and maintain the cold shutdown condition.

Shutdown and Cooldown - No Steam Dump
Off Site Power Available

The method is identical to the Normal method - off site power available except heat removal will be accomplished by the secondary system utilizing the PORV's.

Shutdown and Cooldown - No Steam Dump
Off Site Power Not Available

The method is identical to the Normal method - off site power not available.

Shutdown and Cooldown - No Instrument Air
Off Site Power Available

The plant is tripped and the secondary system safety valves will stabilize the RC system near hot shutdown conditions. The turbine driven, motor driven or standby auxiliary feedwater pumps can be used to supply auxiliary feedwater. Charging will be done through the RC pump seals and valves 392A and B acting as relief valves. Charging water will come from the emergency boration path or from the RWST by opening manual valve 358. Letdown is

isolated by the loss of Instrument Air. If primary system relief is required the Pressurizer PORV's can be operated manually. The component cooling water system and the RHR system are not affected by the loss of Instrument Air.

Shutdown and Cooldown - No Instrument Air
Off Site Power Not Available

This method is identical to the above method with off site power except all AC power is supplied from the diesel generators and the RC pumps are off.

Shutdown and Cooldown - No Instrument Air to Containment
Off Site Power Available

The plant is tripped and the secondary system PORV's can be used to stabilize the RC system at hot shutdown conditions. The turbine driven, motor driven or standby auxiliary feedwater pumps can be used to supply auxiliary feedwater. Charging will be done through the RC pump seals and valves 392A and B acting as relief valves. Charging water will come from the normal boration paths or the emergency boration path. Letdown is isolated by the loss of Instrument Air. If primary system relief is required the Pressurizer PORV's can be operated manually. The component cooling water system and the RHR system are not affected by the loss of Instrument Air.

Shutdown and Cooldown - No Instrument Air to Containment
Off Site Power Not Available

This method is identical to the above method with off site power except all AC power is supplied from the diesel generators. The RC pumps are therefore off and Buses 13 and 15 must be supplied from Buses 14 and 16.

Shutdown and Cooldown - Solid Steam Generators No RHR
Off Site Power Available

The plant is brought to the point where RHR cooling is normally initiated by the methods described in Normal Shutdown and Cooldown - with off site power. Since the RHR is unavailable, the reactor coolant system is cooled below the 350°F point by the secondary system. After a time, the secondary system will approach 225°F and decay heat in the primary system has become small enough to not significantly increase temperature and pressure of the primary system with heat removal accomplished by using the steam generators as water to water heat exchangers. The main steam line supports can be pinned. This would be done to prevent damage to the supports with the piping filled with water. To continue the cooldown after 225°F is achieved in the secondary system, the main steam isolation valves are closed, the steam generator blowdown lines are aligned to the blowdown flash tank for discharge to the circulating water canal, the turbine driven auxiliary feedpump is secured with all drains open, the main steam line drains and bypass valves are opened, and the water

level is brought up in the steam generators until the steam piping is filled to the main steam isolation valves. Heat removal is now accomplished through the drains and steam generator blowdown lines. As the steam piping is filled, the hot water can be drained through the main steam line drains and turbine driven auxiliary feedwater pump drains. The steam generator blowdown system drains hot water directly from the steam generators to the circulating water discharge canal. The rate of cooldown, which in this mode of operation is slow, is regulated by the amount of demineralized water available. Secondary system cooldown of the primary system can be augumented by "feed and bleed" of the primary system utilizing the safety injection or charging pumps with refueling water and the pressurizer relief valves. Before exhaustion of the demineralized water supply, efforts are made to transfer water from the hot well or AVT condensate storage tanks before restoring to service water as supply for the auxiliary feedwater pumps. It should be noted that since the RHR heat exchangers are not in use, it is not imperative that the Component Cooling Water System be in operation. This method of cooling is used until the primary system has been cooled to the cold shutdown condition.

Shutdown and Cooldown - Solid Steam Generators No RHR
Off Site Power Not Available

This method is identical to the above method with off site power except all AC power is supplied from the diesel generators.

Shutdown and Cooldown - Inoperable RHR Valves
Off Site Power Available

This method is used in the event that one of the RHR suction valves (V-700, V-701) or RHR return valves (V-720, and V-721) are stuck closed. The reactor coolant system has been brought to the 350°F point using normal methods. If one of the suction valves is stuck closed, the other letdown valve is closed and the two return valves are opened. In this mode of operation, the return line will provide suction for the RHR pumps through the three inch recirculation line of the RHR pumps. The return route to the reactor coolant system is established by closing valves 624, and 625, RHR heat exchanger outlet valves, and V-626, RHR heat exchanger bypass valves and their respective guard valves V-717, V-715 and V-712B and opening valves 857 A,B, and C to the suction of the Safety Injection pumps. To assure circulation through the core, valves 878 B and D are closed and valves 878 A and C are opened. When this path of flow has been established the RHR system pressure is equalized with HCV-133 to the reactor coolant system pressure. The RHR pumps and Safety Injection pumps are started. Cooldown is continued to cold shutdown with rate of cooldown controlled by the number of safety injection pumps running. If one of the return valves is stuck closed, the other return valve is closed, both suction valves are opened and the remainder of system alignment and operation remains the same, except the recirc line will not be necessary.

Shutdown and Cooldown - Inoperable RHR Valves Off Site Power Not Available

This method is identical to the above method with off site power except all AC power is supplied from the diesel generators.

Shutdown and Cooldown - No Charging Pumps Off Site Power Available

This method of cooldown is used when the charging pumps are not available for maintaining the RC system inventory. The hot shutdown condition is achieved using normal methods. Cooldown is initiated using the turbine driven auxiliary feedwater pump (the motor driven auxiliary feedwater pumps are used when required) . with steam dump to atmosphere. The safety injection pumps are aligned to take suction from the RWST providing the necessary boration and makeup. Reactor coolant system pressure is reduced by opening the pressurizer PORV's to a point where the discharge pressure of the safety injection pumps is higher than the RC system pressure. A safety injection pump is then started. RC system pressure is controlled with pressurizer heaters, the pressurizer relief valves, and letdown. When the RC system reaches 360 psi and 350°F, the safety injection pumps are stopped. The RHR system is aligned for normal letdown and cooling of the RC system and the RHR pumps are started. The safety inejction pumps still have suctions aligned to the RWST and are started as required to makeup to the RC system.

Shutdown and Cooldown - No Charging Pumps Off Site Power Not Available

This method is identical to the above method with off site power except all AC power is supplied by the diesel generators.

Shutdown and Cooldown with no Service Water Off Site Power Not Available

There is no service water until portable alternative sources can be installed. Until service water is available the Diesel Generators should not be run because of lack of cooling. Cooling can be provided by installing a prefabricated hose connection to each diesel generator. Then fire hoses are connected between city fire hydrant outside the diesel generator rooms and the hose connection on each diesel generator. The diesels now can be run normally.

There is no source of cooling for the Instrument Air compressors so cooldown will have to be done without Instrument Air.

The Component Cooling Water System is inoperable until service water can be restored. To provide service water to a component cooling water heat exchanger an elbow in the service water line is removed and replaced with a prefabricated plate containing fire hose connections. Fire hoses are then connected between the plate and portable pump/pumps near the lake capable

of pumping a minimum of 1000 gpm. Valves are then aligned so that only one component cooling water heat exchanger receives the water making one train of the component cooling water system available for cooldown.

Until the diesel generators are available the plant must be operated from the batteries. The plant is designed to operate several hours in this mode.

Auxiliary feedwater will be supplied by the turbine driven pump until the diesel generators can be operated. After the diesel generators are operating the motor driven pumps or the standby pumps can be used. An adequate supply of feedwater is stored in the Condensate Storage Tanks. If additional water is required it can be obtained from a fire hose connected to a city fire hydrant located outside the Service Building.

The Main Steam Isolation Valves and the steam line PORV's will fail closed because of no Instrument Air. Steam pressure will remain at the safety valve setpoint until the PORV's are open manually for cooldown.

Diesel generators must be operating for charging to the primary system. The only source of leakage should be out of the reactor coolant pump seals. The flow should be small and should not drain the pressurizer prior to operating the diesel generators. Once the diesel generators are operating the charging pumps can be operated. Charging can be done through the reactor coolant pump seals, V-392A and V-392B (Since Instrument Air is not available these valves will be operated as relief valves).

Charging water can be supplied from the emergency boration path or from the RWST.

Since Instrument Air is not available, letdown, if required, must be done by manually operating the pressurizer PORV's.

When water is available to one of the component cooling water heat exchangers cooldown can be started. The steam system should be used to cooldown the plant to the point where RHR can be initiated. The RHR system with one component cooling water heat exchanger has sufficient capacity to remove decay heat and slowly cool the plant down.

Shutdown and Cooldown with no Service Water
Off Site Power Available

There is no service water until portable alternative sources can be installed. Until service water is available the Diesel Generators should not be run because of lack of cooling. Since off site power is available the diesel generators are not required.

There is no source of cooling for the Instrument Air compressors so cooldown will have to be done without Instrument Air.

The Component Cooling Water System is inoperable until service water can be restored. To provide service water to a component cooling water heat exchanger an elbow in the service water line is removed and replaced with a prefabricated plate containing fire hose connections. Fire hoses are then connected between the plate and portable pump/pumps near the lake capable of pumping a minimum of 1000 gpm. Valves are then aligned so that only one component cooling water heat exchanger receives the water. Now one train of the component cooling water system is available for cooldown.

Auxiliary feedwater will be supplied by the turbine driven pump, motor driven pumps, or the standby pumps. An adequate supply of feedwater is stored in the Condensate Storage Tanks. If additional water is required it can be obtained from a fire hose connected to a city fire hydrant located outside the Service Building.

The Main Steam Isolation valves and the steam line PORV's will fail closed because of lack of Instrument Air. Steam pressure will remain at the safety valve setpoint until the PORV's are open manually for cooldown.

Since the component cooling water system is not initially available the reactor coolant pumps should be off and natural circulation used to remove decay heat.

Since off site power is available the charging pumps can be operated. Charging can be done through the reactor coolant pump seals, V-392A and V-392B (Since Instrument Air is not available these valves will be operated as relief valves).

Charging water can be supplied from the emergency boration path or from the RWST.

Because of the loss of Instrument Air letdown is not available. Letdown should not be necessary while sitting at hot shutdown or during cooldown. If primary system relief is necessary the PORV's can be operated manually.

When water is available to one of the component cooling water heat exchangers cooldown can be started. The steam system should be used to cooldown the plant to the point where RHR can be initiated. The RHR system with one component cooling water heat exchanger has sufficient capacity to remove decay heat and slowly cool the plant down.

V. SPECIFIC SHUTDOWN METHODS

The following are shutdown methods for a fire in a fire area. In most cases the same method can be used with off site power available or not available. Cases dependent on the availability of off site power are noted here or in Section IV.

FIRE AREA - TURBINE BUILDING OPERATING FLOOR

Shutdown Method:

Normal shutdown and cooldown methods can be used. The fire may affect the turbine stop valves which would require closing the main steam isolation valves.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - TURBINE BUILDING MEZZANINE WEST

Shutdown Method:

Normal shutdown and cooldown methods can be used.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:
Steam Generator Level.

FIRE AREA - TURBINE BUILDING MEZZANINE MID-SECTION

Shutdown Method:

Normal shutdown and cooldown methods without steam dump.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - TURBINE BUILDING MEZZANINE NORTH

Shutdown Method:

Shutdown and cooldown without Instrument Air. Some service water valves may require manual repositioning.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:
Electrical Distribution for offsite power
Electrical Distribution for onsite power

FIRE AREA - TURBINE BUILDING MEZZANINE SOUTH

Shutdown Method:

Shutdown and cooldown without Instrument Air and no offsite power. Offsite power may be disabled by the fire. Some service water valves may require manual repositioning.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:
Electrical Distribution for onsite power

FIRE AREA - TURBINE BUILDING FEEDPUMP ROOM

Shutdown Method:

Normal shutdown and cooldown methods can be used.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - TURBINE BUILDING BASEMENT WEST

Shutdown Method:

Normal shutdown and cooldown methods without steam dump. Some service water valves may require manual repositioning.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - TURBINE BUILDING BASEMENT MID-SECTION

Shutdown Method:

Normal shutdown and cooldown methods without steam dump.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - TURBINE BUILDING BASEMENT EAST

Shutdown Method:

Shutdown and cooldown without Instrument Air and no offsite power. Offsite power may be disabled by the fire. Some service water valves may require manual repositioning. Auxiliary feedwater will be supplied by the motor driven pumps and the Standby System.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Electrical Distribution for onsite power
Steam Line PORV

FIRE AREA - DIESEL GENERATOR ROOM 1A

Shutdown Method:

Operating from offsite power - normal shutdown and cooldown methods. Some service water valves may require manual repositioning.

Operating from onsite power - normal shutdown and cooldown methods except all AC power will come from Diesel Generator 1B. Some service water valves may require manual repositioning.

Modifications:

In order to use the above shutdown method the following systems require modification:

Diesel Generator Fuel Oil Transfer Pumps

FIRE AREA - DIESEL GENERATOR ROOM 1B

Shutdown Method:

Operating from offsite power - normal shutdown and cooldown methods. Some service water valves may require manual repositioning. The service water pumps may have to be operated locally.

Operating from onsite power - normal shutdown and cooldown methods except all AC power will be supplied from Diesel Generator 1A. Some service water valves may require manual repositioning. The service water pumps may have to be operated locally and Bus 17 is isolated.

Modifications:

In order to use the above shutdown method the following systems require modification:

Service Water Pumps
Diesel Generator Fuel Oil Transfer Pump
Electrical Distribution for offsite power
Electrical Distribution for onsite power

FIRE AREA - DIESEL GENERATOR 1A VOLT

Shutdown Method:

Operating from offsite power - normal shutdown and cooldown methods. Some service water valves may require manual repositioning.

Operating from onsite power - normal shutdown and cooldown methods except all AC power will be supplied from Diesel Generator 1B. Some service water valves may require manual repositioning.

Modifications:

In order to use the above shutdown method the following systems require modification:

Electrical Distribution for offsite power
Electrical Distribution for onsite power

FIRE AREA - DIESEL GENERATOR 1B VOLT

Shutdown Method:

Operating from offsite power - normal shutdown and cooldown methods. Some service water valves may require manually reposition ing and the service water pumps may have to be operated locally.

Operating from onsite power - normal shutdown and cooldown methods except all AC power will be supplied from Diesel Generator 1A. Some service water valves may require manual repositioning and the service water pumps may have to be operated locally.

Modifications:

In order to use the above shutdown method the following systems require modification:

Service Water Pumps
Diesel Generator 1A Fuel Oil Transfer Pump
Diesel Generator 1A
Electric Distribution for offsite power
Electric Distribution for onsite power

FIRE AREA - AUXILIARY BUILDING OPERATING FLOOR WEST

Shutdown Method:

Normal shutdown and cooldown methods can be used. One of the pressurizer PORV block valves may fail due to the fire. Since this PORV should not be needed for shutdown or cooldown the loss of the block valve is acceptable.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - AUXILIARY BUILDING OPERATING FLOOR NORTH

Shutdown Method:

A modified normal shutdown and cooldown method is required for a fire in this area. The modification is necessary because vital Bus 14 is lost. This affects charging, auxiliary feedwater component cooling and RHR. Some service water valves may require manual repositioning. Auxiliary feedwater will be supplied by the turbine driven pump, B-motor driven pump, or D-standby pump. The normal charging paths will be used except only the B and C charging pumps are available. Charging water will be taken from the RWST through manual valve 358. The normal letdown paths will be used if required. The RHR valves will require manually repositioning and only one RHR pump and one component cooling water pump will be operational. One of the pressurizer PORV block valves may fail due to the fire. Since this PORV should not be needed for shutdown or cooldown the loss of the block valve is acceptable.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Valving between RWST and Sump B or Waste Holdup Tanks. Inadvertent valve movement could result in draining the RWST into the Sump and/or Waist Holdup Tank.

FIRE AREA - AUXILIARY BUILDING OPERATING FLOOR SOUTH

Shutdown Method:

Use the shutdown and cooldown methods for solid steam generators without RHR with the following exceptions: Auxiliary feedwater will be supplied by the turbine driven pump, motor driven pumps, and D loop of the standby system. The component cooling water pumps are in the fire area and assumed to fail. Therefore, RHR is disabled.

Modifications:

No modifications are required to ensure that the above shutdown method can be used.

FIRE AREA - AUXILIARY BUILDING MEZZANINE FLOOR WEST

Shutdown Method:

Use the shutdown and cooldown methods for solid steam generators without RHR with the following exceptions: Auxiliary feedwater will be supplied from the Auxiliary Feedwater System. The Standby System is disabled by the fire. The normal charging path is disabled but the alternate charging line is useable. The normal sources of borated water are available. Letdown, if required, can be done through the pressurizer PORV's.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Valve 200A, 200B, and 202 to provide letdown isolation.
Pressurizer PORV and block valves to prevent inadvertent operation.
Valve 720 and 721 to prevent inadvertent operation.
Pressurizer Backup Heaters.
RWST Level Indication.
Steam Generator Level Indication.

FIRE AREA - AUXILIARY BUILDING MEZZANINE MID-SECTION

Shutdown Method:

Use the shutdown and cooldown methods for solid steam generators without RHR with the following exceptions: Some service water valves may require manual repositioning. Bus 16 is disabled by the fire. When operating on onsite power Bus 15 is also lost which also disables steam dump. Auxiliary feedwater will be supplied from the turbine driven pump and the A-motor driven pump. The Standby System is disabled by the fire. The normal charging path is disabled but the alternate charging line is useable. Only the A charging pump is operable with a local on/off control. Charging water will be taken from the RWST through manual valve 358. Letdown, if required, can be done using the pressurizer PORV's.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Auxiliary Building DC Distribution Panel 1A
A-motor driven auxiliary feedwater pump
A-charging pump
Pressurizer PORV and block valves to prevent inadvertent operation.
Valve 720, 721, 700 and 701 to prevent inadvertent operation
Valving between RWST and Sump B
Valving between RWST and Waste Holdup Tank
S.I. pumps
Pressurizer Backup Heaters
S.I. Header Pressure Indication
RWST Level Indication
RCS Pressure Indication
Pressurizer Level Indication
Steam Generator Level Indication
Electric Distribution for offsite power
Electric Distribution for onsite power

FIRE AREA - AUXILIARY BUILDING MEZZANINE EAST

Shutdown Method:

Use the normal shutdown and cooldown methods with the following exceptions: Some service water valves may require manual repositioning. Auxiliary feedwater will be supplied by the turbine pump and the motor driven pumps. The Standby System is disabled by the fire. The normal charging paths can be used with borated water coming from the RWST through manual valve 358. Letdown, if required, can be done using normal paths. The RHR system may require manual valve repositioning prior to use.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Auxiliary Building DC Distribution Panels 1A & 1B
Reactor Makeup Water Pumps
Electric Distribution for onsite power

FIRE AREA - AUXILIARY BUILDING BASEMENT WEST

Shutdown Method:

Use the shutdown and cooldown methods for solid steam generators without RHR with the following exceptions: The normal charging path is disabled but the alternate charging line is useable. The normal sources of charging water are available. Letdown, if required, can be done using the excess letdown path.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Valving between RWST and Sump B
Valving between RWST and Waste Holdup Tank
RWST Level Indication

FIRE AREA - AUXILIARY BUILDING BASEMENT NORTH

Shutdown Method:

Use the shutdown and cooldown methods for solid steam generators without RHR with the following exceptions: Auxiliary feedwater will be supplied from the turbine driven pump, A-motor driven pump, and/or standby pumps. The normal charging path is disabled but the alternate charging line is useable. Charging pumps will require local on-off operation. Charging water will be taken from the RWST through manual valve 358 or the emergency boration path (V-350). Letdown, if required, can be done using the excess letdown path. One of the pressurizer PORV block valves may fail due to the fire. Since this PORV should not be needed for shutdown or cooldown the loss of the block valve is acceptable.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

Charging Pump Cooling System
Entrance into Charging Pump Room
Valving in RMW path to charging pumps
V-202 to isolate letdown
Valving between RWST and Waste Holdup Tank
RWST Level Indication
Pressurizer Level Indication

FIRE AREA - AUXILIARY BUILDING BASEMENT SOUTH

Shutdown Method:

Normal shutdown and cooldown methods can be used.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:

RHR Pump Fans
Valving between RWST and Waste Holdup Tank

FIRE AREA - AUXILIARY BUILDING BASEMENT EAST

Shutdown Method:

Use the shutdown and cooldown methods for no charging pumps with the following exceptions: Letdown, if required, can be done using the excess letdown path.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modification:
Pressurizer Level Indication

FIRE AREA - AUXILIARY BUILDING RHR ROOM

Shutdown Method:

Use the shutdown and cooldown methods for solid steam generators without RHR with the following addition:
During the initial stage of the fire re-institute power to V-856 and close the valve to prevent draining the RWST into the disabled RHR system.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - INTERMEDIATE BUILDING TOP LEVEL

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - INTERMEDIATE BUILDING UPPER LEVEL SOUTH

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - INTERMEDIATE BUILDING UPPER LEVEL NORTH

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - INTERMEDIATE BUILDING UPPER LEVEL EAST

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - INTERMEDIATE BUILDING MEZZANINE SOUTH

Shutdown Method:

Use normal shutdown and cooldown methods with the following exceptions: The steam generator blowdown system is disabled by the fire.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - INTERMEDIATE BUILDING MEZZANINE NORTH

Shutdown Method:

This fire area includes both steam line PORV's. Since there is approximately 50 feet between the PORV's and there are no permanent combustibles between them it is unlikely that a fire will affect both valves. The inadvertent opening of a PORV would be covered by the steam line break analysis. The mitigation system used in this analysis (SI System) is not affected by the fire. The normal shutdown and cooldown methods would be used unless the PORV inadvertently opened in which case the procedures for a steam line break would be followed. The auxiliary feedwater for both methods would be supplied by the motor driven pumps and the standby pumps.

Modifications:

In order to ensure that the above shutdown method can be used; the following systems require modifications:

Steam Line PORV's
Motor Driven Auxiliary Feedwater Pump
Steam Generator Pressure Indication

FIRE AREA - INTERMEDIATE BUILDING BASEMENT SOUTH

Shutdown Method:

Use normal shutdown and cooldown method. The fire may cause one steam line PORV to inadvertently open. If this should happen manual block valves can be closed to isolate steam flow. The fire also disables the Steam Generator Blowdown system. This is acceptable because this system is not needed for cooldown.

Modifications:

No modifications are required to ensure that the above shutdown method can be used.

FIRE AREA - INTERMEDIATE SUB-BASTMENT

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to ensure that the above shutdown method can be used.

FIRE AREA - INTERMEDIATE BUILDING BASEMENT NORTH

Shutdown Method:

Use the shutdown and cooldown methods for loss of Instrument Air to containment with the following exceptions: Some service water valves may require manual repositioning. The service water pumps are operable from local on/off controls. Auxiliary feedwater will be supplied by the Standby Auxiliary Feedwater pumps. If the main steam line isolation valves close steam dumps will not be available. Steam Generator blowndown is not available. The backup pressurizer heaters are operable from local on/off controls.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Service Water Pumps
Steam Line PORV's
Pressurizer Backup Heaters
Pressurizer Level Indication
Steam Generator Pressure Indication
Steam Generator Level Indication

FIRE AREA - INTERMEDIATE BUILDING BASEMENT EAST

Shutdown Method:

Use the shutdown and cooldown methods for loss of Instrument Air to containment with the following exceptions: Some service water valves may require manually repositioning. The service water pumps are operable from local on/off controls. Auxiliary feedwater will be supplied by the Standby Auxiliary Feedwater pumps. Steam dump is isolated by the main steam line isolation valves. Steam Generator blowdown is not available. The backup pressurizer heaters are operable from local on/off controls. Some RHR valves may require manual repositioning prior to initiating RHR.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Service Water Pumps
Steam Line PORV's
Standby Auxiliary Feedwater Pump
Pressurizer PORV's
Pressurizer Backup Heaters
Reactor Coolant System Temperature Indication
Pressurizer Level Indication
Steam Generator Pressure Indication
Steam Generator Level Indication

FIRE AREA - CABLE TUNNEL NORTH-SOUTH

Shutdown Method:

Use the normal shutdown and cooldown methods with the following exceptions: Some service water valves may require manual repositioning. Auxiliary feedwater will be supplied by the turbine pump. After the service water valves have been repositioned, if necessary, the Standby Auxiliary Feedwater pumps can be operated from local on/off controls. The normal charging path is disabled but the alternate charging line is useable. The charging pumps may require operation from local on/off controls. Charging water will be taken from the RWST through manual valve 358. Letdown, if required, can be done using the pressurizer PORV's. Component cooling water pumps may require operation from local on/off controls. RHR pumps may require operation from local on/off controls. Some RHR valves may require manual repositioning prior to initiating RHR. The backup pressurizer heaters are operable from local on/off controls.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Standby Auxiliary Feedwater Pumps
Charging Pumps
V-427, V-200A, V-200B and V-202 to isolate letdown
Pressurizer PORV's
Component Cooling Water Pumps
RHR Pumps
V-700, V-701, V-720, and V-721 to prevent inadvertent operation
Valving between RWST and Sump
Valving between RWST and Waste Holdup Tank
S.I. Pumps
Pressurizer Backup Heaters
Charging Pump Flow Indication
RWST Level Indication
Reactor Coolant System Pressure Indication
Pressurizer Level Indication
Standby Auxiliary Feedwater Flow Indication
Steam Generator Level Indication
Electrical Distribution for off site power
Electrical Distribution for on site power
Diesel Generator 1A
Diesel Generator 1B

FIRE AREA - CABLE TUNNEL ELBOW

Shutdown Method:

Use the shutdown and cooldown methods for loss of Instrument Air to containment with the following exceptions: Some service water valves may require manual repositioning. The service water pumps may require operation from local on/off controls. Auxiliary feedwater will be supplied by the Standby Auxiliary Feedwater pumps operated from local on/off controls after the service water admission valves have been manually repositioned. Steam Generator blowdown is not available. The charging pumps may require operation from local on/off controllers. The component cooling water pumps and the RHR pumps may require operation from local on/off controllers. Some RHR valves may require manual repositioning prior to initiating RHR. The backup pressurizer heaters are operable from local on/off controls.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Service Water Pumps
Steam Line PORV's
Standby Auxiliary Feedwater Pumps
Charging Pumps
V-427, V-200A, V-200B and V-202 to isolate letdown
Pressurizer PORV's
Component Cooling Water Pumps
RHR Pumps
V-700, V-701, V-720 and V-721 to prevent inadvertent operation
Valving between RWST and Sump
Valving between RWST and Waste Holdup Tank
S.I. Pumps
Pressurizer Backup Heaters
RWST Level Indication
Reactor Coolant System Temperature Indication
Reactor Coolant System Pressure Indication
Pressurizer Level Indication
Standby Auxiliary Feedwater Flow Indication
Steam Generator Pressure Indication
Steam Generator Level Indication
Electrical Distribution for offsite power
Electrical Distribution for onsite power

FIRE AREA - CABLE TUNNEL EAST-WEST

Shutdown Method:

Use the shutdown and cooldown method for loss of Instrument Air to containment with the following exceptions: Some service water valves may require manually repositioning. The service water pumps may require operation from local on/off controllers. Auxiliary feedwater will be supplied by the Standby Auxiliary Feedwater pumps operated from local on/off controllers after the service water admission valves have been manually repositioned. Some Standby Auxiliary Feedwater system valves may also require manual repositioning. Generator blowdown is not available. The charging pumps may require operation from local on/off controllers. The component cooling water pumps and the RHR pumps may require operation from local on/off controllers. Some RHR valves may require manual repositioning prior to initiating RHR. The backup pressurizer heaters are operable from local on/off controllers.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Service Water Pumps
Steam Line PORV's
Standby Auxiliary Feedwater Pumps
Charging Pumps
V-427, V-200A, V-200B and V-202 to isolate letdown
Pressurizer PORV's
Component Cooling Water Pumps
RHR Pumps
V-700, V-701, V-720 and V-721 to prevent inadvertent operation
Valving between RWST and Sump
Valving between RWST and Waste Holdup Tank
S.I. Pumps
Pressurizer Backup Heaters
RWST Level Indication
Reactor Coolant System Temperature Indication
Reactor Coolant System Pressure Indication
Pressurizer Level Indication
Standby Auxiliary Feedwater Flow Indication
Steam Generator Pressure Indication
Steam Generator Level Indication
Electrical Distribution for offsite power
Electrical Distribution for onsite power

FIRE AREA - RELAY ROOM

Shutdown Method:

Use the shutdown and cooldown methods for loss of Instrument Air with the following exceptions: Some service water valves may require manual repositioning. The service water pumps may require operation from local on/off controls. Auxiliary feedwater will be supplied by the Standby Auxiliary Feedwater pumps operated from local on/off controls after the service water admission valves have been manually repositioned. Some Standby Auxiliary Feedwater systems valves may also require manual repositioning. The charging pumps may require operation from local on/off controllers. The component cooling water pumps and the RHR pumps may require operation from local on/off controllers. Some RHR valves may require manual repositioning prior to initiating RHR. The backup pressurizer heaters are operable from local on/off controls. Power to the Main Control Board Instrumentation from the batteries is lost. Instrument Buses, 1A, 1B, and 1D are also lost. Instrument Bus 1C is operable; however, the major loads are in cabinets in the relay room.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Service Water Pumps
Steam Line PORV's
Standby Auxiliary Feedwater Pumps
Charging Pumps
Pressurizer PORV's
Component Cooling Water Pumps
RHR Pumps
V-700, V-701, V-720 and V-721 to prevent inadvertent operation
Valving between RWST and Sump
Valving between RWST and Waste Holdup Tank
S.I. Pumps
Pressurizer Backup Heaters
RWST Level Indication
Reactor Coolant System Temperature Indication
Reactor Coolant System Pressure Indication
Pressurizer Level Indication
Standby Auxiliary Feedwater Pressure and Flow Indication
Steam Generator Pressure Indication
Steam Generator Level Indication
Electrical Distribution for offsite power
Electrical Distribution for onsite power
Power to required instrumentation must be obtained independent of the Relay Room.

FIRE AREA - AIR HANDLING ROOM

Shutdown Method:

Use the shutdown and cooldown methods for loss of Instrument Air to containment with the following exceptions: Some service water valves may require manual repositioning. The service water pumps may require operation from local on/off controls. Auxiliary feedwater will be supplied by the Standby Auxiliary Feedwater pumps operated from local on/off controls after the service water admission valves have been manually repositioned. Some Standby Auxiliary Feedwater system valves may also require manual repositioning. Steam Generator blowdown is not available. The charging pumps may require operation from local on/off controllers. The component cooling water pumps and the RHR pumps may require operation from local on/off controllers. Some RHR valves may require manual repositioning prior to initiating RHR. The backup pressurizer heaters are operable from local on/off controls.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Service Water Pumps
Standby Auxiliary Feedwater Pumps
Charging Pumps
Pressurizer PORV's
Component Cooling Water Pumps
RHR Pumps
V-700, V-720 and V-721 to prevent inadvertent operation
Valving between RWST and Sump
Valving between RWST and Waste Holdup Tank
S.I. Pumps
Pressurizer Backup Heaters
RWST Level Indication
Reactor Coolant System Temperature Indication
Reactor Coolant System Pressure Indication
Pressurizer Level Indication
Standby Auxiliary Feedwater Flow Indication
Steam Generator Pressure Indication
Steam Generator Level Indication
Electrical Distribution for offsite power
Electrical Distribution for onsite power
Battery Chargers

FIRE AREA - BATTERY ROOM 1A

Shutdown Method:

Use the normal shutdown and cooldown methods noting that one of the two DC trains is inoperable. The normal shutdown and cooldown can be used with the following exceptions: Steam dump is not available. Auxiliary feedwater will be supplied by one loop of the Standby Auxiliary Feedwater system. The other loop and the turbine driven pump can be operated after manual valve repositioning. Charging water will be taken from the emergency boration path or from the RWST through manual valve 358. To prevent charging water from the RMW system, manual isolation valves may have to be closed. Letdown, if required, can be done using local transfer switches. Only one pressurizer PORV is operable. Only one RHR pump is operable. Some RHR valves may require manual repositioning prior to initiating RHR.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications.

Main Steam Isolation Valve
S.I. Pumps
Electrical Distribution in offsite power
Electrical Distribution for onsite power

FIRE AREA - BATTERY ROOM 1B

Shutdown Method:

A fire in this area disables one of the two DC trains. The normal shutdown and cooldown methods for loss of Instrument Air to containment can be used with the following exceptions: Some service water valves may require manual repositioning. Two service water pumps are available to supply service water. Auxiliary feedwater will be supplied by one loop of the Standby Auxiliary Feedwater system. The other loop and the turbine driven pump can be operated after manual valve repositioning. Charging water will be taken from the RWST through manual valve 358. To prevent charging water from the RMW system, manual isolation valves may have to be closed. One of the PORV block valves may fail as is. Since this PORV should not be needed for shutdown or cooldown the loss of the block valve is acceptable. Only one RHR pump is operable. Some RHR valves may require manual repositioning prior to initiating RHR. Instrument Buses 1C and 1D are lost.

Modifications:

Auxiliary Building DC Distribution Panel 1A
Electrical Distribution offsite power
Electrical Distribution onsite power

FIRE AREA - CONTAINMENT VESSEL OPERATING FLOOR-WEST

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - CONTAINMENT VESSEL OPERATING FOOR-MID-SECTION

Shutdown Method:

Use normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - CONTAINMENT VESSEL OPERATING FLOOR-EAST

Shutdown Method:

The only equipment affected by a fire in this area is the pressurizer PORV's and the associated block valves. These valves are in the pressurizer compartment. Since combustables are not stored in this compartment it is unlikely that a fire in the fire area would spread into this compartment. If a fire did exist in this compartment the worst case failure would be for the valves to fail closed or fail open.

If these valves failed closed normal shutdown and cooldown methods could be used. Primary system pressure could be reduced by using pressurizer spray and/or letdown if necessary.

If these valves failed open a small LOCA would result and SI could be used as designed to bring the plant to a safe condition. Normal LOCA procedures would be used in this case.

Modifications:

No modifications are required to use the above shutdown methods.

FIRE AREA - CONTAINMENT VESSEL MEZZANINE-WEST

Shutdown Method:

Use the normal shutdown and cooldown methods with the following exceptions: The normal letdown path is useable; however, the excess letdown path is disabled. Some RHR valves may require manual repositioning prior to initiating RHR.

Modifications:

In order to ensure that the above shutdown method can be used the following systems require modifications.
V-700 and V-701 to prevent inadvertent operation
Reactor Coolant System Temperature Indication
Pressurizer Level Indication
Steam Generator Level Indication

FIRE AREA - CONTAINMENT VESSEL MEZZANINE-EAST

Shutdown Method:

Use the normal shutdown and cooldown methods with the following exceptions: The normal charging path is disabled but the alternate charging line is useable. The normal sources of charging water can be used. Letdown, if required, can be done using the pressurizer PORV's. Some RHR valves may require manual repositioning prior to initiating RHR.

Modifications:

In order to ensure that the above shutdown method can be used the following systems require modifications.
V-427, V-200A, V-200B and V-202 to isolate letdown
Pressurizer PORV's and Block Valves
V-700, V-701, V-720, and V-721 to prevent inadvertent operation
Steam Generator Level Indication
Reactor Coolant System Pressure Indication

FIRE AREA - CONTAINMENT VESSEL BASEMENT-WEST

Shutdown Method:

Use the shutdown and cooldown methods for inoperable RHR valves with the following exceptions: Valves 878A and B are not affected by the fire but valves 878C and D are in the fire area and assured to fail in the worst direction. Since it is necessary to ensure circulation through the core and valves 878C and D may fail open, flow to these valves should be isolated. Close valve 871A and do not operate the SI pump that feeds valves 878C and D.

Modifications:

In order to ensure that the above shutdown method can be used the following systems require modifications.

Steam Generator Level Indication

FIRE AREA - CONTAINMENT VESSEL BASEMENT-EAST

Shutdown Method:

The shutdown and cooldown method used for a fire in this area depends upon which side of the shield wall the fire is in. Installation of the Reactor Coolant Pump Oil Collection System will remove the possibility of spreading a fire from inside the shield wall to outside the shield wall or visa versa. There is then no fire loading path for a fire to follow from inside the shield wall to outside.

Fire Inside Shield Wall

Use the normal shutdown and cooldown methods with the following exceptions: The normal charging path is disabled but charging can be done through the Reactor Coolant Pump seals and V-392B in the relief mode. Letdown, if required, can be done using the pressurizer PORV's. RHR valves 700, 701, and 852B may require manual opening. The RHR flow path will be through valve 700 and 701 to the RHR pumps through the RHR heat exchangers through valve 852B back to the reactor vessel.

Fire Outside Shield Wall

Use the shutdown and cooldown methods for solid steam generators without RHR with the following exceptions: The normal charging path is disabled but charging can be done through the Reactor Coolant Pump seals and V-392B in the relief mode. Letdown, if required, can be done using the pressurizer PORV's. The RHR system is disabled by the fire.

Modifications:

In order to ensure that the above shutdown methods can be used the following systems require modifications.

Reactor Coolant Pump Oil Collection System

V-427, V-200A, V-200B, and V-202 to isolate letdown

Pressurizer PORV's

V-720, V-721 and V-700 to prevent inadvertent operation

Reactor Coolant System Pressure Indication

Pressurizer Level Indication

Steam Generator Level Indication

FIRE AREA - SERVICE BUILDING BASEMENT

Shutdown Method:

Use the normal shutdown and cooldown methods with the following exceptions: The normal source of auxiliary feedwater is in the fire area. This source of water will be available during the initial stage of the fire. Since the standby auxiliary feedwater system is not affected by the fire it can be used to supply feedwater. Also, the alternate source of water to the auxiliary feedwater system is not affected by the fire.

Modifications:

No modifications are required to use the above shutdown methods.

FIRE AREA - SCREEN HOUSE OPERATING FLOOR-SCREENS

Shutdown Method:

Use the normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - SCREEN HOUSE OPERATING FLOOR-BOILER

Shutdown Method:

Use the normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - SCREEN HOUSE OPERATING FLOOR-PUMPS

Shutdown Method:

A fire in this area results in a complete loss of service water. The shutdown method used is dependent upon the availability of offsite power.

Operating from offsite power - Use shutdown and cooldown methods for no service water with offsite power available.

Operating from Diesel Generators - Use shutdown and cooldown methods for no service water with no offsite power available.

Modifications:

In order to ensure that the above shutdown method can be used the following modification is required.

Prefabricated Diesel Generator Hose Connection
Prefabricated Service Water Hose Connection

FIRE AREA - SCREEN HOUSE OPERATING FLOOR-EAST

Shutdown Method:

A fire in this area disables Bus 17 and 18. Since these buses supply the service water pumps a complete loss of service water is assumed. The shutdown method used is dependent upon the availability of offsite power.

Operating from offsite power - Use shutdown and cooldown methods for no service water with offsite power available.

Operating from Diesel Generators - Use shutdown and cooldown methods for no service water with no offsite power available.

Modifications:

In order to ensure that the above shutdown methods can be used the following systems require modifications:

Prefabricated Service Water Connection
Prefabricated Diesel Generator Hose Connection
Electrical Distribution on site power

FIRE AREA - SCREEN HOUSE MIDDLE FLOOR

Shutdown Method:

A fire in this area disables Bus 17 and 18. Since these buses supply the service water pumps a complete loss of service water is assumed. The shutdown method used is dependent upon the availability of offsite power.

Operating from offsite power - Use shutdown and cooldown methods for no service water with offsite power.

Operating from Diesel Generators - Use shutdown and cooldown methods for no service water with no offsite power available.

Modifications:

In order to ensure that the above shutdown methods can be used the following systems require modifications.

Prefabricated Service Water Hose Connections
Prefabricated Diesel Generator Hose Connection
Electrical Distribution offsite power
Electrical Distribution onsite power

FIRE AREA - SCREEN HOUSE BASEMENT

Shutdown Method:

Use the normal shutdown and cooldown methods.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - STANDBY AUXILIARY FEEDWATER ROOM

Shutdown Method:

Use the normal shutdown and cooldown methods with the following exceptions: The standby auxiliary feedwater system is disabled by the fire. Auxiliary feedwater will be supplied by the normal auxiliary feedwater system.

Modifications:

No modifications are required to use the above shutdown method.

FIRE AREA - CONTROL ROOM

Shutdown Method:

This method of cooldown employs equipment remote from the control room. Provisions have been made to afford control of the plant from "full power" to "cold shutdown" by duplicating required instrumentation and controls at stations remote from the control room. There are essentially three remote stations throughout the plant. Control of plant functions at these stations is achieved by operating transfer switches located at the remote stations. Once control has been transferred to the remote stations, the control room controls have no effect on selected equipment.

The transfer switch and associated circuitry are designed such that when the transfer switch is in the local position any malfunction of control circuitry at the control board associated with the selected equipment will not affect the operation of that selected equipment.

Remote station location is as follows:

1. Auxiliary Feedwater Station - basement of Intermediate Building.
2. Charging Pump Station - charging pump room at basement level of Auxiliary Building.
3. Boric Acid Pump Station - boric acid storage tank room at operating level of Auxiliary Building.

In the event the operator has been unable to activate the turbine trip or reactor trip buttons located on the control board before evacuation, a local turbine trip button at the high pressure end of the turbine can be activated and the reactor trip breakers can be deenergized at the breaker cabinets located near the Auxiliary Feedwater Station. A turbine trip with greater than fifty percent load on the turbine will cause an automatic reactor trip. A reactor trip at any load will cause a turbine trip.

An operator will be dispatched to each one of the control stations with communication available between them. The Auxiliary Feedwater Station operator will first trip the reactor trip breakers at the breaker cabinets then transfer control of the containment recirculation fans and service water pumps to the Auxiliary Feedwater Station. Some service water valves may require manual repositioning. Instrument air may be lost as a result of the fire.

Steam generator level and pressure indicators are located at the Auxiliary Feedwater Station to enable the operator to monitor and control the steam generators. Over pressurization of the secondary system is prevented by the main steam safety valves which open automatically on high pressure.

After the operator has verified an oil pump is operating and manually repositions any valves that may have inadvertently moved, the operator may manually start the turbine pump. The transfer switch will allow the operators to start the motor driven pumps from the remote control station. This can be done after proper valve alignment has been verified. The standby pumps can be operated locally after proper valve alignment has been verified.

Local flow indicators provide a means to monitor pump performance while the discharge valves of these pumps are adjusted manually for desired flow. By locally controlling the auxiliary feedwater pumps, the operator can maintain steam generators level thereby maintaining the necessary heat sink.

The reactor coolant system pressure is also controlled at the Auxiliary Feedwater Station. The operator will transfer control of the pressurizer backup heaters to the Auxiliary Feedwater Station. The pressurizer backup heaters on-off switch and pressurizer pressure indication located at this station are all that is required to maintain reactor coolant system pressure for the postulated conditions.

A second operator will man the Boric Acid Pump Station. Boric acid pump control is transferred from the control room to the Boric Acid Pump Station enabling the operator to start and stop the boric acid pumps as required.

The third operator will operate the Charging Pump Station which has the primary function of controlling reactor coolant inventory. Control of the charging pumps is transferred from the control room to the charging pump room by turning the transfer switch for each pump from remote to local control. Pressurizer level instrumentation is provided at this station enabling the operator to monitor the reactor coolant system coolant inventory. A pneumatic controller for each pump provides the operator with means to control charging pump speed which affects rate of flow. RWST level is indicated at the Charging Pump Station. Open-close switches for the three letdown orifice isolation valves are located in the charging pump room. These valves allow the operator to control the amount of outflow from the reactor coolant system. Because of the loss of Instrument Air and the fire, the normal charging and letdown paths cannot be used. Charging will be done through the RC pump seals and valves 392A and B acting as relief valves. Borated water will be charged from the RWST through valve 358. The loss of Instrument Air isolated the letdown paths. Therefore, letdown, if required, will be through manually operated pressurizer PORVs.

Cooldown to the point where RHR can be initiated can be achieved by manually operating the steam line PORVs. The RHR system can be manually aligned and locally operated. The remainder of the cooldown is performed and maintained with the RHR system.

This shutdown method assumes off site power is available. If off site power is not available, the diesel generators can be operated locally. Once AC power is available from the diesel generators, this shutdown method can be used.

Modifications:

In order to ensure that the above shutdown method can be used, the following systems require modifications:

Service Water Pumps
Steam Line PORVs
Auxiliary Feedwater System
Standby Auxiliary Feedwater Pumps
V-200A, V-200B and V-202
Pressurizer PORVs
Boric Acid Transfer Pumps

Component Cooling Water Pumps
RHR Pumps
V-700, V-701, V-720, and V-721 to prevent inadvertent opening
Valving between RWST and Sump
Valving between RWST and Waste Holdup Tank
S.I. Pumps
Pressurizer Backup Heaters
Steam Generator Level Indication
Steam Generator Pressure Indication
Auxiliary Feedwater Flow Indication
Reactor Coolant System Pressure Indication
Pressurizer Level Indication
Reactor Coolant System Temperature
Condensate Storage Tank Level Indication
Charging Pump Flow Indication
Boric Acid Tank Level Indication
RWST Level Indication
Standby Auxiliary Feedwater Flow Indication
Standby Auxiliary Feedwater Pressure Indication
Auxiliary Feedwater Pressure Indication
Electrical Distribution for off site power
Electrical Distribution for on site power
Diesel Generators 1A and 1B

FIRE AREA:
- Computer Room
- AVT Room
- Hydrogen Storage Room
- Oil Storage Room
- Service Building Offices

Shutdown Method:

Since these areas do not contain any vital equipment or associated circuitry normal shutdown methods can be used.

VI. PROPOSED MODIFICATIONS

Several approaches to the design of modifications are proposed. These approaches are classified as follows:

1. Plant Procedures

Plant operating procedures and Technical Specfications have been revised in the past to prevent unacceptable failure modes in certain equipment under LOCA conditions. It is proposed that the method of removing power during power operation of the plant be extended to certain additional equipment where unacceptable failure modes have been demonstrated under fire conditions. Also, a method is suggested for restoring certain equipment to service following a fire. The following approaches are proposed:

A. Require certain breakers to be racked out during power operation of the plant. This will prevent the unacceptable failure mode of inadvertent closing of these breakers during a fire, so that additional modifications would not be required. For equipment that is required to be operational following a fire, see (C) below.

B. Require certain motor operated valves to have AC power removed at the motor control center, with the valves in the safe position, during power operation of the plant. This will prevent the unacceptable failure mode of inadvertent operation of these valves during a fire, so that additional modifications would not be required. For valves that are required to be operational following a fire, see (C) below.

Note that four of the valves requiring modification by the Safe Shutdown Analysis already have AC power removed during power operation by procedure 0-1.1. These valves, V700, V701, V720, and V721 are de-energized in the close position and therefore no further modifications for these valves are proposed.

C. Establish emergency procedures for restoring equipment to service following a fire which involves circuits of that equipment. The availability of manpower and materials to perform these operations within an acceptable amount of time must be demonstrated.

2. Isolation Devices

Certain circuits can be effectively isolated from equipment so that the equipment will fail safe in the event of circuit failure. The following approach is proposed:

A. Install isolation amplifiers in instrumentation circuits such that the failure of the circuits will not affect equipment required by the Safe Shutdown Analysis.

3. Transfer Devices

Circuits that can be transferred include control circuits and low power AC and DC circuits. Transfer switches shall be manually operated. When operated locally, the availability of manpower to perform the manual operations within an acceptable amount of time must be demonstrated. Remote manual transfer switches are acceptable for the transfer of a load to an emergency power supply. The following approaches to the design of transfer switches are proposed:

A. For DC control circuits the transfer switch should be located in proximity to the control fuses. For example, the switch could be mounted on the switchgear or motor control center breaker cubicle. The transfer would be to local control using the normal control power source.

B. For low-power AC and DC circuits, the transfer switch should be located in proximity to the load. For example, the switch could be mounted in a panel adjacent to a motor or solenoid operated valve or pump motor. The transfer would be to local control using a second source of AC power. The availability of the second source of power must be demonstrated, in addition to the manpower requirements.

C. For low-power DC circuits with local or remote manual transfer, the transfer switch should be located in proximity to the load. For example, the switch could be mounted inside a motor control center or in an adjacent panel. The transfer would be made to a second source of DC power. The availability of the second source of power must be demonstrated.

4. Separation Requirements

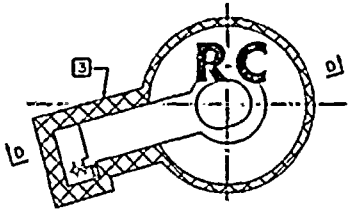
The following approach to the design of adequate separation is proposed:

A. Re-route the circuit out of the fire area, and demonstrate by analysis that failure of the circuit is acceptable in the fire areas of the new routing.

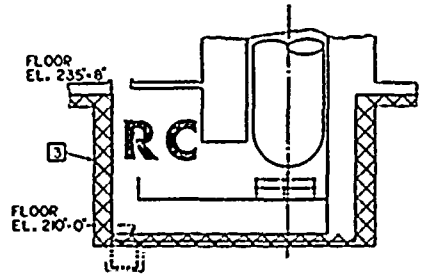
5. Additional Separation Analysis

The cable separation study conducted in conjunction with the Safe Shutdown Analysis was performed based on the assumption that all circuits within a given fire area have failed. No credit is taken for existing separations that may meet or exceed IEEE 384-1977 requirements within a fire area. Credit is taken only for the separation between the fire areas, since the circuits in

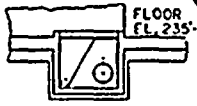
adjacent areas may conservatively assumed not to fail. The existing separations between fire areas generally exceed the minimum separation requirements of IEEE 384, and are therefore preferable. However, there are some circuits for which there are not acceptable modifications which can prevent the unacceptable failure of equipment under the assumptions of the Safe Shutdown Analysis. For these circuits, the separation requirements of IEEE 384 will be imposed within the fire area.



PLAN BELOW EL. 235'-8"

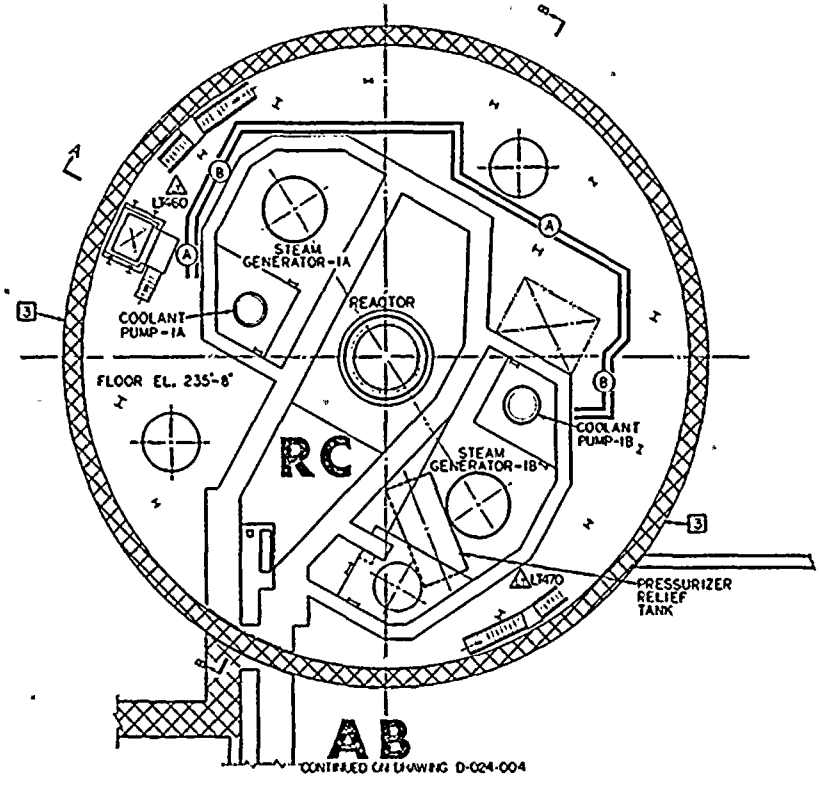


SECTION D-D

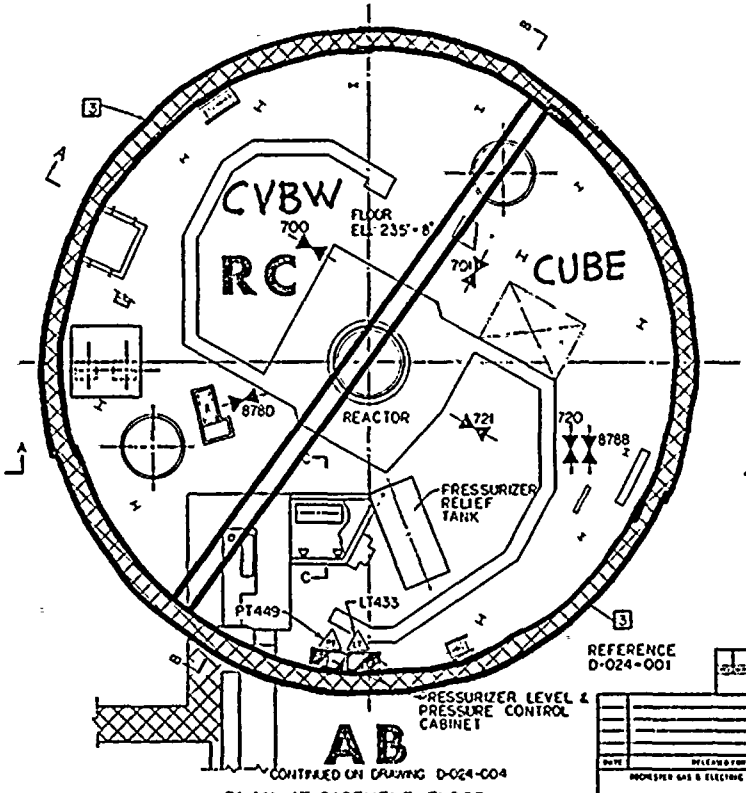


SECTION C-C

N

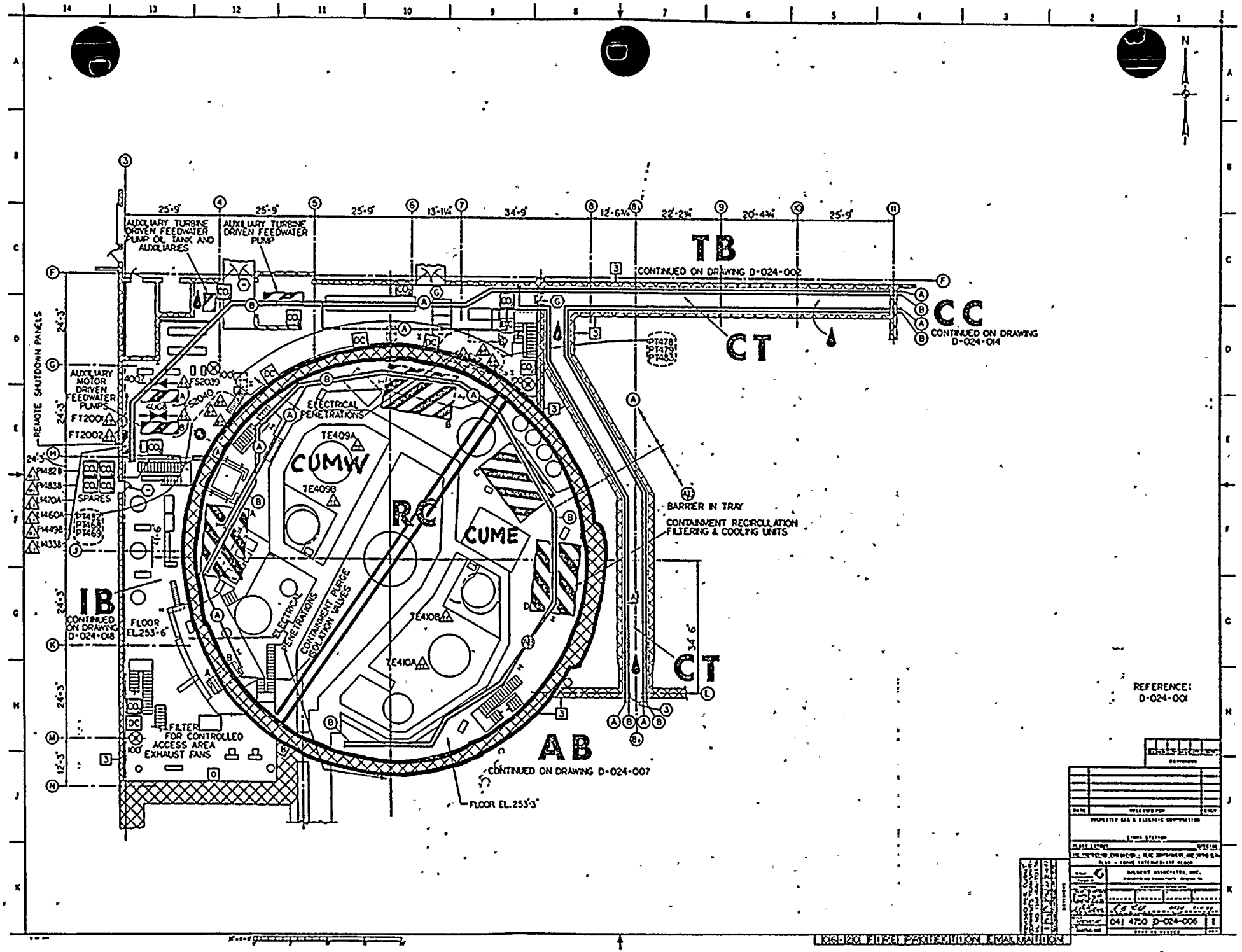


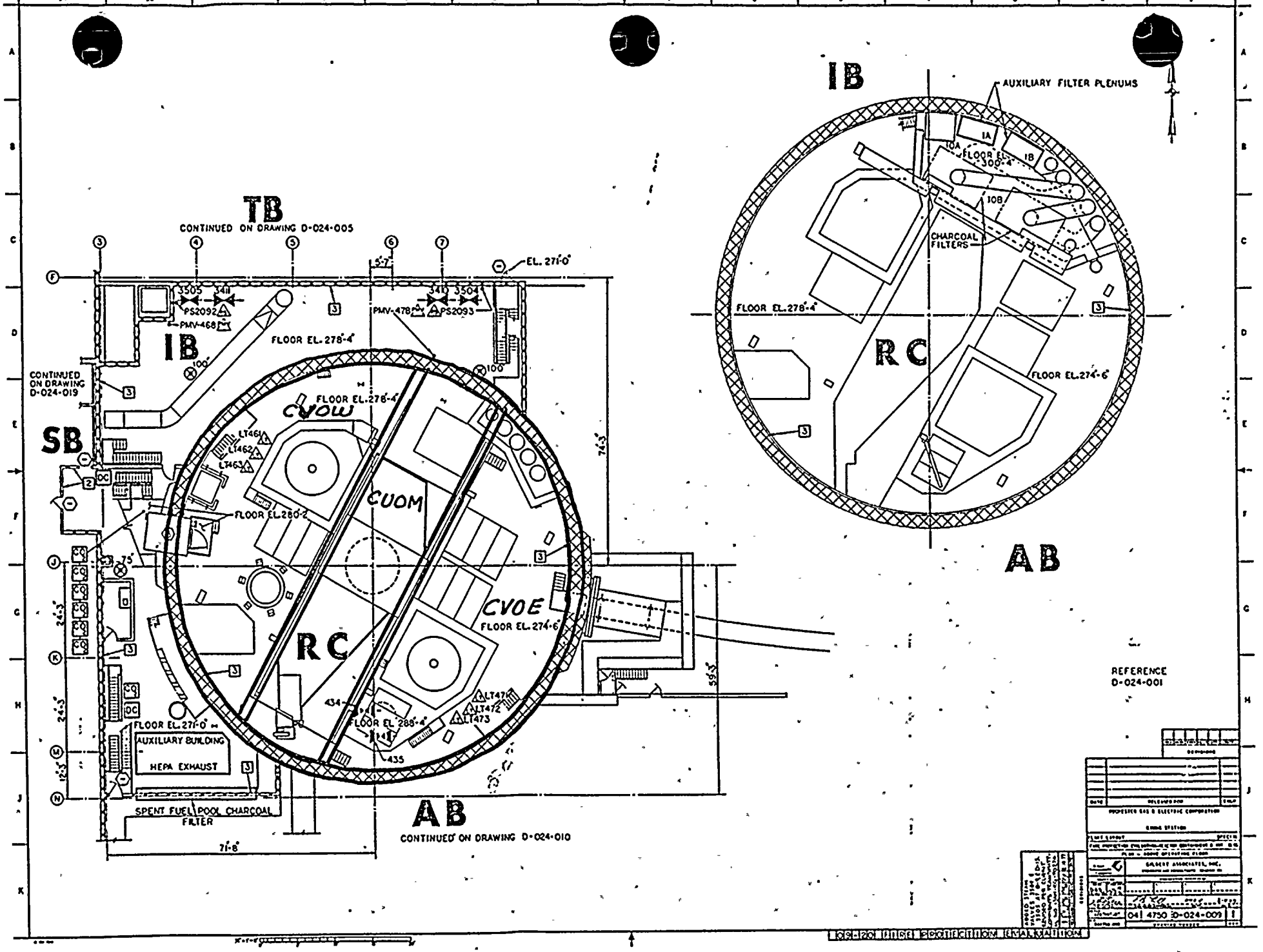
PLAN BELOW INTERMEDIATE FLOOR

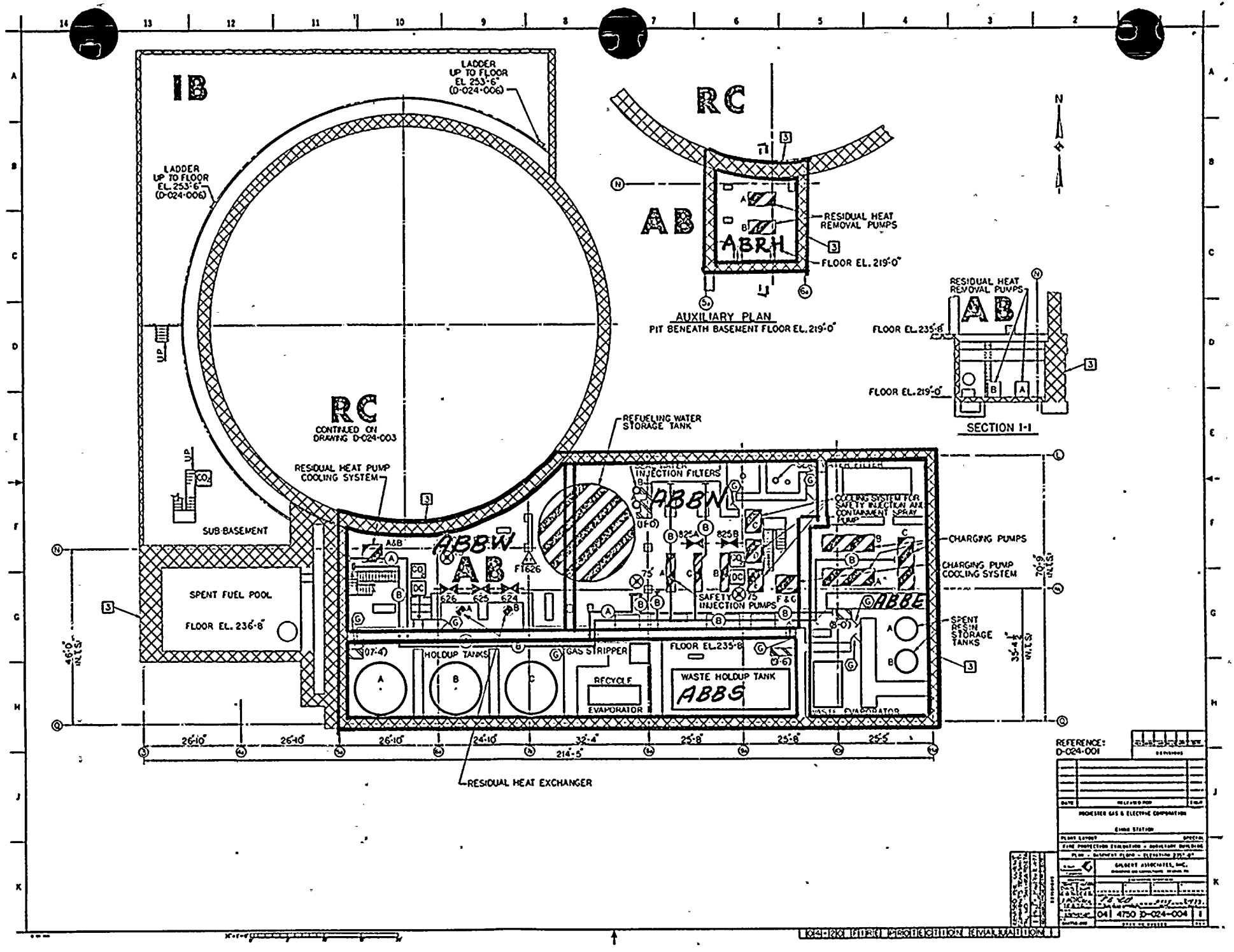


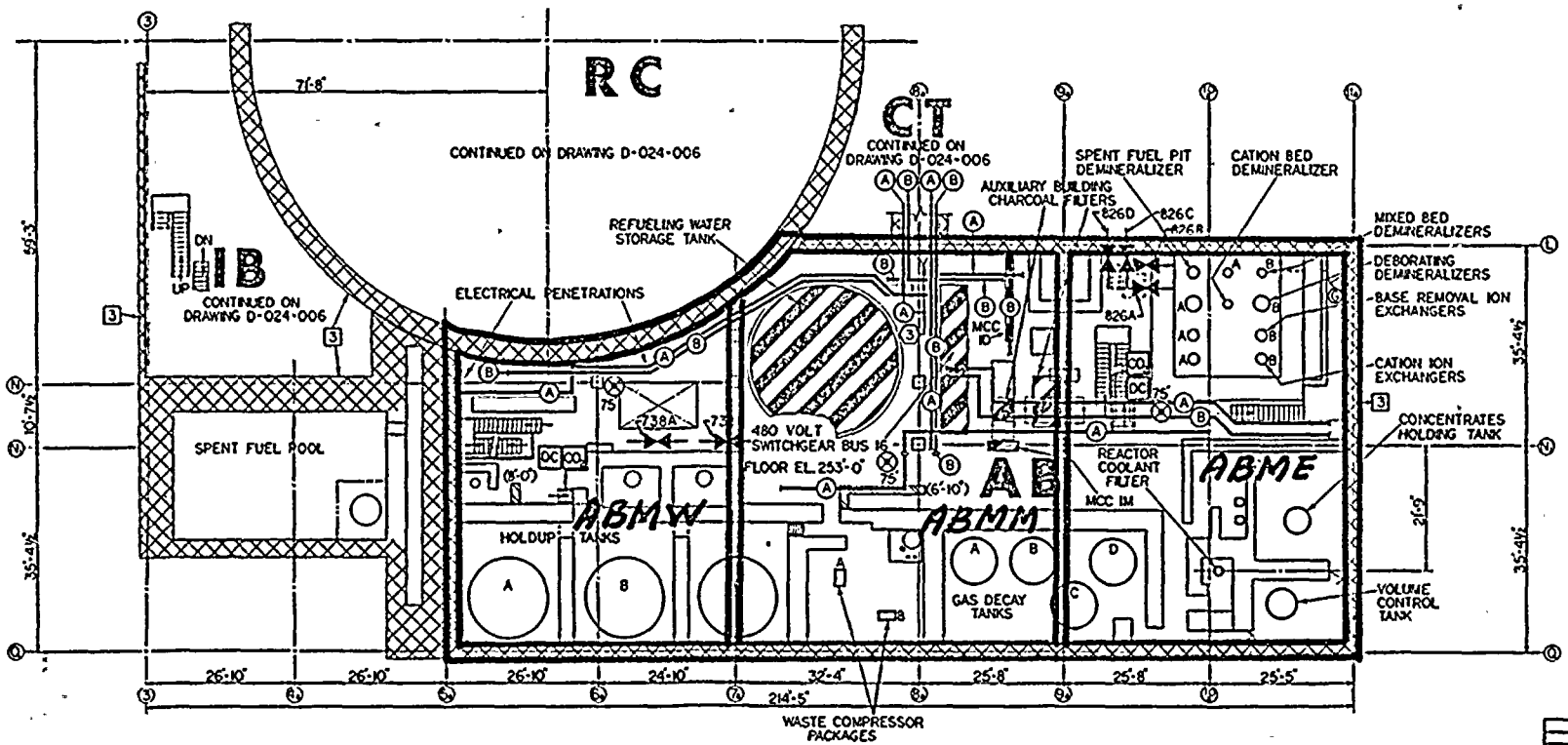
PLAN AT BASEMENT FLOOR

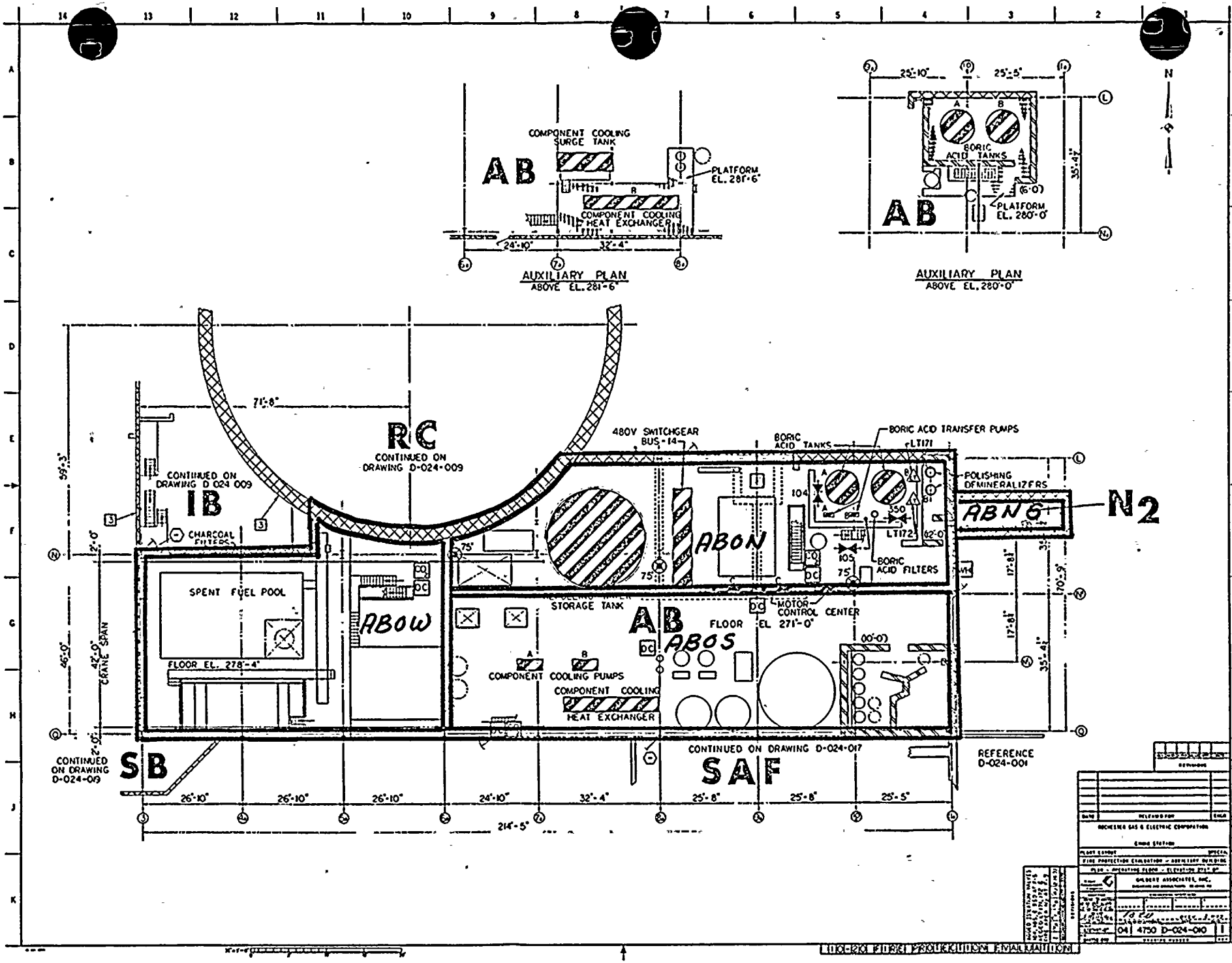
04	4750 D-024-003	0

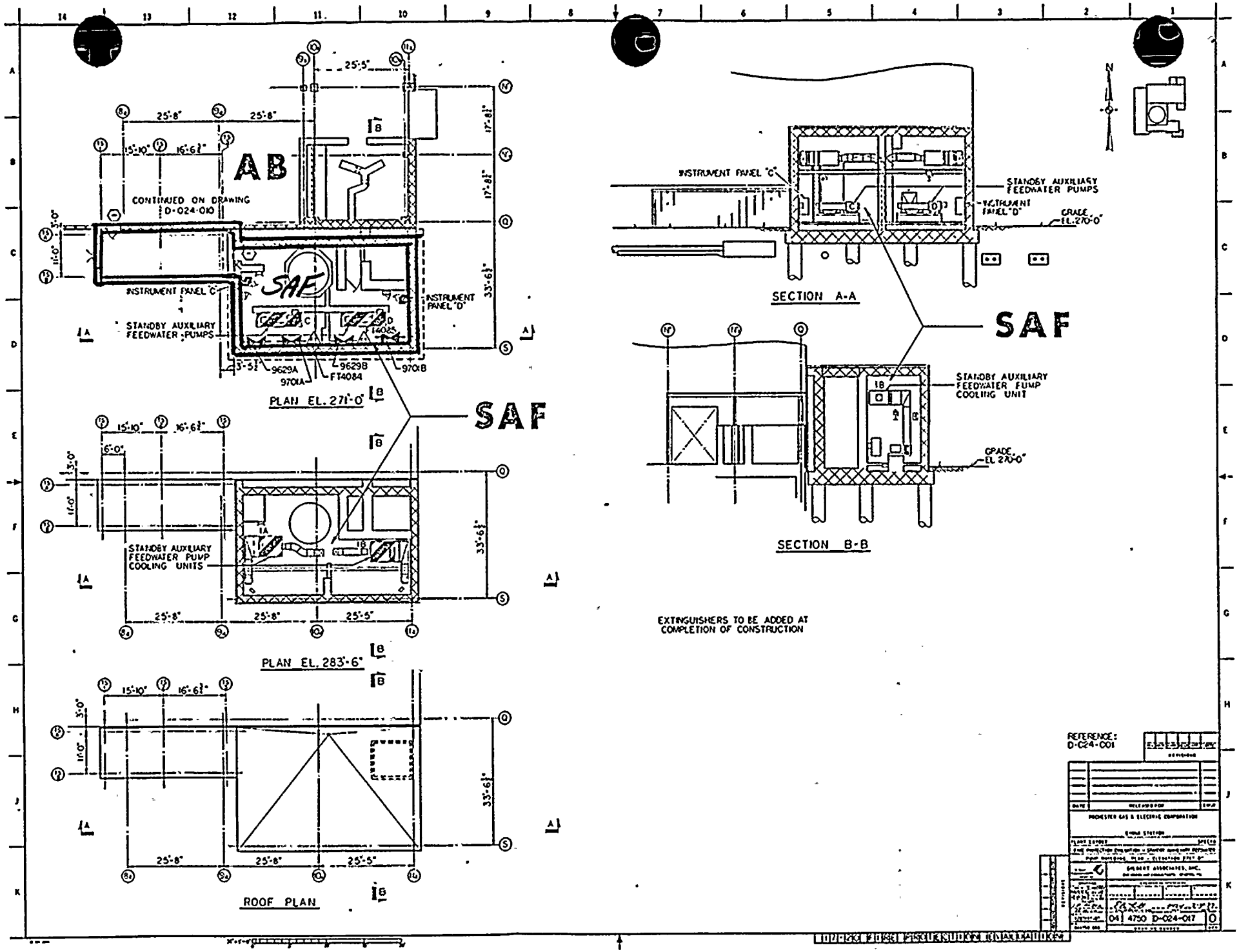

AUXILIARY TURBINE DRIVEN FEEDWATER PUMP OIL TANK AND AUXILIARIES
AUXILIARY TURBINE DRIVEN FEEDWATER PUMP
TB
CONTINUED ON DRAWING D-024-002
CC
CONTINUED ON DRAWING D-024-014
CT
AUXILIARY MOTOR DRIVEN FEEDWATER PUMPS
REMOTE SHUTDOWN PANELS
SPARES
ELECTRICAL PENETRATIONS
CUMW
CUME
RC
TE409A
TE409B
TE410B
TE410A
BARRIER IN TRAY
CONTAINMENT RECIRCULATION FILTERING & COOLING UNITS
IB
CONTINUED ON DRAWING D-024-018
FLOOR EL.253'-6"
ELECTRICAL PENETRATIONS
CONTAINMENT PURGE ISOLATION VALVES
FILTER FOR CONTROLLED ACCESS AREA EXHAUST FANS
AB
CONTINUED ON DRAWING D-024-007
FLOOR EL.253'-3"
REFERENCE: D-024-001
105-20 FIRE PROTECTION EVALUATION
041 4750 D-024-006

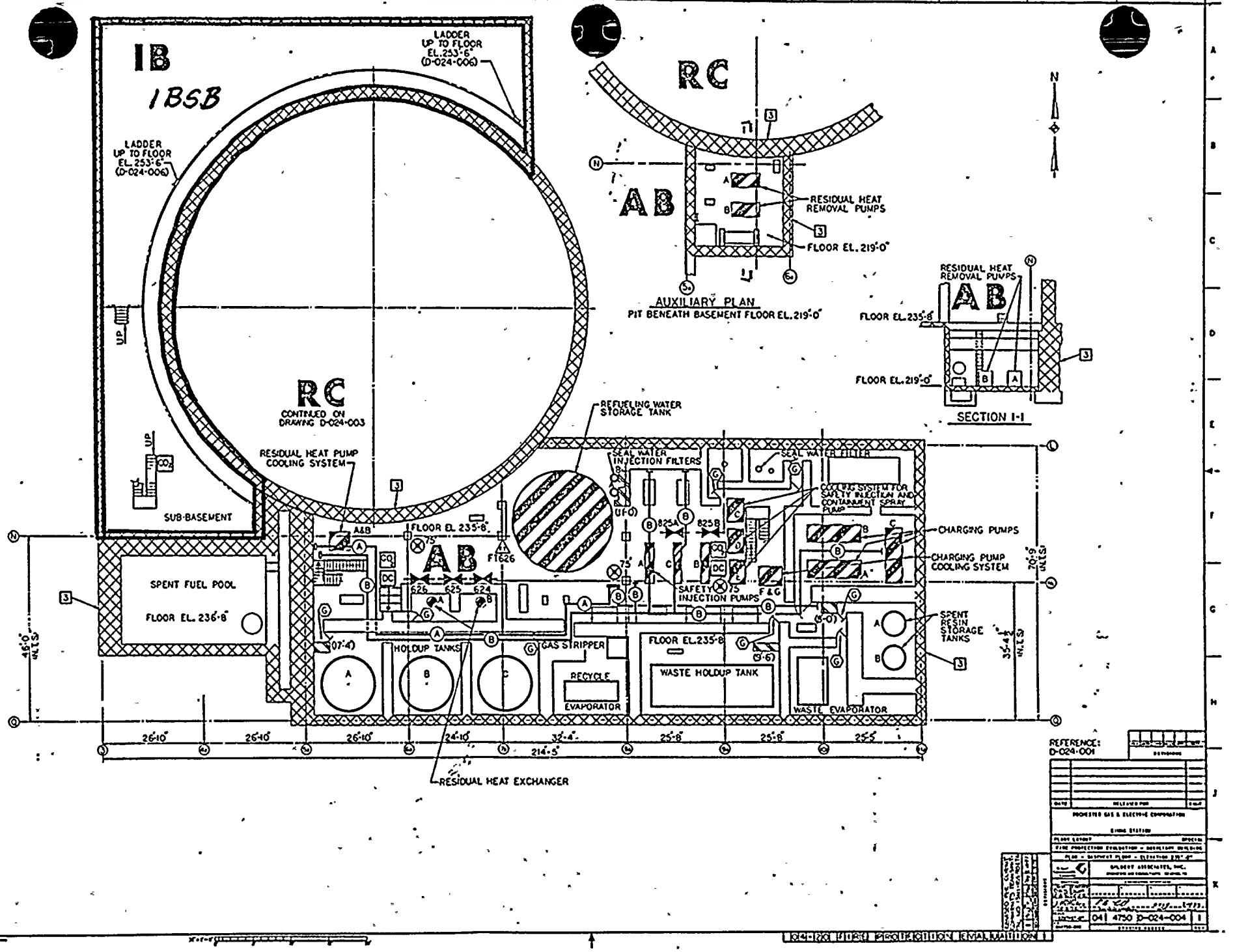

TB
CONTINUED ON DRAWING D-024-005
IB
SB
RC
AB
CONTINUED ON DRAWING D-024-010
CONTINUED ON DRAWING D-024-019
FLOOR EL. 278'-4"
FLOOR EL. 280'-2"
FLOOR EL. 274'-6"
FLOOR EL. 271'-0"
FLOOR EL. 288'-4"
EL. 271'-0"
CVOW
CVOM
CVOE
AUXILIARY BUILDING
HEPA EXHAUST
SPENT FUEL POOL CHARCOAL FILTER
PS2092
PS2093
PMV-468
PMV-478
LT461
LT462
LT463
LT471
LT472
LT473
74'-3"
71'-8"
AUXILIARY FILTER PLENUMS
1A
10A
1B
10B
CHARCOAL FILTERS
FLOOR EL. 300'-4"
REFERENCE
D-024-001

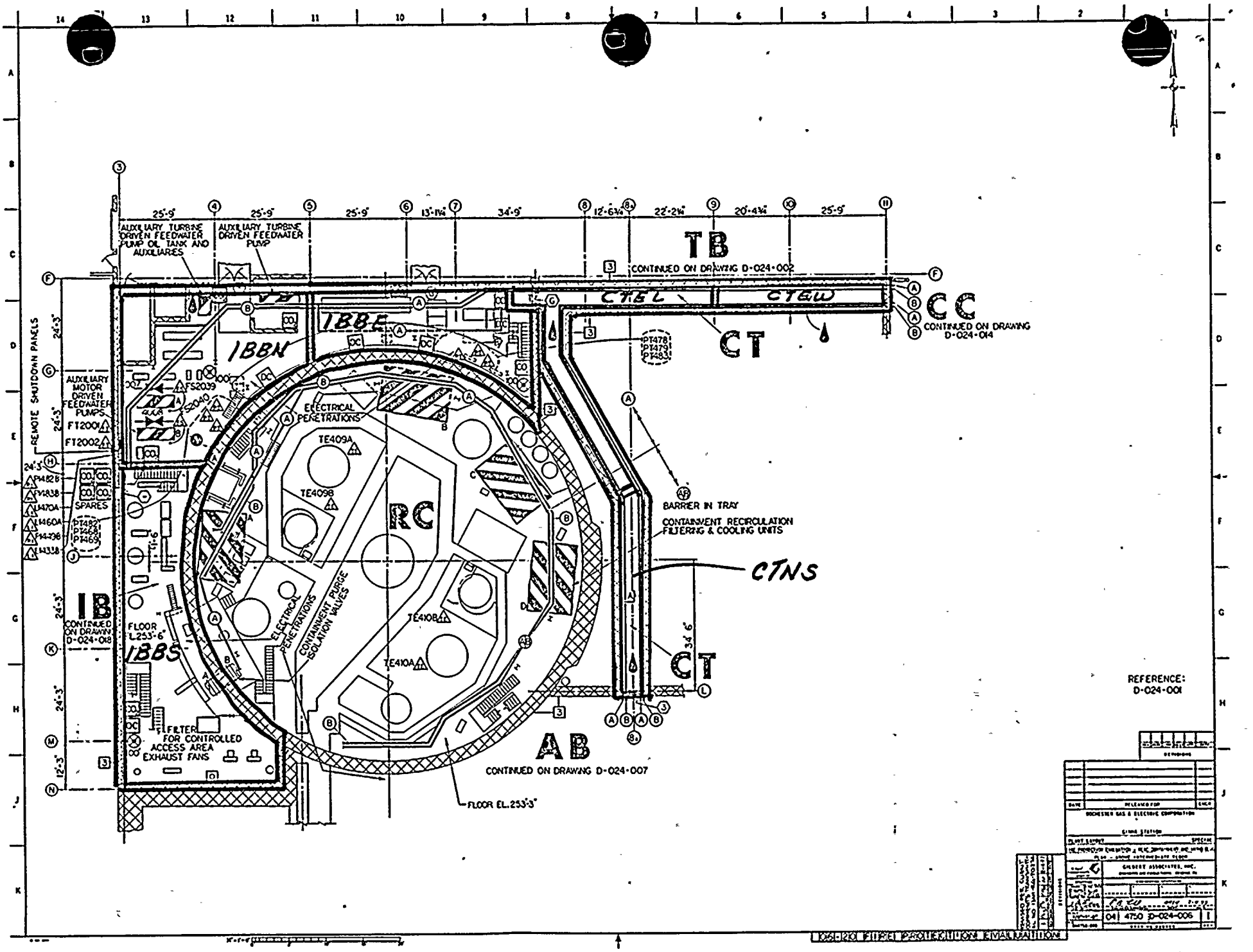

IB
LADDER UP TO FLOOR EL. 253'-6" (D-024-006)
LADDER UP TO FLOOR EL. 253'-6" (D-024-006)
RC
CONTINUED ON DRAWING D-024-003
RC
AB
ABRH
RESIDUAL HEAT REMOVAL PUMPS
FLOOR EL. 219'-0"
AUXILIARY PLAN
PIT BENEATH BASEMENT FLOOR EL. 219'-0"
RESIDUAL HEAT REMOVAL PUMPS
AB
FLOOR EL. 235'-8"
FLOOR EL. 219'-0"
SECTION 1-1
REFUELING WATER STORAGE TANK
RESIDUAL HEAT PUMP COOLING SYSTEM
SUB-BASEMENT
SPENT FUEL POOL
FLOOR EL. 236'-8"
ABBW
AB
ABBN
INJECTION FILTERS
COOLING SYSTEM FOR SAFETY INJECTION AND CONTAINMENT SPRAY PUMP
CHARGING PUMPS
CHARGING PUMP COOLING SYSTEM
SAFETY INJECTION PUMPS
ABBE
SPENT RESIN STORAGE TANKS
HOLDUP TANKS
GAS STRIPPER
RECYCLE EVAPORATOR
FLOOR EL. 235'-8"
WASTE HOLDUP TANK
ABBS
WASTE EVAPORATOR
RESIDUAL HEAT EXCHANGER
46'-0" N.T.S.
70'-8" N.T.S.
35'-4" N.T.S.
26'-10"
26'-10"
26'-10"
24'-10"
32'-4"
214'-5"
25'-8"
25'-8"
25'-5"
REFERENCE: D-024-001
041 4750 D-024-004

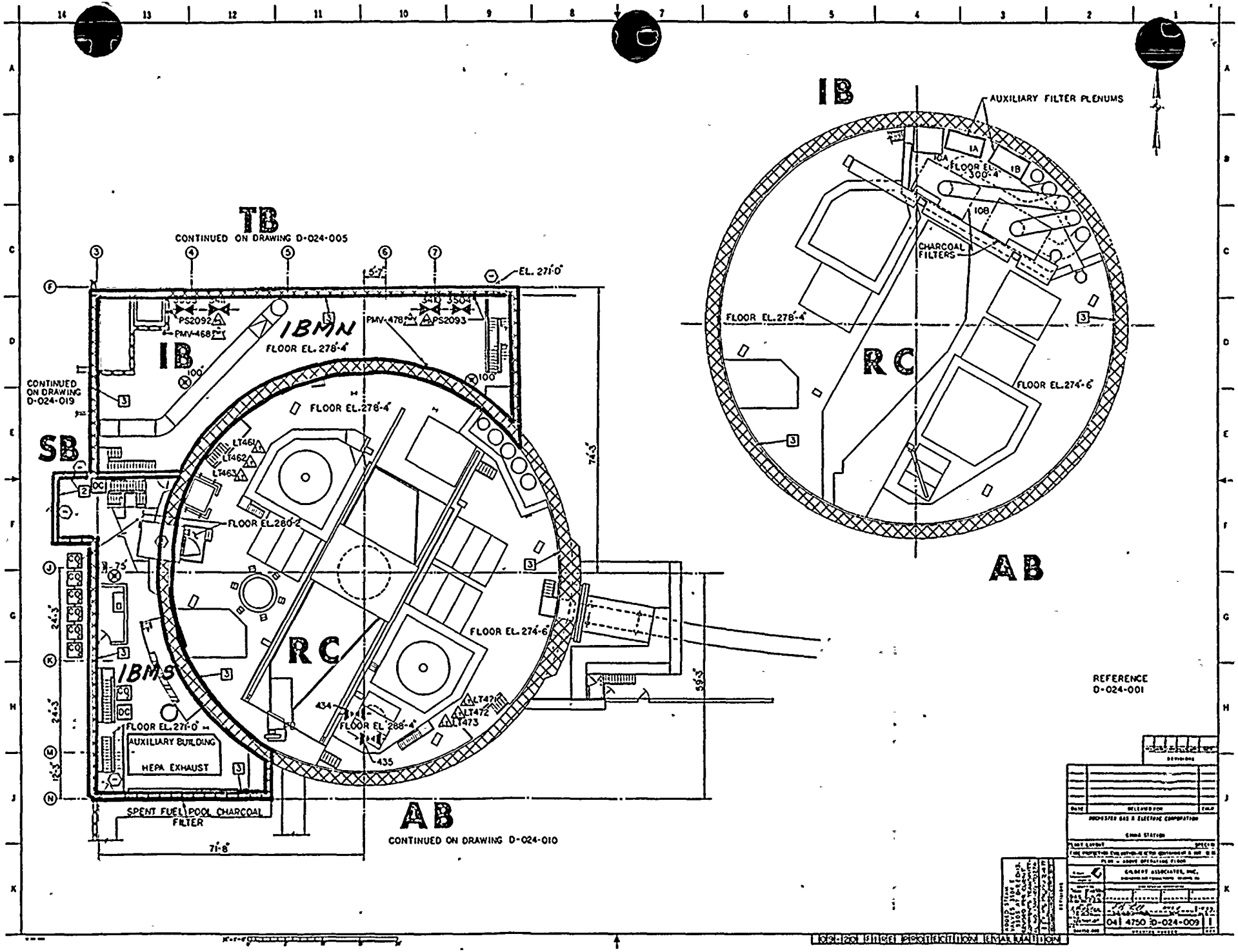

RC
CONTINUED ON DRAWING D-024-006
GT
CONTINUED ON DRAWING D-024-006
SPENT FUEL PIT DEMINERALIZER
CATION BED DEMINERALIZER
AUXILIARY BUILDING CHARCOAL FILTERS
826D
826C
826B
826A
MIXED BED DEMINERALIZERS
DEBORATING DEMINERALIZERS
BASE REMOVAL ION EXCHANGERS
CATION ION EXCHANGERS
CONCENTRATES HOLDING TANK
REFUELING WATER STORAGE TANK
ELECTRICAL PENETRATIONS
IB
CONTINUED ON DRAWING D-024-006
SPENT FUEL POOL
480 VOLT SWITCHGEAR BUS 16
FLOOR EL. 253'-0"
MCC 1D
MCC 1M
REACTOR COOLANT FILTER
ABMW
ABMM
ABME
AB
HOLDUP TANKS
GAS DECAY TANKS
VOLUME CONTROL TANK
WASTE COMPRESSOR PACKAGES
REFERENCE: D-024-001
71'-8"
59'-3"
10'-7½"
35'-4½"
21'-9"
26'-10"
24'-10"
32'-4"
25'-8"
25'-5"
214'-5"
N

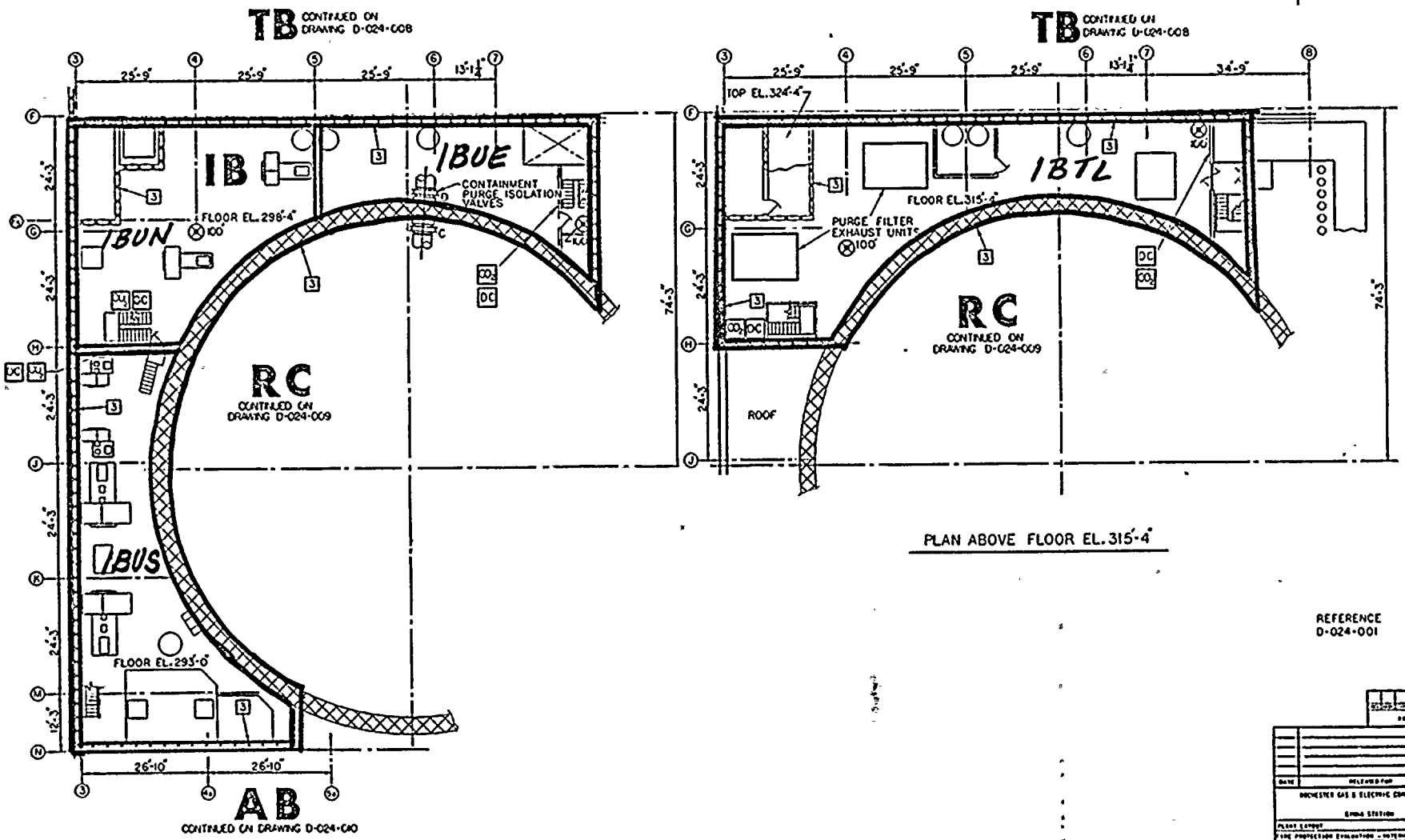

AB
COMPONENT COOLING SURGE TANK
PLATFORM EL. 281'-6"
COMPONENT COOLING HEAT EXCHANGER
24'-10"
32'-4"
AUXILIARY PLAN
ABOVE EL. 281'-6"
AB
BORIC ACID TANKS
PLATFORM EL. 280'-0"
AUXILIARY PLAN
ABOVE EL. 280'-0"
N
RC
CONTINUED ON DRAWING D-024-009
CONTINUED ON DRAWING D 024 009
IB
480V SWITCHGEAR BUS-14
BORIC ACID TANKS
BORIC ACID TRANSFER PUMPS
POLISHING DEMINERALIZERS
ABNG
N2
ABON
CHARCOAL FILTERS
SPENT FUEL POOL
ABOW
FLOOR EL. 278'-4"
CRANE SPAN
BORIC ACID FILTERS
MOTOR CONTROL CENTER
AB
ABOS
FLOOR EL 271'-0"
COMPONENT COOLING PUMPS
COMPONENT COOLING HEAT EXCHANGER
CONTINUED ON DRAWING D-024-017
CONTINUED ON DRAWING D-024-09
SB
SAF
REFERENCE D-024-001
214'-5"
041 4750 D-024-010


AB
SAF
CONTINUED ON DRAWING D-024-010
INSTRUMENT PANEL 'C'
INSTRUMENT PANEL 'D'
STANDBY AUXILIARY FEEDWATER PUMPS
9629A
9701A
FT4084
9629B
9701B
PLAN EL. 271'-0"
SAF
STANDBY AUXILIARY FEEDWATER PUMP COOLING UNITS
PLAN EL. 283'-6"
ROOF PLAN
INSTRUMENT PANEL 'C'
STANDBY AUXILIARY FEEDWATER PUMPS
INSTRUMENT PANEL 'D'
GRADE EL. 270'-0"
SECTION A-A
SAF
STANDBY AUXILIARY FEEDWATER PUMP COOLING UNIT
GRADE EL. 270'-0"
SECTION B-B
EXTINGUISHERS TO BE ADDED AT COMPLETION OF CONSTRUCTION
REFERENCE: D-024-001
041 4750 D-024-017


1B
1BSB
LADDER UP TO FLOOR EL. 253'-6" (D-024-006)
LADDER UP TO FLOOR EL. 253'-6" (D-024-006)
RC
CONTINUED ON DRAWING D-024-003
UP
SUB-BASEMENT
RESIDUAL HEAT PUMP COOLING SYSTEM
REFUELING WATER STORAGE TANK
SEAL WATER INJECTION FILTERS
SEAL WATER FILTER
COOLING SYSTEM FOR SAFETY INJECTION AND CONTAINMENT SPRAY PUMP
CHARGING PUMPS
CHARGING PUMP COOLING SYSTEM
FLOOR EL. 235'-8"
AB
A&B
FT626
SPENT FUEL POOL
FLOOR EL. 236'-8"
SAFETY INJECTION PUMPS
F&G
SPENT RESIN STORAGE TANKS
HOLDUP TANKS
GAS STRIPPER
RECYCLE EVAPORATOR
WASTE HOLDUP TANK
WASTE EVAPORATOR
RESIDUAL HEAT EXCHANGER
46'-0" N.T.S.
35'-4" N.T.S.
26'-10"
26'-10"
26'-10"
24'-10"
32'-4"
25'-8"
25'-8"
25'-5"
214'-5"
AUXILIARY PLAN
PIT BENEATH BASEMENT FLOOR EL. 219'-0"
RESIDUAL HEAT REMOVAL PUMPS
FLOOR EL. 219'-0"
SECTION 1-1
FLOOR EL. 235'-8"
REFERENCE: D-024-001
041 4750 D-024-004


TB
CONTINUED ON DRAWING D-024-002
AUXILIARY TURBINE DRIVEN FEEDWATER PUMP OIL TANK AND AUXILIARIES
AUXILIARY TURBINE DRIVEN FEEDWATER PUMP
CTEL
CTGW
CC
CT
CONTINUED ON DRAWING D-024-014
IBBE
IBBN
AUXILIARY MOTOR DRIVEN FEEDWATER PUMPS
FT2001
FT2002
REMOTE SHUTDOWN PANELS
SPARES
ELECTRICAL PENETRATIONS
TE409A
TE409B
RC
BARRIER IN TRAY
CONTAINMENT RECIRCULATION FILTERING & COOLING UNITS
CTNS
IB
CONTINUED ON DRAWING D-024-018
FLOOR EL.253'-6"
IBBS
ELECTRICAL PENETRATIONS
CONTAINMENT PURGE ISOLATION VALVES
TE410B
TE410A
CT
FILTER FOR CONTROLLED ACCESS AREA EXHAUST FANS
AB
CONTINUED ON DRAWING D-024-007
FLOOR EL. 253'-3"
REFERENCE: D-024-001
25'-9"
25'-9"
25'-9"
13'-11¼"
34'-9"
12'-6¾"
22'-2¼"
20'-4¾"
25'-9"
24'-3"
34'-6"
12'-3"


TB
CONTINUED ON DRAWING D-024-005
IB
AUXILIARY FILTER PLENUMS
1A
1CA
1B
1CB
FLOOR EL. 300'-4"
CHARCOAL FILTERS
FLOOR EL. 278'-4"
RC
FLOOR EL. 274'-6"
AB
EL. 271'-0"
PS2092
PMV-468
IBMN
FLOOR EL. 278'-4"
PMV-478
PS2093
CONTINUED ON DRAWING D-024-019
SB
LT461
LT462
LT463
FLOOR EL. 280'-2"
74'-3"
FLOOR EL. 274'-6"
IBMS
FLOOR EL. 271'-0"
AUXILIARY BUILDING
HEPA EXHAUST
SPENT FUEL POOL CHARCOAL FILTER
71'-8"
LT471
LT472
LT473
434
FLOOR EL. 288'-4"
435
59'-3"
AB
CONTINUED ON DRAWING D-024-010
REFERENCE
D-024-001
041 4750 D-024-009



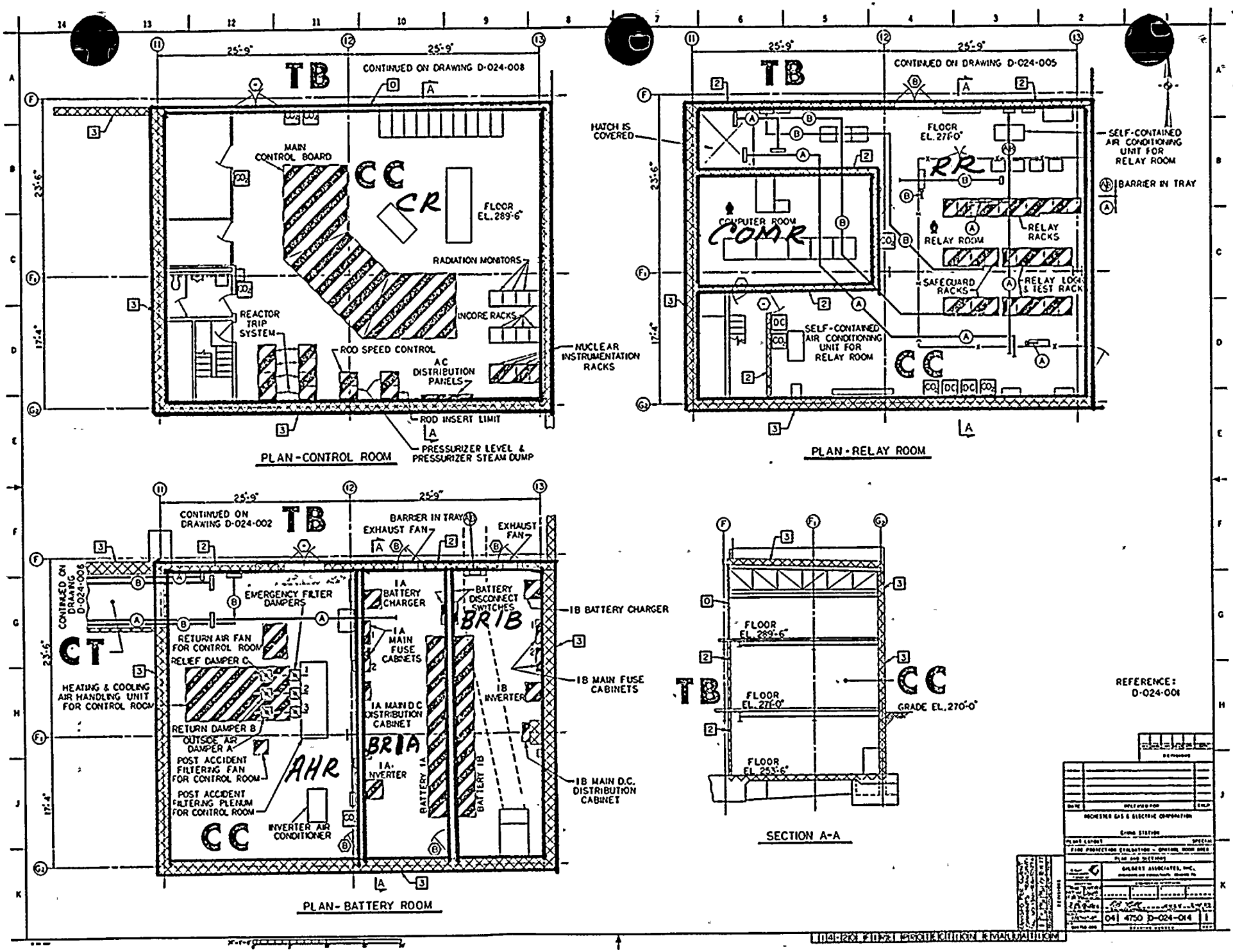
PLAN ABOVE FLOOR EL. 293'-0" & 298'-4"

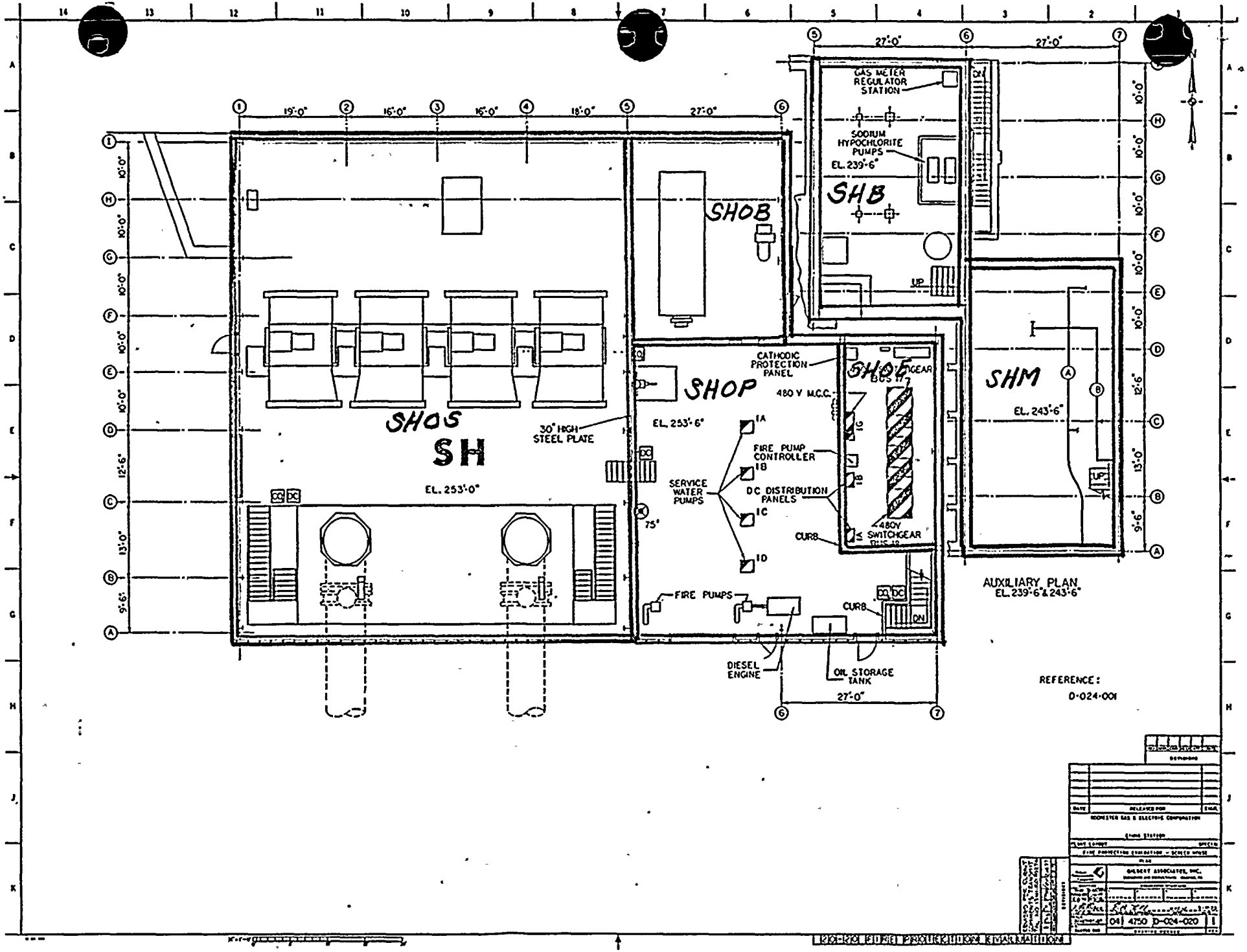
PLAN ABOVE FLOOR EL. 315'-4"

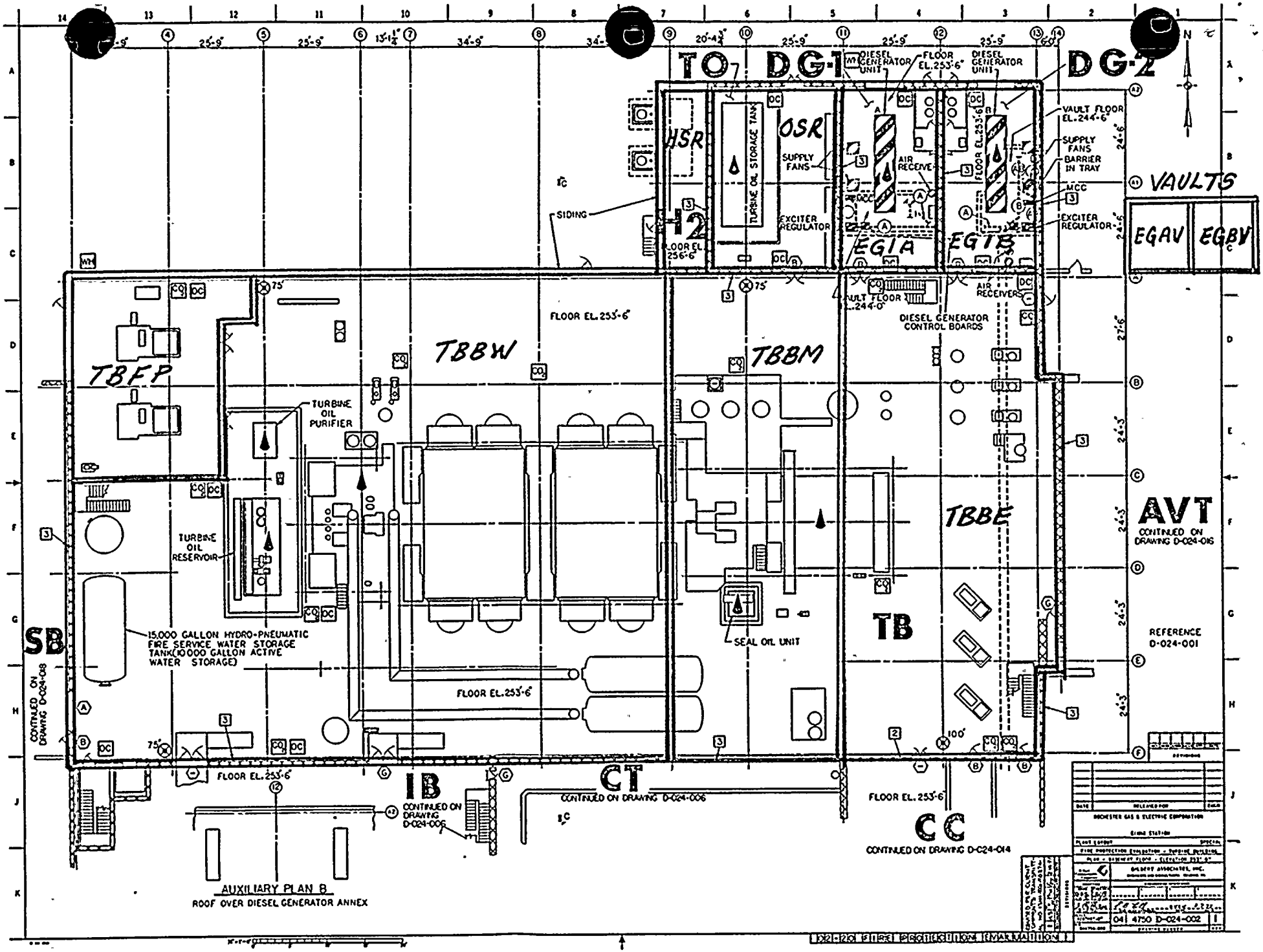
REFERENCE
D-024-001

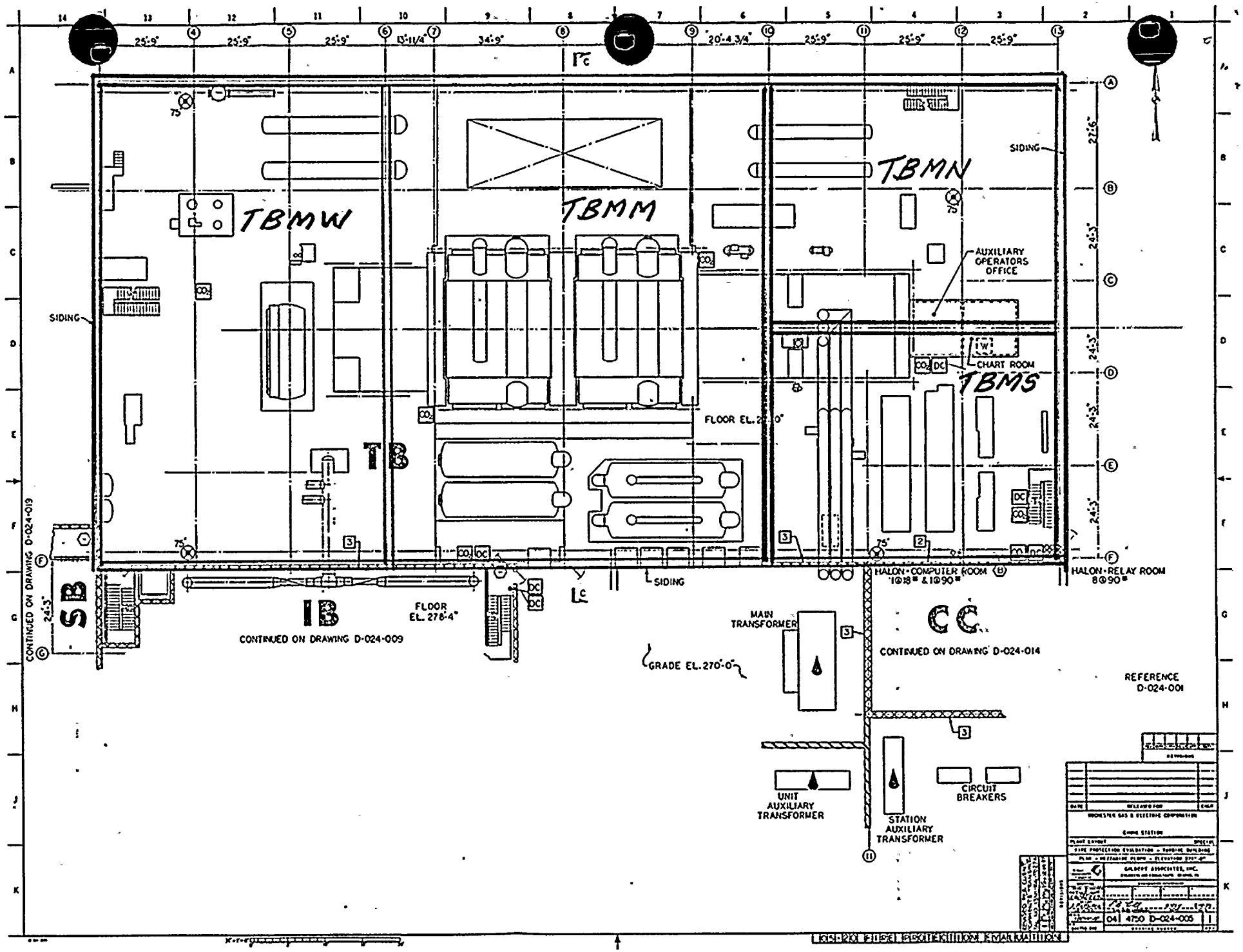
ROCHESTER GAS & ELECTRIC CORPORATION
GINNA STATION
GILBERT ASSOCIATES, INC.
04 4750 D-024-015 0

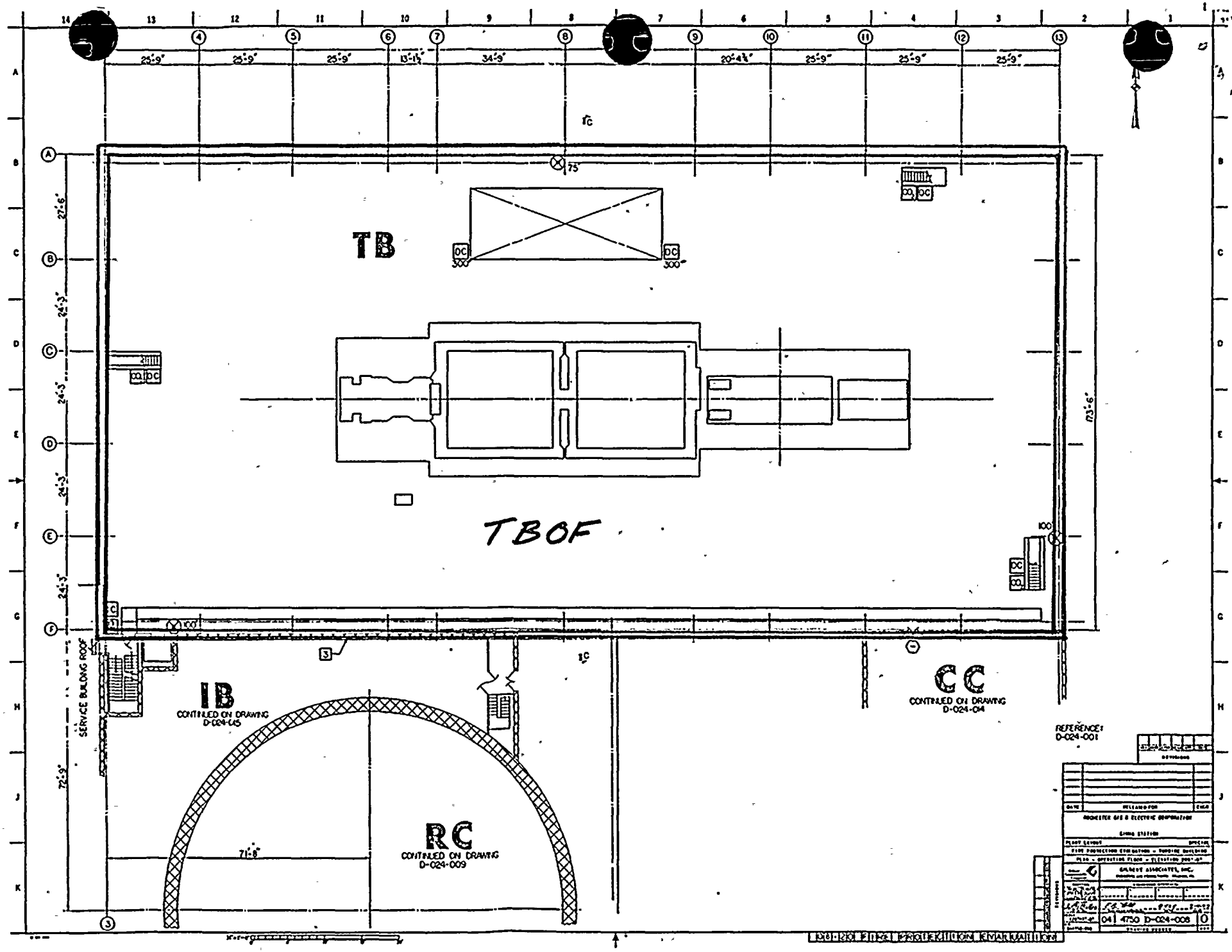
109-120 FIRE PROTECTION EVALUATION

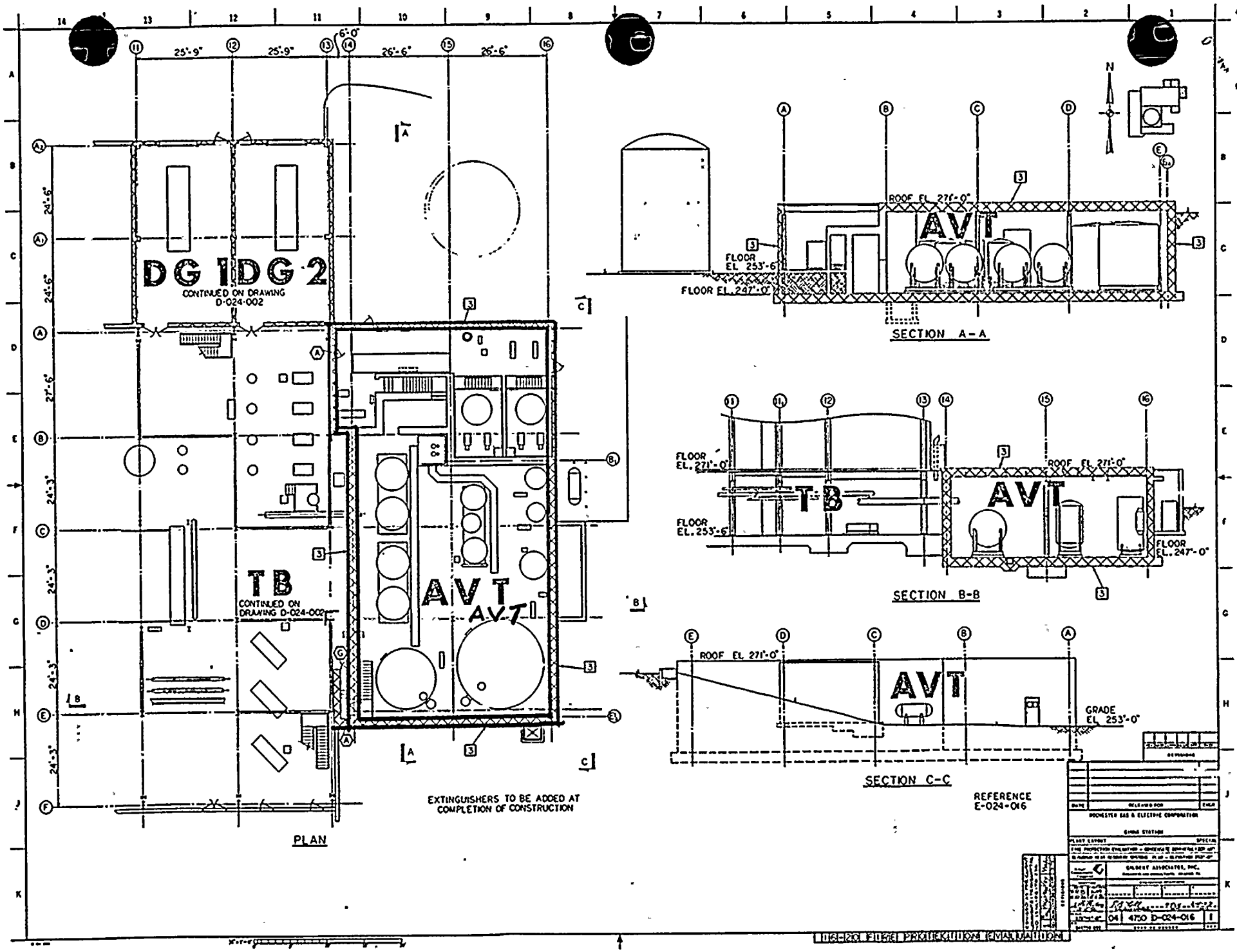

TB
CONTINUED ON DRAWING D-024-008
MAIN CONTROL BOARD
CC
CR
FLOOR EL. 289'-6"
RADIATION MONITORS
INCORE RACKS
REACTOR TRIP SYSTEM
ROD SPEED CONTROL
AC DISTRIBUTION PANELS
NUCLEAR INSTRUMENTATION RACKS
ROD INSERT LIMIT
PRESSURIZER LEVEL & PRESSURIZER STEAM DUMP
PLAN - CONTROL ROOM
TB
CONTINUED ON DRAWING D-024-005
HATCH IS COVERED
FLOOR EL. 277'-0"
RR
SELF-CONTAINED AIR CONDITIONING UNIT FOR RELAY ROOM
BARRIER IN TRAY
COMPUTER ROOM
COMR
RELAY ROOM
RELAY RACKS
SAFEGUARD RACKS
RELAY LOGIC & TEST RACK
SELF-CONTAINED AIR CONDITIONING UNIT FOR RELAY ROOM
CC
PLAN - RELAY ROOM
TB
CONTINUED ON DRAWING D-024-002
CONTINUED ON DRAWING D-024-006
BARRIER IN TRAY
EXHAUST FAN
EXHAUST FAN
EMERGENCY FILTER DAMPERS
1A BATTERY CHARGER
BATTERY DISCONNECT SWITCHES
BRIB
1B BATTERY CHARGER
CT
RETURN AIR FAN FOR CONTROL ROOM
1A MAIN FUSE CABINETS
RELIEF DAMPER C
1B MAIN FUSE CABINETS
HEATING & COOLING AIR HANDLING UNIT FOR CONTROL ROOM
1A MAIN D.C. DISTRIBUTION CABINET
1B INVERTER
RETURN DAMPER B
OUTSIDE AIR DAMPER A
BRIA
POST ACCIDENT FILTERING FAN FOR CONTROL ROOM
AHR
1A INVERTER
BATTERY 1A
BATTERY 1B
1B MAIN D.C. DISTRIBUTION CABINET
POST ACCIDENT FILTERING PLENUM FOR CONTROL ROOM
INVERTER AIR CONDITIONER
CC
PLAN - BATTERY ROOM
TB
FLOOR EL. 289'-6"
CC
FLOOR EL. 277'-0"
GRADE EL. 270'-0"
FLOOR EL. 253'-6"
SECTION A-A
REFERENCE: D-024-001
ROCHESTER GAS & ELECTRIC CORPORATION
GINNA STATION
GILBERT ASSOCIATES, INC.
04 4750 D-024-014

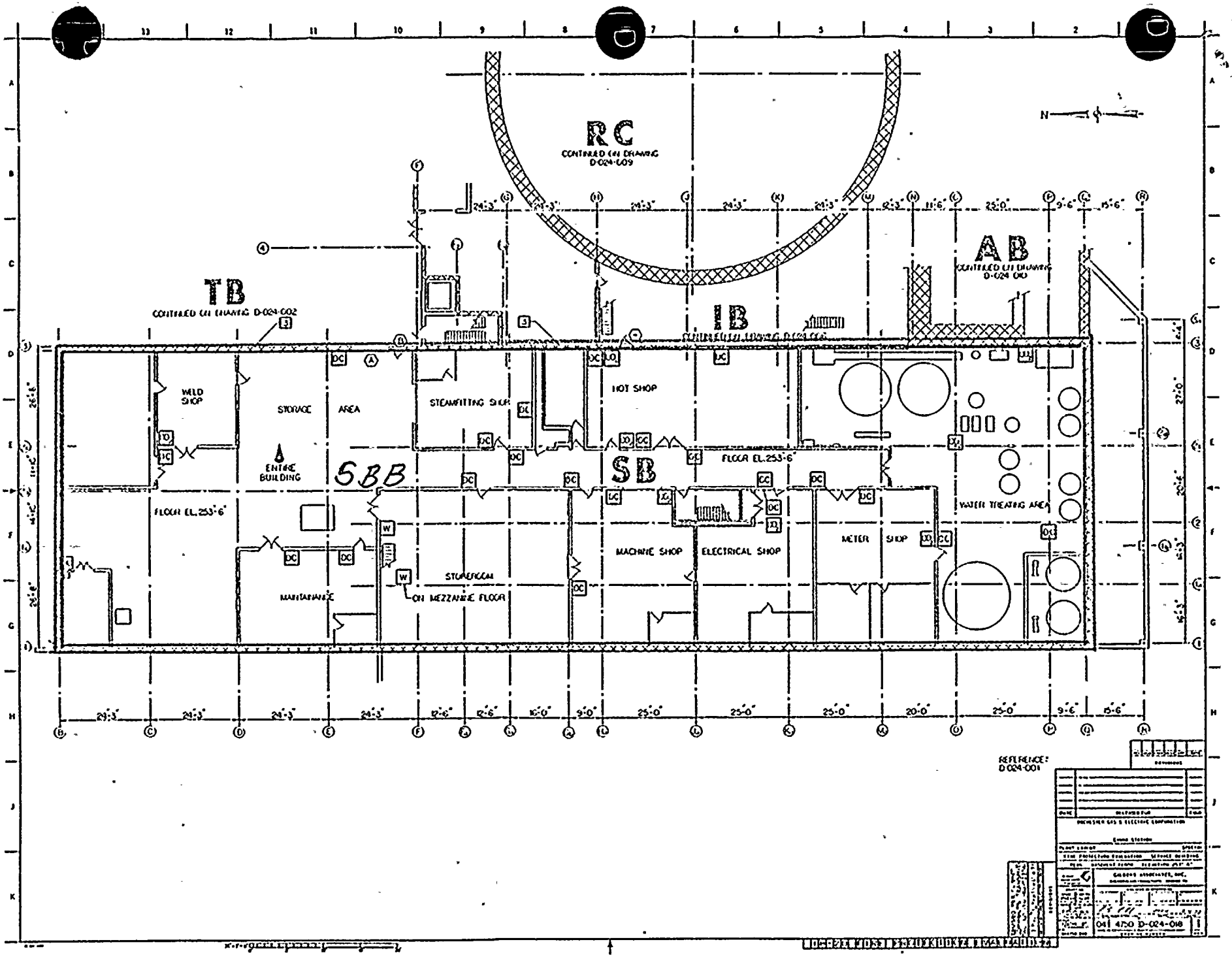

SHOS
SH
EL. 253'-0"
30" HIGH STEEL PLATE
SHOB
SHOP
EL. 253'-6"
CATHODIC PROTECTION PANEL
480 V M.C.C.
SHOE
SWGR
SERVICE WATER PUMPS
1A
1B
1C
1D
FIRE PUMP CONTROLLER
DC DISTRIBUTION PANELS
1G
1B
480V SWITCHGEAR
CURB
75'
FIRE PUMPS
DIESEL ENGINE
OIL STORAGE TANK
SHB
GAS METER REGULATOR STATION
SODIUM HYPOCHLORITE PUMPS
EL. 239'-6"
UP
SHM
EL. 243'-6"
AUXILIARY PLAN
EL. 239'-6" & 243'-6"
REFERENCE:
D-024-001
19'-0"
16'-0"
16'-0"
18'-0"
27'-0"
27'-0"
27'-0"
10'-0"
12'-6"
13'-0"
9'-6"

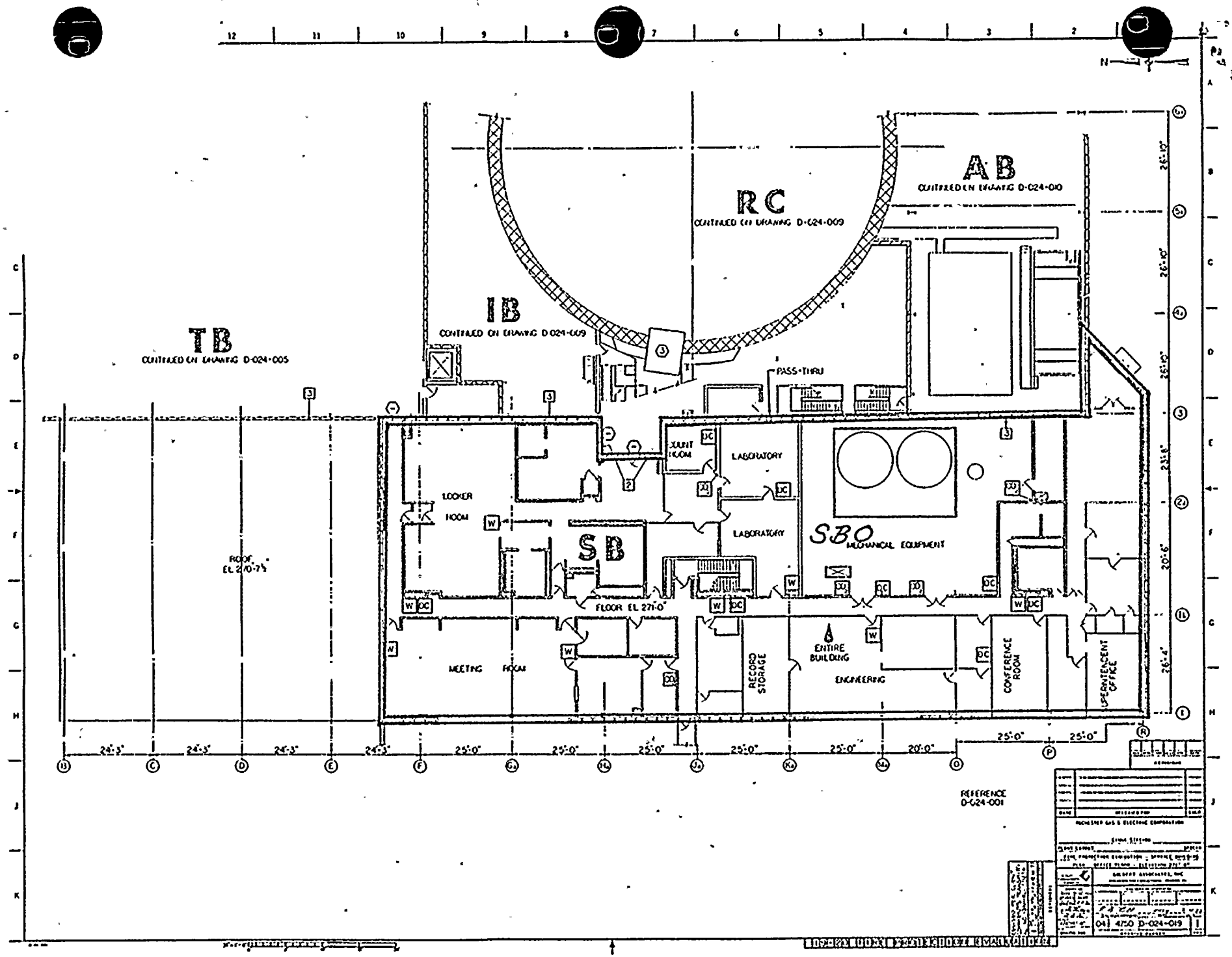

TO DG-1
DG-2
DIESEL GENERATOR UNIT
FLOOR EL. 253'-6"
VAULT FLOOR EL. 244'-6"
SUPPLY FANS
BARRIER IN TRAY
MCC
EXCITER REGULATOR
AIR RECEIVER
VAULTS
EGAV
EGBV
HSR
OSR
TURBINE OIL STORAGE TANK
SIDING
H2
FLOOR EL 256'-6"
EGIA
EGIB
DIESEL GENERATOR CONTROL BOARDS
TBFP
TBBW
TBBM
TBBE
TURBINE OIL PURIFIER
TURBINE OIL RESERVOIR
15,000 GALLON HYDRO-PNEUMATIC FIRE SERVICE WATER STORAGE TANK(10000 GALLON ACTIVE WATER STORAGE)
SEAL OIL UNIT
SB
TB
AVT
CONTINUED ON DRAWING D-024-016
REFERENCE D-024-001
CONTINUED ON DRAWING D-024-008
IB
CONTINUED ON DRAWING D-024-006
CT
CONTINUED ON DRAWING D-024-006
CC
CONTINUED ON DRAWING D-C24-014
AUXILIARY PLAN B
ROOF OVER DIESEL GENERATOR ANNEX
221-20 FIRE PROTECTION INFORMATION
ROCHESTER GAS & ELECTRIC CORPORATION
GINNA STATION
GILBERT ASSOCIATES, INC.
04 4750 D-024-002


TBMW
TBMM
TBMN
TBMS
TB
SIDING
AUXILIARY OPERATORS OFFICE
CHART ROOM
FLOOR EL. 278'-0"
SB
IB
FLOOR EL. 278'-4"
CONTINUED ON DRAWING D-024-009
CONTINUED ON DRAWING D-024-019
SIDING
HALON-COMPUTER ROOM (B) 1@18" & 1@90"
HALON-RELAY ROOM 8@90"
CC
CONTINUED ON DRAWING D-024-014
MAIN TRANSFORMER
GRADE EL. 270'-0"
UNIT AUXILIARY TRANSFORMER
STATION AUXILIARY TRANSFORMER
CIRCUIT BREAKERS
REFERENCE D-024-001
25'-9"
25'-9"
25'-9"
13'-11 1/4"
34'-9"
20'-4 3/4"
25'-9"
25'-9"
25'-9"
27'-6"
24'-3"
24'-3"
24'-3"
24'-3"
04 4750 D-024-005


TB
TBOF
IB
CONTINUED ON DRAWING
D-024-045
RC
CONTINUED ON DRAWING
D-024-009
CC
CONTINUED ON DRAWING
D-024-014
SERVICE BUILDING ROOF
REFERENCE:
D-024-001
25'-9"
25'-9"
25'-9"
13'-1½"
34'-9"
20'-4½"
25'-9"
25'-9"
25'-9"
27'-6"
24'-3"
24'-3"
24'-3"
24'-3"
173'-6"
72'-9"
71'-8"
75'
100'
100
300'
300'


DG 1
DG 2
CONTINUED ON DRAWING D-024-002
TB
CONTINUED ON DRAWING D-024-002
AVT
AVT
PLAN
EXTINGUISHERS TO BE ADDED AT COMPLETION OF CONSTRUCTION
ROOF EL 271'-0"
FLOOR EL 253'-6"
FLOOR EL 247'-0"
AVT
SECTION A-A
FLOOR EL. 271'-0"
FLOOR EL. 253'-6"
TB
ROOF EL 271'-0"
AVT
FLOOR EL. 247'-0"
SECTION B-B
ROOF EL 271'-0"
AVT
GRADE EL 253'-0"
SECTION C-C
REFERENCE E-024-016
ROCHESTER GAS & ELECTRIC CORPORATION
GOLDER ASSOCIATES, INC.
04 4750 D-024-016 1
1984 FIRE PROTECTION EVALUATION


RC
CONTINUED ON DRAWING D-024-009
TB
CONTINUED ON DRAWING D-024-002
AB
CONTINUED ON DRAWING D-024-010
1B
WELD SHOP
STORAGE AREA
STEAMFITTING SHOP
HOT SHOP
ENTIRE BUILDING
SBB
SB
FLOOR EL.253'-6"
FLOOR EL.253'-6"
WATER TREATING AREA
METER SHOP
MACHINE SHOP
ELECTRICAL SHOP
MAINTENANCE
STORE ROOM ON MEZZANINE FLOOR
N
REFERENCE: D-024-001


AB
CONTINUED ON DRAWING D-024-010
RC
CONTINUED ON DRAWING D-024-009
IB
CONTINUED ON DRAWING D-024-009
TB
CONTINUED ON DRAWING D-024-005
PASS-THRU
LABORATORY
LOCKER ROOM
SB
LABORATORY
SBO
MECHANICAL EQUIPMENT
ROOF EL 270'-7½"
FLOOR EL 271'-0"
MEETING ROOM
RECORD STORAGE
ENTIRE BUILDING
ENGINEERING
CONFERENCE ROOM
SUPERINTENDENT OF FICE
REFERENCE D-024-001