REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8602050270 DOC. DATE: 86/01/28 NOTARIZED: NO DOCKET #
FACIL: 50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga 05000275
50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Ga 05000323
AUTH. NAME AUTHOR AFFILIATION
SHIFFER, J. D. Pacific Gas & Electric Co.
RECIP. NAME RECIPIENT AFFILIATION
VARGAS, S. A. PWR Project Directorate 3

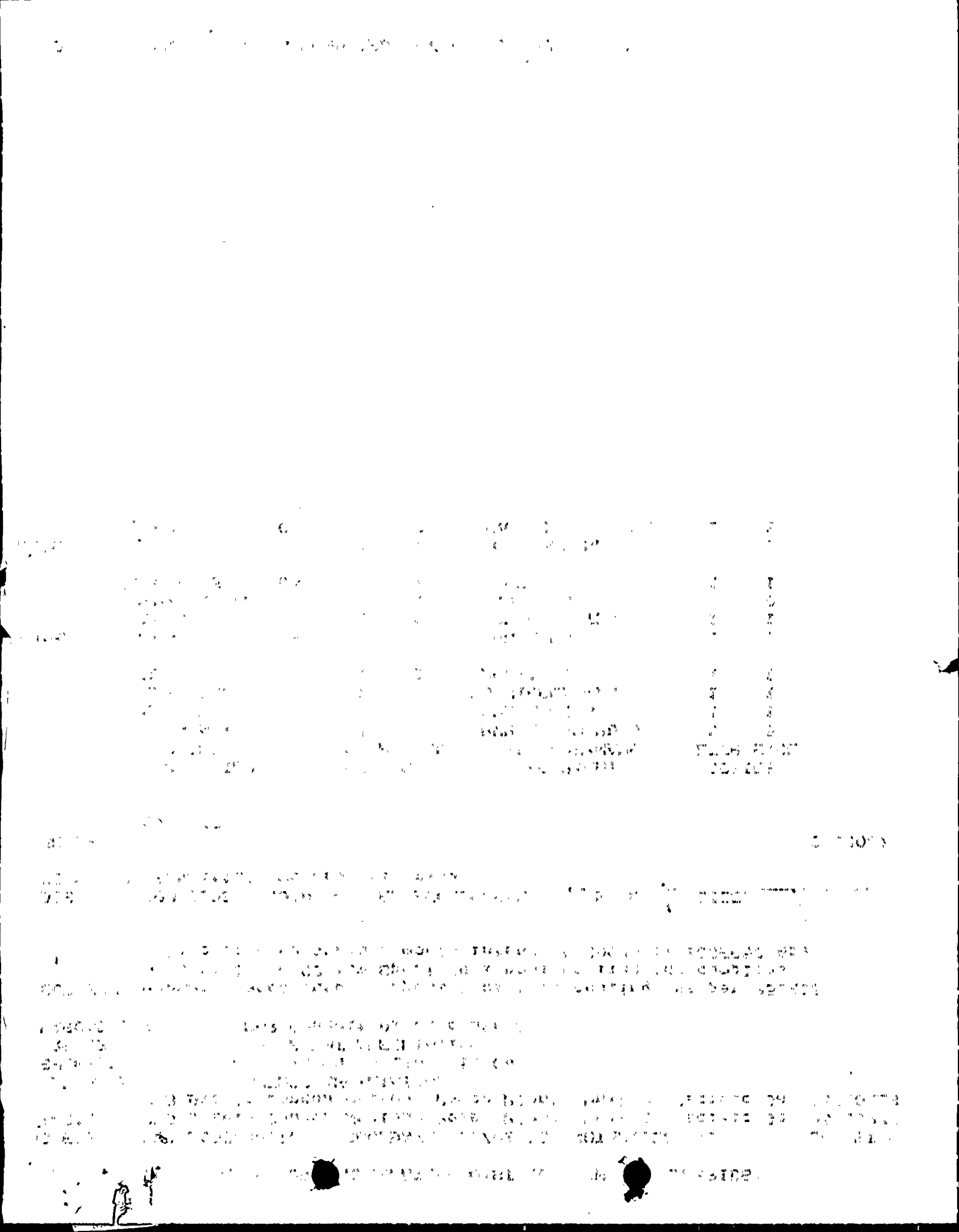
SUBJECT: Forwards addl info re spent fuel pool cooling sys, per 851205 meeting & 860108 ltr. Spent fuel pool cooling sys complies w/licensing criteria & meets intent of GDC44 of 10CFR50, App A.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 7
TITLE: OR Submittal: General Distribution

NOTES: 05000275
OL: 09/22/81

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	PWR-A ADTS		1	0	PWR-A PD3 PD 01		5	5
	PWR-A EB		1	1	PWR-A EICSB		1	1
	PWR-A FOB		1	1	SCHIERLING, H		1	1
	PWR-A PSB		1	1	PWR-A RSB		1	1
INTERNAL:	ACRS	09	6	6	ADM/LFMB		1	0
	ELD/HDS2		1	0	NRR/DHFT/TSCB		1	1
	NRR/DSRO/RRAB		1	1	NRR/ORAS		1	0
	REG FILE	04	1	1	RGN5		1	1
EXTERNAL:	24X		1	1	EG&G BRUSKE, S		1	1
	LPDR	03	2	2	NRC PDR	02	1	1
	NSIC	05	1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR 31 ENCL 27



PACIFIC GAS AND ELECTRIC COMPANY

PG&E — 77 BEALE STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211 • TWX 910-372-6587

JAMES D. SHIFFER
VICE PRESIDENT
NUCLEAR POWER GENERATION

January 28, 1986

PGandE Letter No.: DCL-86-020

Mr. Steven A. Varga, Director
PWR Project Directorate No. 3
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Supplement to the Spent Fuel Pool Reracking Report

Dear Mr. Varga:

On December 5, 1985, PGandE met with the NRC Staff to discuss the Diablo Canyon Units 1 and 2 spent fuel pool reracking report and the associated License Amendment Request 85-13. At this meeting, and in a letter to PGandE dated January 8, 1986, the NRC Staff requested further information regarding the spent fuel pool cooling system. This information is enclosed. The spent fuel pool cooling system, as described in the enclosure, complies with its licensing criteria and meets the intent of General Design Criterion 44 of 10 CFR 50, Appendix A.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

for J. D. Shiffer

Enclosure

cc: L. J. Chandler
R. T. Dodds
R. C. Herrick (FRC)
J. B. Martin
B. Norton
H. E. Schierling
CPUC
Diablo Distribution

0638S/0040K/DWO/1998

A001
1/1

ENCLOSURE

DIABLO CANYON UNITS 1 AND 2

SPENT FUEL POOL COOLING SYSTEM

NRC Request:

Discuss the spent fuel pool cooling system with respect to the requirements of General Design Criterion 44 of 10 CFR 50, Appendix A.

PGandE Response:

Spent fuel is placed in the spent fuel pool during the refueling sequence and stored there until it is shipped offsite. The spent fuel pool cooling system removes decay heat from fuel stored in the spent fuel pool and has no emergency function during a reactor accident. Each unit has a completely independent spent fuel pool and pool cooling system. Each cooling system consists of one pump and heat exchanger, with provisions to connect a portable pump (shared by both units) as a backup to the permanently installed pump. The cooling system is presently licensed to allow storage of up to 270 fuel assemblies.

To facilitate pump maintenance and improve operational flexibility, a second 100% capacity pump for each spent fuel pool, powered from a vital power supply, will be installed as discussed later in this enclosure. The following is a detailed description of the current spent fuel pool cooling system (Figure 1 is a piping schematic of the existing spent fuel pool cooling and cleanup system).

The cooling system water is pumped from the pool through the tube side of the heat exchanger and returned to the pool. The pump suction line is protected by a strainer and is located at an elevation 4 feet below the normal spent fuel pool water level. The return line contains an antisiphon hole near the surface of the water to prevent gravity drainage of the pool. System piping is arranged so that failure of any pipeline cannot drain the spent fuel pool below the water level required for radiation shielding.

The spent fuel pool pump is a horizontal, centrifugal unit. The pump has a design flow of 2,300 gpm and is controlled manually from a local station. The spent fuel pool heat exchanger is of the shell and U-tube type with the tubes welded to the tube sheet. During the normal operation, component cooling water circulates through the shell side at a higher pressure than the tube

side which circulates spent fuel pool water. Pertinent design information is provided below:

Spent Fuel Pool Heat Exchanger

Design heat transfer, Btu/hr 11.94×10^6

	Shell	Tube
Design pressure, psig	150	150
Design temperature, °F	200	200
Design flow, lb/hr	1.49×10^6	1.14×10^6
Inlet temperature, °F	95	120
Outlet temperature, °F	103	109.5
Fluid circulated	Component cooling water	Spent fuel pool water
Material	Carbon steel	Stainless steel

Manual stop valves are used to isolate equipment and manual throttle valves provide flow control. All piping and valves in contact with spent fuel pool water are austenitic stainless steel. The piping is welded except where flanged connections are used to facilitate maintenance.

The existing spent fuel pool cooling system is highly reliable and designed to Seismic Design Class I criteria. Electrical power is Class IE and the system is located in a mild environment. It is a low-pressure system with borated demineralized water and is capable of providing cooling for both normal and abnormal conditions. In the unlikely event that the spent fuel pool pump should fail for an extended period, a Design Class II portable pump with a flowrate of approximately 700 gpm and permanent connections in the spent fuel pool cooling loop are provided as a backup to the permanently installed pump.

If the spent fuel pool cooling system should be unavailable for an extended period of time, natural surface cooling would maintain the water temperature at or below the boiling point.

Makeup water to the pool in the event of loss of normal cooling is available from various sources as shown in Figure 2. The quantity available from each source, the seismic classification and makeup rate of each system, and the time interval between activation of these systems and attainment of the makeup flow rate are discussed below.

- o Fire Water Tank

  The fire water tank has a capacity of 300,000 gallons with a Technical Specification limit of 278,000 gallons for fire

suppression. The fire water system has been qualified for the Hosgri seismic event and has a flowrate of approximately 250 gpm for spent fuel pool makeup.

- o Fire Water Transfer Tank

  The fire water transfer tank has a capacity of 150,000 gallons and is qualified for the Hosgri seismic event. Portions of the flow path from this fire water transfer tank to the spent fuel pool are not seismically qualified. This path has a flow rate of approximately 200 gpm.

- o Condensate Storage Tank (CST)

  The Design Class I condensate storage tank has a capacity of 425,000 gallons. Tank nozzles are arranged such that 178,000 gallons in the lower portion of the tank can only be accessed by the auxiliary feedwater. The flow path used for spent fuel pool makeup from the tank through the makeup water transfer pumps to the pool is Design Class I. Certain other lines located above the level associated with the 178,000 gallon Technical Specification inventory have not been seismically qualified. The CST is routinely maintained 85% to 90% full. Thus, except in the unlikely event of a failure of one of the lines from the CST which have not been seismically qualified, approximately 200,000 gallons of water is available through this path for makeup.

- o Raw Water Reservoir (RWR)

  Makeup from the raw water reservoir can be provided by gravity drain through the makeup water system. The reservoir has a capacity of approximately 4,500,000 gallons of water. While not Seismic Category I, the reservoir is highly reliable as described in SSER 8. It was constructed by excavating into rock and providing a reinforced concrete shell with a liner. Fire hose stations have been provided along the route from the RWR to the plant to assure a long term reliable source of water.

All the makeup sources except the gravity drain from the raw water reservoir are provided with pumps. The piping systems are kept full; thus, the full makeup flowrate will be achieved immediately after activation of the pumps.

The following sources can be used to refill the condensate storage tank or fire water tank:

- o If offsite power is available, the condensate storage tank can be refilled with the normal makeup water system from the raw water reservoir (currently 400 gpm for both units) or from the condenser hotwell (during plant operation). Transfer of water between the other unit's condensate storage tank or the firewater tank or transfer tank can also be accomplished. This system is not seismically qualified.

- o If offsite power is not available, either of these tanks can be refilled by gravity alone from the raw water reservoir through the existing piping or hose connections. Also, the fire water tank can

be refilled by using the portable diesel-driven firewater pumps and hose connections by taking suction from the raw water reservoir or the condenser hotwell. The portable diesel-driven firewater pumps and the hose stations are Seismic Category I and can be connected in less than 8 hours. These pumps have a flowrate of 250 gpm at 100 psig.

Based on the number and diverse sources of makeup water available, complete loss of pool makeup capability is not considered credible.

As discussed earlier, PGandE will install a permanent second 100% capacity spent fuel pool cooling pump for each unit prior to exceeding the spent fuel storage limit identified in the FSAR Update (i.e., 270 fuel assemblies). Provisions for the existing portable pump will be eliminated at that time. To minimize the impact on operation of the existing cooling system when installing these pumps, and to help maintain radiation exposures as low as is reasonably achievable during installation, the piping connections for the second 100% capacity pump to the existing cooling loop will be installed prior to the first refueling outage of each unit. These new Design Class I pumps will be seismically qualified and provided with Class 1E power.

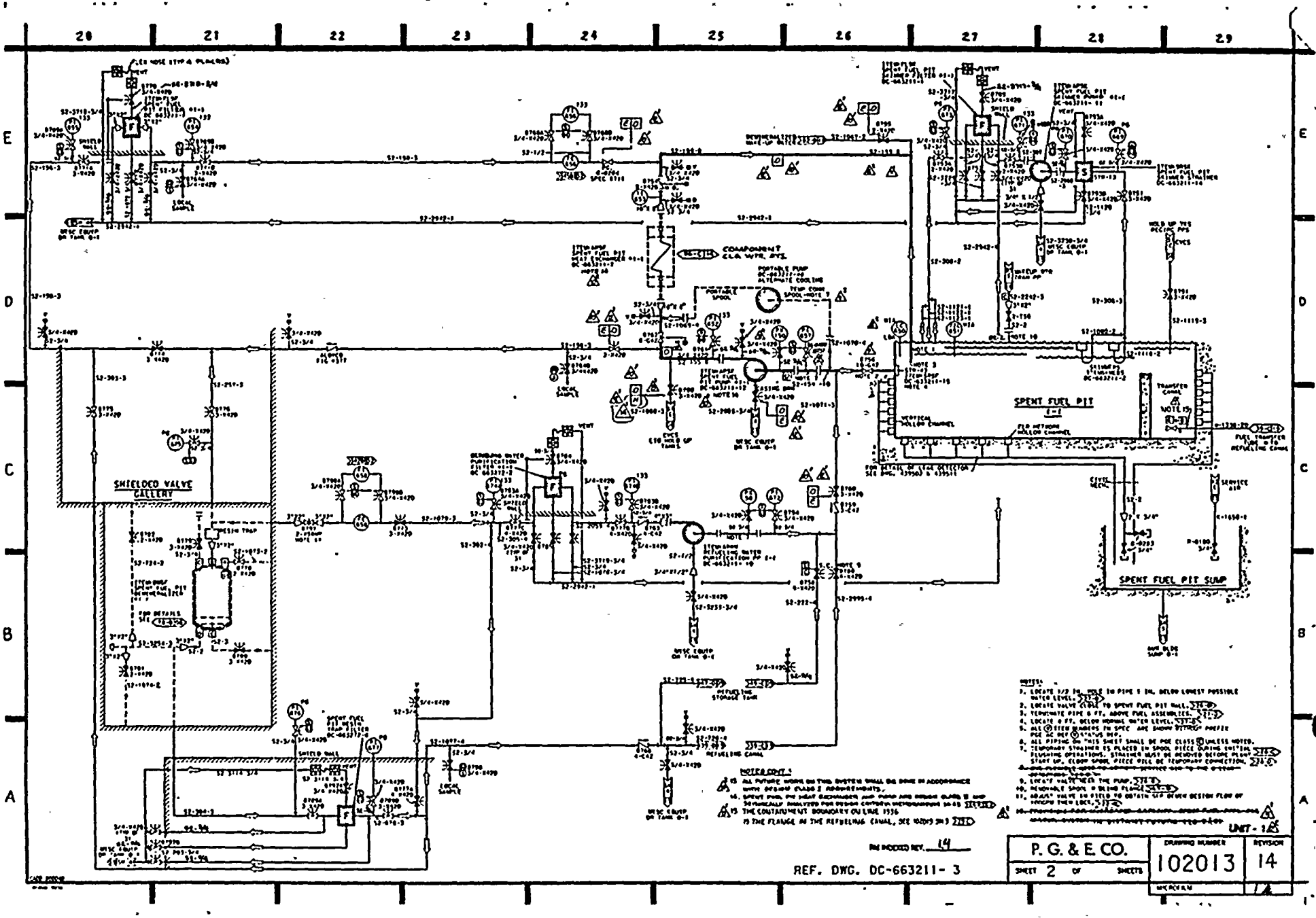

SHIELDED VALVE GALLERY
SPENT FUEL PIT
SPENT FUEL PIT SUMP
REF. DWG. DC-663211-3
P. G. & E. CO.
SHEET 2 OF SHEETS
DRAWING NUMBER
102013
REVISION
14

Figure 1

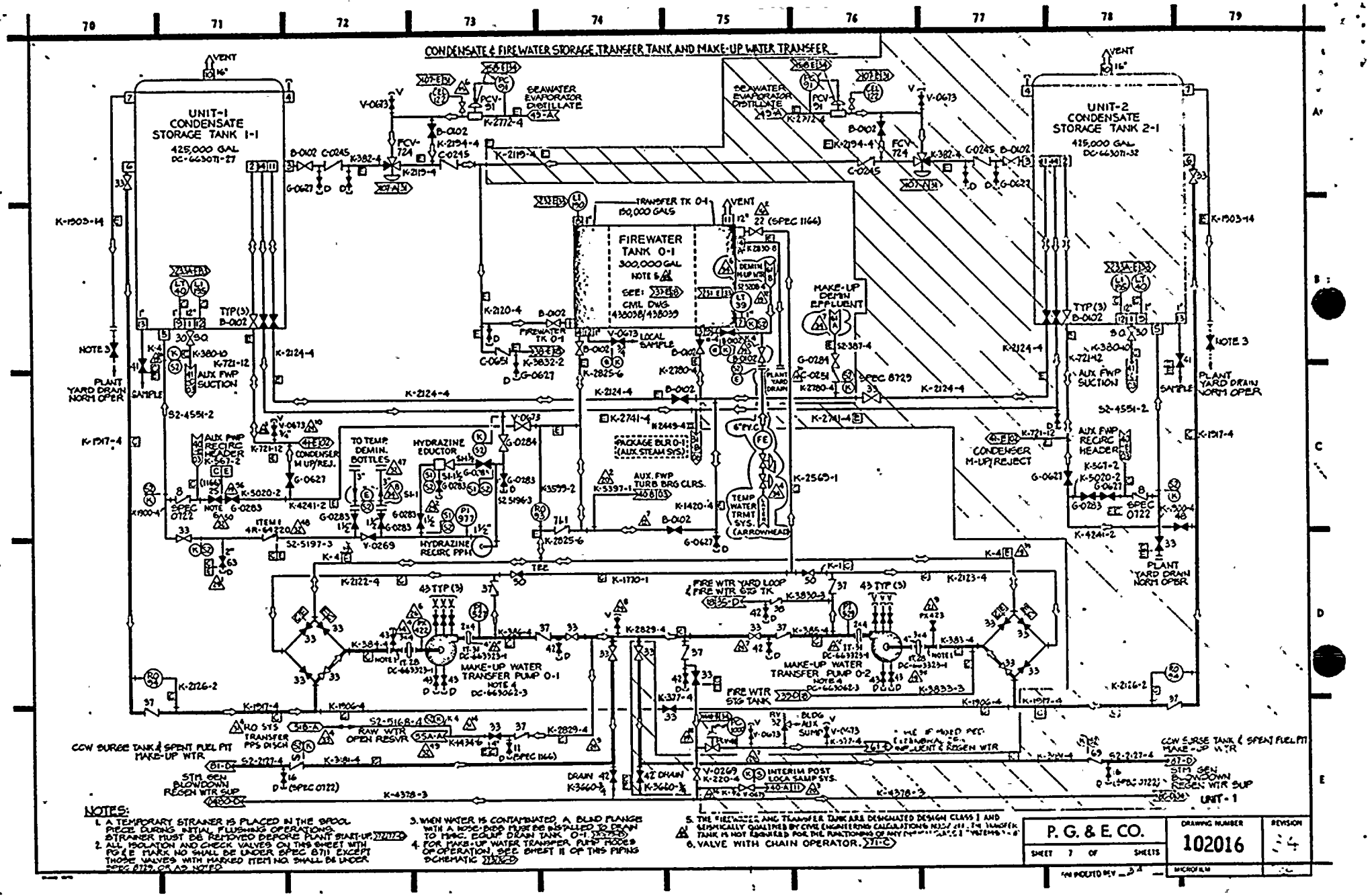

CONDENSATE & FIREWATER STORAGE, TRANSFER TANK AND MAKE-UP WATER TRANSFER
UNIT-1 CONDENSATE STORAGE TANK 1-1
425,000 GAL
UNIT-2 CONDENSATE STORAGE TANK 2-1
425,000 GAL
FIREWATER TANK 0-1
300,000 GAL
TRANSFER TK 0-1
150,000 GALS
MAKE-UP DEMIN EFFLUENT
SEAWATER EVAPORATOR DISTILLATE
MAKE-UP WATER TRANSFER PUMP 0-1
MAKE-UP WATER TRANSFER PUMP 0-2
FIRE WTR STG TANK
AUX FWP RECIRC HEADER
AUX FWP SUCTION
CONDENSER M-UP/REJECT
PLANT YARD DRAIN NORM OPER
HYDRAZINE EDUCTOR
HYDRAZINE RECIRC PPS
TO TEMP. DEMIN. BOTTLES
AUX FWP TURB BRG CLRS.
TEMP WATER TRMT SYS. (ARROWHEAD)
PACKAGE BLR 0-1 (AUX STEAM SYS)
RAW WTR OPEN RESVR
INTERIM POST LOCA SUMP SYS.
CCW SURGE TANK & SPENT FUEL PIT MAKE-UP WTR
STM GEN BLOWDOWN REGEN WTR SUP
UNIT - 1
NOTES:
1. A TEMPORARY STRAINER IS PLACED IN THE SPOOL PIECE DURING INITIAL FLUSHING OPERATIONS. STRAINER MUST BE REMOVED BEFORE PLANT START-UP.
2. ALL ISOLATION AND CHECK VALVES ON THIS SHEET WITH PG&E MARK NO SHALL BE UNDER SPEC. 8711 EXCEPT THOSE VALVES WITH MARKED ITEM NO SHALL BE UNDER SPEC 8729 OR AS NOTED
3. WHEN WATER IS CONTAMINATED A BLIND FLANGE WITH A NOSE-BIDD MUST BE INSTALLED TO DRAIN TO MISC. EQUIP DRAIN TANK 0-1
4. FOR MAKE-UP WATER TRANSFER PUMPS MODE OF OPERATION, SEE SHEET II OF THIS PIPING SCHEMATIC
5. THE FIREWATER AND TRANSFER TANK ARE DESIGNATED DESIGN CLASS I AND SEISMICALLY QUALIFIED BY CIVIL ENGINEERING CALCULATIONS NO. [illegible]. THE TRANSFER TANK IS NOT ENGINEERED FOR THE FUNCTIONING OF ANY [illegible]
6. VALVE WITH CHAIN OPERATOR.
P. G. & E. CO.
SHEET 1 OF SHEETS
DRAWING NUMBER 102016
REVISION 24
MICROFILM

Figure 2