

**SUPPLY SYSTEM
NUCLEAR PROJECT
NO. 1**

**FIRE
PROTECTION SYSTEM
REVIEW**

APCSB 9.5—1

**WASHINGTON PUBLIC POWER
SUPPLY SYSTEM**

8205180309

Amendment 3
May 1982

WNP-1
FPSR

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May 1982

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A. INTRODUCTION

On April 6, 1977, the "Fire Protection Evaluation" for WNP-1/4 was submitted to the NRC for review. Amendments 1 and 2 to the evaluation were submitted on February 27, 1979 and June 12, 1980 respectively. On January 22, 1982, the Supply System's Board of Directors voted to terminate WNP-4. Therefore, in this amendment references to WNP-4 have been deleted.

On November 19, 1980, the NRC issued Appendix R to 10CFR50, effective February 17, 1981, amending its regulations to require certain provisions for fire protection at operating nuclear power plants. This rule applies to all nuclear power plants licensed to operate prior to January 1, 1979. It was supplemented by the NRC generic letter 81-12 (2/20/81) requesting additional information required by the Staff in order to complete the Appendix R review thoroughly and expeditiously. Appendix R was extended to include WNP-1 by letter from Mr. R. L. Tedesco, NRC, to Mr. R. L. Ferguson, Supply System, received January 16, 1982.

This review required not only a more comprehensive evaluation of safety systems, including those structures, systems and components important to safe shutdown, but also a reevaluation of the fire protection program, fire hazards analysis, and fire protection features at the plant. Therefore, the previous comparison to BTP-9.5-1, Appendix A has been updated to incorporate 10CFR50 Appendix-R requirements and to incorporate design changes since the submittal of Amendment 2 to the "Fire Protection Evaluation" for WNP-1.

The format for the Fire Protection System Review (FPSR) follows the outline of SRP 9.5-1, Rev. 3. All topics are included for ease in future comparison to SRP 9.5-1, Rev. 3. Comparison has not been made in this submittal in order to allow for appropriate analysis of all parts of SRP 9.5-1, Rev. 3. This comparison will be made in the next submittal of the FPSR when the in-depth circuit analysis is made for WNP-1.

In order to conduct the aforementioned review, a multi-disciplined task force was formed. The task force encompassed A/E (United Engineers & Constructors Inc.) design personnel, operations personnel and qualified fire protection consultants. Design and operations personnel identified the structures, systems and components important to safety and performed the Failure Modes and Effects Analysis (FMEA) based on the Appendix R criteria. The fire protection consultant, Professional Loss Control, Inc., performed the fire hazards analysis for each fire area and compared the overall fire protection program to the appropriate regulatory positions. The resumes for the key individuals involved in the development and review of the completed FPSR are included at the end of this section.

Section C.5.b identifies the systems and functions important to safe shutdown. It also describes the methodology utilized in determining equipment. This list provided input for the Fire Hazards Analysis in Section D. The methodology utilized in the Fire Hazards Analysis is described in Section C.1.b.

Section C outlines the plant fire protection program and addresses plant fire protection features covered in the NRC guidelines. Each subsection is correlated to the appropriate section of both 10CFR50, Appendix R and BTP-9.5-1, Appendix-A in Section E.

The Fire Protection System Review (FPSR) is a comprehensive documentation of the Fire Protection Program and Fire Hazards Analysis for WNP-1. It is a ready reference for fire protection objectives and criteria utilized in plant design and operation. It is a working document that will be updated as necessary to incorporate plant changes. The document is intended to allow continuity in implementation of the Fire Protection Program during design, construction and operation.

RESUME

ANDREW G. MINISTER

(Supply System)

EDUCATION:

B.S. Mechanical Engineering
University of Nevada - Reno 1975

EXPERIENCE:

Washington Public Power Supply System - Fire Protection
Engineer

July 1981 to
Present

To provide the principle technical expertise for the fire protection engineering required in the design construction, licensing and operation of all Supply System facilities by:

- 1) Assure facility fire protection engineering requirements are incorporated in the design by providing fire protection engineering criteria to Architect/Engineer and facility engineering organizations.
- 2) Assure fire protection licensing and insurability standards are included in design plans and specifications by performing detailed engineering reviews and/or giving technical direction to Engineering personnel.
- 3) Meet plant operation schedules for the preparation and updating of plant fire hazard analysis reports, Safety Analysis Reports and other documentation requiring submittal to the NRC by providing the fire protection engineering technical input.
- 4) Provide technical support in the preparation of plant operating procedures and technical specifications by authoring and reviewing procedures and specifications.
- 5) Maintain an effective Plant Fire Protection Program, as required by NRC, by serving in the capacity of cognizant Plant Fire Protection Engineer for the program.

July 1980 to
July 1981

Western Division, Naval Facilities Engineering
Command-Fire Protection Engineer

Reviewing A/E designs of new and modified naval facilities for compliance with fire codes. Preparing specifications for fire alarm and fire detection systems, local energy and shunt type; fire sprinkler systems, wet, dry, deluge, and pre-action; carbon dioxide systems; halon systems; and fire pump systems. Review contractors submittals on fire protection equipment. Performing acceptance tests on all types of fire protection surveys of Navy and Marine Corps facilities, preparing reports of these surveys, and making recommendations for correction of unsatisfactory conditions. Investigating fires involving a significant loss or the loss of life. Providing fire protection consultation to facilities, fire and public works departments as needed.

July 1975 to
July 1980

Insurance Services Office - Engineering
Representative and Assistant Supervisor

Conducting physical inspections and surveys of community fire defenses including preparation of necessary reports and recommendations. Evaluating fire prevention and building code enforcement. Making detailed physical inspections of properties protected by automatic sprinkler systems and nonsprinklered properties. Prepare detailed underwriting reports, diagrams, and surveys.

Supervise field engineering representatives by reviewing work for technical adequacy; preparing and providing technical training on fire protection systems and building construction; making decisions concerning engineering judgement; and making assignments and keeping records of all items.

RESUME

RICHARD B. WHITE

(United Engineers)

EDUCATION:

Bishop McDevitt High School
Wyncote, Pennsylvania (1964)
U.S. Navy Schools (1964-1973)

- Electronic Technician Class "A" and "B"
- Basic Nuclear Power School
- Nuclear Power Prototype DIG
- Submarine School
- (Many short Electronic Schools)

Pennsylvania State University

University of Idaho

Washington State University

(110 Credits - Mechanical Engineering -Continuing)

QUALIFICATION SUMMARY:

Over eighteen years experience in the operation, testing, and construction of Nuclear Reactors including supervision and scheduling responsibilities. This experience was gained on U.S. Navy propulsion reactors, Dept. of Energy Reactors and commercial reactors.

EXPERIENCE:

Test and Startup Engineer

March 1979 to
Present

Washington Public Power Supply System
Nuclear Generating Plants No. 1 and 4, consisting of two power units. Responsibilities included are:

Writing System Descriptions and preoperational test specification, verification of system testing in mechanical and electrical disciplines, review of contractor test procedures for completeness, initiating and developing system packages for construction turnover to startup. Major systems assigned were Emergency Diesel Generators and Support Systems, Auxiliary Power Network, Vital Power Network, Component Cooling Water, Main Steam System, Plant Security and Plant Computers. An additional responsibility was the development and issuance of work packages to contractors for correcting equipment deficiencies.

WNPSR1

Attended and completed Fundamentals School and systems Technology School that is applicable towards an operator's license.

May 1978 to
March 1979

Test and Startup Engineer
Public Service Electric & Gas Company's
Nuclear Generating Plant, Salem 2, consisting of
one 1100 MWe Power Unit. Responsibilities
included: The direction and coordination of trades in the performance of system testing, ordering material or parts, developing procedures, verifying and completing documents for turnover to the owner, performed preoperational testing that included evaluation of equipment comparison of obtained data to codes and design, and recommendation of corrective actions, if needed.

May 1974 to
May 1978

Senior Reactor and Experiment Engineer
EG&G, Department of Energy, Advanced Test Reactor
Responsibilities included:

Supervision of a reactor engineer and seven (7) experimental reactor operators during the operation and refueling cycles of ATR, coordinated rewriting of operating manuals, and incorporating new specifications into the plant's technical specifications.

Completed ATR requirements for the following positions:

Experimental Loop Operator (7 individual pressurized loops), Reactor Control Room Operator, Reactor Instrument Technician.

May 1964 to
October 1973

Electronic Technician 1st Class (E-6)
U.S. Navy
Qualified on the following submarine watch stations:

Reactor Technician, Electric Plant Control Panel, Reactor Plant Control Panel, Steam Plant Control Panel, Auxiliary Electrician and Submarines. Assisted Squadron Engineering as an Assistant to the Electronic and Nuclear Modifications.

RESUME

RONALD E. ANZALONE

SUPERVISING NUCLEAR/MECHANICAL ENGINEER

(United Engineers)

SPECIAL COMPETENCE

Nuclear/Mechanical engineering and design of all facets of pressurized water, boiling water, and high temperature gas-cooled nuclear power plants. The above activities include conceptual system design, equipment sizing and selection, design calculations, equipment purchases, and licensing support.

EDUCATION

Villanova University, Bachelor of Mechanical Engineering, 1967

Newport News Shipbuilding & Dry Dock Company, Basic Courses in Nuclear Reactor Theory, Navy Reactor Plant Systems, and Radiological Controls, 1968-1969.

EMPLOYMENT HISTORY

1970-Present	United Engineers
1980-Present	Supervising Nuclear/Mechanical Engineer
1974-1980	Mechanical Engineer
1970-1974	Mechanical Engineering Assistant
1967-1970	Newport News Shipbuilding & Dry Dock Company Design Engineer - Atomic Power Division

PROFESSIONAL REGISTRATIONS

North Carolina Pennsylvania

SELECTED EXPERIENCE:

Washington Public Power Supply System, Richland, Wa
Two 1,200 MW pressurized water reactor units at the Hanford
Reservation. Assistant Supervising Engineer for all nuclear and
balance-of-plant design engineering; Group Leader responsible for
engineering, evaluation, and coordination of proposed Babcock & Wilcox

modifications, and for engineering, coordination, and implementation of safety reviews such as Anticipated Transients Without Scram, Safe Shutdown, Internal Missiles, and Post-Accident Radwaste Disposition.

Carolina Power & Light Company, Southport, NC

Two 800 MW boiling water reactor units of the Brunswick Steam Electric Plant, including turbine-generators with auxiliaries, buildings, and switchyard. Supervising Nuclear/Mechanical Engineer for all nuclear, balance-of-plant, and mechanical services retrofit engineering. Responsible for engineering five of the plant's nuclear systems, sizing of equipment, seismic analysis of tanks and valves, bid evaluations, and purchase of major equipment.

Public Service Company of New Hampshire, Manchester, NH

Engineering and design of nuclear safety class and auxiliary systems, sizing of equipment and purchase order administration for two 1,160-MW pressurized water reactor units at the Seabrook Station, Seabrook, New Hampshire.

Delmarva Power & Light Company, Wilmington, DE

Group Leader responsible for engineering and design of all gas handling systems for two 770 MW high-temperature, gas-cooled reactor units at the Summit Power Station. Coordination of a study and issuance of a report on HTGR radioactive gas waste management philosophy.

As Design Engineer, Newport News Shipbuilding & Dry Dock Company:

Preparation, implementation, and design coordination of modifications to nuclear reactor plant systems in support of repair, maintenance, and modernization of U.S. Navy nuclear reactor plants, emphasizing detailed calculations in stress analysis, heat transfer, and fluid mechanics.

RESUME

DAVID L. OAR

(United Engineers)

PROFESSIONAL AFFILIATIONS:

Society of Fire Protection Engineers----Grade of Member

National Fire Protection Association - Member

EDUCATION:

Bachelor in Electronic Engineering Technology, DeVry Institute of Technology, Chicago, Illinois. Graduated December 5, 1969. University of Oregon, School of Architecture, Eugene, Oregon--lyear.

EXPERIENCE:

July 1981 to
Present

UNITED ENGINEERS & CONSTRUCTORS, INC. Richland, Washington. Supervising Engineer -- Fire Protection Discipline. Responsible for the review, comment, and approval of all work related to Fire Protection, including Fire Protection Systems, Automatic Fire Suppression Systems, Manual Passive Fire Barriers, Fire Separation, Manual Supression Capabilities and Fire Protection Yard Piping on Washington Nuclear Project No. 1. The branch technical position APCSB9.5-1, Appendix "R", American Nuclear Insurers Criteria, Underwriters Laboratory Standards, and NFPA Codes and Standards are all used as guidelines in the review of Fire Protection for each area of the Plant.

April 1980 to
July 1981

UNITED ENGINEERS & CONSTRUCTIONS, INC. Richland, Washington 99352. Fire Protection Engineer. Responsible for the review and comment of Fire Protection Systems designed and installed by the Fire Protection Contractor for conformance with plans and specifications. Also responsible to review contract documents for conformance with the Fire Hazards Analysis.

January 1975 to
April 1980

SOUTHWEST FIRE EQUIPMENT COMPANY, INC., Phoenix, Arizona 85021. Division Manager and Chief Engineer, Contracts Division. Worked directly under President and General Manager to supervise personnel involved in the engineering, installation, and servicing of sophisticated Fire Evacuation Systems, Life Safety Communications Systems, Fire Suppression Systems, and Intrusion Systems, including design of Fire Protection Systems for Palo Verde Nuclear Project and Navajo Generating Station. Developed policies concerning operating procedures.

Responsible for engineering design and cost control for projects and job costing procedures for company. Represented company on State and Local Fire Advisory Committees. Conducted seminars on: Various Types of detection Systems on the Market and Their Proper Utilization; Proper Applications of Dry Chemical Extinguishment Systems; Use of Halon 1301 as an Extinguishment Agent and Design Considerations; and other related subjects. Was qualifying party for company's C-11 State Electrical License.

August 1974 to
January 1975

ADVANCE ENGINEERED SYSTEMS, 7016 N. 55th Avenue, Glendale, Arizona 85311. President and Partner of small intercommunications company. Obtained distribution-ships of equipment necessary to provide complete package to customers. Dissolved partnership to join Fire Protection Co.

January 1970 to
August 1974

JOHNSON SERVICE COMPANY, Phoenix, Arizona. Service Salesman/Technical Representative. Worked in all phases of control system design, principally fire and smoke detection systems, intrusion systems, and electronic and pneumatic control systems. Was responsible for working with consulting engineers and owners regarding the design of systems. Was responsible for follow-up with owner on the maintenance of their systems. Was able to develop a reputation as an authority on fire alarm and smoke detection systems of all types with engineers and fire officials.

March 1968 to
January 1979

AMPEX CORPORATION, Elk Grove Village, Illinois. Engineering Technician, Technical Seervices, Quality Assurance. Worked with all phases of audio stereo tape duplication. Responsible for all duplicating equipment to insure standard of quality and assist in technical advise concerning the operation of equipment. Performed various tests on equipment, made modifications to equipment, analyzed and corrected problems that occurred with equipment, and assisted operators when called upon.

August 1967 to
March 1968

BELTONE ELECTRONICS CORPORATION, Chicago, Illinois. Electronic Circuit Analyst, Audiometer Department. Checked operation of new Audiometer and calibrated for proper operation. Also repaired units.

February 1967
August 1967

LaMARCHE MANUFACTURING COMPANY, Des Plaines, Illinois. Final Tester. Started as assembler of medium sized battery chargers. Advanced to working with special order units and later advanced to position as final tester. Understanding of all types of chargers and converters was necessary. Experience was gained in trouble-shooting procedures and test methods.

Military

United States Army--September 1962 thru September 1965. Special Forces Advisor, Radio Operator. Spent considerable time in training at the Special Warfare Center and the Defense Language Institute. Spent one year in the Far East as an advisor and instructor in radio communications. Received Honorable Discharge--August 1968. Received direct Commission to Warrant Officer in March 1975 while serving in the Arizona Army National Guard. Served as Avionics Officer and Battalion Mess Officer for the 997th Aviation Battalion (CAC), Arizona Army National Guard until 1980. Currently serving as Property Book Officer for the 2nd TNG BDG 104th Division, U. S. Army Reserve.

RESUME

JOHN MICHAEL RUCKI

(United Engineers)

POSITION:

Consulting Engineer

EUCATION:

Villanova University
Villanova, Pennsylvania (1967-1971)
Degree Earned - Bachelor of Electrical Engineering

Drexel University
Three courses in Transmission Analysis (1971-1972)

RELATED EXPERIENCE:

Member of Construction Union
-Local-584, Sayreville, NJ (1967-1971)
Building Commercial, Industrial and Power Plant Facilities

EXPERIENCE:

October 1981 Task Force Leader - Appendix R
to Present

Assignment: Washington Public Power Supply System, Units 1 & 4
Hanford, Washington - Consisting of Two (2) 1250 MW Turbo
Generators, Pressurized Water Reactors

Responsibilities: Supervision of the Task Force established to review NRC
regulation 10CFR50 Appendix R as applicable to the present
plant design. This review includes the issuance of an
Appendix to the Final Safety Analysis Report (FSAR) as
well as the recommended plant modifications needed to
comply with the Federal Regulations.

November 1979 to Lead Site Engineer (UE&C)
October 1981: Principal Engineer (Acting for Client)

Assignment: Carolina Power & Light Co., Brunswick Steam Electric Plant
Consisting of Two (2) 847 MW turbo Generators, Boiling
Water Reactors

Responsibilities: Directly assisted Client's Resident Engineer in
establishing and supervising CP&L Site Engineering Support
Services Group for Operating Plants. Duties included staffing
of personnel, generation of administrative, financial,

scheduling and engineering procedures, also documents needed for interfacing with plant, construction and outside engineering. Scope of projects included design, resolution of installation problems, coordination with plant and construction on priority sequencing for outages, writeup of plant modification, testing of installed modification, turnover of packages including Q/A-Q/C close-out and revision of operation procedures as necessary. Some modifications performed were: torus integrity upgrade, fire protection, RHR heat exchanger upgrade and repair, radwaste system upgrade, pipe support review for NRC IEB-79-02, 07 & 014, TMI modifications, and Environmental Qualification Program including generation of NRC required 90 day report.

November 1979 to Lead Site Engineer (UE&C)
February 1978

Assignment: Carolina Power & Light Co., Brunswick Steam Electric Plant

Responsibilities: A/E engineering support, Client interface, resolution of installation problem and consultation to plant staff. Some modifications and duties during this period were: Conducted classes for plant engineering staff on design techniques, documents and specifications; expansion of spent fuel pool, fire protection; Recirculation Pump trip modifications; evaluation of plant scrams; digital to analog modification for plant instrumentation and service water system pipe replacement.

July 1972 to Site Lead Electrical Engineer
February 1978

Assignment: Carolina Power & Light Co., Brunswick Steam Electric Plant

Responsibilities: A/E engineering support, resolution of design and installation problems which affected plant construction and start-up. Resolution of NRC inspectors' concerns and findings. Some specifics during this period included: total as-built and review of control room panels and cabinets and resolution of discrepancies to NRC in order to satisfy pre-requisite for fuel loading approval. Review and closure of: equipment deficiencies, design deviation reports (Q/A items), system modifications, preoperational test problems, testing of engineered items after receipt on site (i.e. electrical penetrations, cable and cabinets).

May 1971 to Electrical Design Engineer
July 1972

Assignment: Carolina Power & Light Co., Brunswick Steam Electric Plant

Responsibilities: Generation of specifications and purchase orders for equipment procurement, preparation of the conduit and cable schedule, review of control wiring diagrams with system descriptions, approval of manufacturing drawings, and witnessing of factory tests and inspection for release to ship.

RESUME

MICHAEL E. MOWRER

VICE PRESIDENT

(Professional Loss Control, Inc.)

EDUCATION:

Bachelor of Science, Fire Protection Engineering, Illinois Institute of Technology, 1969.

PROFESSIONAL AFFILIATIONS:

Registered Professional Engineer, California
Society of Fire Protection Engineers, Member (President, local chapter)
National Fire Protection Association, Member of Technical Committee

PROFESSIONAL EXPERIENCE:

Mr. Mowrer has more than twelve (12) years of fire protection engineering experience with hazardous industry. He is currently involved in a variety of projects relating to the energy industry, including nuclear power plant audits, establishment and review of fire detection and suppression system design criteria, fire hazards analyses, development of detailed pre-fire plans for fire brigade use, project management, fire system design, and fire brigade leadership training programs to satisfy OSHA and NRC requirements. He has developed and presented numerous seminars on fire protection for nuclear and fossil power plants, hazardous industry, and fire emergency planning for utilities.

Previously Mr. Mowrer was Assistant Manager for a large fire protection consulting firm. As such he was responsible for the supervision of eleven (11) engineering personnel with an emphasis on fire protection services for the hazardous paint and coatings industry. These services included both fire protection system review and chemical process analysis. Additional responsibilities included conducting surveys buildings, evaluation of compliance with OSHA regulations at U.S. Army, Navy, and government facilities and review of plans for building construction to determine divergence from national consensus standards.

Before joining the consulting firm, Mr. Mowrer worked as Assistant Chief Engineer for a large fire insurance rating organization. His responsibilities included HPR inspections of large sprinklered properties to determine the need for special hazard detection or suppression equipment to improve life safety and property protection and evaluation of the level of public fire protection provided to a number of communities, making

recommendations for improved public fire protection. Mr. Mowrer has experience as a volunteer fire fighter.

AREAS OF SPECIALIZATION:

Project Management

Fire Protection for Electrical Power Generating Facilities (nuclear and fossil fuel)

Development, Presentation and Evaluation of Fire Training Programs.

Design and Evaluation of Fire Detection and Suppression Systems

Evaluation of Compliance with Consensus Standards, Codes and Regulations

Municipal Fire Defense Analysis

Industrial Fire Hazard Evaluations

Pre-Fire Planning

RESUME

JAMES M. DEWEY

SENIOR FIRE PROTECTION ENGINEER

(Professional Loss Control, Inc.)

EDUCATION:

B.S., Fire Protection Engineering, University of Maryland, 1968
Associate in Risk Management, Insurance Institute of America, 1981
Seminars on Supervisory Skills and Advanced Supervisory Skills, American Management Association, 1970-1971.

PROFESSIONAL ACTIVITIES AND ORGANIZATIONS:

Registered Professional Engineer, Pennsylvania, Tennessee
Society of Fire Protection Engineers, Member
American Society of Safety Engineers, Member
National Fire Protection Association, Member of Technical Committee

PROFESSIONAL EXPERIENCE:

Mr. Dewey has more than 13 years of experience in fire protection engineering and has specialized in industrial fire protection. He is currently involved in procedure development, HPR type inspections and review, determining engineering criteria on risk selection, nuclear power plant audits, project management, report writing, and fire hazard analyses. He has broad experience in new construction specifications, plan review, account and personnel management, project management and risk evaluation.

Prior to joining PLC, Mr. Dewey worked for a major HPR organization. His responsibilities included coordinating engineering activities as Engineering Manager. He was responsible for a staff of 29 field engineers providing HPR inspection services for insured risks throughout the mid-Atlantic states.

He previously worked for an insurance related firm in a major city conducting individual industrial risk inspections and inspections of fire protection services for municipalities.

AREAS OF SPECIALIZATION:

HPR Type Inspections
Fire Protection System Evaluation
Personnel Management
Inspections and Audits
Fire Hazard Evaluation

Project Management
Property Risk Management
Fire Protection for Nuclear Power Plants

B DEFINITIONS

1. Approved: Tested and accepted for specific purpose or application by nationally recognized testing laboratory or demonstrated equivalent.
2. Automatic: Self action, operating by its own mechanism when activated by some impersonal influence such as a change in current, pressure, temperature, or mechanical configuration.
3. Combustible Material: Material which is expected to release heat energy when ignited, heated or otherwise exposed to abnormal conditions.
4. Combustible Loading:
 - (1) Potential heat energy of combustible materials expressed per unit area. This is usually calculated by multiplying the total mass of materials in an area by the heat of combustion and dividing by the floor area of interest.
 - (2) More generally, used to describe qualitatively the fire hazard associated with an area from a total heat energy standpoint.
 - (3) Used to correlate varying types, amounts and densities of combustible materials to an equivalent fire severity in terms of the ASTM E119 standard time temperature curve. (See fire severity).
5. Design Basis Fire: (DBF) Maximum credible fire within the specified fire zone or area based on the fixed and transient combustibles available.
6. Exposure Fire: A fire in a given area that involves either in-situ or transient combustibles external to any structures, systems, or components of interest located in or adjacent to the same area. The effects of such a fire can adversely affect those structures, systems or components important to safety. Thus, a fire involving one train of safe shutdown equipment may constitute an exposure fire for the redundant train located in the same area, and a fire involving combustibles other than either redundant train may constitute an exposure fire to both redundant trains located in the same area.

7. Fire Areas: Portion of the plant that is separated by three hour fire rated barriers consisting of walls, ceilings and floor assemblies with all penetrations equivalently protected.
8. Fire Barriers: A system of components which are designed and installed equivalent to rated assemblies tested to provide a fire resistive separation. The degree of fire resistance is given in terms of hours. Fire barriers include structural components, such as ceilings, walls, floors, etc. and localized barriers such as cable tray protection schemes, etc.
9. Fire Brigade: Group or team of assigned plant personnel, who are trained, equipped and deployed to provide manual suppression capability.
10. Fire Detection System: A system of detectors, alarm circuitry, and control panels designed to annunciate a fire condition within specific plant areas.
11. Fire Detector: A device designed to automatically detect the presence of fire and initiate a signal to an alarm panel and other appropriate action (See NFPA 72E "Automatic Fire Detectors").
12. Fire Loading: See Combustible Loading.
13. Fire Hazards Analysis: A review based on integrated safety analysis techniques wherein all plant areas are evaluated with respect to safety-related equipment, fire hazards, and fire protection features such that unacceptable fire risks are identified and controlled.
14. Fire Protection Program: The integrated efforts involving components, procedures and personnel utilized in carrying out all activities of fire protection. It includes system and facility design, fire prevention, fire detection, annunciation, confinement, suppression, administrative controls, fire brigade organization, inspection and maintenance, training, quality assurance, and testing.
15. Fire Protection System Review (FPSR): A complete review describing the hardware and software aspects of the plant with respect to fire protection. The FPSR details the design and operating features of the facility with respect to the fire hazards present and applicable

NRC guidance and regulations. This review forms the basis for ensuring adequate defense-in-depth control of fire hazards as they relate to nuclear safety.

16. Fire Resistance Rating: That rating, in terms of hours, derived from tests of an assembly conducted in accordance with ASTM E119.
17. Fire Severity: A subjective measure of the exposure to an area resulting from combustion of the available fire loading.
18. Fire Suppression: Control and/or extinguishment of a fire manually with hose lines, portable extinguishers, and associated necessary equipment; or automatically, using fixed systems which are self actuating. Such automatic systems include sprinkler systems, water spray systems or gaseous halon systems. (Certain fixed pipe systems may require manual operation).
19. Fire Zones: When used in the Fire Hazards Analysis, a fire zone represents an area chosen for subdividing the systematic review of the station. In general, several zones are located in a fire area. The zones may or may not correspond to the location of fire detection and/or suppression zones. Fire zones located for purposes of the fire hazards analysis are selected to detail the inter-relationship between nuclear safety systems and the exposing fire hazards, as closely as possible.
20. Fixed Combustibles: Combustibles whose location is permanent due to the design of the plant. Such combustibles include lubricating oils in pumps, motors, cable insulation and jacket materials, resins and grease. Certain cellulose materials are considered fixed, such as records in record storage vaults, paper in office areas, etc. The critical portion of the definition is the permanent location.
21. Manual Fire Suppression: The means of fire suppression involving trained fire brigade and/or local fire department use of fixed or portable equipment to suppress fire incidents. Manual suppression includes the use of portable extinguishers, standpipe and hose streams, as well as manual actuation of fixed automatic or non-automatic systems. Where important nuclear safety systems are involved, manual fire

suppression is generally utilized as a secondary means of suppression.

22. Primary Means of Suppression:

The means of fire suppression assumed to function as designed to accomplish the fire protection goal (e.g. preservation of safe shutdown capability). Primary fire suppression often consists of a fixed automatic suppression system. The primary means of suppression does not imply that such a system will necessarily actuate prior to initiation of manual suppression. The use of a primary means of suppression implies that some credit is being taken in the analysis for the actuation of that system. The primary means of suppression may in certain cases be manual suppression utilizing either portable extinguishers or hose streams.

23. Safe Shutdown Systems:

Those systems or parts of systems including mechanical equipment, valves, pumps, piping, cable (power, control, and signal) and instrumentation components necessary to take the plant from a full power operating condition to a maintained cold shutdown status.

24. Secondary Means of Suppression:

The suppression provided assuming failure of the primary means of suppression. The secondary system normally consists of manual fire suppression using hose stations or portable fire extinguishers.

25. Sprinkler System:

A network of piping, nozzles, fittings, valves etc. designed especially for fire suppression as defined in NFPA 13 "Standard for the Installation of Sprinkler System." Several types of sprinkler systems are used including:

wet pipe systems,
pre-action systems, and
deluge systems.

Appropriate definitions are found in NFPA 13. Where the term "automatic sprinkler system" is used, it shall mean an automatic wet pipe sprinkler system.

26. Standpipe and Hose System:

A fixed fire suppression piping system with hose outlets, valves, hose, and nozzles connected to a fixed, reliable water supply system, designed to provide effective manually operated water streams to areas inside plant buildings.

27. Transient
Combustibles:

Combustibles introduced due to normal plant operations. These combustibles include flammable and combustible liquids and Class A combustibles used for maintenance and health physics operations. In general, transient combustibles are assumed in all plant areas. The quantity and type of combustibles varies with location in the plant. The significance of transient combustibles relates to their variability in location and quantity.

28. Water Spray System:

A network of piping, spray nozzles, fittings, valves etc. designed especially for fire suppression as defined in NFPA 15, "Standard for the Installation of Water Spray Systems."

C.1 Fire Protection Program Positions

C.1.a Fire Protection Program

1) Objective

The fire protection program is the means of ensuring fire safety through defense-in-depth. The defense-in-depth principle is aimed at accomplishing the following three part objective:

- 1 Preventing fires from starting.
- 2 Quickly detecting and suppressing those fires that do occur, in order to limit the resultant damage.
- 3 Designing plant safety systems such that a fire, which starts despite the fire prevention program, and is not extinguished despite fire suppression activities, will not prevent essential functions required for safe shutdown from being performed.

Stated concisely, the objective of the fire protection program is to minimize the probability, severity, and consequences of a postulated fire. Although each aspect is addressed independently by the fire protection program, each also interacts with the others. Improvement in any one aspect will strengthen the overall fire protection program and may compensate for weaknesses, known or unknown, in others.

The first part of the fire protection program objective, fire prevention, is accomplished by development and implementation of administrative controls. These controls are designed to minimize transient combustible loading where possible, to minimize the presence of ignition sources and to assure implementation of the fire protection program with respect to all essential safety-related facets of plant operations.

The second part of the objective is met by designing, installing, and maintaining fire detection and suppression systems to detect, contain, control and/or extinguish postulated fires. Administrative controls on transient combustibles act to limit the size of the postulated fire to that which was evaluated. Fire suppression systems include both automatic and manual suppression capabilities.

The third part of the objective, minimizing the consequences of the postulated fire, is demonstrated through the fire hazards analysis. The zone by zone evaluation identifies the equipment important for safe operations as well as the fire loading. Through the methodology established in a subsequent section, the design basis fire is established for each area of analysis and its consequences determined. The designation of fire areas provide a boundary condition (i.e. rated fire barriers) to limit the spread of a fire. The fire barriers establish the outside limits for the severity of a postulated fire. Administrative controls are developed to assure that appropriate steps are

taken to limit the consequences of the DBF to a level that is consistent with the overall objectives of plant fire safety.

By utilization of the fire protection program from design through operation, the ability to minimize significant fires and to ensure the capability to shutdown the reactor and maintain it in a safe shutdown condition is achieved. In addition, radioactive releases to the environment are minimized even in the event of a significant fire.

Management has and will continue to participate in the fire protection program from design through operation. The fire protection program allows management to delegate the responsibility for the engineering design and maintenance of fire protection systems to a qualified staff. In addition the qualified staff will be responsible for fire prevention activities, training and manual fire fighting activities.

2) Organization and Qualification

Responsibility for the Supply System's overall fire protection system is assigned to the Director of Safety and Security. Although the Director of Safety and Security retains the ultimate responsibility, development of program policy and auditing for assurance of program implementation are delegated to the Manager of Industrial Safety and Fire Protection. Program implementation is the responsibility of the WNP-1 Plant Manager.

The Supply System has employed United Engineers & Constructors, Inc. to design and select equipment, and inspect and test the completed physical aspects of the fire protection system. The qualification of the individuals coordinating this function are stated in Section 1 of this report.

The qualification of the Supply System Fire Protection Engineer who will assist in the inspection and test of the completed physical aspects of the system, develop the fire protection program and assist in the fire fighting training for the operating plant are provided in the FSAR (Section 9.5.1). The training and updating provisions such as fire drills, providing for maintaining the competence of the plant fire brigade including personnel responsible for maintaining and inspecting the fire protection equipment, are also under his cognizance.

The fire protection staff is responsible for design review and administrative procedures as follows:

- a) Coordination of building layout and system design with fire safety requirements;
- b) Design and maintenance for fire detection, suppression and extinguishing systems;

- c) Fire prevention activities;
- d) Training and manual fire fighting activities of plant personnel and the fire brigade.

The qualification for the A/E Fire Protection Engineer, the Fire Protection Consultant and the Supply System Fire Protection Engineer are the same as required for the grade of Member in the Society of Fire Protection Engineers. These individuals assist in the design of the system and the selection of equipment, and will assist in the inspection and test of the completed system. The Manager of Industrial Safety and Fire Protection will develop the fire protection program and assist in the fire fighting training for the operating plant personnel.

C.1.b Fire Hazards Analysis Methodology

1) Introduction

The primary purpose of the Fire Hazards Analysis is to provide a systematic evaluation of the fire hazards with respect to plant safety systems. The objectives of the analyses are to ensure that the interactions of the fire hazards, fire protection features and safe shutdown systems are such that under fire accident conditions, safe shutdown capability is preserved and radioactive releases to the environment are minimized. In addition, the effect of inadvertent operation of the fire protection systems is considered for their impact on plant safety.

A critically important point is that most regulatory compliance items with regards to fire protection features are independent of the results of a fire hazards analysis. However such analysis is critical in evaluating post fire accident shutdown capability. The prescriptive nature of the regulations and guidance used precludes the necessity for such analysis with notable exception of the post fire safe shutdown system evaluation. Therefore, the most important criteria used in the conduct of this evaluation are those of post fire accident safe shutdown capability.

The adequacy of fire protection features for shutdown systems and components including spatial separation, passive barriers and active systems was evaluated by comparison with the requirements of 10CFR50 Appendix R. Deviations from this approach are evaluated and justified as they arise in the analysis.

The basic tasks performed during the Fire Hazards Analysis section of the FPSR include:

1. Identification of Fire Zones and Fire Areas.
2. Evaluation of Design Basis Fires in each area.
3. Identification of safe shutdown systems, including all necessary cabling, components and instrumentation.

4. Location of required safe shutdown equipment in fire zones.
5. Physical effects of Design Basis Fire(s) on safe shutdown equipment.
6. Effects of fire exposure on safe shutdown functions.
7. Decision process on protection, rerouting, alternate means.
8. Evaluation of radioactive release caused by Design Basis Fire(s).
9. Evaluation of inadvertent actuation of fire protection systems on safety-related systems.
10. Determination of additional design or operational features to ensure objectives.

In this manner, a systematic plant review with respect to the basic objectives of the fire protection program was accomplished. The data and analysis are summarized by fire area or zone, as shown on the example Fire Hazards Analysis sheet (shown on the following pages).

FORMAT SHEET FOR "FHA"

1.0 Building

2.0 Areas of Analysis

3.0 Area Description

3.1 Construction

Material

Fire Resistance

3.1.1 Walls: North
South
East
West

3.1.2 Floor

3.1.3 Ceiling (roof)

3.1.4 Openings

Doors -
Dampers -
Penetrations

3.2 Ventilation

Normal -
Emergency -

3.3 Drainage

3.4 Emergency Lighting

3.5 Accessibility

3.6 Radioactivity

Yes

No

in Equipment -

Airborne -

4.0 Floor Area

5.0 Equipment Description

5.1 Safe Shutdown

6.0 Fire Protection

6.1 Detection

6.2 Fixed Suppression

Hazard Classification

System Objective

6.3 Manual Suppression

7.0 Fire Loading Quantity

7.1 Combustible Loading Fixed Transient

Oil

Grease

Flammable/Combustible Liquids

Chemicals

Cabling

Resins

Other

7.2 Area Fire Loading Evaluation

8.0 Consequences of Design Basis Fire

8.1 With Primary Fire Suppression

8.2 Without Primary Fire Suppression

9.0 Accidental Operation of Fire Protection System

9.1 Equipment Subject

9.2 Accidental Discharge Consequences

10.0 APPENDIX-R EVALUATION

10.1 Major Equipment

10.2 Detailed Equipment

2) Identification of Fire Zones/Areas

Fire areas exist as a fire protection feature, generally enclosed with 3-hour barriers, utilized to limit the consequences of a fire by minimizing the area exposed.

Two criteria were used in selecting the boundaries of fire zones: the logical location of local exposure fire sources and the physical boundaries located around plant subsystems. It is critically important to realize that the boundaries of fire zones do not necessarily correspond to fire barrier locations or to the location of detection or suppression system zones. Where several fire zones are located within a given fire area, the combustible loading associated with all fuel items within the three hour fire rated enclosure is used. The specification of fire zones in this manner offers the following advantages:

1. More precise definition of the probable transient fire loads is possible.
2. Direct, localized fire exposure can be more adequately addressed.
3. Fire areas within three hour rated fire barriers are in general too large to adequately identify safe shutdown system cables, instruments, equipment piping etc. in a meaningful manner. The use of fire zones enables this crucial task to be performed more accurately.
4. The specification of additional protection features, particularly passive fire barriers is clearer, enabling better analysis and easier review.

3) Evaluation of Design Basis Fire Incident(s)

Design Basis Fire incidents are assumed to be fully developed post-flashover fires within the boundaries of a fire area. The rationale for choosing such an unrealistically conservative assumption in most plant area is based on the following:

1. In most cases, the combustible loading concept gives conservative results when evaluating passive fire barriers.
2. The practice of equating fire development with combustible loading has been used in the past and has been accepted by the NRC.

In unique situations where the combustibles are not continuous or unusually light combustible loadings exist, an alternate approximation involving more detailed, complex calculations can be utilized. The availability of such calculations as a tool for evaluating design basis fires is a function of the state-of-the-art in fire dynamics. Since the primary purpose of the combustible loading evaluation is to examine the adequacy of passive fire barriers the approximation is adequate. Detailed exposure calculations, when required, are performed utilizing more technical models. Calculations

of actuation time for detection and suppression systems will be performed, when required, using the best available physical models.

All fire area boundaries are nominally three hour fire rated assemblies. With few exceptions, the combustible loading posed by fixed and transient combustibles will not pose an exposure even approaching this limit. This factor, in conjunction with the low probability of post flashover fire states in plant fire areas indicates that the combustible loading concept is sufficiently conservative.

Both fixed and transient fire loads are considered in the combustible loading calculations. The approximation of transient fire loads considers maximum loading usual to the area and conservatively accounts for uncertain operating conditions.

Fixed fire loading, such as cabling and lubricants, was calculated based on the following assumptions:

1. The combustible loading of a mass of cabling, including insulation and jacket materials, is taken to be 10,400 Btu/lb even though all cabling is IEEE 383 qualified.
2. Cabling enclosed in conduit contributes no fuel to a postulated fire in that area.
3. Cable trays are taken as 40% filled as an average for combustible loading calculations.
4. Effective heating values of combustibles are assumed as follows:

Mineral Oil	150,000 Btu/gal
Turbine Lubricating Oil	150,000 Btu/gal
Grease	18,000 Btu/lb
Cellulosic Materials	8,000 Btu/lb
Polymeric Materials	13,000 Btu/lb
Charcoal	13,000 Btu/lb
Cable Jacket/Insulation Materials	10,400 Btu/lb
Resins	15,000 Btu/lb
Fuel Oil (No. 2)	150,000 Btu/gal

5. Combustible loadings due to rotor winding insulation is not considered.

6. A fire of maximum credible intensity was assumed in order to evaluate the adequacy of passive fire barriers. This assumption overestimates the room conditions during a fire; hence, barriers adequate for such exposures are adequate for the more likely, less severe, conditions.
7. Demineralizer resins located inside of equipment are assumed to contribute no fuel loading to an area. However, open storage of resins near the demineralizing equipment is assumed as a transient combustible.
8. Filters, other than charcoal, in HVAC units are not considered to contribute to the combustible loading.
9. Pipe insulation is non-combustible and therefore will not contribute to the combustible loading.
- 4) Effect of Fire Exposure on Safe Shutdown Capability

In general, the following assumptions apply to the evaluation of potential damage to safe shutdown systems:

1. Regardless of the particular fire exposure, unprotected cable insulation was assumed to result in loss of cable function. Adequate protection was assumed, in general, to consist of a combination of passive fire barriers and active fire protection. The passive barrier assumed was to be a one-hour rated cable protection scheme. Where specifically justified on the basis of limited fire exposure and/or rapidly actuating suppression systems, the one hour barrier scheme may be eliminated or downgraded.
2. In evaluating the protection for safe shutdown equipment, failure of the automatic fire suppression system was not assumed. However, in all cases, the availability of backup or secondary means of fire suppression was demonstrated.
3. Damage to unprotected instruments, valves, piping, pumps, etc. in zones containing automatic suppression systems was evaluated on an individual basis.
4. Liquid filled piping was assumed to retain integrity for a sufficient time to allow initiation of effective manual and/or automatic fire suppression operations.
5. Valves on liquid filled piping were assumed to maintain their integrity for sufficient time to allow initiation of effective manual and/or automatic fire suppression operations.
6. Motors and valve operators were assumed to fail prior to actuation of suppression systems if not protected by a passive barrier.

7. Liquid filled pumps were assumed to maintain mechanical integrity for a sufficient time to allow initiation of effective manual and/or automatic suppression operations.
8. All power, control and signal functions provided by exposed cables or cables in conduit were assumed to fail prior to automatic suppression system operation unless provided with passive fire barrier protection. In a few cases, where limited fire exposures were expected to be spatially separated from cable/conduit systems, the operation of the suppression system prior to cable function damage may be demonstrated on an individual basis.
9. No credit was taken for brigade response as a primary suppression means when safe shutdown systems were exposed. The primary means of evaluating the protection of safe shutdown capability was to utilize the requirements of 10CFR50 Appendix R, Section III, G.2.a and c. In general, a combination of fire detection, fire suppression and passive fire barriers was utilized (Section III.G.2.c).

If the protection scheme for the safe shutdown equipment was in accordance with Section III.G.2.a, 10CFR50 Appendix R, its acceptability to perform that protection function was assured unless extreme fire exposure conditions were anticipated.

5) Evaluation of Fire Damage to Safety Related Systems

Safety-related system components are identified by fire zone and/or area. The effects on such components, when exposed to the Design Basis Fire within the area, were analyzed to verify that a fire occurring within one system would not result in damage to the redundant system. An exposure fire resulting in damage to redundant systems (not safe shutdown systems) was considered to be acceptable in accordance with the requirements of Appendix R to 10CFR50. Fires are not postulated as occurring simultaneously with design basis accidents or events.

6) Evaluation of Radioactive Release Potential Caused By Design Basis Fires

The purpose of this evaluation was to ensure that no design basis fire incident would result in excessive radioactive atmospheric or liquid effluent release. This is shown in the following ways:

1. Post fire safe shutdown capability is preserved.
2. No fire induced post-accident mitigation function is impaired by a single fire originating in a single train of required safety-related equipment.
3. Liquid effluents caused by fire protection system actuation in contaminated areas are controlled by adequate containment and drainage.

4. Airborne contamination resulting from a fire exposure is adequately controlled through ventilation and monitoring.

The post fire safe shutdown capability is the major concern of the fire hazards analysis. The assurance of such a capability eliminates this potential source.

The release of radioactive liquid effluents was analyzed by considering the adequacy of the plant drainage system. Fire induced failures of secondary containment resulting in a potential release of radioactive liquid effluent were evaluated. These effluents were assumed to be fire induced, therefore, the primary source was an automatic or manual fire suppression system.

The release of airborne contamination resulting directly from a fire incident, i.e. a "radioactive" smoke plume, was evaluated by considering the plant ventilation and atmospheric monitoring system. Airborne contamination resulting from other causes was examined by the evaluation in items 1 and 2 listed above.

7) Evaluation of Inadvertent Fire Suppression System Operation

The potential effects of the accidental operation of a fixed fire suppression system were evaluated under the following assumptions:

1. For closed head water suppression systems, only single nozzle discharge was assumed.
2. For gaseous suppression systems, all discharge points on a given single actuation zone were considered.
3. Damage caused by accidental discharge of a single suppression system nozzle was assumed to be limited to inducing electrical control, signal or power failures. Especially critical items include; switchgear, motor control centers, instrument panels, control panels, non-drip proof or non-waterproof electrical motors.
4. Water discharge on insulated, undamaged cables was assumed to cause no damage to such cables.
5. Where floor drainage was evaluated as adequate, the effects of water damage caused by a liquid level rise in the zone were not considered, since equipment is installed on pads or pedestals.

C.1.c Fire Suppression System Design Basis

The fire hose standpipe system design has a header through the General Services Building that is an extension of the yard main system and connects with the yard main system at two (2) remote points. The header is controlled by post indicator and building interior isolation valves at each end so that a single failure of the system will not create a lack of water supply to the building. Automatic sprinkler systems have an independent connection to the yard main

system. Each system takeoff is through a system valve, either OS&Y or other approved shutoff valves, and a water flow alarm. Therefore, a fire suppression system line break will not disable both the hose standpipe system and automatic suppression system at the same time.

The hose standpipe system in the Containment and the GSB are designed to be functional after the safe shutdown earthquake. As described in Section C.6.c, an alternate water supply, designed to Seismic Category I requirements, is provided for the hose standpipe systems.

C.1.d Alternative or Dedicated Shutdown

The equipment/system used to provide Safe Shutdown (SSD) capability was selected from plant systems that provide reactivity control, reactor coolant system inventory control and reactor decay heat removal. Any system that interfaces with the SSD equipment or is needed to support the operation of Safe Shutdown equipment was given SSD equipment/system status.

The SSD equipment/system have either redundant trains that provide the same function or redundant components that provide the same function. The equipment/system selected is provided with dual power sources, off-site power, if available, and on-site power if off-site power is not available. The SSD equipment/system selected, in general, have redundant/alternate controls. They can be controlled from the control room, from one of the two hot shutdown panel areas, or locally.

For a further discussion of the SSD equipment/systems see Section C.5.b and C.5.c.

C.1.e Implementation of Fire Protection Program

Fire Protection Program implementation is the responsibility of the Plant Manager.

During construction, United Engineers & Constructors, Inc. (UE&C) as Architect-Engineer, and Bechtel Power Corporation, as Construction Manager, provided the design and installation of fire protection systems. They also assist in the selection, inspection, and testing of equipment for the completed fire protection systems.

The Plant Manager will be responsible for the implementation, through administrative procedures, of the plant fire protection program requirements. This will include maintenance and surveillance of fire protection systems, testing of fire protection equipment, fire safety inspections, fire protection training, fire fighting procedures, fire drills, etc.

The Industrial Safety Fire Protection Specialist assigned to the plant will perform the following:

- 1) Periodic fire protection audits to ascertain that fire defenses are in place and in operating order, combustibles are controlled as required by procedure, and housekeeping is maintained at a high level.
- 2) Assist in training of plant fire brigade, plant staff and (both the Supply System and Contractors) workers in fire protection aspects.
- 3) Preplanning and critiquing the performance of fire brigade drills.

The Plant's Training Coordinator is responsible for scheduling and coordinating fire protection training for the plant staff, maintaining records for each person receiving training, and maintaining records of fire brigade drills.

Maintenance Supervisors are responsible for preventive and corrective maintenance of fire protection equipment in accordance with plant procedures. Plant procedures define responsible personnel for inspecting assigned plant areas and resolving housekeeping deficiencies in a timely manner.

All fire protection systems will be in service prior to the time fuel arrives on site. Required procedures, administrative controls and manual suppression capability will also be in operation before fuel arrives on site.

C.2 Administrative Controls

C.2.a Testing

A successful fire protection program requires testing of the fire protection equipment. Testing of fire suppression and fire detection systems will be completed in accordance with the appropriate NFPA standards, NRC guidelines and the plant technical specifications.

Testing will be accomplished under the supervision of the Shift Supervisors and Maintenance Supervisors in accordance with the surveillance testing program procedures.

Leak testing, smoke detector testing and similar procedures such as air flow determination will be done by means other than open flames or combustion generated smoke.

Persons performing the tests of fire suppression and fire detection systems will be qualified by appropriate experience and/or training in conducting these tests.

C.2.b Surveillance

The Plant Manager is responsible for the development of administrative procedures necessary to meet the surveillance requirements outlined in the Plant Technical Specifications.

Surveillance procedures will be established to ensure that fire barriers are in place and that fire suppression and fire detection systems are operable. Fire barrier surveillance will include fire doors, fire dampers, cable penetration seals, and other mechanical penetration seals.

Surveillance procedures will include provisions for correcting deficiencies found as well as maintaining a record of the surveillance and the correction of any deficiencies.

C.2.c Control of Combustibles

The use of plastic materials is minimized where possible. In particular, halogenated plastics such as PVC and neoprene are used only when substitute non-combustible materials are not available. Where neoprene is used as cable jacket material, it will be qualified to IEEE-383-1974 flame test requirements.

Bulk storage of flammable liquids will, as a minimum, comply with the requirements of NFPA 30, "Flammable and Combustible Liquids Code" in the design and venting of tanks. All bulk storage tanks containing flammable and combustible liquids are protected by thermal detection and automatic deluge sprinkler systems, if they are located in the buildings or within 50 feet of a building except for the turbine lube oil storage tanks which are located about 50 feet from the Turbine Generator Building. These tanks are situated above an open

pit designed to contain the oil stored in the tanks. Protection will be afforded by fire hydrants and hose houses in the area of the tank. These tanks are used primarily during shutdown while performing maintenance on the turbine/generator and contain clean and dirty lube oils.

Effective administrative measures will be implemented to prohibit bulk storage of combustible materials inside safety related buildings or adjacent to safety related systems during operation or maintenance periods. Guidance provided in Regulatory Guide 1.39 will be utilized in the development of these measures.

Use of combustible materials such as charcoal filters, dry ion exchange resins, wood laydown supports, or other combustible supplies, will be controlled in all safety-related areas. Other use of wood in buildings containing safety-related systems or equipment will not be permitted, except when suitable non-combustible substitutes are not available. If wood is used for such purposes, only identifiable fire retardant treated wood will be permitted. Such materials and supplies will be allowed in safety-related areas only during periods of use and storage of such materials will not be permitted.

All safety-related systems are isolated or separated from combustible material wherever feasible. Where isolation is not feasible, appropriate fire protection is provided, based on the fire hazards analysis, to ensure that a fire does not defeat the safety-related system function.

C.2.d Control of Ignition Sources

Administrative controls will be established to protect safety related areas from work involving ignition sources, such as welding, cutting, grinding, or use of open flame work.

Controls will provide for a permit system to control welding, cutting, grinding and open flame work. Permit issuance will be handled by qualified personnel at a responsible point of control and will require appropriate measures before, during and after the work is performed.

Administrative controls will be established to prohibit the use of open flame or combustion smoke for leak or fire detection system testing. Smoking in safety-related areas will be controlled by establishing designated smoking areas and posting of "No Smoking" signs.

C.3 Fire Brigade

C.3.a Personnel

A minimum fire brigade team complement of five persons will be maintained on all shifts. Fire brigade composition for each shift will be as follows:

The Fire Brigade shall consist of the following personnel:

- A) Shift Support Supervisor - Brigade Leader
- B) Equipment Operators (2)
- C) Health Physics/Chemistry Technician (1)
- D) Maintenance Support Personnel (1)

The Fire Brigade Leader is dedicated to stay with the brigade during a fire emergency.

The Industrial Safety and Fire Protection Specialist assigned to the plant will fill the position of Fire Brigade Chief.

C.3.b Qualifications

To be qualified as a fire brigade member, the employee must complete all classes in the initial fire brigade course. Each fire brigade member will be required to participate in at least two-fire drills per year and will attend planned meetings to review topics pertinent to the fire brigade activities and to repeat initial classroom instruction over a two year period.

The fire brigade leader will have sufficient knowledge as a senior employee of plant safety-related systems to understand the effects of fire and fire suppressants on safe shutdown capability.

C.3.c Training

Fire brigade training will insure an adequate manual fire protection capability at all times. Members of each shift crew will be trained in fire protection. Training of the plant fire brigade will be coordinated with the Department of Energy (DOE) Fire Department so that responsibilities and duties are delineated in advance. The DOE Fire Department has been trained in the operational precautions to be taken when fighting fires on nuclear power plant sites. They are made aware of the need for radioactive protection of personnel and the special hazards associated with a nuclear power plant.

Applicable fire protection industry standards and other pertinent industry reference materials are used in developing the fire brigade training program.

Additionally, courses in fire protection and fire suppression sponsored by the fire protection industry will be utilized.

The Fire Brigade personnel will be trained and retrained in responding to and fighting fires in accordance with the Fire Brigade Training Program. This training program is prepared and conducted by qualified personnel from the Industrial Safety and Fire Protection Department (IS&FP). Fire brigade leaders may also conduct this training as prepared by IS&FP.

Initial fire brigade training will include:

1. Familiarization with the Fire Protection Program emphasizing each individual's responsibilities.
2. Identification of types of fire potentials and their location within the plant.
3. Familiarization with the characteristics of the expected products of combustion.
4. Familiarization with fire fighting equipment, its proper use and its location within each fire area.
5. Identification of plant fire areas and access to each.
6. Familiarization and proper use of communication systems, emergency lighting systems, ventilation equipment, and emergency breathing apparatus.
7. Review of fire fighting strategies and procedures including the proper method of fighting the type of fire expected.

Fire brigade leaders will be trained in the direction and coordination of fire fighting activities.

Through regular meetings the fire brigade will be made aware of plant modifications and the resultant effects on fire fighting strategies. Instruction at these meetings will include periodic repetition of the initial classroom instruction and current topics.

C.3.d Drills

Fire drills for each shift will be conducted at intervals not to exceed three months. At least one unannounced drill for each shift fire brigade will be held annually. A minimum of one drill per year will be held on a backshift for each shift fire brigade.

All drills will be preplanned with unannounced drills critiqued by the Plant Industrial Safety Specialist. Drill critiques will include alarm effectiveness, brigade response and performance as a team, individual

brigade members performance, simulated use of fire fighting equipment, and evaluation of the brigade leader's efforts.

When deficiencies in fire brigade performance exist, additional training for the brigade or individual members will be conducted. Where drill performance is unsatisfactory, a repeat drill will be conducted within 30 days.

Practice sessions will be held for each shift fire brigade once a year. Sessions will include actual experience in extinguishing fires of the type expected to be encountered within the plant. Combined drills with the fire brigade and the DOE fire department will be held at least once per year.

C.3.e Fire Fighting Strategies

The DOE fire department (offsite fire fighting support group) response is considered in the overall fire protection system. WNP-1 is designed and will be operated to be self sufficient with respect to fire fighting activities; DOE response will be used to supplement manpower and for additional backup capability. Specific responsibilities of the DOE fire department will be defined.

Fire fighting strategies will be developed for each safety related area of the plant and will include:

1. Fire hazards within the area.
2. Fire extinguishing agent available to be used and alternate agents available.
3. Primary and alternate fire fighting access routes.
4. Specific plant systems that can be arranged to reduce the fire potential.
5. Vital heat sensitive equipment.
6. Assignment of specific duties to brigade members.
7. Potential radiological and toxic hazards.
8. Ventilation system operation.
9. Authorization levels for key plant equipment operations.
10. Instructions for operators and other plant personnel.

C.4 Quality Assurance

Quality Assurance (QA) programs of applicants and contractors are developed and implemented to assure that the requirements for design, procurement, installation, and testing and administrative controls for the fire protection program for safety-related areas are satisfied. The program is under the management control of the QA organization. The QA program criteria that apply to the fire protection program include the following:

C.4.a Design Control and Procurement Document Control

Measures are established to assure that all design related guidelines are included in design and procurement documents and that deviations there from are controlled.

C.4.b Instructions, Procedures and Drawings

Inspections, tests administrative controls, fire drills and training that govern the fire protection program will be prescribed by documented instructions, procedures or drawings and should be accomplished in accordance with these documents.

C.4.c Control of Purchased Material, Equipment and Services

Measures are established to assure that purchased material, equipment and services conform to the procurement documents.

C.4.d Inspection

A program for independent inspection of activities affecting fire protection will be established and executed by, or for, the organization performing the activity to verify conformance with documented installation drawings and test procedures for accomplishing the activities.

C.4.e Test and Test Control

A test program will be established and implemented to assure that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. The tests will be performed in accordance with written test procedures; test results will be properly evaluated and acted on.

C.4.f Inspection, Test and Operating Status

Measures are established to provide for the identification of items that have satisfactorily passed required tests and inspections.

C.4.g Non-Conforming Items

Measures are established to control items that do not conform to specified requirements to prevent inadvertent use of installation.

C.4.h Corrective Action

Measures will be established to assure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and non-conformances are promptly identified, reported and corrected.

C.4.i Records

Records are being prepared and maintained to furnish evidence that the criteria enumerated above are being met for activities affecting the fire protection program.

C.4.j Audits

Audits should be conducted and documented to verify compliance with the fire protection program including design and procurement documents, instructions, procedures and drawings, and inspection and test activities.

Design and Construction Phase

For those portions of the Fire Protection Systems protecting safety-related equipment or protecting areas which contain potential fire hazards to safety-related equipment:

- A. The design, procurement, installation and testing activities conducted prior to March 1, 1977 was reviewed by the Architect Engineer to ascertain to what degree the Branch Technical Position was complied with.
- B. The design, procurement, installation and testing activities conducted after March 1, 1977 will be conducted in accordance with applicable portions of the existing Design and Construction Quality Assurance Programs so as to comply with Appendix A to BTP 9.5-1.

Operating Phase

The Fire Protection Program and those portions of the Fire Systems protecting safety-related equipment or protecting areas which contain potential fire hazards to safety-related equipment, as defined in the plant technical specifications, will be subject to the applicable portions of the existing Operational Quality Assurance Program so as to comply with Appendix A to BTP 9.5-1.

C.5 General Plant Design

C.5.a Building Design

The General Services Building consists of steel supported reinforced concrete floors with reinforced concrete bearing walls. Where steel structural members are a part of a three hour rated fire barrier, they are protected with a coating tested to provide a three hour fire resistance for the steel. Where the failure of steel structural members within a fire area could jeopardize the boundary of the barrier, these steel members are also protected.

Metal deck roof construction is non-combustible and complies with the requirements of Class I construction of Factory Mutual requirements.

All Category I buildings in the plant are fully protected from lightning by a lightning protection system consisting of lightning masts tied to an adequate grounding system utilizing NFPA 78, Lightning Protection Code, as guidance.

There are no combustible oil-filled outdoor transformers located within 50 feet of a building containing safety-related systems. All transformers are dry types in the areas of concern, and no other oil immersed apparatus is used in these areas.

Doorways are provided with unlabeled UL-63 equivalent imbedded frames and approved fire doors providing three hour rated fire resistance. Where removable transoms are used for equipment accessibility, manufacturer certification is provided to assure construction of doors and transoms is equivalent to that of doors listed for three hour rated fire resistance.

Elevator doors have a 1½ hour rating.

Fire exits will be clearly marked; exit routes will be clearly marked and established by pre-fire plan. Periodic drills by operating and fire brigade personnel will be conducted to establish familiarity with these routes and procedures.

All stairwells and elevator shafts in the General Services Building are enclosed in concrete towers built to three hour fire resistive construction with three hour fire rated doors on the stairwells and 1 1/2 hour doors on the elevators.

All fire doors in the stairwells are of the self closing type and are normally closed.

The stairwells in the Containment and the Isolation Buildings are not enclosed by fire rated barriers, therefore, escape and access route procedures described above will be followed.

Containment hatches do not have a fire rating, although substantial steel construction and multipoint latching are at least equal to a three hour rated door.

All penetration seals in three hour rated fire barriers will be rated at three hours.

All dampers installed at three hour rated fire barrier walls will have a rating equivalent to the wall. Where stainless steel dampers have been utilized for contamination control purposes, two 1 1/2 hour rated dampers have been utilized in series to protect ventilation penetrations.

Suspended ceilings and their supports are non-combustible construction. Concealed spaces may house telephone cabling, control and low power wiring with combustible insulation/jacket. This wiring is in conduit. Concealed spaces may also contain lighting wiring which is in conduit or is aluminum sheath cable. Lighting wiring in the Main Control and Auxiliary Equipment Room is run in conduit. This wiring does not contribute combustibles as discussed in Fire Hazards Analysis section of the FPSR.

The computer sub-floor has cabling which is not in conduit. However, this area is protected by a total flooding Halon system.

Interior finishes in safety related areas have a flame spread, fuel contribution and smoke development rating of 25 or less with the exception of the following: plaster, gypsum wallboard, wallpaper, oil or water base painted surfaces, ceramic tile or panels, vinyl tile, vinyl-asbestos tile, linoleum, or asphalt tile on concrete.

Interior finishes have a flame spread rate and fuel contribution and smoke of development 25 or less except paint which has a smoke development of 125.

The plant design locates floor drains through the plant's buildings where required. Special consideration is given in those areas where fixed water spray systems and/or hose streams would put excessive quantities of water on the floor.

The water from the floor drains in non-radioactive areas is collected in several floor sumps where it is continually checked for radioactivity prior to being pumped to the Radwaste Treatment Area for processing.

Floor drains in potentially radioactive areas are drained directly into the Radwaste Treatment Area. Areas that may have combustible fluids (i.e. Diesel Generator Areas, Diesel Fuel Storage Areas) have floor drain systems and/or floor sumps for accumulation of fire water and combustible liquids. These floor drains are all trapped to prevent burning liquid from backing up through another floor drain and the sumps have their inlets under the normal water line.

Where flooding may be a problem, all mechanical plant equipment is mounted on pedestals, therefore, water accumulation on the floor will not be detrimental to equipment operation. Electrical equipment is generally mounted on pads; however, when not, water accumulation on the floor has been determined not to be detrimental to the equipment.

Floor drains and/or curbs are provided to prevent damage to safety related equipment in adjacent areas from automatic and/or manual fire suppression system operations.

C.5.b Safe Shutdown Systems

1) Introduction

In order that the objective of the Fire Hazards Analysis could be met, it was necessary to identify those systems normally required or which could be used to shutdown the plant. The criteria used to select those systems or portions of the systems for the safe shutdown list involved four categories. These four categories are:

1. Reactivity Control
2. Removal of Decay Heat
3. Maintaining Reactor Coolant Inventory and Pressure Control
4. Support Services for Categories 1 thru 3

Reactivity control is achieved by insertion of the control rods and by injection of boron into the Reactor Coolant System (RCS). Control rod insertion is accomplished by interrupting the electrical power to the control rod drive mechanisms. This allows rapid insertion of the control rods into the core region.

Boron injection is accomplished by using the Make-up System (MUS), a high pressure injection system, as the injection path for borated water. Borated water is obtained from the borated water storage tank (BWST) or by the injection of concentrated boric acid from the storage tanks directly into the suction of the MUS pumps.

Decay heat generated at the reactor core is removed by the Reactor Coolant System (RCS). Heat is removed from the RCS during hot shutdown conditions by the secondary side of the steam generators or during cold shutdown conditions by the Decay Heat Removal System (DHR).

Reactor coolant inventory is maintained by assuring the MUS a continuous supply of water. This water source is the BWST. The RCS inventory can be maintained by coordinating pressurizer level indication with the operation of the MUS.

Primary pressure control can be maintained by use of the pressurizer heaters on an "as required basis". A second method of pressure control is use of the pressurizer spray valve.

Support systems required for the systems in the first three categories fall into general classification such as: Electrical Power Distribution, Equipment Cooling, and Ventilation needed to maintain environmental conditions.

Another group of support systems which do not directly support a system but is of equal importance are lighting and communications systems.

Certain systems like Emergency Load Sequencer (ELS) and Emergency Power Sequencing System (EPSS) are electrical systems that sequence loading of the Emergency Diesel Generators (EDG) and provide automatic line-up of systems in response to a LOOP or ESFAS (Engineered Safety Feature Actuation System) condition. Since ESFAS is in response to a Design Basis Event (DBE) and Appendix R does not consider a DBE concurrent with a fire, that portion of EPSS which pertains to ESFAS was not considered for Appendix R treatment.

Appendix R considers two electrical power conditions; condition one is off-site power available and condition two is loss of off-site power (LOOP). With off-site power available, the ELS and EPSS systems will not be needed to perform their intended functions. During a LOOP, these two systems will be used at the beginning of Appendix R fire sequence of events and since both systems have a duration of use measured in minutes, they will subsequently be isolated electrically from the SSD circuits in order to prevent spurious operation during a fire.

2) Methodology

Systems required for Fire Induced Safe Shutdown (FISS) were selected from the WNP-1 Operating System List based on Babcock & Wilcox Standard Technical Specifications (NUREG 103), the FSAR and UE&C System Design Descriptions. 10 CFR 50 Appendix R criteria were applied to the preliminary list to further reduce the number of systems needing in-depth analysis.

The Appendix R criteria used to reduce the preliminary list were the following:

1. Appendix R postulates that a loss of off-site power can happen concurrently with a fire.
2. Single failure was not assumed to occur except to equipment that was damaged by the fire.
3. Design basis events do not occur simultaneously with the fire.

The resulting list of systems was used by the task force for in-depth analysis.

Each system, that was selected for in-depth analysis, was analyzed for applicable flow paths. Once a flow path was established, boundaries and other system interfaces were established. (See Exhibit 2 P&ID).

Boundaries were established based on the functional use of the system components, on the availability of normally closed manually operated valves, or on valves that will close upon receipt of a LOOP signal.

If an individual component is shared with another system, i.e. a tank, then its physical boundary is considered to extend into that system, and the boundary guidelines will be extended to the other system.

Choosing the system boundary using the above guidelines assures that fires will not cause a loss of system integrity; thus, the system's function will not be lost due to a breach of the system's boundary.

Exhibit 3 (Tab sheet) shows how each system was analyzed on a component by component basis. Those components not required are listed and a justification is given for why they are not needed.

Exhibit 1 (Anal. Summary) is a report prepared for each system analyzed. This report lists the reasoning, the minimum equipment, and any pertinent comments that were made during the analysis. A complete set of reports is available for review as required.

Table C.1 lists systems by name, the category they fall under, and the plant condition for which they will be used.

Category 1, 2, and 3 systems are briefly described below:

CATEGORY 1 REACTIVITY CONTROL

Reactor Protection and Control Rod Drive

The Reactor Protection System (RPS) performs the sole function of initiating a trip of all reactor control rods when plant conditions require such action.

The RPS actuates the trip breakers used to interrupt power to the control rod drives. The portions of the RPS & CRD systems that were given FISS analysis is the four trip breakers and the manual trip pushbuttons. The portion of the Control Rod Drive System (CRDS) analyzed is the power supply for the CRD mechanism holding current.

Chemical Addition and Boron Recovery System

The Chemical Addition and Boron Recovery (BRS) System is normally used to provide a chemical shim for reactivity control and to recover and recycle unused Boron from the RCS. A secondary use of the BRS is to provide a source of concentrated boric acid for use in the RCS. This provides an alternate method of shutting down the reactor (reactivity control). This is accomplished by pumping concentrated boric acid from storage tanks through filters (to remove any boric acid crystals) and injecting it into the Make-up pump suction for injection into the RCS via the high pressure injection flow path. The capability also exists for using the concentrated boric acid with DHR to maintain the cold-shutdown reactivity margin.

CATEGORY 2 REMOVAL OF DECAY HEAT

Reactor Coolant System

The reactor is a B&W 3800 MWt two loop pressurized water reactor. The RCS consists of two (2) Once Through Steam Generators, four (4) reactor coolant pumps, reactor vessel and pressurizer, and associated piping valves, controls and instrumentation. The RCS is used to remove and transfer reactor core heat to the secondary side of the steam generators or to the Decay Heat Removal System.

1 provide assurance that the RCS is capable of performing its function, the following guidelines were used in the Fire Induced Safe Shutdown analysis:

- A. The physical integrity of the RCS is maintained
- B. Circulation is established
- C. Pressurizer level is maintained
- D. Pressurizer pressure is controlled

Circulation is established when off-site power is available by use of one or more reactor coolant pumps, and when off-site power is not available by use of natural circulation. Natural circulation is enhanced by control of the steam generator secondary side water level and the auxiliary feedwater flow rate.

Pressurizer level is maintained by controlling make-up flow into the RCS.

Pressure is controlled by use of the pressurized Group #8 and #9 heaters, the Power Operated Relief Valves (PORV), code safety valves, and pressurizer spray.

Main Steam System

The Main Steam System (MSS) is the means of removing heat from the Reactor Coolant System (RCS) during startup, operation and normal shutdown of the reactor.

For Fire Induced Safe Shutdown conditions with off-site power available, the MSS is considered to consist of code safety valves, modulating atmospheric dump valves (MAD), main steam isolation valves, atmospheric dump valves, modulating turbine by-pass valves, and the high pressure turbine stop valves. These valves and associated piping, controls and instrumentation comprise the primary means of removing RCS heat and placing the reactor in a hot standby condition. The minimum components necessary for heat removal are the MAD valves. Thus, the Appendix R analysis concentrated on the minimum equipment needed.

Main Feedwater System

The Main Feedwater System (FWS) is the normal source of water for the steam generators. The system consists of 2 main feedwater pumps, 2 stages of pre-heaters and the associated valves and piping. The FWS system requires off-site power to run the condensate system (CND) which supplies water to the FWS. During a LOOP (Loss of Off-Site Power) the CND system is not functional.

The Steam Generator level indication belongs to the FWS. The level indication instrument loop will furnish level signals to the auxiliary feedwater steam generator level and feed rate control circuits.

Auxiliary Feedwater System

The Auxiliary Feedwater System (FWA) is the backup source of feedwater for the steam generators. The system consists of two motor driven pumps, one steam driven pump and associated piping valves, controls and instrumentation designed to assure that sufficient water is available to the steam generators for removal of decay heat from the RCS.

Each motor driven pump is powered from a separate emergency power bus. Each motor driven pump is normally lined up to a particular steam generator, while the steam driven pump is dedicated to both steam generators. Each motor driven pump can supply its alternate steam generators by operator action.

There are two sets of logic circuits which pertain to FWA. The first set involves the Engineered Safety Feature Actuation System (ESFAS) and this logic selects only the good steam generators to feed. The second set decides what the steam generator's level and feed rate should be depending on Reactor Coolant Pump status, temperature and pressure conditions in the RCS.

Decay Heat Removal

The Decay Heat Removal (DHR) system is used to remove decay heat from the RCS when the RCS temperature is below 305°F. The system consists of two motor driven pumps, two heat exchangers, and associated piping, valves, controls and instrumentation designed to assure sufficient heat removal capacity exists to put the reactor in a cold shutdown condition.

The DHR system is arranged into two independent trains. Each DHR train is supplied power from two sources. One source is normal power when off-site power is available, and the second source is emergency power. Emergency power is supplied from the emergency diesel generators.

Both DHR trains take a suction on the reactor coolant system loop 1A hot leg. The trains then separate into the two individual trains. The two DHR trains then return cooled water to the RCS via the two core flooding tank discharge lines. The two trains are redundant with either train capable of 100% cooling.

Nuclear Service Water System

The Nuclear Service Water (NSW) System is used to cool plant equipment during normal, abnormal and emergency conditions. Some of the systems and cooled components are Emergency Diesel Jacket Water System, Nuclear Instrument Air Compressors, Make-up Pumps, Component Cooling heat exchangers and the Shutdown Cooling Water heat exchangers.

The NSW System consists of piping, valves, controls and instrumentation designed to assure that sufficient water is available to remove the heat input from its serviced components. The NSW System has two independent sources of water. The normal source of water is the Balance of Plant Service Water System and the emergency source is the Emergency Shutdown Service Water System.

The NSW is arranged in a two train configuration. NSW Train "A" serves associated Train "A" components while NSW Train "B" serves associated Train "B" components.

Shutdown Cooling Water is a sub-system of the NSW. It is used to cool the Decay Heat Removal pumps and heat exchangers and the Containment Spray pumps and heat exchangers. The shutdown cooling water system is two independent and redundant closed loop cooling systems.

Each loop consists of heat exchangers, pump, expansion tank, piping, valves, controls and instrumentation to perform its design function. Each shutdown cooling water train is supplied power from a normal and emergency source.

The NSW system is automatically lined up for operation during a LOOP. In this configuration, ESW is supplying water to the NSW system. NSW flow to the cooled components is augmented or reduced according to the components use during a LOOP. It is the LOOP configuration that is analyzed for FISS conditions.

Emergency Shutdown Service Water System

The Emergency Shutdown Service Water (ESW) System is the ultimate heat sink. The ESW system supplies water to the Nuclear Service Water (NSW) system and in turn cools the return water from the NSW System. The ESW system is designed to perform its function as the ultimate heat sink when the plant is experiencing a Loss-Of-Off-Site Power condition or a design basis event.

The ESW system consists of a spray pond, pumps, piping, valves, control and instrumentation designed to assure sufficient water is available to the NSW system to remove its heat load. Except for the spray pond itself, the ESW system is arranged in a two train configuration. ESW Train "A" serves NSW Train "A" and ESW Train "B" serves NSW Train "B". ESW Train "A" is independent of and redundant to ESW Train "B".

The ESW system is supplied power from two sources. One source is normal power when off-site power is available, and the second source is emergency power. Emergency power is supplied from the emergency diesel generators.

The ESW system automatically starts and lines up for spray operation during a LOOP condition. It is the LOOP mode of operation that is analyzed for FISS conditions.

CATEGORY 3 MAINTENANCE OF REACTOR COOLANT INVENTORY & CONTROL PRESSURE

Make-up and Purification System

The Make-up and Purification (MUS) System provides for control of the RCS inventory, and control of the boron concentration in the RCS. The MUS also supplies the seal water to the RC pumps and make-up water for the Core Flooding System (CFS).

The MUS is part of Emergency Core Cooling during LOCA conditions, but that mode of operation is not considered under the guidelines for Appendix R review. The MUS system, for injection of water into the RCS, is configured in a two train, three pump line-up. Two of the three pumps are dedicated to Train "A" and Train "B" exclusively. The third pump is mechanically connected to both trains but requires local operator actions to valve it to a particular train. The pump also requires operator action to provide electrical power to it. The "A" and "B" train pumps are provided emergency power from the emergency diesel generators if off-site power is lost.

The purification, letdown and deboration portion of the MUS is not required for Fire Induced Safe Shutdown of the reactor and can be isolated by remote operated isolation valves. This isolation is not an automatic function and requires operator action.

The RCS Pump Seal injection and the borating function of the MUS is retained for FISS.

The Borated Water Storage Tank is considered the only reliable source of water for the MUS. The Make-up Pump Suction is shifted to the BWST by operator action of remote operated valves.

TABLE C.1

FIRE INDUCED SAFETY SHUTDOWN SYSTEMS

<u>System</u>	<u>Abbrev.</u>	<u>Category</u>	
		<u>HSTBY</u>	<u>CSD</u>
Control Rod Drive	CRD	1	1
Reactor Protection (Partial)	RPS	1	1
Chemical Addition & Boron Recovery (Partial)	BRS	1	1
Reactor Coolant	RCS	2	2
Main Feedwater (Partial)	FWS	2	-
Auxiliary Feedwater	FWA	2	-
Main Steam (Partial)	MSS	2	-
Demineralized Water Distribution (Partial)	DWD	2	-
Decay Heat Removal	DHR	-	2,3
Nuclear Service Water	NSW	4	2,4
Emergency Shutdown Service Water	ESW	4	2,4
Core Flood (Partial)	CFS	-	2
Make-up & Purification (Partial)	MUS	3	3
Containment Spray (Partial)	CSS	3	3
Nuclear Instrument Air (Partial)	IAC	4	4
Component Cooling Water (Partial)	CCW	4	4
High Pressure Steam Trap Returns (Partial)	HPR	4	-
Emergency Diesel Generator	EDG	4	4
Emergency Diesel Generator Fuel Oil	DFO	4	4
Emergency Diesel Generator Jacket Water	DJW	4	4
Emergency Diesel Generator Starting Air	DSA	4	4
Emergency Diesel Generator Intake & Exhaust	DIE	4	4

<u>System</u>	<u>Abbrev.</u>	<u>Category</u>	
		<u>HSTBY</u>	<u>CSD</u>
Emergency Diesel Generator Lube Oil	DLO	4	4
Vital Power Network	VPN	4	4
Auxiliary Power Network (Partial)	APN	4	4
Plant Lighting (Partial)	PLS	4	4
Plant Communication Network (Partial)	PCN	4	4
Heating, Ventilation & Air Conditioning (Partial)	HVAC	4	4
Spent Fuel Cooling & Purif. (Partial)(1)	FPC	*	*

ABBREVIATIONS USED: HSTBY: Hot Standby Condition
 CSD: Cold Shutdown Condition

*The FPC System is not a safe shutdown system but is given a safe shutdown analysis because of its function.

CATEGORY Nos.

1. Reactivity Control
2. Removal of Decay Heat
3. Maintenance Reactor Coolant Inventory & Pressure Control
4. Support Services for Categories 1 thru 3

C.5.b DECAY HEAT REMOVAL SYSTEM (DHR) EXHIBIT #1

ANALYSIS BASE: The DHR System is used to cool down the Reactor Coolant System (RCS) from a hot shutdown condition and to maintain the RCS in a cold shutdown condition.

ANALYZED MODE: The analysis of the DHR System was based on the assumption that it is placed into operation by the reactor operator verses automatic initiation e.g. ESFAS caused.

MINIMUM REQUIREMENTS: One pump, one heat exchanger and associated piping, valves, indication and control signals are available.

MINIMUM PARAMETERS OR CONTROL: DHR-FT-2A, FT-2B and their associated instrumentation loops are needed.

DHR-TE-4A, TE-4B and their associated instrument loops are needed.

All DHR remote operated valve controls, interlocks and indication are needed except DHR-V63-A and V64-B.

DHR-PMP-1A and PMP-2B controls, indications and interlocks are needed.

CONTENTS: DHR loop flow indication was selected because it would indicate the pump was running and a proper valve line-up exists.

DHR Heat Exchanger Outlet Temperature was selected because it would indicate that heat was being removed from the RCS when monitored over a period of time.

BWST, valves V1-A, V2-B, V63-A, V-64B and portions of the DHR that pertain to refueling operations are commented on as follows:

The BWST is used as the source of makeup water to maintain the water inventory of the DHR System, hence RCS System.

Valves V1-A and V2-B were analyzed for their effect on DHR System Fluid Boundary.

Valves V63-A and V64-B were analyzed as system boundaries because a failure of these valves

C.5.b DHR SYSTEM EXHIBIT #1 (Cont'd)

might lead to a significant loss of water from the DHR System. However, it was decided that the inadvertent opening of these valves would not constitute a problem since the flow path from these two valves is to the MUS Pump Suctions and thus back to the RCS.

The portions of the DHR System that are involved in refueling operations were analyzed for their effect on the System Fluid Boundary.

[illegible]

SECTION C.5.b

C.5.c Failure Modes and Effect Analysis Methodology

The Failure Modes and Effects Analysis (FMEA) involved all safe shutdown systems or equipment defined in Section C.5.b. The safe shutdown equipment was located by using physical location drawings. The physical location was then used to find the individual components fire zone. A complete listing of components by fire zone was then compiled for all safe shutdown equipment. The compiled safe shutdown equipment fire zone listing was used as the basis for performing the FMEA.

The FMEA Task Force Group assembled composite packages of equipment components corresponding to each area of analysis (Listed in Section 5 of FHA). The packages consist of system P&ID's with their respective zone equipment highlighted. The packages were assembled this way so the safe shutdown equipment could be FMEA'd on an area of analysis basis per the Appendix R criteria.

The results of the analysis identified components/equipment whose loss would impair safe shutdown of the reactor. These identified components/equipment were tabulated by area of analysis and the tabulation was submitted to the fire protection specialists as needing additional fire protection review for Appendix R requirements. The specialists would then determine the added protection needed for the equipment or provide justification. This result is shown in Section 10 of the Fire Hazard Analysis (FHA).

C.5.d Control of Combustible

The plant design calls for bulk compressed gas storage (hydrogen, carbon dioxide, oxygen, chlorine and nitrogen) to be well detached from major plant structures. The containers are oriented to minimize damage to any safety related equipment or structure in the event of a container failure. Fire protection will consist of use of nearby fire hydrants and hose houses.

C.5.e Electrical Cable Construction Cable Trays and Cable Penetrations

All electrical cabling, except lighting cable and a limited amount of communications cable in the plant, passes IEEE-383-1974 flame tests.

All cables installed in open raceway systems on WNP-1 are qualified per IEEE-383-1974.

All safety related cables conform to the provisions of Regulatory Guide 1.75.

All cable, conduit and cable tray penetration seals of fire barriers (Horizontal and Vertical) have been tested as providing the three hour rating of the fire barrier. The design of the fire barrier penetration seals shall meet, as a minimum, the requirements of ASTM E-119, Fire Test of Building Construction and Materials, including the hose stream test.

C.5.f Ventilation

Most ventilating systems consist of a recirculating air system with capability for fresh air intake and exhaust air. This capability can be utilized for purging an area of smoke and heat. However, since the General Services Building is a multi-story building, the ventilation ductwork must pass through several floors and/or area walls. Therefore, there may be several fire dampers in the duct system that will close in the event of a fire in its specific area. This would then entail the manual resetting of the fire dampers prior to purging the area.

The plant design incorporates ventilation systems for all cable tunnels and spreading rooms. These ventilation systems all have exhaust features in them and can be utilized as such. However, in the event of a fire, fire dampers in the system may close and smoke detectors in the system ductwork would de-energize the ventilation system. These dampers would have to be manually reset and the ventilation system manually restarted prior to smoke evacuation of an area. In addition, the air supply to some areas consists of the exhaust from other areas. For example, the cable spread room is supplied through unducted penetrations from the switchgear rooms below. Fire dampers in these penetrations are operated by ionization detectors in the switchgear areas to reduce smoke spread into the cable spread area. Smoke actuated fire dampers are also provided to prevent smoke spread from the computer room, peripheral rooms and training room to the control room through the recirculating HVAC system.

The plant ventilation system's designs do not specifically provide special smoke or corrosive gas exhaust systems. All exhausting will be done through the ventilation systems where possible or by use of portable equipment. The same design criteria are used in the Containment functions that assure public safety and in the habitability systems for the Control Room.

Radioactivity carried by the products of combustion will be monitored by portable monitoring equipment carried by the fire brigade and evaluated prior to discharge. The discharge will be done through the ventilation system for the areas and will be monitored at the building exhaust port prior to discharge to the atmosphere. Since the ventilation system shuts down and fire dampers in the system close in the event of a fire, all products of combustion are maintained in the fire area until purging is initiated manually.

Inadvertent operation of the exhaust portion of the ventilation system is minimized, since all fire dampers must be manually reset prior to system reactivation and the evacuation of the area.

The Atmospheric Cleanup Air Filtration units utilized in the normally operating ventilating systems of the following Category I areas of WNP-1 are provided with a bypass ventilation system that allows air from the redundant operating system to pass air over the charcoal filter of the standby unit. This flow of air is sufficient to maintain the charcoal filters, if they are "loaded" with radioactivity, at a temperature below the auto-ignition temperature of

radioactive charcoal. Normally clean charcoal will not auto-ignite. The use of this bypass ventilation system is in compliance with Regulatory Guide 1.52, Rev. 1, dated July 1976, paragraph "K" of Section 3, "Component Design Criteria and Qualification Testing."

HVAC SYSTEMS WITH CHARCOAL FILTERS

Control & Auxiliary Equipment Room	(HCL)
Fuel Storage Area	(HSF)
Safeguards Area	(HSG)
Piping & Electrical Areas	(HPT)
Component Cooling Auxiliary Area	(HCA)
Containment Purge	(CPP)

Charcoal filters are contained within a double walled steel casing. Ignition of the charcoal will destroy the filters, but the fire will be contained within the casing. All charcoal filtration units will have high temperature alarms which will annunciate in the Control Room. Charcoal filters are provided with water spray systems that will be manually activated if the auto ignition temperature is reached. There will be no significant release as a result of this activation. All charcoal filtration units and their combustible loading were evaluated in the Fire Hazard Analysis of their particular fire area.

The plant design has fresh air intakes for all ventilation systems for the General Services Building located in the side of the building. This building houses the bulk of the safety-related equipment. The exhaust plenum and outlet for all of these ventilation systems is located on the roof of the General Services Building. The intake louvers located on the south wall and the exhaust louvers located on the north wall are horizontally separated by 205'-0" and vertically separated by 15'-0". In addition, the air intake for the Control Room is located in three (3) remote areas (one on the building and two (2) remotely located - approximately 2200 feet apart). Air for the Control Room is monitored for smoke and receives air from an uncontaminated air intake. The remoteness of the building air intakes and exhaust air outlets will prevent the possibility of contaminating the intake air with the products of combustion.

C.5.g Lighting and Communication

Emergency lighting and two-way voice communication for WNP-1 are as follows:

- a. Normal lighting systems in the Containment Building and GSB will be supplemented by emergency lighting systems powered by station batteries

and standby diesel generators. This emergency lighting, including exit lighting, will be wired through EMT conduit or by type ALS cable.

Special emergency lighting will provide adequate illumination in all areas required for safe shutdown of the reactor. These areas include, for example, the control room complex, remote shutdown panel areas and stairwells, corridors and other access/egress routes thereto. The special emergency lighting will consist of individual lighting units with self-contained eight (8) hour battery packs and automatic chargers. Loss of normal AC power to a unit will cause automatic switching to battery power.

In the control room complex and remote shutdown panel areas in particular, the special emergency lighting will consist of strategically chosen normally lit fluorescent lamps. Each battery pack unit, one per lamp, will be fitted with an inverter to provide emergency AC power.

- b. Suitable sealed beam battery powered portable hand lights will be made available for use by the fire brigade or other emergency personnel.
- c. In addition to telephone systems, there will be fixed emergency communications consisting of sound powered phone jacks at preselected and strategically located stations throughout the plant. Wiring for this system is routed in an embedded raceway system.
- d. In addition to telephone systems, there will be two base stations installed to permit the use of portable radio communications units in the majority of the plant.

C.6 Fire Detection and Suppression

C.6.a Fire Detection

The plant fire detection system design will, as a minimum, comply with NFPA 72D, "Proprietary Signaling Systems."

Fire detection systems are located in all fire areas and zones containing safety related and safe shutdown equipment and will give early warning and also actuate some fire suppression systems.

The fire detection systems sound audible alarms in the local area and indicate both visually and audibly in the Control Room on the Main Fire Protection Panel (MFPP). Visual indication will be given on the MFPP along with a permanent printed record for all trouble and alarm conditions for each fire zone. Local fire detection panels will be located outside the entrance of the protected area and indicate the fire zone in alarm or trouble.

Fire alarms will have a distinctive sound from other plant system alarms.

The fire detection and actuation systems will be powered from emergency power supply within each control panel. All components of the MFPP system will have integral emergency power supplies. The MFPP system is designed and installed to meet the requirements for Class A circuits as defined in NFPA 72D, 1975.

Local Fire Detection Panels (FDP) which report to the MFPP are designed and installed to meet the requirements of Class "B" circuits as defined in NFPA 72A, "Local Protective Signaling Systems." Local panels which activate suppression systems in safety related areas utilize Class "A" wiring for initiation circuits.

NFPA 72E, "Automatic Fire Detectors" is used as a guideline for the selection and installation of fire detectors in the plant.

C.6.b Fire Protection Water Supply System

The primary water supply for fire protection is the Circulating Water System. This is a recirculating system with no consumptive uses. Water is lost from this system only due to evaporator cooling and blowdown. The fire pump installation conforms to NFPA 20, "Standard for the Installation of Centrifugal Fire Pumps" and consists of three (3) 50% UL listed fire pumps and controllers, two electrically driven and one diesel engine driven, each capable of delivering 2000 gpm. The diesel driven pump has power supply and controls independent from the electrically driven pumps. The pumps are located in the Circulating Water Pump House in individual rooms whose perimeters have a minimum three (3) hour fire rating. The pumps feed a common header that is connected to the fire main loop at two (2) locations -at each end of the pump house and is sectionalized outside the pump house by post indicator valves so that the fire main loop can be fed from either, or both, connections.

The fire pumps take suction from a common sump shared with the four circulating water pumps and the three plant service water pumps. The sump is fed from the three cooling tower basins, each containing over 1.5 million gallons of water. Therefore the total inventory above the fire pumps suction is over 4.5 million gallons. This level is maintained automatically by the Plant Make-up Water System which consists of two normally operating and one spare, 10,000 gpm pumps taking suction from the Columbia River. Two diesel driven make-up pumps can supply 1,000 gpm each to the fire pump sump in the event of a loss of off-site power.

The secondary water supply for fire protection will be provided by a ground level storage tank that will supply three UL listed fire pumps. The water storage tank will contain a minimum of a two hour supply based on the maximum water demand plus 500 gpm for hose streams dedicated for fire protection by a passive means. The fire pump installation is completely separate from primary supply pumps and are installed in conformance with NFPA 20. The fire pumps are each 50% pumps, two electrically driven and one diesel engine driven, that pump 2000 gpm each. The complete design for the secondary water supply system has not been completed at this time. Additional details will be provided in the next amendment.

Alarms indicating "fire pump running," "driver not available," and "failure to start," among others, are provided in the control room.

The underground fire main loop is designed and installed to furnish the anticipated fire water requirements in conformance with NFPA 24, "Standard for Outside Protection."

The pipe installed is cement lined to inhibit internal tuberculation.

The Circulating Water System is treated with chlorine to control biofouling and sulfuric acid to maintain pH for scale control. The fire system has provisions for flushing.

Sections of the main can be isolated, during periods of maintenance and repair by closing approved sectional post indicator valves that are equipped with visual indicators.

The fire main system piping exclusively serves the fire protection system. All interior main and branch system control valves are electrically supervised in accordance with NFPA 26, "Supervision of Valves" and indicate on the Fire Protection Panel in the Control Room.

The outside PIVs are not electrically supervised, but all have visual indication of being opened or closed and will be locked in the appropriate position. To assure that the valves are locked in the proper position, an administrative program will be set up to supervise these valves including a strict key control, tamper proof seals, and a periodic preventive maintenance program to provide a visual check of all valves.

The hydrants on the plant loop are located approximately 250 feet apart. Each hydrant is supplied by a lateral from the yard main, and each lateral is provided with a curb box valve.

Each hydrant is provided with a hose house which is furnished considering the recommendations of NFPA No. 24. A typical hose house contains 400 feet of 2 1/2" and 200 ft of 1 1/2" hose in 50 foot lengths. The hose is double jacketed and rubber lined.

All threads used on standpipe risers, hose couplings and hydrants are National Standard Fire Hose Thread and are compatible with equipment used by the DOE fire department.

C.6.c Water Sprinkler and Hose Standpipe Systems

1) Water Sprinkler Systems

NFPA 13, "Standard for the Installation of Sprinkler System" is utilized for guidance in the design and installation of automatic sprinkler systems. The design and installation of water spray systems utilize NFPA 15, "Standards for Water Spray Fixed Systems" for guidance.

Automatic sprinkler wet pipe or preaction systems, where employed, will be installed to prevent water from damaging any equipment. Areas containing automatic water suppression systems are provided with floor drains and/or sump pump facilities.

2) Hose Standpipe Systems

The fire protection system has hose stations located throughout all buildings and on all floors, including the Containment, such that all areas can be reached with a maximum of 100 feet of hose. Each hose station consists of a 2 1/2" hose connection with a 2 1/2" valve, 1 1/2" pressure reducer, 100 feet of 1 1/2" woven jacket lined fire hose and suitable nozzle. The hose stations are supplied by standpipes with a minimum diameter of 4".

Standpipes, in general, are in the stairwells with hose stations located outside the stairwell entrances on each floor for Class II use. A 2 1/2" hose connection is located in the stairwell at each floor for Class I use. Class III stations are located where needed to meet the maximum spacing requirements.

The standpipe system in the General Services and Containment Buildings is seismically supported and installed in accordance with ANSI Standard B.31.1

A cross-connection between the standpipe header and a Seismic Category I water system, the Nuclear Service Water System (NSW), is made through a connection with a manually operated valve to provide the standpipe system for the entire GSB Building and Containment Building with a Seismic Category I water supply. The NSW System is capable of supplying Class II hose streams

at a reduced pressure. Failure of the fire protection system will in no way degrade the function of the NSW system.

All standpipe hose stations in areas with concentration of electrical equipment will be equipped with adjustable fog nozzles approved for use on Class C fires by Factory Mutual and/or listed by Underwriter's Laboratories, Inc.

Other hose stations will use hose nozzles appropriate to the equipment and/or area to be protected from fire.

The standpipe system design has a header through the General Services Building that is an extension of the yard main system and each header connects with the yard main system at two (2) remote points. The headers are controlled by post indicator and isolation valves so that a single failure of the system does not create a lack of water supply to the building. Sprinkler systems and standpipe systems therefore have independent connection to the yard main system through either building header or the yard main itself. Each system takeoff has a separate valve, either OS&Y or other approved shutoff valves, and a water flow alarm.

C.6.d Halon Suppression Systems

Halon suppression systems utilize Halon 1301 and comply with the requirements of NFPA-12A, "Halon 1301 Fire Extinguishing Systems."

A total flooding Halon gas extinguishing system is installed under the raised floor of the computer room.

A total flooding Halon gas extinguishing system is installed in the QA Records Storage Vault. The air conditioning and ventilation system for this area has fire dampers in all ducts that will close upon actuation of the Halon system to maintain the concentration.

C.6.e Carbon Dioxide Suppression Systems

There are no carbon dioxide suppression systems presently utilized at WNP-1.

C.6.f Portable Extinguishers

Portable fire extinguishers will be provided in accordance with guidelines of NFPA 10 and 10A, Portable Fire Extinguishers, Maintenance and Use.

Four types of portable fire extinguishers will be specified as follows:

- a. Halon
- b. Dry Chemical
- c. Pressurized Water
- d. Carbon Dioxide

Extinguishers are selected and installed with considerations given to combustibles in the area; such as paper and wood, liquid fuel and/or electrical equipment.

Dry chemicals will be used in plant areas where such hazards as combustible liquids exist and where other extinguishing agents are of limited effectiveness. The cleanup problems associated with the use of dry chemicals are recognized. Cleanup procedures will be developed and covered in training classes as will the possible adverse effects on equipment.

The specific location of portable fire extinguishers will be developed at a later date.

C.7 GUIDELINES FOR SPECIFIC PLANT AREAS

C.7.a Primary and Secondary Containment

The detection system will alarm with a visual indication of the alarmed zone at the local panel located outside the Containment at the personnel hatch. An audible alarm will be given inside the Containment. An audible and visual alarm will be given in the Control Room indicating the fire zone. The detection system consists of ionization and photoelectric detectors.

Each of the four (4) containment recirculation ventilation fans is located in an individual fire zone and draws air from the Containment, from its zone, thus causing the detection system in that zone to act as a general alarm if the ventilation system draws smoke prior to another zone's detection system detecting it.

All of the necessary equipment and accessories required to allow the fire brigade to enter the Containment and attack the fire will be located outside the Containment personnel hatch. This equipment will include; self-contained breathing air packs, portable fire extinguishers, including 200 lb. wheeled units, and radiation detectors. The Containment contains a permanent seismically supported standpipe system with hose stations.

Administrative procedures and control will be initiated for use during refueling and maintenance operations in the Containment. They will include provisions for fire watches and the availability of self-contained breathing units, portable hand fire extinguishers and 200 lb. wheeled fire extinguishers.

Each Reactor Coolant Pump Motor contains 397 gallons of lubricating oil. The major concerns regarding the potential for an oil related fire are an internal motor fire, or an external fire caused by leakage of oil from the motor on to the pump. During normal operations the pump casing could be hot enough to cause the oil to auto-ignite.

The probability of a major internal lube oil fire is low because of the absence of a heated surface to ignite the oil and the lack of limited surface area for burning. The small amount of oxygen inside the motor would quickly cause the fire to go out.

Regarding the potential for an external fire, two principle sources of leakage have been considered on other reactor coolant pump motor designs in the past. One source has been a failure of the piping in the high pressure lube oil system. The other has been a failure of the cooling water line to the oil reservoir cooler inside the reservoir. The cooling water failure would flood the reservoir causing it to overflow via the overflow nozzles and possibly down the shaft. Traditionally, a sheet metal drip pan/splash collar which is piped to a collection tank has been used to satisfy the above concerns.

The AEG motors which are used on WNP-1 are designed so as to preclude either of these events. All of the high pressure piping is contained within the motor. This eliminates the possibility of external leakage from any type of high pressure lube oil pipe ruptures. Also, the upper and lower bearing reservoirs are provided with large overflows to prevent the oil level from reaching the top of the reservoir standpipe in the event of a cooling water failure inside the reservoirs. The overflows from each pair of reactor coolant pumps lead via seismic Category I piping to a 500 gallon seismic Category I collection tank. The tank has a high level alarm and an overflow which is piped to a covered containment sump. This piping is also seismic Category I.

In addition, the motors are seismically analyzed to preclude external oil leakage during an earthquake. They have high level alarms in the bearing oil reservoirs and the sight glasses are normally covered and sealed unless actually being used during filling and draining operations.

Other design details of the motors are currently being evaluated with B&W to confirm that there are no other credible sources of leakage.

C.7.b Control Room Complex

The Control Room Complex is designed with 3-hour fire rated perimeter walls, floor, and ceiling, and with equivalent 3-hour fire rated doors. The complex consists of several rooms, including the Computer Room. The Computer Room enclosure is a separate fire area with equivalent 3-hour fire rated barriers. The peripheral rooms which include offices, kitchen and toilet, are separated with a 1-hour fire rated barrier and are sprinklered. The contents of these rooms are standard combustibles such as paper, wood, plastic, etc. Each room, therefore, will have ionization detectors for early warning alarm sounding in the Control Room and at the Main Fire Protection Panel (MFPP). Fire protection within the Control Room will be by portable extinguishers and backed up by hose stations outside the Control Room.

In addition, all consoles and cabinets which contain redundant Class 1E equipment will contain ionization detectors. These detectors will, in an alarm condition, sound signals in the Control Room, illuminate a light on the affected console or cabinet, and alarm at the MFPP.

Protection will be by portable extinguishers backed up by hose stations located outside the Control Room.

The hose stations will utilize hoses with electrical type nozzles. All fire alarms in other parts of the plant will alarm in the Control Room on the MFPP and fire fighting direction will originate from there.

Breathing apparatus will be available in the Control Room for use by Control Room personnel.

The Control Room ventilation system is common with the training room, computer room and peripheral rooms. It is supplied with air through one of the three

(3) remotely located intakes. Each intake will have smoke detectors which will indicate in the Control Room, allowing the selection of the cleanest of the three (3) intakes to supply air to the Control Room. Operation of all three (3) intakes will be under the surveillance of Control Room personnel with manual operation selection capability. The exhaust portion of the ventilation system which is through the kitchen and toilet will also be under the surveillance of Control Room personnel.

All cables entering the Control Room will terminate there.

The plant can be brought to a safe shutdown by utilizing the remote shutdown panels which are located in other fire areas.

C.7.c Cable Spreading Room

The Cable Spreading Area has wet pipe sprinkler systems throughout the area to control a fire occurring in the area. Detection will be by ionization detectors for early warning. The Detection system will alarm locally and in the Control Room.

Hose stations and portable extinguishers will be provided as secondary suppression.

The Cable Spreading Area is enclosed by 3-hour fire rated walls, floor, ceiling, and doors. Divisional cable separation is accomplished by installing primary and backup cable systems in separate cable trays as per Regulatory Guide 1.75.

The plant design has four (4) remote and separate entrances to the cable spreading area, two are located on each floor level.

The design of the cable spreading area will provide 3-foot wide aisles with 8 ft. high clearances for fire fighting access throughout most of the area. Some double tray stacks are separated by less than 3 feet, but are accessible from either side of the double stack for fire fighting.

The Cable Spreading Room meets the guidelines of Regulatory Guide 1.75.

Cables will not be coated with a fire retardant coating because of: the quality of the cable insulation which meets IEEE-383-1974 requirements; the plant's remote shutdown capabilities, and of the automatic wet pipe sprinkler system provided throughout.

Also, remote shutdown capability with all cabling independent of the Cable Spreading Room is provided.

C.7.d Plant Computer Room

The Plant Computer Room, which is not safety related, is part of the Plant Control Room complex. The room itself is contained in 3-hour fire rated

walls, floor, and roof with equivalent 3-hour fire rated doors and dampers. The room has a metal deck raised floor with the underfloor area protected by a fixed Halon system actuated by cross-zoned ionization detectors.

The Computer Room fire protection system has area ionization detectors for an early warning and sounding alarm locally and in the Control Room and at the MFPP. Portable extinguishers backed up by hose stations outside the Control Room are provided.

C.7.e Switchgear Rooms

The Switchgear Rooms are separated from the remainder of the plant by 3-hour fire rated barriers. A very limited quantity of power cables will pass through the Switchgear rooms. Most power cables entering a Switchgear Room will terminate there.

Hose stations and portable extinguishers are provided in the area with nozzles appropriate for the hazard. Ionization detectors are installed through the area which will alarm locally and in the Control Room.

C.7.f Remote Safety Related Panels

The areas housing the Remote Safety Related Panels (Zones SL5-5B and SL5-5D) are provided with ionization detectors that will alarm locally and in the Control Room.

Portable extinguishers and hose stations are also available in the area.

Administrative procedures will establish a surveillance program and instruct personnel in proper housekeeping methods to keep combustible material in the area at a bare minimum in order to limit the possibility of fire.

C.7.g Safety Related Battery Rooms

The station battery rooms are located in the Switchgear Area in the plant design. Each Battery Room is contained in a 3-hour fire rated enclosure with equivalent 3-hour fire rated doors. The Battery Rooms have normal exhaust through fixed ducts to outside and emergency fans which exhaust to the Switchgear Rooms in the event of a hydrogen buildup in the Battery Room.

The IE motors for the ventilation fans receive power from the diesel generators.

The fire protection system for these areas will be ionization detectors for early warning, sounding an alarm locally and in the Control Room, and portable fire extinguishers backed up by hose stations located in the Switchgear area. A loss of ventilation alarm which sounds in the Control Room is provided for each Battery Room.

C.7.h Turbine Building

There are no safety related systems in the Turbine Building. The hydraulic control fluid is fire retardant.

The lube oil reservoir tank in the Turbine Generator Building will be housed in a room enclosure of 3-hour fire rating including an equivalent 3-hour fire rated door. The fire protection system is an automatic deluge system actuated by thermal detectors. Detectors sound an alarm locally and in the Control Room. Secondary suppression capability is provided by local hose stations.

The Turbine Building and Water Treatment Building are separated from the Isolation Building by a 3-hour rated fire barrier.

C.7.i Diesel Generator Areas

The plant design has the fuel oil day tanks (550 gallons each) and associated piping located in each of the Diesel Generator areas. Each diesel generator and its day tank is located in a room designed with 3-hour fire rated walls, ceiling and equivalent 3-hour fire rated doors.

Platforms around the diesel and generator are of unprotected steel. In the event a floor fails, the extent of damage will be limited to the subject area and safe shutdown will not be impaired.

The fire protection system in this area includes an automatic deluge sprinkler system covering the day tank, diesel engine and its associated oil piping with the system actuated by thermal detectors. The area beneath, around and above the diesel generators are protected by an automatic preaction sprinkler system actuated by thermal detectors. All detection systems will alarm locally and in the Control Room.

C.7.j Diesel Fuel Oil Storage Areas

The Diesel Fuel Oil Storage Tanks are located in their own underground rooms. These rooms are attached to the General Services Building and access to the rooms is through the Diesel Generator Cells. The tanks are part of the safety related systems and are designed as seismic Category I equipment. They also comply with NFPA 30, "Flammable and Combustible Liquids Code".

The rooms are designed with 3-hour fire rated walls, floor and all doors are equivalent 3-hour rated. The floors of the rooms are depressed below the entrances to the rooms so that in the event of a spill, the room will hold the entire contents of the storage tank. Each room has a sump and pumps to pump any spills to a waste disposal area.

The fire protection system for these tanks consists of automatic open head deluge systems actuated by a thermal detection system. The detectors will sound an alarm locally and in the Control Room. Backup is by local hose stations and portable extinguishers.

C.7.k Safety Related Pumps

The fire protection system does not call for automatic sprinkler protection of pump houses and rooms housing safety related pumps. Piping penetrations through the fire barriers will be provided with 3-hour fire rated material approved for penetration seals. Curbing and drains in the areas will keep water away from safety related equipment.

The fire protection system for each pump area has ionization detectors which alarm locally and in the Control Room, and utilizes local hose stations and/or hydrants and portable fire extinguishers.

C.7.l New Fuel Area

The fire protection system for the fuel storage area and the adjacent fire areas will be fully operational prior to receiving fuel on site. The program will include contingency plans, fire brigade operational plans, a fire stand-pipe system and fire detection systems.

Portable extinguishers will be located in the area with local hose stations in close proximity. The smoke detection system will alarm locally and in the Control Room.

C.7.m Spent Fuel Pool Area

Portable extinguishers are located in the area with hose stations in close proximity. The smoke detection system will alarm locally and in the Control Room.

C.7.n Radwaste and Decontamination Areas

Radwaste and Decontamination Areas are provided with ionization detectors throughout which alarm locally and in the Control Room. Portable extinguishers and hose stations are provided for manual suppression capability. Selected portions of the Radwaste and Decontamination Areas are protected by automatic wet pipe sprinklers, the water will drain the LIQUID Radwaste area sumps. The ventilation system is capable of isolation.

All flammable liquids will be stored in approved safety containers.

C.7.o Safety Related Water Tanks

Local hose stations and portable fire extinguishers are provided in the vicinity of safety related water tanks. Ionization detectors alarm locally and in the Control Room.

C.7.p Records Storage Area

The Records Storage Area is located in the General Services Building. The area is enclosed with 3-hour fire rated barriers. The storage area is provided

with ionization detectors which will alarm locally and in the Control Room. Automatic suppression is provided by a Halon Extinguishing System actuated by cross-zoned ionization detectors.

Hose stations and portable extinguishers are provided for manual suppression.

C.7.q Cooling Towers

The cooling tower basins are not used as the ultimate heat sink. The towers are constructed of non-combustible materials and the basin is sized large enough to supply 6,000,000 gallons of water for fire protection.

C.7.r Miscellaneous Areas

The plant design has located all miscellaneous areas so that a fire or effects of a fire, including smoke, will not adversely affect any safety related systems or equipment. Electric auxiliary boilers are used eliminating the need for auxiliary boiler feed oil tanks.

C.8 Special Protection Guidelines

C.8.a Storage of Oxygen and Acetylene Gases

The use of oxygen and acetylene inside buildings will be controlled by administrative procedures. Acetylene and oxygen cylinders to be used during plant maintenance will be stored in an open caged storage area in the Turbine Generator Building. The storage will be protected by a water suppression system.

Administrative procedures based on NFPA 51, Oxygen Fuel Gas Systems for Welding and Cutting and 51B Cutting and Welding Processes, requirements will be initiated for these gases in the plant.

C.8.b Storage Areas for Ion Exchange Resins

Storage areas for ion exchange resins will not be located near safety related areas. The resin storage areas will be protected by automatic wet pipe sprinklers. Detection will be by smoke detectors for early warning which will alarm locally and in the Control Room. Local hose stations and portable extinguishers will provide backup.

C.8.c Hazardous Chemicals

Hazardous chemicals will be stored and protected in accordance with NFPA 49, "Hazardous Chemicals Data" in well-ventilated storage areas.

Hazardous materials will be closely controlled. Their hazardous properties will be reviewed and protection provided commensurate with their inherent hazards.

C.8.d Materials Containing Radioactivity

When materials which collect and contain radioactivity are removed they will be properly stored in an otherwise combustible-free and protected area. If required, consideration will be given to the removal of isotopic decay heat from the material.

WNP-1
FPSR

REACTOR CONTAINMENT BUILDING

<u>AREA OF ANALYSIS</u>	<u>ELEV.</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>	<u>REF. DWG.</u>
All 36 Zones (1AA thru 1DH)	-	Reactor Containment	D.1-1	XR-FIG-A1, A2, A3 A4, A5, A6

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Containment Building
- 2.0 AREA OF ANALYSIS: All 36 Zones (IAA thru IDH)
- 3.0 AREA DESCRIPTION: Reactor Containment
- 3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours
3.1.4	<u>Openings:</u>		

Doors: Personnel and equipment hatches of steel equivalent to 3 hour fire resistance rating.

Dampers: None

Penetrations: Sealed at barrier to Isolation Building and General Services Building with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied from CFC-HVAC system

Emergency: Smoke exhaust through normal system for radioactive material control.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: From GSB through personnel hatch and from exterior through equipment hatch.

FIRE HAZARD ANALYSIS

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u>x</u>	<u> </u>

4.0 FLOOR AREA: 3,090,000 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

Containment Building (All 36 Zones):

C-A-1-A: CSS-V41A, CSS-V42B, DHR-V76B, DHR-V125B, DHR-V75A, DHR-V133A.

C-A-1-C: CCW-ZS-2944, CCW-ZS-4134, CC-ZS-2945, CCW-ZS-4135, CCW-V521, CCW-V92, CCW-V202A, CCW-V195, CCW-V532, CCW-V533, CCW-V523, CCW-V534, CCW-V280, CCW-V536, CCW-V491, CCW-V549A, CCW-V548B, CCW-314B, CCW-V317, CCW-V535, MUS-V249, MUS-V247, MUS-V245, MUS-V243, MUS-V413, MUS-V408, MUS-V279A, MUS-V382, MUS-V251A, MUS-V354, MUS-V424, MUS-V252A, MUS-V260B, MUS-V472, MUS-ZS-39D, MSS-V169, MSS-V168, RCS-V73, RCS-V30.

C-A-1-D: MUS-V282A, MUS-V401, MUS-V281A, MUS-V396, MUS-V280A, MUS-V389, MUS-ZS-39A, MUS-ZS-39B, MUS-ZS-39C.

C-A-1-E: DHR-V23A, DHR-V157A, DHR-V304A, DHR-V137A, DHR-V25A, DHR-V166A, DHR-V29A, DHR-V24B, DHR-V129B, DHR-V156B, DHR-V305B, DHR-V26B, DHR-V28B, DHR-V30B, DHR-V182B, DHR-ZS-12B, DHR-ZS-6389, DHR-ZS-11B, DHR-ZS-6388, DHR-ZS-12A, DHR-ZS-11A, CCW-V284, CCW-FE-1127, CCW-V286, CCW-V287.

C-A-1-F: MUS-TE-3, MUS-TE-12B4, MUS-ZS-2A, MUS-TE-12B4, MUS-ZS-2A, MUS-TE-1283, MUS-ZS-2B, MUS-ZS-1B, MUS-ZS-1A, MUS-V3A, MUS-V422, MUS-V4A, MUS-V423, MUS-V268, MUS-V267, MUS-V2B, MUS-V1A, MUS-HX-1, MUS-HX-2, MUS-V277, MUS-V276, CCW-V342A, MUS-TCV-1283, MUS-V343B, MUS-TCV-1284.

C-A-1-G: CFS-V35A, CFS-V52A, CFS-V53A, CCW-V350A, CCW-V344A, CCW-V352A, CCW-V354A, CCW-V356A, CCW-V358A, CCW-V351B, CCW-V345B, CCW-V353B, CCW-V355B, CCW-V357B, CCW-V359B.

C-A-1-I: CFS-ZS-1B1, CFS-ZS-1B2, CFS-ZS-1B3, CFS-V32B, CFS-V34B, CFS-V54B, CFS-V55B.

FIRE HAZARD ANALYSIS

C-B-1-A: FWS-LT-10A3, RCS-LT-14-5, RCS-LT-14-6, RCS-PT-16-1, RCS-PT-16-2, RCS-PT-5A2, RCS-FT-1A3, RCS-FT-1A6, RCS-FT-1A4.

C-B-1-B: RCS-PT-5A1, RCS-FT-1A1, RCS-FT-1A5, RCS-FT-1A2, FWS-LT-10A2.

C-B-1-C: RCS-PT-5B1, RCS-FT-1B1, RCS-FT-1B5, RCS-FT-1B2, FWS-LT-10B2.

C-B-1-D: RCS-PT-5B2, RCS-FT-1B3, RCS-FT-1B6, RCS-FT-1B4, FWS-LT-10B3.

C-B-1-E: RCS-V2B, RCS-V1A, RCS-V33, RCS-V34, RCS-V3A, RCS-V4B, RCS-V21, RCS-V22, RCS-V8, RCS-V19, RCS-V32, RCS-V25, RCS-V26, RCS-V74, RCS-V67, RCS-V27, RCS-V75, RCS-V24, RCS-V68, RCS-V88, RCS-V10, RCS-V89, RCS-V11, RCS-V90, RCS-V12, RCS-V91, RCS-V13, RCS-V92, RCS-V14, RCS-V93, RCS-V15, RCS-V94, RCS-V16, RCS-V95, RCS-V17, RCS-ZS-10, RCS-ZS-17, RCS-ZS-11.

C-B-1-F: CCW-ZS-1309, CCW-V390, CCW-V392, CCW-FCA-2, CCW-FCA-6, CCW-V398, CCW-V394, CCW-V396, CCW-V400, CCW-V402B, CCW-FE-1310, CCW-V404, CCW-V406, RCS-TE-4A6, RCS-TE-3A4, RC-V113, RCS-V114, RCS-V117, RCS-V118, RCS-V41, RCS-V42, RCS-V82, RCS-V83, RCS-V76, RCS-V69, RCS-V47, RCS-V56, RCS-SG-1A, RCS-PMP-2, MUS-V719, MUS-V246, MUS-V261B, MSS-V144, MSS-V130, MSS-V115, MSS-V146, MSS-V117, MSS-V131, MSS-OR-1, MSS-V41A, FWA-V63A, FWS-V69A, FWS-V95A, FWS-V70A, FWS-V96A, FWS-V18A, FWS-45A, FWS-132, FWS-V134.

C-B-1-G: MUS-V718, MUS-V262B, MUS-V244, MUS-V262B, RCS-V115, RCS-V116, RCS-V111, RCS-V112, RCS-V39, RCS-V40, RCS-V80, RCS-V81, RCS-FE-1A, RCS-V77, RCS-V70, RCS-V51, RCS-V53, RCS-PMP-1, SGC-V17, SGC-V19, SGC-V23, SGC-V25, SGC-V27, SGC-V29, SGC-V83, SGC-V84, FWS-V66A, FWS-V92A, FWS-113A, FWS-V114A, FWS-V67A, FWS-V93A, FWS-V68A, FWS-V94A, FWS-V43A, FWS-V44A, FWS-V12B, FWS-V130, FWS-V109A, CCW-V389, CCW-V391, CCW-FCA-1, CCW-FCA-5, CCW-V397, CCW-V393, CCW-V399, CCW-V401A, CCW-FE-1298, CCW-V405, CCW-V403, CCW-ZS-1297.

C-B-1-H: CFS-ZS-1A1, CFS-ZS-1A2, CFS-ZS-1A3, CFS-V33A, CFS-V31A.

C-B-1-J: CCW-ZS-1285, CCW-ZS-1286, CCW-V288A, CCW-V318, CCW-V320, CCW-FCA-4, CCW-FCA-8, CCW-V326, CCW-V322, CCW-V324, CCW-V330, CCW-V334B, CCW-FE-1334, CCW-V336, CCW-V337, CCW-V313B, CCW-FE-4926, CCW-V558, CCW-V559, CCW-V560, CCW-V561, RCS-TE-4B6, RCS-V64, RCS-V61, RCS-V59, RCS-V43, RCS-V71, RCS-V78, RCS-V119, RCS-V120, RCS-V123, RCS-V124, RCS-V35, RCS-V36, RCS-V84, RCS-V85, RCS-V28, RCS-PMP-4, MUS-V721, MUS-V250, MUS-V253A, MSS-V44B, MSS-V128,

FIRE HAZARD ANALYSIS

MSS-V119, MSS-V129, MSS-V121, SGC-V21, SGC-V28, SGC-V30,
SGC-V26, SGC-V85, FWS-V71B, FWS-V97B, FWS-V115B, FWS-V116B,
FWS-V72B, FWS-V98B, FWS-V73B, FWS-V99B, FWS-V30B, FWS-V48B,
FWS-V140, FWS-V142, CFS-V36B.

C-B-1-K: RCS-TE-3B4, RCS-V72, RCS-V79, RCS-V87, RCS-V37,
RCS-V86, RCS-V38, RCS-V125, RCS-V126, RCS-V121, RCS-V122,
RCS-FE-1B, RCS-PMP-3, CCW-ZS-1321, CCW-V319, CCW-V321, CCW-335A,
CCW-FE-1322, CCW-V338, CCW-V339, MUS-V720, MUS-V248, MUS-V254A,
MSS-OR-2, MSS-V140, MSS-V142, FWA-V21B, SGC-V18, SGC-V24,
SGC-V86, FWS-V74B, FWS-V100B, FWS-V75B, FWS-V101B, FWS-V111B,
FWS-V46B, FWS-V47B, FWS-V136, FWS-V138, CCW-FCA-3, CCW-FCA-7,
CCW-V327, CCW-V323, CCW-V325, CCW-V333.

C-B-1-L: FWS-V107A, MSS-V175.

C-D-1-C: CCW-V199, CCW-V198.

C-D-1-H: RCS-V106.

6.0 FIRE PROTECTION

6.1 Detection: Ionization and photoelectric detectors arranged to
sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Standpipes with hose stations-seismically
qualified system.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient

Oil	1588 gals	
Grease		
Flammable/Combustible Liq.		
Chemicals		
Cabling	79378 lbs	
Resins		
Other		

FIRE HAZARD ANALYSIS

7.2 Area Fire Loading Evaluation: In zones C-1B-F and C-1B-C the fire loading is 94,228 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Due to lack of continuity of combustibles fire will consume combustibles within a zone but will not spread beyond.

8.2 Without Primary Fire Suppression: Due to interior divisions and lack of continuity of combustibles fire will consume combustibles within the zone, but will not spread beyond zone of origin.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Due to separation and barriers, a fire in one zone of containment will not damage redundant safe shutdown equipment. Flame shields will be provided to separate redundant equipment so that both divisions will not be damaged. In zone 1AE, DHR-V24B or DHR-V23A will be separated by a non-combustible flame shield to prevent damage to both from an exposure fire. In zones 1AC and 1AD, MUS valves 279A, 280A, 281A, and 282A will be protected with non-combustible flame shields to protect the valve from an exposure fire. In zones 1BA and 1BB redundant transmitters will be separated by non-combustible flame barriers to prevent damage to redundancy from an exposure fire. In zones 1BE, 1BF, 1BG, 1BJ, and 1BK required safe shutdown equipment will be protected with non-combustible flame barriers to prevent damage from an exposure fire.

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GENERAL SERVICES BUILDING

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
GSB-L1-1	446'	Demineralized Storage Water	D.2-1	XR-FIG-A3
GSB-L1-2	446'	Borated Water Storage	D.2-4	XR-FIG-A3
GSB-L1-3A, 3B, L3-2A thru 2E, L3-3, L4-2	445', 474'	Rail Car Area, Fuel Area Spent Fuel Storage & HVAC Room	D.2-7	XR-FIG-A3, A4, A5
GSB-L1-4A thru 4L	455'	Waste Treatment Area	D.2-10	XR-FIG-A3
GSB-L1-5	455'	Containment Penetration Area	D.2-13	XR-FIG-A3
GSB-L1-6A thru 6G	455'	Primary Auxiliary Area	D.2-16	XR-FIG-A3
GSB-L1-7	455'	HVAC/Electrical Tunnel Area	D.2 19	XR-FIG-A3
GSB-L1-8	455'	HVAC Area for MUS and Com- ponent Cooling (Channel B)	D.2-22	XR-FIG-A3
GSB-L1-9, 10, 13	455'	Shops, Locker Rooms	D.2-25	XR-FIG-A3
GSB-L1-11, 12	455'	Contaminated Laundry and Vestibule Area	D.2-28	XR-FIG-A3
GSB-L1-14	455'	Clean Laundry Area	D.2-31	XR-FIG-A3
GSB-L1-15	455'	Lube Oil Storage Area	D.2-34	XR-FIG-A3
GSB-L2-2, SL1-4A, SL1-4B	422'6" 462	Cable Spreading Area	D.2-37	XR-FIG-A2, A3
GSB-L3-1A thru 10	479'	Waste Treatment Area	D.2-40	XR-FIG-A4
GSB-L3-4A, thru 4I	479'	Primary Auxiliary Area, cabs, chem, sta. & shops	D.2-43	XR-FIG-A4
GSB-L3-5	479'	HVAC Area	D.2-46	XR-FIG-A4
L3-6A thru 6E	479'	Office Area	D.2-49	XR-FIG-A4
GSB-L3-7A thru 7G	479'	Control Room and Peri- pheral Rooms	D.2-52	XR-FIG-A4

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GENERAL SERVICES BUILDING

AREA OF ANALYSIS	ELEV.	TITLE	PAGE NO.	REF. DWG.
GSB-L3-7H thru 7I	479'	Computer Room	D.2-55	XR-FIG-A4 AB
GSB-L3-7J thru	479'	Training & Habitation Areas	D.2-58	XR-FIG-A4
GSB-L4-1	479'	HVAC Area	D.2-61	XR-FIG-A5
GSB-L4-4	501'	HVAC Area	D.2-65	XR-FIG-A5
GSB-L5-1A	519'	Electrical Substation	D.2-68	XR-FIG-A6
GSB-L5-1B & 1D	519'	HVAC Area	D.2-71	XR-FIG-A6
GSB-L5-1C	519'	Electrical Substation	D.2-74	XR-FIG-A6
GSB-L4-3, L5-7B, L5-2, L5-3	501' 519'	HVAC Area	D.2-77	XR-FIG-A6, A5
GSB-SL1-2, SL1-3	442'	QA Records - Vault & Entrance	D.2-81	XR-FIG-A2
GSB-SL2-1, SL1-1	439'-6"	Pipe Tunnel	D.2-84	XR-FIG-A2
GSB-SL3-1A and 1B	437'	Electrical Tunnel	D.2-87	XR-FIG-A2
GSB-SL4-1, L2-1	433'	Component Cooling	D.2-90	XR-FIG-A2, A3
GSB-SL4-2	501'	Safeguards Area	D.2-93	XR-FIG-A2
GSB-SL4-3	432'	Safeguards Area	D.2-96	XR-FIG-A2
GSB-SL4-4	433'	Safeguards Area	D.2-99	XR-FIG-A6
GSB-SL5-1	421'	Component Cooling Area	D.2-102	XR-FIG-A2
GSB-SL5-2A thru 2K	421'	Primary Auxiliary Area	D.2-106	XR-FIG-A2
GSB-SL5-3, SL6-11A, 11B	395' 406', 428'-6"	Emergency Diesel Generator B Area	D.2-109	XR-FIG-A1 A2

GENERAL SERVICES BUILDING

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
GSB-SL5-4, SL6-12A, 12B	395', 406' 428'-6"	Emergency Diesel Generator A Area	D.2-113	XR-FIG-A1, A2
GSB-SL5-5A	421'	Switchgear Area (Channel X)	D.2-117	XR-FIG-A2
GSB-SL5-5B	421'	Switchgear Area (Channel B)	D.2-120	XR-FIG-A2
GSB-SL5-5C	421'	Switchgear Area (Battery Room X)	D.2-123	XR-FIG-A2
GSB-SL5-5D, 5J	421'	Switchgear Area (Channel A)	D.2-126	XR-FIG-A2
GSB-SL5-5E	421'	Switchgear Area (Channel B)	D.2-129	XR-FIG-A2
GSB-SL5-5F	421'	Switchgear Area (Channels C & D)	D.2-132	XR-FIG-A2
GSB-SL5-5G	421'	Switchgear Area (Battery Room D)	D.2-135	XR-FIG-A2
GSB-SL5-5H	421'	Switchgear Area (Battery Room C)	D.2-138	XR-FIG-A2
GSB-SL5-5I	421'	Switchgear Area (Battery Room A)	D.2-141	XR-FIG-A2
GSB-SL5-6	428'-6"	HVAC for Non-Contaminated Service Area	D.2-144	XR-FIG-A2
GSB-SL5-7	428'-6"	Machine Shop Storage Area	D.2-147	XR-FIG-A2
GSB-SL5-8A, 8B, 8C	416'	Electrical Tunnel	D.2-150	XR-FIG-A2, A7
GSB-SL6-1A thru 1G	399'	Makeup Pump Area	D.2-153	XR-FIG-A1
GSB-SL6-2A thru 2F	295'	Auxiliary Feedwater Area	D.2-157	XR-FIG-A1
GSB-SL6-3	399'	Safeguards Area	D.2-161	XR-FIG-A1
GSB-SL6-4	405'	Safeguards Area	D.2-164	XR-FIG-A1
GSB-SL6-5	399'	Safeguards Area	D.2-167	XR-FIG-A1

GENERAL SERVICES BUILDING

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
GSB-SL6-6	399'	Safeguards Area	D.2-170	XR-FIG-A1
GSB-SL6-7	407'	Safeguards Area	D.2-173	XR-FIG-A1
GSB-SL6-8A thru 8P	395'	Primary Auxiliary Area	D.2-176	XR-FIG-Z1
GSB-SL6-9	399'	Diesel Fuel Tank B Area	D.2-179	XR-FIG-A1
GSB-SL6-10	399'	Diesel Fuel Tank A Area	D.2-182	XR-FIG-A1
GSB-SL6-13A, 13B	399'	Nuclear Instrument Air Compressor Room	D.2-185	XR-FIG-A1
GSB-SL6-14A thru 14D, SL6-15	399'	Mechanical Equipment Room	D.2-188	XR-FIG-A1
GSB-SL6-16	399'	Mechanical Equipment and Pipe Tunnel	D.2-193	XR-FIG-A1
GSB-SL6-17	399'	Pipe Penetration Area	D.2-196	XR-FIG-A1
GSB-All Elev.	-	Typical for all Elevations	D.2-200	XR-FIG-A1 thru A5
GSB-All Stair- wells	-	Typical for all Stairwells	D.2-205	XR-FIG-A1 thru A5

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L1-1

3.0 AREA DESCRIPTION: Demineralized Water Storage, Elev. 446'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling</u>	unprotected steel beams	-

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally activated dampers with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supplied from MER-HVAC system through common ducts

Emergency: Smoke exhaust capability through normal ducts.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 479' Elevation

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 4,620. sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

GSB-L1-1: DMW-V9, DMW-V7, DMW-V8, DMW-V3, DMW-LIT-4012,
DMW-LIT-4020, DMW-LY-4020, DMW-LIC-4020, DMW-TK-1, FWA-V1,
FWA-V71-C, FWA-V75-C, FWA-V76-C, FWA-V42-C, FWA-V73-C,
FWA-V74-C, MER-FAN-7A, MER-FAN-7B, MER-FIS-9897, MER-FIS-9899.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed and arranged to sound
an alarm locally and in the control room

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations
provided in adjacent areas.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil		
Grease	80 lbs	
Flammable/Combustible Liq.		5 gal
Chemicals		
Cabling	3,484 lbs	
Resins		
Other	Class A	10 lbs.

7.2 Area Fire Loading Evaluation: 10,870 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be limited within the material of origin by fire brigade efforts using hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION: N/A

- 10.1 Major Equipment: Redundant level indicating transmitters are located on top of the tank (about 50 feet above the floor) and are separated by approximately 30 feet. The limited transient fire exposure will not involve both transmitters due to their location on the tank.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-2
- 3.0 AREA DESCRIPTION: Borated Water Storage, Elev. 446'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with steel beams	-

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with approved material of 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supplied by MER-HVAC system

Emergency: Smoke exhaust capability through fixed ducts.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 479' Elevation

FIRE HAZARDS ANALYSIS

- 3.6 Radioactivity:
- | | <u>Yes</u> | <u>No</u> |
|--------------|---------------|---------------|
| in Equipment | <u>x</u> | <u> </u> |
| Airborne | <u> </u> | <u>x</u> |
- 4.0 FLOOR AREA: 4,620 sq. ft.
- 5.0 EQUIPMENT DESCRIPTION:
- 5.1 Safe Shutdown:
- GSB-L1-2: CSS-TK-1(BWST TK)
- 6.0 FIRE PROTECTION
- 6.1 Detection: Ionization detectors installed at ceiling
- 6.2 Fixed Suppression: None
- Hazard Classification: N/A
- System Objective: N/A
- 6.3 Manual Suppression: Portable extinguishers and hose stations provided in adjacent areas.
- 7.0 FIRE LOADING
- 7.1 Combustible Loading
- | | Quantity |
|----------------------------|----------------------------------|
| | Fixed Transient |
| Oil | |
| Grease | 80 lbs |
| Flammable/Combustible Liq. | |
| Chemicals | |
| Cabling | 3,484 lbs |
| Resins | |
| Other | |
- 7.2 Area Fire Loading Evaluation: 10,650 Btu/sq. ft.
- 8.0 CONSEQUENCES OF DESIGN BASIS FIRE:
- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARDS ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in this area, affected by fire.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-3A, L1-3B, L3-2A thru 2E, L3-3, L4-2
- 3.0 AREA DESCRIPTION: Rail Car Area, Elev. 451', Fuel Area, Spent Fuel, Storage and HVAC Room, Elev. 479'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Interior doors are equivalent 3 hour rated fire resistance. Tornado doors provided to outside.

Dampers: Thermally activated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied from HSF and HFS-HVAC system.

Emergency: Smoke exhaust through normal system and portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible from exterior and adjacent areas through 2 or more openings.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u>x</u>	<u> </u>

4.0 FLOOR AREA: 21,236 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

<u>GSB-L1-3A</u> :	No safe shutdown equipment in zone
<u>GSB-L1-3B</u> :	No safe shutdown equipment in zone
<u>GSB-L3-2A</u> :	No safe shutdown equipment in zone
<u>GSB-L3-2B</u> :	No safe shutdown equipment in zone
<u>GSB-L3-2C</u> :	No safe shutdown equipment in zone
<u>GSB-L3-2D</u> :	No safe shutdown equipment in zone
<u>GSB-L3-2E</u> :	No safe shutdown equipment in zone
<u>GSB-L3-3</u> :	No safe shutdown equipment in zone
<u>GSB-L4-1</u> :	No safe shutdown equipment in zone

6.0 FIRE PROTECTION

6.1 Detection: Smoke detection is provided at the ceiling except in the railcar area where thermal detection is provided. Detection is arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Protection sprinklers are provided for the railcar area with actuation provided by thermal detector.

Hazard Classification: Ordinary hazard

System Objective: Control fire occurring in the railcar area.

6.3 Manual Suppression: Hose stations are provided extinguishers are provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity
	Fixed Transient
Oil	92 gals

FIRE HAZARD ANALYSIS

Grease	18 lbs	
Flammable/Combustible Liq.		50 gals
Chemicals		
Cabling	4,184 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 3,104 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Smoke detectors will alarm and fire brigade will respond utilizing hose streams. Due to lack of continuity of combustibles fire will be controlled and extinguished in material of origin within the zone. A fire occurring in the railcar area will be controlled by the suppression system.

8.2 Without Primary Fire Suppression: Due to lack of continuity of combustibles and provision of passive barriers, the fire will be contained to the area origin.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Not applicable.

9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no redundant safe shutdown equipment installed in area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-4A thru 4L
- 3.0 AREA DESCRIPTION: Waste Treatment Area, Elev. 455'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours
except for zones
L1-4C and 4D which
are open to 479'
elev. above.

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HRW-HVAC system.

Emergency: Smoke exhaust utilizing normal system ductwork or portable exhaust equipment.

3.3 Drainage: Floor drains are provided.

FIRE HAZARD ANALYSIS

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 1 stairway and 1 adjacent area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u>x</u>	<u> </u>

4.0 FLOOR AREA: 10,370 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L1-4-A: HCA-ISO-9802, CCW-V682, CCW-V683, CCW-V684,
CCW-V685

GSB-L1-4-B-L: No safe shutdown equipment located in this zone.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system located at ceiling of zones 4A (corridor) and 4I (resin storage area).

Hazard Classification: Ordinary hazard combustibles.

System Objective: Control fire occurring within the zone.

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	8 gals	
Grease	40 lb	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	12,908 lbs	

FIRE HAZARD ANALYSIS

Resins	6,000 lbs	
Other	7,020 lbs	100 lbs

7.2 Area Fire Loading Evaluation: 27,297 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression in Zones 4A and/or 4I.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: CCW valves and HVAC isokinetic probe

9.2 Accident Discharge Consequences: No redundant equipment is located in the area so only one division is subject.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No redundant safe shutdown equipment is located in these zones.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L1-5

3.0 AREA DESCRIPTION: Containment Penetration Area, Elev. 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour fire rated resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HPT-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 1 stairway.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 2,184 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L1-5: APN-MCC-EA32A, APM-MCC-EA-31A, CFS-HIS-5292.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	
	Resins	
	Other Class A	25 lbs

7.2 Area Fire Loading Evaluation: 435 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: None

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no redundant safe shutdown equipment located in this area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-6A thru 6G
- 3.0 AREA DESCRIPTION: Primary Auxiliary Area, Elev. 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HPA-HVAC system

Emergency: Smoke exhaust through normal system ductwork or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 2 stairways and 2 adjacent areas

FIRE HAZARD ANALYSIS

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 14,997 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L1-6A: BRS-V367, BRS-V368, BRS-V369, BRS-V370, BRS-V371, BRS-V372, BRS-V379, BRS-V380, BRS-FLT-3, BRS-FLT-4, BRS-V375, BRS-V376, BRS-V538, BRS-V539, BRS-V373, BRS-V374, BRS-V377, BRS-V378, BRS-V760, BRS-V381, BRS-V763, MUS-V200, MUS-V190, MUS-V191, MUS-V118, MUS-V117.

GSB-L1-6B: BRS-FE-61, BRS-V384, BRS-V385, BRS-V756, BRS-V757, MUS-V137B, MUS-V136A, MUS-V135, MUS-V134.

GSB-L1-6C: CCW-V108, CCW-V118, CCW-V120, CCW-V109, CCW-V119, CCW-V121, CCW-V449A, CCW-ZS-3629, MUS-286, MUS-V287, MUS-V289, MUS-V303, MUS-V288, MUS-V301, MUS-V288, MUS-V300, MUS-V302, MUS-HX-3, MUS-HX-4.

GSB-L1-6D: MUS-V285, MUS-V124, MUS-V125, MUS-TK-1.

GSB-L1-6E: MUS-V186, MUS-V187, MUS-V193, MUS-V194, MUS-V192, MUS-V188, MUS-V189, MUS-V196, MUS-V197, MUS-V203, MUS-FLT-5, MUS-FLT-6.

GSB-L-6F: No safe shutdown equipment in this zone.

GSB-L1-6G: MUS-V116, IAC-V383, IAC-V191, IAC-V58, IAC-V57.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinklers installed over cable trays.

Hazard Classification: Ordinary hazard.

System Objective: Control fire near cable trays

FIRE HAZARD ANALYSIS

6.3 Manual Suppression: Hose stations and portable extinguishers are provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	1 gal	
Grease	33 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	49,117 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 34,214 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: One division

9.2 Accident Discharge Consequences: Redundant equipment is located in separate area so only one division is exposed.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant equipment is in other areas. Safe shutdown valve CCW-V-499A is located in Fire Zone L1-6C, which is surrounded by concrete walls with a labyrinth entrance. One hour rated fire resistance wrap around valve and operator will prevent damage from fire in transient combustibles.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L1-7

3.0 AREA DESCRIPTION: HVAC/Electrical Tunnel, Elev. 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance.

Dampers: Thermally operated damper with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied from HSG-HVAC system.

Emergency: Smoke exhaust using portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 3 adjacent areas.

FIRE HAZARD ANALYSIS

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 4,350 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-L1-7
No safe shutdown equipment located in area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and at the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system at ceiling for general area.

Hazard Classification: Cable trays

System Objective: Control fire occurring in the zone to reduce damage.

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil		
Grease	2.5 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	17,266 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 41,646 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A fire will be limited to the vicinity of origin by operation of the fixed suppression system.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment in this area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-8
- 3.0 AREA DESCRIPTION: HVAC Area for MUS and Component Cooling, Channel B, Elev. 455'0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HCA-HVAC system.

Emergency: Smoke exhaust utilizing normal system ductwork or portable exhaust equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible through 1 stairway and 1 adjacent area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 4,350 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L1-8: HCA-AHU-1B, HCA-ACT-1B, HCA-ACT-2B, HCA-FAN-1B, HCA-FAN-2B, HCA-DAO-1B, HCA-DAO-2B, HCA-DAO-3B, HCA-DAO-4B, HCA-DAO-5B, HCA-DAO-10B, HCA-AMS-1B, HCA-LP-1, HCA-HIS-8936, HCA-HIS-9626A, HCA-HIS-7690, HCA-FIS-9614A, HCA-ZSC-9617, HCA-ZSC-9620, HCA-FIC-9641, HCA-FI-9643, HCA-ZSC-9644, HCA-FI-9642, HCA-ZSC-9440, HCA-ZI-9440, HCA-ZI-8991, HCA-ZI-8990, HCA-ZI-9651, HCA-ZI-9652, IAC-V395, IAC-V425, IAC-V426, IAC-V427, IAC-V428.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	2 lbs
Flammable/Combustible Liq.	5 gals
Chemicals	
Cabling	

FIRE HAZARD ANALYSIS

Resins		
Other	Charcoal & Class A 9300 lbs	100 lbs

7.2 Area Fire Loading Evaluation: 28,150 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers. The charcoal filters are protected with a manually operated water spray system and high temperature alarms.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Not applicable

9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-9, L1-10, L1-13
- 3.0 AREA DESCRIPTION: Shops, Locker Room, Elev. 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor</u> :	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling</u> :	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HCH-HVAC system

Emergency: Smoke exhaust through fixed system ductwork or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from several directions

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 12,829 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L1-9: IAC-V192, IAC-V193, IAC-V429, IAC-V430
 GSB-L1-10: No safe shutdown equipment in this zone
 GSB-L1-13: HCL-FAN-3A, HCL-DAO-4A, HCL-AMS-3A, HCL-ZSC-4241,
 HCL-FAN-3B, HCL-DAO-4B, HCL-AMS-3B, HCL-ZSC-9277

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: Automatic sprinklers installed throughout area

Hazard Classification: Ordinary hazard combustibles.

System Objective: Control fire in vicinity of origin

6.3 Manual Suppression: Hose stations and portable extinguishers installed in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>		Quantity
		Fixed	Transient
	Oil	200 gals	
	Grease	108 lbs	
	Flammable/Combustible Liq.		
	Chemicals		55 gals
	Cabling		
	Resins		
	Other	Class A 15,300 lbs	100 lbs

7.2 Area Fire Loading Evaluation: 12,736 Btu/sq. ft.

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: A fire will be limited to vicinity of origin by operation of the fixed suppression system.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Fans and associated equipment
- 9.2 Accident Discharge Consequences: Fans are located inside duct and will not be damaged.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant HCL fans and dampers (HCL-FAN-3A, 3B and HCL-DAO-4A, 4B) are adjacent to each other. A one hour barrier wrap over ductwork around fan and damper and on damper operator will protect one division from damage while sprinklers control fire.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-11, L1-12
- 3.0 AREA DESCRIPTION: Contaminated Laundry and Vestibule, Elev. 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally activated with 3 hour rated fire resistance

Penetrations: Sealed with material approved for 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supplied by HDI-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Accessible through 2 adjacent areas

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u>x</u>	<u> </u>

4.0 FLOOR AREA: 2,024 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L1-11: No safe shutdown equipment in this area.

GSB-L1-12: No safe shutdown equipment in this area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room

6.2 Fixed Suppression: Automatic wet pipe sprinklers installed throughout

Hazard Classification: Ordinary hazard combustibles.

System Objective: Control fire in vicinity of origin

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	
Chemicals	
Cabling	9438 lbs
Resins	
Other Class A	1000 lbs

7.2 Area Fire Loading Evaluation: 56,500 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: A fire will be limited to the vicinity of origin by operation of the fixed suppression system.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: None
- 9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: There is no safe shutdown equipment located in this area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L1-14
- 3.0 AREA DESCRIPTION: Clean Laundry Area, Elev 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance.

3.2 Ventilation:

Normal: Supplied by HDI-HVAC system

Emergency: Smoke by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 directions

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

5.0 EQUIPMENT DESCRIPTION:

6.0 FIRE PROTECTION

6.2 Fixed Suppression: Automatic wet pipe sprinklers

System Objective: Control fire in vicinity of origin

7.0 FIRE LOADING

7.2 Area Fire Loading Evaluation: 178,218 Btu/sq. ft.

8.1 With Primary Fire Suppression: Fire will will be limited to the vicinity of origin by operation of the fixed suppression system.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment in fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-L1-15
3.0 AREA DESCRIPTION: Lube Oil Storage, Elev. 455'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	8" Concrete Block	Exterior Wall
	South	8" Concrete Block	Exterior Wall
	East	8" Concrete Block	Exterior Wall
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours
3.1.4	<u>Openings:</u>		

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally activated 3 hour rated dampers.

Penetrations: Sealed with material approved for 3 hour fire rating.

3.2 Ventilation:

Normal: Ventilation independent of other systems, directly from outside.

Emergency: Portable equipment will be used.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: N/A

3.5 Accessibility: Exterior doorway from loading dock.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 150 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-L1-15
No safe shutdown equipment located in area.

6.0 FIRE PROTECTION

6.1 Detection: Thermal detection sounding an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers provided and hose station in adjacent area. Two fire hydrants are provided nearby in yard.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	990 gal
	Grease	
	Flammable/Combustible Liq.	
	Chemicals	
	Cabling	
	Resins	
	Other	

7.2 Area Fire Loading Evaluation: 990,000 Btu/sq. ft.

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled to the area by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment in area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L2-2, SL1-4A, SL1-4B
- 3.0 AREA DESCRIPTION: Cable Spreading Area, Elev. 442'6", 462'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floors</u> :	Concrete & protected steel	3 hours
3.1.3	<u>Ceiling</u> :	Concrete & protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Ventilation openings are provided with thermally operated three hour fire resistance rated fire dampers. Dampers on unducted HVAC supply are also operated by smoke detectors in switchgear areas.

Penetrations: All electrical and mechanical penetrations are sealed with material approved 3 hour fire resistance

3.2 Ventilation:

Normal: Normal ventilation is provided through curbed, unducted floor openings from the switchgear room.

Emergency: Portable equipment will be used for smoke removal.

3.3 Drainage: Floor drains are provided.

FIRE HAZARDS ANALYSIS

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Each level has 2 remote entrances, one main entrance is common to both elevations

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 26,250 sq. ft. (Total for all three fire zones)

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: Cabling (all Divisions), termination cabinets

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout ceiling sounding signals locally and in the Control Room.

6.2 Fixed Suppression: Automatic closed head wet sprinkler system at ceiling.

Hazard Classification: IEEE 383 qualified cable in open trays and limited transient combustible at floor level.

System Objective: Confine a fire to the area of origin and limit damage of exposure fire to cable trays directly exposed.

6.3 Manual Suppression: Portable extinguishers are provided throughout the cable spread area and manual hose stations are installed within the area and in adjacent areas.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	5 gals
Chemicals	
Cabling	139,953 lbs
Resins	
Other Class A	100 lbs

FIRE HAZARDS ANALYSIS

7.2 Area Fire Loading Evaluation: 57,100 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A fire will be limited to the vicinity of origin by operation of the fixed suppression system.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Undamaged cabling is not subject to damage from water discharge in this area. Switchgear is located at the floor level below this zone.

9.2 Accidental Discharge Consequences: Accidental discharge of sprinkler system may damage equipment but will not prevent safe shutdown which can be accomplished from the remote shutdown panels located in a separate fire area. Water spray shields are provided over the curbed, unducted HVAC supply openings to prevent water damage to switchgear in the zones below.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: A fire can damage all cabling within the fire area. Manual suppression and three hour barriers will prevent fire spread to adjacent areas. Safe shutdown capability will not be affected since alternate shutdown facilities exist in fire areas separate from the cable spread and control room complex areas.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L3-1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L, 1M, 1N, 1O
- 3.0 AREA DESCRIPTION: Waste Treatment Area, Elev. 479'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor</u> :	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling</u> :	Concrete with protected steel*	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally activated with 3 hour rated fire resistance

Penetrations: Sealed with material approved for 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supplied by HRW-HVAC System

Emergency: Smoke exhaust by fixed duct or portable equipment

3.3 Drainage: Floor drains are provided

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

*Note: Except for unprotected opening to L1-4C and L1-4D on elevation 455' below.

3.5 Accessibility: Accessible through 2 adjacent areas

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u>x</u>	<u> </u>

4.0 FLOOR AREA: 8,848 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

GSB-L3-1A: CCW-CV-2131, CCW-CV-2132, CCW-ZS-2132, HSG-DAO-1A, HSG-DAO-1B, HSG-ZSC-9048, HSG-ZSC-9098, HSG-FIS-9000A, HSG-FIS-9050A.

GSB-L3-1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L, 1M, 1N, 1O,
No safe shutdown equipment located in these zones.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout at ceiling except in L3-1G.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system installed in L3-1G.

Hazard Classification: Ordinary

System Objective: Control fire to zone

6.3 Manual Suppression: Hose stations and portable extinguishers are provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	112 gals	
Grease	46 lbs	
Flammable/Combustible Liq.		10 gals
Chemicals		
Cabling	11798 lbs	

FIRE HAZARDS ANALYSIS

Resins
Other

100 lbs

7.2 Area Fire Loading Evaluation: 16,119 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers. In zone L3-1G the fire will be prevented from spreading to other zones by operation of the fixed fire suppression.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and by lack of continuity of combustibles at opening between L3-1N and L1-4C and L3-1O and L1-4D.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: A transient fire in zone (L3-1A) will damage equipment in the zone. A one hour passive barrier on a damper of one division will prevent damage to both pieces of equipment. Due to limited combustibles, automatic suppression is not being provided.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L3-4A thru 4I
- 3.0 AREA DESCRIPTION: Primary Auxiliary Area, Labs, Chem, Sta. & Shops
Elev. 479'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HPA-HVAC system.

Emergency: Smoke exhaust utilizing normal system ductwork or portable exhaust equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible through 2 stairway and 5 adjacent areas.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u>x</u>	<u> </u>

4.0 FLOOR AREA: 14,697 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

<u>GSB-L3-4A</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4B</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4C</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4D</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4E</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4F</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4G</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4H</u> :	No safe shutdown equipment in zone
<u>GSB-L3-4I</u> :	No safe shutdown equipment in zone

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system installed at ceiling over redundant cable trays.

Hazard Classification: Ordinary Hazard.

System Objective: Control fire within vicinity of cable trays.

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	7 gals
Grease	
Flammable/Combustible Liq.	5 gals

FIRE HAZARD ANALYSIS

Chemicals	18 lbs
Cabling	25,634 lbs
Resins	
Other	Class A 100 lbs

7.2 Area Fire Loading Evaluation: 18,277 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression in the vicinity of cable trays.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: None
- 9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: No safe shutdown equipment is located in the zones.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L3-5

3.0 AREA DESCRIPTION: HVAC Area, Elev. 479'0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floors: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HCA-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Accessible through 1 stairway and 1 adjacent area

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 4,125 sq. ft

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L3-5: IAC-V353, IAC-V354, IAC-V355, IAC-V356, HCA-AHU-1A, HCA-ACT-1A, HCA-ACT-2A, HCA-FAN-1A, HCA-FAN-2A, HCA-DAO-1A, HCA-DAO-2A, HCA-DAO-3A, HCA-DAO-4A, HCA-DAO-5A, HCA-DAO-10A, HCA-LP-2, HCA-AMS-1A, HCA-HIS-8933, HCA-HIS-9593, HCA-7583, HCA-FIS-9581A, HCA-ZSC-9584, HCA-ZSC-9587, HCA-FIC-9608, HCA-FI-9610, HCA-ZSC-9611, HCA-FI-9609, HCA-ZSC-9433, HCA-ZI-9433, HCA-ZI-9647, HCA-ZI-9648, HCA-ZI-9649, HCA-ZI-9650.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the control room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADINGS

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	4 lbs
Flammable/Combustible Liq.	5 gals
Chemicals	
Cabling	
Resins	
Other Charcoal & Class A	9,300 lbs 100 lbs

FIRE HAZARDS ANALYSIS

7.2 Area Fire Loading Evaluation: 29,702 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the area by fire brigade efforts using available hose streams and/or portable fire extinguishers. The charcoal filters are protected with a manually operated water spray system and high temperature alarms.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-L3-6A thru 6E
3.0 AREA DESCRIPTION: Office Area, Elev. 479'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor</u> :	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling</u> :	Concrete & protected steel with suspended noncombustible ceiling	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance rating

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied by HCH-HVAC system

Emergency: Smoke exhaust utilizing normal system ductwork and/or portable exhaust equipment

3.3 Drainage: Floor drains are provided.

FIRE HAZARDS ANALYSIS

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 3 stairways and 3 adjacent areas

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 18,182 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

<u>GSB-L3-6A</u> :	No Safe shutdown equipment located in zone
<u>GSB-L3-6B</u> :	No Safe shutdown equipment located in zone
<u>GSB-L3-6C</u> :	No Safe shutdown equipment located in zone
<u>GSB-L3-6D</u> :	No Safe shutdown equipment located in zone
<u>GSB-L3-6E</u> :	No Safe shutdown equipment located in zone

6.0 FIRE PROTECTION

6.1 Detection: Automatic wet pipe sprinkler system located in ceiling with alarm signals locally and in the control room

6.2 Fixed Suppression: Automatic wet pipe sprinkler system located in ceiling with alarms to control room

Hazard Classification: Light and Ordinary Hazard Group

System Objective: Control fire to the room of origin

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	5 gals
Chemicals	

FIRE HAZARDS ANALYSIS

Cabling		10,639 lbs
Resins		
Other	Class A	72,410 lbs

7.2 Area Fire Loading Evaluation: 37,946 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Automatic sprinklers will activate, sounding alarms locally and in the Control Room. Fire will be controlled to the room of origin.

8.2 Without Primary Fire Suppression: Due to interior subdivision between offices, fire spread will be limited in area. Perimeter construction will prevent fire spread to adjacent areas. Upon notification fire brigade will extinguish fire utilizing hose streams.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment is located in this area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L3-7A thru 7G
- 3.0 AREA DESCRIPTION: Control Room and Peripheral Rooms, Elev. 479'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hour
	South	Concrete	3 hour
	East	Concrete	3 hour
	West	Concrete	3 hours

Note: Peripheral rooms (zones 7B through 7G) are separated from the Control Room by one hour rated walls)

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete on 3 hours (for
protected exterior fire
steel exposure)
noncombustible

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire doors to adjacent areas. 1 1/2 hour rated doors to internal offices.
(Zones L3-7B through 7G)

Dampers: Fire resistance rating equivalent to the wall in which installed. Dampers are thermally and smoke activated.

Penetrations: Fire resistance rating equivalent to the wall in which installed.

3.2 Ventilation:

Normal: Supplied by HCL-HVAC system

Emergency: Smoke exhaust through kitchen and bathroom exhaust system. Portable equipment may also be utilized.

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from three separate sides

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 6,495 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-L3-7A thru 7G
Area contains control panels, alarm panels, and associated logic circuits

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout sounding alarms locally and on the MFPP in the Control Room

6.2 Fixed Suppression: Automatic wet pipe sprinkler protection in peripheral rooms (Zones 7B through 7G). None (Zone 7A).

Hazard Classification: Offices, kitchen and toilet areas.

System Objective: Limit exposure to the control room from the peripheral rooms.

6.3 Manual Suppression: Portable fire extinguishers are provided inside control room and hose stations are provided outside the control room with spray nozzles

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	
Chemicals	
Cabling	

FIRE HAZARDS ANALYSIS

Resins
Other Paper, Misc. Comb. 2,760 lbs 200

7.2 Area Fire Loading Evaluation: 3,650 Btu/sq. ft. (Cabling in cabinet is not included).

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A Control Room fire will be controlled by fire brigade or operator's efforts using available hose streams and/or portable fire extinguishers. A fire occurring in the peripheral rooms will be contained to the room of origin by the suppression system.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Control cabinets and equipment

9.2 Accident Discharge Consequences: Discharge of the sprinkler system in peripheral room will not affect equipment in the control room itself.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: With loss of the Control Room, the plant can still be brought to a safe shutdown from the remote shutdown panels which are in separate fire areas.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-L3-7H and 7I
3.0 AREA DESCRIPTION: Computer Room, Elev. 479'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Metal raised floor over concrete with protected steel	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with hung acoustic tile unpro- tected steel	3 hours (for exterior fire exposure)

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally and smoke actuated dampers with
3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour
rated fire resistance.

3.2 Ventilation:

Normal: Supplied by duct from HCL-HVAC system.

Emergency: Smoke exhaust through portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire
fighting and safe shutdown facilities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible from 2 directions.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 1,149 sq. ft. (each of two zones)

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-L3-7H
No safe shutdown equipment located in zone.

GSB-L3-7I
No safe shutdown equipment located in zone.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection is provided above and below the raised floor. Alarm signals sound locally and on the MFPP in the Control Room.

6.2 Fixed Suppression: Automatic fixed halon extinguishing system intalled beneath the raised floor.

Hazard Classification: Ordinary Hazard Group 1.

System Objective: Halon system is designed to extinguish a fire originating beneath the raised floor.

6.3 Manual Suppression: Fire extinguishers are provided within the room and hose stations are installed in adjacent areas.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil		
Grease		
Flammable/Combustible Liq.		
Chemicals		
Cabling	1,000 lbs	
Resins		
Other	Class A 400 lbs	100 lbs.

7.2 Area Fire Loading Evaluation: 12,500 Btu/sq. ft.

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A fire below the raised floor will be detected and controlled by the fixed Halon system. Loss of computer facility will not have an affect on plant safety. A fire in computer room will be controlled to the area by manual suppression.

8.2 Without Primary Fire Suppression: A fire will be detected and confined by manual suppression and 3 hour fire barriers. The loss of the computer room will not have an affect on plant safety.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: EDP Equipment

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in this area.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L3-7J

3.0 AREA DESCRIPTION: Training and Habitation Areas, Elev. 479'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete & protected steel	3 hours
3.1.3	<u>Ceiling:</u>	Concrete & unprotected steel*	3 hours (from exterior fire exposure)

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Ventilation ducts provided with thermally and
smoke operated 3 hour fire resistance rated dampers.

Penetrations: No other penetrations.

3.2 Ventilation:

Normal: Supplied by HCL-HVAC System Control Room Complex

Emergency: Smoke exhaust capability thru portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire
fighting and safe shutdown activities.

3.5 Accessibility: Entrances from Control Room or adjacent corridor

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	x
	Airborne	_____	x

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FIRE HAZARDS ANALYSIS

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION

10.1 Major Equipment: There is no safe shutdown equipment located in this area.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L4-1

3.0 AREA DESCRIPTION: HVAC Area, Elev. 501'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete with	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with unprotected steel	-

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by MER-HVAC system

Emergency: Smoke exhaust through normal system duct or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 stairways and 3 adjacent areas.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 10,848 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shut Down:

GSB-L4-1: NSW-V339, CCW-V519, CCW-V169, CCW-V165, CCW-V167, CCW-V166, CCW-V168, CCW-V171, CCW-V38, CCW-V44, CCW-V268, CCW-V38, CCW-V41, CCW-V40, CCW-V42, CCW-V43, CCW-TK-1, CCW-TK-2, APN-USS-EA5-A, APN-USS-EB5-B, APN-PP-EA52-A, APN-PP-EB52-B, APN-MCC-EA51-A, APN-EB51-B, IAC-V363, IAC-V365, IAC-V446, IAC-V447, IAC-V448, IAC-V449, HSG-AHU-1A, HSG-AHU-1B, HSG-ACT-3A, HSG-ACT-3B, HSG-FAN-2A, HSG-FAN-2B, HSG-FAN-1A, HSG-FAN-1B, HSG-DAO-4A, HSG-DAO-4B, HSG-DAO-5A, HSG-DAO-5B, HSG-DAO-3A, HSG-DAO-3B, HSG-DAO-6A, HSG-DAO-6B, HSG-DAO-7A, HSG-DAO-7B, HSG-DAO-10A, HSG-DAO-10B, HSG-DAO-1B, HSG-AMS-1A, HSG-AMS-1B, HSG-FS-9000B, HSG-LP-1B, HSG-HIS-9050A, HSG-HIS-8896, HSG-HIS-7565, HSG-HIS-7565, HSG-FIS-9050A, HSG-FIC-9055, HSG-ZI-9002, HSG-ZI-9003, HSG-ZI-9404, HSG-ZI-9052, HSG-ZI-9053, HSG-ZI-9054, HSG-PDIS-9037, HSG-PDIS-9044, HSG-PDIS-9087, HSG-PDIS-9094, HSG-ZSC-9034, HSG-ZSC-9006, HSG-ZSC-9084, HSG-ZSC-9056, HSG-FIC-9005, HSG-FIC-9055, MER-AHU-1A, MER-AHU-1B, MER-FAN-1A, MER-FAN-1B, MER-FAN-2A, MER-FAN-2B, MER-DAO-1A, MER-DAO-1B, MER-DAO-2A, MER-DAO-2B, MER-DAO-3A, MER-DAO-3B, MER-CLE-2, MER-LP-1A, MER-LP-1B, MER-HIS-9295A, MER-HIS-9304A, MER-HIS-9810, MER-HIS-7584, MER-HIS-9300, MER-HIS-8913, MER-HIS-7676, MER-HIS-9309, MER-FIS-9295A, MER-FIS-9321, MER-FIS-9897, MER-FIS-9304A, MER-FIS-9322, MER-FIS-9899, MER-ZI-9298, MER-ZI-9297, MER-ZI-9307, MER-ZI-9306, MER-ZSC-9297, MER-ZSC-9306.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinklers at ceiling.

Hazard Classification: Ordinary hazard group occupancy.

System Objective: Control transient fire to vicinity of origin.

6.3 Manual Suppression: Hose stations and portable extinguishers are provided in area.

FIRE HAZARD ANALYSIS

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	12 gal	
Grease		
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	35,164 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 34,306 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be limited to the vicinity of origin by operation of the fixed suppression system.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Electrical Equipment
- 9.2 Accident Discharge Consequences: Water spray shield over substation will prevent water spray damage.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: A one hour partial wall will be provided in front of "B" division substation. Barrier in conjunction with automatic sprinklers will prevent damage to redundant equipment.

HSG and MER local panels will be provided with a one hour passive barrier so that an exposure fire in the vicinity will not damage the both panels.

HSG and MER fans are located inside the air handling units. A fire in any fan will not spread outside the unit due to the steel enclosure. An exposure outside the unit will not damage the fan.

FIRE HAZARD ANALYSIS

HSG and MER dampers will be provided with one hour passive barriers in order to prevent an exposure fire in transient combustibles from damaging redundant units.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-L4-4
3.0 AREA DESCRIPTION: HVAC Area, Elev. 501'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Exposed beams & metal deck None

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by MER-HVAC system.

Emergency: Smoke by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 2 stairways and 1 adjacent area.

FIRE HAZARD ANALYSIS

- 3.6 Radioactivity:
- | | <u>Yes</u> | <u>No</u> |
|--------------|------------|-----------|
| in Equipment | <u>x</u> | |
| Airborne | | <u>x</u> |
- 4.0 FLOOR AREA: 22,000 sq. ft.
- 5.0 EQUIPMENT DESCRIPTION:
- 5.1 Safe Shutdown:
- GSB-L4-4: HDG-TCV-1
- 6.0 FIRE PROTECTION
- 6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.
- 6.2 Fixed Suppression: None
- Hazard Classification: N/A
- System Objective: N/A
- 6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.
- 7.0 FIRE LOADING
- 7.1 Combustible Loading
- | | | Quantity |
|----------------------------|--------------------|-----------|
| | Fixed | Transient |
| Oil | | |
| Grease | 18 lbs | |
| Flammable/Combustible Liq. | | 5 gals |
| Chemicals | | |
| Cabling | 59,760 lbs | |
| Resins | | |
| Other | Class A 30,600 lbs | 25 lbs |
- 7.2 Area Fire Loading Evaluation: 45,999 Btu/sq. ft.
- 8.0 CONSEQUENCES OF DESIGN BASIS FIRE:
- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Required HDG-TCV-1 is at floor level in enclosed heavy steel exhaust plenum. A fire in the area will not affect the functional capability of the TCV.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L5-1A
- 3.0 AREA DESCRIPTION: Electrical Substation, Elev. 519'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with unprotected steel None

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by MER-HVAC system.

Emergency: Smoke exhaust provided by portable equipment.

3.3 Drainage: Floor drains a.c provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 1 adjacent area

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 504 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L5-1A: No safe shutdown equipment in area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	4639 lbs
	Resins	
	Other	25 lbs

7.2 Area Fire Loading Evaluation: 97,610 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in this area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-L5-1B, 1D
3.0 AREA DESCRIPTION: HVAC Area, Elev. 519'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
3.1.3	<u>Ceiling:</u>	Steel beam & concrete	None

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by MER-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 2 adjacent areas

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 2,976 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L5-1B: IAC-V372, IAC-V373, IAC-V386.

GBB-L5-1D: IAC-V399, IAC-V451, IAC-V452, MER-FAN-4A, MER-FAN-4B,
MER-FIS-9321, MER-FIS-9322.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	28 gals
	Grease	
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	9278 lbs
	Resins	
	Other Class A	25 lbs

7.2 Area Fire Loading Evaluation: 34,153 Btu/sq. ft.

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: Not Applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant fans, MER-FAN-4A and 4B, are located approximately 3 feet apart. A one hour barrier around one fan with one hour rated fire damper on intake will prevent the limited exposure fire from damaging fan before fire brigade extinguishes fire. Due to limited combustible loading automatic suppression is not necessary.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-L5-1C

3.0 AREA DESCRIPTION: Electrical Substation, Elev. 519'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete & steel beams None

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by MER-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown equipment.

3.5 Accessibility: Accessible from 2 adjacent areas

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 504 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L5-1C: No safe shutdown equipment in this area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Load</u>	Quantity	
		Fixed	Transient
	Oil		
	Grease	4 lbs	
	Flammable/Combustible Liq.		5 gals
	Chemicals		
	Cabling	4639 lbs	
	Resins		
	Other		25 lbs

7.2 Area Fire Loading Evaluation: 97,753 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment in area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-L5-7B, L5-2 and L5-3, L4-3
- 3.0 AREA DESCRIPTION: HVAC Area, Elev. 501' and 519'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete with 3 hours
protected steel

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by MER-HVAC system

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 1 stairway and adjacent area

FIRE HAZARD ANALYSIS

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 24,218 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-L4-3: HCL-FAN-4A, HCL-FAN-4B, HCL-DAO-5A, HCL-DAO-5B, HCL-AMS-4A, HCL-AMS-4B, HCL-ZSC-9243, HCL-ZSC-9279, HCL-FIS-9245, HCL-FIS-9281, HSC-ACT-1A, HSC-ACT-1B, HSG-ACT-2A, HSG-ACT-2B, HSG-DAO-8A, HSG-DAO-8B, HSB-DAO-9A, HSG-DAO-9B, HSG-LP-1A, HSG-HIS-9000A, HSG-HIS-8894, HSG-ZSC-9021, HSG-ZSC-9008, HSG-FIC-9005, HSG-PDIS-9011, HSG-PDIS-9018, HSG-PDIS-9024, HSG-PDIS-9031, HSG-ZI-9003, HSG-ZI-9004, HSG-PDIS-9024, HSG-PDIS-9031, HSG-ZI-9003, HSG-ZI-9004, HSG-ZI-9002, HSG-ZSC-9071, HSG-ZSC-9058, HSG-PDIS-9061, HSG-9018, HSG-PDIS-9074, HSG-PDIS-9081, HSC-FAN-9A, HSC-FAN-9B, HSC-DAO-5A, HSC-DAO-5B, HSC-AMS-3A, HSC-AMS-3B, HSC-ZSC-9752, HSC-ZSC-9755, HSC-FIS-9753, HSC-FIS-9890, NSW-V382, IAC-V385, IAC-V367, IAC-V369, IAC-V368, IAC-V370, IAC-V366, IAC-V398, IAC-V441, IAC-V442, IAC-V443, IAC-V444, IAC-V445.

GSB-L5-2: IAC-V397, IAC-V458, IAC-V457, IAC-V454, IAC-V-455, IAC-V456, IAC-V388, IAC-V378, IAC-V379, IAC-V375, IAC-V376, IAC-V377.

GSB-L5-3: MEA-TCV-9, MEA-TCV-10, MEA-TCV-11, MEA-TCV-12, MEA-TCV-13, MEA-ISO-9759, MEA-HIS-7602A, MEA-HIS-7628A, MEA-HIS-7609A, MEA-HIS-7634A, MEA-HIS-7623A, MEA-HIS-EL-7602A, MEA-EL-7602B, MEA-EL-7628A, MEA-EL-7628B, MEA-EL-7609A, MEA-EL-7609B, MEA-EL-7623A, MEA-EL-7623B, MEA-EL-7634A, MEA-EL-7634B, MEA-EL-7636A, MEA-EL-7636B.

GSB-L5-7B: No safe shutdown equipment in zone.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprink'ers installed throughout the 501' elev.

FIRE HAZARD ANALYSIS

Hazard Classification: Ordinary hazard

System Objective: Control fire in the area.

- 6.3 Manual Suppression: Hose stations and portable extinguishers are provided in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	12 gal	
Grease		
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	79,634 lbs	
Resins		
Other	Charcoal Class A 21,700 lbs	100 lbs

- 7.2 Area Fire Loading Evaluation: 45,940 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: HVAC Equipment
- 9.2 Accident Discharge Consequences: One division is enclosed with passive barriers so no more than one division is subject to inadvertent discharge.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: MEA tornado check valves are located in floor of L5-3 (Elev. 519'). On underside of floor (ceiling of L4-3) is a steel plate air plenum approximately 18" deep. This will

FIRE HAZARD ANALYSIS

prevent the spread of fire into zones L5-3. The tornado check valves will not be damaged such that the airways will be blocked.

Redundant equipment in HVAC area will be provided with a one-hour passive barrier to prevent damage prior to initiation of suppression activities.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL1-2, SL1-3

3.0 AREA DESCRIPTION: QA Records - Vault and Entrance, Elev. 442'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally actuated with 3 hour rated fire resistance. Dampers are also smoke actuated for containment of gaseous suppression agent.

Penetrations: Sealed with material approved for 3 hour fire resistance.

3.2 Ventilation:

Normal: Supplied from HSC-HVAC system.

Emergency: Smoke exhaust through fixed ducting.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: One entrance

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 2,350 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL1-2
No safe shutdown equipment in this zone.

GSB-SL1-3
HSC-FAN-3B
HSC-DAO-4B
HSC-CLE-3
HSC-ZSC-9736

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection is provided throughout the area sounding signal locally and in the Control Room.

6.2 Fixed Suppression: A fixed automatic halon extinguishing system is installed in the QA Records Vault.

Hazard Classification: Class A combustibles.

System Objective: Extinguish a fire in the early stages, minimizing fire damage to material of origin.

6.3 Manual Suppression: Portable extinguishers provided in area and a hose station is available adjacent to the area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil		
Grease	2 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling		
Resins		
Other	Class A	48,750 lbs

FIRE HAZARD ANALYSIS

7.2 Area Fire Loading Evaluation: 166,000 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Fixed Fire Suppression: A fire will be limited to the vicinity of origin by operation of the fixed suppression system.

8.2 Without Fixed Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL2-1, SL1-1
- 3.0 AREA DESCRIPTION: Pipe Tunnel, Elev. 439'-6"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HPT-HVAC system.

Emergency: Smoke exhaust provided by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from either and through hatch openings

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 6,900 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL1-1: No safe shutdown equipment in this zone

GSB-SL2-1: No safe shutdown equipment in this zone

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	
	Resins	
	Other Class A	25 lbs

7.2 Area Fire Loading Evaluation: 135 Btu/sq. ft.

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: Not Applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in these zones.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL3-1A and 1B
- 3.0 AREA DESCRIPTION: Electrical Tunnel, Elev. 437'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally activated dampers with 3 hour rated fire resistance

Penetrations: Sealed with material approved for 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supply from HSG HVAC system with exhaust through wall to adjacent area.

Emergency: Smoke exhaust using portable equipment.

3.3 Drainage: Floor drains are provided and equipment is on pedestals

3.4 Emergency Lighting: Lighting is being provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Stairways at either end of the tunnel enter into the area.

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 4,977 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL3-1A
Cabling

GSB-SL3-1B
CFS-HIS-5293
APN-MCC-EB31-B
APN-MCC-EB32-B

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout and designed to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Closed head wet pipe sprinkler system at ceiling

Hazard Classification: Electrical cable in open trays.

System Objective: Control fire to the area of origin.

6.3 Manual Suppression: Hose station at each stairways and portable fire extinguishers.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	75,520 lbs
	Resins	
	Other Class A	100 lbs

7.2 Area Fire Loading Evaluation: 158,100 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Priamry Fire Suppression: A fire will be limited to the vicinity of origin by operation of the fixed suppression system.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Undamaged cabling is not subject to damage from water discharge.
- 9.2 Accidental Discharge Consequences: Since the cabling will not be affected and only one division is present, safe shutdown and safety related functions will not be affected.

10.0 APPENDIX R EVALUATION

- 10.1 Major Equipment: Redundant safe shutdown equipment is located in a separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-SL4-1, L2-1
3.0 AREA DESCRIPTION: Component Cooling, Elev. 433'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed at barrier to Isolation Building with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Smoke exhaust by normal system ductwork or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible through 1 stairway and 2 adjacent area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 5,860 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL4-1: CCW-V483, CCW-V485, CCW-V484, CCW-CV-3632, CCW-V690, CCW-V707, CCW-V708, CCW-V488, CCW-V417, CCW-V420, CCW-V489, CCW-V482, CCW-V409, CCW-V418, CCW-TCV-1225, CCW-V691, CCW-V487, CCW-CV-3582, CCW-CV-3574, CCW-CV-3578, CCW-V486, CCW-CV-3586, CCW-V689, CCW-V410, CCW-V419, CCW-TCV-1229, CCW-V423, NSW-V16B, NSW-CV-3575, NSW-V319A, NSW-V230A, NSW-V229A, NSW-V17A, NSW-V13A, NSW-CV-3573, NSW-V312B, NSW-V311B, NSW-V18B, NSW-V14B, NSW-CV-3583, NSW-V320B, NSW-CV-3581, FPC-V189, FPC-V188, FPC-V158, FPC-V157, FPC-HX-1, FPC-V54, FPC-V1, FPC-V3, FPC-V5, FPC-PMP-4B, FPC-V11, FPC-V9, FPC-V13, FPC-V15, FPC-V17, FPC-HX-2, FPC-V23, FPC-V25, FPC-FE-2092, FPC-V29, FPC-V27, FPC-V31, FPC-V2, FPC-V4, FPC-V12, FPC-V10, FPC-V14, FPC-V16, FPC-V18, FPC-V24, FPC-V26, FPC-FE-2093, FPC-V28, FPC-V30, FPC-V32, FPC-V34, FPC-V33, FPC-V55, FPC-V71, FPC-V72, IAC-V103, IAC-V96, IAC-V97, IAC-V98, IAC-V99, IAC-V100, IAC-V101, IAC-V102, IAC-V423, IAC-V43, IAC-V195, IAC-V55, IAC-V56, IAC-V461, IAC-V35, IAC-V194, IAC-V52, IAC-V53, IAC-V54, NSW-ZS-3581, NSW-ZS-3583, NSW-ZS-3575, NSW-ZS-3573, FPC-HIS-2931B, FPC-HIS-2930B, CCW-ZS-3632, CCW-ZS-3582, CCW-ZS-3574, CCW-ZS-3578, CCW-ZS-3586.

GSB-L2-1: NSW-ZS-1930, NSW-HIS-1903B, NSW-ZS-1891, NSW-HIS-1891B, NSW-TK-2B, NSW-V252B, NSW-V255B, NSW-V257B, NSW-V254B, NSW-V256B, NSW-V258B, NSW-CV-192B, NSW-V228, NSW-CV1930, NSW-V316B, NSW-V170A, NSW-V176A, NSW-V175A, NSW-V173A, NSW-V172A, NSW-V174A, NSW-V21A, NSW-V315A, NSW-CV-1891, NSW-TK-1A.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling and arranged to sound an alarm locally and in the Control Room.

FIRE HAZARD ANALYSIS

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	1.6 gals	
Grease	10.5 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	4,500 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 8,460 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Ionization detectors will alarm and fire brigade will respond utilizing hose streams. Fire will be extinguished in material of origin, due to lack of continuity of combustibles.

8.2 Without Primary Fire Suppression: The fire will not spread beyond material of origin, due to lack of continuity of combustibles.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Due to limited combustible loading and the separation of redundant equipment, a transient exposure fire will not damage any of the three CCW valves required. Analytical modeling is being developed to support this evaluation.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL4-2

3.0 AREA DESCRIPTION: Safeguards Area, Elev. 501'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
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3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours
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3.1.4 Openings:

Doors: Equivalent 3 hour fire resistant rating

Dampers: Thermally activated with 3 hour rated fire resistance

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied from HSG-HVAC

Emergency: Exhaust through portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Accessible from 2 adjacent areas

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 3,250 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL4-2: CSS-V82-A, CSS-V99-A, CSS-V84-A, CSS-V108, CSS-V5-A,
CSS-V4-B, CSS-V3-A, CSS-V6-B, CSS-HX-1-A, CSS-ZS-2742,
CSS-ZS-2743, NSW-V191-A, NSW-V192-A, NSW-V-184-A, NSW-V189-A,
NSW-FCV-3577, NSW-FE-1980.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout at ceiling
arranged to sound an alarm locally and in control room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations are provided in adjacent
areas. Portable extinguishers in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	9.5 lbs	
Grease		
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	3542 lbs	
Resins		
Other Class A		100 lbs

7.2 Area Fire Loading Evaluation: 11,860 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: None
- 9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant valves, on sodium hydroxide tank are 3 feet apart. A one hour barrier on one valve and its operator will prevent damage to both valves due to combustibles being limited to cables at ceiling level.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-SL4-3
3.0 AREA DESCRIPTION: Safeguards Area, Elev. 432'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system.

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 1 stairway and 2 adjacent areas

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment in area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL4-4
- 3.0 AREA DESCRIPTION: Safeguards Area, Elev. 433'
- 3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hour

3.1.3 Ceiling: Concrete with protected steel 3 hour

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally operated dampers with 3 hour fire resistance rating

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Portable smoke removal equipment will be used

3.3 Drainage: Floor drains are provided

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Accessible from 3 adjacent areas

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 1,560 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe shutdown

GSB-SL4-4: IAC-V95, IAC-V394, IAC-V393, NSW-V272-B, NSW-V271-B,
NSW-V269-B, NSW-V266-B, NSW-FCV-3585, NSW-FE-1982, CSS-V85-B,
CSS-V98-B, CSS-V83-B, CSS-HX-2-B.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged
to sound an alarm locally and at the control room

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area.
Portable extinguishers provided in area.

7.0 FIRE LOADING

	Quantity	
	Fixed	Transient
Oil		
Grease	2.5 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	54,170 lbs	
Resins		
Other		100 lbs

7.2 Area Fire Loading Evaluation: 1,022 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Not applicable
- 9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant safe shutdown equipment located in separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-1
- 3.0 AREA DESCRIPTION: Component Cooling Area, Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour rated fire resistance rating

Penetrations: Sealed with material approved for 3 hour rated resistance.

3.2 Ventilation:

Normal: Supplied by HCA-HVAC system

Emergency: Smoke exhaust through fixed duct or by portable equipment

3.3 Drainage: Floor drains are provided

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Accessible from 2 directions

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 10,560 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

GSB-SL5-1: HCA-DAO-11A, HCA-DAO-12A, HCA-DAO-11B, HCA-DAO-12B, IAC-V77, IAC-V420, IAC-V421, IAC-V93, IAC-V94, IAC-V188, IAC-V189, IAC-V32, IAC-V190, IAC-V49, IAC-V50, CCW-V688, CCW-V475-B, CCW-V12, CCW-V493, CCW-V427, CCW-V428, CCW-V13, CCW-HX-1-A, CCW-V19, CCW-V25, CCW-V74A, CCW-V76A, CCW-PMP-5-A, CCW-V84A, CCW-82A, CCW-V86-A, CCW-V75-B, CCW-V77-B, CCW-PMP-6-B, CCW-V85-B, CCW-V83-B, CCW-V87-B, CCW-V88-A, CCW-V89-B, CCW-V90-B, CCW-V91-B, CCW-V48, CCW-V51, CCW-PMP-2, CCW-V66, CCW-V63, CCW-V69, CCW-V46, CCW-V49, CCW-PMP-1, CCW-V64, CCW-V61, CCW-V67, CCW-V72-A, CCW-V73-A, CCW-V469, CCW-V470, CCW-V474A, CCW-V14, CCW-HX-3-C, CCW-V20, CCW-V26, CCW-V262, CCW-V15, CCW-V21, CCW-V27, CCW-V34, CCW-V35, CCW-HX-2-B, CCW-ZS-3628, CCW-PSL-1223, CCW-PSL-1219, NSW-TI-4578, NSW-TE-1017, NSW-TE-1023, NSW-V135-A, NSW-V133-A, NSW-TCV-1023, NSW-V137-A, NSW-V111-A, NSW-V115-A, NSW-V-117-A, NSW-V-127-A, NSW-V-129-A, NSW-V-317-A, NSW-FE-1989, NSW-V-89-A, NSW-V91-A, NSW-V136-B, NSW-V138-B, NSW-TCV-1017, NSW-V134-B, NSW-V114-B, NSW-V139, NSW-V140, NSW-V145, NSW-V132-B, NSW-V116-B, NSW-V118-B, NSW-V128-B, NSW-V318-B, NSW-FE-1978, NSW-V92-B, NSW-V90-B, NSW-PMP-2B, NSW-HX-2B, NSW-FE-1916, NSW-V234-B, NSW-V233-B, NSW-V242-B, NSW-TCV-1926, NSW-V243-B, NSW-V241-B, NSW-V313-B, NSW-V263-B, NSW-V265-B, NSW-V260-B, NSW-V251-B, NSW-V248-F, NSW-V240-B, NSW-V247-B, NSW-V327-B, NSW-V328-B, NSW-HX-1A, NSW-V161A, NSW-TCV-1887, NSW-V153-A, NSW-FE-1877, NSW-V151-A, NSW-V152-A, NSW-V231-A, NSW-V159-A, NSW-V181-A, NSW-V329-A, NSW-V178-A, NSW-V169-A, NSW-V165-A, NSW-V158-A, NSW-V330-A, NSW-V183-A, NSW-V160-A, NSW-V166-A, NSW-PMP-1-A, NSW-V235-B, NSW-V82-B, NSW-V84-B, NSW-ZS-1887, NSW-ZT-1887, NSW-FIT-1877, NSW-TE-1887, NSW-ZT-1023, NSW-ZS-1023, NSW-ZT-1017, NSW-ZS-1017, NSW-ZS-1926, NSW-ZT-1926, NSW-TE-1926, NSW-FIT-1916

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout.

FIRE HAZARDS ANALYSIS

- 6.2 Fixed Suppression: Automatic wet pipe sprinklers installed at ceiling over cable trays and on CCW pumps.

Hazard Classification: Transient combustible or oil spill at pumps.

System Objective: Control transient combustible in vicinity of origin.

- 6.3 Manual Suppression: Hose stations and portable extinguishers installed in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	4.5 gals	
Grease	73 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	53,873 lbs	
Resins		
Other		100 lbs

- 7.2 Area Fire Loading Evaluation: 53,342 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppressions.

- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Motors, valve operators and associated electrical equipment.

- 9.2 Accident Discharge Consequences: Only one division will be affected due to spatial separation or provision of passive barriers.

FIRE HAZARDS ANALYSIS

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant NSW pumps are separated by 100 feet with no continuity of combustibles between. Pumps are also located under automatic sprinklers at ceiling. A fire will not spread from one to the other.

Redundant CCW pumps are separated by approximately 8 feet. A one hour partial barrier wall between the pumps with closed head spray nozzles directed at each pump will prevent a fire in one pump from affecting the other pump.

Redundant air operated dampers are adjacent to each other. A one hour barrier around the air operators and damper of either division in conjunction with sprinklers at ceiling will prevent a transient exposure fire from damaging both.

Redundant TCV's, FIT's and PSL's are separated by 20 or more feet and sit approximately 15 feet above floor. Automatic sprinklers are installed at ceiling over cable trays between the redundant units. A one hour passive barrier for one division will prevent damage to both from a transient combustible fire.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-2A thru 2K
- 3.0 AREA DESCRIPTION: Primary Auxiliary Area, Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally operated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied from HPA-HVAC system through single supply duct.

Emergency: Smoke exhaust through normal ductwork or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible from 2 adjacent areas

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 10,834 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL5-2A thru 2K: BRS-V340, BRS-V637, BRS-V341, BRS-V329, BRS-V330, BRS-V347, BRS-V348, BRS-V350, BRS-V351, BRS-V352, BRS-V353, BRS-V354, BRS-V355, BRS-V356, BRS-V357, BRS-V358, BRS-V361, BRS-V362, BRS-V363, BRS-V364, BRS-V365, BRS-V366, BRS-V761, BRS-PMP-5-A, BRS-PMP-6-B, BRS-TE-56A, BRS-TE-56B, BRS-V457, BRS-V608, BRS-V309, BRS-V360, BRS-V654, BRS-V748, BRS-V337, BRS-V338, BRS-V339, BRS-V54B, BRS-V331, BRS-V334, BRS-V335, BRS-V336, BRS-V359, BRS-V609, BRS-V458, BRS-V655, BRS-V749, BRS-TK-3, BRS-TK-4, BRS-STR-12, BRS-V577, MUS-CV25, MUS-V125, MUS-V120, MUS-V119, MUS-V242, MUS-V241-A, CCW-V95, CCW-V105, CCW-V107, CCW-V224, CCW-V225, CCW-FE-2144, CCW-V94, CCW-V104, CCW-V106, APN-MCC-EB11, APN-MCC-EA11.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors provided throughout arranged to sound signals locally and in the Control Rooms.

6.2 Fixed Suppression: Automatic wet pipe sprinklers installed at ceiling over cable trays.

Hazard Classification: Ordinary hazard class

System Objective: Control transient combustible fire to vicinity of origin.

6.3 Manual Suppression: Hose stations are provided at stairways. Portable extinguishers in area.

FIRE HAZARD ANALYSIS

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	2 gals	
Grease	4 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	93,303 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 89,742 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Motor Control Centers

9.2 Accident Discharge Consequences: Redundant MCC's are separated by about 60 feet so only one division could be affected by sprinkler discharge.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant Motor Control Centers (EA11 and EB11) are separated by 60 feet. Sprinklers over cable trays (only fixed intervening combustibles) will prevent spread to redundant MCC. Redundant BRS pumps are in same zone (SL5-2D) 3 feet apart. There are no fixed combustibles in zone except pump lubricant. A one hour barrier on one pump or partial wall between pumps will prevent damage to both pumps from a transient fire.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-3, SL6-11A, SL6-11B
- 3.0 AREA DESCRIPTION: Emergency Diesel Generator B Area, Elev. 395',
406', 428'-6"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel except for un- protected steel plat- form around diesel	3 hours

3.1.4 Opneings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally operated 3 hour rated fire resistance dampers.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HDG-HVAC System (B Train Diesel)

Emergency: Smoke exhaust through normal system duct work or portable equipment.

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 directions

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 3,862 sq. ft. (each of three zone)

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

GSB-SL5-3: DIE-PDS-2411A, DIE-PDS-2411B, DIE-FLT-1B, DIE-FLT-2B, DIE-EXJ-6B, IAC-V460, IAC-TK-2-B, IAC-V165, MEA-HIS-7636A, MEA-EL-7636A & B, HDG-AHU-1B, HDG-FAN-2B, HDG-FAN-4B, HDG-LP-1B, HDG-HIS-9818A, HDG-HIS-7606, HDG-FIS-9805, HDG-FIS-9887, HDG-FI-9812, HDG-FI-9813.

GSB-SL6-11A: DLO-PI-5671, DLO-TSHL-5672, DLO-TAL-5672, DLO-TAH-5672, DLO-TAH-5673, DLO-TAL-5673, DLO-PDI-5677, DLO-PDS-5678, DLO-PAH-5678, DLO-LAL-5675, DLO-LI-5674, DLO-PAH-5669, DLO-PI-5668, DJW-TSHL-5650, DJW-TAL-5650, DJW-TAH-5650, DJW-LSL-5649, DJW-LAL-5649, DJW-LS-4949, DJW-PAL-5641, DJW-TSL-5645, DJW-HS-5645A, DJW-HS-5644A, DJW-PSL-5644, DJW-TAL-5643, DJW-TAH-5643, DJW-PI-5642, DJW-PSL-5641, DIE-PHH-2411, DIE-PI-2409, DIE-PI-5651, DIE-EXJ-3B, DIE-EXJ-4B, DIE-SIL-1B, DIE-SIL-3B, DIE-SIL-4B, PSA-V63-B, PSA-V59-B, PSA-V62-B, PSA-V64-B, PSA-V66-B, PSA-V67-B, PSA-SV-6217-A, PSA-SV-6217-B, PSA-SV-6217-C, PSA-SV-6217-D, PSA-PI-5655, PSA-PI-5656, PSA-HIS-6217-A, PSA-KY-6217, PSA-SI-2491A, PSA-SI-2489A, PSA-PSL-6216B, PSA-PSLL-6216A, PSA-PALL-6216, PSA-PSL-6209A, DSA-PSH-6209B, DSA-PSL-6214A, DSA-PSH-6214B, DFO-V63B, DFO-V111B, DFO-V88B, DFO-V102B, DFO-V96B, DFO-LCV-4947, DFO-TK-3B, DFO-HIS-2072, DFO-LI-5073, DFO-LSLL-5044, DFO-LSH-5044, DFO-LSL-5045, DFO-LSH-5045, DFO-LSHH-15-1, DFO-LAHH-15-1, DFO-LSLL-14-1, DFO-PDAH-17-1, DFO-ZA-12-1, DFO-PDAH-16-1, DFO-PS-28C, DFO-PAL-20-1, DFO-PDS-18C, DFO-PAH-18-1, DFO-PS-36B, DFO-PS-36C, DFO-PAH-19-1, DFO-LAH-5058, DFO-LAL-5058, DFO-HIS-2061, NSW-FAL-1950, APN-MCC-EB34-B, EDG-PNL-3B, EDG-TFR-5B, EDG-DG-1B, EDG-PNL-DG-1B.

FIRE HAZARDS ANALYSIS

GSB-SL6-11B: NSW-FIT-1950, NSW-ZS-2955, NSW-V30-B, NSW-FE-1950, NSW-V28-B, NSW-V26-B, NSW-V32-B, NSW-V36-B, NSW-V34-B, NSW-CV-2955, DIE-EDG-DG-1B, DJW-TSHL-5643, DJW-PMP-1B, DJW-PMP-3B, DJW-HX-1B, DJW-TK-1B, DJW-HTR-1B, EDG-DG-1B, EDG-PPU-1B, DFO-PMP-5B, DFO-PMP-7B, DFO-V98-B, DFO-V100-B, DFO-LSHL-5200, HDG-ZSC-9816, HDG-SZC-9814, HDG-DAO-2B, HDG-DAO-3B, DSA-V47-B, DSA-V44-B, DSA-V48-B, DSA-V49-B, DSA-REC-1-B, DSA-V51-B, DSA-V52-B, DSA-TRP-6-B, DSA-V54-B, DSA-V69-B, DSA-V36-B, DSA-V37-B, DSA-V38-B, DSA-REC-2-B, DSA-V39-B, DSA-V40-B, DSA-TRP-5-B, DSA-V43-B, DSA-V70-B, IAC-V160, IAC-V413, IAC-V137, IAC-V138, DLO-TSHL-5673, DLO-PS-8C, DLO-PS-8D, DLO-LSL-5675, DLO-TSH-5676, DLO-PDS-5669, DLO-TK-1B, DLO-HTR-1B, DLO-PMP-3B, DLO-PMP-1B, DLO-HX-1B, DLO-FLT-1B, DLO-FLT-3B.

6.0 FIRE PROTECTION

6.1 Detection: Thermal detection provided throughout diesel cell arranged to sound an alarm locally and in the control room and will activate preaction system. Ionization detection provided in HVAC area (SL5-3).

6.2 Fixed Suppression: Automatic deluge sprinkler system on fuel oil day tank diesel engine, and associated piping as well as preaction sprinkler system over general area activated by thermal detectors. No fixed protection in HVAC area (SL5-3).

Hazard Classification: Fuel oil spill.

System Objective: Control fuel oil fire involving total floor area.

6.3 Manual Suppression: Manual hose standpipes provided adjacent to area and portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil and diesel fuel	1,550 gals	
Grease	8 lbs.	
Flammable/Combustible Liq.		55 gal
Chemicals		
Cabling	8,675 lbs	
Resins		
Other	Class A	100 lbs.

FIRE HAZARDS ANALYSIS

7.2 Area Fire Loading Evaluation: 85,950 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A fire will be limited to the vicinity of origin by operation of the fixed suppression system. A fire in the HVAC will be controlled by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Diesel generator B and related equipment.

9.2 Accidental Discharge Consequences: Since the redundant system is in a separate fire area with independent suppression system, accidental discharge will not disable both safety systems.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown system is separated by 3 hour rated fire barrier. Fully involved spill fire will not breach this barrier. Therefore safe shutdown is not affected by loss of area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-4, SL6-12A, SL6-12B
- 3.0 AREA DESCRIPTION: Emergency Diesel Generator "A" Area, Elev. 395',
406', 428'-6"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel except for the un- protected steel plat- form around the diesel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally actuated with 3 hour rated fire
resistance.

Penetrations: Sealed with material approved for 3 hour
rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HDG-HVAC System (A train Diesel)

Emergency: Smoke exhaust through normal system ductwork or
portable equipment.

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Entrances from 2 opposite corners.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 4,688 sq. ft. (each of three zones)

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL5-4: HDG-FIS-9785, HDG-HIS-9800A, HDG-HIS-758C, HDG-FIS-9885, HDG-FI-9795, HDG-FI-9794, HDG-FAN-2A, HDG-FAN-4A, HDG-LP 1A, HDG-AHU-1A, MEA-HIS-7635A, MEA-EL-7635-A & B, DIE-PDS-2420A, DIE-PDS-2420B, DIE-FLT-3A, DIE-FLT-4A, DIE-EXJ-5A, IAC-V459, IAC-TK-1-A, IAC-V166.

GSB-SL6-12A: DLO-PAH-5658, DLO-PI-5657, DLO-PI-5660, DLO-TSHL-5661, DLO-TAL-5661, DLO-TAH-5661, DLO-TAH-5662, DLO-TAL-5662, DLO-PDI-5666, DLO-PDS-5667, DLO-PAH-5667, DLO-LAL-5664, DLO-LI-5663, EDG-PNL-4A, EDG-TFR-6A, EDG-DG-2A, EDG-PNL-DG-2A, DSA-V28-A, DSA-V24-A, DSA-V27-A, DSA-V29-A, DSA-V31-A, DSA-V32-A, DSA-SV-6208-A, DSA-SV-6208-B, DSA-SV-6208-C, DSA-SV-6208-D, DSA-PI-5653, DSA-PI-5654, DSA-HIS-6208A, DSA-KY-6208, DSA-SI-2495A, DSA-SI-2493A, DSA-PSLL-2431-B, DSA-PSLL-2431A, DSA-PALL-2428A, DSA-PSH-2428B, DSA-PSL-2427A, DIE-EXJ-1A, DIE-EXJ-2A, DIE-SIL-2A, DIE-SIL-5A, DIE-SIL-6A, DIE-PAH-2420, DIE-PI-2416, DIE-PI-5652, DFO-LCV-4946, DFO-V-6A, DFO-TK-4A, DFO-V95A, DFO-V87A, DFO-V97A, DFO-V109A, DFO-LI-5050, DFO-LSLL-5048, DFO-LSH-5048, DFO-LSL-5049, DFO-LSH-5049, DFO-LSHH-15-1, DFO-LAHH-15-1, DFO-LSLL-14-1, DFO-LALL-14-1, DFO-PDAH-17-1, DFO-ZA-12-1, DFO-PDAH-16-1, DFO-PS-28C, DFO-PAL-20-1, DFO-PDS-18C, DFO-PAH-18-1, DFO-PS-36B, DFO-PS-36C, DFO-PAH-19-1, DFO-LAH-5055, DFO-LAL-5055, DFO-HIS-5072, DFO-HIS-2060, APN-MCC-EA34, DJW-TAL-5640, DJW-TAH-5640, DJW-TSHL-5640, DJW-LS-4948, DJW-LSL-5639, DJW-LAL-5639, DJW-TSL-5638, DJW-HS-5638A, DJW-HS-5637A, DJW-PSL-5637, DJW-TAL-5636, DJW-TAH-5636, DJW-PI-5634, DJW-PSL-5635, DJW-PAL-5635, IAC-V178.

FIRE HAZARDS ANALYSIS

GSB-SL6-12B: NSW-V31-A, NSW-V35-A, NSW-V33-A, NSW-CV-2954, NSW-FE-1959, DJW-HX-2-A, DLO-TK-2A, DLO-HTR-2A, DLO-PMP-4A, DLO-PMP-2A, DLO-HX-2A, DLO-FLT-2A, DLO-FLT-4A, DLO-PDS-5658, DLO-TSHL-5662, DLO-PS-8A, DLO-PS-8B, DLO-LSL-5664, DLO-TSH-5665, DFO-PMP-6A, DFO-PMP-8A, DFO-V101-A, DFO-V99-A, DFO-LSHL-5199, PSA-V12-A, PSA-V9-A, PSA-V13-A, PSA-V14-A, PSA-V16-A, PSA-V17-A, PSA-V19-A, PSA-V34-A, PSA-V1-A, PSA-V2-A, PSA-V3-A, PSA-V4-A, PSA-V5-A, PSA-V8-A, PSA-V35-A, PSA-REC-3-A, PSA-REC-4-A, PSA-TRP-7-A, PSA-TRP-8-A, EDG-DG-2A, EDG-PPU-2-A, NSW-FIT-1959, NSW-FAL-1959, NSW-ZS-2954, NSW-V29-A, NSW-V25-A, NSW-V27-A, DJW-PMP-2A, DJW-PMP-4A, DJW-HX-2A, DJW-TK-2A, DJW-HTR-2A, DJW-TSHL-5636, IAC-V133, IAC-V139, IAC-V140, IAC-V155, IAS-V505, HDG-DAO-2A, HDG-DAO-3A, HDG-ZSC-9798, HDG-ZSC-9796.

6.0 FIRE PROTECTION

6.1 Detection: Thermal detection provided throughout diesel cell arranged to sound an alarm locally and in the Control Room and to activate preaction system. Ionization detection provided in HVAC area (SL5-4).

6.2 Fixed Suppression: Automatic deluge sprinkler system on fuel day tank diesel engine, and associated piping and pre-action sprinkler system over general area activated by thermal detectors. No fixed protection in HVAC area (SL5-4).

Hazard Classification: Fuel oil spill.

System Objective: Control fuel oil fire involving total floor area.

6.3 Manual Suppression: Manual hose standpipes provided adjacent to the area and portable extinguishers provided in area.

7.0 FIRE LOADING7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	1550 gals	
Grease	8 lbs	
Flammable/Combustible Liq.		55 gals
Chemicals		
Cabling	7,634 lbs	
Resins		
Other	Class A	100 lbs

FIRE HAZARDS ANALYSIS

7.2 Area Fire Loading Evaluation: 68,500 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A fire in the diesel cell will be limited to the vicinity of origin by operation of the fixed suppression systems. A fire in the HVAC area will be controlled by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Diesel Generator A related equipment

9.2 Accidental Discharge Consequences: Since the redundant system is in a separate fire area with independent suppression system accidental discharge will not disable both safety systems.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown system is separated by 3 hour rated fire barrier. Fully involved spill fire will not breach this barrier. Therefore safe shutdown is not affected by loss of area.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-5A

3.0 AREA DESCRIPTION: Switchgear Area (Channel X), Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
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3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours
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3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally operated 3 hour rated fire dampers in ventilation openings. Exhaust dampers are also smoke actuated.

Penetrations: Sealed with material approved for 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supplied from HSC HVAC System with unducted exhaust to cable spread area.

Emergency: Utilize portable fixed equipment for smoke removal

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities

3.5 Accessibility: 3 separate entrances from different fire areas. area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 5,016 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5A
No safe shutdown equipment located in this area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection is installed throughout this area, sounding alarms locally and in the control room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations installed in area with electrical nozzles. Portable extinguishers are provided.

7.0 FIRE LOADING

<u>7.1 Combustible Loading</u>		Quantity	
		Fixed	Transient
Oil			
Grease			
Flammable/Combustible Liq.			5 gals
Chemicals			
Cabling		35,204 lbs	
Resins			
Other	Class A		100 lbs

FIRE HAZARDS ANALYSIS

7.2 Area Fire Loading Evaluation: 73,300 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Fixed Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Fixed Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION

10.1 Major Equipment: No redundant safe shutdown equipment is located in the area.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-5B

3.0 AREA DESCRIPTION: Switchgear Area (Channel B), Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
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3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours
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3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally operated 3 hour rated fire dampers in ventilation openings. Exhaust dampers are also smoke actuated.

Penetrations: All penetrations sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supply ducted with unducted exhaust to cable spread area.

Emergency: Utilize portable and fixed ducts for smoke removal.

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: 3 separate entrances from adjacent fire area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 2,625 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL5-5B: VPN-SWG-DB-B, VPN-UPS-VB-A-B, VPN-PDC-DB1-B,
CCW-HIS-1219B, FWS-LI-10A5, FWS-LI-10B5, FWS-HIS-20B,
FWA-HIC-20A5, FWA-HIC-20B5, FWA-HIS-3067-B, FWA-HIS-3069-B,
FWA-4018-B, RCS-HIS-10-2, RCS-HS-17-3, RCS-LI-14-2, RCS-PI-16-2,
RCS-PSHL-16-4, RCS-HIS-17-7, RCS-TT-3B4, RCS-TI-3B-2,
RCS-TT-4A6, RCS-TI-4A3, NSW-HIS-1945-B, MUS-HIS-32B2,
MUS-HIS-33B4, MUS-HIS-33C2, MUS-HIS-4-2, MUS-HIS-48-2,
MUS-HIS-4727B, MUS-HIS-43C2, MUS-HIS-43D2, APN-SWGR-EB-B,
APN-MCC-EB21-B, APN-USS-EB1-B, APN-USS-EB2-B, APN-USS-EB3-B,
APN-USS-EB4-B, MSS-PI-12B4, MSS-HIC-14B1, MSS-PI-12A4,
MSS-HIC-14A3.

6.0 FIRE PROTECTION

6.1 Detection: Ionization smoke detectors installed in general area to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in area and in adjacent areas. Hose stations are provided with nozzles approved for use on electrical fires.

FIRE HAZARDS ANALYSIS

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity
Fixed	Transient

Oil	
Grease	
Flammable/Combustible Liq.	5 gals
Chemicals	
Cabling	26,074 lbs
Resins	
Other	100 lbs
Others	

7.2 Area Fire Loading Evaluation: 103,900 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Switchgear and associated equipment

9.2 Accidental Discharge Consequences: Water shields are provided over unducted HVAC exhaust openings to cable spread area above to prevent water spray from entering this zone.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: The loss of equipment in area will not affect safe shutdown capability as redundant equipment is in separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-5C
- 3.0 AREA DESCRIPTION: Switchgear Area (Battery Room-X), Elev. 421'
- 3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floors: Concrete & protected steel 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally actuated 3 hour rated fire resistant damper installed in ventilation openings.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supply from switchgear area and exhaust through fixed duct.

Emergency: On high H₂ alarm an emergency ventilation fan is operated discharging to switchgear area. Smoke exhaust is through fixed duct.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Entrance from switchgear area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 432 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5C
No safe shutdown equipment in this area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection provided to sound alarm locally and in the Control Room. H₂ detection provided to activate local exhaust fan.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in areas adjacent to battery room.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	
Chemicals	
Cabling	
Resins	
Other Plastic	2,000 lbs

7.2 Area Fire Loading Evaluation: 83,300 Ft²/sq. ft. (Hydrogen production is 11.3 cu. ft./day at 77°F. Unventilated concentration by volume over 24 hour period is 0.29%).

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: There is no safe shutdown equipment in area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-5D and SL5-5J
- 3.0 AREA DESCRIPTION: Switchgear Area (Channel A), Elev. 421'
- 3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally actuated with 3 hour rated fire resistance. In exhaust to cable spread room, dampers are also smoke actuated.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied from HSC-HVAC system through ducted supply with unducted exhaust to cable spread room.

Emergency: Utilize portable equipment and fixed ducts for smoke removal

3.3 Drainage: Floor drains are provided.

FIRE HAZARDS ANALYSIS

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 opposite directions.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 3,961 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL5-5D: MSS-PI-12A-1, MSS-HIC-14A1, MSS-PI-12B1, FWA-HIS-20B, MSS-HIC-14B3, FWA-HIC-20A3, FWA-HIS-20A, FWA-HIC-20B3, FWA-HIS-4016B, FWA-HIS-3066-B, FWA-HIS-3068-B, FWS-LI-10A4, FWS-LI-10B4, CCW-HIS-1223-B, NSW-HIS-1906-B, RCS-TT-4B6, RCS-TI-4B3, RCS-TT-3A4, RCS-TI-3A2, RCS-HIS-17-5, RCS-HIS-11-2, RCS-LI-14-1, RCS-PI-16-1, RCS-PSHL-16-1, RCS-PSHL-16-3, RCS-HIS-17-6, MUS-HIS-3317-B, MUS-HIS-43B2, MUS-HIS-43A2, MUS-HIS-33B2, MUS-HIS-32A2, MUS-HIS-33A2, MUS-HIS-2A2, MUS-HIS-2B2, APN-SWGR-EA, APN-USS-EA1, APN-USS-EA2, APN-USS-EA3, APN-USS-EA4, APN-MCC-EA21, VPN-SWG-DA, VPN-UPS-VA-A, VPN-PDC-DA1.

GSB-SL5-5J: No safe shutdown equipment in this zone

6.0 FIRE PROTECTION

6.1 Detection: Ionization smoke detectors installed throughout to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in area and in adjacent areas. Hose stations are provided with nozzles approved for use on electrical fires.

7.0 FIRE LOADING

FIRE HAZARDS ANALYSIS

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil		
Grease		
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	20,290 lbs	
Resins		
Other Class A		100 lbs

7.2 Area Fire Loading Evaluation: 57,500 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Switchgear and associated equipment

9.2 Accidental Discharge Consequences: Water shields are provided over unducted HVAC openings to cable spread area above to prevent spray from entering this zone.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-5E

3.0 AREA DESCRIPTION: Switchgear Area (Battery Room-B)

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally actuated 3 hour rated fire resistance dampers.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supply from switchgear area, with exhaust through fixed duct.

Emergency: On high H₂ alarm an emergency ventilation fan is operated discharging to switchgear area. Smoke exhaust through fixed duct.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Entrance from switchgear area.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 425 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5E
VPN-BTT-DB
HSC-FAN-5B

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection provided to sound alarm locally and in the Control Room. H₂ detection provided to actuate local exhaust fan.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in adjacent areas.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity	
		Fixed	Transient
	Oil		
	Grease		
	Flammable/Combustible Liq.		
	Chemicals		
	Cabling		
	Resins		
	Other Plastic	800 lbs	

7.2 Area Fire Loading Evaluation: 19,600 Btu/sq. ft.
(Hydrogen production is 2.6 cu. ft./day at 77°F. Unventilated concentration by volume over a 24 hour period is .07%.)

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Fixed Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Fixed Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-5F
- 3.0 AREA DESCRIPTION: Switchgear Area, (Channels C and D), Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floors: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermal activated dampers with 3 hour fire resistance rating. Exhaust dampers to cable spread area are also smoke actuated.

Penetrations: Sealed with material approved for 3 hour rated fire resistance rating.

3.2 Ventilation:

Normal: Supplied from HSC-HVAC system through ducted supply with exhaust to the cable spread area

Emergency: Portable equipment with flexible duct for smoke removal and utilize fixed system.

3.3 Drainage: Floor drains are provided.

FIRE HAZARDS ANALYSIS

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: 3 separate entrances from adjacent fire areas.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 1,696 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5F
VPN-SWG-DC-C
VPN-UPS-VC-A-C
VPN-SWG-DD-D
VPN-UPS-VD-A-D
APN-PP-EA33
APN-PP-EB33

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection is installed throughout and sounds an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations provided at stairwells in adjacent areas and portable extinguishers provided in room.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	5 gals

FIRE HAZARDS ANALYSIS

Chemicals		
Cabling		8,189 lbs
Resins		
Other	Class A	100 lbs

- 7.2 Area Fire Loading Evaluation: 913 Btu/sq. ft. (Combustible loadings associated with cable was disregarded since all are enclosed with a passive fire barrier).

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Fixed Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Switchgear
- 9.2 Accidental Discharge Consequences: Water shields are provided over the curbed, unducted HVAC openings to the Cable Spread area above to prevent spray from entering this zone.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant safe shutdown equipment is separated by a one hour barrier. Therefore, a transient fire will only damage one channel.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-5G

3.0 AREA DESCRIPTION: Switchgear Area (Battery Room-D), Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1 <u>Walls:</u>	North	Concrete	3 hour
	South	Concrete	3 hour
	East	Concrete	3 hour
	West	Concrete	3 hours
3.1.2 <u>Floor:</u>		Concrete with protected steel	3 hours
3.1.3 <u>Ceiling:</u>		Concrete with protected steel	3 hours
3.1.4 <u>Openings:</u>			

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated 3 hour rated fire resistance damper installed in ventilation openings.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied from switchgear area, with exhaust through fixed duct.

Emergency: On high H₂ alarm, an emergency ventilation fan is operated discharging to switchgear area. Smoke exhaust is through fixed duct.

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Entrance from switchgear area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 272 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5G
VPN-BTT-DD
HSC-FAN-6B

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection provided sound alarm locally and in the Control Room. H₂ detection provided to activate local exhaust fan.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in areas adjacent to battery room.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	
Chemicals	
Cabling	
Resins	
Other Plastic	600 lbs

FIRE HAZARDS ANALYSIS

- 7.2 Area Fire Loading Evaluation: 39,700 Btu/sq. ft. (Hydrogen production is 1.6 cu. ft./day at 77°F. Unventilated concentration by volume over 24 hour period is 0.06%.)

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Fixed Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant safe shutdown equipment is located in a separate fire area.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-5H

3.0 AREA DESCRIPTION: Switchgear Area (Battery Room-C), Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
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3.1.3	<u>Ceiling:</u>	Concrete	3 hours
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3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistant

Dampers: Thermally actuated 3 hour rated fire resistance damper installed in ventilation openings.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied from switchgear area, through ventilation opening with damper and exhaust through fixed ducts

Emergency: On high H₂ alarm an emergency ventilation fan is operated discharging to switchgear area. Smoke exhaust is through fixed duct.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Entrance from switchgear area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 272 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5H
VPN-BTT-DC
HSC-FAN-7A

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors provided to sound alarm locally and in the Control Room. H₂ detection provided to activate local exhaust fan.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in areas adjacent to battery room.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	
Chemicals	
Cabling	
Resins	
Other Plastic	2,000 lbs

7.2 Area Fire Loading Evaluation: 83,300 Btu/sq. ft. (Hydrogen production is 11.3 cu. ft./day at 77°F. Unventilated concentration by volume over 24 hour period is 0.29%.)

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Fixed Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-5I
- 3.0 AREA DESCRIPTION: Switchgear Area (Battery Room-A), Elev. 421'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2	<u>Floors:</u>	Concrete & protected steel	3 hours
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3.1.3	<u>Ceiling:</u>	Concrete	3 hours
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3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally operated 3 hour rated fire resistant damper installed in ventilation openings.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied from switchgear area, through ventilation opening with damper and exhaust through duct located in switchgear area.

Emergency: On high H₂ alarm, an emergency ventilation fan is operated discharging to switchgear area. Smoke exhaust is through fixed duct.

FIRE HAZARDS ANALYSIS

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Entrance from switchgear area.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 391 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-5I
VPN-BTT-DA
HSC-FAN-8A

6.0 FIRE PROTECTION

6.1 Detection: Ionization detection provided to sound alarm locally and in control room. H₂ detection provided to activate local exhaust fan.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations provided in areas adjacent to battery room.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity
	Fixed Transient
Oil	
Grease	
Flammable/Combustible Liq.	
Chemicals	
Cabling	
Resins	
Other Plastic	800 lbs

FIRE HAZARDS ANALYSIS

- 7.2 Area Fire Loading Evaluation: 36,800 Btu/sq. ft. (Hydrogen production is 2.5 cu. ft./day at 77°F. Unventilated concentration by volume over 24 hour period is 0.07%).

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Fixed Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Fixed Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION

- 10.1 Major Equipment: Redundant safe shutdown equipment is located in a separate fire area.

FIRE HAZARD ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-6

3.0 AREA DESCRIPTION: HVAC for Non-contaminated Service Area,
Elev. 428'-6"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete with protected steel 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied from HCH-HVAC system.

Emergency: Smoke exhaust utilizing portable exhaust equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire and safe shutdown activities.

3.5 Accessibility: Accessible through 2 stairways and 1 adjacent area.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 2,831 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: GSB-SL5-6
No safe shutdown equipment located in area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	8 lbs
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	
	Resins	
	Other Class A	100 lbs

7.2 Area Fire Loading Evaluation: 598 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled to the vicinity of origin by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Not applicable

9.2 Accidental Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment located in a separate area.

FIRE HAZARDS ANALYSIS

1.0 BUILDING: General Services Building

2.0 AREA OF ANALYSIS: GSB-SL5-7

3.0 AREA DESCRIPTION: Machine Shop Storage Elev. 428'6"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2	<u>Floor:</u>	Concrete with protected steel	3 hours
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3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours
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3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally operated fire dampers with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance

3.2 Ventilation:

Normal: Supplied from HSC-HVAC System with exhaust through HSC-AHU to outside.

Emergency: Smoke purge capability provided through normal ventilation ducts to exhaust air plenum.

3.3 Drainage: Floor drains are provided.

FIRE HAZARDS ANALYSIS

- 3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities
- 3.5 Accessibility: One entrance from HVAC area adjacent to this area.
- 3.6 Radioactivity:
- | | <u>Yes</u> | <u>No</u> |
|--------------|------------|-----------|
| in Equipment | _____ | <u>x</u> |
| Airborne | _____ | <u>x</u> |
- 4.0 FLOOR AREA: 1,950 sq. ft.
- 5.0 EQUIPMENT DESCRIPTION:
- 5.1 Safe Shutdown
- GSB-SL5-7
HSC-DAO-4A
HSC-FAN-3A
HSC-ZSC-9723
HCL-AMS-5A
HCL-AMS-5B
- 6.0 FIRE PROTECTION
- 6.1 Detection: Ionization detectors are installed in general area and arranged to sound an alarm locally and in the Control Room.
- 6.2 Fixed Suppression: None
- Hazard Classification: N/A
- System Objective: N/A
- 6.3 Manual Suppression: Two hose stations provided at nearby stairwells for use by fire brigade. Portable extinguishers are provided in area.
- 7.0 FIRE LOADING
- 7.1 Combustible Loading
- | | <u>Quantity</u> | |
|----------------------------|-----------------|------------------|
| | <u>Fixed</u> | <u>Transient</u> |
| Oil | | 55 gals |
| Grease | | 10 lbs. |
| Flammable/Combustible Liq. | | 10 gals |

FIRE HAZARDS ANALYSIS

Chemicals			
Cabling			
Resins			
Other	Class A	50 lbs	20 lbs

7.2 Area Fire Loading Evaluation: 5,380 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 Without Fixed Fire Suppression: The fire will be controlled within the area by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 With Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION

10.1 Major Equipment

Redundant equipment is located in a separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL5-8A, 8B, and 8C
- 3.0 AREA DESCRIPTION: Electrical Tunnel, Elev. 416'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by duct from HPT-HVAC system.

Emergency: Portable smoke exhaust equipment or through fixed exhaust.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Stairways with access at either end and in the center.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 7,329 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: Cabling

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Closed head wet pipe sprinkler system installed at the ceiling.

Hazard Classification: Electrical cable in open trays.

System Objective: Control exposure fire

6.3 Manual Suppression: Hose stations provided at stairway. Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity
Fixed	Transient

Oil		
Grease		
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	85,111 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 121,000 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be limited to the vicinity of origin by operation of the fixed suppression system.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Cabling

9.2 Accident Discharge Consequences: Undamaged electrical cabling is not subject to damage from water discharge.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in a separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-1A through 1G
- 3.0 AREA DESCRIPTION: Makeup Pump Area, Elev. 399'
- 3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed at barrier to Isolation Building with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HCA-HVAC system

Emergency: Smoke exhaust through normal system ductwork or by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through two stairways and other adjacent areas.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	
	Airborne		<u>x</u>

4.0 FLOOR AREA: 10,825 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-1A: IAC-V33, IAC-V183, IAC-V184, IAC-V185, IAC-V186, MUS-V-161-A, HCA-DAO-6A, HCA-DAO-9A, HCA-DAO-6B, HCA-DAO-9B, APN-MUS-PMP-3C Transfer Switch.

GSB-SL6-1B: HCA-DAO-7A, MUS-PMP-1A, MUS-V437A, MUS-V438A, NSW-V387A, NSW-V385A.

GSB-SL6-1C: MUS-PMP-3C, MUS-V445C, MUS-V446C, NSW-V390, NSW-V389, HCA-DAO-8A, HCA-DAO-8B.

GSB-SL6-1D: HCA-DAO-7B, MUS-PMP-2B, MUS-V441B, MUS-442B, NSW-V388B, NSW-V386B, IAC-V416, IAC-V417, IAC-V418, IAC-V419.

GSB-SL6-1E: MUS-V198A, MUS-V199B, MUS-ZS-36, MUS-ZS-37.

GSB-SL6-1F: NSW-ZS-1178, NSW-ZS-1914, NSW-ZS-1957, NSW-ZS-1875, NSW-ZS-1966, NSW-ZS-1187, NSW-V367A, NSW-V363A, NSW-STR-3A, NSW-V371A, NSW-V373A, NSW-V365A, NSW-V366A, NSW-V362B, NSW-STR-4B, NSW-V370B, NSW-V372B, NSW-V364B, NSW-V369A, NSW-V368B, NSW-V2B, NSW-CV-1178, NSW-V12B, NSW-V4B, NSW-V86B, NSW-CV-1914, NSW-V88B, NSW-V44B, NSW-V73B, NSW-V76B, NSW-V72B, NSW-V6B, NSW-V5A, NSW-V81A, NSW-V83A, NSW-V85A, NSW-CV-1875, NSW-V87A, NSW-V43A, NSW-V74A, NSW-V75A, NSW-V71A, NSW-V1A, NSW-CV-1187, NSW-V11A, NSW-V3A, MUS-PS-3341C, MUS-PS-3341A, MUS-PS-3341B, IAC-V47, IAC-V48, IAC-V182, IAC-V76, IAC-V88, IAC-V87, IAC-V415, IAC-V415, ESW-V51A, ESW-V53A, ESW-V55B, ESW-V57B.

GSB-SL6-1G: MUS-V162C, MUS-V160A, MUS-FO-35A, MUS-V155A, MUS-V273A, MUS-V466A, MUS-V467A, MUS-V158A, MUS-FO-35C, MUS-V157B, MUS-V275B, MUS-V360A, MUS-V216, MUS-V465B, MUS-V686B, MUS-V142B, MUS-V141B, MUS-V361, MUS-V148B, MUS-V164B, MUS-V169B, MUS-V374, MUS-V375, MUS-V378, MUS-V379, MUS-V147C, MUS-V165C, MUS-V168C, MUS-V171C, MUS-V172C, MUS-V381B, MUS-V377, MUS-V380A, MUS-V376, MUS-V685A, MUS-V145A, MUS-V144A, MUS-V146A, MUS-V166A, MUS-V167A, MUS-V470B, MUS-V471B, MUS-V163B, MUS-V159C, MUS-FO-35B, MUS-V156C, MUS-V274C, MUS-V468C, MUS-V469C, MUS-ZS-32-B, MUS-ZS-32-A, MUS-PS-3342C,

FIRE HAZARD ANALYSIS

MUS-PS-3343C, MUS-PS-3342A, MUS-PS-3342B, MUS-PS-3343A, MUS-PS-3343B, MUS-ZS-3317, MUS-ZS-4727, BRS-FE-6165, BRS-V901, BRS-V902, NSW-V97A, NSW-V97A, NSW-V99A, NSW-V101A, NSW-V103A, NSW-V105A, NSW-V95A, NSW-V146, NSW-V147, NSW-V148, NSW-V149, NSW-V150, NSW-V107A, NSW-V96B, NSW-V98B, NSW-V100B, NSW-V102B, NSW-V104B, NSW-V106B, NSW-V108B.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling throughout area arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinklers installed at ceiling over makeup pumps, cable trays and pump lay down area.

Hazard Classification: Ordinary hazard.

System Objective: Control fire and prevent damage to redundancy.

6.3 Manual Suppression: Hose stations provided in area and adjacent areas. Portable extinguishers installed in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	123 gals	
Grease	79 lbs	
Flammable/Combustible Liq. Chemicals		55 gals
Cabling	16,984 lbs	
Resins		
Other Class A		100 lbs

7.2 Area Fire Loading Evaluation: 19,350 Btu/sq. ft. over entire area, Pump lay down area (fire zone GSB-SL6-1A) has concentration equal to 43,500 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading to redundant equipment by operation of the fixed fire suppression.

FIRE HAZARD ANALYSIS

- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: MUS and NSW equipment
- 9.2 Accident Discharge Consequences: Passive barriers and proper location of sprinkler nozzles prevent more than one division from being subject of suppression system discharge and subsequent damage.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Swing pump (MUS-PMP-3C) controls and "B" Train pump (MUS-PMP-2B) controls will be provided with a one hour passive fire barrier. Automatic sprinklers over pumps and laydown area in conjunction with passive barriers will prevent a fire in the area from damaging redundant shutdown equipment.

A curb at the entrance to each pump bay will prevent a flammable liquid spill in the laydown area from entering the pump bays. Analytical modeling is being done to show that a fire at the face of the bay will not damage the pump and driver.

Redundant valves in zone SL6-1G are separated by full height walls. Sprinklers are installed at ceiling over cable trays at face of valve cubicles. With one hour passive barrier around one division of redundant valves, a fire will not damage both divisions.

A one hour passive barrier around both MUS-V198A and MUS-V199B and related cabling will prevent inadvertent valve operation. There are no fixed combustibles in this zone (SL6-1E) and it is separated by concrete walls from remainder of area.

Passive barriers on one division of NSW redundant valves and automatic sprinklers in the vicinity will prevent damage to both divisions of equipment due to an exposure fire (SL6-1F).

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-2A thru 2F
- 3.0 AREA DESCRIPTION: Auxiliary Feedwater Area, Elev. 395'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Smoke exhaust through normal system ductwork or by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 3 directions.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 12,472 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-2A: IAC-V148, IAC-V41, IAC-V42, IAC-V144, IAC-V147,
IAC-V84, IAC-V85, FWA-FIC-4001, FWA-FIC-4003.

GSB-SL6-2B: FWA-V8A, FWA-V18B, FWA-V53A, FWA-V52A, FWA-CV-3121,
FWA-FCV-4001, FWA-FE-4001, FWA-FE-4003, FWA-PMP-1A, FWA-V60B,
FWA-V12B, FWA-V4B, FWA-V27A, FWA-V24B, FWA-V59B, FWA-CV-3122,
FWA-FCV-4003, FWA-PMP-2B.

GSB-SL6-2D: FWA-V2C, FWA-V30C, FWA-V40C, FWA-V41C, FWA-V35A,
FWA-V29B, FWA-PMP-3C, FWA-TMD-1C, MSS-V96C, MSS-V159C, MSS-V84,
MSS-V434, MSS-CV-7398, MSS-CV-4673, MSS-EXJ-1, MSS-7-1-14 (Exhaust
Line), MSS-V282, MSS-V309, MSS-V310, MSS-283, MSS-V284, MSS-PT-3079,
MSS-PT-3078, HPR-V316, HPR-V318, HPR-V317, HPR-V320, HPR-V321,
HPR-V322, HPR-STR-29, HPR-TRP-29, HPR-CV-4258, HPR-OR-29, HPR-V325,
HPR-V326, HPR-V465, HPR-V370, HPR-V367, HPR-V240, HPR-V241, HPR-V323,
HPR-V324, HPR-STR-30, HPR-TRP-30, HPR-V373, HPR-V374, HPR-V369,
HPR-V368, HPR-LSHL-4258.

GSB-SL6-2E: MSS-V285, HPR-V242, HPR-V243.

GSB-SL6-2F: HPR-LSHL-6410, HPR-V332, HPR-V333, HPR-V331, HPR-V327,
HPR-V334, HPR-V335, HPR-V329, HPR-328, HPR-TRP-28, HPR-STR-28,
HPR-CV-6410, HPR-OR-49, MSS-V512, MSS-V513, NSW-V455, IAC-V180,
IAC-V26, IAC-V27, IAC-V72, IAC-V73.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged
to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinklers installed at
ceiling over cable trays and over FWA pumps below the partial
wall level.

Hazard Classification: Class A and B exposure fire.

FIRE HAZARD ANALYSIS

System Objective: Control fire in any pump bay or to vicinity of origin at cable trays.

- 6.3 Manual Suppression: Hose stations and portable extinguishers installed in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	10 gal	10 gals
Grease	15 lbs	
Flammable/Combustible Liq.		
Chemicals		
Cabling	24,000 lbs	
Resins		
Other		100 lbs

- 7.2 Area Fire Loading Evaluation: 20,339 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Feedwater pumps and associated equipment.
- 9.2 Accident Discharge Consequences: With passive barriers provided for one division, and appropriate sprinkler nozzle location accidental discharge will not affect redundant equipment.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: The turbine driven pumps associated equipment, including valves, will be provided with one hour passive barriers. In addition, associated equipment of both electric pumps located outside volume of the 12 foot high cubicle will be provided with a one hour passive barrier. With automatic sprinklers installed below the top of the partial wall on three sides of each pump

FIRE HAZARD ANALYSIS

bay and over the pump laydown area (in addition to the barriers discussed above), a fire in any bay will not damage redundant equipment.

Analytical modeling is being performed to demonstrate that a fire in the pump laydown area will not damage the turbine or its pump. Pending the results of this analysis the partial wall may be extended into the laydown area as necessary to protect the turbine pump or adjacent electric pump from the same exposure fire.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-3
- 3.0 AREA DESCRIPTION: Safeguards Area, Elev. 399'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floors: Concrete 3 hours

3.1.3 Ceiling: Concrete with protected steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally operated with 3 hour fire resistance rating

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Smoke exhaust through portable exhaust equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 adjacent areas

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 3,840 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

CSB-SL6-3: DHR-V33A, DHR-V161A, DHR-PMP-1A, DHR-V45A, DHR-V37A, DHR-V87A, DHR-V112, DHR-V41A, DHR-V39A, DHR-FCV-14A, DHR-V51A, DHR-HX-1A, DHR-V53A, DHR-FO-13A, DHR-V21A, DHR-V55A, DHR-V71A, DHR-FE-16A, DHR-FE-15A, DHR-V69A, DHR-V62A, DHR-V4-B, DHR-FCV-3A, DHR-V77, DHR-V61, DHR-ZS-14A, DHR-FY-14A, DHR-ZS-3A, DHR-FY-3A, DHR-FT-2A, DHR-TE-4A, DHR-FE-16B, IAC-V181, IAC-V145, IAC-V43, IAC-V44, IAC-V28, IAC-V29, CSS-PMP-1A, CSS-V76A, CSS-V151A, CSS-FE-2918, CSS-V133A, CSS-V21A, CSS-V23A, CSS-EDR-1A, CSS-V68A, CSS-V66A, CSS-V19A, CSS-V29A, CSS-V31A, CSS-V104A, CSS-FE-1459, NSW-FE-1900, NSW-V228A, NSW-V227A, NSW-FCV-3576 NSW-V225A, NSW-V220A, NSW-V211A, NSW-V407A, NSW-V408A, NSW-V213A, NSW-V216A, NSW-V217A, NSW-V208A, NSW-FE-1895, NSW-FE-1886, NSW-V202A, NSW-V204A, NSW-V207, NSW-V218A, NSW-V219A, NSW-V209A, NSW-V210A, NSW-V205A, NSW-V214A.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors provided at ceiling arranged to sound an alarm locally and in the Control Room

6.2 Fixed Suppression: Automatic wet pipe sprinkler installed over cable trays.

Hazard Classification: Ordinary hazard exposure to cable trays

System Objective: Control exposure fire in area of cable trays

6.3 Manual Suppression: Hose stations provided in adjacent areas. Portable extinguishers provided in area.

FIRE HAZARDS ANALYSIS

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	4 gals	
Grease	59 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	48,000 lbs	
Resins		
Other Class A		100 lbs

7.2 Area Fire Loading Evaluation: 130,000 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts. The CSS and DHR pumps are located in separate pit areas and do not expose each other.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: CSS and DHR pumps

9.2 Accidental Discharge Consequences: Redundant equipment is located in a separate fire area.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Loss of area will not affect safe shutdown capability as redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-4
- 3.0 AREA DESCRIPTION: Safeguards Area, Elev. 405'
- 3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally operated with 3 hour fire resistance rating

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 2 adjacent areas

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 1,512 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

GSB-SL6-4: DHR-V9-A, DHR-V11-A, DHR-V13-A, DHR-V17-A,
DHR-V15-A, DHR-V102-A, DHR-V103-A, DHR-V67-A, DHR-V116-A,
DHR-V82-A, DHR-V5-A, DHR-FE-2A, CSS-V15-A, CSS-V43-A.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout at ceiling.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and portable extinguishers provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

		Quantity	
		Fixed	Transient
Oil		0.5 gals	
Grease		16 lbs	
Flammable/Combustible Liq.			5 gals
Chemicals			
Cabling			
Resins			
Other	Class A		25 lbs

7.2 Area Fire Loading Evaluation: 820 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: None

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment located in separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-5
- 3.0 AREA DESCRIPTION: Safeguards Area, (Containment Penetration) Elev. 399'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours
3.1.4	<u>Openings:</u>		

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally operated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HPT-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 1 adjacent area

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 1,440 sq. ft.5.0 EQUIPMENT DESCRIPTION:5.1 Safe Shutdown:

GSB-SL6-5: CSS-VSL-1-A, CSS-EXJ-1-A, CSS-V120-A, CSS-V39-A,
CSS-V17-A, CSS-V117-A, CSS-V123-A, CSS-V112-A, CSS-ZS-2747,
DHR-ZS-9A, DHR-ZS-1A, DHR-V1-A, DHR-VSL-1-A, DHR-V117-A,
DHR-V185-A, DHR-V119-A, DHR-V121-A, DHR-V122-A, DHR-V31-A,
DHR-V83-A, DHR-V73-A, DHR-EXJ-1-A, DHR-V-80, DHR-V85, DHR-V86,
IAC-V45, IAC-V46, FWA-V13-A, FWA-V72-B, FWA-LCV-4025, FWA-V14-A,
FWA-V31-B, IAC-LCV-4026.

6.0 FIRE PROTECTION6.1 Detection: Ionization detectors installed at ceiling arranged
to sound alarms locally and in the Control Room.6.2 Fixed Suppression: NoneHazard Classification: N/ASystem Objective: N/A6.3 Manual Suppression: Portable extinguishers provided in area.
Hose stations provided in adjacent area.7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity	
		Fixed	Transient
	Oil	0.5 gals	
	Grease	105 lbs	
	Flammable/Combustible Liq.		5 gals
	Chemicals		
	Cabling		
	Resins		
	Other	Class A	50 lbs

FIRE HAZARD ANALYSIS

7.2 Area Fire Loading Evaluation: 2,163 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Fire brigade will respond utilizing fire extinguishers and/or hose streams. Due to lack of continuity of combustibles fire will not spread beyond material of origin.

8.2 Without Primary Fire Suppression: Due to lack of continuity of combustibles fire will burn itself out in material of origin.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Safe shutdown valve (CSS-V39-A) is approximately 25 ft off of floor and hence it's operator will not be damaged by transient fire. In all other cases the redundant equipment is located in a separate area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-6
- 3.0 AREA DESCRIPTION: Safeguards Area, Elev. 399'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally operated with 3 hour fire resistance rating

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown.

3.5 Accessibility: Accessible through 2 adjacent areas

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 3,200 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-6: IAC-V90, IAC-V143, IAC-V89, IAC-V78, IAC-V79,
DHR-ZS-14B, DHR-FY-14B, DHR-ZS-3B, DHR-FY-3B, DHR-TE-4B,
DHR-FT-2B, DHR-V10-B, DHR-V34-B, DHR-V163-B, DHR-PMP-2-B,
DHR-V-46-B, DHR-V-38-B, DHR-V88-B, DHR-V40-B, DHR-V42-B,
DHR-FCV-14-B, DHR-V52-B, DHR-HX-2-B, DHR-V54-B, DHR-F.O.13-B,
DHR-V22-B, DHR-V56-B, DHR-V72-B, DHR-V70-B, DHR-FE-15B,
DHR-V104-B, DHR-V3A, DHR-FCV-3B, CSS-FE-1456, CSS-EDR-2-B,
CSS-PMP-2-B, CSS-V24-B, CSS-V22-B, CSS-V77-B, CSS-V30-B,
CSS-V32-B, CSS-V152-B, CSS-V134-B, CSS-V69B, CSS-V20-B,
CSS-V67-B, CSS-FE-2919, CSS-V105-B, NSW-V310-B, NSW-V309-B,
NSW-FE-1939, NSW-FCV-3584, NSW-V307-B, NSW-V302B, NSW-V284B,
NSW-V286B, NSW-V289B, NSW-V287B, NSW-V290B, NSW-FE-1934,
NSW-FE-1934, NSW-V291-B, NSW-V292-B, NSW-V300-B, NSW-V301-B,
NSW-V299-B, NSW-V296-B, NSW-V298-B, NSW-V410-B, NSW-V409-B,
NSW-V293-B, NSW-V295-B.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system over cable trays.

Hazard Classification: Class A and B combustibles

System Objective: Control transient and cable tray fire to vicinity of origin.

6.3 Manual Suppression: Hose stations located in adjacent area. Portable extinguishers provided in area.

FIRE HAZARD ANALYSIS

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	4 gals	
Grease	28 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cables	54,170 lbs	
Resins		
Other	Class A	50 lbs

7.2 Area Fire Loading Evaluation: 176,750 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading to other important equipment by operation of the fixed fire suppression.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: DHR and CSS pumps and related equipment and NSW valves.

9.2 Accident Discharge Consequences: Redundant equipment is in a separate area.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment located in separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-7
- 3.0 AREA DESCRIPTION: Safeguards Area, Elev. 408'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor</u> :	Concrete	3 hours
3.1.3	<u>Ceiling</u> :	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance rating

Penetrations: Sealed with material approved for 3 hour fire resistance rating

3.2 Ventilation:

Normal: Supplied by HSG-HVAC system

Emergency: Smoke exhaust through normal system ducts or portable exhaust equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 2 adjacent areas

FIRE HAZARDS ANALYSIS

- 3.6 Radioactivity:
- | | <u>Yes</u> | <u>No</u> |
|--------------|---------------|---------------|
| in Equipment | <u>x</u> | <u> </u> |
| Airborne | <u> </u> | <u>x</u> |
- 4.0 FLOOR AREA: 2,160 sq. ft.
- 5.0 EQUIPMENT DESCRIPTION:
- 5.1 Safe Shutdown
- GSB-SL6-7: DHR-ZS-9B, DHR-ZS-1B, DHR-ZS-10B, DHR-V2-B,
DHR-VSL-2-B, DHR-EXJ-2-B, DHR-V120-B, DHR-V6-B, DHR-V14-B,
DHR-V32-B, DHR-V12-B, DHR-V18-B, DHR-V16-B, DHR-FE-2B,
DHR-V100-B, DHR-V101-B, DHR-V68-B, DHR-V84-B, DHR-V74-B,
DHR-V186-B, DHR-V118-B, DHR-V123-B, DHR-V124-B, CSS-EXJ-2-B,
CSS-VSL-2-B, DHR-V119-B, CSS-V44-B, CSS-V40-B, CSS-V118-B,
CSS-V18-B, CSS-V115-B, CSS-V111-B, CSS-V124-B, CSS-V16-B,
CSS-2S-2764, IAC-V414, IAC-V91, IAC-V92, FWA-V66-B, FWA-V36-A,
FWA-CCV-4007, FWA-V37-A, FWA-V20-B, FWA-LCV-4009
- 6.0 FIRE PROTECTION
- 6.1 Detection: Ionization detectors installed throughout at ceiling
arranged to sound an alarm locally and in the control room.
- 6.2 Fixed Suppression: None
- Hazard Classification: N/A
- System Objective: N/A
- 6.3 Manual Suppression: Hose stations installed in adjacent area.
Portable extinguishers provided in area.
- 7.0 FIRE LOADING
- 7.1 Combustible Loading
- | | <u>Quantity</u> | |
|----------------------------|-----------------|------------------|
| | <u>Fixed</u> | <u>Transient</u> |
| Oil | 0.5 gals | |
| Grease | 87 lbs | |
| Flammable/Combustible Liq. | | 5 gals |
| Chemicals | | |
| Cabling | | |
| Resins | | |
| Other | | 25 lbs |

FIRE HAZARDS ANALYSIS

7.2 Area Fire Loading Evaluation: 1,200 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled to the area of origin by limited combustibles and fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to the area of origin by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accident Discharge Consequences: None

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Required safe shutdown valve CSS-V-40B is located approximately 30 feet off floor. Transient fire exposure will not affect valve operability, due to limited combustibles loading.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-8A thru 8P
- 3.0 AREA DESCRIPTION: Primary Auxiliary Area, Elev. 395'0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HPA-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown.

3.5 Accessibility: Accessible through 2 stairways and 4 adjacent areas.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 13,526 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-8A: CCW-ZI-1114, CCW-HIS-1279B, CCW-HIS-1271B, CCW-FE-1121, CCW-V153, CCW-V152, CCW-CV-1114, HPR-LSHL-6411, HPR-STR-27, HPR-V424, HPR-V425, HPR-V341, HPR-CV6411, HPR-OR-50, HPR-V342, HPR-V340, HPR-V336, HPR-TRP-27, HPR-V343, HPR-V344, HPR-V338, HPR-V337, IAC-V71, IAC-V114, IAC-V25, IAC-V113, IAC-V381, MSS-V514, MSS-V515, MSS-V288.

GSB-SL6-8B: CCW-PSL-1271, CCW-FE-1246, CCW-V204A, CCW-V205A, CCW-HX-4A, CCW-V78A, CCW-V206A, CCW-V174A, CCW-PMP-3A, CCW-V182A, CCW-V186A, CCW-V188A, CCW-V190A, CCW-V189A, CCW-V191, CCW-V161B, CCW-HX-5B, CCW-V79B, CCW-V207B, CCW-V173B, CCW-V177B, CCW-PMP-4B, CCW-V181B, CCW-V185B, CCW-V187B, CCW-V510B, CCW-V178A, CCW-V223B, CCW-HX-5B, CCW-V221B, CCW-V155B, CCW-V222B, CCW-HX-4A, CCW-V220A, CCW-V154A, HPR-V350, HPR-V352, HPR-V353, HPR-CV4257, HPR-OR-26, HPR-STR-26, HPR-V351, HPR-V349, HPR-V345, HPR-TRP-26, HPR-V354, HPR-V355, HPR-V347, HPR-V346, MSS-V311, MSS-V312, MSS-V180, MSS-V341, MSS-V340.

GSB-SL6-8C: CCW-CV-2145, CCW-ZS-2145

GSB-SL6-8D: No safe shutdown equipment in this area.

GSB-SL6-8H: No safe shutdown equipment in this area.

GSB-SL6-8I: No safe shutdown equipment in this area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

FIRE HAZARD ANALYSIS

- 6.3 Manual Suppression: Hose stations and portable extinguishers are provided in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	3.5 gals	
Grease	10 lb	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling	21,504 lbs	
Resins		
Other	Class A	100 lbs

- 7.2 Area Fire Loading Evaluation: 16,700 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: CCW control valves 1114 and 2145 are located above CCW heat exchangers in zone SL6-8B, approximately 15 to 20 feet above the floor. Fixed combustibles consist of cable trays 15 feet away. Both valves will be protected with a one hour barrier to protect them from a transient exposure fire in the vicinity. Due to the limited combustible loading in this zone, automatic suppression is not being provided.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-SL6-9
3.0 AREA DESCRIPTION: Diesel Fuel Tank 3 Area, Elev. 399'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Unprotected steel & concrete	-

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally actuated 3 hour rated fire resistance dampers

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HDG (B Train Diesel) HVAC through Diesel Generator area. Exhaust through ducts in Diesel cell.

Emergency: Smoke exhaust through normal system ducts.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 directions

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>
4.0	<u>FLOOR AREA:</u> 1260 sq. ft		

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown

GSB-SL9-9: DFO-V48B, DFO-TK-1C, DFO-V51-A, DFO-STR-1,
DFO-PMP-1A, DFO-PMP-2B, DFO-STR-2, DFO-V44-B, DFO-V45-B,
DFO-V50-B, DFO-V57-A, DFO-V46-B, DFO-V47-B, DFO-V103-B,
DFO-V53-B, DFO-V54-A, DFO-V55-A, DFO-V65-C, DFO-LIS-5058

6.0 FIRE PROTECTION

6.1 Detection: Thermal detectors installed throughout actuating deluge sprinkler system and sounding alarms locally and in the control room.

6.2 Fixed Suppression: Deluge sprinkler system activated by thermal detectors.

Hazard Classification: Fuel oil spill over entire area.

System Objective: Control oil fire.

6.3 Manual Suppression: Hose standpipes installed in adjacent areas.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	77,200 gals	
Grease		
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling		
Resins		
Other Class A		10 lbs

7.2 Area Fire Loading Evaluation: 9,191,000 Btu/sq. ft. however due to limited floor area and room volume fuel will not be completely consumed.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be prevented from spreading to adjacent areas by operation of the fixed fire suppression.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Diesel Fuel Tank B and related pumps
- 9.2 Accidental Discharge Consequences: Redundant fuel oil storage and pumps are located in a separate fire area. Loss of equipment function will not affect plant safety or safe shutdown.

10.0 APPENDIX R EVALUATION

- 10.1 Major Equipment: Redundant fuel oil storage is in separate fire area. The 3 hour fire barrier will not be breached by the fire. Therefore loss of area will not affect safe shutdown. Oil piping crossing between rooms has valves that can be manually closed if necessary.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-10
- 3.0 AREA DESCRIPTION: Diesel Fuel Tank A Area, Elev. 399'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with unprotected steel	-

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally operated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour
rated fire resistance

3.2 Ventilation:

Normal: Supplied by HDG-HVAC System (A Train Diesel) through
Diesel Generator area. Exhaust through ducts in Diesel cell.

Emergency: Smoke exhaust through normal system ducts.

3.3 Drainage: Floor drains are provided.3.4 Emergency Lighting: Lighting is provided to facilitate fire
fighting and safe shutdown activities.3.5 Accessibility: Accessible from two directions

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 1260 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-10: DFO-TK-2C, DFO-V3B, DFO-V2B, DFO-STR-4, DFO-V8A,
DFO-STR-33, DFO-PMP-3A, DFO-PMP-4B, DFO-V10A, DFO-V11A,
DFO-V104A, DFO-V13A, DFO-V7B, DFO-V4B, DFO-V5B, DFO-V49B,
DFO-V14C, DFO-V40C, DFO-V56A, DFO-LIS-5055.

6.0 FIRE PROTECTION

6.1 Detection: Thermal detectors installed throughout sounding alarm locally and in the Control Room and actuating deluge sprinkler system.

6.2 Fixed Suppression: Deluge sprinkler system activated by thermal detectors.

Hazard Classification: Fuel oil spill over entire area.

System Objective: Control fuel oil fire.

6.3 Manual Suppression: Hose standpipes installed in adjacent areas.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity	
		Fixed	Transient
	Oil	77,200 gals	
	Grease		
	Flammable/Combustible Liq.		5 gals
	Chemicals		
	Cabling		
	Resins		
	Other	Class A	10 lbs

FIRE HAZARDS ANALYSIS

- 7.2 Area Fire Loading Evaluation: 9,191,000 Btu/sq. ft. However due to limited floor area and room volume, fuel will not be completely consumed.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be prevented from spreading to adjacent areas by operation of the fixed fire suppression.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: Diesel Fuel Tank A and related pumps.
- 9.2 Accidental Discharge Consequences: Redundant fuel oil storage and pump are located in a separate fire area. Loss of equipment function will not affect safe shutdown.

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Redundant fuel oil storage is in separate fire area. The 3 hour fire barrier will not be breached by the fire. Therefore loss of area will not affect safe shutdown. Oil piping crossing between rooms has valves that can be manually closed if necessary.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-13A, 13B
- 3.0 AREA DESCRIPTION: Nuclear Instrument Air Compressor Room, Elev. 399'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HSC-HVAC System

Emergency: Smoke exhaust accomplished through normal duct system.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARDS ANALYSIS

3.5 Accessibility: Accessible through doorway from fire area
SL6-14.

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 694 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-13A: IAC-V7, IAC-V134, IAC-V14, IAC-V16, IAC-V18,
IAC-V20, IAC-V3, IAC-V5, IAC-PPU-1-A, IAC-V11, IAC-V13, IAC-V15,
IAC-V380, IAC-PSL-2817, IAC-PSH-2818, IAC-PNL-1-A, NSW-V40-B,
NSW-FE-1979, NSW-V38-B, NSW-FE-1990, NSW-V37-A, NSW-V39-A,
NSW-V357-A, NSW-V355-A, NSW-STT-1-A, NSW-V358-A, NSW-V359-A,
NSW-V356-A, NSW-V61-A, NSW-V67-A, NSW-V69-A, NSW-V360-A,
NSW-V361-A, NSW-V383-A,

GSB-SL6-13B: IAC-PSL-1809, IAC-PSH-1810, IAC-PNL-2-B, IAC-V4,
IAC-V6, IAC-PPU-2-B, IAC-V10, IAC-V135, IAC-V136, IAC-V12,
IAC-V19, IAC-V21, IAC-V389, NSW-V350-B, NSW-V348-B, NSW-STT-2-B,
NSW-V351-B, NSW-V352-B, NSW-V349-V, NSW-V62-B, NSW-V70-B,
NSW-V68-B, NSW-V353-B, NSW-V354-B, NSW-V384-B.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system.

Hazard Classification: Compressor oil spill

System Objective: Control compressor oil spill fire

6.3 Manual Suppression: Hose standpipes provided in adjacent area.
Portable extinguishers provided in room.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity
	Fixed Transient

Oil	110 gals
Grease	

FIRE HAZARDS ANALYSIS

	Fixed	Transient
Flammable/Combustible Liq.	55 gals	
Chemicals		
Cabling		
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 36,815 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A fire will be limited to compressor of origin by operation of the fixed suppression system.

8.2 Without Primary Fire Suppression: The fire will be contained to one compressor zone by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Nuclear Instrument Air Compressors

9.2 Accidental Discharge Consequences: Since redundancies are separated by a passive barrier, inadvertent suppression system operation would impact only one division.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: With 1 hour fire rated wall separating redundant compressors and components, automatic suppression and 1 hour fire barriers for the air header as needed, fire damage will be limited to one compressor and its associated equipment.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-14A thru 14D & SL6-15
- 3.0 AREA DESCRIPTION: Mechanical Equipment Room, Elev. 399'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally operated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HPT-HVAC system

Emergency: Smoke exhaust by fixed system or portable equipment to outside.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from stairwells on 3 sides

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 19,605 sq. ft.5.0 EQUIPMENT DESCRIPTION:5.1 Safe Shutdown:

GSB-SL6-14A: APN-MCC-EA12-A, APN-MCC-EB12-B, APN-MCC-EB41-B, HCL-CLC-1A, CHW-V327A, CHW-V352A, CHW-V309A, CHW-V307A, CHW-V324A, HCL-HIS-8584A, HCL-HIS-8492, HCL-FIS-8589, HCL-CLC-1B, CHW-V427B, CHW-V425B, CHW-V409B, CHW-V-407B, CHW-V424-B, HCL-HIS-8602A, HCL-HIS-8490, HCL-FIS-8607, CHW-CV-426B, CHW-V-405B, HSC-CLC-1A & 2A, HSC-AS-501, HSC-ETK-501, HSC-PMP-1A, CHW-CV-585A, HSC-ST-501, HSC-HIS-8624A, HSC-HIS-8479, CHW-V509A, CHW-V517A, CHW-V541A, CHW-V542A, CHW-V546A, CHW-V502A, CHW-V550A, CHW-V586A, CHW-V527A, CHW-V563A, CHW-V507A, CHW-V540A, CHW-V511A, CHW-V549A, CHW-V547A, CHW-CHL-1B, CHW-CLC-1B & 2B, CHW-AS-601, CHW-ETK-601, CHW-PMP-1B, CHW-CV-685B, HSC-ST-601, HSC-HIS-8643A, HSC-HIS-8482, CHW-V609B, CHW-V617B, CHW-V641B, CHW-V642B, CHW-V646B, CHW-V602B, CHW-V650B, CHW-V686B, CHW-V627B, CHW-V663B, CHW-V607B, CHW-V640B, CHW-V611B, CHW-V649B, CHW-V647B, CHW-V605B, CHW-V670B, CHW-V669B, CHW-V628, CHW-V608B, CHW-V606B, CHW-V648B, CHW-V671B, CHW-V672B, HSC-FIS-8629, HSC-LP-1A, CHW-V601B, CHW-V604B, CHW-V629, CHW-V630, HSC-ZSC-8489, HSC-FIS-8648, HSC-UA-8660, HSC-LP-1B, HSC-FIS-8629, CHW-V601B, CHW-V604B, CHW-V629, CHW-V630, HSC-ZSC-8484, HSC-FIS-8648, HSC-AHU-1A, HSC-FAN-1A, HSC-DAO-1A & 6A, HSC-DAO-2A, HSC-DAO-3A, HSC-ZI-9720, HSC-ZI-9726, HSC-AMS-1A, HSC-AMS-2A, HSC-LP-1A, HSC-HIS-9717A, HSC-HIS-8439, HSC-HIS-7582, HSC-ZSC-9717, HSC-FIS-9717A, HSC-FIS-9724, HSC-ZSC-9720, HSC-ZSC-9726, HSC-FIS-9753, HSC-AHU-1B, HSC-FAN-1B, HSC-DAO-1B & 6B, HSC-DAO-2B, HSC-DAO-3B, HSC-ZI-9732, HSC-ZI-9739, HSC-AMS-1B, HSC-AMS-2B, HSC-LP-1B, HSC-HIS-9729A, HSC-HIS-8941, HSC-HIS-7688, HSC-ZSC-9729, HSC-FIS-9729A, HSC-FIS-9737, HSC-ZSC-9732, HSC-ZSC-9739, HSC-FIS-9890, HCL-AHU-1A, HCL-FAN-1A, HCL-DAO-1A, HCL-DAO-2A, HCL-DAO-3A, HCL-DAO-6A, HCL-DAO-15A, HCL-DAO-13A, HCL-AMS-1A, HCL-LP-1A, HCL-HIS-9218A, HCL-HIS-9229, HCL-FI-9220, HCL-ZSC-9220, HCL-ZSC-9221, HCL-ZSC-9218, HCL-ZI-9220, HCL-FIS-9218A, HCL-AE-5740, HCL-TIS-9228, HCL-TIS-9225, HCL-ZI-9221, HCL-TIS-9261, HCL-ZI-9757, HCL-ZI-9254, HCL-ZI-9277, HCL-PDIC-8953, HCL-ZI-9279, HCL-FIS-9281, HCL-RE-9733, HCL-ZSC-9240, HCL-ZI-9240, HCL-ZSC-9239, HCL-ZI-9239, HCL-SDS-9253, HCL-SDS-9289, HCL-ZSC-9276, HCL-ZI-9276, HCL-ZSC-9275, HCL-ZI-9275, HCL-SDS-9425, HCL-SDS-9426, NSW-V52B, IAC-V170, IAC-V171, IAC-V172, IAC-V173, IAC-V403, IAC-V410, HCL-ZI-9218, HCL-ZI-9241, HCL-PDIC-8952, HCL-ZI-9243, HCL-FIS-9245,

FIRE HAZARD ANALYSIS

HCL-RE-9706, HCL-AHU-1B, HCL-FAN-1B, HCL-DAO-1B, HCL-DAO-2B, HCL-DAO-3B, HCL-DAO-6B, HCL-DAO-15B, HCL-DAO-13B, HCL-AMS-1B, HCL-LP-1B, HCL-HIS-9254A, HCL-HIS-8978, HCL-FI-9256, HCL-ZSC-9256, HCL-ZSC-9257 HCL-ZSC-9254, HCL-ZI-9256, HCL-FIS-9254A, HCL-AE-5741, HCL-TIS-9264, IAC-V411, IAC-V412, IAC-V404, IAC-V405, IAC-V406, HCL-LP-1A, HCL-LP-1B, HSC-SDS-9727, HSC-SDS-9728, HSC-SDS-9740, HSC-SDS-9741,

GSB-SL6-14D: HSC-SHL-1A, HSC-ZSC-8481, CHW-V505A, CHW-V570A, CHW-V569A, CHW-V528, CHW-V508A, CHW-V506A, CHW-V548A, CHW-V571A, CHW-V572A, CHW-V501A, CHW-V504A, CHW-V532, CHW-V534, HSC-UA-8641, HSC-FIS-8629, APN-MCC-EA41-A, NSW-V42B, NSW-V51A, NSW-V41A, IAC-V169, IAC-V168, IAC-V402, HCL-CHL-1-A, HCL-AS-301, HCL-ETK-301, HCL-PMP-1A, CHW-CV-326A, CHW-V305A, CHW-V301A, CHW-V333A, CHW-V359A, CHW-V320, CHW-V306A, CHW-V365A, CHW-V308A, CHW-V1529, CHW-V332A, CHW-V330A, CHW-V318A, CHW-V350A, CHW-V334A, CHW-V335A, CHW-V304A, CHW-V302A, CHW-V331A, CHW-V336, CHW-V337, CHW-V329A, HCL-ZSC-8488, HCL-CHL-1B, HCL-AS-401, HCL-ETK-401, HCL-PMP-1B, HCL-ST-401, CHW-V401B, CHW-V433B, CHW-V459B, CHW-428B, CHW-V420, CHW-V406B, CHW-V465B, CHW-V408B, CHW-V1530, CHW-V432B, CHW-V430B, CHW-V418B, CHW-450B, CHW-V434B, CHW-V435B, CHW-V404B, CHW-V402B, CHW-431B, CHW-V436, CHW-V437, CHW-V429B, HCL-ZSC-8487,

GSB-SL6-15: IAC-V174, IAC-V175, IAC-V407, HPT-AHU-1A, HPT-FAN-1A, HPT-FAN-2A, HPT-DAO-1A, HPT-DAO-2A, HPT-DAO-3A, HPT-DAO-4A, HPT-DAO-10A, HPT-HIS-9671A, HPT-HIS-7650, HPT-FIS-9663A, HPT-ZSC-9670, HPT-FIS-9668, HPT-ZSC-9669, HPT-ZSC-9665, HPT-ZSC-8839, HPT-AHU-1B, HPT-FAN-1B, HPT-FAN-2B, HPT-DAO-1B, HPT-DAO-2B, HPT-DAO-3B, HPT-DAO-4B, HPT-DAO-10B, HPT-LP-1B, HPT-HIS-7683A, HPT-HIS-7566, HPT-FIS-9675A, HPT-ZSC-9682, HPT-FIS-9680, HPT-ZSC-9681, HPT-ZSC-9677, HPT-ZSC-8840, HPT-ZI-9669, HPT-ZI-9666, HPT-ZI-9665, HPT-ZSC-9686, HPT-ZSC-9687, HPT-ZSC-9710, HPT-DAO-5, HPT-DAO-6, HPT-DAO-7, HPT-DAO-8, HPT-ZI-9681, HPT-ZI-9678, HPT-ZI-9677, HPT-ZSC-9687, HPT-ZSC-9688, HPT-ZSC-9710.

GSB-SL6-14B

No safe shutdown equipment in this area.

GSB-SL6-14C

No safe shutdown equipment in this area.

FIRE HAZARD ANALYSIS

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout at ceiling level designed to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: Automatic wet pipe sprinkler system at ceiling over cable trays and major equipment.

Hazard Classification: Oil spill at chillers and ordinary hazard exposure fires to cable trays

System Objective: Control fire in vicinity of important equipment or cabling.

6.3 Manual Suppression: Hose stations are provided in the area as well as portable fire extinguishers.

7.0 FIRE LOADING

7.1 Combustible Loading

		Quantity	
		Fixed	Transient
Oil		54 gals	
Grease		30 lbs	
Flammable/Combustible Liq.			5 gals
Chemicals			
Cabling		49,423 lbs	
Resins			
Other	Charcoal, Class A	15,003 lbs	100 lbs

7.2 Area Fire Loading Evaluation: 36,700 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: A transient fire or oil fire at the chillers will be controlled by the sprinklers. Damage will be limited to the immediate equipment. An exposure fire will be controlled if occurring in the vicinity of cable trays by the suppression system.

A fire in the fans would be limited to the fan only, due to the housing. This will prevent damage to the redundant system until manual suppression activities are initiated. (Manually operated water spray systems are provided on charcoal filters.)

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Electrical panels, electric motors

9.2 Accident Discharge Consequences: All fan motors are enclosed within the air handling units. Fixed suppression is not provided over the electric panel. Accidental discharge will not affect redundant functions.

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: A fire in the area can affect both divisions of redundant equipment, even with automatic sprinklers over most of the area. One division of equipment is wrapped with a one hour passive barrier or spatially separated by more than 20 feet to prevent damage to redundant components.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-16
- 3.0 AREA DESCRIPTION: Mechanical Equipment & Pipe Tunnel, Elev. 399'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HPT-HVAC system.

Emergency: Smoke exhaust by fixed ducts or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from several directions.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	<u>x</u>	<u> </u>
	Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 6,320 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-16: CCW-V203-B, CCW-V520, CCW-V522, CCW-V194B,
CCW-V509, CCW-V276, CCW-V277, CCW-V256, CCW-V257, CCW-V258,
CCW-V259, CCW-CV-2133, CCW-FE-1100, CCW-V278, CCW-V279A,
CCW-V315A, CCW-V316, CCW-ZS-1123, CCW-ZS-1124, CCW-ZS-2133,
CCW-ZS-1248, CCW-ZS-1252, MSS-CV-2872, MSS-V429, IAC-V176,
IAC-V177, IAC-V36, IAC-V408, IAC-V409, IAC-V80, IAC-V81,
IAC-V131.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged
to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: Automatic sprinkler installed over chillers.

Hazard Classification: Oil spill

System Objective: Control oil spill fire

6.3 Manual Suppression: Portable extinguishers and hose stations
installed in area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	60 gals	
Grease	10 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling		
Resins		
Other	Class A	100 lbs

FIRE HAZARD ANALYSIS

7.2 Area Fire Loading Evaluation: 2,869 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be prevented from spreading beyond the chiller equipment by operation of the fixed fire suppression.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Chillers

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Chillers are approximately 40 feet from safe shutdown valves. Limited transient combustibles will be at floor level while valves are 30 feet above floor. The fire will not develop sufficient heat to impair valve operator.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
- 2.0 AREA OF ANALYSIS: GSB-SL6-17
- 3.0 AREA DESCRIPTION: Pipe Penetration Area, Elev. 399'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour fire resistance rating.

Dampers: Thermally operated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HPT-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 1 stairway

FIRE HAZARD ANALYSIS

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	<u>x</u>	<u> </u>
Airborne	<u> </u>	<u>x</u>

4.0 FLOOR AREA: 1,550 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

GSB-SL6-7: MUS-V5-B, MUS-V350-A, MUS-V176-A, V175A,
MUS-MUS-V372, MUS-V179A, MUS-V284, MUS-V283B, MUS-V320,
MUS-V319A, MUS-V341A, MUS-V371, MUS-V174A, MUS-V204, MUS-V205,
MUS-V209, MUS-V206, MUS-V207, MUS-V208B, MUS-V217, MUS-V218,
MUS-V329, MUS-V330, MUS-V225, MUS-V226, MUS-FE-42B, MUS-FE-42A,
MUS-FE-45, MUS-FE-52A, MUS-FCV-52A, MUS-FCV-46, MUS-V233,
MUS-V237, MUS-V219, MUS-V331, MUS-V220, MUS-V332, MUS-V227,
MUS-V228, MUS-V234, MUS-V238, MUS-V221, MUS-V333, MUS-V222,
MUS-V334, MUS-V229, MUS-V230, MUS-V235, MUS-V239, MUS-V223,
MUS-V335, MUS-V224, MUS-V336, MUS-V231, MUS-V232, MUS-V236,
MUS-V240, MUS-V180B, MUS-V181B, MUS-V342B, MUS-V368, MUS-V184B,
MUS-V182B, MUS-V183B, MUS-V343B, MUS-V367, MUS-V185B,
MUS-FE-52B, MUS-FE-52C, MUS-FE-52D, MUS-FE-42C, MUS-FE-42D,
MUS-FCV-52B, MUS-FCV-52C, MUS-FCV-52D, MUS-ZS-4, MUS-ZS-43B,
MUS-ZS-38, MUS-ZS-43A, MUS-ZS-48, MUS-ZS-53A, MUS-ZS-53B,
MUS-ZS-53C, MUS-ZS-53D, MUS-ZS-43C, MUS-ZS-43D, MUS-FT-52A,
MUS-FT-52B, MUS-FT-52C, MUS-FT-52D, MUS-FY-52B2, MUS-FY-52C2,
MUS-FY-52D2, MUS-FY-52A2, IAC-V37, IAC-V40, IAC-V39, IAC-V38,
IAC-V82, IAC-V130, IAC-V83.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged
to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and portable extinguishers
are installed in area

FIRE HAZARD ANALYSIS

7.0 FIRE LOADING

7.1 Combustible Loading

		Quantity	
		Fixed	Transient
Oil			
Grease		1 lb	
Flammable/Combustible Liq.			5 gals
Chemicals			
Cabling			
Resins			
Other	Class A		25 lbs

7.2 Area Fire Loading Evaluation: 652 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: The fire will be controlled within the area by fire brigade efforts using available hose streams and/or portable fire extinguishers.
- 8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided or hose streams. Fire will be extinguished in material of origin due to lack of continuity of combustibles.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

- 9.1 Equipment Subject: N/A
- 9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

- 10.1 Major Equipment: Required MUS valves (7 total) are located adjacent to containment wall. Valves are approximately 30 feet or more above the floor and are separated by 3 feet or more from each other. A transient fire at floor level (cabling in area is in conduit) will not damage valve operability.

The four MUS flow control valves (52A, 52B, 52C and 52D) and flow transmitters (52A, 52B, 52C and 52D) are located at floor level and are separated by 4 to 8 feet. In order to prevent a transient fire from damaging the valve operator or transmitters, a one hour barrier around each will be provided. With the limited fire exposure the barrier

FIRE HAZARD ANALYSIS

will provide time for initiation of manual suppression effort.

MUS valves 179A, 174A, 184B and 185B are separated into two groups (one A and one B in each) approximately 20 feet apart. A one hour barrier will be provided for either the "A" valves or "B" valves in order to prevent a transient fire from damaging both. Due to the limited fire loading, fire will not develop beyond material of origin.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-All Elevators
3.0 AREA DESCRIPTION: Typical for all elevators

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete with
exposed steel
beams -

3.1.4 Openings:

Doors: Bi-parting with 1 1/2 hour fire resistance rating
at each level

Dampers: None

Penetrations: Sealed with material approved for 3 hour
fire resistance rating.

3.2 Ventilation:

Normal: No fixed supply is provided.

Emergency: Portable smoke exhaust equipment.

3.3 Drainage: Floor drains are provided in the elevator pit.

3.4 Emergency Lighting: N/A

3.5 Accessibility: At elevator machine room at top of elevator.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: N/A

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: None

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at top of shaft and in the machine room arranged to sound an alarm in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and hose connection provided in adjacent stairways.

7.0 FIRE LOADING

7.	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	
	Flammable/Combustible Liq.	
	Chemicals	
	Cabling	
	Resins	
	Other	Class A 50 lbs

7.2 Area Fire Loading Evaluation: 2,000 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Fire will be detected in machine room and fire brigade will control the fire using hose lines using portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: A fire in the elevator shaft will be confined to the shaft by the construction.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment in area, therefore a fire will have no impact on safe shutdown.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: General Services Building
2.0 AREA OF ANALYSIS: GSB-All Stairwells
3.0 AREA DESCRIPTION: Typical for all stairwells

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours
3.1.4	<u>Openings:</u>		

Doors: Equivalent 3 hour fire resistance rating.

Dampers: None

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Only infiltration is provided for normal ventilation.

Emergency: Portable smoke exhaust equipment.

3.3 Drainage: Floor drains are provided at the bottom of each stairwell.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Door openings to multiple elevations.

FIRE HAZARD ANALYSIS

- 3.6 Radioactivity: Yes No
- in Equipment x
- Airborne x
- 4.0 FLOOR AREA: N/A
- 5.0 EQUIPMENT DESCRIPTION:
- 5.1 Safe Shutdown: None
- 6.0 FIRE PROTECTION
- 6.1 Detection: Ionization detectors installed at top of shaft and on the ceiling of the 455' elevation.
- 6.2 Fixed Suppression: None
- Hazard Classification: N/A
- System Objective: N/A
- 6.3 Manual Suppression: Hose stations are provided at each doorway landing.
- 7.0 FIRE LOADING
- 7.1 Combustible Loading Quantity
- Fixed Transient
- Oil
- Grease
- Flammable/Combustible Liq.
- Chemicals
- Cabling
- Resins
- Other
- 7.2 Area Fire Loading Evaluation: None
- 8.0 CONSEQUENCES OF DESIGN BASIS FIRE:
- 8.1 With Primary Fire Suppression: Detection in stairwell will alarm in control room and fire brigade will extinguish fire using hose stations and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: A fire in the stairwell involving transient combustibles will not spread to adjacent area due to construction and lack of continuity of combustibles.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: None

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in stairwells, therefore a fire in this area will have no impact on safe shutdown capability.

ISOLATION BUILDING

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
IB-L3-1, L2-1, L1-1, SL1-1, SL1-2	- -	Mechanical Equipment Valve, and Switchgear Vault Rooms (Channel 8)	D.3-1	XR-FIG-A10
IB-SL1-3	423'	Electrical Vault	D.3-4	XR-FIG-A10
IB-SL1-4, SL1-5, L1-2, L1-3, L2-2, L3-2	-	Mechanical Equipment, Valve Pump, Elec. Vaults Room (Channel A)	D.3-7	XR-FIG-A10

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Isolation Building
- 2.0 AREA OF ANALYSIS: IB-L3-1, L2-1, L1-1, SL1-1, SL1-2
- 3.0 AREA DESCRIPTION: Mechanical Equipment, Valve, and Switchgear Vault
Rooms (Channel B)

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Exposed steel beams	-

3.1.4 Openings:

Doors: Equivalent 3 hour rate fire resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour
rated fire resistance.

3.2 Ventilation:

Normal: Supplied by HIA-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire
fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 452' elev. of the TGB

FIRE HAZARD ANALYSIS

3.6 <u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 4,111 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

IB-L3-1: No safe shutdown equipment in this zone.

IB-L2-1: IAC-V152, IAC-V121, IAC-V118, IAC-V115, IAC-V116, IAC-V117, MSS-V3-C, MSS-V4-C, MSS-PCV-14B, MSS-PCV-14D, MSS-V23B, MSS-V25B, MSS-V24B, MSS-V173, MSS-V491B, MSS-V32B, MSS-V33B, MSS-V28B, MSS-V29B, MSS-V30B, MSS-V31B, MSS-V36B, MSS-V37B, MSS-V38B, MSS-V39B, MSS-V40B, MSS-V499B, MSS-V63B, MSS-V27B.

IB-L1-1: FWS-V28B, FWS-V29A, FWS-V85B, FWS-V205, MSS-V178, MSS-V450, MSS-V451, MSS-V453, MSS-V452, MSS-V179, MSS-V503, IB-SL1-1, IAC-V31, IAC-V75.

IB-SL1-2: No safe shutdown equipment in zone.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers and hose stations are provided in the area.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	<u>Quantity</u>	
	<u>Fixed</u>	<u>Transient</u>
Oil		
Grease	2 lbs	
Flammable/Combustible Liq.		5 gals

FIRE HAZARD ANALYSIS

Chemicals			
Cabling			
Resins			
Other	Class A	550 lbs	10 lbs

7.2 Area Fire Loading Evaluation: 1,285 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Ionization detectors will alarm and fire brigade will respond utilizing hose streams to contain the fire to the zone of origin.

8.2 Without Primary Fire Suppression: Due to lack of continuity of combustibles between the 5 fire zones the fire will be contained to the zone of origin.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Not applicable

9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is in a separate fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: Isolation Building
- 2.0 AREA OF ANALYSIS: IB-SL1-3
- 3.0 AREA DESCRIPTION: Electrical Vault, Elev. 423'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours

3.1.2 Floors: Concrete 3 hours

3.1.3 Ceiling: Concrete with
protected
steel 3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance

Dampers: Thermally actuated with 3 hour fire resistance
rating

Penetrations: Sealed with material approved for 3 hour
fire resistance.

3.2 Ventilation:

Normal: Supplied by HIA-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire
fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 2 adjacent fire area

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	x
	Airborne	_____	x

5.0 EQUIPMENT DESCRIPTION:

6.0 FIRE PROTECTION

6.2 Fixed Suppression: None

System Objective: N/A

7.0 FIRE LOADING

7.2 Area Fire Loading Evaluation: 15,906 Btu/sq. ft.

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARDS ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment in fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Isolation Building
- 2.0 AREA OF ANALYSIS: IB-SL1-4, SL1-5, L1-2, L1-3, L2-2, L3-2
- 3.0 AREA DESCRIPTION: Mechanical Equipment, Valve, Pump, Elec. Vaults Room (Channel A)

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Exposed steel beams	-

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by HIA-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from 452' elev. of the TGB

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 3,869 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5. Safe Shutdown:

IB-SL1-4: IAC-V120, IAC-V126.

IB-SL1-5: No safe shutdown equipment in zone.

IB-L1-2: FWS-V16B, FWS-V17A, FWS-V87A, MSS-V176, MSS-V449, MSS-V448, MSS-V177, MSS-V500, MSS-V446, MSS-V447.

IB-L1-3: No safe shutdown equipment in zone.

IB-L2-2: IAC-V124, IAC-V125, IAC-V122, IAC-V123, IAC-V119, IAC-V153, MSS-V1-C, MSS-V172, MSS-V49A, MSS-V5A, MSS-V6A, MSS-V490A, MSS-V9A, MSS-V10A, MSS-V11A, MSS-V12A, MSS-V13A, MSS-V2C, MSS-V16A, MSS-V15A, MSS-V14A, MSS-PCV-14A, MSS-PCV-14C, MSS-V22A, MSS-V21A, MSS-V20, MSS-V19A, MSS-V18A, MSS-V498A.

IB-L3-2: No safe shutdown equipment in zone.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged sound alarm locally and in Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations provided in adjacent area. Portable extinguishers provided in area.

FIRE HAZARD ANALYSIS

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	1 gal	
Grease	12 lbs	
Flammable/Combustible Liq.		5 gals
Chemicals		
Cabling		
Resins		
Other	Class A 550 lbs	10 lbs

7.2 Area Fire Loading Evaluation: 1,470 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Ionization detectors will alarm and fire brigade will respond utilizing hose streams. Due to lack of continuity of combustibles between zones within area, fire will be confined to the zone of origin.

8.2 Without Primary Fire Suppression: Due to lack of continuity of combustibles between the zones the fire will be confined to the zone of origin.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: Not applicable

9.2 Accident Discharge Consequences: Not applicable

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment in a separate fire area.

TURBINE GENERATOR & WATER TREATMENT BUILDING

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
ALL ZONES	-	Entire Building	D.4-1	XR-FIG-A11, A12, A13, A14

FIRE HAZARDS ANALYSIS

1.0 BUILDING: Turbine Generator and Water Treatment Building

2.0 AREA OF ANALYSIS: Ail Zones

3.0 AREA DESCRIPTION: Entire Building

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Metal Siding	-
	South	Metal Siding	-
	East	Metal Siding & concrete	-
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Exposed steel & concrete -

3.1.4 Openings:

Doors: Exterior with no fire rating. Tornado resistant doors to Isolation building equivalent 3 hour rated fire resistance.

Dampers: None

Penetrations: Sealed at barrier to Isolation Building with material approved for 3 hour rated fire resistance

3.2 Ventilation:

Normal: Supplied by HTA-HVAC system

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting activities.

3.5 Accessibility: Accessible from exterior entrances

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 80,700 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

Turbine Generator Building: No safe shutdown equipment in this area.

Water Treatment Building: No safe shutdown equipment in this area.

6.0 FIRE PROTECTION

6.1 Detection: Thermal detection installed for the following special hazards: H₂ Seal Oil Unit, Feedwater pumps, Turbine and Generator bearings, Lube oil cooler and reservoirs arranged to sound alarms locally and in the control room.

6.2 Fixed Suppression: Automatic wet pipe sprinklers installed throughout ground floor, mezzanine level and Water Treatment Building. Water spray systems installed over special hazards listed in 6.1.

Hazard Classification: Major oil spill

System Objective: Control oil spill fire to prevent structural failure.

6.3 Manual Suppression: Hose stations and portable extinguishers installed throughout building.

7.0 FIRE LOADING

7.1 Combustibles in Turbine Building

7.1.1 Oils

7.1.1.2 T/G Oil 20,600 gals.

7.1.1.3 T/G Hydrogen Seal 260 gals.

FIRE HAZARDS ANALYSIS

7.1.1.4	Feed Pump	1,275 gals.
7.1.1.5	Air Compressor	12 gals.
7.1.2	Hydrogen	70,500 SCF.
7.1.3	Cable	277,200 Pounds
7.2	<u>Combustibles in Water Treatment Building</u>	
	Resin	2,000 Pounds
	Cable	28,500 Pounds

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

- 8.1 With Primary Fire Suppression: Primary suppression in the Water Treatment Building is automatic wet pipe sprinklers.

Primary suppression in the Turbine Building is as follows:

<u>Area</u>	<u>Sprinkler</u>
H ₂ seal oil unit	Deluge
FW pumps	Deluge
Turbine & Generator bearings	Preaction
Lube Oil Coolers and Reservoir	Deluge
Air Compressors	Wet Pipe
Areas under Turbine Generator	Wet Pipe
Operating Floor	

In areas not covered by automatic suppression, on an alarm from the detectors the fire brigade will respond using portable extinguishers and hose station facilities and the fire will be rapidly extinguished. In all other areas the fire will be suppressed by the automatic suppression and damage will be limited to the subject area.

- 8.2 Without Primary Fire Suppression: The Turbine/Water Treatment Building is a steel frame, metal siding structure with three (3) sides exposed to the exterior. The fourth or west side is part of the Isolation Building structure constructed of 3'-0" thick reinforced concrete with equivalent 3-hour fire rated doors.

Combustible turbine oils located in the turbine portion of the building are spatially separated from the Isolation Building wall by the Water Treatment portion of the building which is 70'-0" wide.

FIRE HAZARDS ANALYSIS

The lube oil reservoir tank in the Turbine building is housed in an enclosure with a 3-hour fire rating.

Combustible resin materials located in the water treatment portion of the building are spatially separated from the Isolation Building wall by a minimum of 3'-0" thickness.

The design basis fire will therefore be isolated within the limits of the subject building.

There is no safe shutdown system within the subject area.

On alarm from detectors, the fire brigade will respond using the secondary suppression (hose station facilities and portable extinguishers) systems.

Yard hydrant facilities around the exterior of the subject building are available.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in this area.

CIRCULATING WATER PUMP HOUSE

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
CWPH-1A, 1B, 1C, 1F, 1G	-	Lay-Down, Pump, Switchgear, and Mechanical Equipmdnt Area	D.5-1	XR-FIG-A16
CWPH-1D	-	Electric Fire Pump Area	D.5-4	XR-FIG-A16
CWPH-1E	-	Electric Fire Pump Area	D.5-7	XR-FIG-A16
CWPH-1H	-	Diesel Fire Pump Area	D.5-10	XR-FIG-A16
MB-L1-1A thru 1D	374' 385'	Makeup Water Pump House	D.5-13	

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Circulating Water Pump House
- 2.0 AREA OF ANALYSIS: CWPH-1A, 1B, 1C, 1F, 1G
- 3.0 AREA DESCRIPTION: Lay-Down, Pump, Switchgear, and Mechanical Equipment Areas.

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Metal	-
	South	Metal	-
	East	Metal	-
	West	Metal	-

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Exposed steel beams & metal roof deck -

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance to interior pump rooms.

Dampers: Thermally activated with 3 hour rated resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance.

3.2 Ventilation:

Normal: Supplied by VAB-HVAC system.

Emergency: Smoke exhaust by normal system or portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through 3 exterior doors

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 13,473 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

CWPH-1A	No safe shutdown equipment in zone
CWPH-1B	No safe shutdown equipment in zone
CWPH-1C	No safe shutdown equipment in zone
CWPH-1F	No safe shutdown equipment in zone
CWPH-1G	No safe shutdown equipment in zone

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and portable extinguishers installed in area.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	150 gals	
Grease	6 lbs	
Flammable/Combustible Liq.		55 gals
Chemicals		
Cabling	42,917 lbs	
Resins		
Other	Class A	100 lbs

7.2 Area Fire Loading Evaluation: 35,477 Btu/sq. ft.

FIRE HAZARD ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the area by fire brigade efforts using available hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment in fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Circulating Water Pump House
- 2.0 AREA OF ANALYSIS: CWPB-1D
- 3.0 AREA DESCRIPTION: Electric Fire Pump Area

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours
3.1.4	<u>Openings:</u>		

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour fire resistance rating.

Penetrations: Sealed with material approved for 3 hour fire rating.

3.2 Ventilation:

Normal: Supplied by VAB-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from adjacent fire area.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 292 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

CWPH-1D: No safe shutdown equipment in fire area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization and thermal detectors installed at ceiling arranged to sound alarm locally and in Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and portable extinguishers provided in adjacent area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	1 lb
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	
	Resins	
	Other Class A	5 lbs

7.2 Area Fire Loading Evaluation: 2,770 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the area by fire brigade efforts using hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment in fire area.

FIRE HAZARD ANALYSIS

1.0 BUILDING: Circulating Water Pump House

2.0 AREA OF ANALYSIS: CWPB-1E

3.0 AREA DESCRIPTION: Electric Fire Pump Area, Elev. 443'-4"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours
3.1.4	<u>Openings:</u>		

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour rated fire resistance.

Penetrations: Sealed with material approved for 3 hour rated fire resistance.

3.2 Ventilation:

Normal: Supplied by VAB-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from adjacent fire area.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 198 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: CWPB-1E:
No safe shutdown equipment in this area.

6.0 FIRE PROTECTION

6.1 Detection: Ionization and thermal detectors installed at ceiling arranged to sound alarm locally and in Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Hose stations and portable extinguishers provided in adjacent area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	1 lb
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	
	Resins	
	Other	5 lbs

7.2 Area Fire Loading Evaluation: 4,080 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using available hose streams and/or portable fire extinguishers.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: No safe shutdown equipment located in fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Circulating Water Pump House
- 2.0 AREA OF ANALYSIS: CWPH-1H
- 3.0 AREA DESCRIPTION: Diesel Fire Pump Area, Elev. 443'-4"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete with protected steel	3 hours

3.1.4 Openings:

Doors: Equivalent 3 hour rated fire resistance.

Dampers: Thermally activated with 3 hour fire resistance.

Penetrations: Sealed with material approved for 3 hour fire resistance.

3.2 Ventilation:

Normal: Supplied by VAB-HVAC system.

Emergency: Smoke exhaust by portable equipment.

3.3 Drainage: Curbs and floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible from adjacent fire area.

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 292 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: CWPB-1H
No safe shutdown equipment in area.

6.0 FIRE PROTECTION

6.1 Detection: Heat detectors installed at ceiling to sound alarm locally and in Control Room.

6.2 Fixed Suppression: Wet pipe automatic sprinklers

Hazard Classification: Diesel fuel spill

System Objective: Control fire to zone

6.3 Manual Suppression: Hose stations and portable extinguishers provided in adjacent area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil & Diesel Fuel	52 gals
	Grease	1 lb
	Flammable/Combustible Liq.	5 gals
	Chemicals	
	Cabling	
	Resins	
	Other Class A	5 lbs

7.2 Area Fire Loading Evaluation: 29,479 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the area by operation of the suppression system.

FIRE HAZARD ANALYSIS

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided and manual fire suppression efforts.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment in fire area.

FIRE HAZARDS ANALYSIS

- 1.0 BUILDING: Make-Up Water Pump House
- 2.0 AREA OF ANALYSIS: MB-L1-1A through 1D
- 3.0 AREA DESCRIPTION: MWPH, Elev. 374'-0", 385'-0"

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	-
	South	Concrete	-
	East	Concrete	-
	West	Concrete	-

3.1.2 Floors: Concrete 3 hours

3.1.3 Ceiling: Concrete with
unprotected
steel -

3.1.4 Openings:

Doors: Exterior doors

Dampers: N/A

Penetrations: N/A

3.2 Ventilation:

Normal: Supplied by HIS-HVAC System

Emergency: Smoke exhaust through HIS-HVAC or portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

3.5 Accessibility: Accessible through exterior door areas

FIRE HAZARDS ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 7,952 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

MB-L1-1A: No safe shutdown equipment in this zone.
 MB-L1-1B: No safe shutdown equipment in this zone.
 MB-L1-1C: No safe shutdown equipment in this zone.
 MB-L1-1D: No safe shutdown equipment in this zone.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound alarms locally and in the control room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers provided in area.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	300 gals
	Grease	
	Flammable/Combustible Liq.	10 gals
	Chemicals	
	Cabling	808 lbs
	Resins	
	Other Class A	100 lbs

7.2 Area Fire Loading Evaluation: 5950 Btu/sq. ft.

FIRE HAZARDS ANALYSIS

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Fire will be contained to vicinity of origin due to lack of continuity of combustibles.

8.2 Without Primary Fire Suppression: Becasue this is a separate building, remote from the main plant site, fire will not spread beyond building.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject:

9.2 Accidental Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: There is no safe shutdown equipment located in the area.

WNP-1

FPSR

SPRAY PCND PUMP HOUSE

AREA OF ANALYSIS	ELEV.	DESCRIPTION	PAGE NO.	REF. DWG.
SPPH-1A & 1B	442'	ESW Pump Room Channel A & Exhaust Plenum	D.6-1	XR-FIG-A15
SPPH-1C	442'	Electrical Vault	D.6-4	XR-FIG-A15
SPPH-2A & 2B	442'	ESW Pump Room Channel B & Exhaust Plenum	D.6-7	XR-FIG-A15
SPPH-2C	442'	Electrical Vault	D.6-10	XR-FIG-A15

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Spray Pond Pump House
- 2.0 AREA OF ANALYSIS: SPPH-1A & 1B
- 3.0 AREA DESCRIPTION: ESW Pump Room Channel A & Exhaust Plenum,
Elev. 442'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	-
	South	Concrete	-
	East	Concrete	3 hours
	West	Concrete	-
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	-

3.1.4 Openings:

Doors: Tornado resistant and equivalent 3-hour rated resistance.

Dampers: N/A

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by VAB-HVAC system

Emergency: Smoke exhaust by normal system or portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown activities.

FIRE HAZARD ANALYSIS

3.5 Accessibility: Accessible through adjacent area and exterior

3.6 <u>Radioactivity</u> :	<u>Yes</u>	<u>No</u>
in Equipment	_____	<u>x</u>
Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 1,846 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

SPPH-1A: APN-MCC-EA13-A, ESW-V21-A, ESW-V70-A, ESW-V19-A, ESW-V69-A, ESW-V3-A, ESW-V4-A, ESW-V24-A, ESW-V25-A, ESW-V26-A, ESW-V31-A, ESW-V61-A, ESW-V54-A, ESW-PMP-1-A, ESW-EXJ-1-A, ESW-FE-2869, VAB-LP-1, VAB-FAN-12A, VAB-TCV-11, VAB-TCV-12, VAB-LUV-10, VAB-HIS-7581, VAB-HIS-9850A, VAB-HIS-7641, VAB-FIS-9849, ESW-ZS-7641, ESW-EL-7641.

SPPH-1B: ESW-V6-A, ESW-V7-A, ESW-V52-A

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers provided in area. Yard hydrant outside building.

7.0 FIRE LOADING

7.1 <u>Combustible Loading</u>	Quantity	
	Fixed	Transient
Oil	2 gals	
Grease	10 lbs	
Flammable/Combustible Liq.		
Chemicals		
Cabling	6,353 lbs	
Resins		
Other		

FIRE HAZARD ANALYSIS

7.2 Area Fire Loading Evaluation: 36,051 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the area by fire brigade efforts using hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Spray Pond Pump House
2.0 AREA OF ANALYSIS: SPPH-1C
3.0 AREA DESCRIPTION: Electrical Vault, Elev. 442'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor:</u>	Concrete	3 hours
3.1.3	<u>Ceiling:</u>	Concrete	3 hours

3.1.4 Openings:

Doors: Manhole with equivalent 3 hour rated resistance.

Dampers: N/A

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: No fixed supply

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drain provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting.

3.5 Accessibility: Accessible through manhole from adjacent areas

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 132 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown: Cabling

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed at ceiling arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers provided in area
Yard hydrant installed outside building.

7.0 FIRE LOADING

7.1	<u>Combustible Loading</u>	Quantity
		Fixed Transient
	Oil	
	Grease	
	Flammable/Combustible Liq.	
	Chemicals	
	Cabling	3,292 lbs
	Resins	
	Other	

7.2 Area Fire Loading Evaluation: 259,370 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: Ionization detector will alarm and fire brigade will respond utilizing fire extinguishers.

8.2 Without Primary Fire Suppression: Due to limited room volume fire will be contained within vault by fire barriers.

FIRE HAZARD ANALYSIS

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Spray Pond Pump House
- 2.0 AREA OF ANALYSIS: SPPH-2A & 2B
- 3.0 AREA DESCRIPTION: ESW Pump Room Channel B & Exhaust Plenum,
Elev. 442'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls:</u>		
	North	Concrete	-
	South	Concrete	-
	East	Concrete	-
	West	Concrete	3 hours

3.1.2 Floor: Concrete 3 hours

3.1.3 Ceiling: Concrete -

3.1.4 Openings:

Doors: Tornado resistant and equivalent 3 hour rated resistance.

Dampers: N/A

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: Supplied by VAB-HVAC system

Emergency: Smoke exhaust by normal system or portable equipment

3.3 Drainage: Floor drains are provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting and safe shutdown.

3.5 Accessibility: Accessible through adjacent area and exterior

FIRE HAZARD ANALYSIS

3.6	<u>Radioactivity:</u>	<u>Yes</u>	<u>No</u>
	in Equipment	_____	<u>x</u>
	Airborne	_____	<u>x</u>

4.0 FLOOR AREA: 1,846 sq. ft.

5.0 EQUIPMENT DESCRIPTION:

5.1 Safe Shutdown:

SPPH-2A: APN-MCC-EB13-B, ESW-V22-B, ESW-V68-B, ESW-V20-B,
ESW-V67-B, ESW-V8-B, ESW-V10-B, ESW-V11-B, ESW-V28-B, ESW-V29-B,
ESW-V30-B, ESW-V32-B, ESW-V58-B, ESW-V62-B, ESW-PMP-2-B,
ESW-EXJ-2B, ESW-FE-2870, VAB-HIS 7646, VAB-HIS-9859A,
VAB-HIS-7639, VAB-FIS-9858, VAB-ZS-7639, VAB-EL-7639, VAB-LP-2,
VAB-FAN-22-B, VAB-TCV-21, VAB-TCV-22.

SPPH-2B: ESW-V13-B, ESW-V14-B, ESW-V56-B.

6.0 FIRE PROTECTION

6.1 Detection: Ionization detectors installed throughout at ceiling
arranged to sound an alarm locally and in the Control Room.

6.2 Fixed Suppression: None

Hazard Classification: N/A

System Objective: N/A

6.3 Manual Suppression: Portable extinguishers provided in area.
Yard hydrant outside building.

7.0 FIRE LOADING

7.1 Combustible Loading

	Quantity	
	Fixed	Transient
Oil	2 gals	
Grease	10 lbs	
Flammable/Combustible Liq.		
Chemicals		
Cabling	2697 lbs	
Resins		
Other		

FIRE HAZARD ANALYSIS

7.2 Area Fire Loading Evaluation: 15,454 Btu/sq. ft.

8.0 CONSEQUENCES OF DESIGN BASIS FIRE:

8.1 With Primary Fire Suppression: The fire will be controlled within the zone by fire brigade efforts using hose streams and/or portable fire extinguishers.

8.2 Without Primary Fire Suppression: The fire will be contained to this area by the fire barriers provided.

9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

FIRE HAZARD ANALYSIS

- 1.0 BUILDING: Spray Pond Pump House
2.0 AREA OF ANALYSIS: SPPH-2C
3.0 AREA DESCRIPTION: Electrical Vault, Elev. 442'

3.1 Construction

		<u>Material</u>	<u>Fire Resistance</u>
3.1.1	<u>Walls</u> :		
	North	Concrete	3 hours
	South	Concrete	3 hours
	East	Concrete	3 hours
	West	Concrete	3 hours
3.1.2	<u>Floor</u> :	Concrete	3 hours
3.1.3	<u>Ceiling</u> :	Concrete	3 hours

3.1.4 Openings:

Doors: Manhole with equivalent 3 hour rated resistance.

Dampers: N/A

Penetrations: Sealed with material approved for 3 hour fire resistance rating.

3.2 Ventilation:

Normal: No fixed supply

Emergency: Smoke exhaust by portable equipment

3.3 Drainage: Floor drain provided.

3.4 Emergency Lighting: Lighting is provided to facilitate fire fighting.

3.5 Accessibility: Accessible through manhole from adjacent area

FIRE HAZARD ANALYSIS

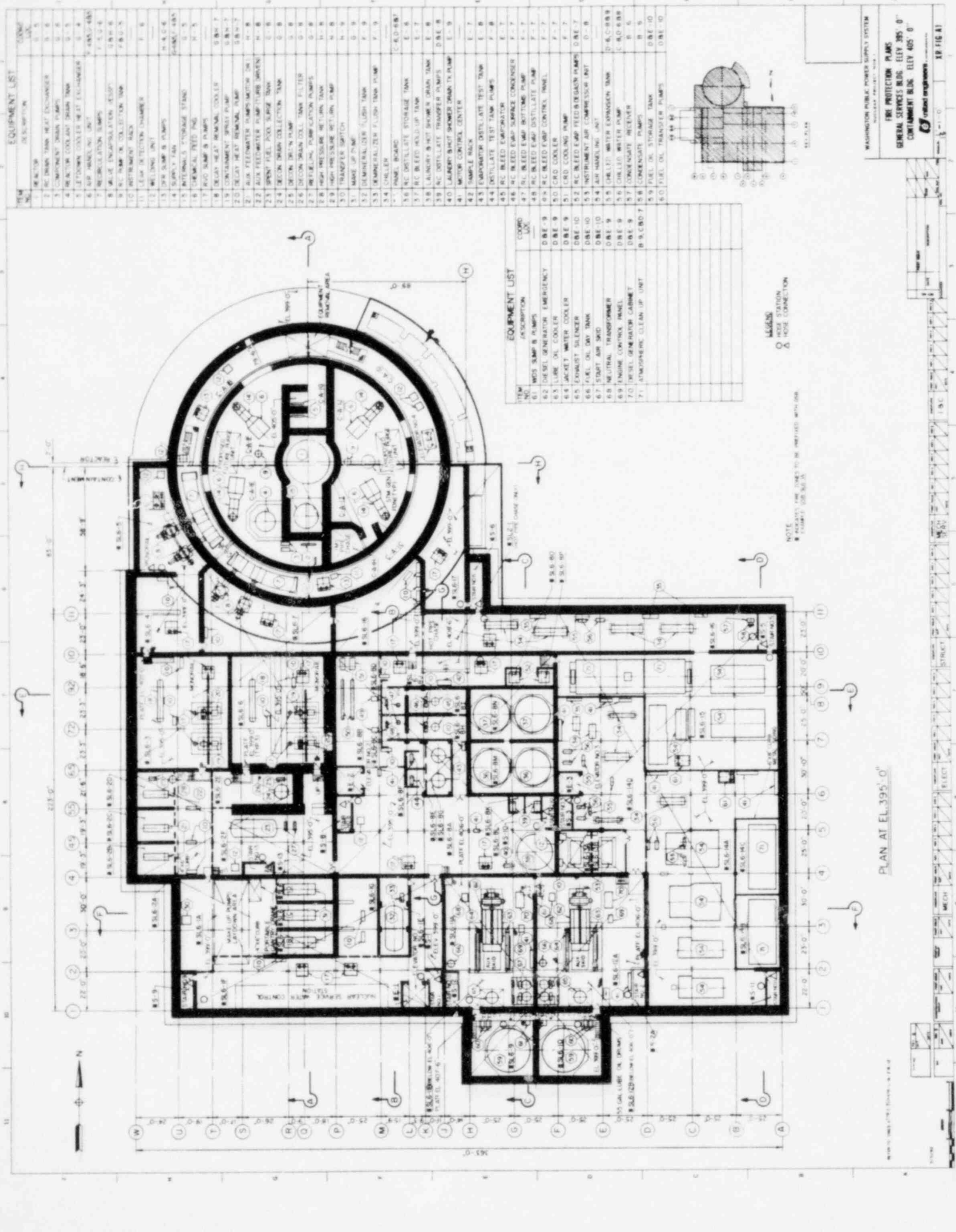
9.0 ACCIDENTAL OPERATION OF FIRE PROTECTION SYSTEM:

9.1 Equipment Subject: N/A

9.2 Accident Discharge Consequences: N/A

10.0 APPENDIX R EVALUATION:

10.1 Major Equipment: Redundant safe shutdown equipment is located in separate fire area.

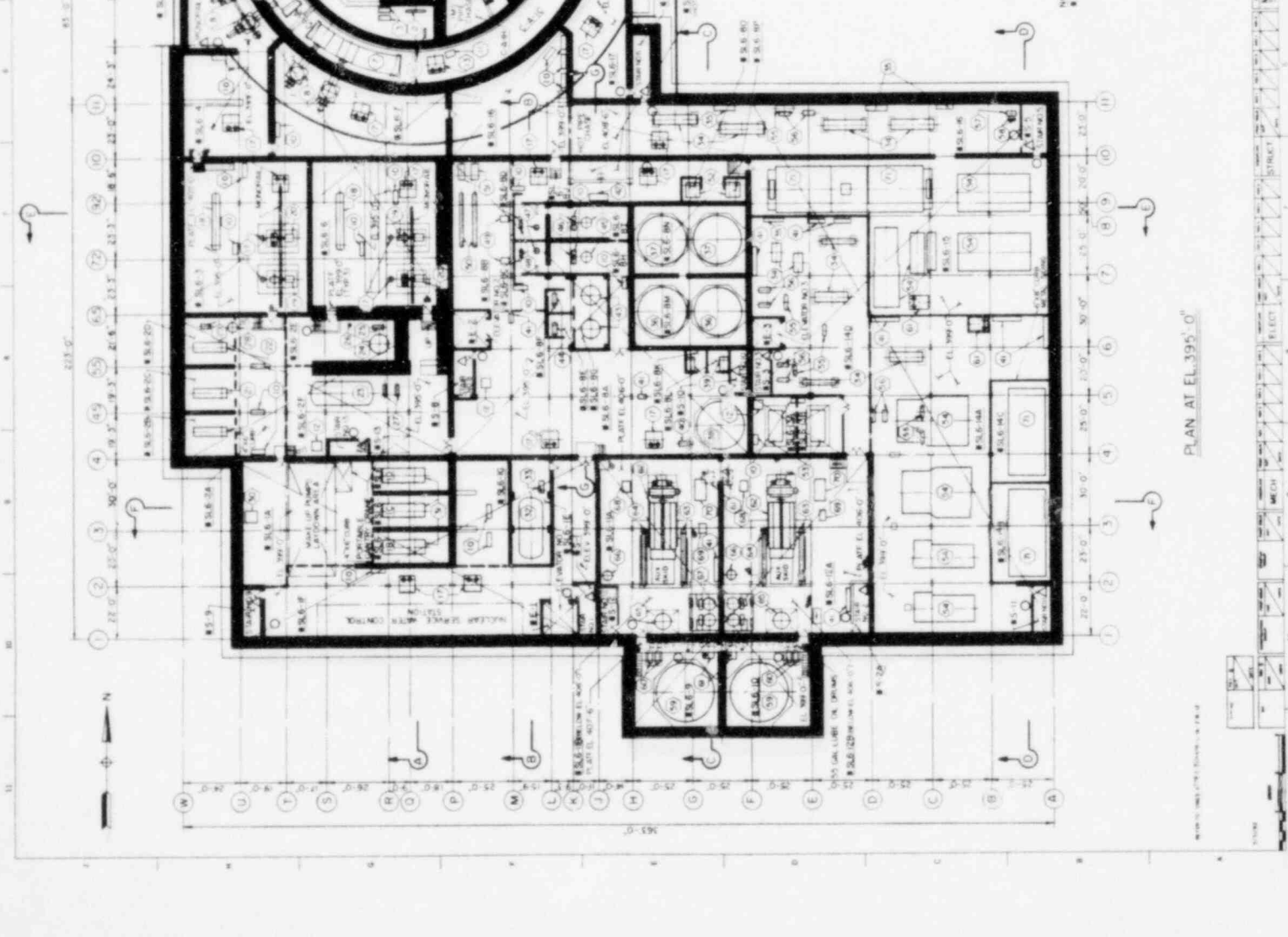


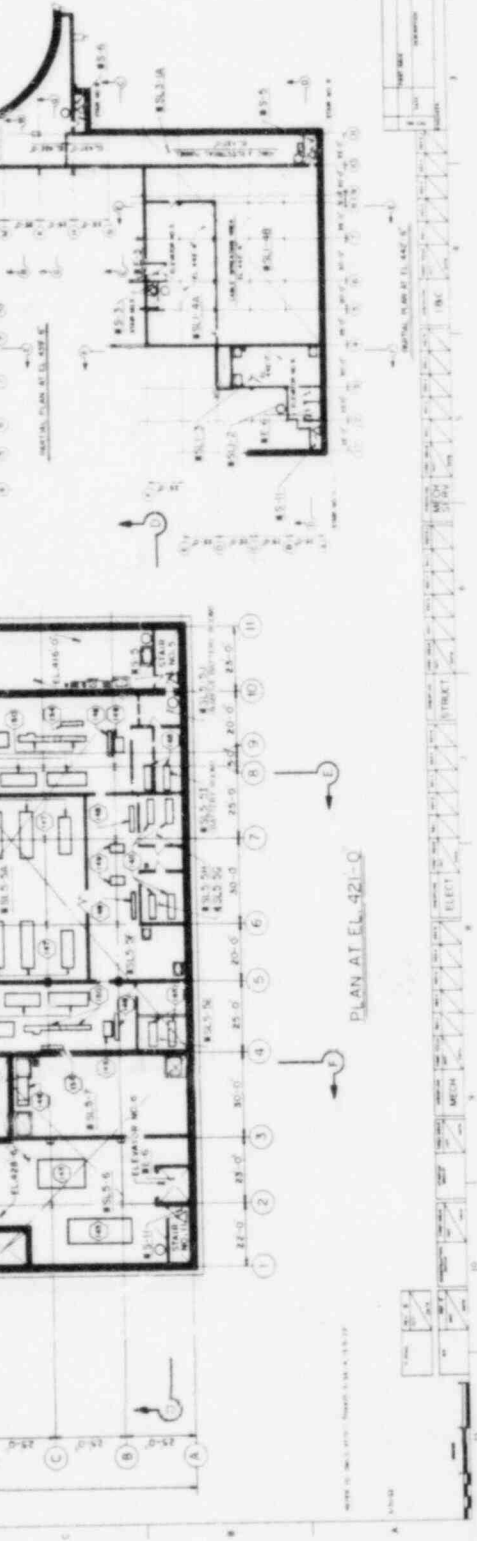
EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
1	HEAT TAP
2	RC DRAIN TANK HEAT EXCHANGER
3	COMPONENT SHAFT PUMPS
4	REACTOR COOLER HEAT EXCHANGER
5	LEADEN COOLER HEAT EXCHANGER
6	AIR HANDLING UNIT
7	RECIRCULATION PUMPS
8	WATER ENCAPSULATION SYSTEM
9	RC TANK FOR COLLECTION TANK
10	REFRIGERATION
11	LEAD DETECTION CHAMBER
12	WELDED JOINT
13	WELDED JOINT
14	WELDED JOINT
15	INTERNAL STORAGE STAND
16	CHEMICAL FEED PUMP
17	WATER TAP PUMPS
18	DECAT HEAT REMOVAL COOLER
19	CONTAMINANT SPILL PUMP
20	DECAT HEAT REMOVAL PUMP
21	WATER TAP PUMPS
22	WATER TAP PUMPS
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26	WATER TAP PUMPS
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66	WATER TAP PUMPS
67	WATER TAP PUMPS
68	WATER TAP PUMPS
69	WATER TAP PUMPS
70	WATER TAP PUMPS
71	WATER TAP PUMPS

EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
61	WATER TAP PUMPS
62	WATER TAP PUMPS
63	WATER TAP PUMPS
64	WATER TAP PUMPS
65	WATER TAP PUMPS
66	WATER TAP PUMPS
67	WATER TAP PUMPS
68	WATER TAP PUMPS
69	WATER TAP PUMPS
70	WATER TAP PUMPS
71	WATER TAP PUMPS

NOTE: ALL DIMENSIONS ARE IN FEET AND INCHES. DIMENSIONS IN PARENTHESES ARE IN METERS.

LEGEND:
○ WIRE STATION
○ WIRE CONNECTION



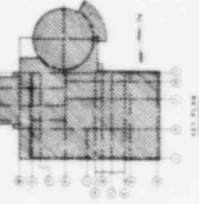


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EQUIPMENT LIST		
ITEM	DESCRIPTION	CODE
2-6	2-6 SERVICE STRUCTURE	F-5
2-7	2-7 SODIUM SULFATE DRY TANK	F-8
2-8	2-8 HYDRAULIC OIL RESERVOIR	F-9
2-9	2-9 ATMOSPHERIC CLEAN UP UNIT	F-10
2-10	2-10 SCS CONTROL PANEL	F-11
2-11	2-11 SODIUM SULFATE PUMP	F-12
2-12	2-12 SODIUM DRY TANK	F-13
2-13	2-13 WASTE MIX PUMP	F-14
2-14	2-14 WASTE PUMP	F-15
2-15	2-15 WASTE PUMP	F-16

LEGEND
 ○ HORSE STATION
 ▲ HORSE COMMUNITIES

NOTE:
APPENDIX B: NAME: PAGES: 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000



WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NORTHSEA PROJECT 400-1

FIRE PROTECTION PLANS

GENERAL SUPPRESS RING ELEV 458'-0"

CONTAMINANT IN LG. ELEV 454'-0"

MAIN STE FIGHTING RING ELEV 452'-0"

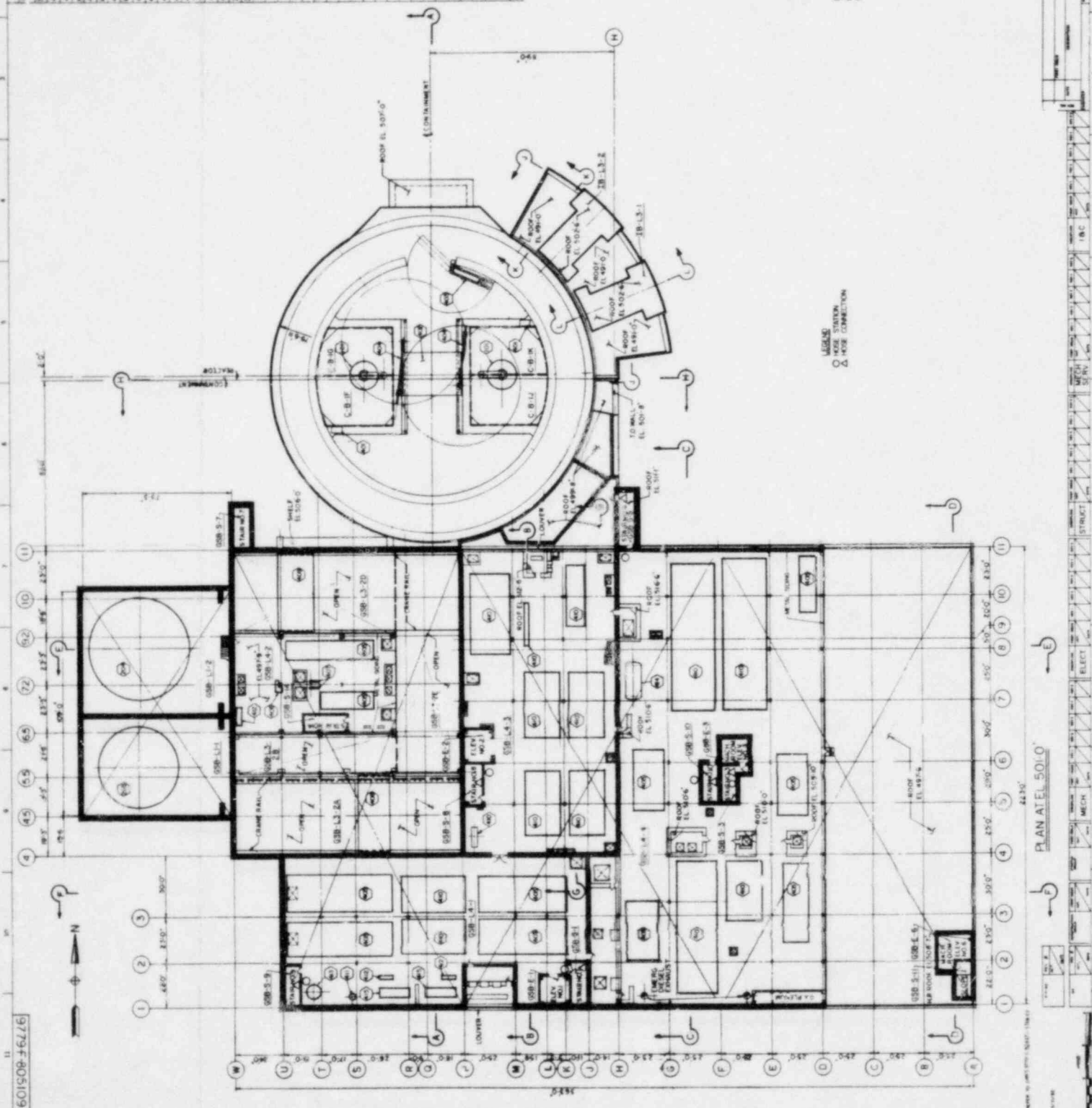
0' vertical measurements

XR F16 A3

PLAN AT EL. 455'-Q'

19-FIG A3

ITEM	DESCRIPTION	QUANTITY	UNIT
1	1/2" DIA. STEEL PIPE	100	FT.
2	1/4" DIA. STEEL PIPE	50	FT.
3	1/2" DIA. STEEL PIPE	50	FT.
4	1/4" DIA. STEEL PIPE	50	FT.
5	1/2" DIA. STEEL PIPE	50	FT.
6	1/4" DIA. STEEL PIPE	50	FT.
7	1/2" DIA. STEEL PIPE	50	FT.
8	1/4" DIA. STEEL PIPE	50	FT.
9	1/2" DIA. STEEL PIPE	50	FT.
10	1/4" DIA. STEEL PIPE	50	FT.
11	1/2" DIA. STEEL PIPE	50	FT.
12	1/4" DIA. STEEL PIPE	50	FT.
13	1/2" DIA. STEEL PIPE	50	FT.
14	1/4" DIA. STEEL PIPE	50	FT.
15	1/2" DIA. STEEL PIPE	50	FT.
16	1/4" DIA. STEEL PIPE	50	FT.
17	1/2" DIA. STEEL PIPE	50	FT.
18	1/4" DIA. STEEL PIPE	50	FT.
19	1/2" DIA. STEEL PIPE	50	FT.
20	1/4" DIA. STEEL PIPE	50	FT.
21	1/2" DIA. STEEL PIPE	50	FT.
22	1/4" DIA. STEEL PIPE	50	FT.
23	1/2" DIA. STEEL PIPE	50	FT.
24	1/4" DIA. STEEL PIPE	50	FT.
25	1/2" DIA. STEEL PIPE	50	FT.
26	1/4" DIA. STEEL PIPE	50	FT.
27	1/2" DIA. STEEL PIPE	50	FT.
28	1/4" DIA. STEEL PIPE	50	FT.
29	1/2" DIA. STEEL PIPE	50	FT.
30	1/4" DIA. STEEL PIPE	50	FT.
31	1/2" DIA. STEEL PIPE	50	FT.
32	1/4" DIA. STEEL PIPE	50	FT.
33	1/2" DIA. STEEL PIPE	50	FT.
34	1/4" DIA. STEEL PIPE	50	FT.
35	1/2" DIA. STEEL PIPE	50	FT.
36	1/4" DIA. STEEL PIPE	50	FT.
37	1/2" DIA. STEEL PIPE	50	FT.
38	1/4" DIA. STEEL PIPE	50	FT.
39	1/2" DIA. STEEL PIPE	50	FT.
40	1/4" DIA. STEEL PIPE	50	FT.
41	1/2" DIA. STEEL PIPE	50	FT.
42	1/4" DIA. STEEL PIPE	50	FT.
43	1/2" DIA. STEEL PIPE	50	FT.
44	1/4" DIA. STEEL PIPE	50	FT.
45	1/2" DIA. STEEL PIPE	50	FT.
46	1/4" DIA. STEEL PIPE	50	FT.
47	1/2" DIA. STEEL PIPE	50	FT.
48	1/4" DIA. STEEL PIPE	50	FT.
49	1/2" DIA. STEEL PIPE	50	FT.
50	1/4" DIA. STEEL PIPE	50	FT.



PLAN ATEL 5010'

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 1

FIRE PROTECTION PLANS

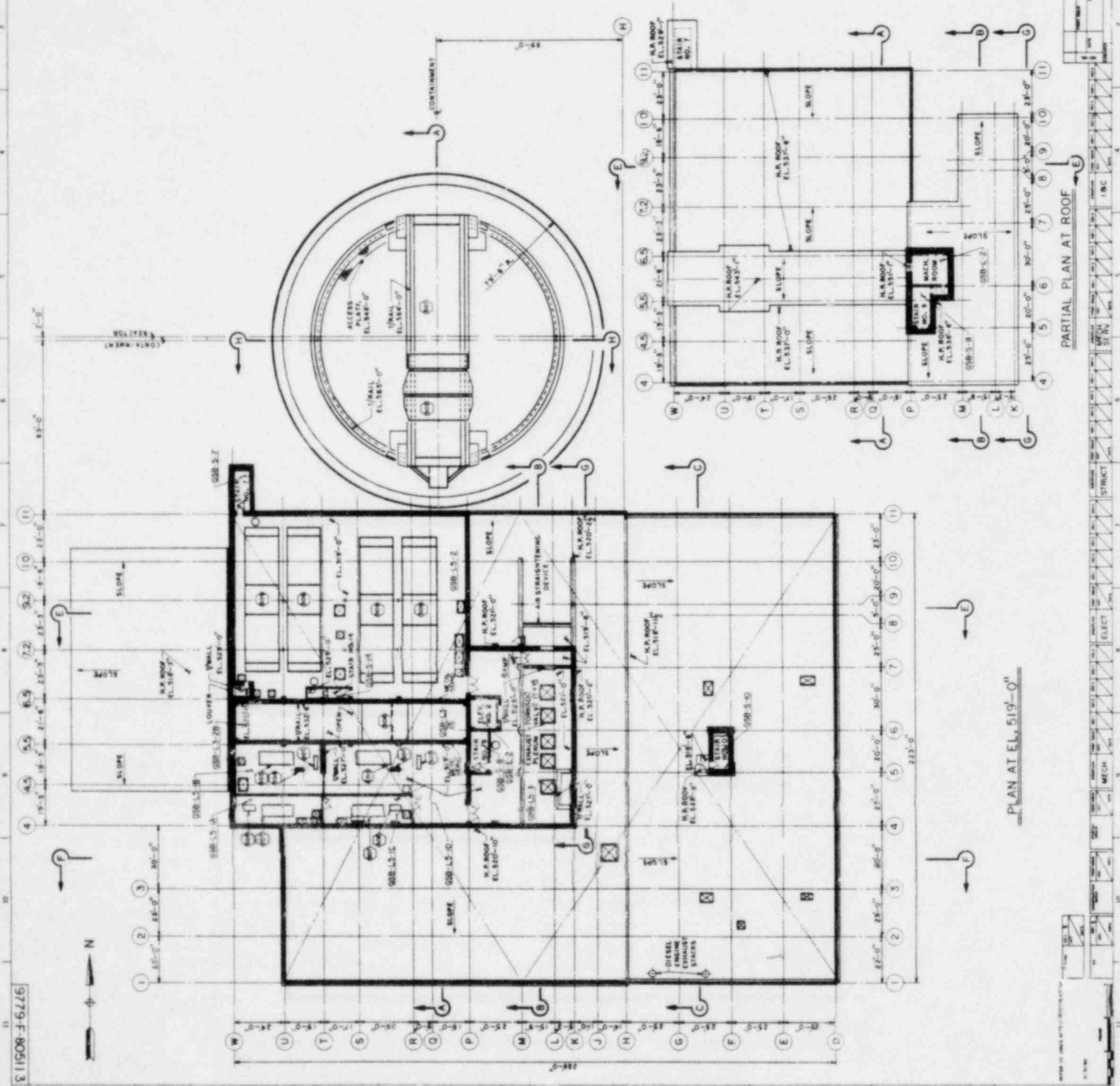
GENERAL SUPPLIES BLDG. ELEV. 501' 0"
CONTAINMENT BLDG. ELEV. 499' 0"
MAIN STEAM TOWER CSD BLDG. ELEV. 401' 0"

 United Brotherhood of Carpenters and Joiners of America

Scale: 1" = 1'-0"

XR-FIG. A-5

EQUIPMENT LIST	
ITEM	DESCRIPTION
NO. 1	ENGINE
NO. 2	TRUCK
NO. 3	TRUCK
NO. 4	TRUCK
NO. 5	TRUCK
NO. 6	TRUCK
NO. 7	TRUCK
NO. 8	TRUCK
NO. 9	TRUCK
NO. 10	TRUCK
NO. 11	TRUCK
NO. 12	TRUCK
NO. 13	TRUCK
NO. 14	TRUCK
NO. 15	TRUCK
NO. 16	TRUCK
NO. 17	TRUCK
NO. 18	TRUCK
NO. 19	TRUCK
NO. 20	TRUCK
NO. 21	TRUCK
NO. 22	TRUCK
NO. 23	TRUCK
NO. 24	TRUCK
NO. 25	TRUCK
NO. 26	TRUCK
NO. 27	TRUCK
NO. 28	TRUCK
NO. 29	TRUCK
NO. 30	TRUCK
NO. 31	TRUCK
NO. 32	TRUCK
NO. 33	TRUCK
NO. 34	TRUCK
NO. 35	TRUCK
NO. 36	TRUCK
NO. 37	TRUCK
NO. 38	TRUCK
NO. 39	TRUCK
NO. 40	TRUCK
NO. 41	TRUCK
NO. 42	TRUCK
NO. 43	TRUCK
NO. 44	TRUCK
NO. 45	TRUCK
NO. 46	TRUCK
NO. 47	TRUCK
NO. 48	TRUCK
NO. 49	TRUCK
NO. 50	TRUCK
NO. 51	TRUCK
NO. 52	TRUCK
NO. 53	TRUCK
NO. 54	TRUCK
NO. 55	TRUCK
NO. 56	TRUCK
NO. 57	TRUCK
NO. 58	TRUCK
NO. 59	TRUCK
NO. 60	TRUCK
NO. 61	TRUCK
NO. 62	TRUCK
NO. 63	TRUCK
NO. 64	TRUCK
NO. 65	TRUCK
NO. 66	TRUCK
NO. 67	TRUCK
NO. 68	TRUCK
NO. 69	TRUCK
NO. 70	TRUCK
NO. 71	TRUCK
NO. 72	TRUCK
NO. 73	TRUCK
NO. 74	TRUCK
NO. 75	TRUCK
NO. 76	TRUCK
NO. 77	TRUCK
NO. 78	TRUCK
NO. 79	TRUCK
NO. 80	TRUCK
NO. 81	TRUCK
NO. 82	TRUCK
NO. 83	TRUCK
NO. 84	TRUCK
NO. 85	TRUCK
NO. 86	TRUCK
NO. 87	TRUCK
NO. 88	TRUCK
NO. 89	TRUCK
NO. 90	TRUCK
NO. 91	TRUCK
NO. 92	TRUCK
NO. 93	TRUCK
NO. 94	TRUCK
NO. 95	TRUCK
NO. 96	TRUCK
NO. 97	TRUCK
NO. 98	TRUCK
NO. 99	TRUCK
NO. 100	TRUCK



PLAN AT EL. 519'-0"

PARTIAL PLAN AT ROOF

WASHINGTON PUBLIC PLANTS SUPPLY SYSTEM
FIRE PROTECTION PLANT
GENERAL SERVICE BLDG. - ELEV. 519'-0"
FIRE PROTECTION BLDG. - ELEV. 545'-0"
FIRE PROTECTION BLDG. - ELEV. 545'-0"

9779 F 805113

EQUIPMENT LIST

NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1	1" DIA. TANK	1	EA	100.00	100.00
2	2" DIA. TANK	1	EA	150.00	150.00
3	3" DIA. TANK	1	EA	200.00	200.00
4	4" DIA. TANK	1	EA	250.00	250.00
5	5" DIA. TANK	1	EA	300.00	300.00
6	6" DIA. TANK	1	EA	350.00	350.00
7	7" DIA. TANK	1	EA	400.00	400.00
8	8" DIA. TANK	1	EA	450.00	450.00
9	9" DIA. TANK	1	EA	500.00	500.00
10	10" DIA. TANK	1	EA	550.00	550.00
11	11" DIA. TANK	1	EA	600.00	600.00
12	12" DIA. TANK	1	EA	650.00	650.00
13	13" DIA. TANK	1	EA	700.00	700.00
14	14" DIA. TANK	1	EA	750.00	750.00
15	15" DIA. TANK	1	EA	800.00	800.00
16	16" DIA. TANK	1	EA	850.00	850.00
17	17" DIA. TANK	1	EA	900.00	900.00
18	18" DIA. TANK	1	EA	950.00	950.00
19	19" DIA. TANK	1	EA	1000.00	1000.00
20	20" DIA. TANK	1	EA	1050.00	1050.00
21	21" DIA. TANK	1	EA	1100.00	1100.00
22	22" DIA. TANK	1	EA	1150.00	1150.00
23	23" DIA. TANK	1	EA	1200.00	1200.00
24	24" DIA. TANK	1	EA	1250.00	1250.00
25	25" DIA. TANK	1	EA	1300.00	1300.00
26	26" DIA. TANK	1	EA	1350.00	1350.00
27	27" DIA. TANK	1	EA	1400.00	1400.00
28	28" DIA. TANK	1	EA	1450.00	1450.00
29	29" DIA. TANK	1	EA	1500.00	1500.00
30	30" DIA. TANK	1	EA	1550.00	1550.00
31	31" DIA. TANK	1	EA	1600.00	1600.00
32	32" DIA. TANK	1	EA	1650.00	1650.00
33	33" DIA. TANK	1	EA	1700.00	1700.00
34	34" DIA. TANK	1	EA	1750.00	1750.00
35	35" DIA. TANK	1	EA	1800.00	1800.00
36	36" DIA. TANK	1	EA	1850.00	1850.00
37	37" DIA. TANK	1	EA	1900.00	1900.00
38	38" DIA. TANK	1	EA	1950.00	1950.00
39	39" DIA. TANK	1	EA	2000.00	2000.00
40	40" DIA. TANK	1	EA	2050.00	2050.00
41	41" DIA. TANK	1	EA	2100.00	2100.00
42	42" DIA. TANK	1	EA	2150.00	2150.00
43	43" DIA. TANK	1	EA	2200.00	2200.00
44	44" DIA. TANK	1	EA	2250.00	2250.00
45	45" DIA. TANK	1	EA	2300.00	2300.00
46	46" DIA. TANK	1	EA	2350.00	2350.00
47	47" DIA. TANK	1	EA	2400.00	2400.00
48	48" DIA. TANK	1	EA	2450.00	2450.00
49	49" DIA. TANK	1	EA	2500.00	2500.00
50	50" DIA. TANK	1	EA	2550.00	2550.00
51	51" DIA. TANK	1	EA	2600.00	2600.00
52	52" DIA. TANK	1	EA	2650.00	2650.00
53	53" DIA. TANK	1	EA	2700.00	2700.00
54	54" DIA. TANK	1	EA	2750.00	2750.00
55	55" DIA. TANK	1	EA	2800.00	2800.00
56	56" DIA. TANK	1	EA	2850.00	2850.00
57	57" DIA. TANK	1	EA	2900.00	2900.00
58	58" DIA. TANK	1	EA	2950.00	2950.00
59	59" DIA. TANK	1	EA	3000.00	3000.00
60	60" DIA. TANK	1	EA	3050.00	3050.00
61	61" DIA. TANK	1	EA	3100.00	3100.00
62	62" DIA. TANK	1	EA	3150.00	3150.00
63	63" DIA. TANK	1	EA	3200.00	3200.00
64	64" DIA. TANK	1	EA	3250.00	3250.00
65	65" DIA. TANK	1	EA	3300.00	3300.00
66	66" DIA. TANK	1	EA	3350.00	3350.00
67	67" DIA. TANK	1	EA	3400.00	3400.00
68	68" DIA. TANK	1	EA	3450.00	3450.00
69	69" DIA. TANK	1	EA	3500.00	3500.00
70	70" DIA. TANK	1	EA	3550.00	3550.00
71	71" DIA. TANK	1	EA	3600.00	3600.00
72	72" DIA. TANK	1	EA	3650.00	3650.00
73	73" DIA. TANK	1	EA	3700.00	3700.00
74	74" DIA. TANK	1	EA	3750.00	3750.00
75	75" DIA. TANK	1	EA	3800.00	3800.00
76	76" DIA. TANK	1	EA	3850.00	3850.00
77	77" DIA. TANK	1	EA	3900.00	3900.00
78	78" DIA. TANK	1	EA	3950.00	3950.00
79	79" DIA. TANK	1	EA	4000.00	4000.00
80	80" DIA. TANK	1	EA	4050.00	4050.00
81	81" DIA. TANK	1	EA	4100.00	4100.00
82	82" DIA. TANK	1	EA	4150.00	4150.00
83	83" DIA. TANK	1	EA	4200.00	4200.00
84	84" DIA. TANK	1	EA	4250.00	4250.00
85	85" DIA. TANK	1	EA	4300.00	4300.00
86	86" DIA. TANK	1	EA	4350.00	4350.00
87	87" DIA. TANK	1	EA	4400.00	4400.00
88	88" DIA. TANK	1	EA	4450.00	4450.00
89	89" DIA. TANK	1	EA	4500.00	4500.00
90	90" DIA. TANK	1	EA	4550.00	4550.00
91	91" DIA. TANK	1	EA	4600.00	4600.00
92	92" DIA. TANK	1	EA	4650.00	4650.00
93	93" DIA. TANK	1	EA	4700.00	4700.00
94	94" DIA. TANK	1	EA	4750.00	4750.00
95	95" DIA. TANK	1	EA	4800.00	4800.00
96	96" DIA. TANK	1	EA	4850.00	4850.00
97	97" DIA. TANK	1	EA	4900.00	4900.00
98	98" DIA. TANK	1	EA	4950.00	4950.00
99	99" DIA. TANK	1	EA	5000.00	5000.00
100	100" DIA. TANK	1	EA	5050.00	5050.00
101	101" DIA. TANK	1	EA	5100.00	5100.00
102	102" DIA. TANK	1	EA	5150.00	5150.00
103	103" DIA. TANK	1	EA	5200.00	5200.00
104	104" DIA. TANK	1	EA	5250.00	5250.00
105	105" DIA. TANK	1	EA	5300.00	5300.00
106	106" DIA. TANK	1	EA	5350.00	5350.00
107	107" DIA. TANK	1	EA	5400.00	5400.00
108	108" DIA. TANK	1	EA	5450.00	5450.00
109	109" DIA. TANK	1	EA	5500.00	5500.00
110	110" DIA. TANK	1	EA	5550.00	5550.00
111	111" DIA. TANK	1	EA	5600.00	5600.00
112	112" DIA. TANK	1	EA	5650.00	5650.00
113	113" DIA. TANK	1	EA	5700.00	5700.00
114	114" DIA. TANK	1	EA	5750.00	5750.00
115	115" DIA. TANK	1	EA	5800.00	5800.00
116	116" DIA. TANK	1	EA	5850.00	5850.00
117	117" DIA. TANK	1	EA	5900.00	5900.00
118	118" DIA. TANK	1	EA	5950.00	5950.00
119	119" DIA. TANK	1	EA	6000.00	6000.00
120	120" DIA. TANK	1	EA	6050.00	6050.00
121	121" DIA. TANK	1	EA	6100.00	6100.00
122	122" DIA. TANK	1	EA	6150.00	6150.00
123	123" DIA. TANK	1	EA	6200.00	6200.00
124	124" DIA. TANK	1	EA	6250.00	6250.00
125	125" DIA. TANK	1	EA	6300.00	6300.00
126	126" DIA. TANK	1	EA	6350.00	6350.00
127	127" DIA. TANK	1	EA	6400.00	6400.00
128	128" DIA. TANK	1	EA	6450.00	6450.00
129	129" DIA. TANK	1	EA	6500.00	6500.00
130	130" DIA. TANK	1	EA	6550.00	6550.00
131	131" DIA. TANK	1	EA	6600.00	6600.00
132	132" DIA. TANK	1	EA	6650.00	6650.00
133	133" DIA. TANK	1	EA	6700.00	6700.00
134	134" DIA. TANK	1	EA	6750.00	6750.00
135	135" DIA. TANK	1	EA	6800.00	6800.00
136	136" DIA. TANK	1	EA	6850.00	6850.00
137	137" DIA. TANK	1	EA	6900.00	6900.00
138	138" DIA. TANK	1	EA	6950.00	6950.00
139	139" DIA. TANK	1	EA	7000.00	7000.00
140	140" DIA. TANK	1	EA	7050.00	7050.00
141	141" DIA. TANK	1	EA	7100.00	7100.00
142	142" DIA. TANK	1	EA	7150.00	7150.00
143	143" DIA. TANK	1	EA	7200.00	7200.00
144	144" DIA. TANK	1	EA	7250.00	7250.00
145	145" DIA. TANK	1	EA	7300.00	7300.00
146	146" DIA. TANK	1	EA	7350.00	7350.00
147	147" DIA. TANK	1	EA	7400.00	7400.00
148	148" DIA. TANK	1	EA	7450.00	7450.00
149	149" DIA. TANK	1	EA	7500.00	7500.00
150	150" DIA. TANK	1	EA	7550.00	7550.00
151	151" DIA. TANK	1	EA	7600.00	7600.00
152	152" DIA. TANK	1	EA	7650.00	7650.00
153	153" DIA. TANK	1	EA	7700.00	7700.00
154	154" DIA. TANK	1	EA	7750.00	7750.00
155	155" DIA. TANK	1	EA	7800.00	7800.00
156	156" DIA. TANK	1	EA	7850.00	7850.00
157	157" DIA. TANK	1	EA	7900.00	7900.00
158	158" DIA. TANK	1	EA	7950.00	7950.00
159	159" DIA. TANK	1	EA	8000.00	8000.00
160	160" DIA. TANK	1	EA	8050.00	8050.00
161	161" DIA. TANK	1	EA	8100.00	8100.00
162	162" DIA. TANK	1	EA	8150.00	8150.00
163	163" DIA. TANK	1	EA	8200.00	8200.00
164	164" DIA. TANK	1	EA	8250.00	8250.00
165	165" DIA. TANK	1	EA	8300.00	8300.00
166	166" DIA. TANK	1	EA	8350.00	8350.00
167	167" DIA. TANK	1	EA	8400.00	8400.00
168	168" DIA. TANK	1	EA	8450.00	8450.00
169	169" DIA. TANK	1	EA	8500.00	8500.00
170	170" DIA. TANK	1	EA	8550.00	8550.00
171	171" DIA. TANK	1	EA	8600.00	8600.00
172	172" DIA. TANK	1	EA	8650.00	8650.00
173	173" DIA. TANK	1	EA	8700.00	8700.00
174	174" DIA. TANK	1	EA	8750.00	8750.00
175	175" DIA. TANK	1	EA	8800.00	8800.00
176	176" DIA. TANK	1	EA	8850.00	8850.00
177	177" DIA. TANK	1	EA	8900.00	8900.00
178	178" DIA. TANK	1	EA	8950.00	8950.00
179	179" DIA. TANK	1	EA	9000.00	9000.00
180	180" DIA. TANK	1	EA	9050.00	9050.00
181	181" DIA. TANK	1	EA	9100.00	9100.00
182	182" DIA. TANK	1	EA	9150.00	9150.00
183	183" DIA. TANK	1	EA	9200.00	9200.00
184	184" DIA. TANK	1	EA	9250.00	9250.00
185	185" DIA. TANK	1	EA	9300.00	9300.00
186	186" DIA. TANK	1	EA	9350.00	9350.00
187	187" DIA. TANK	1	EA	9400.00	9400.00
188	188" DIA. TANK	1	EA	9450.00	9450.00
189	189" DIA. TANK	1	EA	9500.00	9500.00
190	190" DIA. TANK	1	EA	9550.00	9550.00
191	191" DIA. TANK	1	EA	9600.00	9600.00
192	192" DIA. TANK	1	EA	9650.00	9650.00
193	193" DIA. TANK	1	EA	9700.00	9700.00
194	194" DIA. TANK	1	EA	9750.00	9750.00
195	195" DIA. TANK	1	EA	9800.00	9800.00
196	196" DIA. TANK	1	EA	9850.00	9850.00
197	197" DIA. TANK	1	EA	9900.00	9900.00
198	198" DIA. TANK	1	EA	9950.00	9950.00
199	199" DIA. TANK	1	EA	10000.00	10000.00
200	200" DIA. TANK	1	EA	10050.00	10050.00
201	201" DIA. TANK	1	EA	10100.00	10100.00
202	202" DIA. TANK	1	EA	10150.00	10150.00
203	203" DIA. TANK	1	EA	10200.00	10200.00
204	204" DIA. TANK	1	EA	10250.00	10250.00
205	205" DIA. TANK	1	EA	10300.00	10300.00
206	206" DIA. TANK	1	EA	10350.00	10350.00
207					

[illegible]

Architectural floor plan of the East Wing of the White House. The plan shows the layout of the East Wing, including the East Wing Lobby, East Wing Office, East Wing Conference Room, and East Wing Reception. The plan is oriented with the entrance at the top. Key areas include the East Wing Lobby, East Wing Office, East Wing Conference Room, and East Wing Reception. The plan is labeled 'EAST WING' and 'WHITE HOUSE'.

Architectural floor plan of the second floor of the building at 1000 North Dearborn Street, Chicago. The plan shows various rooms including offices, a conference room, a kitchen, and a lounge. It includes room numbers, dimensions, and labels for fixtures like sinks, toilets, and showers. A grid system with letters A through J and numbers 1 through 7 is overlaid on the plan.

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
 1986 PROTECTION

0-0.8	7000-300 CRANE	0-5
0-0.8	500 HANDLING UNIT	0-5
0-0.7	PIEST SET PUMP	0-6
0-0.9	500 INFLUATOR UNIT	0-9
0-0.9	NEW F.B. (WORKING IN PRODUCTION)	0-7
0-0.8	500 ATMOSPHERIC CLEAN UP TRAIN	0-10
0-1.2	MOTOR CONTROL CENTER	0-10
0-1.5	500 SUBSTATION	0-10
0-1.5	500 POLAR CRANE	0-10
0-1.2	500 TOLLER	0-6
0-1.5	500 MILLER PUMP	0-9
0-0.8	500 EXHAUST TANK	0-9
0-0.8	500 HANDLING CRANE	0-9
0-0.9	500 ATMOSPHERIC CLEAN UP UNIT	0-7.5

Figure 1 is a detailed architectural floor plan of a building, likely a school or institutional structure. The plan shows various rooms, corridors, and outdoor areas. Key features include a large central hall, several classrooms or meeting rooms, and a large outdoor area with a circular feature. Dimensions are provided for many rooms and areas. The plan is oriented with North at the top.

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
WASHINGTON, D.C. 20004-1099

[illegible]

1

GENERAL SERVICES BUILDING
AND CONSTRUCTION

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PARTIAL SECTION B-B
LOOKING WEST

SECTIONS "A-A" AND "B-B"

[illegible]

Keywords: child sexual abuse; disclosure; social support

	$\sin \theta = \frac{4}{5}$ $\cos \theta = \frac{3}{5}$ $\tan \theta = \frac{4}{3}$
--	-------------------------------------------------------------------------------------------

100% Satisfaction Guarantee
 100% Satisfaction Guarantee
 100% Satisfaction Guarantee

[illegible]

Iteration	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Iteration	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

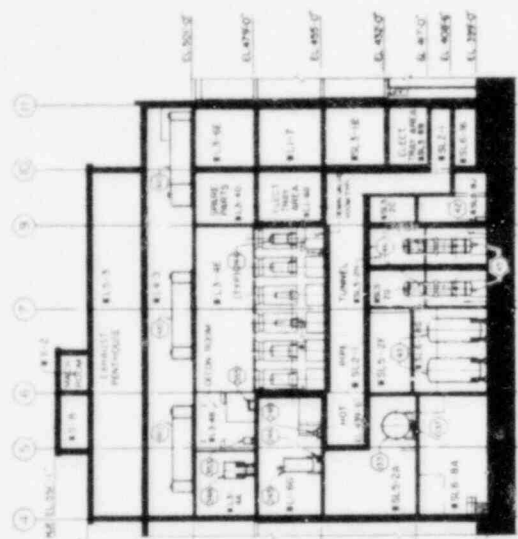
[illegible][illegible]

Figure 1

100

9779 F 8050311

EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
1	REACTOR
2	300 GPM FUEL COLLECTION TANK
3	100 GPM FUEL PUMP
4	100 GPM FUEL PUMP
5	100 GPM FUEL PUMP
6	100 GPM FUEL PUMP
7	100 GPM FUEL PUMP
8	100 GPM FUEL PUMP
9	100 GPM FUEL PUMP
10	100 GPM FUEL PUMP
11	100 GPM FUEL PUMP
12	100 GPM FUEL PUMP
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94	100 GPM FUEL PUMP
95	100 GPM FUEL PUMP
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98	100 GPM FUEL PUMP
99	100 GPM FUEL PUMP
100	100 GPM FUEL PUMP

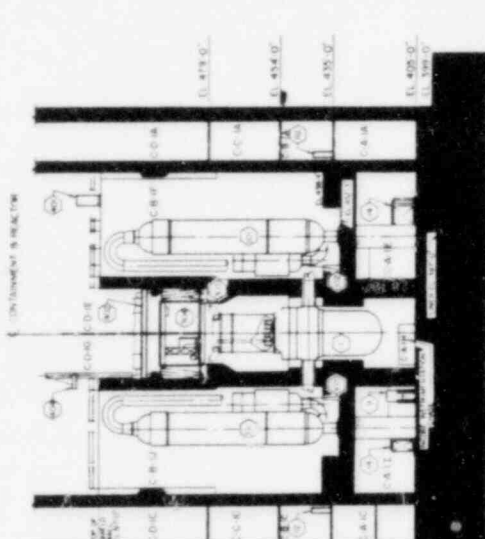


PARTIAL SECTION "C-C"
LOOKING WEST

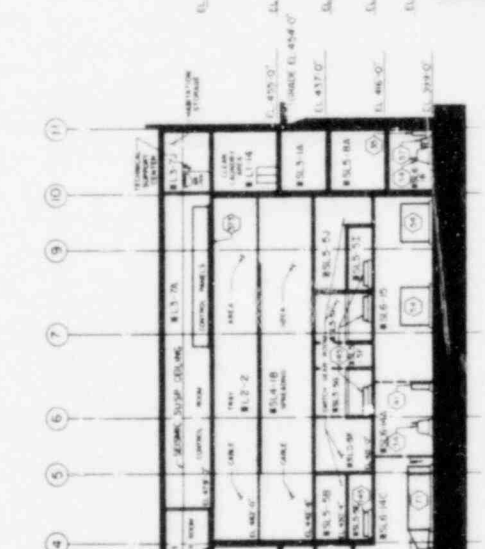


PARTIAL SECTION "D-D"
LOOKING WEST

NOTE:
REACTOR AND TANKS TO BE MODIFIED WITH OHS
STANDARD FOR 2000.



PARTIAL SECTION "E-E"
LOOKING WEST



PARTIAL SECTION "F-F"
LOOKING WEST

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
FIRE PROTECTION
CONCRETE AND STEELWORK
SECTION "C-C", "D-D", "E-E" AND "F-F"
DATE: 11/16/88
BY: J. L. H. 116 48

9779-F-805112

EQUIPMENT LIST



SECTION E-E
LOOKING SOUTH

NOTES:
ELEVATIONS ARE BASED ON THE PRELIMINARY SURVEY DATA.

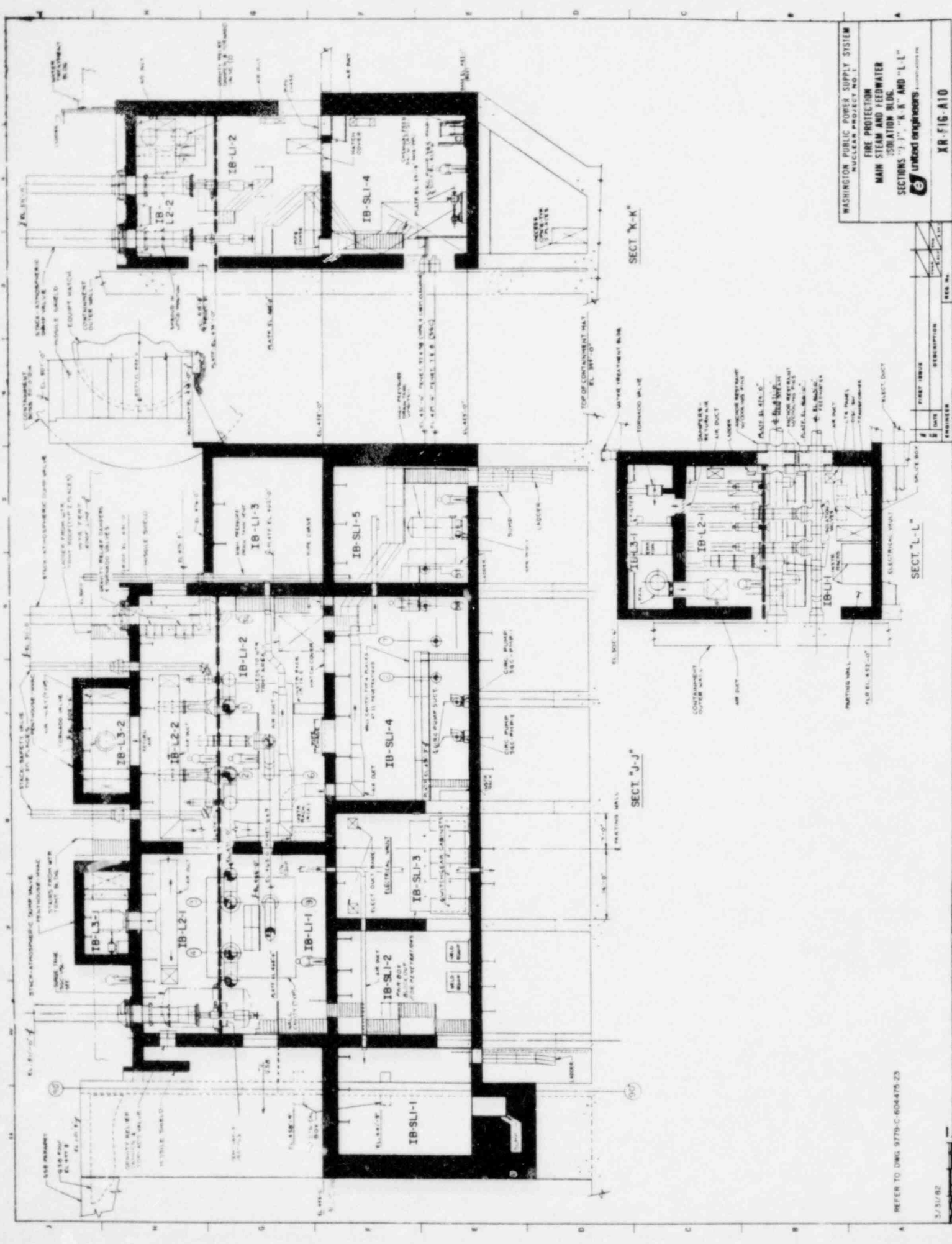
ITEM	DESCRIPTION	QTY	UNIT
1	1" DIA. STEEL TUBING	100	FT.
2	1" DIA. STEEL TUBING	100	FT.
3	1" DIA. STEEL TUBING	100	FT.
4	1" DIA. STEEL TUBING	100	FT.
5	1" DIA. STEEL TUBING	100	FT.
6	1" DIA. STEEL TUBING	100	FT.
7	1" DIA. STEEL TUBING	100	FT.
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75	1" DIA. STEEL TUBING	100	FT.
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89	1" DIA. STEEL TUBING	100	FT.
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91	1" DIA. STEEL TUBING	100	FT.
92	1" DIA. STEEL TUBING	100	FT.
93	1" DIA. STEEL TUBING	100	FT.
94	1" DIA. STEEL TUBING	100	FT.
95	1" DIA. STEEL TUBING	100	FT.
96	1" DIA. STEEL TUBING	100	FT.
97	1" DIA. STEEL TUBING	100	FT.
98	1" DIA. STEEL TUBING	100	FT.
99	1" DIA. STEEL TUBING	100	FT.
100	1" DIA. STEEL TUBING	100	FT.



SECTION F-F
LOOKING SOUTH

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
GENERAL SERVICES DIVISION
SECTION E-E AND F-F
ELEVATION REQUIREMENTS





WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 1

FIRE PROTECTION
MAIN STEAM AND FEEDWATER
ISOLATION BLDG.

SECTIONS "J-J", "K-K" AND "L-L"

ENGINEERS

DATE	DESCRIPTION	REVISION
10/1/82	1. REVISED FOR 3D MODELING	1
11/1/82	2. REVISED FOR 3D MODELING	2
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4/1/86	43. REVISED FOR 3D MODELING	43
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7/1/86	46. REVISED FOR 3D MODELING	46
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4/1/87	55. REVISED FOR 3D MODELING	55
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5/1/88	68. REVISED FOR 3D MODELING	68
6/1/88	69. REVISED FOR 3D MODELING	69
7/1/88	70. REVISED FOR 3D MODELING	70
8/1/88	71. REVISED FOR 3D MODELING	71
9/1/88	72. REVISED FOR 3D MODELING	72
10/1/88	73. REVISED FOR 3D MODELING	73
11/1/88	74. REVISED FOR 3D MODELING	74
12/1/88	75. REVISED FOR 3D MODELING	75
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2/1/89	77. REVISED FOR 3D MODELING	77
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4/1/89	79. REVISED FOR 3D MODELING	79
5/1/89	80. REVISED FOR 3D MODELING	80
6/1/89	81. REVISED FOR 3D MODELING	81
7/1/89	82. REVISED FOR 3D MODELING	82
8/1/89	83. REVISED FOR 3D MODELING	83
9/1/89	84. REVISED FOR 3D MODELING	84
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2/1/90	89. REVISED FOR 3D MODELING	89
3/1/90	90. REVISED FOR 3D MODELING	90
4/1/90	91. REVISED FOR 3D MODELING	91
5/1/90	92. REVISED FOR 3D MODELING	92
6/1/90	93. REVISED FOR 3D MODELING	93
7/1/90	94. REVISED FOR 3D MODELING	94
8/1/90	95. REVISED FOR 3D MODELING	95
9/1/90	96. REVISED FOR 3D MODELING	96
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11/1/90	98. REVISED FOR 3D MODELING	98
12/1/90	99. REVISED FOR 3D MODELING	99
1/1/91	100. REVISED FOR 3D MODELING	100

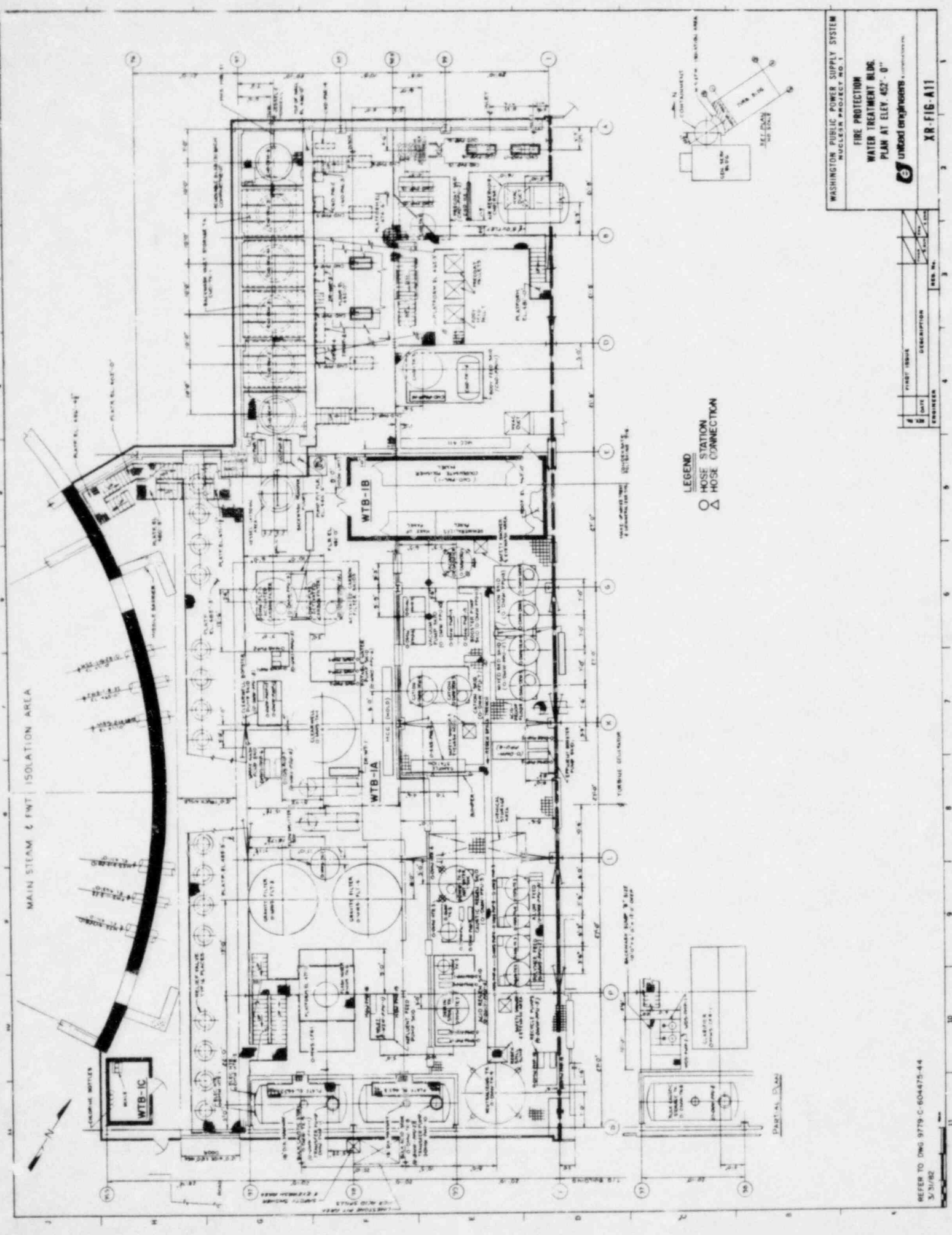
SECTION "J-J"

SECTION "K-K"

SECTION "L-L"

REFER TO DWG. 9779-C-804475-23

3/31/82



WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 1

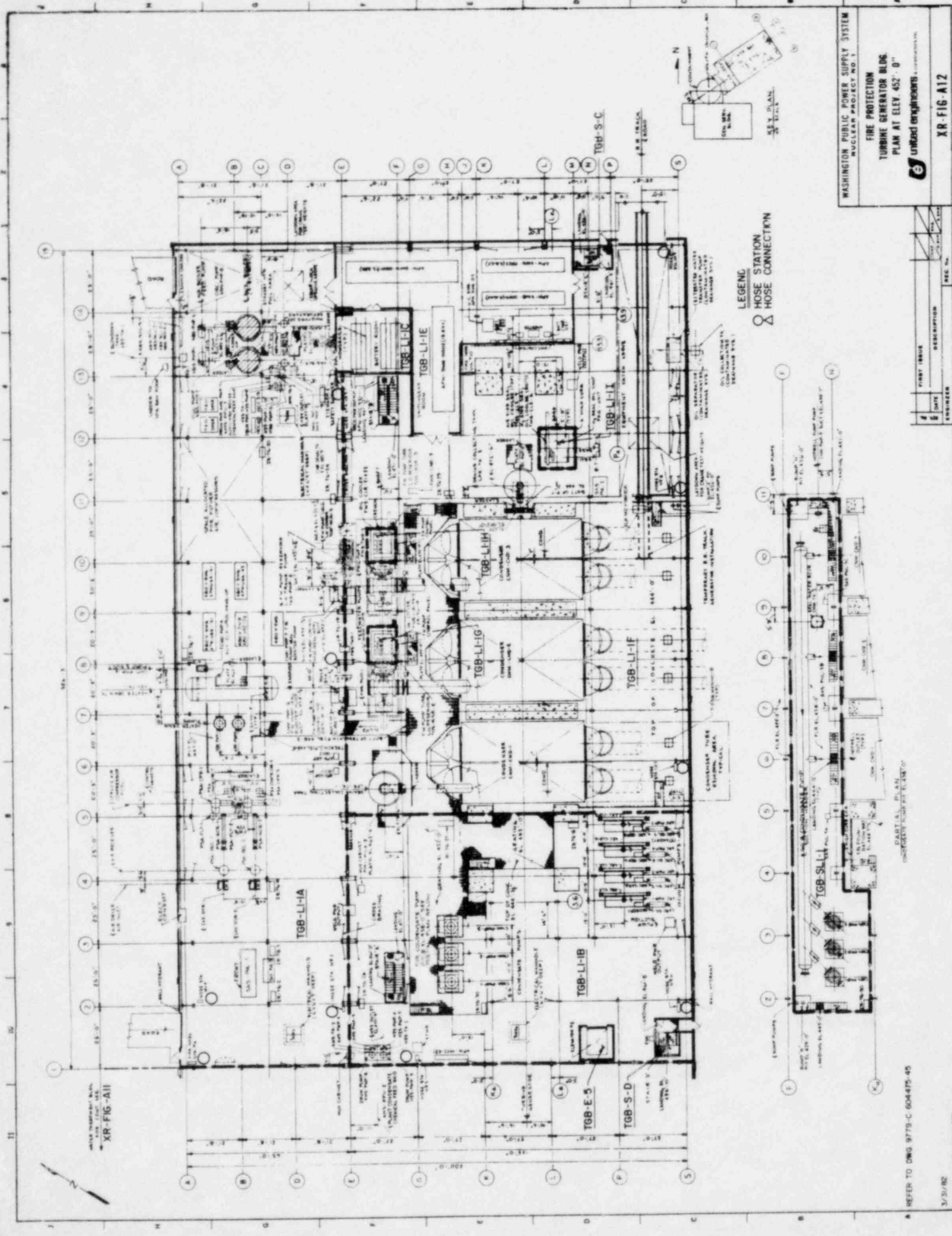
**FIRE PROTECTION
WATER TREATMENT BLDG.
PLAN AT ELEV. 452'-0"**

UNION ENGINEERS

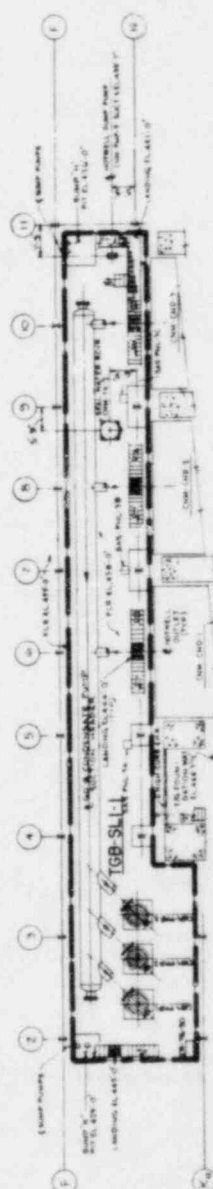
XR-FIG-A11

REV.	DATE	DESCRIPTION	BY	CHK.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

REFER TO DWG 9779-C-604475-44
3/3/82



LEGEND
HOSE STATION
HOSE CONNECTION



PARTIAL PLAN
CONTINUED FROM FIG. 11-10

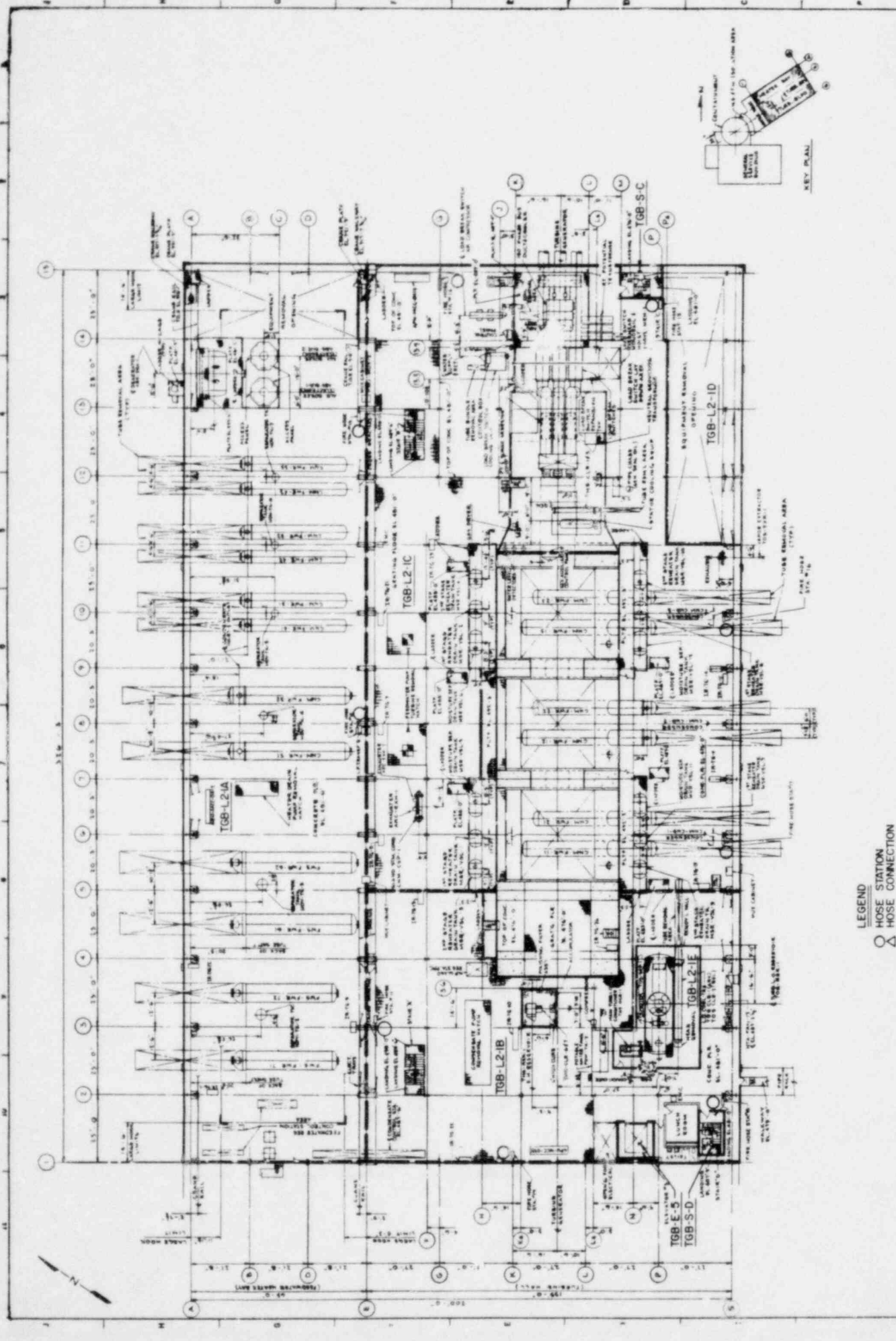
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 1
FIRE PROTECTION
TURBINE GENERATOR BLDG.
PLAN AT ELEV. 452'-0"

REFER TO DWG 9779-C 604475-45

3/25/82

NO.	DATE	DESCRIPTION	BY	CHK.
1				
2				
3				
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6				
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XR-FIG-A12



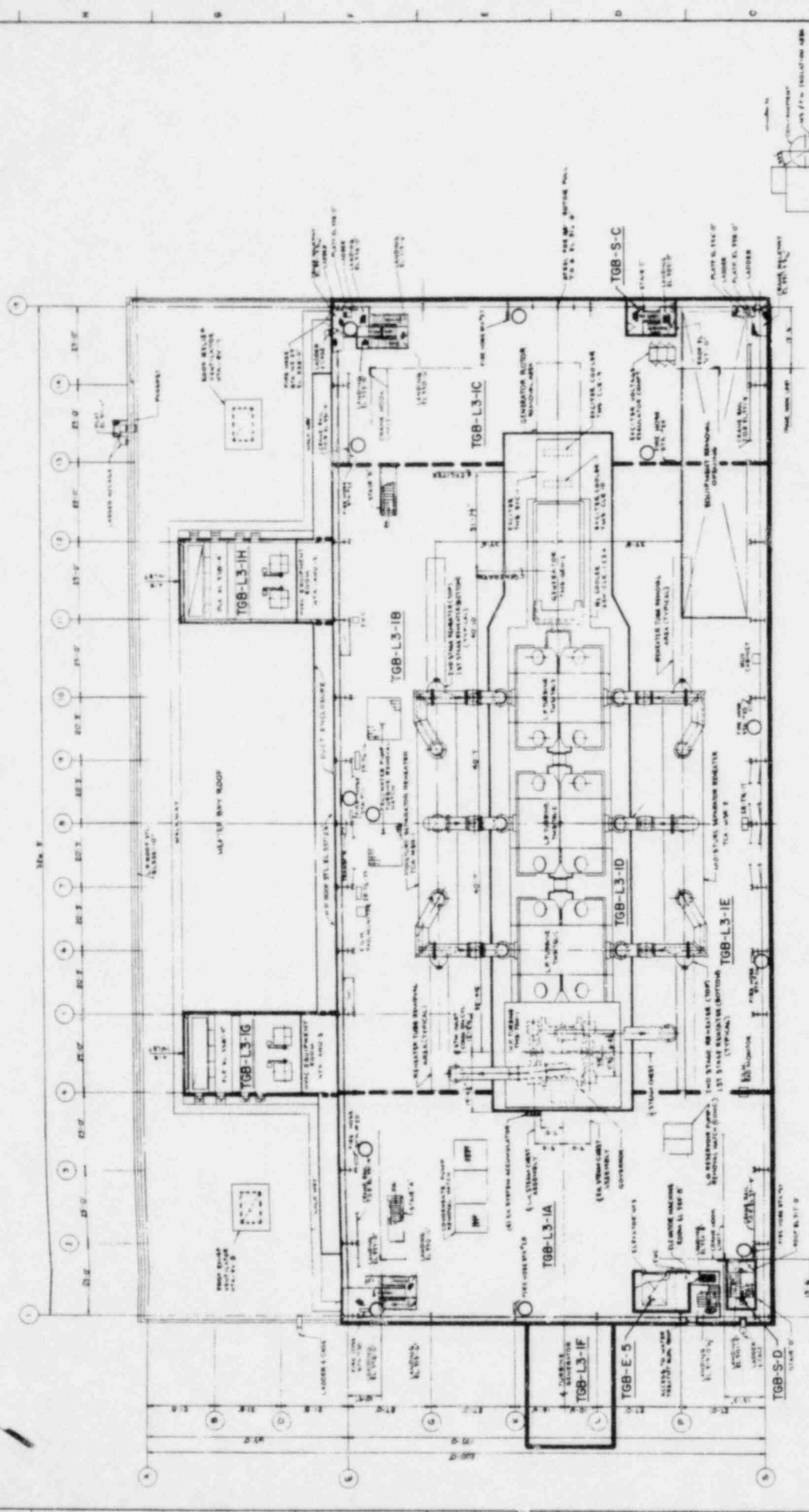
LEGEND
 ○ HOSE STATION
 △ HOSE CONNECTION

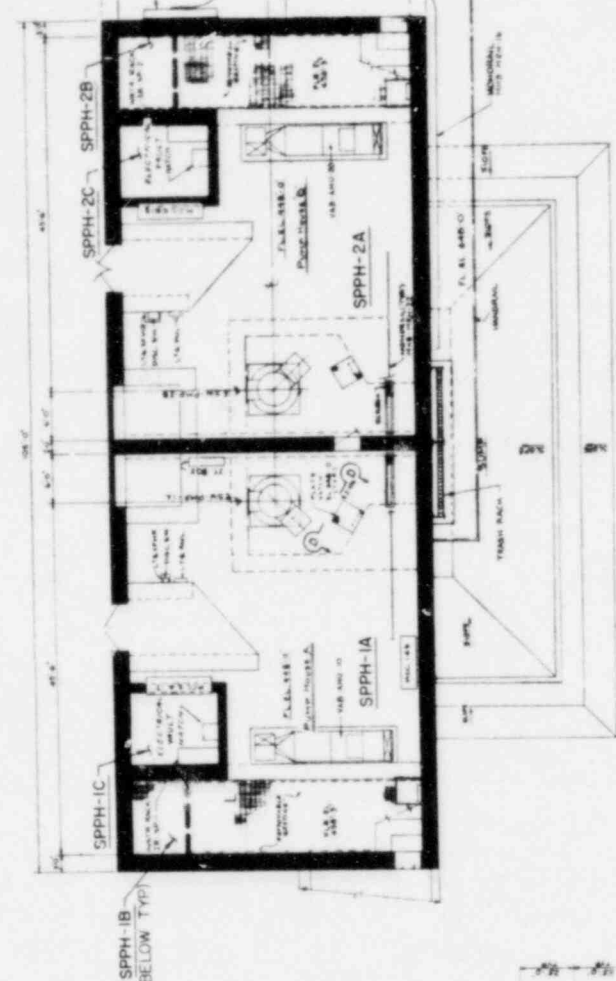
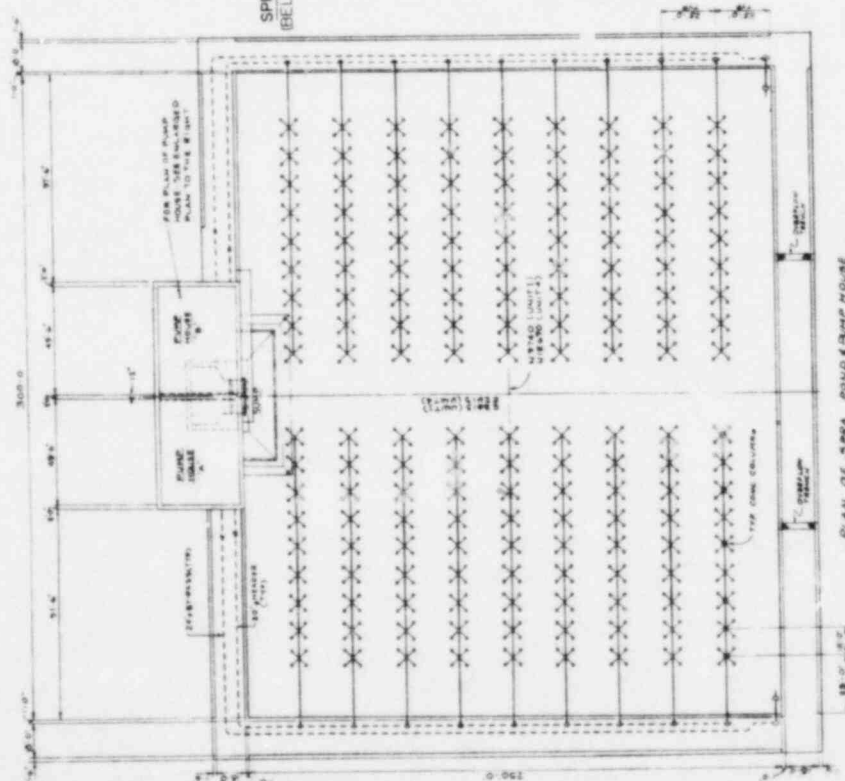
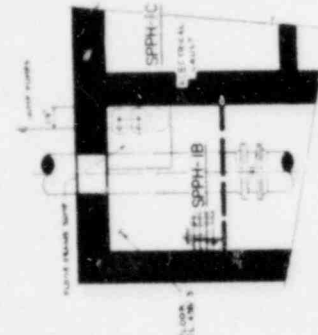
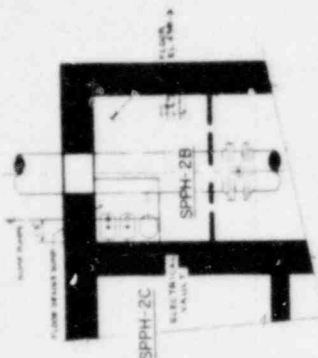
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
 NUCLEAR PROJECT NO. 1
 FIRE PROTECTION
 TURBINE GENERATOR BLDG.
 PLAN AT ELEV. 475'-0" AND 481'-0"
 UNITED ENGINEERS

NO.	DATE	DESCRIPTION	BY	CHKD.
1				
2				
3				
4				

REFER TO DWG. 9779-C-604475-46
 3/31/82

XR-FIG-A13





LEGEND
 ○ HOSE STATION
 △ HOSE CONNECTION

REFER TO DWS 9779-C 804875-27

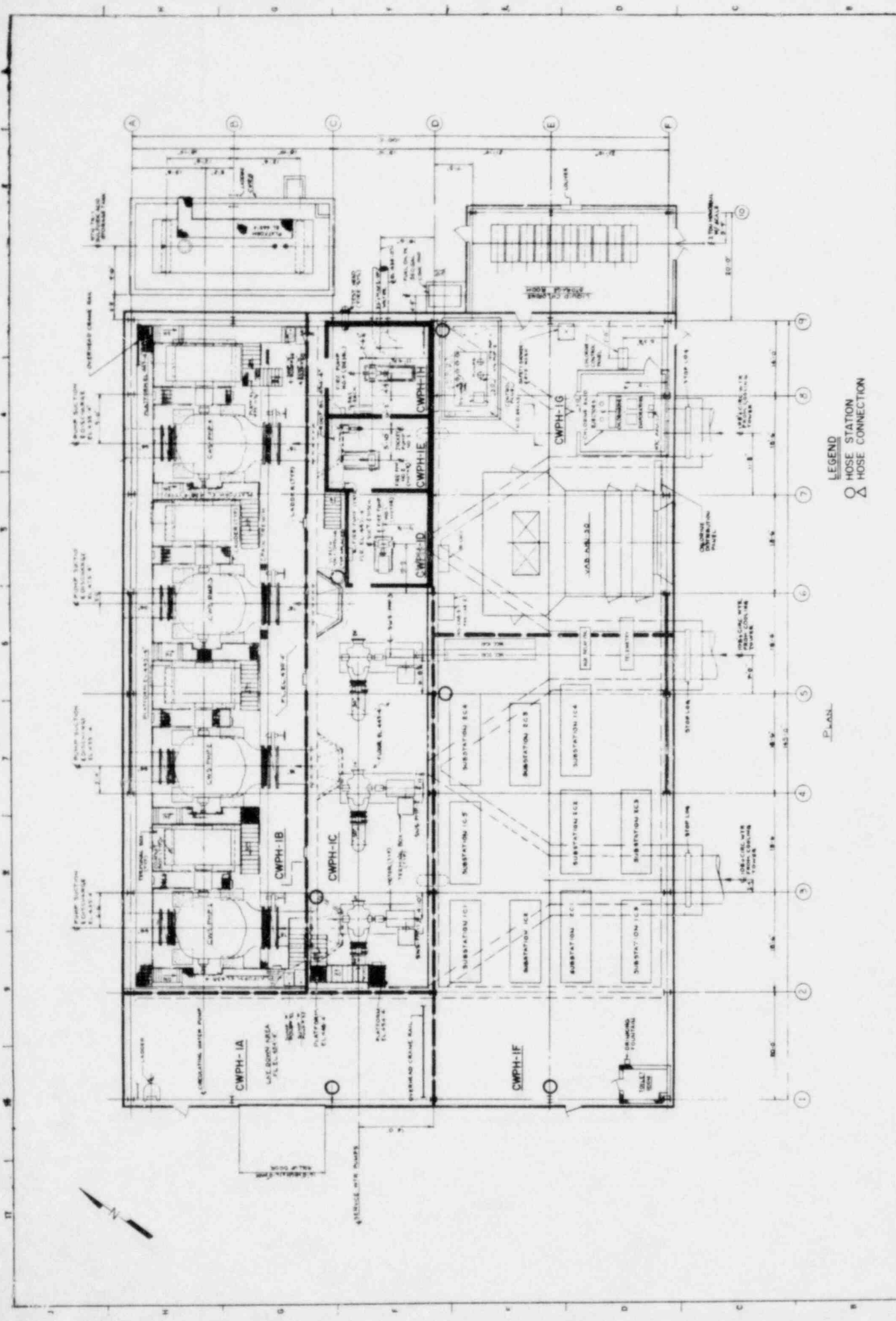
3/31/82

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
 NUCLEAR PROJECT NO. 1
 FIRE PROTECTION
 SPRAY POND AND PUMP HOUSE
 PLAN AT ELEV. 448'-0"

United Engineers, Inc.

XR-FIG-A15

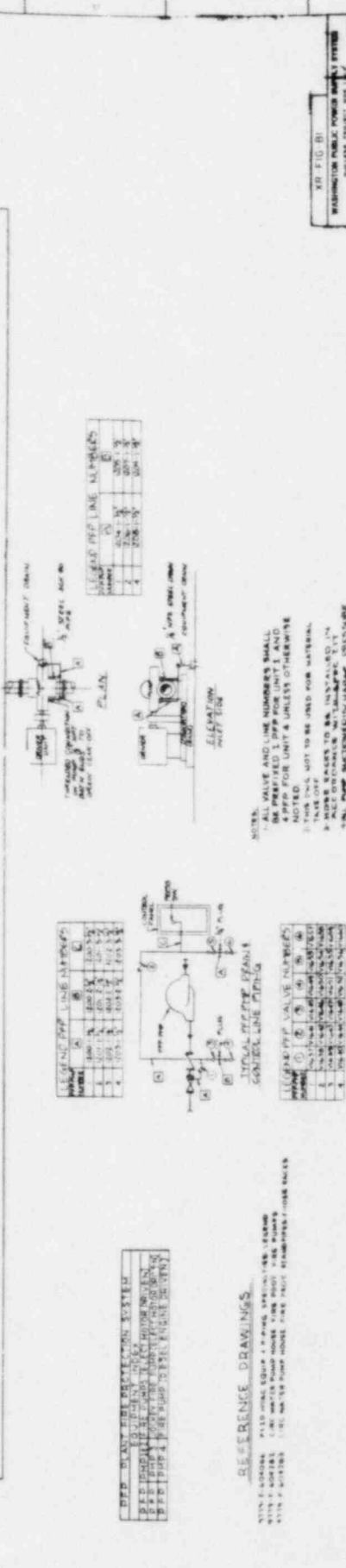
NO.	DATE	DESCRIPTION	BY	CHKD.
1		FINAL ISSUE		
2		ENGINEER		



WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 1
**FIRE PROTECTION
CIRCULATING WATER PUMP HOUSE
PLAN**
UNIVERSITY ENGINEERS
XR-FIG-A16

NO.	DATE	DESCRIPTION	ENGINEER
1	10/1/78	ISSUED FOR CONSTRUCTION	J. L. HARRIS

LEGEND
 ○ HOSE STATION
 △ HOSE CONNECTION
 PLAN
 REFER TO DWG 9779-C-604475-24
 3/31/82



VALVE	(1)	(2)	(3)	(4)	(5)	(6)
1	100.0	100.0	100.0	100.0	100.0	100.0
2	100.0	100.0	100.0	100.0	100.0	100.0
3	100.0	100.0	100.0	100.0	100.0	100.0

NOTE: 1. ALL VALVE AND LINE NUMBERS SHALL BE PREFIXED 1.0PP FOR UNIT 1, AND 4.0PP FOR UNIT 4 UNLESS OTHERWISE NOTED.

REFERENCE DRAWINGS

XR FIG. B1

WASHINGTON PUBLIC POWER DISTRICT SYSTEM

MAINTENANCE REPORT

PROCESS & WATER MANAGEMENT

ON-LINE WATER PUMP STATION

FOR PUMP-OUT STATION

FOR PUMP & STATION

XR FIG. B1

REFERENCE DRAWINGS

8779-7-001344 THE PROTECTION SYSTEM, L. 400-01
 8779-7-001345 THE PROTECTION SYSTEM, L. 400-02
 8779-7-001346 THE PROTECTION SYSTEM, L. 400-03
 8779-7-001347 THE PROTECTION SYSTEM, L. 400-04
 8779-7-001348 THE PROTECTION SYSTEM, L. 400-05
 8779-7-001349 THE PROTECTION SYSTEM, L. 400-06
 8779-7-001350 THE PROTECTION SYSTEM, L. 400-07
 8779-7-001351 THE PROTECTION SYSTEM, L. 400-08
 8779-7-001352 THE PROTECTION SYSTEM, L. 400-09
 8779-7-001353 THE PROTECTION SYSTEM, L. 400-10
 8779-7-001354 THE PROTECTION SYSTEM, L. 400-11
 8779-7-001355 THE PROTECTION SYSTEM, L. 400-12
 8779-7-001356 THE PROTECTION SYSTEM, L. 400-13
 8779-7-001357 THE PROTECTION SYSTEM, L. 400-14
 8779-7-001358 THE PROTECTION SYSTEM, L. 400-15
 8779-7-001359 THE PROTECTION SYSTEM, L. 400-16
 8779-7-001360 THE PROTECTION SYSTEM, L. 400-17
 8779-7-001361 THE PROTECTION SYSTEM, L. 400-18
 8779-7-001362 THE PROTECTION SYSTEM, L. 400-19
 8779-7-001363 THE PROTECTION SYSTEM, L. 400-20
 8779-7-001364 THE PROTECTION SYSTEM, L. 400-21
 8779-7-001365 THE PROTECTION SYSTEM, L. 400-22
 8779-7-001366 THE PROTECTION SYSTEM, L. 400-23
 8779-7-001367 THE PROTECTION SYSTEM, L. 400-24
 8779-7-001368 THE PROTECTION SYSTEM, L. 400-25
 8779-7-001369 THE PROTECTION SYSTEM, L. 400-26
 8779-7-001370 THE PROTECTION SYSTEM, L. 400-27
 8779-7-001371 THE PROTECTION SYSTEM, L. 400-28
 8779-7-001372 THE PROTECTION SYSTEM, L. 400-29
 8779-7-001373 THE PROTECTION SYSTEM, L. 400-30
 8779-7-001374 THE PROTECTION SYSTEM, L. 400-31
 8779-7-001375 THE PROTECTION SYSTEM, L. 400-32
 8779-7-001376 THE PROTECTION SYSTEM, L. 400-33
 8779-7-001377 THE PROTECTION SYSTEM, L. 400-34
 8779-7-001378 THE PROTECTION SYSTEM, L. 400-35
 8779-7-001379 THE PROTECTION SYSTEM, L. 400-36
 8779-7-001380 THE PROTECTION SYSTEM, L. 400-37
 8779-7-001381 THE PROTECTION SYSTEM, L. 400-38
 8779-7-001382 THE PROTECTION SYSTEM, L. 400-39
 8779-7-001383 THE PROTECTION SYSTEM, L. 400-40
 8779-7-001384 THE PROTECTION SYSTEM, L. 400-41
 8779-7-001385 THE PROTECTION SYSTEM, L. 400-42
 8779-7-001386 THE PROTECTION SYSTEM, L. 400-43
 8779-7-001387 THE PROTECTION SYSTEM, L. 400-44
 8779-7-001388 THE PROTECTION SYSTEM, L. 400-45
 8779-7-001389 THE PROTECTION SYSTEM, L. 400-46
 8779-7-001390 THE PROTECTION SYSTEM, L. 400-47
 8779-7-001391 THE PROTECTION SYSTEM, L. 400-48
 8779-7-001392 THE PROTECTION SYSTEM, L. 400-49
 8779-7-001393 THE PROTECTION SYSTEM, L. 400-50
 8779-7-001394 THE PROTECTION SYSTEM, L. 400-51
 8779-7-001395 THE PROTECTION SYSTEM, L. 400-52
 8779-7-001396 THE PROTECTION SYSTEM, L. 400-53
 8779-7-001397 THE PROTECTION SYSTEM, L. 400-54
 8779-7-001398 THE PROTECTION SYSTEM, L. 400-55
 8779-7-001399 THE PROTECTION SYSTEM, L. 400-56
 8779-7-001400 THE PROTECTION SYSTEM, L. 400-57
 8779-7-001401 THE PROTECTION SYSTEM, L. 400-58
 8779-7-001402 THE PROTECTION SYSTEM, L. 400-59
 8779-7-001403 THE PROTECTION SYSTEM, L. 400-60
 8779-7-001404 THE PROTECTION SYSTEM, L. 400-61
 8779-7-001405 THE PROTECTION SYSTEM, L. 400-62
 8779-7-001406 THE PROTECTION SYSTEM, L. 400-63
 8779-7-001407 THE PROTECTION SYSTEM, L. 400-64
 8779-7-001408 THE PROTECTION SYSTEM, L. 400-65
 8779-7-001409 THE PROTECTION SYSTEM, L. 400-66
 8779-7-001410 THE PROTECTION SYSTEM, L. 400-67
 8779-7-001411 THE PROTECTION SYSTEM, L. 400-68
 8779-7-001412 THE PROTECTION SYSTEM, L. 400-69
 8779-7-001413 THE PROTECTION SYSTEM, L. 400-70
 8779-7-001414 THE PROTECTION SYSTEM, L. 400-71
 8779-7-001415 THE PROTECTION SYSTEM, L. 400-72
 8779-7-001416 THE PROTECTION SYSTEM, L. 400-73
 8779-7-001417 THE PROTECTION SYSTEM, L. 400-74
 8779-7-001418 THE PROTECTION SYSTEM, L. 400-75
 8779-7-001419 THE PROTECTION SYSTEM, L. 400-76
 8779-7-001420 THE PROTECTION SYSTEM, L. 400-77
 8779-7-001421 THE PROTECTION SYSTEM, L. 400-78
 8779-7-001422 THE PROTECTION SYSTEM, L. 400-79
 8779-7-001423 THE PROTECTION SYSTEM, L. 400-80
 8779-7-001424 THE PROTECTION SYSTEM, L. 400-81
 8779-7-001425 THE PROTECTION SYSTEM, L. 400-82
 8779-7-001426 THE PROTECTION SYSTEM, L. 400-83
 8779-7-001427 THE PROTECTION SYSTEM, L. 400-84
 8779-7-001428 THE PROTECTION SYSTEM, L. 400-85
 8779-7-001429 THE PROTECTION SYSTEM, L. 400-86
 8779-7-001430 THE PROTECTION SYSTEM, L. 400-87
 8779-7-001431 THE PROTECTION SYSTEM, L. 400-88
 8779-7-001432 THE PROTECTION SYSTEM, L. 400-89
 8779-7-001433 THE PROTECTION SYSTEM, L. 400-90
 8779-7-001434 THE PROTECTION SYSTEM, L. 400-91
 8779-7-001435 THE PROTECTION SYSTEM, L. 400-92
 8779-7-001436 THE PROTECTION SYSTEM, L. 400-93
 8779-7-001437 THE PROTECTION SYSTEM, L. 400-94
 8779-7-001438 THE PROTECTION SYSTEM, L. 400-95
 8779-7-001439 THE PROTECTION SYSTEM, L. 400-96
 8779-7-001440 THE PROTECTION SYSTEM, L. 400-97
 8779-7-001441 THE PROTECTION SYSTEM, L. 400-98
 8779-7-001442 THE PROTECTION SYSTEM, L. 400-99
 8779-7-001443 THE PROTECTION SYSTEM, L. 400-100

OPERATING FLOOR EL. 400'-0"

OPERATING FLOOR EL. 400'-0"

OPERATING FLOOR EL. 400'-0"

OPERATING FLOOR EL. 400'-0"

OPERATING FLOOR EL. 400'-0"

NOTES:
 1. ALL WIRE AND LINE NUMBERS SHALL
 BE PRESENTED IN THE UNIT 1 AND
 UNIT 2 UNLESS OTHERWISE
 NOTED.
 2. THIS DRAWING IS TO BE USED FOR
 MATERIAL TAKE OFF.

8779-7-001344

8779-7-001344

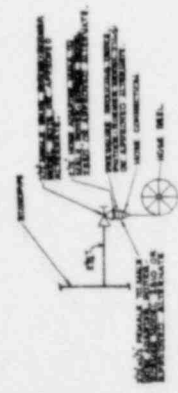
4-8-50

8779-7-001344

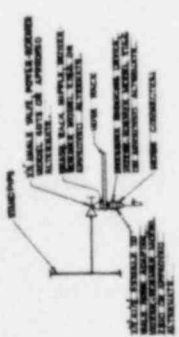
8779-7-001344

8779-7-001344

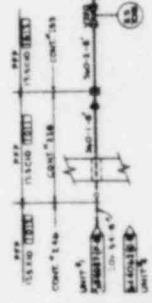
NOTES:
1. ALL VALVES SHALL BE 150 LB. STEEL, 1/2" NPT, 150 LB. PRESSURE RATING.
2. ALL VALVES SHALL BE 150 LB. STEEL, 1/2" NPT, 150 LB. PRESSURE RATING.
3. ALL VALVES SHALL BE 150 LB. STEEL, 1/2" NPT, 150 LB. PRESSURE RATING.



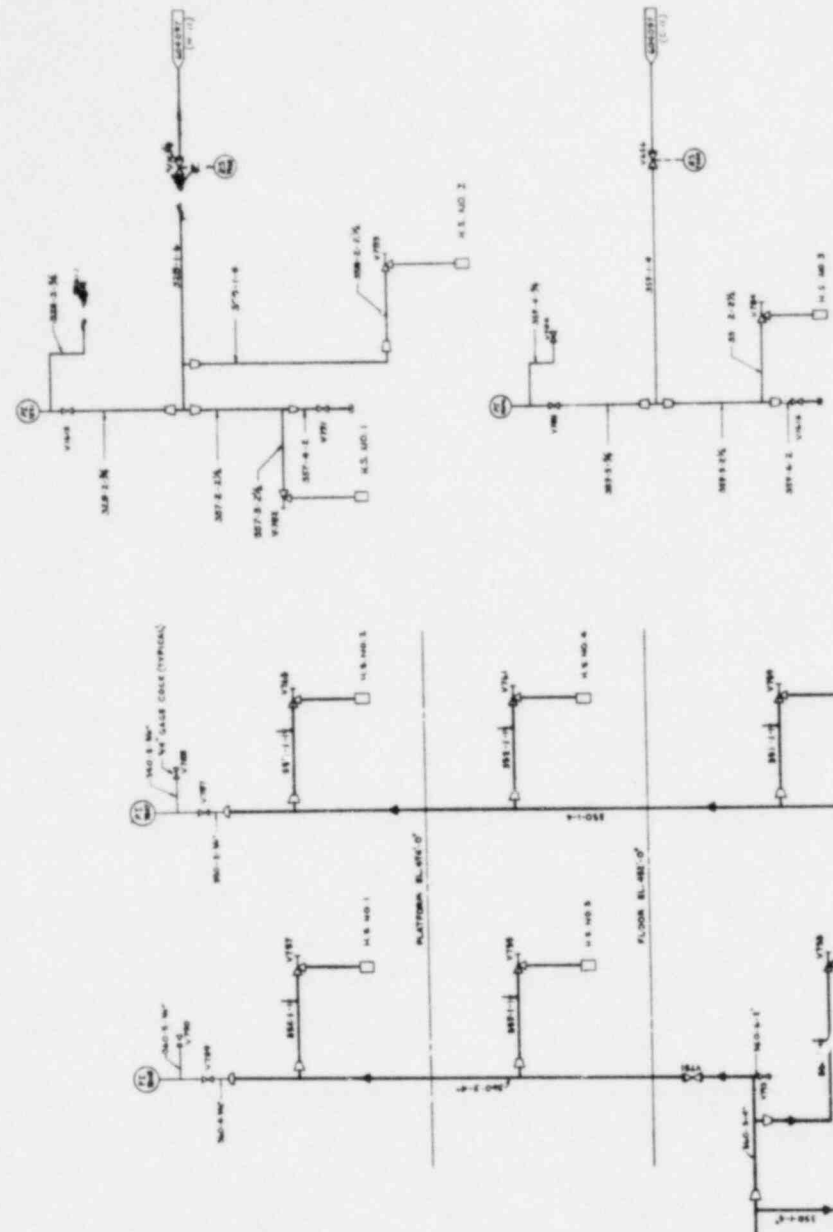
DETAIL 1: SECTION OF MAIN STEAM LINE
INSTALLED BY CONTRACT 217



DETAIL 2: SECTION OF MAIN STEAM LINE
INSTALLED BY CONTRACT 217



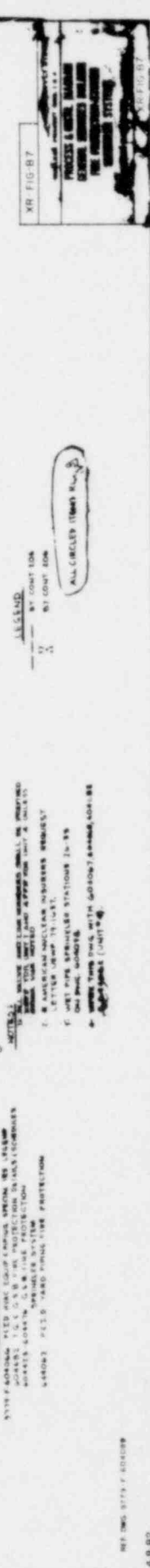
DETAIL 3: SECTION OF MAIN STEAM LINE
INSTALLED BY CONTRACT 217



MAIN STEAM ISOLATION AREA
INSTALLED BY CONTRACT 217

WATER TREATMENT BLDG.
PLANTING MATERIALS FOR CONTRACT 217

NOTES:
1. ALL VALVES SHALL BE 150 LB. STEEL, 1/2" NPT, 150 LB. PRESSURE RATING.
2. ALL VALVES SHALL BE 150 LB. STEEL, 1/2" NPT, 150 LB. PRESSURE RATING.
3. ALL VALVES SHALL BE 150 LB. STEEL, 1/2" NPT, 150 LB. PRESSURE RATING.



[illegible]

NOTES:

1. ALL VALVE AND LINE NUMBERS SHALL BE PROVIDED 1" PIP FOR UNIT 1 & 4 AND 3/4" PIP FOR UNIT 2 UNLESS OTHERWISE NOTED.
2. THIS UMG. MAY TO BE USED FOR MATERIAL TAKE-OFF.

1. K9-FIG 68
 TRANSMISSION PULVER POWER SUPPLY 10000
 PROCESS & INSTR. MACHINE
 CONTAINER
 FOR PROTECTIVE SYSTEM
 SUPPLIES & WARE HOUSE
 K9-FIG 68

REFERENCE DRAWINGS
 ATTN: WOODMAN FIELD HALL GROUP 1-1-1 SPECIALIST'S LEAD
 ATTN: W. H. 101 WARD HOPING FIRE PROTECTION PLAN

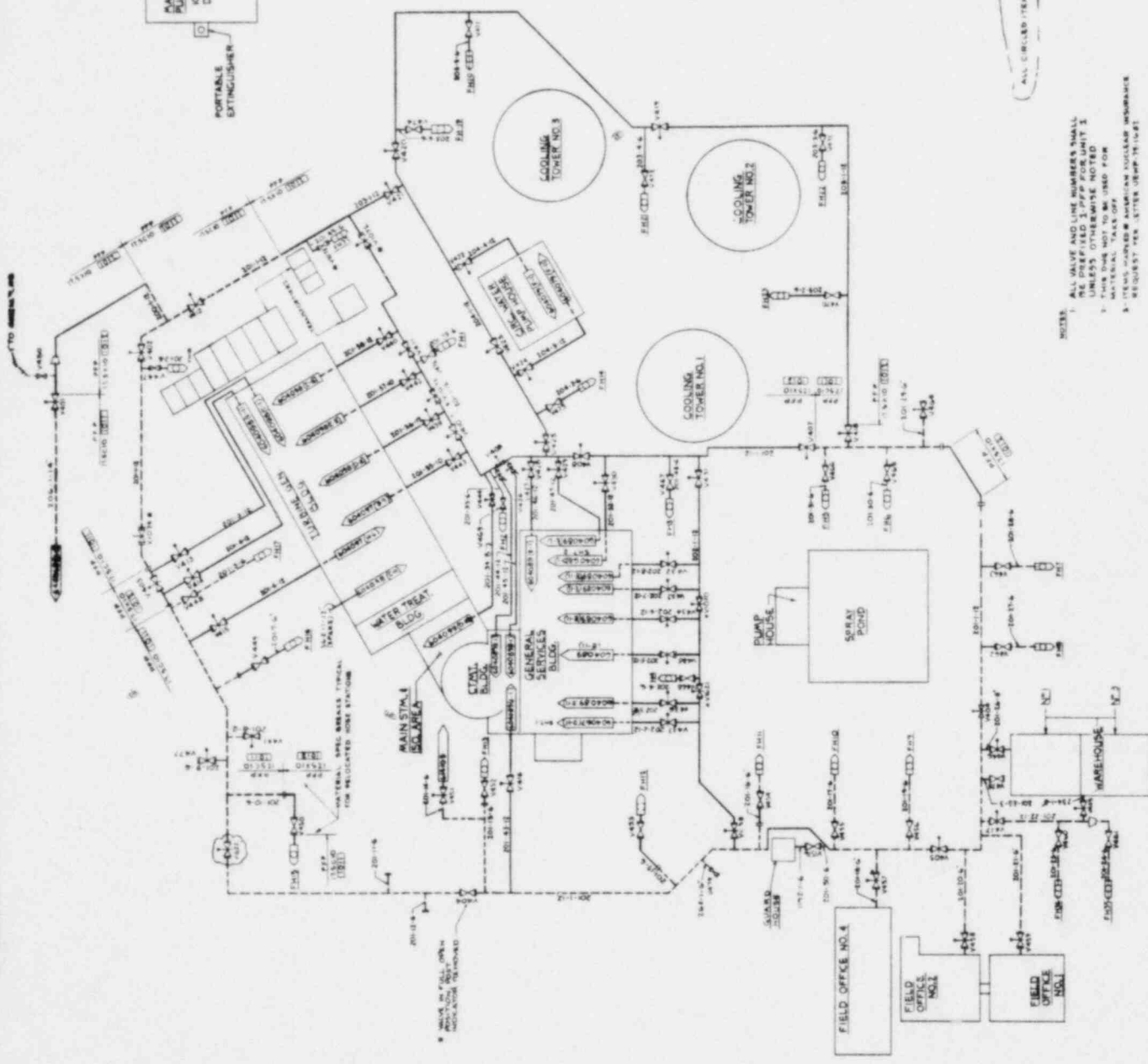
LEGEND
 1. 1/2" DIA. 100' MAX (100')
 2. 1/2" DIA. 100' MAX (100')

XR-110-B9
 WASHINGTON PUBLIC POWER SUPPLY SYSTEM
 PROCESS & NOTE: WARDMAN
 WARD HOPING FIRE PROTECTION SYSTEM
 XR-110-B9

MAKE UP WATER
 PUMP HOUSE
 IONIZATION
 DETECTOR
 PORTABLE
 EXTINGUISHER

ALL CHILLED ITEMS ARE

NOTES
 1. ALL VALVE AND LINE NUMBERS SHALL
 BE IDENTICAL TO THE CORRESPONDING
 UNLESS OTHERWISE NOTED
 2. THIS DRAWING IS NOT TO BE USED FOR
 MATERIAL TAKE OFF
 3. ITEMS SHOWN IN AMERICAN SYMBOLS
 REQUEST FOR LETTER GROUP PRINT



E. Summary of Compliance

Comparison Matrix E.1 is provided to identify the level of compliance with BTP APCSB 9.5-1 Appendix A.

Comparison Matrix E.2 is included to summarize compliance with the requirements of 10CFR50 Appendix R. Note the format of this submittal has been arranged to coordinate with the SRP-9.5-1 (Rev. 3) format, therefore, a reference column has been supplied as a cross reference to the text for each matrix contained in this section.

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1, APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
A.	Overall Requirements of Nuclear Plant Fire Protection Program				
1.	Personnel	XX			C.1.a
2.	Design Bases	XX			C.1.b,c
3.	Backup	XX			C.1.b
4.	Single Failure Criterion	XX			C.1.b
5.	Fire Suppression Systems	XX			C.1.c
6.	Fuel Storage Areas	XX			C.7.1,m
7.	Fuel Loading	XX			C.1.e
8.	Multiple-Reactor Sites	XX			C.1.e
9.	Simultaneous Fires	XX			C.1.b

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1, APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
B.	<u>Administrative Procedures, Controls, & Fire Brigade</u>				
1.	Administrative Procedures	XX			C.2
2.	Housekeeping	XX			C.2.c
3.	Special Actions	XX			C.2.b
4.	Public Fire Departments	XX			C.3.e
5.	Organization, Training and Equipping Fire Brigades				
a.	Procedure for testing, maintenance, etc.	XX			C.2.a,b
b.	Training program	XX			C.3.c
c.	Coordinate with Fire Dept.	XX			C.3.e
d.	Reference documents	XX			C.3

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1, APPENDIX A

COMPARISON MATRIX

<u>APPENDIX A BRANCH TECHNICAL APSCB 9.5-1</u>		<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
<u>POSITIONS</u>					
C.	<u>Quality Assurance Program</u>				
1.	Design Control and Procurement Document Control	XX			C.4.a
2.	Instructions, Procedures and Drawings	XX			C.4.b
3.	Control of Purchased Material Equipment and Services	XX			C.4.c
4.	Inspection	XX			C.4.d
5.	Test & Test Control	XX			C.4.e
6.	Inspection, Test & Operating Status	XX			C.4.f
7.	Non-Conforming Items	XX			C.4.g
8.	Corrective Action	XX			C.4.h
9.	Records	XX			C.4.i
10.	Audits	XX			C.4.j

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1, APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
D.	<u>General Guidelines for Plant Protection</u>				
1.	Building Design				
a.	(1) Isolate safety related systems from unacceptable fire hazards	XX			C.5.a
	(2) Safety related systems subject to damage from a single fire	XX			C.5.a
b.	Fire hazard analysis	XX			C.1.b
c.	Shared cable spreading room	N/A			-
d.	Metal deck roof construction	XX			C.5.a
e.	Suspended ceilings	XX			C.5.a
f.	Transformers (inside bldgs)	XX			C.5.a
g.	Oil filled outdoor Transformers	XX			C.5.a
h.	Floor drain	XX			C.5.a
i.	Fire area construction	XX			C.5.a

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1, APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
D.2	<u>Control of Combustibles</u>				
a.	Suppression systems for non-separable combustibles	XX			C.2.c
1.	Diesel generator fuel oil day tank	XX			C.7.i
2.	Turbine-generator oil and hydraulic control systems	XX			C.2.c
3.	Reactor coolant pump lube oil sys.	(See Appendix R Matrix)			D.1
b.	Bulk gas storage	XX			C.5.d
c.	Plastics	XX			C.5.d
d.	Storage of flammable liquids	XX			C.5.d

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1 APPENDIX A

COMPARISON MATRIX

<u>APPENDIX A BRANCH TECHNICAL APSCB 9.5-1</u>		<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
<u>POSITIONS</u>					
D.3	Electric Cable Construction <u>Cable Trays & Cable Penetrations</u>				
a.	Cable tray materials	XX		C.5.e	
b.	Refer to Section E.3 cable spreading room	XX		C.5.e	
c.	Fire suppression for cable trays outside cable spreading room		XX	C.5.e	
d.	Cable & cable tray penetrations of fire barriers	XX		C.5.e	
e.	Fire breaks	XX		C.5.e	
f.	Electric cable construction	XX		C.5.e	
g.	Cable construction	XX		C.5.e	
h.	Use of cable area	XX		C.5.e	
i.	Smoke venting	XX		C.5.e	
j.	Cables in control room	XX		C.5.e	

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1 APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
D.4	<u>Ventilation</u>				
a.	Venting products of combustion		XX		C.5.f
b.	Single failure of inadvertent operations	XX			C.5.f
c.	Electric power & controls outside fire area		XX		C.5.f
d.	Fire suppression of charcoal filters	XX			C.5.f
e.	Fresh air intakes			XX	C.5.f
f.	Stairwells	XX			C.5.f
g.	Smoke & heat vents		XX		C.5.f
h.	Breathing apparatus	XX			C.5.f
i.	Dampers for gas	XX			C.5.f
D.5	<u>Lighting & Communication</u>				
a.	Fixed emergency lighting	XX			C.5.g
b.	Portable lights	XX			C.5.g
c.	Emergency communication	XX			C.5.g
d.	Portable radio communications	XX			C.5.g

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1 APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
E.	<u>Fire Detection & Suppression</u>				
1.	Fire Detection				
	(a) Proprietary Protection Signaling System NFPA 72D	XX			C.6.a
	(b) Alarm Systems	XX			C.6.a
	(c) Distinctive & Unique	XX			C.6.a
	(d) Emergency Power Supply	XX			C.6.a
2.	Fire Protection Water Supply System				
	(a) Yard Fire Main Loop	XX			C.6.b
	(b) Single Loop with Sectionalizing Valves for Multi-unit Plant	XX			C.6.b
	(c) Fire Pumps	XX			C.6.b
	(d) Water Tanks	XX			C.6.b
	(e) Tank and Pump Capacities	XX			C.6.b
	(f) Lakes or Fresh Water Ponds	(Not Applicable)			-
	(g) Fire Hydrants & Hose Houses	XX			C.6.b

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1 APPENDIX A

COMPARISON MATRIX

<u>APPENDIX A BRANCH TECHNICAL APSCB 9.5-1</u>		<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
<u>POSITIONS</u>					
E.3	<u>Water Sprinklers and Hose Standpipe Systems</u>				
a.	Independent connections to supply; valve & alarms; water shields	XX			C.6.c
b.	Supervised valves	XX			C.6.b
c.	Sprinkler systems	XX			C.6.c
d.	Hose stations	XX			C.6.c
e.	Hose nozzles	XX			C.6.c
f.	Foam for oil fire suppression	(Not Applicable)			-
E.4	<u>Halon Suppression Systems</u>	XX			C.6.d
E.5	<u>Carbon Dioxide Suppression Systems</u>	(Not Applicable)			C.6.e
E.6	<u>Portable Extinguishers</u>	XX			C.6.f

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1 APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL APSCB 9.5-1		COMPLY WITH	BASICALLY COMPLY WITH	DO NOT COMPLY WITH	FPSR SECTION
<u>POSITIONS</u>					
F.	<u>Guidelines for Specific Plant Areas</u>				
1.	Primary & Secondary Containment				
	a. Normal Operation	XX			C.7.a
	b. Refueling & Maintenance	XX			C.7.a
2.	Control Room	XX			C.7.b
3.	Cable Spreading Room	a. (Not Applicable) b. XX			C.7.c
4.	Plant Computer Room	XX			C.7.d
5.	Switchgear Rooms	XX			C.7.e
6.	Remote Safety Related Panels	XX			C.7.f
7.	Station Battery Rooms	XX			C.7.g
8.	Turbine Lubrication & Control Storage and Use Areas	XX			C.7.h
9.	Diesel Generator Areas	XX			C.7.i
10.	Diesel Fuel Oil Storage Area	XX			C.7.j
11.	Safety Related Pumps	XX			C.7.k

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1 APPENDIX A

COMPARISON MATRIX

<u>APPENDIX A BRANCH TECHNICAL APSCB 9.5-1</u>		<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
<u>POSITIONS</u>					
<u>F. Continued</u>					
12.	New Fuel Area	XX			C.7.l
13.	Spent Fuel Pool Area	XX			C.7.m
14.	Radwaste Building	XX			C.7.n
15.	Decontamination Areas	XX			C.7.n
16.	Safety Related Water Tanks	XX			C.7.o
17.	Cooling Towers	XX			C.7.q
18.	Miscellaneous Areas	XX			C.7.r
19.	Records Storage Area	XX			C.7.p

E.1 SUMMARY OF COMPLIANCE - BTP 9.5-1, APPENDIX A

COMPARISON MATRIX

APPENDIX A BRANCH TECHNICAL <u>APSCB 9.5-1</u>		<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
<u>POSITIONS</u>					
G.	<u>Special Protection Guidelines</u>				
1.	Welding & Cutting, Acetylene- Oxygen Fuel Gas Systems	XX			C.8.a
2.	Storage Areas for Dry Ion Exchange Resins	XX			C.8.b
3.	Hazardous Chemicals	XX			C.8.c
4.	Materials Containing Radio- activity	XX			C.8.d

E.2 SUMMARY OF COMPLIANCE - 10CFR50 APPENDIX R

COMPARISON MATRIX

<u>10 CFR 50 APPENDIX R</u>	<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
II. <u>General Requirements</u>				
A. Fire Protection Program	XX			C.1
B. Fire Hazards Analysis	XX			C.1.b
C. Fire Prevention Features				
1. In-situ fire hazards	XX			D
2. Transient fire hazards	XX			D
3. Detection & Manual Suppression Equipment	XX			C.6
4. Protection of Redundant Systems	XX			C.5.b
5. Fire Brigade	XX			C.3
6. Fire Protection Systems	XX			C.2 C.6
7. Surveillance	XX			C.2.b
D. Alternative or Dedicated Shutdown Capability	XX			C.5.c

E.2 SUMMARY OF COMPLIANCE - 10CFR50 APPENDIX R

COMPARISON MATRIX

<u>10 CFR 50 APPENDIX R</u>	<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
III. <u>Specific Requirements</u>				
A. Water Supplies for Fire Suppression Systems	XX		C.6.b	
B. Sectional Isolation Valves	XX		C.6.b	
C. Hydrant Isolation Valves	XX		C.6.b	
D. Manual Fire Suppression	XX		C.6.c	
E. Hydrostatic Hose Test	XX			
F. Automatic Fire Detection	XX		C.6.a	
G. Fire Protection of Safe Shutdown Capability		XX	C.1.b C.5.b	
H. Fire Brigade	XX		C.3	
I. Fire Brigade Training				
1. Instruction	XX		C.3.c	
2. Practice	XX		C.3.c	
3. Drills	XX		C.3.d	
4. Records	XX		C.3	

E.2 SUMMARY OF COMPLIANCE - 10CFR50 APPENDIX R

COMPARISON MATRIX

<u>10 CFR 50 APPENDIX R</u>	<u>COMPLY WITH</u>	<u>BASICALLY COMPLY WITH</u>	<u>DO NOT COMPLY WITH</u>	<u>FPSR SECTION</u>
III.				
J. Emergency Lighting	XX		C.5.g	
K. Administrative Controls	XX		C.2.	
L. Alternative & Dedicated Shutdown Capability	XX		C.5.c	
M. Fire Barrier Cable Penetration Seal Qualif.	XX		C.5.a	
N. Fire Doors	XX		C.5.a	
O. Oil Collection System for Reactor Coolant Pump	XX		C.7.a	