Denton

UNION ELECTRIC COMPANY
1901 GRATIOT STREET
ST. LOUIS, MISSOURI

JOHN K. BRYAN
VICE PRESIDENT

MAILING ADDRESS:
P. O. BOX 149
ST. LOUIS, MISSOURI 63166

August 19, 1981

RECEIVED AUG 20 1981 U.S. NUCLEAR REGULATORY COMMISSION

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

Dear Mr. Denton:

ULNRC- 483

DOCKET NUMBERS 50-483 AND 50-486
CALLAWAY PLANT, UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

On May 14, 1981, a meeting was held between the NRC Power Systems Branch and the SNUPPS utilities concerning auxiliary systems. This letter serves to close out items 430.2, 430.3.3, 430.3.4, and 430-15 and also provides a description of the hydrogen storage system (item 430.43). This information was previously given to the NRC project manager for Callaway, but was not transmitted formally.

This information will be incorporated into the Callaway Plant FSAR in the next revision. This information is hereby incorporated into the Callaway Application.

Very truly yours,

John K. Bryan

John K. Bryan

DS/mdj

B001
s
1/1

STATE OF MISSOURI)
)   S S
CITY OF ST. LOUIS)

John K. Bryan, of lawful age, being first duly sworn upon oath says that he is Vice President-Nuclear and an officer of Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By John K. Bryan

John K. Bryan
Vice President
Nuclear

SUBSCRIBED and sworn to before me this 19th day of August, 1981

Margaret S. Heida

MARGARET S. HEIDA
NOTARY PUBLIC -- STATE OF MISSOURI
ST. LOUIS COUNTY
MY COMMISSION EXPIRES JANUARY 2, 1982

cc: Glenn L. Koester
Vice President
Operations
Kansas Gas & Electric
P.O. Box 208
Wichita Kansas 67201

John E. Arthur
Chief Engineer
Rochester Gas & Electric Company
89 East Avenue
Rochester, New York 14649

A. V. Dienhart
Vice President
Plant Engineering and Construction
Northern States Power
414 Nicollet Mall
Minneapolis, Minnesota 55401

Donald T. McPhee
Vice President
Kansas City Power and Light Company
1330 Baltimore Avenue
Kansas City, Missouri 64141

Gerald Charnoff, Esq.
Shaw, Pittman, Potts & Trowbridge
1800 M. Street, N.W.
Washington, D.C. 20036

Nicholas A. Petrick
Executive Director
SNUPPS
5 Choke Cherry Road
Rockville, Maryland 20850

W. Hansen
Callaway Resident Office
U.S. Nuclear Regulatory Commission
RR#1
Steedman, Missouri 65077

been removed, and all valves are in the proper position to permit a manual start of the equipment. After the unit has been satisfactorily started and load tested, return the unit to ready automatic standby service and under the control of the control room operator.

Provide a discussion of how the above requirements have been implemented in the emergency diesel generator system design and how they will be considered when the plant is in commercial operation, i.e., by what means will the above requirements be enforced.

Response: For responses to Item 430.3.1 and 430.3.2, refer to Standard Plant Responses.

3. The Callaway approach to Emergency Diesel Maintenance will adequately cover these concerns.

   Administratively, maintenance results of all safety-related components will be approved by the Superintendent, Maintenance, or his designee. In addition, it is intended that completion documents of significant maintenance activities (and certainly Emergency Diesel Maintenance is significant) be reviewed by cognizant engineers. The two individuals are responsible to take any action necessary to ensure optimum operability. Files will be built containing history of repairs.

   This will ensure that if a component malfunctions repeatedly, the proper corrective action will be taken.

4. Maintenance Procedures will provide for a final equipment check upon completion of repairs or maintenance.

Item 430.15 (9.5.4) You state in section 9.5.4.3 that diesel oil is normally delivered to the site by tanker truck and if road transportation is unavailable, it can be delivered onsite by railroad tanker. Discuss per sources where diesel quality fuel oil will be available and the distances required to be travelled from the source to the plant. Also discuss how fuel oil will be delivered onsite under extremely unfavorable environmental conditions including maximum probable flood conditions.

Response: The source of fuel oil has not been contracted at this time. However, there are multiple access routes to the site. The Callaway plant is sited above the PMF level, and it is not anticipated that all access routes would be blocked for an extended period of time to preclude fuel delivery as needed. Some possible source of fuel oil for the Callaway Plant and the distances to these sources are as follows:

J. D. Frame Oil Co.
Fulton, Missouri
14 miles

Tri-County Oil Co.
Jefferson City, Missouri
34 miles

MFA Oil Co.
Columbia, Missouri
40 miles

The storage vessels are refilled from an over-the-road trailer as required. The anticipated refill cycle is four weeks.

The storage tanks are of the horizontal cylindrical type and are located approximately 350 feet from the power block.

A fire hydrant and hose house are located within 200 feet of the gas storage area.

2.2.1.2.3.4 Hydrogen

Refer to Section 2.2.2 for a description of the hydrogen system.

2.2.1.2.3.5 Carbon Dioxide

Carbon dioxide is stored on site as a pressurized refrigerated liquid in an insulated storage vessel. It is vaporized electrically as required and piped to the power block through Schedule 80 steel pipes laid in the same vented masonry trench as the hydrogen pipes. These supply lines are fitted with pressure relief valves.

The storage vessel is refilled with liquid from an over-theroad trailer as required. The anticipated refill cycle is four weeks.

The storage tank is of the horizontal cylindrical type. The axes are not directed towards any buildings within the plant site.

hazardous commodity was shipped per day, and the maximum quantity likely to be transported on any one train was between 30 and 40 cars (Janovec, 1979). The only spur or siding within a 5-mile radius of the site is one leading directly north from the rail line to the plant site.

Although chlorine was reported to have been transported on the railroad in previous years, none was transported in 1978. Chlorine is a commodity that is not shipped on a regular basis and no projections of future shipments can be made (Doyle, 1979).

2.2.1.5 Water Transportation

The Missouri River, approximately 5 miles southeast of the site, is a transportation artery for barge traffic. Maximum cargo loads are a function of barge size and river depth. The largest cargo load reported by Sioux City and New Orleans Barge Lines was 1,600 short tons during a period of seasonally high water levels. Maximum cargo loads are usually 1,200 short tons, and the maximum number of barges in a single tow as many as 8 to 10 depending on barge size and water levels (Hynes, 1979). Nine hundred fifty-five thousand four hundred and eighty-three (955,483) tons of hazardous commodities, listed in Table 2.2-5, were shipped on the Missouri River between Kansas City and St. Louis in 1979. Forty-one thousand nine hundred and seventy-four (41,974) passengers used the river between Kansas City and the mouth of the river in 1977 (U.S. Army Corps of Engineers, 1977).

2.2.1.6 Pipelines

No pipelines or tank farms are located within 5 miles of the site. The nearest pipeline, Williams Brothers' 8-inch diameter products pipeline, approximately 8 miles north of the site, runs from St. Charles to Columbia, Missouri, and carries refined petroleum products. The pipeline route is shown on Figure 2.2-3 (Steuerwalz, 1979).

2.2.2 DESCRIPTIONS

The description of products (other than hydrogen) manufactured, stored, or transported offsite as well as the maximum quantities of hazardous materials likely to be processed, stored, or transported on site, are fully described in Section 2.2.1. Hazardous materials are listed in Tables 2.2-1, 2.2-4, and 2.2-5. The description of the hydrogen system follows.

2.2.2.1 Hydrogen System

The hydrogen system (HS) is designed to provide low pressure gaseous hydrogen continuously to the turbine and auxiliary buildings for volume control tank purge, generator fill and generator leakage make-up. This system description relates only to components of the site HS outside the Standard Power Blocks.

2.2.2.1.1 Design Basis

2.2.2.1.1.1 Safety Design Basis

The HS has no Safety Design Basis.

2.2.2.1.1.2 Power Generation Design Basis

The HS is designed to provide hydrogen continuously to the Standard Power Block as required for components related to power generation.

2.2.2.1.1.3 Codes and Standards

The following codes and standards are used as guidelines in the design of the Hydrogen System and equipment and, where required by law, the system and equipment conform to the applicable standards:

a. National Fire Protection Association (NFPA)
b. Occupational Safety and Health Standards (OSHA)
c. American Nuclear Insurers (ANI)

2.2.2.1.2 System Description

2.2.2.1.2.1 Location

The location of the HS bulk storage facility and the distribution piping outside the Standard Power Blocks are shown on Figure 2.2-4. A flow diagram of the HS is shown in Figure 2.2-5. The hydrogen storage system is located plant South of and approximately 350 feet away from the Power Block. The axes of the pressure vessels are oriented plant East-West and are not directed at any of the buildings within the plant site. Due to the distance between the Power Block and the hydrogen storage area a fire in the storage area does not pose any hazard to systems required for safe shut-down. The hydrogen storage system for each unit will sit on its own grade-level concrete foundation slab and the rest of the fenced gas storage area will be rock-covered and kept brush free to prevent any brush fire from impinging on the storage tanks. There is a fire hydrant and hose house within 160 feet of the storage facility.

2.2.2.1.2.2 Facilities

The HS consists of multiple pressure vessels with appurtenances, pressure regulators, excess flow control valves, unloading facilities and distribution lines to each turbine building.

2.2.2.1.2.2.1 Storage

The hydrogen is stored in gaseous form at a maximum pressure of 2250 psig and the design usable storage capacity is 95,600 scf for one Power Block. This capacity is divided between the primary section, consisting of six high pressure tubes and an identical six-tube secondary section. The secondary section does not provide gas until the useful capacity of the primary section has been consumed. The primary and secondary sections are independent in the sense that a problem in one section will not affect the operation of the other. Each high pressure storage tank is fitted with a rupture disc pressure relief device. There are two pressure relief valves in the high pressure header between the storage tanks and the pressure regulator, and two more in the low pressure piping downstream of the regulator.

2.2.2.1.2.2.2 Supply

The storage vessels will be refilled from an over-the-road tube trailer as required. The anticipated refill cycle is four weeks. The truck unloading stanchion will have equipment to electrically ground the trucks to the site grounding system to which also the control cabinet, piping, steel framing and the storage tubes are connected. The unloading stanchion will be provided with a check valve, a shut-off valve, a purge valve and a pressure regulator. The purge gas will be piped away from the operator and vented upwards to the atmosphere. The open end of the purge line will be protected against the entrance of the precipitation, dust and other debris.

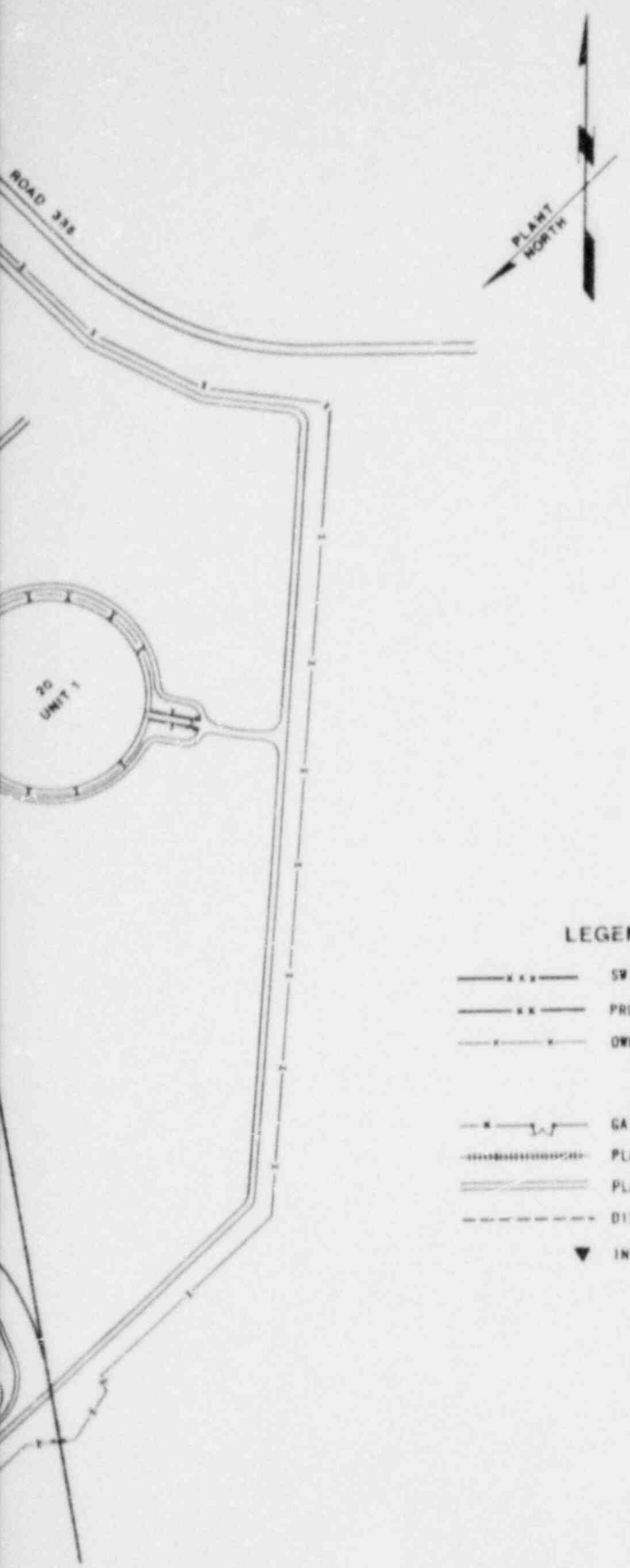
2.2.2.1.2.2.3 Transfer and Distribution

The pressure regulators reduce the pressure of the gas to the levels required by the power blocks. The gas is piped to the power blocks in Schedule 80 carbon steel pipes laid in ventilated masonry surface trenches wherever possible but buried when it is necessary to cross roads, drainage ditches and other interferences. An excess flow valve is provided in the line to each unit to shut off the supply of hydrogen at excessively high flow rates. The pressure relief valves fitted to the supply lines are 200 feet from the oxygen pressure relief valves and vent 10.5 feet above ground. The hydrogen piping is laid in the same trench as the carbon dioxide piping.

2.2.2.1.2.2.4 Source

Union Electric has contracted with a reputable and qualified company, experienced in the handling of this product, to replenish the storage vessels as required.

PLANT OPERATIONS ACCESS ROAD
COUNTY ROAD 337
UNIT 2
UNIT 1



LEGEND

SWITCHYARD FENCE
PROTECTED AREA FENCE
OWNER CONTROL FENCE
GATE
PLANT RAILROAD
PLANT ROAD
DISTRIBUTION PIPING
▼ INTERFACE

LEGEND

1. REACTOR BLDG.
2. TURBINE BLDG.
3. CONTROL BLDG.
4. AUXILIARY BLDG.
5. DIESEL GENERATOR BLDG.
6. FUEL BLDG.
7. RADWASTE BLDG.
8. DRUM STORAGE (SOLID WASTE)
9. AUXILIARY BOILER ROOM
10. CONTROL BLDG. COMMUNICATIONS CORR.
11. HOT MACHINE SHOP
12. ESSENTIAL SERVICE WATER PUMPHOUSE
13. SWITCHYARD
14. SERVICE BLDG.
15. FIRE WATER STORAGE TANKS
16. FUEL OIL STORAGE TANK
17. FIRE PUMPHOUSE
18. COOLING WATER SYSTEM PUMPHOUSE (CIRC & SERVICE)
19. DEMINERALIZED & POTABLE WATER PLANT
20. COOLING TOWER
21. CO2 STORAGE
22. HYDROGEN STORAGE
23. ULTIMATE HEAT SINK RETENTION POND
24. PARKING-OPERATIONAL
25. ULTIMATE HEAT SINK COOLING TOWER
26. WATER TREATMENT PLANT
27. CONDENSATE WATER STORAGE TANK
28. REACTOR MAKEUP WATER STORAGE TANK
29. REFUELING WATER STORAGE TANK
30. DEMINERALIZED WATER STORAGE TANK
31. START-UP TRANSFORMER
32. MAIN TRANSFORMERS
33. UNIT AUXILIARY TRANSFORMER
34. ESF TRANSFORMER
35. STATION SERVICE TRANSFORMER
37. MATERIAL DELIVERY SPUR
39. SECURITY BLDG.
40. NEUTRALIZATION TANK
41. WATER TREATMENT PLANT CONTROL BLDG.
42. SWITCHYARD CONTROL BLDG.
43. MAIN PERMANENT ENTRANCE
53. SEWAGE TREATMENT PLANT
55. OILY WASTE TREATMENT AREA
57. OXYGEN STORAGE
72. NITROGEN STORAGE
75. BULK CHEMICAL STORAGE
80. STORES BLDG.
85. COOLING WATER CHEMICAL CONTROL AREA
87. SPARE MAIN TRANSFORMER STORAGE AREA
88. AUXILIARY OIL TRANSFER
89. EQUALIZATION BASIN
90. UNDERGROUND DIESEL FUEL STORAGE TANKS
91. UNDERGROUND GASOLINE STORAGE TANK
92. SECURITY DIESEL GENERATOR BUILDING
93. GAS STORAGE AREA

200 0 200 400

SCALE IN FEET

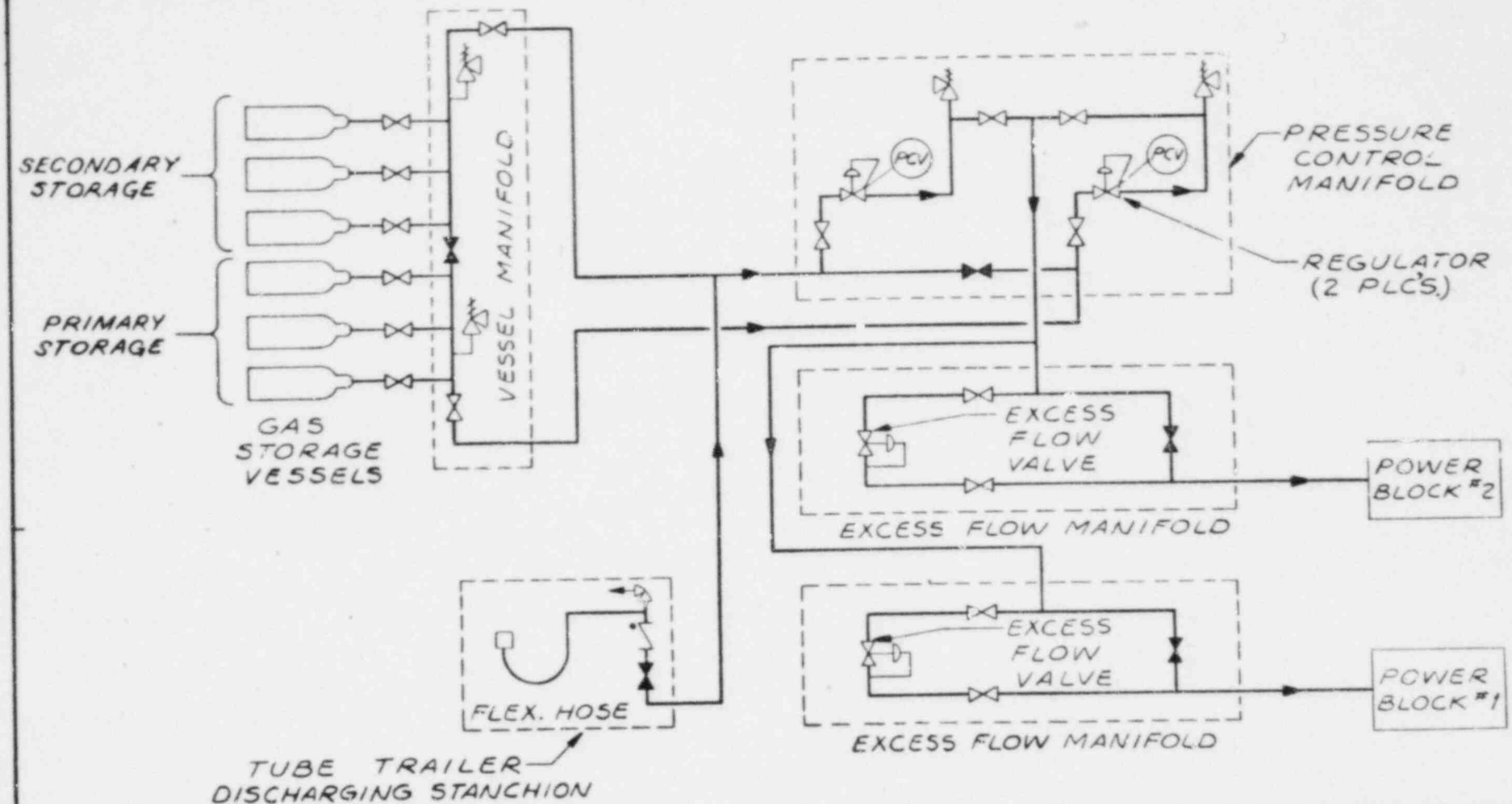
UNION ELECTRIC COMPANY
CALLAWAY PLANT UNITS 1 AND 2
FINAL SAFETY ANALYSIS REPORT

FIGURE 2.2-4

HYDROGEN SYSTEM

STORAGE & DISTRIBUTION

Rev 4 8/81



UNION ELECTRIC COMPANY
CALLAWAY PLANT UNITS 1 AND 2
FINAL SAFETY ANALYSIS REPORT

FIGURE 2.2-5
HYDROGEN SYSTEM
FLOW DIAGRAM

Rev4 8/81