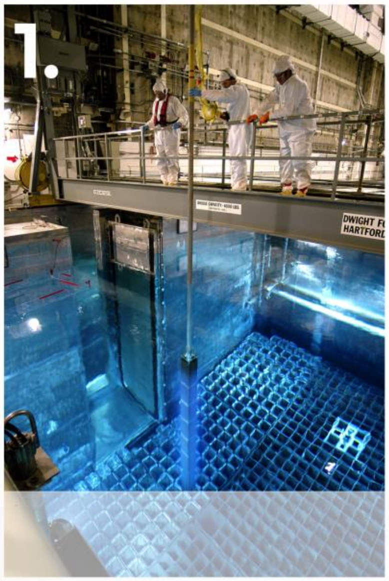
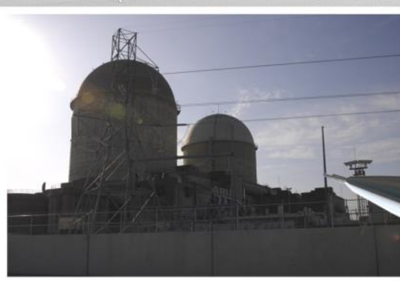
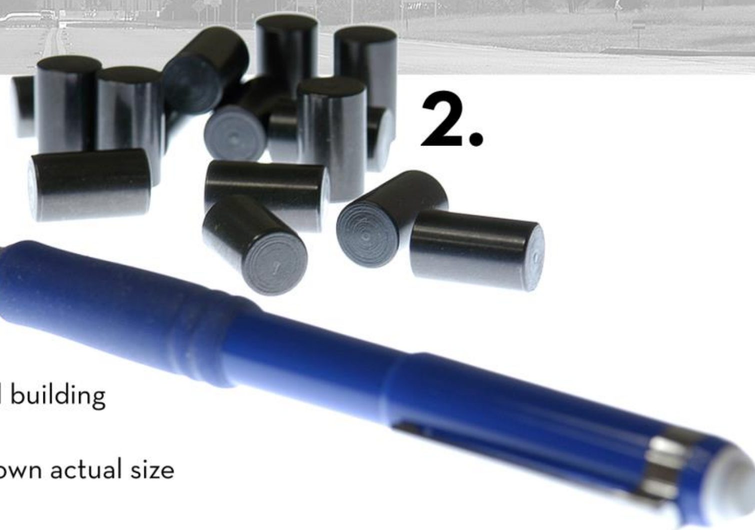


Unit 1 was placed in commercial operation in mid-1990. Unit 2 followed three years later in 1993.





1. Fuel assembly being moved in fuel building during refueling outage
2. Simulated nuclear fuel pellets, shown actual size

Comanche Peak Nuclear Power Plant

MEDIA GUIDE

November 2017

MEDIA GUIDE

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SECTION 1

ASSISTANCE TO THE NEWS MEDIA

ASSISTANCE TO THE NEWS MEDIA

1. Welcome to the Comanche Peak Joint Information Center (JIC). Located at 116 W. Bridge Street in Granbury at the Granbury City Hall, the facility is designed to accommodate the news media during an emergency at Comanche Peak. If you have any needs, please ask one of the Joint Information Center Aides for assistance.

2. Your safety is important to us just as your story is important to you. We ask that you not attempt to go to any other areas or facilities unless an escort can be arranged.

3. Ample parking is provided around the Joint Information Center.

4. The **Company Spokesperson** is the main source of event-related information during an emergency at Comanche Peak.

5. News organizations may reach the Joint Information Center by calling 682-498-8010.

6. Please wear your Comanche Peak Press Pass at all times. Return the Press Pass to the registration desk when you leave.

7. Granbury Regional Airport (KGDJ) is the designated landing zone for helicopters. The airport is located at 400 Howard Clemmons Road in Granbury. See next page for instructions and map.

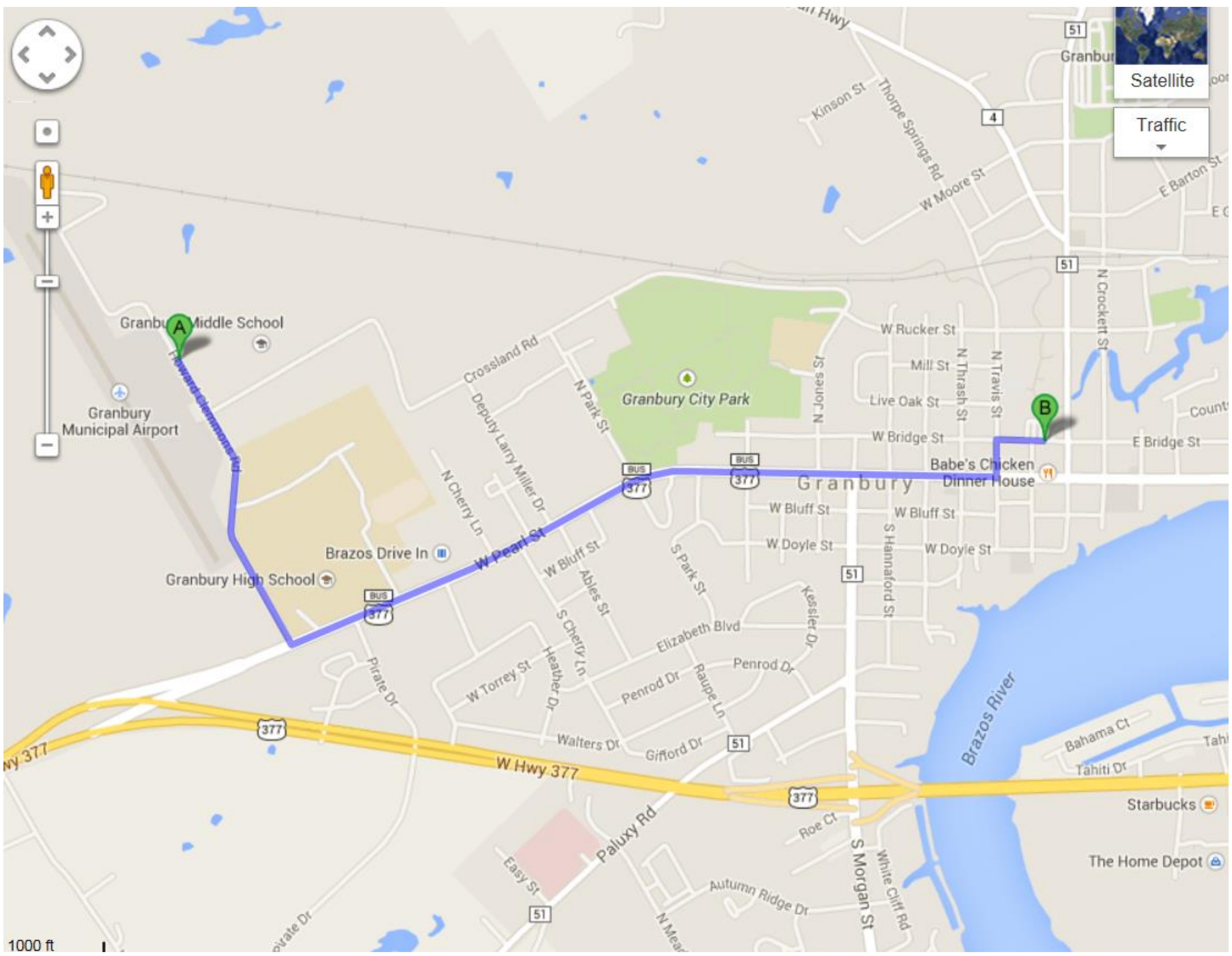
Thank you for your cooperation.

HELICOPTER LANDING INSTRUCTIONS

LANDING ZONES

To request permission to land a helicopter, CONTACT KGDJ - Granbury Regional Airport by calling 817-579-8533, or on common traffic advisory frequency of 123.0.

The airport is located at 400 Howard Clemmons Road in Granbury.



SECTION 2

MEDIA INFORMATION CONTACTS

Comanche Peak Nuclear Power Plant
Media Information Contacts

NOTE: Definitions for classification levels may be found in Section 6.

For information concerning any *Unusual Event*, CONTACT:

Luminant Media Relations **214-875-8004**

EMAIL – media.relations@luminant.com

For information concerning any *Alert* or *Higher*:

COME TO THE JOINT INFORMATION CENTER at Granbury City Hall, 116 W. Bridge Street, Granbury, TX.

OR

CALL RUMOR CONTROL: 682-498-8010

OR

CALL MEDIA RELATIONS: 214-875-8004

EMAIL – media.relations@luminant.com

SECTION 3

COMPANY SPOKESPERSONS

John Dreyfuss
Plant Manager

John Dreyfuss assumed the position of Plant Manager at Luminant's Comanche Peak Nuclear Power Plant in 2015.

A Penn State University graduate in Nuclear Engineering, Dreyfuss has a diverse background in nuclear power and has held Senior Reactor Operator Licenses and Certifications at several different nuclear plants. A 30 year veteran in the business, he has served previously at other utilities as Plant Manager, Director of Engineering, Director of Nuclear Safety and Regulatory Affairs and other senior director and manager positions during his career in both fleet and single nuclear unit environments. Dreyfuss has led or participated in several industry initiatives including the US industry Fukushima Response and the Nuclear Energy Institute Task Force on Extended Power Uprates. A 2001 graduate of the Institute of Nuclear Power Operations (INPO) Senior Nuclear Plant Manager's course, Dreyfuss joined Luminant in March of 2014 as the Director of Organizational Effectiveness at Comanche Peak. He brings to Comanche Peak broad experience in the direction of nuclear power and in aligning and motivating organizations.

Dreyfuss' accountabilities include:

- Leading the safe, reliable and cost-effective operation of CPNPP in compliance with federal, state and local laws and regulations
- Representing Luminant as CPNPP Plant Manager to various organizations including the Institute of Nuclear Power Operations (INPO), the Nuclear Regulatory Commission (NRC) and various other federal, state, and local agencies and stakeholders

In addition to his corporate duties, Dreyfuss has also served as leadership mentor for emerging industry leaders through INPO. He is active in his community and has served on the boards of multiple, non-profit organizations. A dedicated jazz guitarist and performer, Dreyfuss enjoys music and the arts. John is married to Sadie and currently resides in Fort Worth. He has two daughters, Kayla and Alison, and a son, Mathew.

Bob Deppi
Director of Engineering Projects and Support

Bob Deppi is the Director of Engineering Projects and Support.at Luminant's Comanche Peak Nuclear Power Plant, or CPNPP. Luminant is a competitive power generation subsidiary of Vistra Energy. Luminant's activities include plant, mine, wholesale marketing and trading, and development operations.

Deppi holds a Bachelor degree in the Dynamics of Organizational Behavior from Saint David's University in Pennsylvania and a Project Management Institute Certification in Project Management. He has a diverse background in nuclear power and has held Senior Reactor Operator Licenses and Certifications and has been part of several management teams across the nuclear industry during his 35 years in nuclear power. Deppi has held senior director and manager positions during his career in two nuclear fleets and at individual nuclear plants in Operations, Work Management and Outage Management, Project Management, and Nuclear Oversight and Quality Control. Deppi has led or participated in several industry initiatives including the Institute of Nuclear Power Operations (INPO) Operations and Work Management working groups, and the US industry Fukushima Response serving on the BWROG and Nuclear Energy Institute Steering committees and the steering committee for the National Response Centers. Deppi joined Luminant in July of 2015 at Comanche Peak. He brings to Comanche Peak a broad a range of experience in plant operations, management of outages and work control, and large scale projects and a focus on organizational alignment and motivation.

Bob's accountabilities include:

- Ensuring governance, oversight, technical conscience, and risk management for major project design modifications.
- Provide direct oversight of teaming contracts (Engineering Support Services for Turbine Generator and auxiliaries with Siemens, Engineering Support for Core Design and Probabilistic Risk Assessment along with outage support with Westinghouse, and General contract with Fluor for Design Engineering Support and Plant support) during all phases of operation.
- Ensures that CPNPP continually develops, implements, and improves the cyber security processes, procedures, and activities required to improve and sustain the safe and reliable operation of Comanche Peak Nuclear Power Plant
- Maintaining long range planning for station equipment and facilities
- Oversees site support of EPRI, PWROG, and the tow SAFER National Emergency Response Centers management committees

In addition to his corporate duties, Bob has been President of two Home Owner's Associations and other organizations. He is married and lives on Lake Granbury with his wife and youngest daughter. He is an avid Mustang enthusiast and enjoys building and racing cars and boating. Depp's son is a Commander in the US Army and his eldest daughter is a Physiologist in family therapy in Ohio.

Tim Gilder
Manager – Engineering Technical Support

Tim Gilder is currently the Manager – Engineering, Technical Support at Luminant's Comanche Peak Nuclear Power Plant, or CPNPP. Luminant is a competitive power generation subsidiary of Vistra Energy. Luminant's activities include plant and mine operations, wholesale marketing and trading, and development operations.

A Mississippi State University graduate with a BS in Mechanical Engineering, Gilder has over 30 years of experience in nuclear power. He earned Senior Reactor Operator Management Certification at Comanche Peak Nuclear Power Plant in 2011 and is a registered professional engineer in the State of Texas.

Gilder has served in various capacities at CPNPP including Director of Performance Improvement, Corrective Action Program Management, and Project Management. He held the position of Site Development Manager while Luminant was pursuing a new license application for proposed new nuclear construction. He has experience in Nuclear Oversight Management, Engineering Design and Configuration Management, and Engineering Analysis Management.

Gilder's accountabilities include:

- Providing safe, reliable and cost-effective engineering services in support of CPNPP to assure compliance with federal, state and local laws and regulations
- Representing the design authority for CPNPP and overseeing all plant design changes and modifications – both small and large
- Ensuring the licensing and design bases are maintained accurately and safety, design, and operating margins are maintained

Gilder focuses on operational excellence and has been a member of the management team that has consistently improved nuclear safety and plant reliability. He routinely works with the Institute of Nuclear Power Operations to improve standards and programs that facilitate safe nuclear operations to ensure public and employee safety not only at CPNPP but across the nuclear industry.

Gilder and his wife, Beth, live in Fort Worth, Texas and have three children – a daughter and two sons.

Thomas P. (Tom) McCool
Site Vice President

Tom McCool is Site Vice President at Luminant's Comanche Peak Nuclear Power Plant, or CPNPP. Luminant is a competitive power generation subsidiary of Vistra Energy. Luminant's activities include plant, mine, wholesale marketing and trading, and development operations.

A Maine Maritime Academy graduate, McCool represents Luminant on many nuclear industry committees and working groups. He has attended numerous leadership training courses including the Institute of Nuclear Power Operations (INPO) Senior Nuclear Plant Management course and INPO's / NEI Executive Seminar. Prior to joining the Luminant system, McCool held various managerial roles at other nuclear power stations, including Plant Manager, Operations Director, Maintenance Director, and Corporate Training Director. He has also held a Reactor Operator license and three Senior Reactor Operator licenses at other nuclear stations.

McCool's accountabilities include:

- Directing the safe, reliable and cost-effective operation of CPNPP in compliance with federal, state and local laws and regulations
- Representing Luminant as the Site Vice President with the Nuclear Regulatory Commission (NRC), the Institute of Nuclear Power Operations, the Nuclear Energy Institute and the nuclear industry
- Providing strategic direction as well as support services in the areas of operation, maintenance, refueling, radiation protection, safety, security, training, performance improvement, and community relations necessary for the operation of a commercial nuclear facility

In addition to his corporate duties, McCool has been active in the industry and his community. He has served as a mentor for various leadership courses at INPO, such as the Senior Nuclear Plant Management course. He has served on the Board of the Boys and Girls Club of San Clemente, CA.

Tom and his wife, Rose, reside in Granbury, Texas. They have two children, a son-in-law, a daughter-in-law, and one grandson.

Kenneth J. (Ken) Peters
Senior Vice President and Chief Nuclear Officer

Ken Peters is the Chief Nuclear Officer at Luminant's Comanche Peak Nuclear Power Plant, or CPNPP. Luminant is a competitive power generation subsidiary of Vistra Energy. Luminant's activities include plant and mine operations, wholesale marketing and trading, and construction and development of new power plants.

A New Jersey Institute of Technology graduate, Peters also received a Masters degree from Virginia Tech. He has attended several executive programs, including the Nuclear Energy Institute (NEI) Senior Executive Leadership Seminar, the Wharton Executive Development Program and the Goizueta Directors Institute at Emory University. Prior to joining Luminant, Peters held various managerial roles at other nuclear power stations, including Plant Manager and Vice President, Engineering and Projects. He also received a Senior Reactor Operator Certification at another nuclear station.

Peters' accountabilities include:

- Directing the safe, reliable and cost-effective operation of CPNPP in compliance with federal, state and local laws and regulations
- Representing Luminant as the Chief Nuclear Officer with the Nuclear Regulatory Commission (NRC), the Institute of Nuclear Power Operations, the Nuclear Energy Institute and the nuclear industry
- Providing strategic direction as well as support services in the areas of operation, maintenance, refueling, engineering, radiation protection, safety, security, training, quality assurance, performance improvement, and community relations necessary for the operation of a commercial nuclear facility

Peters and his team are responsive to changes dictated by regulation, best-industry practices and corporate policies and programs. Safety must be maintained while the team continuously strives to improve performance and cost effective operation. Peters and his team are continuously reforming practices, work methods and long-range planning skills to promote CPNPP to a top-decile-performing facility.

In addition to his corporate duties, Peters has been active in the industry and his community. He has served as a mentor for various leadership courses at INPO, such as the Senior Nuclear Plant Management course. He is a member of the INPO Executive Advisory Group (EAG) and the NEI Nuclear Strategic Issues Advisory Committee (NSIAC) steering group. He serves on the Board of Directors for the Utilities Service Alliance (USA) and has served on the Board of the Lucia Mar (CA) school district Foundation for Innovation.

Ken and his wife reside in Granbury, Texas. They have two married children, and two grandchildren.

Steven Sewell
Comanche Peak, Sr. Director of Engineering and Regulatory Affairs

Steven Sewell is the Sr. Director of Engineering and Regulatory Affairs at Luminant's Comanche Peak Nuclear Power Plant, or CPNPP. Luminant is a competitive power generation subsidiary of Energy Future Holdings Corp. Luminant's activities include plant and mine operations, wholesale marketing and trading, and construction and development of new power plants.

A Nuclear Engineering graduate of the Georgia Institute of Technology in Atlanta Georgia, Sewell held a Nuclear Regulatory Commission senior operator license at CPNPP for twenty one years. He was involved in the initial startup, testing, and operation of Comanche Peak Power Plant providing on shift direction for fourteen years. He has provided management direction in positions as Training Manager, Director of Operations, Organizational Effectiveness and Plant Manager. Sewell continues to provide direction and oversight of Engineering, Projects, and Regulatory Affairs. In addition, he has been involved with the industry performing organizational evaluations of other nuclear power plants as a team manager with the Institute of Nuclear Power Operations.

Sewell's accountabilities include:

- Supporting the safe, reliable and cost-effective operation of CPNPP in compliance with federal, state and local laws and regulations
- Representing Luminant as Sr. Director of Engineering at CPNPP and point of contact for the Institute of Nuclear Power Operations, or INPO, and the nuclear industry
- Providing strategic direction for Engineering, Projects, and Regulatory Affairs.

In addition to his corporate duties, Sewell is active in his community, church and profession. He is also a licensed professional real estate inspector. He serves as a mentor for nuclear leaders participating in management courses offered through INPO.

Sewell and his wife reside in Granbury, Texas, and have three children.

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SECTION 4

COMANCHE PEAK FACT SHEET

COMANCHE PEAK NUCLEAR POWER PLANT FACT SHEET

The Comanche Peak Nuclear Power Plant is a two-unit nuclear-fueled power plant located four and a half miles northwest of Glen Rose in Somervell County, and about 80 miles southwest of downtown Dallas.

CAPABILITY
2,300 megawatts (two 1,150 megawatt units)

OWNERSHIP
Comanche Peak Power Company LLC (CP PowerCo)

OPERATION
Vistra Operations Company LLC (Vistra OpCo) is responsible for plant operation. Luminant Generation Company LLC provides management, operations and maintenance services to Vistra OpCo. The total number of personnel required to operate the plant is about 1,000 for two units.

SCHEDULE
Unit 1 received its low-power license on February 8, 1990, and attained commercial operation in August 1990. Unit 2 received its low-power license on February 2, 1993, and attained commercial operation in August 1993.

CONSTRUCTION

ENGINEERING AND CONSTRUCTION RESPONSIBILITY
Comanche Peak Power Company LLC (owner) and Vistra Operations Company LLC (operator)

MAJOR CONTRACTERS
A. Architect-Engineer: Gibbs & Hill, Inc., Stone & Webster, Ebasco and Bechtel among others
B. General Construction: Brown & Root, Inc.
C. Squaw Creek Dam and Spillway Design: Freese & Nichols
D. Nuclear Steam Supply System: Westinghouse Electric Corp.
E. Turbine Generator: Allis Chalmers Power Systems, Inc.

MILESTONE DATES

A. Squaw Creek Reservoir
1. Started construction: January 1975
2. Pumping from Lake Granbury started February 15, 1977
3. Achievement of normal pool elevation (775 feet): May 1979

B. Safe Shutdown Impoundment
1. Started construction: April 1, 1976
2. Completed construction: May 20, 1977

C. Plant
1. Contracted Westinghouse for nuclear steam supply system: October 1972
2. Submitted Preliminary Safety Analysis Report (PSAR) and Environmental Report (ER) to Atomic Energy Commission (AEC): June 1973
3. Application docketed by AEC: July 1973
4. AEC issued Safety Evaluation Report (SER) - construction phase: September 1974
5. Advisory Committee on Reactor Safeguards (ACRS) hearing: October 1974
6. Limited work authorization granted: October 17, 1974
7. Began work at site: October 18, 1974
8. Construction permit received: December 19, 1974
9. Began foundation work: March 1975
10. Reactor vessel delivery: Unit 1, June 1977; Unit 2, June 1979
11. Turbine generator delivery: Unit 1, January 1978; Unit 2, June 1979
12. Submitted request for operating license, Final Safety Analysis Report (FSAR) and ER: February 1978
13. Reactor vessels set inside containment buildings: Unit 1, May 1978; Unit 2, July 1979
14. Containment buildings “topped out” with concrete: Unit 1, January 1979; Unit 2, October 1979
15. Major concrete work completed: Unit 1, July 1979; Unit 2, October 1980
16. Unit 1 control room staffed for first time: January 1980
17. Atomic Safety and Licensing Board (ASLB) begins public hearings on operating license
    Application: December 1981
18. Successful completion of Unit 1 reactor containment building integrated leak rate and structural integrity test: January 1983
19. Hot functional testing on Unit 1 begins: February 1983
20. Unit 1 steam turbine rolled on steam for the first time: April 1983
21. First shipment of nuclear fuel arrives: May 1983
22. Closing of Unit 2 containment building equipment hatch: July 1985

23. Hot functional testing on Unit 1: April-May 1989
24. Integrated leak rate test on Unit 1: July 1989
25. Integrated test sequence on Unit 1: July-August, 1989
26. Unit 1 low-power licensing: February 8, 1990
27. Unit 1 fuel load: February 9-14, 1990
28. Unit 1 initial reactor start-up: April 3, 1990
29. Unit 1 full-power license issued: April 17, 1990
30. Unit 1 begins supplying electricity: April 24, 1990
31. Unit 1 reaches 100 percent power level: July 13, 1990
32. Unit 1 is placed in commercial operation: August 13, 1990
33. Unit 2 low-power licensing: February 2, 1993
34. Unit 2 fuel load: February 3-7, 1993
35. Unit 2 initial reactor start-up: March 24, 1993
36. Unit 2 full-power license issued: April 6, 1993
37. Unit 2 begins supplying electricity: April 9, 1993
38. Unit 2 reaches 100 percent power level: July 18, 1993
39. Unit 2 placed in commercial operation: August 3, 1993

PHYSICAL CHARACTERISTICS

STEAM GENERATORS

A. Number per unit: 4
B. Weight, each: 679,000 lbs. (340 tons)
C. Steam flow, each: 7554 gal./min. (3.78 E 6 lbs./hr)
D. Steam pressure at full power: 1,000 pounds/sq. inch absolute {measured + atmospheric pressure} (psia)
E. Steam temperature at full power: 544.6 degrees F.

CONTAINMENT BUILDING

A. Type: reinforced concrete with steel liner
   1. Wall thickness at base – 4 foot 6 inch reinforced concrete
   2. Dome thickness – 2 foot 6 inch reinforced concrete
   3. Steel liner plate thickness - 3/8 inches
B. Height: 265 feet (260 above ground)
C. Diameter: 135 feet

REACTOR VESSEL

A. Material: carbon steel with stainless steel internal cladding
B. Wall thickness: 8.5 inches
C. Height: 43.8 feet
D. Inside diameter: 173 inches (14.4 feet)
E. Weight: 879,500 lbs. (440 tons)
F. Operating pressure: 2,250 psia

SAFETY BARRIERS

Three barriers protect against the release of any radioactive material from the nuclear fuel.

1. Uranium fuel is manufactured as solid ceramic pellets approximately one-half inch long. The pellets are encased in zircaloy tubes called cladding. The fuel and the cladding provide the first barrier.
2. The second barrier is the reactor vessel. All fuel rods are enclosed in this thick steel tank. This vessel is x-rayed and pressure tested to ensure sound construction.
3. Finally, the reactor vessel is inside a reactor containment building with a thick, airtight shell of metal and reinforced concrete.

TURBINE GENERATOR

A. Type: Tandem compound, four flow
B. Voltage output: 22,000 volts
C. Rating: 1,150 megawatts electric

MAIN TRANSFORMERS

Step voltage up from 22,000 volts to 345,000 volts

FUEL

Fuel for the Comanche Peak plant is uranium dioxide, with uranium-235 enrichment. The fuel is fabricated in small ceramic pellets. The pellets are clad in metallic tubes, or fuel rods, and the rods are bundled together to form fuel assemblies.

- Transportation of the fuel follows governmental (both state and national) regulations.
- Refueling occurs as scheduled about every 18 months, with about half of the fuel assemblies being replaced.
- Spent fuel storage will be on the plant site until reprocessing or waste-disposal systems are established.

REACTOR CONTROL

A. The senior reactor operators and the reactor operators are licensed by the Nuclear Regulatory Commission.

B. Reactivity Control
   1. Control rods: silver/indium/cadmium
   2. Soluble neutron absorption: boron

C. Safeguards equipment includes emergency core-cooling system, containment-spray system and hydrogen recombiners

D. Safety Parameter Display System: allows remote monitoring of key safety parameters in the event of an emergency

COOLING RESERVOIRS

Squaw Creek Reservoir provides cooling water for the generating station. Much of the water in the reservoir is pumped from Lake Granbury.

PHYSICAL CHARACTERISTICS

A. Surface area: 3,275 acres at 775 feet Mean Sea Level (MSL)
B. Capacity: 150,953 acre-feet at 775 feet MSL
C. Average depth: 46 feet at 775 feet MSL

SAFE SHUTDOWN IMPOUNDMENT

An earthquake-proof earth-filled dam separates a second reservoir from Squaw Creek Reservoir. This 367 acre-foot impoundment provides a supply of cooling water for safety systems, including firefighting and safe reactor shutdown.

SECTION 5

ORGANIZATION FOR EMERGENCIES

ORGANIZATION FOR EMERGENCIES

Organizations required to respond to an emergency follow a common philosophy: those who perform a function during day-to-day operations perform that same function during an emergency. Response to an accident at a nuclear power plant follows that same philosophy. The following is a brief description of the emergency response organization, the applicable laws and regulations, existing plans and procedures and the control center at each level of response to an emergency at CPNPP.

COMANCHE PEAK NUCLEAR POWER PLANT EMERGENCY RESPONSE ORGANIZATION

The emergency response organization (ERO) at Comanche Peak is composed of Luminant and designated contract employees. The mission of the ERO is to protect the health and safety of plant employees and the general public.

The Emergency Coordinator is in charge of the ERO. The Emergency Coordinator's role shifts to different emergency facility managers as the level of the emergency increases. For instance, in the initial stage of an emergency, the control room Shift Manager is the Emergency Coordinator. Once the Technical Support Center (TSC) is activated, the TSC manager becomes the Emergency Coordinator. When the Emergency Operations Facility (EOF) is activated, the EOF manager becomes the Emergency Coordinator.

Emergency plans and procedures have been developed to ensure that every member of the CPNPP Emergency Response Organization can perform specific tasks necessary to protect the health and safety of the public. The plans and procedures are reviewed and exercised annually with practice and training throughout the year. Improvements are based on findings and observations from those reviews and exercises.

There are four emergency facilities at Comanche Peak. The Control Room controls the plant's operation and is the first facility to be involved in responding to an emergency. When activated, the TSC provides engineering, technical and management support to the Control Room. The Operations Support Center (OSC) provides emergency repairs necessary to control the situation.

The EOF staff is responsible for coordination with offsite officials and providing radiological projections and protective actions for decision-makers.

LOCAL EMERGENCY ORGANIZATIONS

The governments of Hood and Somervell counties and the cities of Glen Rose, Granbury, Tolar and DeCordova are inside the 10-mile Emergency Planning Zone around Comanche Peak. Each county plans for various emergencies including an emergency at Comanche Peak.

The emergency organizations for the two counties are similar in structure. They are both composed of city and county employees augmented by volunteers. The chief elected official (county judge) is responsible for their respective emergency response organizations. Highly motivated volunteers such as the volunteer fire departments perform emergency functions when called upon to do so. Some individuals may perform more than one emergency function.

Control centers in Hood and Somervell counties are called Emergency Operating Centers (EOCs) and are located in the law enforcement center of each county. Both EOCs have communications personnel on duty 24 hours a day. The Hood County LEC is located at 400 Deputy Larry Miller Drive in Granbury; the Somervell County LEC is located at 750 E. Bo Gibbs Blvd. in Glen Rose.

RECEPTION CENTERS

The cities of Benbrook, Cleburne and Stephenville provide reception centers for the citizens of Hood and Somervell counties that may be evacuated because of an emergency at Comanche Peak. City employees staff the centers and are trained to monitor people and automobiles for radiological contamination and provide decontamination services. In addition, evacuees are registered for accountability and provided assistance with food and lodging, if requested. The reception centers are located at the Benbrook YMCA at 1899 Winscott Road, the Cleburne Senior Center at 1212 Glenwood Drive in Cleburne, and the Stephenville Recreation Hall at 378 West Long Street in Stephenville.

STATE OF TEXAS EMERGENCY RESPONSE ORGANIZATION

The initial state response to an emergency at Comanche Peak will come from the District Disaster Committee at the Department of Public Safety (DPS) district headquarters. The committee is composed of representatives of various state agencies that respond to the needs of local governments. The chairman of the committee is the DPS Commander. The Emergency Operations Center headquarters is staffed 24 hours a day by communications personnel.

The Texas DPS Division of Emergency Management will coordinate long-term state response at the State Operations Center in Austin. The assistant director – Emergency Management Chief, working closely with the governor's office, can direct the resources of the state to be used to mitigate the effects of any event or natural disaster that exceeds the capability of local government and activate the recovery resources necessary to return the affected area to normalcy. The division is also the coordinating link to the Department of Homeland Security (DHS).

The lead state agency for response to accidents and disasters involving nuclear materials in the state is the Department of State Health Services (DSHS)-Radiation Control Programs. It provides technical expertise to local governments such as health physicists and technicians to assist with decontamination and agricultural product screening. The DSHS also has a fully equipped mobile laboratory for the analysis of agricultural, soil and air samples gathered by technicians in the field.

FEDERAL EMERGENCY RESPONSE ORGANIZATION

Federal responsibility for fixed nuclear facilities and associated offsite jurisdictions is assigned to the Nuclear Regulatory Commission (NRC).

The NRC regulates the activities and facilities of reactor licensees. It has resident inspectors assigned to the site that, in emergencies, provide advice and assistance to decision-makers. A NRC communication link exists between NRC headquarters and Comanche Peak to ensure the NRC is immediately aware of any problem at the facility and that any assistance available to the utility from the NRC is activated.

SECTION 6

EMERGENCY CLASSIFICATIONS

EMERGENCY CLASSIFICATIONS

Emergency Classifications are standardized indicators, defined by the Nuclear Regulatory Commission (NRC), of the seriousness of an incident at a commercial nuclear power plant. The four classifications are UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY. An understanding of the meaning of each classification is essential to anyone living nearby or expected to respond to an emergency at a commercial nuclear power plant.

UNUSUAL EVENT

An "Unusual Event" is the least serious of four nuclear power plant classifications. It is a minor event and there is no danger to the public. Notifications will be made to local officials to advise them of the situation and allow them to be prepared in case the situation at the plant deteriorates.

ALERT

An "Alert" is the second least serious of four nuclear power plant emergency classifications. There is no danger to public; however, Emergency Response Facilities are being staffed to ensure any and all resources needed are available. Local officials will be notified to allow them to prepare for the possibility that the situation might worsen and because the plant may need to call upon them for assistance such as police or fire department support.

SITE AREA EMERGENCY

A "Site Area Emergency" is the third most serious of four nuclear power plant emergency classifications. It is a serious event but there is no immediate danger to the public. All Emergency Response Facilities have been staffed and state and local officials/agencies will be notified and placed on stand-by in case they are needed.

During a Site Area Emergency, CPNPP will order evacuation of non-essential personnel from the site and evacuation of Squaw Creek Park. Additionally, as a precautionary measure, local governments may evacuate "Special Facilities" such as camps, parks and schools.

GENERAL EMERGENCY

A “General Emergency” is the most serious of four nuclear power plant emergency classifications. It means that necessary plant systems have been damaged and there may be a hazard to people outside the plant. Local and state officials will be notified to allow them to prepare for large-scale response activities, in the event that the situation at the plant deteriorates. In this phase, local officials may be called upon to implement protective actions such as sheltering or evacuation. The public should stay tuned to the Emergency Alert (EAS) radio station WBAP-820 AM or KFJZ-870 AM (Spanish) for information.

SECTION 7

ALERTING AND INFORMING THE PUBLIC

ALERTING AND INFORMING THE PUBLIC

Alerting and informing the public that an event at Comanche Peak has occurred and that some action on the part of the public must be taken is a responsibility of the local governments. The plans and procedures for Hood and Somervell Counties include instructions for alerting and informing the public.

Should it become necessary to activate the alert and notification system, the decision to do so rests with each county judge. The judge will make this decision based upon the best information available. Upon receiving a judge’s decision, the sheriff will activate the outdoor warning system and mobile units to broadcast the notification in the event of a known siren failure.

The outdoor warning system inside the 10-mile Emergency Planning Zone (EPZ) around Comanche Peak consists of 72 pole-mounted sirens distributed to provide complete coverage. The sirens are tested for coverage by site personnel, twice monthly under an approved FEMA program. Route Alerting is a backup to the siren system, fire trucks and police units with public address capability are dispatched to areas where receipt of the warning is questionable or a siren failure is indicated. Code Red (reverse 911) is another early warning system used by Hood and Somervell counties.

The dissemination of information to the public is best accomplished through the use of media assistance. One such use of the media is the use of the Emergency Alert System (EAS). Should it be necessary for the public to take protective actions, the county judge will use EAS to provide specific instructions to the residents of the county. The EAS station in this area is WBAP (820 AM). The EAS message is re-broadcast in Spanish over KFJZ (870 AM). Follow-up information will be broadcast by WBAP as information is received.

Emergency information is distributed annually to each resident of the 10-mile Emergency Planning Zone around Comanche Peak. ***THE LONE STAR YELLOW PAGES FOR GRANBURY/GLEN ROSE*** contains a full-color section with maps showing protective action zones and other information such as telephone numbers and special evacuation instructions.

SECTION 8

BASIC INFORMATION CONCERNING RADIATION

BASIC INFORMATION CONCERNING RADIATION

RADIATION

People have been continuously exposed to natural sources of radiation since the beginning of time. Thus, radiation is not something new that appeared with the coming of the "Nuclear Age." Radiation is energy, in wave or particle form, that is released from radioactive material. The sun is the most familiar of these sources.

When speaking of radiation during an emergency exercise or at other times, we will use terms including rem, millirem, dose and dose rate.

- **REM** stands for roentgen equivalent man and refers to a measure of radiation based on its potential impact on human cells.
- A rem is a fairly large unit of radiation. More often you will hear the term **MILLIREM.** It takes 1,000 millirem to equal a rem.
- **DOSE** is a term that refers to the amount of radiation absorbed by the whole body or a portion of the body.
- **DOSE RATE** is a term used to describe the amount of dose received over a given period of time. An example of a dose rate would be 8 millirem per hour.

There are two basic sources of radiation: natural and man-made. Natural radiation is present in building materials, the air, our food and even our own bodies. Levels of natural or background radiation can vary greatly from one location to the next. Furthermore, a lot of our natural exposure is due to radon, a gas from the earth's crust that is present in the air we breathe. Man-made radiation is radiation caused by radioactive materials that have been refined to produce a useful effect such as medical procedures or heat in a nuclear power plant.

The average annual radiation exposure from natural sources to an individual in the United States is about 310 millirem or 50 percent of the annual dose. No adverse health effects have been discerned from doses arising from these levels of natural radiation exposure.

In addition, man-made sources of radiation from medical, commercial and industrial activities contribute another 310 millirem, or 50 percent to our annual radiation exposure.

BIOLOGICAL EFFECTS OF RADIATION

The effects of radiation on humans can be divided into three classes:

- Chronic or long-term effects to the body.
- Acute or short-term effects to the body.
- Genetic effects.

Generally, the degree of the somatic or physical effect will depend upon whether the exposure was chronic exposure (a repeated or prolonged exposure such as received from natural background radiation) or acute exposure (radiation received over 24 hours or less).

The most important effect of chronic exposure is the increased possibility of cancer.

Much of the information on the early somatic effects of acute exposure (large amounts of radiation) comes from sources such as victims of atomic bomb detonations such as Hiroshima, Nagasaki and the Marshall Islands; radiation accidents in laboratories and patients who received fairly large doses of radiation for therapeutic purposes.

The observed effects of acute radiation exposure vary with the individual and the type of exposure. Generally, it takes an exposure of 25,000 millirem to cause detectable blood changes. Exposure must reach 200,000 to 600,000 millirem to start causing serious illness or death in an exposed population without medical treatment.

Genetic effects are those which are not evident in those exposed but may appear in later generations. While genetic effects from radiation may be possible, no increase in the natural rate of genetic effects has been found in the 35,000 children conceived by parents exposed to the atomic bombs dropped on Hiroshima and Nagasaki.

RADIATION RISKS

Numerous reports have been written on the effects of radiation, making it one of the most studied items affecting human health.

One of the most recent and most comprehensive reports on the effects and risks of radiation is the 1990 version of the "Biological Effects of Ionizing Radiation" from the National Academy of Sciences. The report is commonly referred to as BEIR V.

Using figures from BEIR V, being exposed to 10,000 millirem raises the normal chance of death due to cancer by 0.8 percent from 20.15 percent for males and 16.15 percent for females. A radiation dose of 10,000 millirem is a large dose.

Modern life includes other risks besides radiation. A useful way to put the risks of radiation in perspective is to compare them to other risks we might face. One way to do this is to compare risks and how they shorten a person's life expectancy.

Estimated loss of life expectancy from health risks:

Smoking 20 cigarettes/day	2370 days
Overweight by 20 percent	985 days
Auto accidents	200 days
Alcohol consumption (U.S. average)	130 days
Home accidents	95 days
Natural background radiation, calculated	8 days
Medical x-rays (U.S. average), calculated	6 days
All catastrophes (earthquake, etc.)	3.5 days
Radiation dose, calculated per 1,000 mR	1 day

These figures indicate the health risks of radiation are comparable to, and in some cases, much smaller than risks posed by many of our day-to-day activities. No amount of radiation can be called completely risk-free. However, the risks caused by the radiation encountered in day-to-day life or in the operation of a nuclear power plant are very small.

CONTAMINATION

"Contamination" is radioactive material in a place where it is not wanted.

The most significant ways that contamination causes problems are through physical contact and internal exposure. Internal contamination is particularly important because one cannot be shielded from the radiation. Contamination can enter the body by inhalation, oral ingestion, and open wounds or by direct absorption through the skin.

Radiation workers are trained to control contamination and take steps to prevent internal contamination by not eating, drinking or smoking in areas where contamination is a problem. In some instances they may wear protective clothing called PCs.

DECONTAMINATION

Since contamination is radioactive material in a place where it is not wanted, removing the material is called decontamination. Decontamination can be accomplished by washing the affected area with mild soap and water.

SECTION 9

GLOSSARY OF NUCLEAR TERMS

GLOSSARY OF NUCLEAR TERMS

1. **Alpha Radiation** - (See radioactivity)

2. **Background Radiation** - is the radiation that occurs naturally in the environment.

3. **Borated Water** - is a dilute mixture of boric acid and water used in controlling the fission process inside the reactor.

4. **Chain Reaction** - is the self-sustaining reaction that occurs when a neutron splits an atom, releasing enough neutrons to cause other atoms to split in the same way.

5. **Cladding** - is a metal (zirconium alloy) cover surrounding the uranium fuel. This cladding acts as a barrier between the fuel and the reactor's primary cooling water.

6. **Cold Shutdown** - is when the reactor is shut down and coolant water in the reactor is below the boiling point and the pressure is reduced to that of the atmosphere.

7. **Control Rods** - are made of a material (silver-indium-cadmium) that absorbs neutrons. When inserted into the reactor core, the rods stop the fission process, thus shutting down the reactor.

8. **Control Room** - is the center where the nuclear power plant is operated, monitored, and controlled.

9. **Core** - is the central part of a nuclear reactor that contains the fuel.

10. **Credible Security Threat** - A security threat to CPNPP which has been determined by the NRC, law enforcement, or plant management to be credible.

11. **Criticality** - is the point at which the nuclear fuel can sustain a chain reaction.

12. **Decay Heat** - is heat produced by the nuclear fuel after the reactor has been shut down.

GLOSSARY OF NUCLEAR TERMS (continued)

13. **Dosimeter** - is a device worn by plant workers to measure the amount of radiation received.

14. **Emergency Core Cooling System** - is a series of backup systems which can provide cooling water to the reactor is case the primary cooling system fails.

15. **Failed Fuel** - failed fuel can range from a small leak in radioactive gases from a fuel assembly, to much more severe damage, including core meltdown. The severity of fuel damage is one of the considerations in determining the Emergency Action Level during a nuclear accident.

16. **Fission** - is the splitting of an atom into two new atoms.

17. **Fission Products** - are the atoms formed when a uranium atom fissions. The fission products are usually radioactive.

18. **Fuel Assembly** - consists, at Comanche Peak, of 264 fuel rods grouped together. There are 193 fuel assemblies in each reactor core at Comanche Peak.

19. **Fuel Leak** - fuel is considered leaking when there is a small breach in the protective metal cladding which surrounds the fuel pellets. A fuel leak will allow radioactive gases to escape the fuel into the water of the cooling systems. A small number of leaking fuel assemblies are within the capacity of the cleaning systems, and do not constitute a nuclear safety concern.

20. **Fuel Pellets** - made of uranium dioxide in a ceramic form, are placed in the fuel rods to provide the energy to operate a nuclear power plant. Each pellet is about one-half inch long and provides the equivalent amount of energy as in one ton of coal. There are about 14 million pellets in each reactor.

21. **Fuel Rod** - is a cylindrical rod approximately one-eighths inch in diameter and 12 feet long, containing the uranium fuel pellets.

22. **Gamma Radiation** - (See Radioactivity)

23. **Geiger Counter** - is an instrument used to detect and measure radiation.

GLOSSARY OF NUCLEAR TERMS (continued)

24. **Half-Life** - is the time required for a radioactive substance to lose one-half of its radioactivity. Half-life can very from less than a second to more than a billion years, depending on the substance.

25. **Ingestion Exposure Pathway** - is the area within 50 miles of a nuclear power plan in which the state could control food and water supplies to prevent the ingestion of radioactive materials in the event of a radioactive release.

26. **Insider Threat** - a credible security threat to CPNPP that involves a person with unescorted access to the Protected Area who assists those threatening the plant.

27. **Millirem (mrem)** - is the unit used to measure radiation dosage. It is a 1/1,000th of a REM. REM stands for Roentgen Equivalent Man, a measure of radiation that indicates potential impact on human cells.

28. **Noble Gases** - are gases that do not react chemically with other materials and cannot be absorbed by plants or animals. The noble gases are helium, neon, argon, krypton, xenon, and radon.

29. **Nuclear Regulatory Commission (NRC)** - is the federal governmental agency that is responsible for the regulation and inspection of nuclear power plants to assure safety.

30. **Plume Exposure Pathway** - is the area that would be exposed to a radioactive release. The release would travel with the wind, covering a wider area, but becoming more diluted the further it travels from the plant.

31. **Pressurized Water Reactor (PWR)** - is a system in which the primary coolant is kept under enough pressure that it does not boil. A second and separate water system is used to produce steam to turn the turbine generators. The reactors at CPNPP are PWR's.

32. **Pressurizer** - is the tank of steam and water that controls the pressure in a PWR.

33. **Primary Coolant** - refers to the water used to transfer heat in a PWR from the reactor to the steam generators.

GLOSSARY OF NUCLEAR TERMS (continued)

34. **Radioactivity** - is the property possessed by some elements that spontaneously give off energy in the form of waves or particles. The three forms of radiation are alpha, beta, and gamma.

    A. **Alpha radiation** - is emitted from the nucleus of an atom, is the least penetrating type. It can be stopped by a sheet of paper.
    B. **Beta radiation** - is emitted from the nucleus of an atom during fission. It can be stopped by a thin sheet of aluminum.
    C. **Gamma radiation** - is a form of electromagnetic waves emitted from a nucleus and is essentially the same as X-rays. Several inches of lead or several feet of concrete will stop most gamma rays.

35. **Reactor** - is a large steel vessel that contains the uranium fuel, primary coolant, control rods and structures that support the uranium fuel.

36. **Reactor Trip** - refers to the insertion of control rods into the fuel core of the reactor, stopping the fission process.

37. **Relief Valve** - is one of the valves used to release steam and reduce pressure.

38. **Residual Heat Removal System** - removes the heat from the reactor after the fission process has been stopped and the reactor has been shut down.

39. **Secondary Coolant** - is the non-radioactive water in a PWR that is heated into steam which turns the turbine.

40. **Shielding** - is the material inside a nuclear power plant that provides protection against radiation. Shielding can be steel, lead, concrete or water.

41. **Steam Generator** - is the component in a PWR that permits heat to be transferred from the primary coolant to the secondary coolant without water in the two systems actually touching. Each reactor at Comanche Peak is connected to four steam generators.

42. **Two-Person Rule (2-Person Rule)** - usually implemented when there is an insider threat. All personnel in or entering a Vital Area must be paired with another person. These pairs maintain line of sight and observe each other continuously.

SECTION 10

ACRONYMS

ACRONYMS

-A-

AC	Alternating Current
ACP	Access Control Point
AFW	Auxiliary Feed Water
A/N	Alert/Notification System
ALARA	As Low As Reasonably Achievable
ANTI-C	Anti-Contamination Clothing

-B-

BRC	Bureau of Radiation Control
BRS	Boron Recycle System
BTRS	Boron Thermal Recycle System

-C-

CCP	Centrifugal Charging Pump
CCW	Component Cooling Water
CHG	Charge
CNMT	Containment
CPRS	Containment Pressure Relief System
CPNPP	Comanche Peak Nuclear Power Plant
CRDM	Control Rod Drive Mechanism
CS	Containment Spray
CST	Condensate Storage Tank
CVCS	Chemical and Volume Control System
CVP	Condenser Vacuum and Water box Priming System
CWS	Circulating Water System

-D-

DBA	Design Basis Accident
DC	Direct Current
DEM	Division of Emergency Management
DG	Diesel Generator
DPS	Department of Public Safety

-E-

EAB	Exclusion Area Boundary
EAL	Emergency Action Level
EAS	Emergency Alert System
ECCS	Emergency Core Cooling System
EMS	Emergency Medical Service
EOC	Emergency Operating Center
EOF	Emergency Operations Facility
ESF	Engineered Safety Feature
EPA	U.S. Environmental Protection Agency
EPZ	Emergency Planning Zone
ERF	Emergency Response Facility
EV	Electron Volt

ACRONYMS

-F-

FAA	Federal Aviation Administration
FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
FRERP	Federal Radiological Emergency Response Plan
FRMAC	Federal Radiological Monitoring and Assessment Center
FRRP	Federal Radiological Response Plan
FW	Feed Water

-G-

GE	General Emergency
GEN	Generator
GPM	Gallons Per Minute
GWPS	Gaseous Waste Processing System

-H-

HP	Health Physicist or Health Physics Technician
HPCI	High Pressure Coolant Injection System
HPSI	High Pressure Safety Injection
H_3	Tritium
HVAC	Heating Ventilation Air Conditioning
HX	Heat Exchanger

-I-

INPO	Institute of Nuclear Power Operations
IPP	Institute of Public Power
ISO	Isolation

-J-

JIC	Joint Information Center
JPIC	Joint Public Information Center
JWS	Jacket Water System

-K-

KI	Potassium Iodide
KV	Kilovolt
KW	Kilowatt
KWH	Kilowatt Hour
KEV	Kilo-Electron Volt

-L-

LFA	Lead Federal Agency
LLEA	Local Law Enforcement Agency
LOCA	Loss of Coolant Accident
LTDN	Letdown
LWPS	Liquid Waste Processing System

-M-

mREM	Millirem
mR/h	Millirem per hour
MS	Main Steam
MSIV	Main Steam Isolation Valve
MW	Megawatt
MWH	Megawatt Hour

ACRONYMS

-N-

NEI	Nuclear Energy Institute
NOAA	National Oceanic and Atmospheric Admin
NOUE	Notification of Unusual Event
NRC	Nuclear Regulatory Commission
NRT	National Response Team
NUREG	Nuclear Regulation
NWS	National Weather Service

-O-

ORNL	Oak Ridge National Laboratory
OSC	On Scene Commander or Operations Support Center
OSHA	Occupational Safety and Health Administration

-P-

PAG	Protective Action Guide
PAR	Protective Action Recommendation
PASS	Post Accident Sampling System
PDP	Positive Displacement Charging Pump
PIO	Public Information Officer
PL	Public Law
PORV	Power Operated Relief Valve
ppm	Parts Per Million
PSIG	Pounds Per Square Inch Gauge
Pu	Plutonium
PWR	Pressurized Water Reactor (also Power)
PZR	Pressurizer

-Q-

NONE

-R-

R	Roentgen
Ra	Radium
rad	Radiation Absorbed Dose
RADEF	Radiological Defense
RCDT	Reactor Coolant Drain Tank
RCS	Reactor Coolant System
REA	Radiological Emergency Area
REP	Radiological Emergency Preparedness
rem	Roentgen Equivalent Man
RHRS	Residual Heat Removal System
RM	Radiological Monitor
RMS	Reactor Makeup System
RMWST	Reactor Makeup Water Storage Tank
RO	Radiological Officer
RP	Radiological Protection
RPT	Radiological Protection Technician
RRT	Radiological Response Team
RVLIS	Reactor Vessel Level Indicating System
RWST	Refueling Water Storage Tank
RX	Reactor

ACRONYMS

-S-

SAE	Site Area Emergency
SCBA	Self Contained Breathing Apparatus
SFP	Spent Fuel Pool
SFCP	Spent Fuel Pool Cooling Pump
SG	Steam Generator
SGTR	Steam Generator Tube Rupture
SI	Safety Injection
SIP	Safety Injection Pump
SOP	Standard Operating Procedures
SPDS	Safety Parameter Display System
SSW	Station Service Water
STP	South TX Project Electric Generating Station

-T-

TBA	Thyroid Blocking Agent
TCP	Traffic Control Point
TDAFW	Turbine Driven Auxiliary Feedwater
TDH	Texas Department of Health
TLD	Thermo Luminescent Dosimeter
TPCW	Turbine Plant Cooling Water
TSC	Technical Support Center

-U-

U	Uranium
UPS	Uninterruptible Power Supply

-V-

VFD	Volunteer Fire Department

-W-

WGS	Waste Gas System

-X-

X	Common or Both Units

-Y-

NONE

-Z-

NONE

SECTION 11

NUCLEAR POWER
QUESTIONS & ANSWERS

NUCLEAR POWER
QUESTIONS & ANSWERS

1. How does nuclear power work?

   Heat generated as a result of uranium atoms splitting (fission) boils water to make steam that turns an electrical generator to produce electricity.

2. How is that different from making electricity other ways?

   The only difference is the heat source. In coal, natural gas and oil-fired plants, heat is generated from the burning of those fuels. The heat makes steam that turns a generator.

3. Is the steam in a nuclear plant radioactive?

   Not in the type of plant at Comanche Peak. The steam that turns the generator doesn't go through the reactor vessel and doesn't mix with the water that removes heat from the nuclear fuel assemblies.

4. What is the reactor vessel?

   The reactor vessel is the pressure vessel, about 16-feet in diameter and 44-feet high, that holds the nuclear fuel assemblies. Pressurized water circulating through the reactor vessel removes the heat of fission occurring within the fuel assemblies and transfers the heat in the steam generators to a second water system that boils and produces the steam.

5. Where is the radioactive material in a nuclear plant?

   It originates, and most stays, within the nuclear fuel assemblies in the reactor vessel. During refueling outages, when systems are opened up and drained, small amounts of radioactive material can be found outside the reactor vessel. Called "radioactive contamination," the material is easily detected in the smallest amounts and is kept inside what is called a Radiation Controlled Area.

NUCLEAR POWER
QUESTIONS & ANSWERS

6. What's the difference between radiation and radioactive material?

   Radioactive material is the source of radiation – like the sun is the source of sunlight.

7. What is radiation?

   Radiation is energy in the form of particles or rays. Ionizing radiation (called that because it can produce a charged particle) can damage living tissue whether it comes from space, the radioactive material found naturally in the ground, air and food we eat, medical x-rays or nuclear power plants.

8. How much ionizing radiation do we get?

   In Texas, about 300 units (called millirem) every year. People who live in Denver get more (they are higher up and there's less air to shield them from cosmic radiation). In some parts of the northeast people receive more because of the increased concentration of radioactive material in the granite bedrock underneath them. In comparison, a person who lives right at the boundary of Comanche Peak property receives no to too-small-to-measure radiation as a result of plant operation.

9. What is the danger then?

   The danger is if the radioactive material within the nuclear fuel assemblies gets outside the reactor vessel and the domed containment buildings. The radioactive material can be both solids and gases that can be carried by the wind and weather.

10. What is nuclear waste?

    Nuclear waste is the radioactive material left over from, and produced as a result of, the fission process. It is contained within the nuclear fuel assemblies and stored in the fuel building (on site) in deep water-filled pools. The water both removes the thermal heat still generated and blocks the radiation coming from the nuclear waste within the fuel assemblies.

NUCLEAR POWER
QUESTIONS & ANSWERS

11. How long is nuclear waste dangerous?

    Some waste products remain radioactive for millions of years. The two isotopes that comprise the majority of the nuclear waste (strontium and cesium) have half-lives of about 30 years. That means that it takes about 600 years for those to lose (called “decay”) most of their radioactivity.

12. Where will nuclear spent fuel be stored?

    Each nuclear power plant in the country stores its spent fuel on site.

13. What’s the difference between nuclear fission and nuclear fusion?

    Nuclear fission involves splitting apart a heavy atom (uranium) to release energy. Nuclear fusion is the joining together of light atoms (usually isotopes of hydrogen) that releases energy in the process. Fusion is what happens on our sun and other stars.

14. Why was nuclear power at a standstill for so many years?

    After the Three Mile Island accident in 1979 no new orders for nuclear plants were placed. At the time there were enough regulatory, financial and political uncertainties surrounding the building of nuclear units and the TMI accident was the last straw.

    Recently however, nuclear energy is poised for a rebirth because of the growing realization that nuclear power plants reliably generate electricity without emitting carbon dioxide or other greenhouse gases. Currently about 20 percent of all the country’s electricity comes from the 100 units in 31 states that have been in operation for many years.

NUCLEAR POWER
QUESTIONS & ANSWERS

15. Why is nuclear power necessary? Can wind power substitute?

    Wind power can help, but the wind doesn't blow all the time. Use of electricity, however, continues around the clock and large base load units are needed to supply the continual need for power. Large coal, natural gas or oil-fired plants also can generate base load electricity, but cost and environmental concerns make them second choices to nuclear power.

    More and more wind "farms" are being built, especially in Texas, and every kilowatt-hour generated by the wind is one kwhr less generated by carbon-emitting fossil fuels.

16. What is dry cask spent fuel storage?

    After cooling in the used fuel storage pool, assemblies may be moved into robust steel and concrete storage containers. These massive, NRC-licensed containers can hold up to 87 assemblies and are built to withstand extreme conditions such as earthquakes and tornadoes.

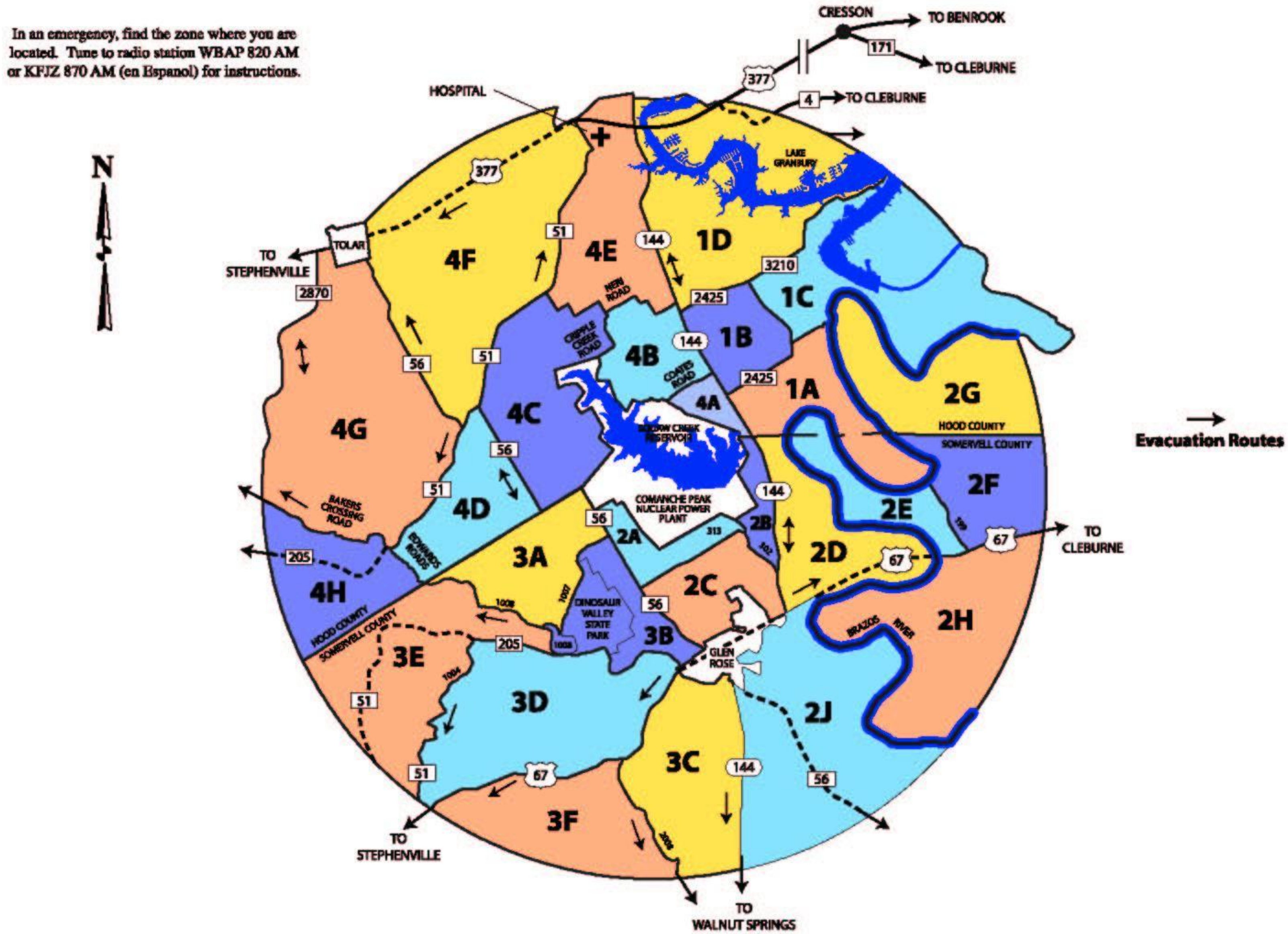
17. Where can I find information about nuclear power in this country?

    The Nuclear Energy Institute (NEI) in Washington, D.C. is a good source. Try www.nei.org, or give them a call at 202-739-8000.

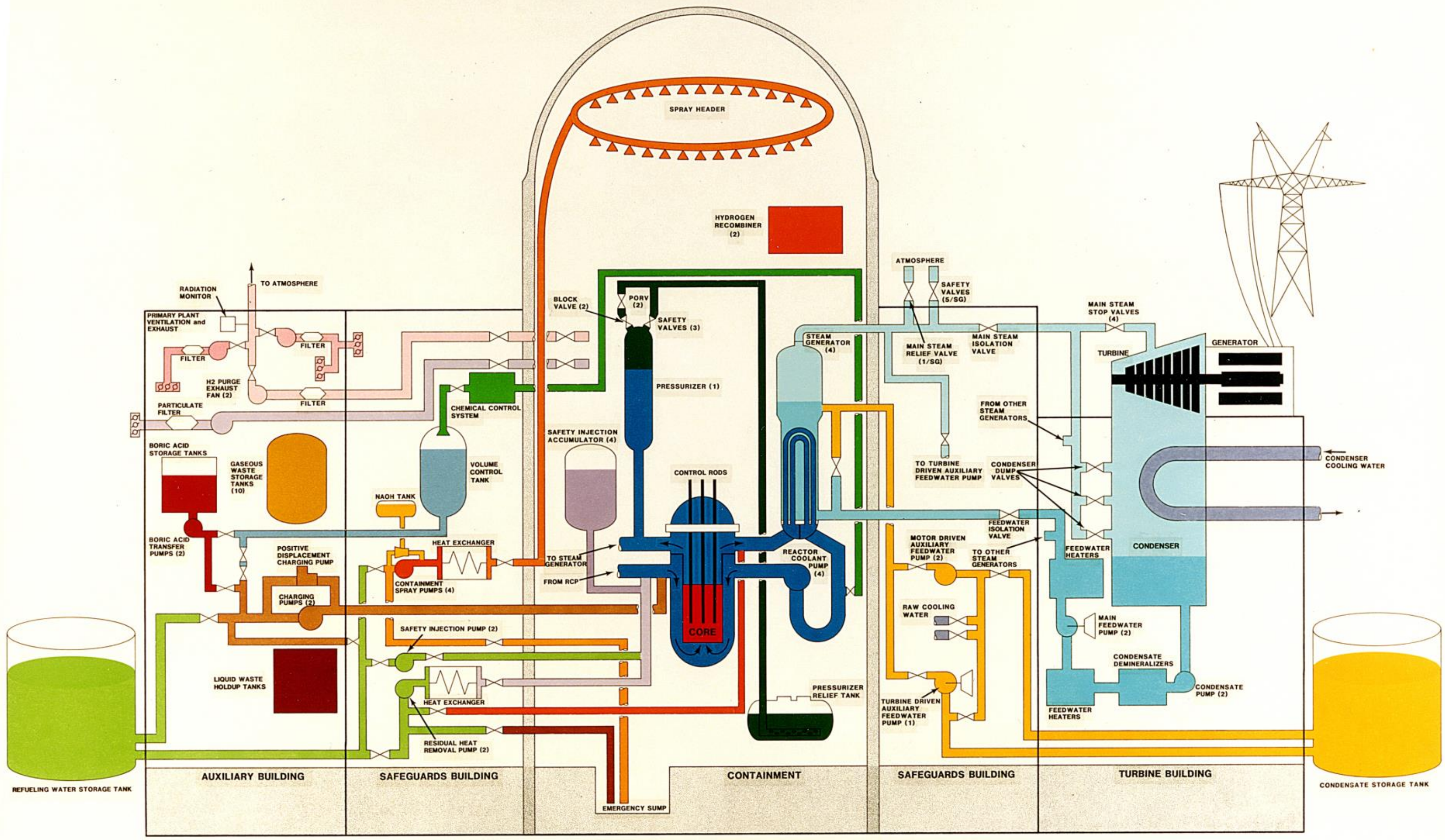
SECTION 12

MAP AND PLANT SYSTEM DRAWINGS

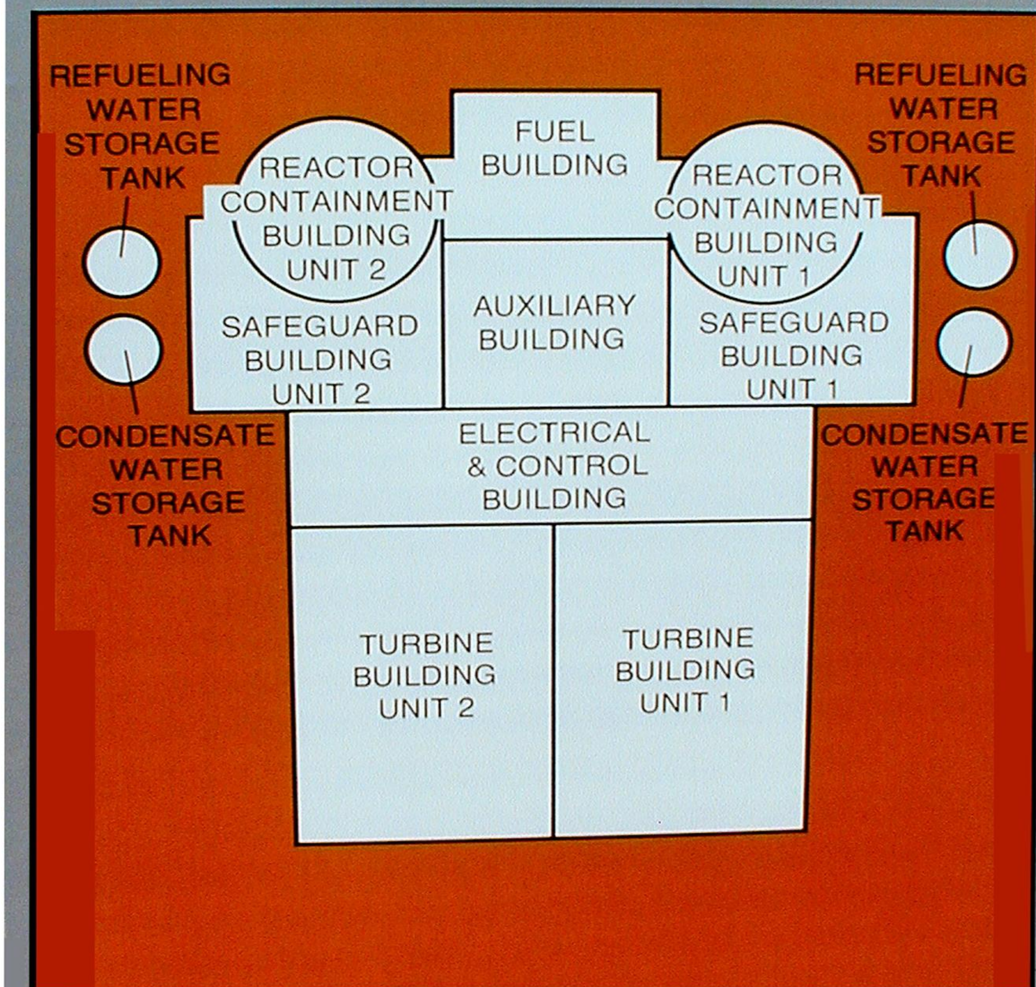
CPNPP 10-MILE EMERGENCY PLANNING ZONE (EPZ)

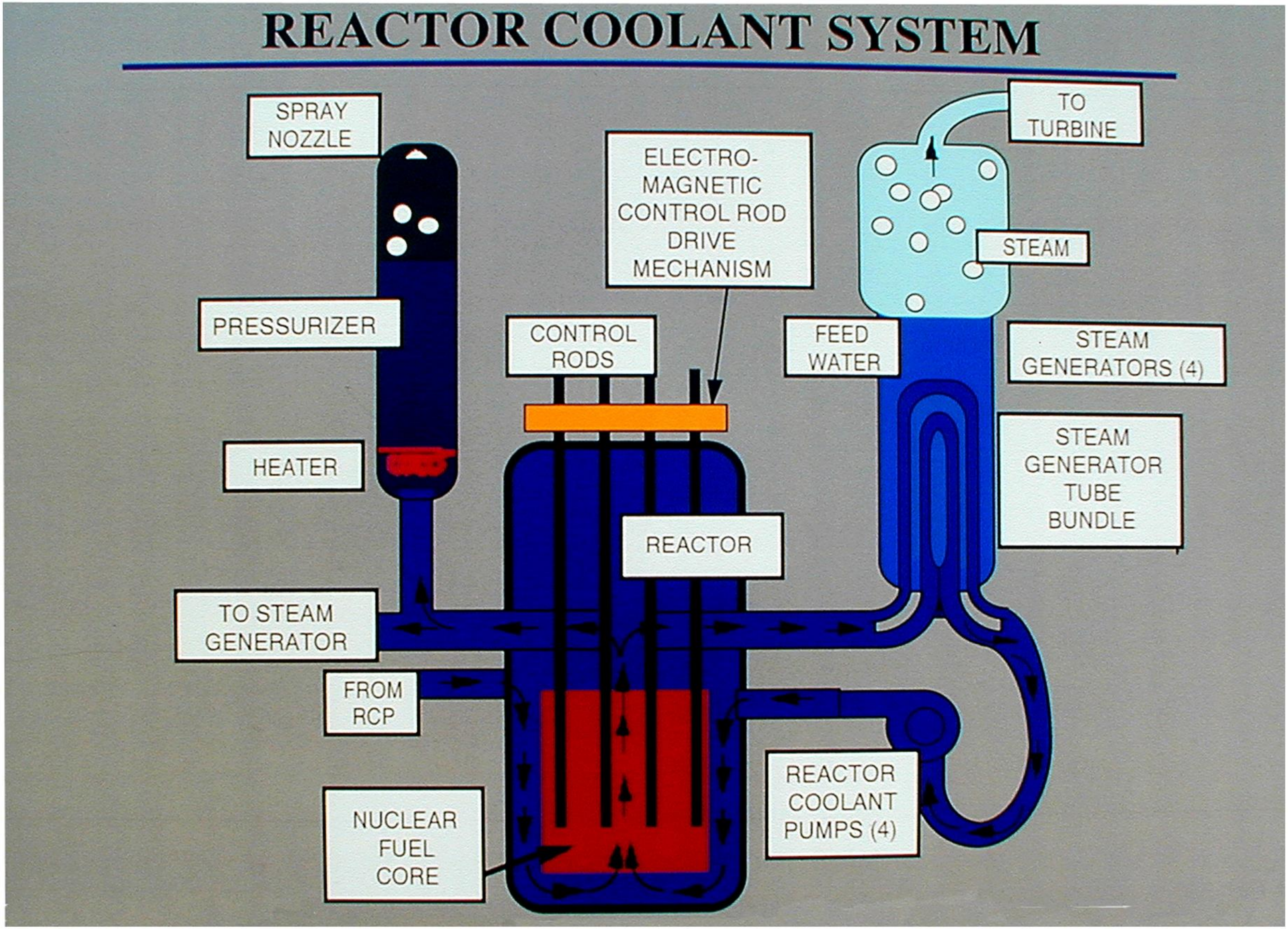


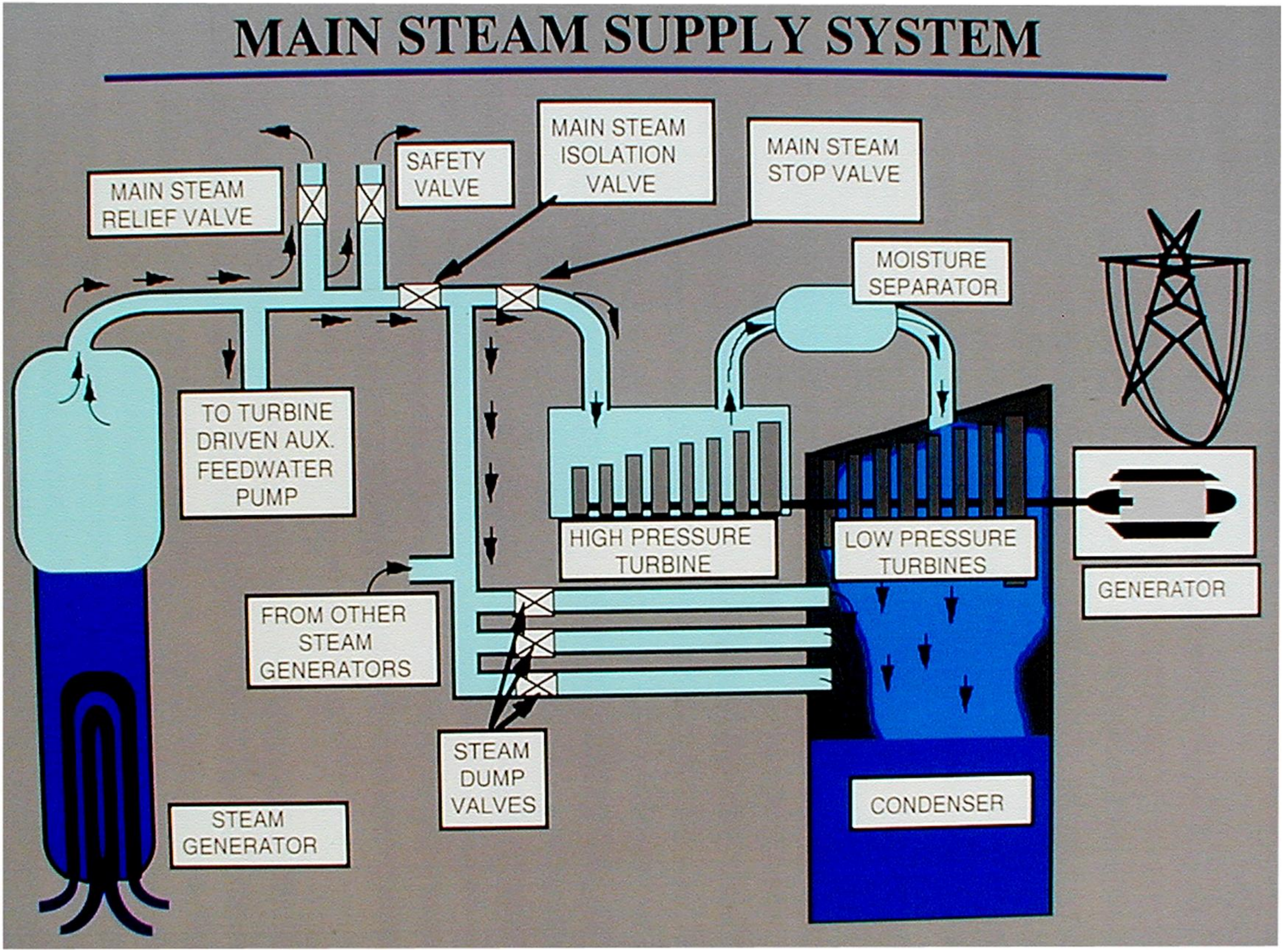
Comanche Peak Nuclear Power Plant

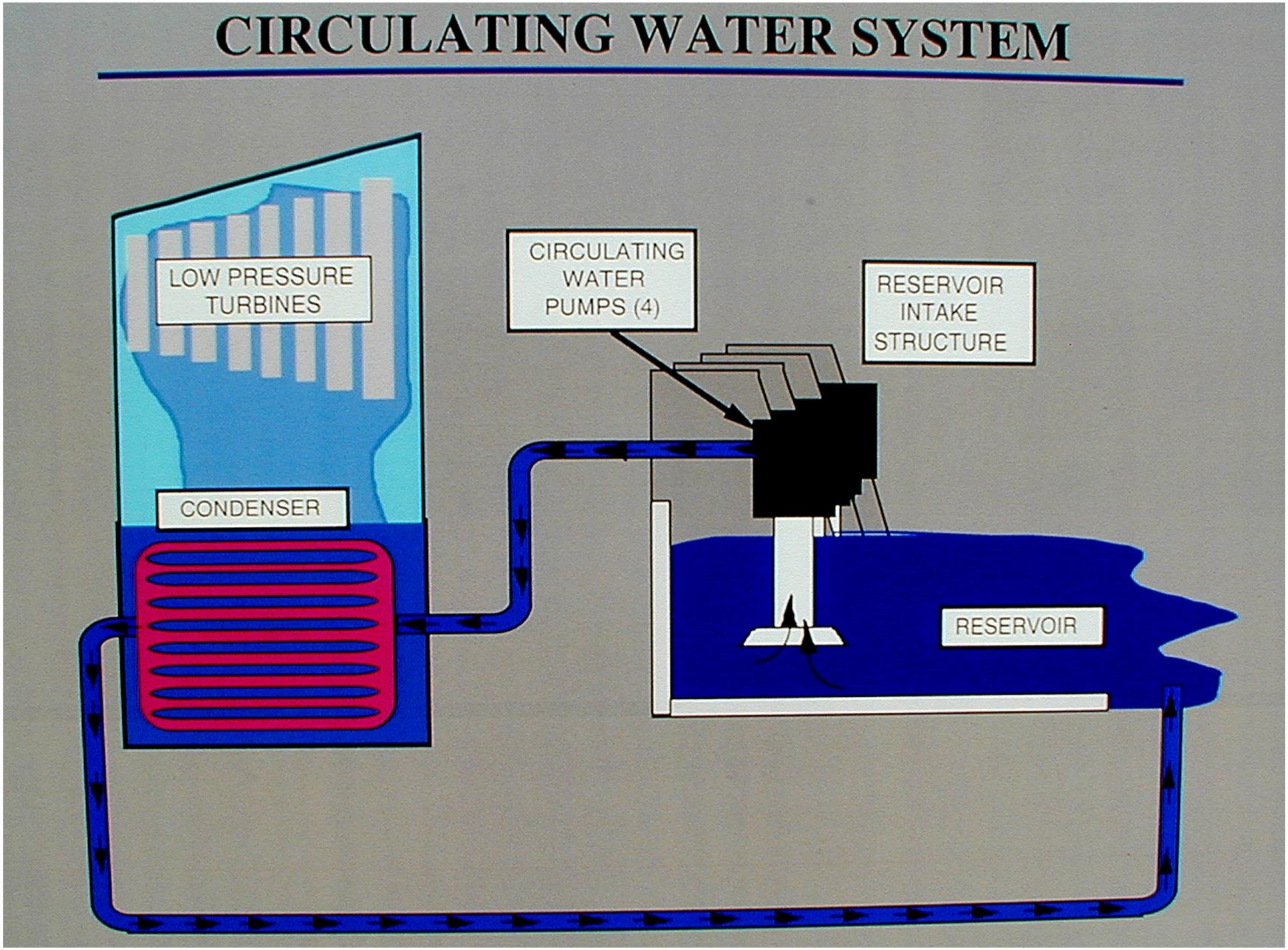


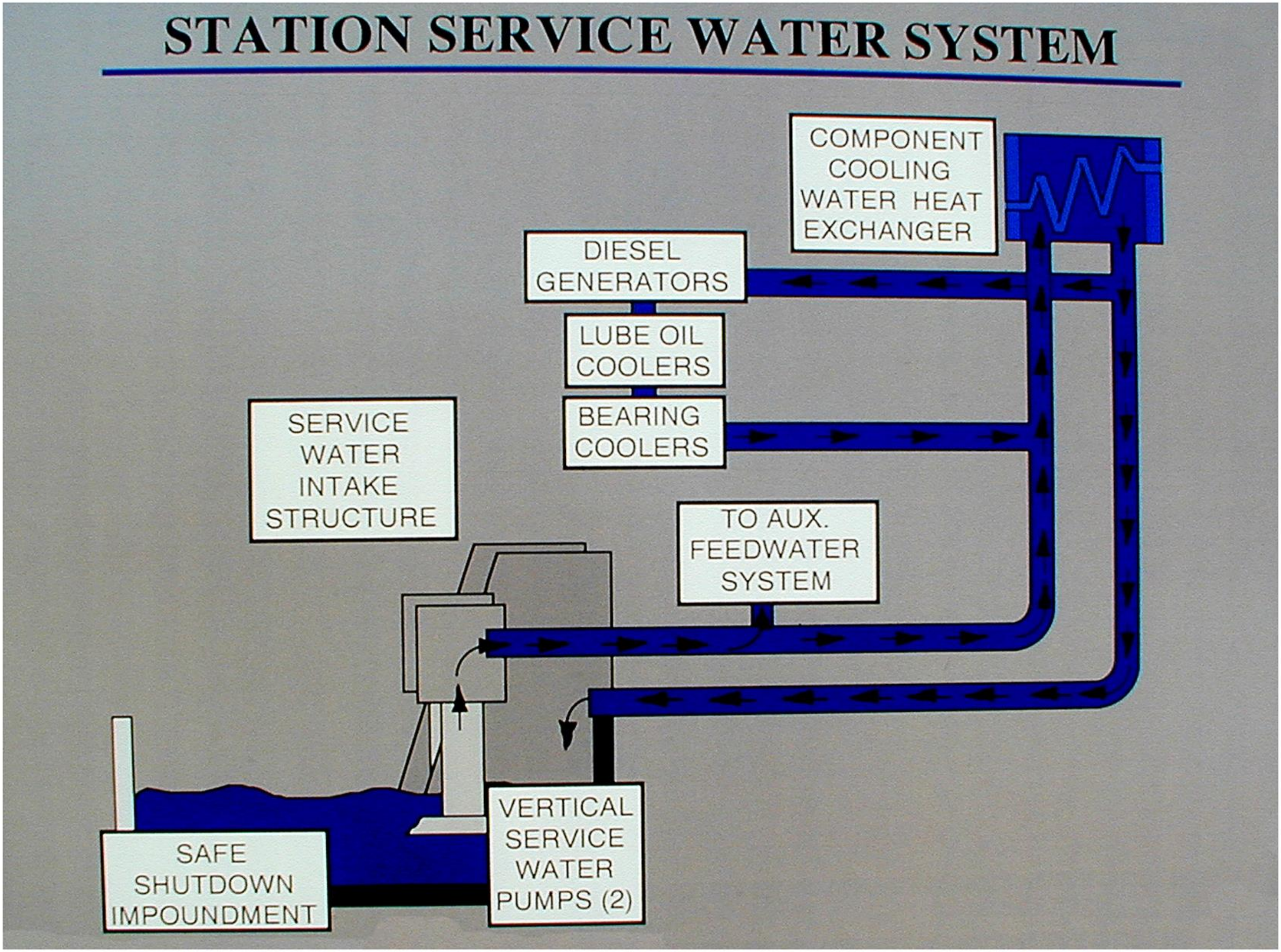
POWER BLOCK

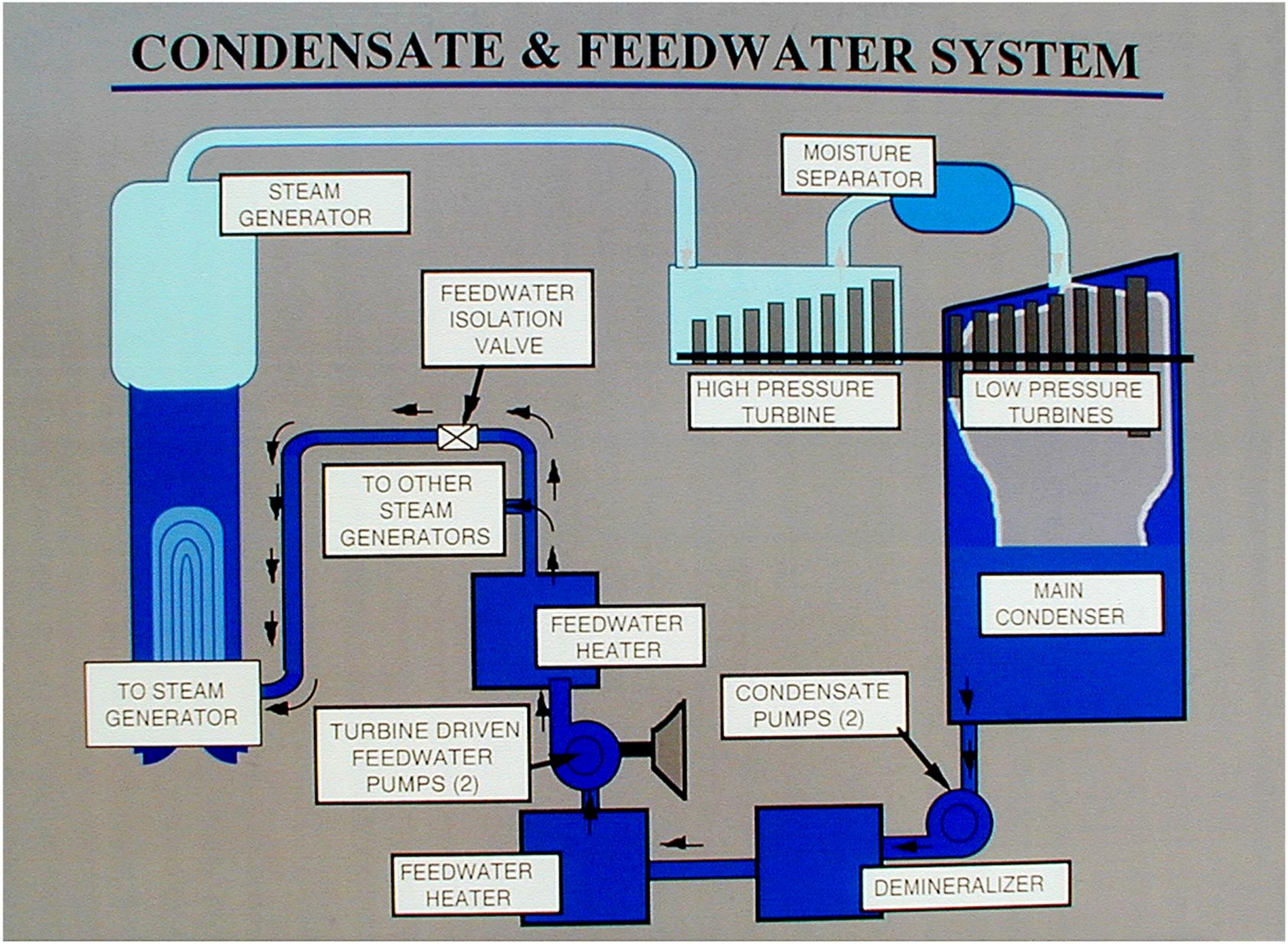

REFUELING WATER STORAGE TANK
REACTOR CONTAINMENT BUILDING UNIT 2
FUEL BUILDING
REACTOR CONTAINMENT BUILDING UNIT 1
REFUELING WATER STORAGE TANK
AUXILIARY BUILDING
SAFEGUARD BUILDING UNIT 2
SAFEGUARD BUILDING UNIT 1
CONDENSATE WATER STORAGE TANK
ELECTRICAL & CONTROL BUILDING
CONDENSATE WATER STORAGE TANK
TURBINE BUILDING UNIT 2
TURBINE BUILDING UNIT 1

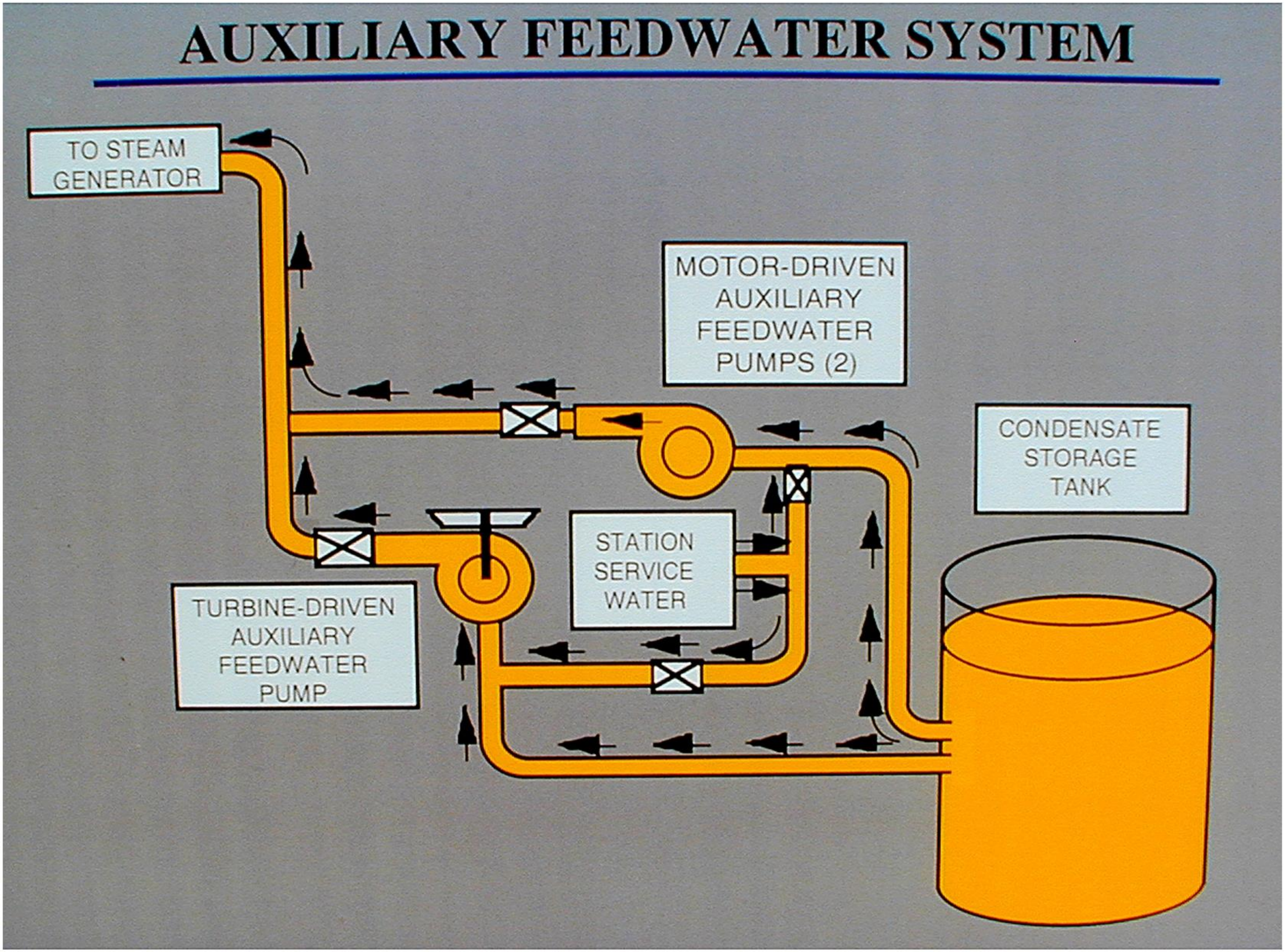

REACTOR COOLANT SYSTEM
SPRAY NOZZLE
ELECTRO-MAGNETIC CONTROL ROD DRIVE MECHANISM
TO TURBINE
STEAM
PRESSURIZER
CONTROL RODS
FEED WATER
STEAM GENERATORS (4)
HEATER
STEAM GENERATOR TUBE BUNDLE
REACTOR
TO STEAM GENERATOR
FROM RCP
REACTOR COOLANT PUMPS (4)
NUCLEAR FUEL CORE

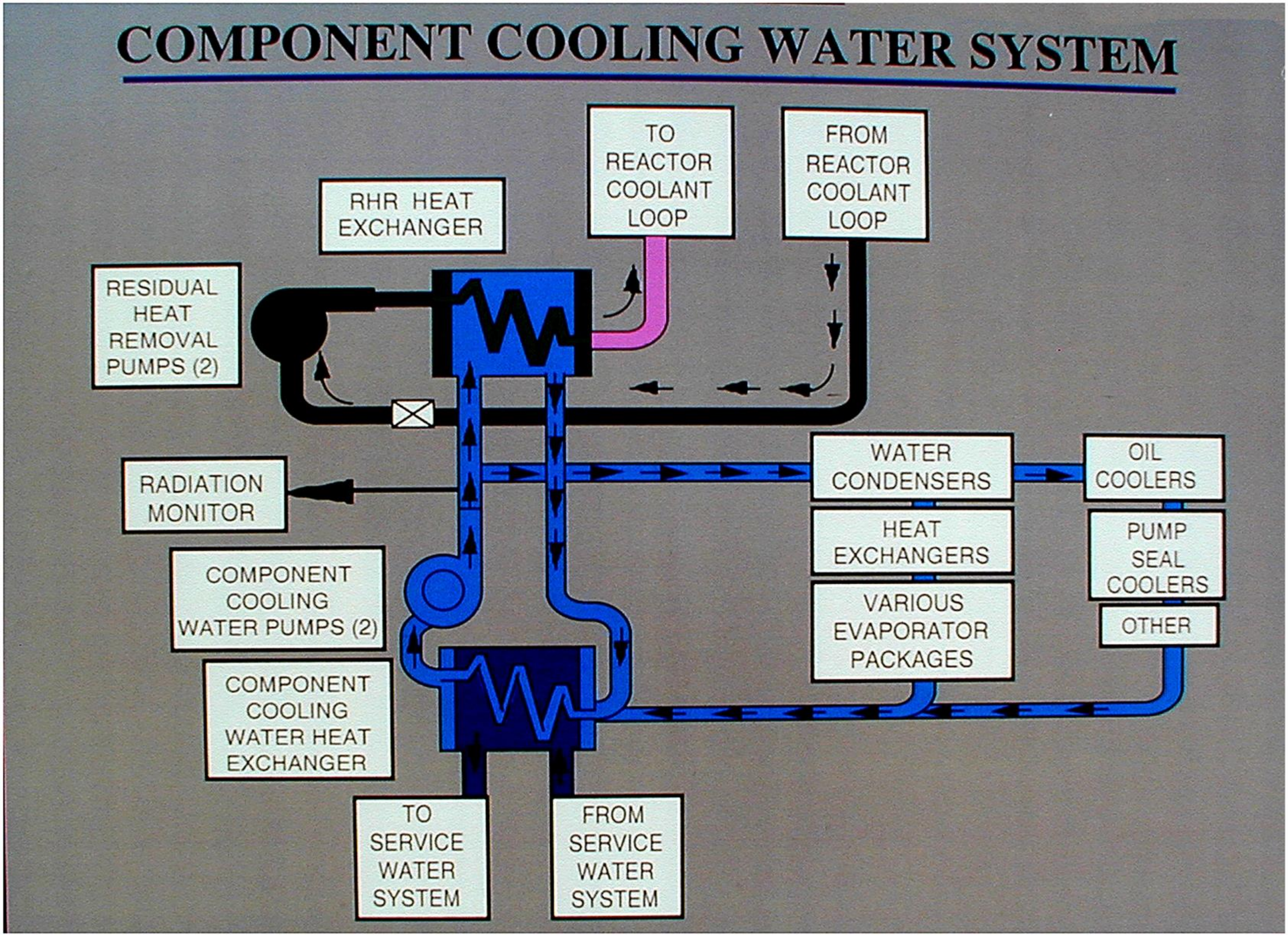

MAIN STEAM SUPPLY SYSTEM
MAIN STEAM RELIEF VALVE
SAFETY VALVE
MAIN STEAM ISOLATION VALVE
MAIN STEAM STOP VALVE
MOISTURE SEPARATOR
TO TURBINE DRIVEN AUX. FEEDWATER PUMP
HIGH PRESSURE TURBINE
LOW PRESSURE TURBINES
GENERATOR
FROM OTHER STEAM GENERATORS
STEAM DUMP VALVES
CONDENSER
STEAM GENERATOR


CIRCULATING WATER SYSTEM
LOW PRESSURE TURBINES
CIRCULATING WATER PUMPS (4)
RESERVOIR INTAKE STRUCTURE
CONDENSER
RESERVOIR

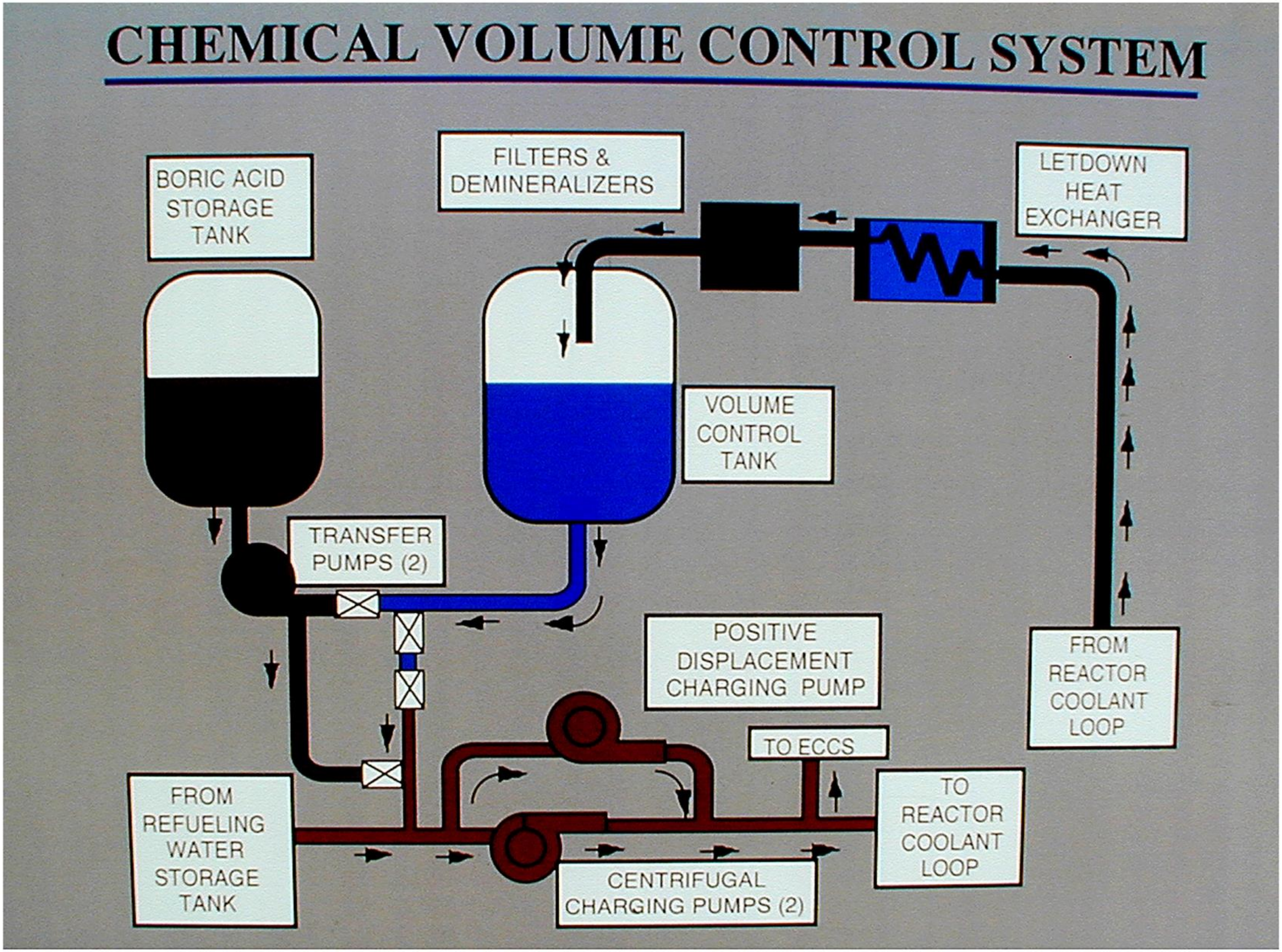

STATION SERVICE WATER SYSTEM
COMPONENT COOLING WATER HEAT EXCHANGER
DIESEL GENERATORS
LUBE OIL COOLERS
BEARING COOLERS
SERVICE WATER INTAKE STRUCTURE
TO AUX. FEEDWATER SYSTEM
VERTICAL SERVICE WATER PUMPS (2)
SAFE SHUTDOWN IMPOUNDMENT

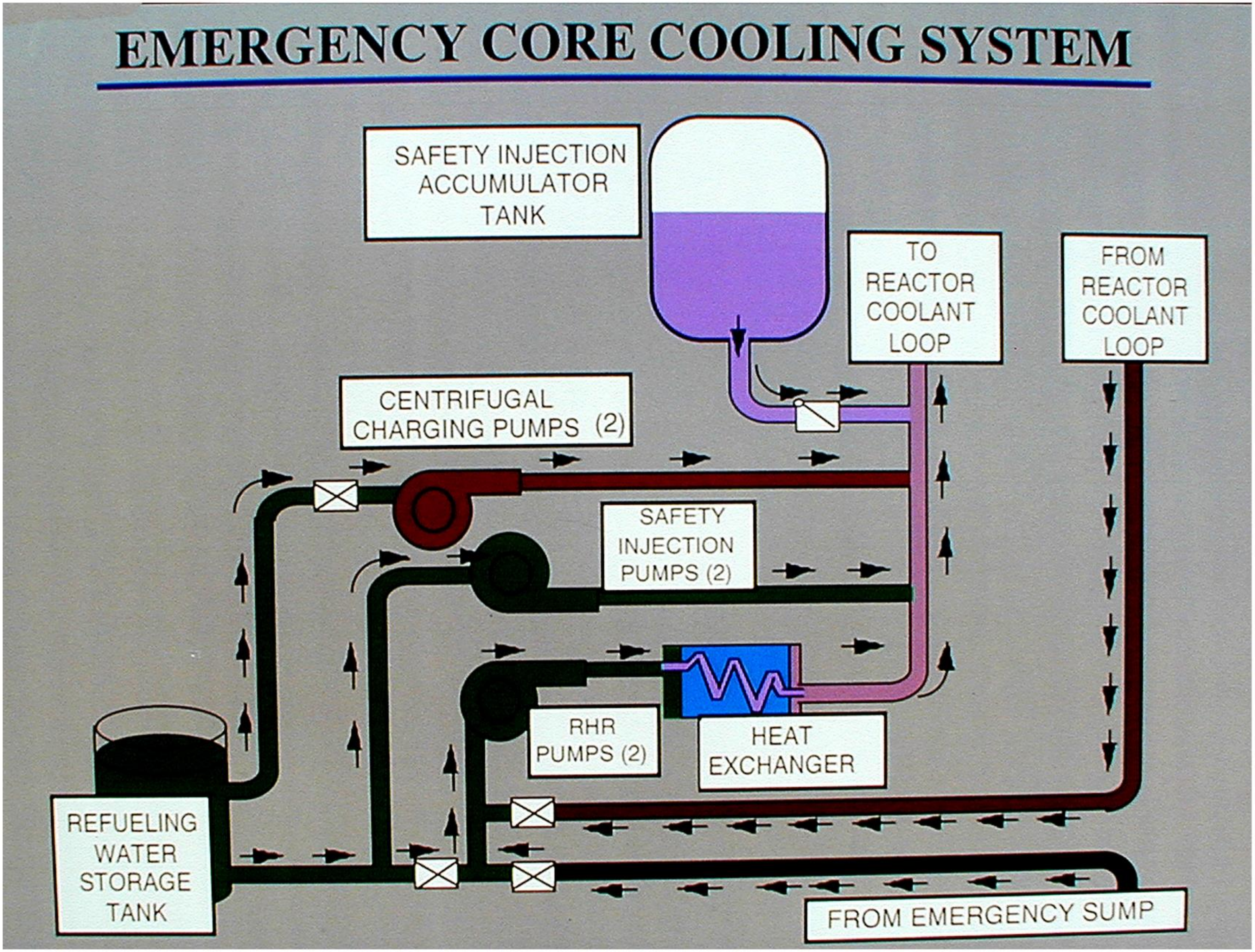

CONDENSATE & FEEDWATER SYSTEM
STEAM GENERATOR
MOISTURE SEPARATOR
FEEDWATER ISOLATION VALVE
HIGH PRESSURE TURBINE
LOW PRESSURE TURBINES
TO OTHER STEAM GENERATORS
MAIN CONDENSER
FEEDWATER HEATER
TO STEAM GENERATOR
CONDENSATE PUMPS (2)
TURBINE DRIVEN FEEDWATER PUMPS (2)
FEEDWATER HEATER
DEMINERALIZER

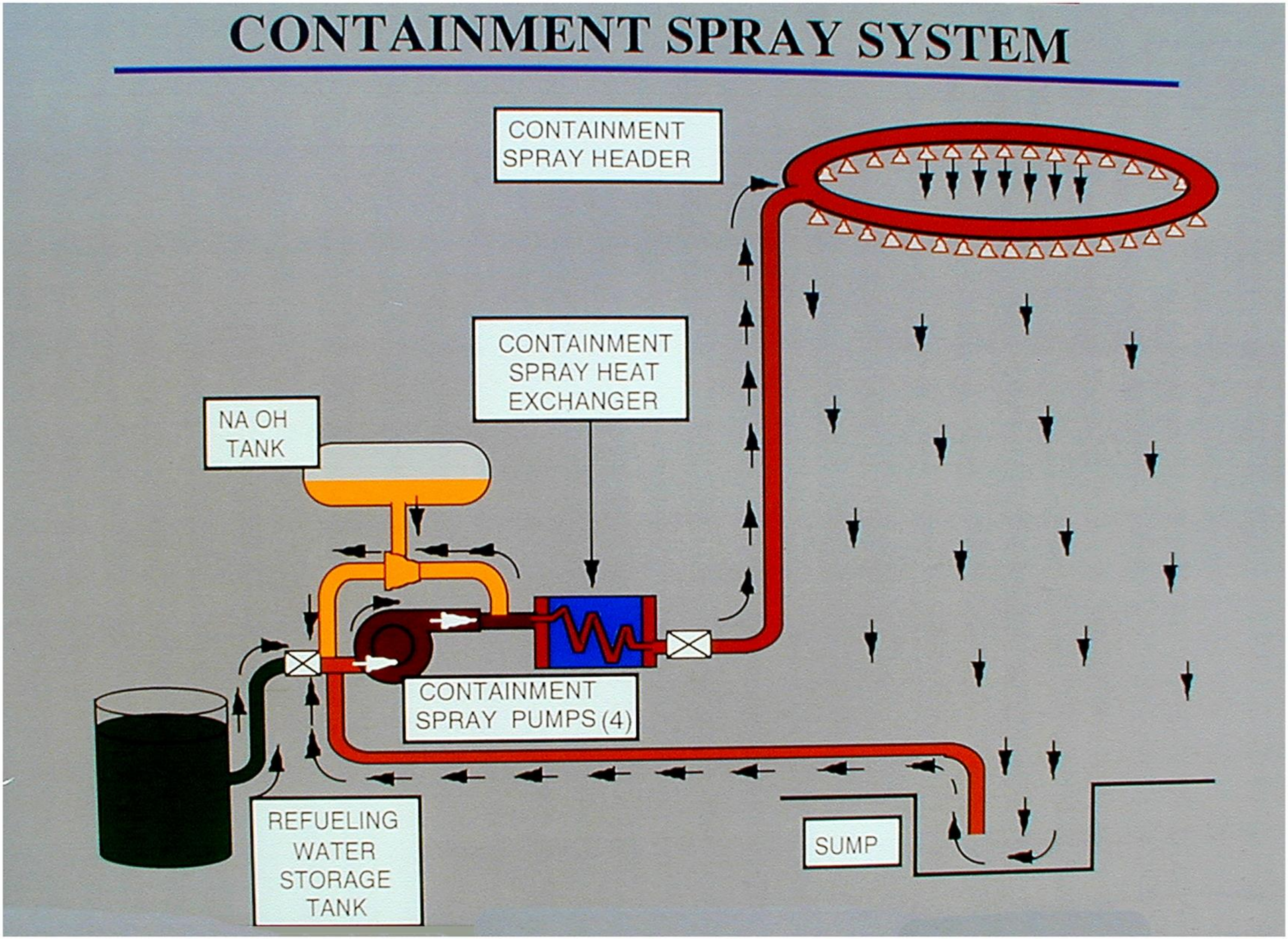

AUXILIARY FEEDWATER SYSTEM
TO STEAM GENERATOR
MOTOR-DRIVEN AUXILIARY FEEDWATER PUMPS (2)
CONDENSATE STORAGE TANK
STATION SERVICE WATER
TURBINE-DRIVEN AUXILIARY FEEDWATER PUMP

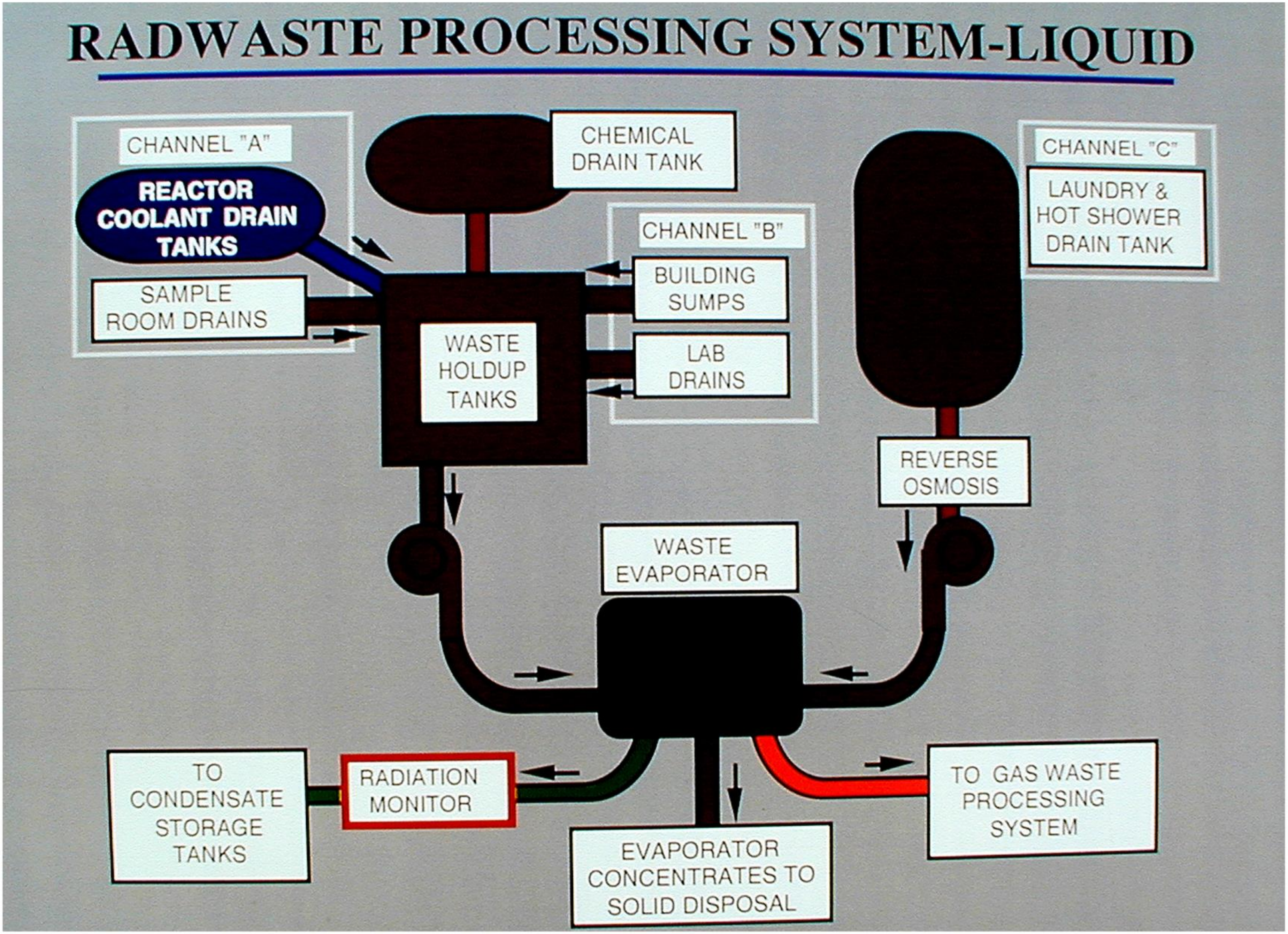


COMPONENT COOLING WATER SYSTEM
TO REACTOR COOLANT LOOP
FROM REACTOR COOLANT LOOP
RHR HEAT EXCHANGER
RESIDUAL HEAT REMOVAL PUMPS (2)
WATER CONDENSERS
OIL COOLERS
RADIATION MONITOR
HEAT EXCHANGERS
PUMP SEAL COOLERS
COMPONENT COOLING WATER PUMPS (2)
VARIOUS EVAPORATOR PACKAGES
OTHER
COMPONENT COOLING WATER HEAT EXCHANGER
TO SERVICE WATER SYSTEM
FROM SERVICE WATER SYSTEM

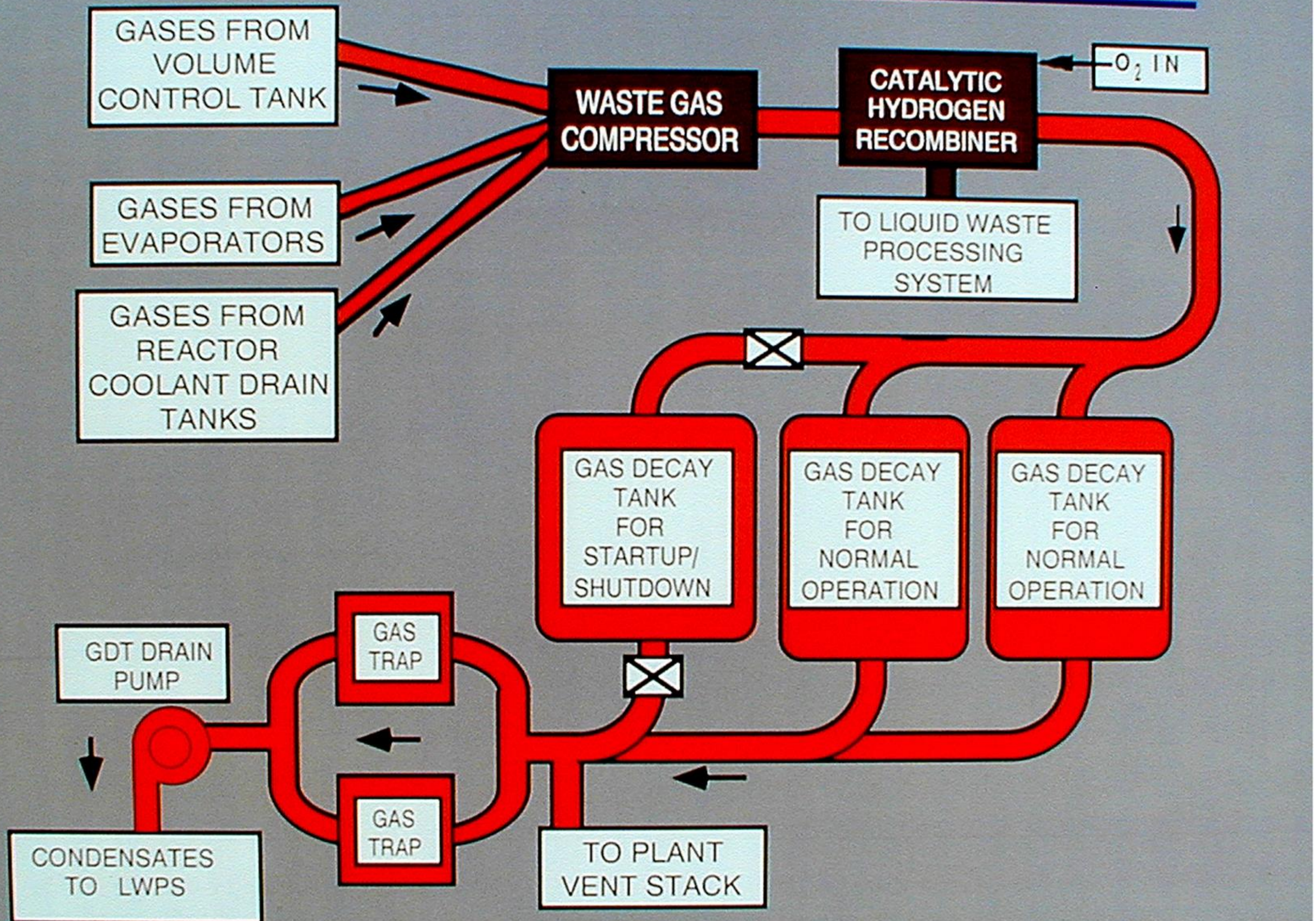

CHEMICAL VOLUME CONTROL SYSTEM
BORIC ACID STORAGE TANK
FILTERS & DEMINERALIZERS
LETDOWN HEAT EXCHANGER
VOLUME CONTROL TANK
TRANSFER PUMPS (2)
POSITIVE DISPLACEMENT CHARGING PUMP
FROM REACTOR COOLANT LOOP
TO ECCS
FROM REFUELING WATER STORAGE TANK
TO REACTOR COOLANT LOOP
CENTRIFUGAL CHARGING PUMPS (2)

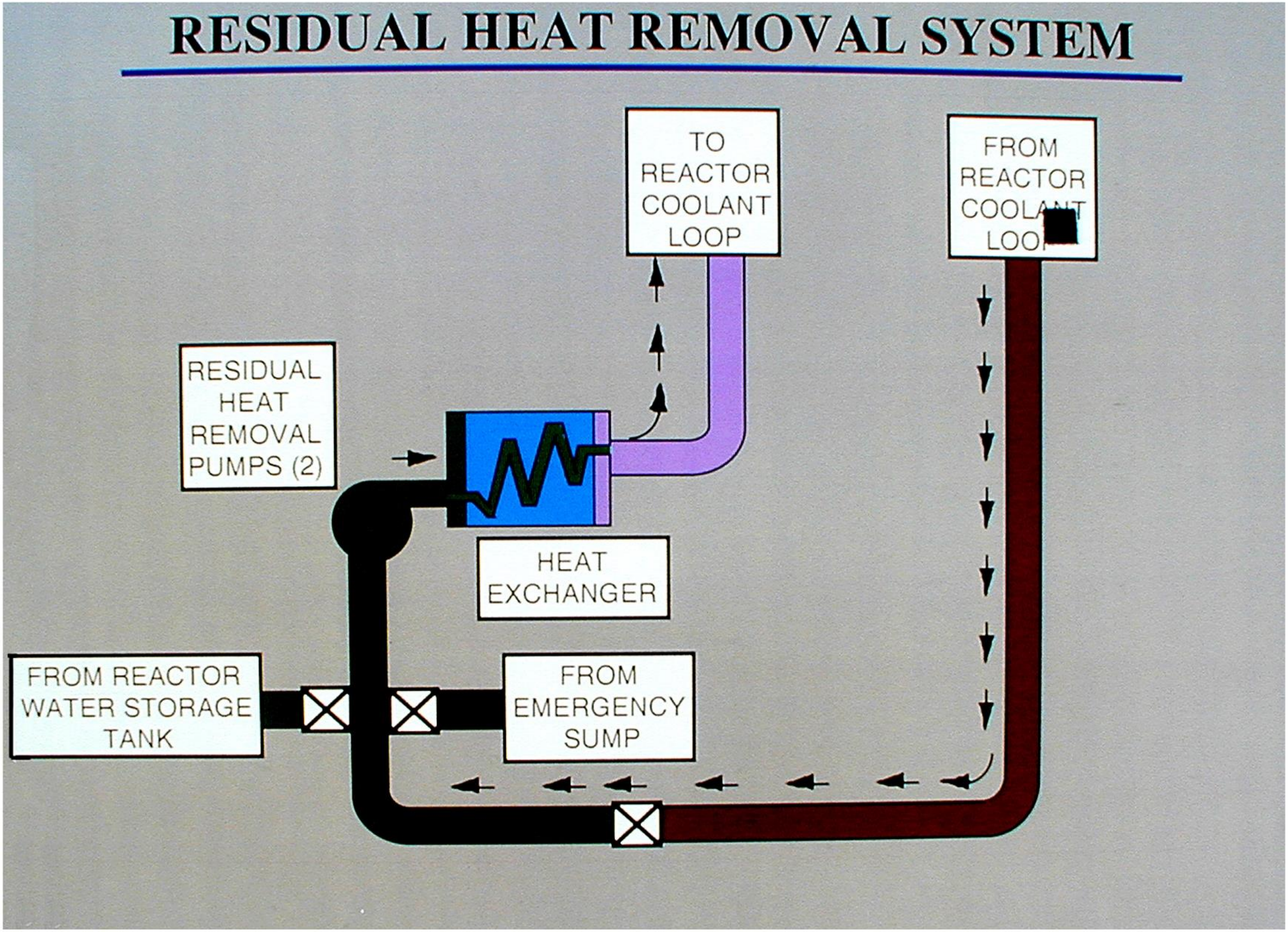

EMERGENCY CORE COOLING SYSTEM
SAFETY INJECTION ACCUMULATOR TANK
TO REACTOR COOLANT LOOP
FROM REACTOR COOLANT LOOP
CENTRIFUGAL CHARGING PUMPS (2)
SAFETY INJECTION PUMPS (2)
RHR PUMPS (2)
HEAT EXCHANGER
REFUELING WATER STORAGE TANK
FROM EMERGENCY SUMP

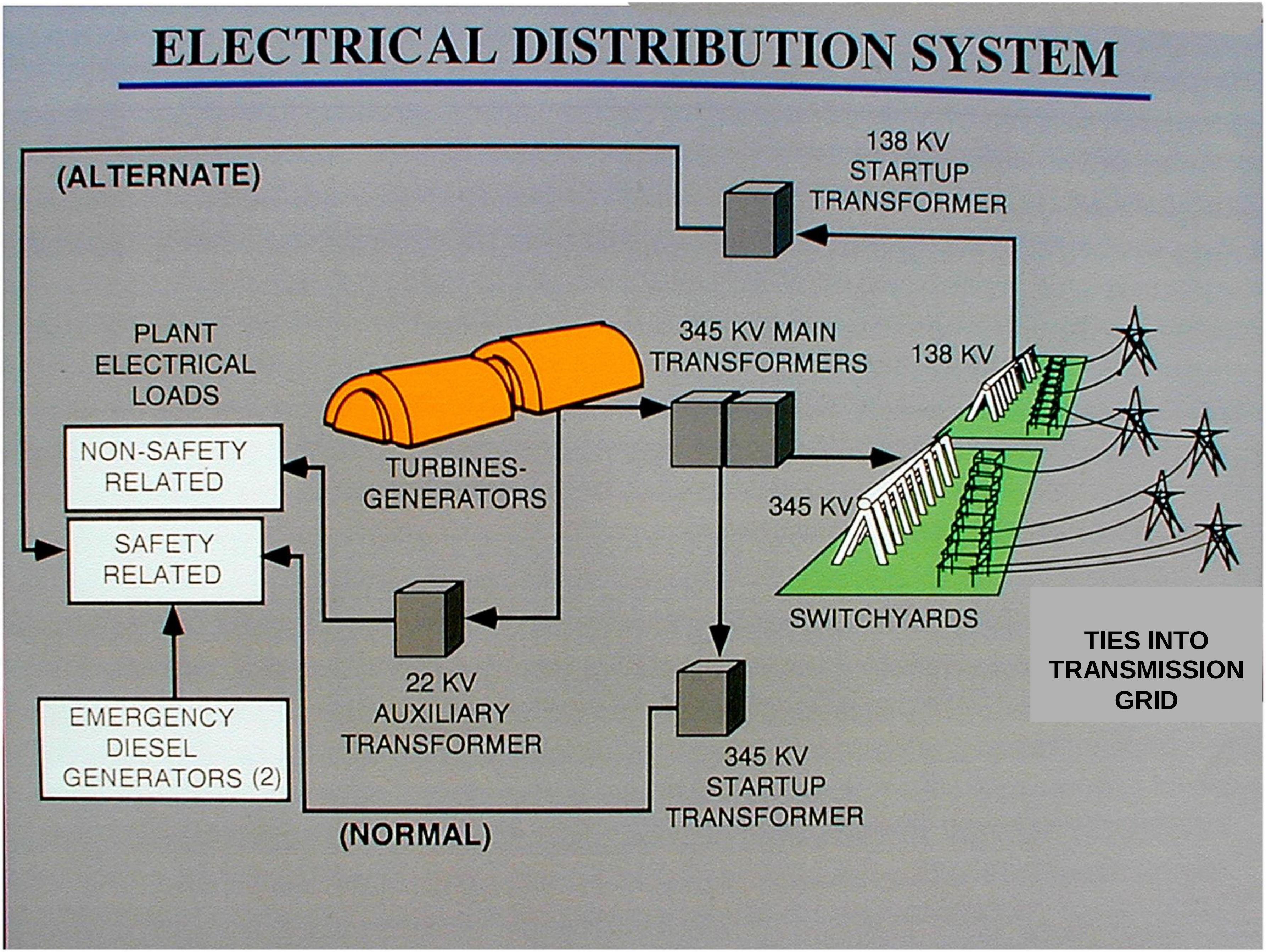

CONTAINMENT SPRAY SYSTEM
CONTAINMENT SPRAY HEADER
CONTAINMENT SPRAY HEAT EXCHANGER
NA OH TANK
CONTAINMENT SPRAY PUMPS (4)
REFUELING WATER STORAGE TANK
SUMP


RADWASTE PROCESSING SYSTEM-LIQUID
CHANNEL "A"
REACTOR COOLANT DRAIN TANKS
SAMPLE ROOM DRAINS
CHEMICAL DRAIN TANK
CHANNEL "B"
BUILDING SUMPS
LAB DRAINS
WASTE HOLDUP TANKS
CHANNEL "C"
LAUNDRY & HOT SHOWER DRAIN TANK
REVERSE OSMOSIS
WASTE EVAPORATOR
TO CONDENSATE STORAGE TANKS
RADIATION MONITOR
EVAPORATOR CONCENTRATES TO SOLID DISPOSAL
TO GAS WASTE PROCESSING SYSTEM

RADWASTE PROCESSING SYSTEM-GASEOUS




RESIDUAL HEAT REMOVAL SYSTEM
TO REACTOR COOLANT LOOP
FROM REACTOR COOLA[redacted]
LOO
RESIDUAL HEAT REMOVAL PUMPS (2)
HEAT EXCHANGER
FROM REACTOR WATER STORAGE TANK
FROM EMERGENCY SUMP


ELECTRICAL DISTRIBUTION SYSTEM
(ALTERNATE)
138 KV
STARTUP
TRANSFORMER
PLANT
ELECTRICAL
LOADS
345 KV MAIN
TRANSFORMERS
138 KV
NON-SAFETY
RELATED
TURBINES-
GENERATORS
345 KV
SAFETY
RELATED
SWITCHYARDS
TIES INTO
TRANSMISSION
GRID
22 KV
AUXILIARY
TRANSFORMER
EMERGENCY
DIESEL
GENERATORS (2)
345 KV
STARTUP
TRANSFORMER
(NORMAL)

CPNPP Plant Design
4 loop Westinghouse PWR