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EXECUTIVE VICE PRESIDENT
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October 8, 1980

Mr. Harold R. Denton
Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
FIRE PROTECTION SYSTEM

Dear Mr. Denton:

The original Fire Hazards Analysis for Comanche Peak Steam Electric Station was written in July, 1977. From July, 1977 to the present, significant changes have occurred in the NRC's interpretation and enforcement of Fire Protection Programs. For this reason, there are numerous design changes being made to the CPSES Fire Protection Program which will be incorporated into a revised Fire Hazard Analysis.

Attached is a presentation of the assumptions, methodology and a tabulation of BTP 9.5-1, Appendix A compliances that are currently being used to establish the Fire Protection Program at CPSES. Upon completion of the revised Fire Hazards Analysis, the CPSES FSAR will be amended to reflect an updated Fire Hazards Analysis and design changes in the Fire Protection System.

We are submitting this letter prior to the issuance of the amended FSAR section for your early review to facilitate our current Safety Evaluation Report (SER) schedule and to request an early Site Fire Protection Review. We would be pleased to discuss a schedule for the Site Fire Protection Review at your earliest convenience.

Should you have any questions concerning the contents of this letter, please do not hesitate to contact this office.

Sincerely,

R. J. Gary

R. J. Gary

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Attachment

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COMANCHE PEAK STEAM ELECTRIC STATION

FIRE PROTECTION SYSTEM
FSAR SECTION 9.5

A. Assumptions:

1. The total heat of combustion for each fire area is determined assuming all combustibles in the fire area are consumed by a fire. In addition, an appropriate amount of transient combustibles are considered for each fire area. The transient combustible loading is added to the installed combustible loading to form the total combustible loading.

2. The minimum fire barrier rating is three hours except for the barriers enclosing the stairwells and elevator shafts, which are rated at two hours, and the cable tray fire barriers which are rated either 1/2 hour or 1 hour.

3. When it is determined that a fire involving a safety train or system will not affect its redundant counterpart, the redundant system is assumed to operate without failures.

4. The amount of cable insulation and jacket material in a cable tray is calculated assuming the tray is filled with the type of cable that contains the most insulation for its cross sectional area. In general, trays containing power cables have approximately 30 percent fill by cross sectional area, and trays containing instrument and control cables have approximately 40 percent fill by cross sectional area. For conservatism, the Fire Hazards Analysis will consider trays containing power cables to be filled to 40 percent of the trays cross sectional area, and instrument and control trays to be filled to 50 percent of

the cross sectional area of the trays.

5. Transient combustibles such as cleaning fluids, lubricating or fuel oil, or paint are considered in each fire area of the plant. The volume of transient flammable liquid that is considered in each fire area is two gallons. In those areas of the Auxiliary Building and Safeguards Building that are specifically designated as access routes for larger quantities of combustibles, the transient fire hazard is 55 gallons of flammable liquid.

B. Methodology:

In order to evaluate potential fire hazards, provide adequate fire protection, ensure isolation of safety related systems from these hazards, and prevent the release of radioactive material to the environment, the following method of analysis has been formulated and implemented for the entire plant.

1. The buildings and the areas within each building are divided into separate fire areas using existing plant walls and floors as barriers. At this stage, maximum consideration is given to the isolation and separation of redundant safety related components from each other, from other safety related and non-safety related components and from major concentrations of combustible materials. Considerations are also given to other area characteristics such as electrical cable routing into and through the area, the ductwork supplying and exhausting the area, access and egress routes for the area, and vent area for depressurization during a tornado.

2. The type and amount of installed combustibles and transient combustibles are determined for each area of the plant.

The heat release that these types of combustibles would produce is then calculated. This becomes the total combustible loading for this area.

The heat release value determined for each area is then evaluated with and compared to the heat release of the adjacent areas to determine if a major potential fire hazard exists. If so, the fire area configuration is reestablished. The above procedure is repeated and the heat release is reevaluated to determine acceptable fire areas.

The safety related equipment in each area is also tabulated at this stage. All efforts are made to isolate equipment and cabling essential for plant shutdown from its redundant counterpart by fire barriers.

When an acceptable heat-release fire area configuration is established that satisfies the above considerations, the fire areas are tabulated according to building, elevation, safety classification and architectural room numbers (as shown on figures FHA-44 through FHA-48).

3. Once the fire area and combustible material information is tabulated, the fire protection (extinguishing) systems and the fire detection equipment are located throughout the plant based on the severity and configuration of the fire hazards, the calculated heat release of each fire area, the plant equipment and components located in the fire area and the accessibility of the area based on potential radiation exposure.

4. Fire detectors are located in all areas of the plant where there is a significant combustible loading. In addition,

fire detectors are located in all areas containing equipment required for safety shutdown and in all areas where fire could cause a significant release of radioactive materials.

5. Hose stations and portable extinguishers are installed in all safety related buildings of the plant, such that an effective hose stream can reach any location in a safety related building.

6. Fixed automatic water suppression systems will generally be installed in safety related plant areas where any of the following conditions exist:

   a. A high fire hazard exists

   b. Redundant safe shutdown equipment or cabling is located in the same fire area and is separated by less than 20 feet.

   c. There is a congestion of cabling.

   In areas where situation (a) and in some areas where situation (b) described above exists, the type of protection that will be provided will be a sprinkler system providing floor area coverage. The water spray design density will be based on the following table:

Heat Release BTU per Square Foot	Minimum Design Density Gallon per Minute per Square Foot
8,000 to 80,000	0.10
80,001 to 120,000	0.15
120,001 to 160,000	0.20
160,001 to 200,000	0.25
200,001 to 240,000	0.30
240,001 to 320,000	0.40

This table is based on BTU values for Class A materials, and is used as minimum density requirements for areas containing Class C materials. The table is taken from copper life safety fire sprinkler system handbook and values recommended by NFPA. Increased densities are used for high heat release materials.

Where the situation described in (c) and in some areas where the situation described in (b) exists, automatic sprinklers will be arranged to provide water spray directly on the cable trays. The design density of the water spray systems will be 0.15 gpm per square foot of cable tray in accordance with NFPA requirements.

7. Where redundant safe shutdown equipment cabling is located in the same fire area and is separated by less than 20 feet, one train of this cabling will be wrapped with a one hour fire barrier, or both trains will be wrapped with a 1/2 hour fire barrier.

8. The Cable Spreading Room contains more than one safety train equipment. The following fire protection systems will therefore be provided:

   a. Hose stations for manual fire fighting

   b. Fixed halon primary suppression system

   c. Ceiling mounted backup wet pipe sprinkler system with a design density of 0.30 gpm per square foot of floor area.

   d. An alternate shutdown system with cabling independant of the cable spreading room.

9. The plant will be capable of being safely shutdown in the event any of the design basis fires postulated in the Fire Hazards Analysis occurs. Alternate shutdown systems and procedures will be developed using shutdown paths available to the operator which are either free from fire damage or otherwise controllable in spite of such fire damages.

C. CPSES compliance with Branch Technical Position APCSB 9.5-1 Appendix A of Standard Review Plan 9.5-1.

CPSES FSAR Section 9.5.1.6.1 accurately reflects CPSES compliance with BTP APCSB 9.5-1 Appendix A with the following exceptions:

Section D.1(2)A: Separation of Redundant Safety Related System

The CPSES design provides adequate protection and/or suppression for redundant systems which are not isolated from each other and are essential to protect the safety of the plant and public.

Section D.1(i): Floor Drains

Fixed suppression systems will be installed in the switchgear rooms because of high cable density. Due to the small number of sprinkler heads, the water flow is expected to be minimal. No floor drains are installed in the area; nearby equipment will be protected for the effects of water spray.

Section D.2(a): Control of Combustibles

The Westinghouse Reactor Coolant Pump Oil Collection System will be installed to provide fire protection for safety related components in the area of the Reactor Coolant Pump Lube Oil System. This system is designed to collect any oil spilled from an oil line break, allowing it to drain to a remote tank and thus removing the combustibles from the potential ignition source.

All other safety related areas which contain large amounts of combustibles are isolated by 3 hour fire barriers.

Section D.3(b): Fire Protection for Cable Spreading Rooms

See F.3.

Section D.3(c): Fire Protection for Cable Trays Outside of Cable Spreading Rooms.

Automatic water spray protection is being provided in areas where; (1) exposed redundant essential

cables are within 20 feet of each other, or, (2) where high cable densities exist. Where Reg. Guide 1.75 spacing is not met, fire retardant coatings will be provided, however, automatic sprinklers will not be provided unless it meets one of the above requirements.

Section D.3(j): Cable in Control Room

A small amount of cabling has been routed in conduit in the false ceiling of the control room.

Section D.5(a): Fixed Emergency Lighting

8 hour battery packs will be provided in areas where they are needed to achieve a safe plant shutdown.

Section D.5(c): Fixed Emergency Communications

Voice powered phones will be provided in areas where they are needed to achieve a safe plant shutdown.

Section E.2(d): Fire Protection Water Supply System

The existing fire protection system inside Containment has only one supply (Demineralized Water). Standard fire protection hose stations in accordance with NFPA 14 will be added with supply as described in E.2.f.

Section E.3(c): Compliance with NFPA-13 and 15

Where applicable, sprinkler systems will comply with NFPA-13 and 15. Sprinkler systems added to provide suppression for transient fires will meet the intent of NFPA.

Section E.3(d): Interior Hose Stations (NFPA-14)

1 1/2" hose stations are not currently provided inside Containment, however, standard 1 1/2" fire protection hose stations will be added.

Additional hose stations will be added to provide coverage for other plant areas.

Section F.1(a): Guidelines for Specific Plant Areas

The Westinghouse Oil Collection System will be provided.

Section F.2. : Control Room

A minimal number of cables have been routed in conduits in concealed ceiling space. No fixed automatic fire suppression equipment has been provided.

Section F.3. : Cable Spreading Room

F.3.a.2 Two wet pipe hose stations and portable extinguishers are provided in each cable spreading room.

F.3.b.3 A fixed, automatically actuated halon systems is provided for each cable spreading area. A fixed ceiling mounted sprinkler system will be added as a backup for the halon system.

Section F.5. : Switchgear Rooms

Automatic sprinkler protection is being added in areas of high cable density in switchgear rooms.

Section F.11. : Safety Related Pumps

Automatic sprinklers will be provided for redundant safety related pumps which are required for safe shutdown and which are not located in separate 3 hour fire areas.

Section F.13. : Spent Fuel Pool Area

Hose stations will be added to provide required coverage.