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March 5, 1982

In reply, please refer to LAC-7931

DOCKET NO. 50-409

U. S. Nuclear Regulatory Commission
ATTN: Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
Division of Operating Reactors
Washington, D. C. 20555

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
SEP TOPIC IX-3, STATION SERVICE AND COOLING WATER SYSTEMS

REFERENCE: (1) DPC Letter, LAC-7387, Linder to Eisenhut, dated February 27, 1981.

Gentlemen:

Enclosed find Safety Evaluation Report (SER) for Station Service and Cooling Water Systems (SEP IX-3) which we have prepared for the La Crosse Boiling Water Reactor.

Our letter, Reference 1, identified topics for DPC to submit for NRC evaluation. The subject topic was listed in the schedule submitted with Reference 1.

If there are any questions regarding this letter, please contact us.

Very truly yours,

DAIRYLAND POWER COOPERATIVE

Frank Linder

Frank Linder, General Manager

FL:GSB:dh

cc - J. G. Keppler, Reg. Dir., NRC-DRO III
NRC Resident Inspector

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LA CROSSE BOILING WATER REACTOR
SYSTEMATIC EVALUATION PROGRAM
SEP TOPIC IX-3 STATION SERVICE AND COOLING WATER SYSTEMS

I. INTRODUCTION

The safety objective of Topic IX-3 is to assure that the cooling water systems have the capability, with adequate margin, to meet design objectives and, in particular, to assure that:

a. systems are provided with adequate physical separation such that there are no adverse interactions among those systems under any mode of operation;

b. sufficient cooling water inventory has been provided or that adequate provisions for makeup are available;

c. tank overflow cannot be released to the environment without monitoring and unless the level of radioactivity is within acceptable limits;

d. vital equipment necessary for achieving a controlled and safe shutdown is not flooded due to the failure of the main condenser circulating water system.

II. REVIEW CRITERIA

The current criteria and guidelines used to determine if the plant systems meet the topic safety objectives are those provided in Standard Review Plan (SRP) Sections 9.2.1, "Station Service Water System," and 9.2.2, "Reactor Auxiliary Cooling Water Systems."

III. RELATED SAFETY TOPICS AND INTERFACES

The scope of review for this topic was limited to avoid duplication of effort since some aspects of the review were, or are being, performed under related topics. The related topics and the subject matter are identified below. Each of the related topic reports contains the acceptance criteria and review guidance for its subject matter.

II-2.A	Severe Weather Phenomena
II-3.B.1	Flooding of Equipment
VI-7.D	Flooding of Equipment (Long Term Passive Failures)
III-3.C	Inservice Inspection of Water Control Structures
III-4.C	Internally Generated Missiles
III-5	Mass and Energy Releases (High Energy Line Break)
VI-2.D	Mass and Energy Releases
III-6	Seismic Qualification
VI-7.C.1	Independence of Onsite Power
VII-3	Systems Required for Safe Shutdown
VIII-2	Diesel Generators
IX-1	Fuel Storage
IX-6	Fire Protection
	Environmental Qualification

IV. EVALUATION

The systems reviewed under this topic are the Component Cooling Water System (CCW), the Low Pressure Service Water System (LPSW) and the Shield Cooling System.

A. Component Cooling Water System (CCW)

The Component Cooling Water System is a closed system consisting of two pumps, two heat exchangers, a surge tank, and the necessary piping, valves, controls, and instrumentation to distribute the cooling water as shown in attached drawing 41-400-416.

The Component Cooling Water Pumps, Coolers, and the Surge Tank are located in the Turbine Building. Water flows from the pumps, to the cooler, and then to the component cooling supply header in the Reactor Building.

The components cooled by the Component Cooling System are as follows:

1. Forced-Circulation Pump Hydraulic Coupling Coolers (2)
2. Forced-Circulation Pump Lube Oil Coolers (2)
3. Shield Cooler
4. Control Rod Nozzle Effluent Pumps (2)
5. Purification Pump
6. Purification Cooler
7. Reactor Building Air-Conditioners (2)
8. Decay Heat Pump
9. Decay Heat Cooler
10. Fuel Element Storage Well Cooler
11. Sample Coolers (8)
12. Station Air Compressors (2) (located in Turbine Building)

Water from each of the components, listed above, flows to the component cooling water return header. This header leaves the Reactor Building and connects to the suction of the Component Cooling Pumps. A sample stream from the supply header is monitored for radioactivity and returned to the suction header.

The CCW System cools the coupling oil and lube oil for the Forced Circulation Pumps. Failure of the CCW System would cause the oil temperature to increase to the alarm point. If no action were taken, the pump fluid coupling bearings could seize. This would have no effect on the coolant pressure boundary.

The CCW System is a non-radioactive system. However, the surge tank, located in the Turbine Building overflows to the Waste Water Storage Tanks, which are sampled and analyzed to insure that the radioactivity is within acceptable limits.

The cooling medium for the CCW coolers is Low Pressure Service Water (LPSW). In the event that the LPSW System fails, a backup supply is provided to one CCW cooler from the High Pressure Service Water (HPSW) System which is supplied by two diesel-driven pumps.

A. Component Cooling Water System (CCW) - (cont'd)

The CCW System is not required to perform any post-accident heat removal functions. The system may be used, however, to aid in heat removal in a post-accident situation.

The system is being reviewed for environmental qualifications and seismic considerations for utilizing it more fully in post-accident conditions.

B. Low Pressure Service Water (LPSW)

The Low Pressure Service Water System consists of two pumps, rated at 3000 gpm, each powered by 150 h.p. 2300 V motors located in the cribhouse. The flow diagram for the Low Pressure Service Water System is shown in attached drawing b/LR-55. The discharge of the pumps passes through a duplex strainer unit that permits constant flow when shifting strainers. From the cribhouse, the system is piped underground to the Turbine Building and provides the following components with river water for cooling:

1. High Pressure Service Water Supply
2. Component Cooling Water (CCW) Coolers (2)
3. Generator Hydrogen Coolers (4)
4. Turbine Lube Oil Coolers (2)
5. Condenser Vacuum Pump
6. Circulating Water Pumps bearings and packing (2)
7. Reactor Feedwater Pump lube oil and coupling water coolers (2)
8. Recombiner Condenser
9. Waste Gas Compressor and Coolers
10. Flushing Water for Liquid Waste Discharge Piping and Monitor

The Low Pressure Service Water System is not required for the safe shutdown of the plant, or for any accident condition.

The only systems supplied by the Low Pressure Service Water System that are desirable to maintain in operation are provided with other supplies of water. The High Pressure Service Water System has two diesel engine driven pumps that start automatically if system pressure drops to 60 psig, or on high Containment Building pressure of 5 psig, and will supply all of the system requirements. The High Pressure Service Water System also provides a backup supply to the Component Cooling Water Coolers.

Based on our review of the Low Pressure Service Water System, we have determined that it is not important to safety.

C. Shield Cooling System

The Shield Cooling System is designed to maintain the temperature of the Thermal Shield and biological shield concrete below 140°F and 150°F, respectively. The flow diagram for the Shield Cooling System is shown in attached drawing 41-300-082. The system is a closed loop containing 26 stainless steel cooling coils, a cooler, two pumps, a filter, a surge tank, piping, valves, and the necessary instrumentation. Two centrifugal

C. Shield Cooling System - (cont'd)

pumps (one operating, one standby) circulate 75 gpm of treated demineralized water through the closed loop. The coolant from the pump passes through a full-flow filter and into the cooling coil supply header. From the supply header the coolant passes through the 26 individual cooling coils and is returned to a common return header. The coolant from the return header passes through the cooler, and returns to the suction side of the pump. The cooler transfers the heat from the coolant to the Component Cooling Water System.

A surge tank connected to the return line upstream of the cooler, acts as a head tank and accommodates any water expansion and contractions due to temperature changes. The surge tank overflow and drain are connected to the retention tanks within the Containment Building such that overflow cannot be released to the environment without monitoring and unless the level of radioactivity is within acceptable limits.

The shield cooling water is treated with potassium dichromate to minimize corrosion by maintaining 600 to 1000 ppm concentration and a pH of approximately 9. The system shall be sampled once per month and tested for pH, chromates, gamma spectrum, and gross beta-gamma activity.

The full-flow filter in the pump discharge removes particulate matter from the coolant and thus confines radioactivity.

About 70 percent of the heat in the Thermal Shield is transferred from the Reactor Vessel by thermal radiation and the remaining 30 percent is contributed to gamma heating within the shield. The heat transferred to the steam pipe chase and biological shield concrete above the Thermal Shield is a result of thermal radiation from the Reactor Vessel and steam piping. The heat transferred to the recirculation piping cavity and vessel support skirt is a result of thermal radiation and conduction from the Reactor Vessel and recirculation piping.

The total heat load to the cooling water circuit during full-power operation is 3.1×10^5 Btu/hr. This heat load includes the gamma heating in the Thermal Shield and the heat transferred to the shield vessel support skirt, and biological shield concrete as a result of thermal radiation and conduction from the reactor vessel and the forced recirculation and steam piping.

Based on our review of the Shield Cooling System, we have determined that it is not important to safety.

V. CONCLUSION

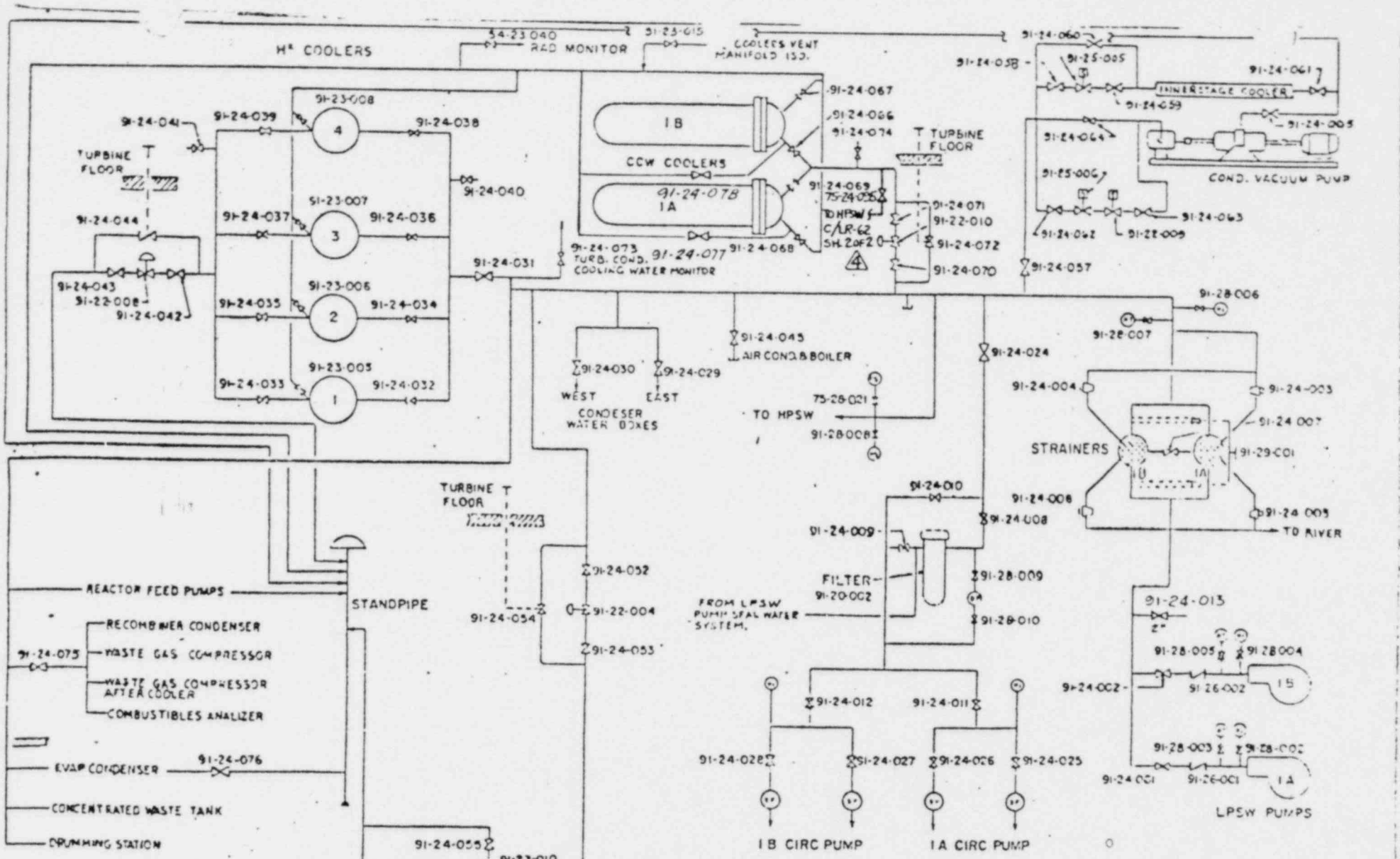
Based on our review of service and cooling water systems, we have concluded that:

V. CONCLUSION - (cont'd)

Component Cooling Water System (CCW) is not required to perform any post-accident functions, but it is being reviewed in order to upgrade it to meet environmental and seismic qualifications.

Low Pressure Service Water System (LPSW) is not required for any functions important to safety.

Shield Cooling Systsem is not required for any functions important to safety.



Prepared or Revised By	Date
R. Cota	2/10/81
Oper. Rev. Com. Approval	Date
R.E. Thomarat	3/30/81
Safety Rev. Com. Approval	Date
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4	1/14/81	F.C. 83-80-1	DE	MJ
3	7/12/79	F.C. 79-03	V.V.	DLS
2	7/21/75	F.C. 77-18	V.V.	DLS
1	8-29-75	FOR CONTIN. SEE D.P.C. REV. FORM UNDER SAME DWG. NO.	V.V.	LWR

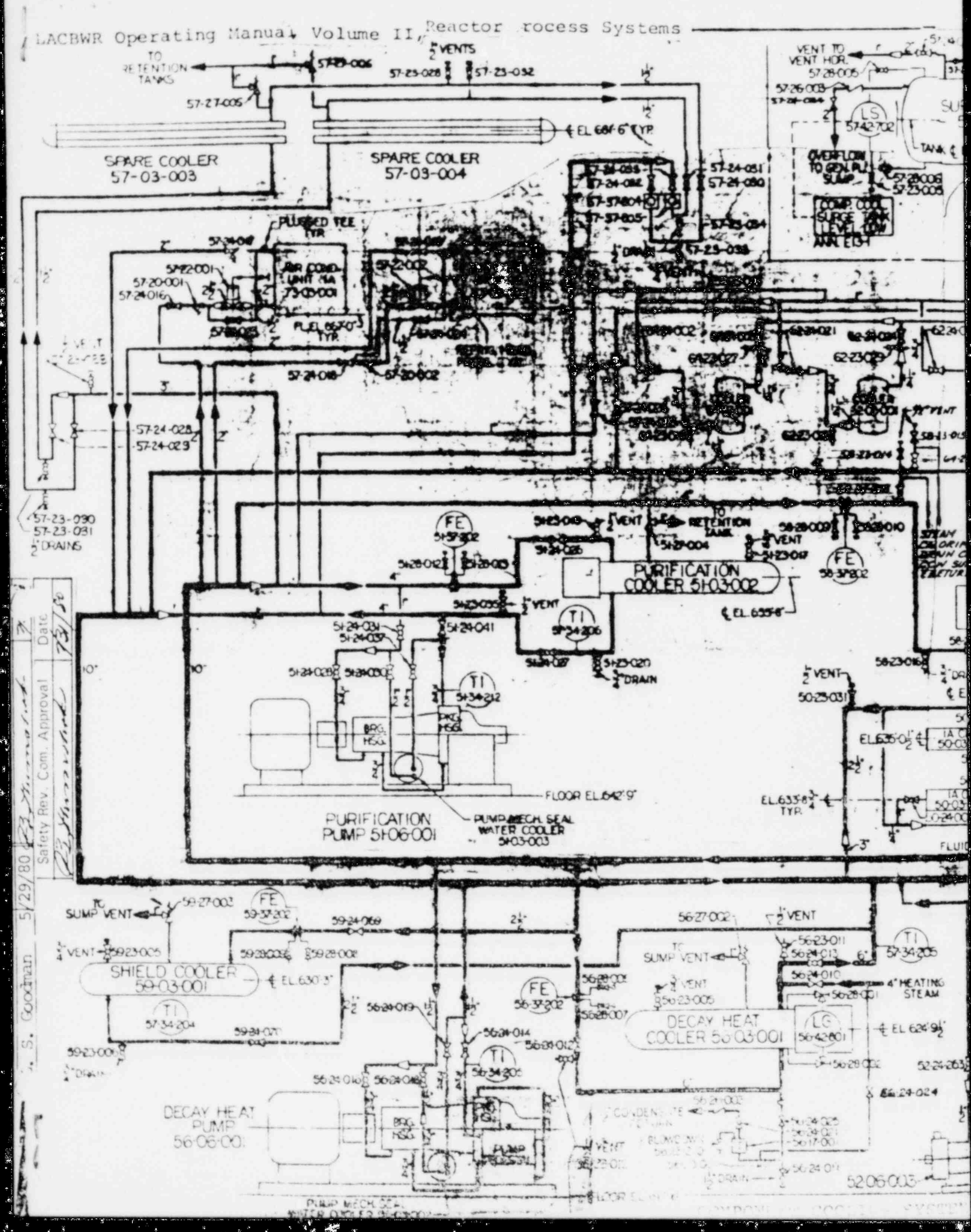
DAIRYLAND POWER
LACBWR

LOW PRESSURE SERVICE WATER SYSTEM

DATE 1-14-75
REV. NO. 4
DAG NO. D/LR-55

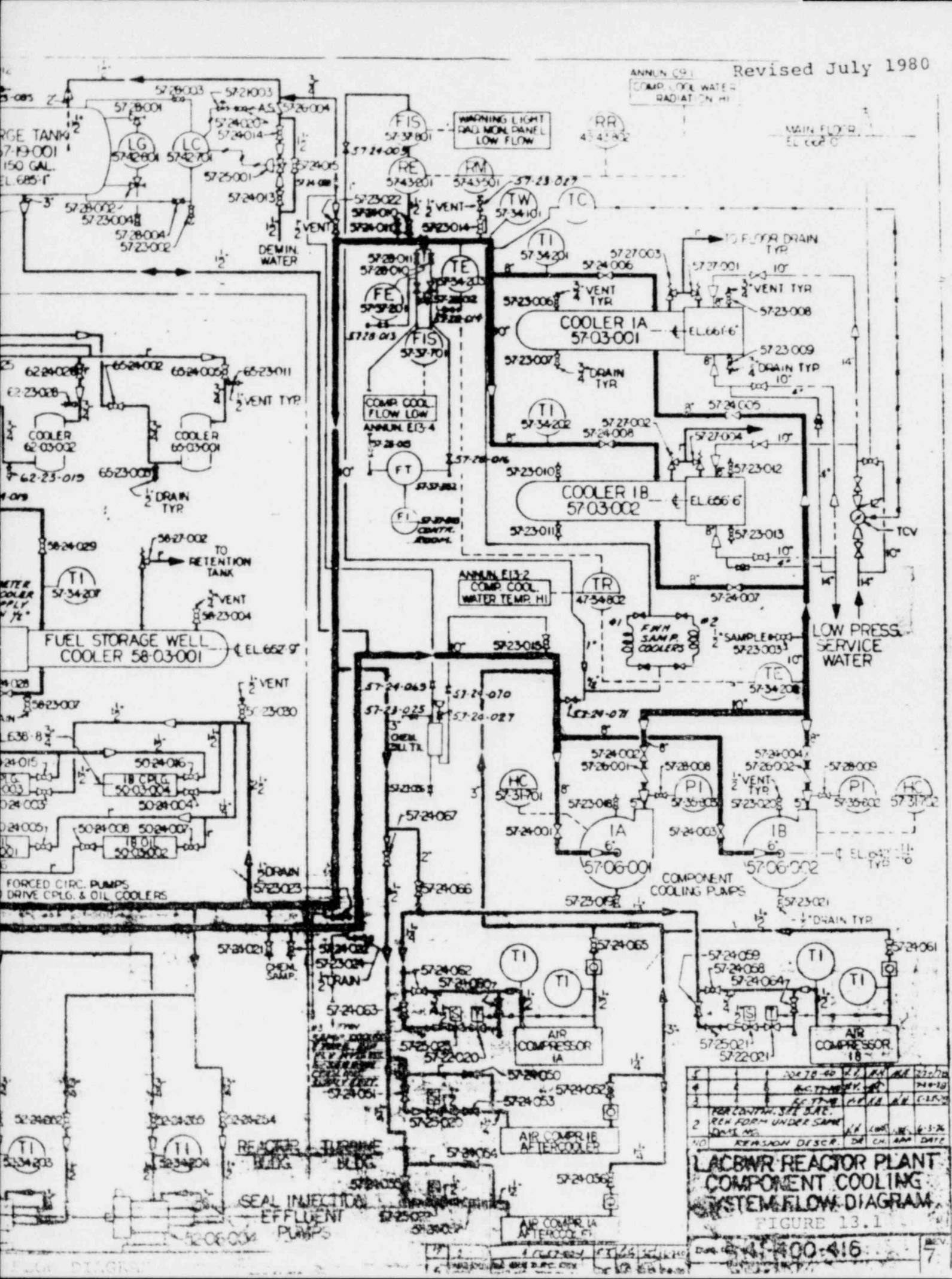
LACBWR Operating Manual, Volume V, Service System

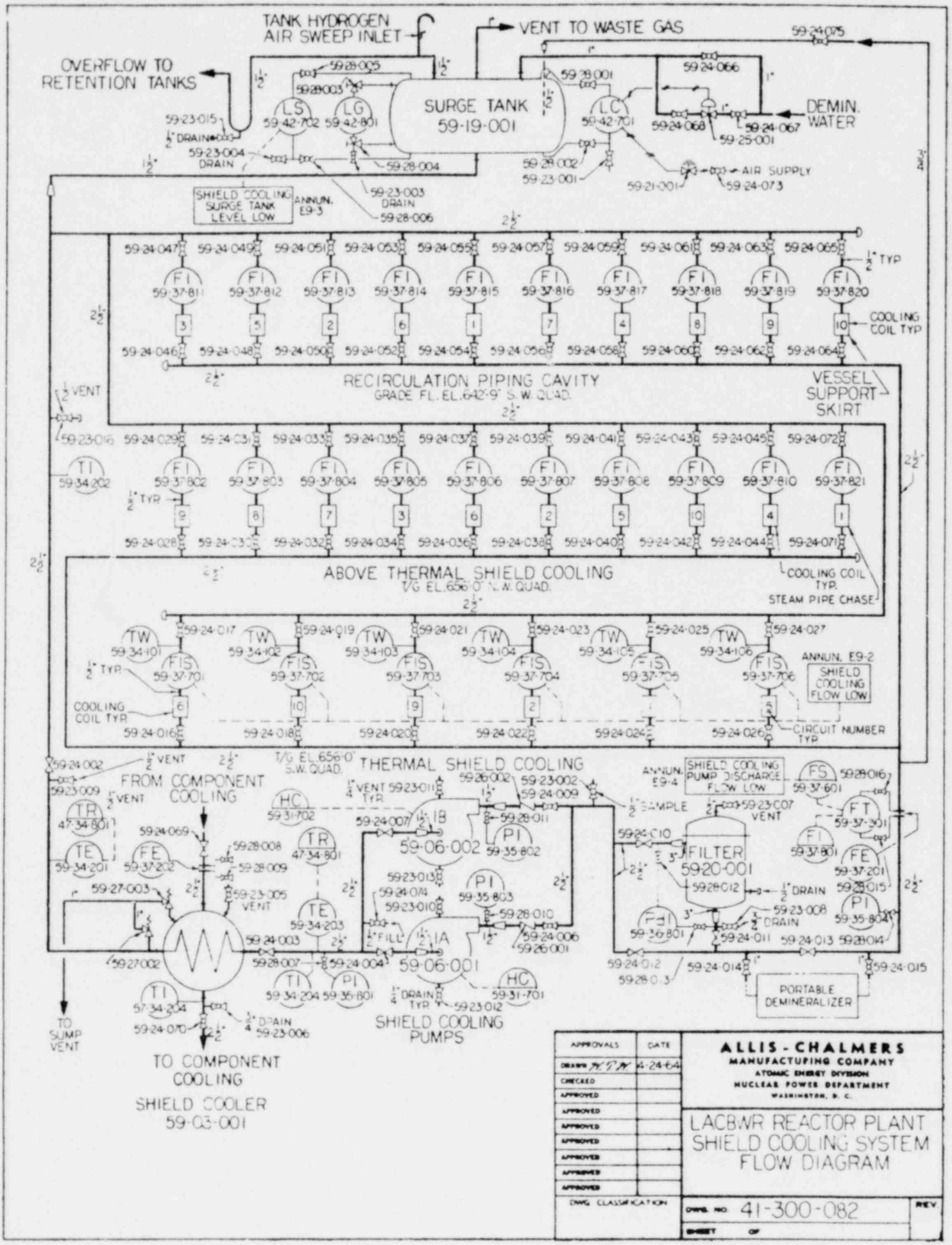
Revised March 1981



J. S. Goodman 5/29/80 Safety Rev. Com. Approval Date

Revised July 1980





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ALLIS-CHALMERS
MANUFACTURING COMPANY
ATOMIC ENERGY DIVISION
NUCLEAR POWER DEPARTMENT
WASHINGTON, D. C.

LACBWR REACTOR PLANT SHIELD COOLING SYSTEM FLOW DIAGRAM

DWG. NO. 41-300-082
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