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SUBJECT: Forwards changes to FSAR Chapters 6 & 11, deleting NSSS interface unit between process radiation & gas stripper effluent monitors & RMS computer sys & deleting line coming off discharge header of antifoam pump.

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Arizona Nuclear Power Project
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

December 19, 1986
ANPP-39454-JGH/JKR/98.05

Director of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Project Director
PWR Project Directorate #7
Division of Pressurized Water Reactor Licensing - B
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 3
Docket No. STN 530
Changes to the FSAR Concerning Chapters 6 and 11
File: 86-E-005-419.05; 86-G-056-026

Dear Mr. Knighton:

Attached for your review on PVNGS Unit 3 are FSAR changes to Chapters 6 and 11. These changes involve (1) deleting the NSSS interface unit between the process radiation and gas stripper effluent monitors and the RMS computer system; (2) deleting the line coming off the discharge header of the Antifoam Pump to the Boric Acid Concentrator; and (3) clarifying the FSAR to accurately reference the proper Technical Specification Sections.

These changes are justified because: (1) this change will increase the efficiency of the RMS computer system and control room indication is still available; (2) ridding the reactor coolant system of the anti-foam agent was not necessary nor practical; (3) in a previous amendment to the FSAR, the references were incomplete.

For PVNGS Units 1 and 2, safety evaluations have been completed for implementation of these changes in accordance with the requirements of 10 CFR 50.59. The safety reviews and evaluations have determined that there are no unreviewed safety questions involved with the changes. These changes will be included in the next FSAR amendment.

If you have any questions, please contact Mr. W. F. Quinn of my staff.

Very truly yours,

J. G. Haynes
Vice President
Nuclear Production

JGH/JKR/rw
Attachment

cc: O. M. De Michele
E. E. Van Brunt, Jr.
E. A. Licitra
R. P. Zimmerman
A. C. Gehr

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unlikely event that radioactivity is introduced into the control building intake plenum.

D. Provide long-term post-accident monitoring of ventilation exhaust from the auxiliary building ESF equipment areas following a loss-of-coolant accident.

E. Inform the control room operator of the occurrence and approximate location of an abnormal radiation increase in a zone adjacent to the containment containing piping, electrical or hatch penetrations.

F. Inform the control room operator and personnel in the immediate vicinity of the monitor of an abnormal radiation increase inside buildings where access is required to service equipment important to safety post-accident.

G. Provide long-term post-accident monitoring of effluents from the plant vent, fuel building vent, main condenser vent, and the main steam relief and atmospheric dump valves.

11.5.2 SYSTEM DESCRIPTION

11.5.2.1 Continuous Process, Effluent and Area Radiation Monitoring and Sampling

The requirements of the system design bases for continuous monitoring are satisfied by an integrated, microcomputer-based system of 50 monitors per unit, including a total of 85 detector channels with their associated sampling and auxiliary equipment. Nine detector channels are provided as part of common area support. Refer also to CESSAR Section 9.3.4.5.6 for descriptions of the NSSS scope radiation monitors which are not part of the computer-based monitoring system. Section 11.5.2.1.1 provides a description of system hardware including design features such as instrumentation, types and locations of readouts, annunciators, and alarms, provisions for emergency power supplies, and provisions for decontamination and replacement. Section 11.5.2.1.2 provides information

ADD

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functional status can be effected either remotely at an operable DCU in the associated unit, or, if local control is taken, at the field unit itself using a PIC (or KEPIC) unit. For the minicomputer, sufficient program is located in read-only memory circuits so that upon subsequent restoration of power, recovery to full functional status is effected automatically, after manual entry of the restart sequence. 12 12

11.5.2.1.1.7.5.3 Battery power supplies provided for read/write memory are rechargeable and provide a minimum of 4 hours of backup power to the read/write memory.

11.5.2.1.1.7.6 Output Relays. Alarm output relays are provided in the field unit for the XJ-SQN-RU-07, RU-12, RU-27, RU-28 and RU-141 non-ESF monitors. They are also provided in the RIC unit for each ESF monitor. These relays initiate the automatic control actions listed in Table 11.5-1 to the BOP ESFAS circuits. Each of the relays has fail open contacts. The relays are deenergized in the presence of a HIGH-HIGH alarm, regardless of whether the monitor is in LOCAL or REMOTE control. 12

11.5.2.1.1.7.7 Deleted

11.5.2.1.1.7.7 Nuclear Steam Supply System Primary Coolant Activity Monitoring Subsystem (NSSS) Interface Unit. This unit includes analog-to-digital converters, a microcomputer, and other equipment necessary to receive the following signals from each of the two channels of the primary coolant activity monitoring subsystem (described in CESSAR Section 9.3.4) and communicate them to the associated non-safety communications loop for DCU display. 12

- Analog level (0-10 Vdc) input 5
- HIGH radiation alarm contact input

DELETE

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5/9

This interface unit is located in the non-ESF RMS control room cabinet.

11.5.2.1.1.7.8 ESF Monitor Interface Units. Each of these two units includes isolation devices, microcomputer(s), and other equipment necessary to receive the following digital information from each of the ESF channels and communicate them to the non-ESF communications loop.

12

- Radiation level
- CHANNEL FAILURE alarm
- CHANNEL TEST signal
- HIGH radiation alarm
- HIGH-HIGH radiation alarm

DELETE

These interface units are located, one each, in the CHANNEL "A" and CHANNEL "B" sides of the ESF RMS control room cabinet.

11.5.2.1.1.7.9 The Minicomputer includes a DEC 11/34 processor with sufficient auxiliaries to control the following peripheral devices:

12

12

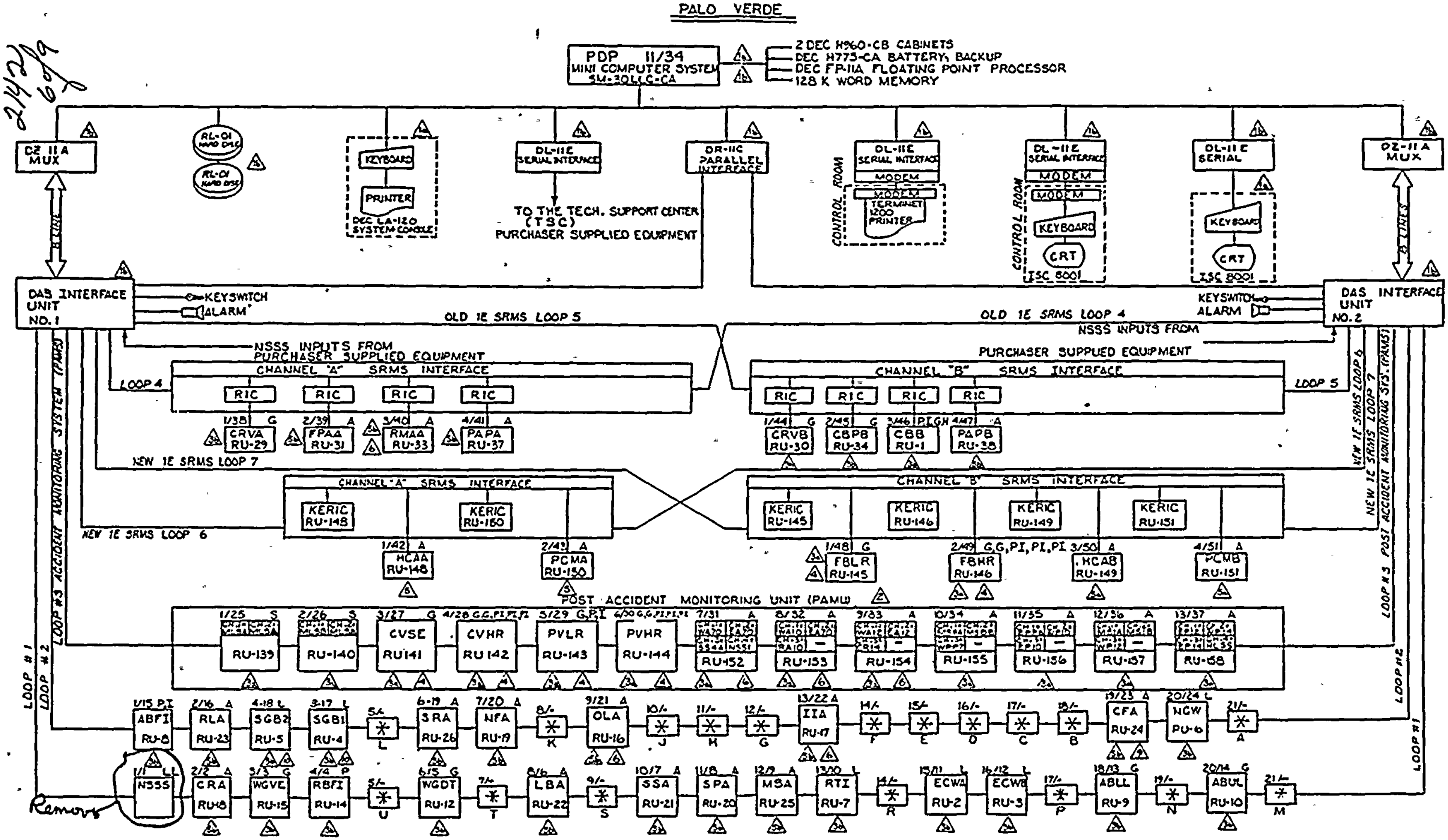
- Two video monitor CRTs with keyboards (Display and Control Units (DCUs))
- Associated controllers and equipment required for communication with the associated communications loops. The minicomputer includes a hardware data link which can transmit information to the ERFDAD system.

5

12

- A status logger typer with a keyboard for the control room communications console.

5



PALO VERDE
PDP 11/34 MINI COMPUTER SYSTEM SM-30LLC-CA
2 DEC H960-CB CABINETS
DEC H775-CA BATTERY BACKUP
DEC FP-11A FLOATING POINT PROCESSOR
128 K WORD MEMORY
DZ 11A MUX
RL-01 HARD DISC
KEYBOARD
PRINTER
DEC LA-120 SYSTEM CONSOLE
DL-11E SERIAL INTERFACE
TO THE TECH. SUPPORT CENTER (TSC) PURCHASER SUPPLIED EQUIPMENT
DR-11C PARALLEL INTERFACE
CONTROL ROOM
MODEM
TERMINET 1200 PRINTER
CRT
TSC 8001
DL-11E SERIAL
DZ-11A MUX
DAS INTERFACE UNIT NO. 1
KEYSWITCH
ALARM
OLD 1E SRMS LOOP 5
OLD 1E SRMS LOOP 4
DAS INTERFACE UNIT NO. 2
NSSS INPUTS FROM PURCHASER SUPPLIED EQUIPMENT
CHANNEL "A" SRMS INTERFACE
CHANNEL "B" SRMS INTERFACE
LOOP 4
LOOP 5
RIC
CRVA RU-29
FPAA RU-31
RMAA RU-33
PAPA RU-37
CRVB RU-30
CBPB RU-34
CBB RU-1
PAPB RU-38
NEW 1E SRMS LOOP 7
NEW 1E SRMS LOOP 6
KERIC RU-148
KERIC RU-150
KERIC RU-145
KERIC RU-146
KERIC RU-149
KERIC RU-151
HCAA RU-148
PCMA RU-150
FBLR RU-145
FBHR RU-146
HCAB RU-149
PCMB RU-151
POST ACCIDENT MONITORING UNIT (PAMU)
LOOP #3 POST ACCIDENT MONITORING SYSTEM (PAMS)
RU-139
RU-140
CVSE RU141
CVHR RU142
PVLR RU-143
PVHR RU-144
RU-152
RU-153
RU-154
RU-155
RU-156
RU-157
RU-158
LOOP #1
LOOP #2
ABFI RU-8
RLA RU-23
SGB2 RU-5
SGB1 RU-4
SRA RU-26
NFA RU-19
OLA RU-16
IIA RU-17
CFA RU-24
NCW RU-6
NSSS
CRA RU-18
WGVE RU-15
RBFI RU-14
WGDT RU-12
LBA RU-22
SSA RU-21
SPA RU-20
MSA RU-25
RTI RU-7
ECWA RU-2
ECWB RU-3
ABLL RU-9
ABUL RU-10
Remove

LEGEND-MONITOR:

DROP NO. / MONITOR NO. — MONITOR TYPE

IDENTIFIER(S)

BECHTEL TAG NUMBER

MONITOR TYPE
- A - AREA
- G - GAS
- L - LIQUID
- P - PARTICULATE
- I - IODINE-131
- S - STEAM LINE
- H - HYGROMETER
- PI - PARTICULATE IODINE COLLECTOR

NOTES:

1. MINICOMPUTER HARDWARE IS LOCATED IN HEALTH PHYSICS OFFICE EXCEPT FOR 1 TSC 8001, AND THE TERMINET 1200 PRINTER IN CONTROL ROOM
2. HOUSED IN MINICOMPUTER CABINETS.
3. PAMS MICROCOMPUTERS ARE LOCATED WITHIN THE PAMU; THE DETECTORS AND SKIDS ARE REMOTE.
4. a) MICROS HAVE KEPIC RECEPTACLES. b) MICROS HAVE PIC RECEPTACLES
5. MONITORS HAVE SKID MOUNTED KERIC UNITS.
6. a) MICROS HAVE KELIC UNITS. b) MICROS HAVE LIC UNITS.
7. LOCAL INDICATOR AND ALARM AT DETECTOR LOCATION.
8. MULTIPLE CHANNEL MONITORS SHOW THE IDENTIFIER FOR EACH CHANNEL.
9. NOT THE FULL TAG NUMBER.
10. RU-24 (CFA) IS IN UNIT 1 ONLY.
11. DROP NUMBERS 3 & 4. MONITOR NUMBERS 17 & 18 ARE OUT OF ORDER. THIS CREATES NO PROBLEMS IN SYSTEM OPERATION.

ADDITIONAL EQUIPMENT

PORTABLE MONITOR (A), PORTABLE MONITOR (A), PORTABLE MONITOR (A), MOVEABLE AIR BORNE MONITOR RU-53 (PIG), PCA RU-27 (A), PCA RU-28 (A), KEPIC FOR PAMU, KEPIC FOR PAMU, KEPIC FOR PAMU, PIC FOR FIELD, PIC FOR FIELD, PIC FOR FIELD, PIC FOR FIELD, RECEPTOR IN 1E CABINET

PORTABLE MONITOR TAG NUMBER
- UNIT 1: RU-61 RU-62 RU-63 RU-51
- UNIT 2: RU-64 RU-65 RU-66 RU-52
- UNIT 3: RU-67 RU-68 RU-69 RU-53

* PORTABLE UNIT CONNECTION BOX

Palo Verde Nuclear Generating Station
FSAR

PROCESS, EFFLUENT, AND AREA RADIATION MONITORING SYSTEM BLOCK DIAGRAM

FIGURE 11.5-1

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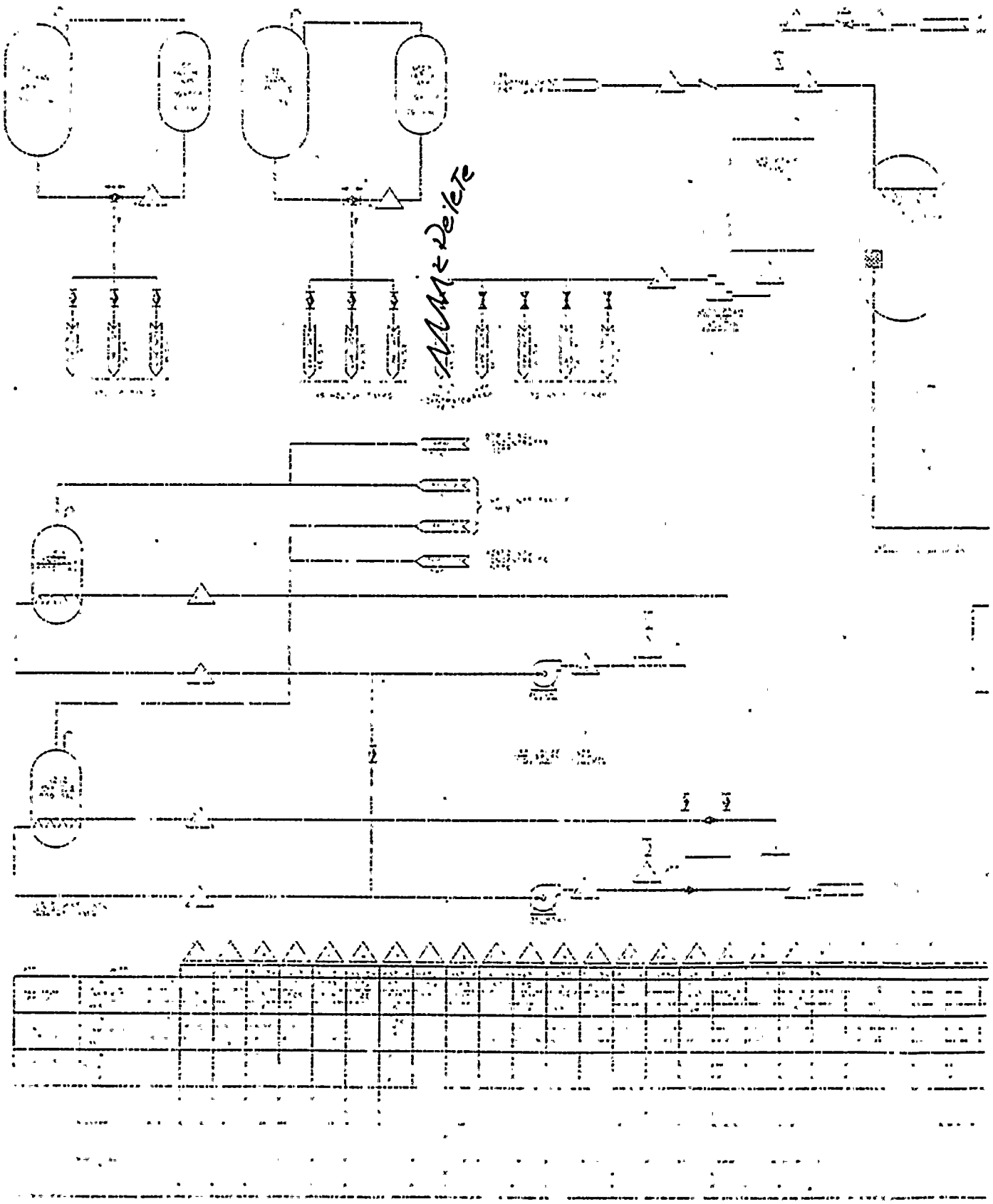

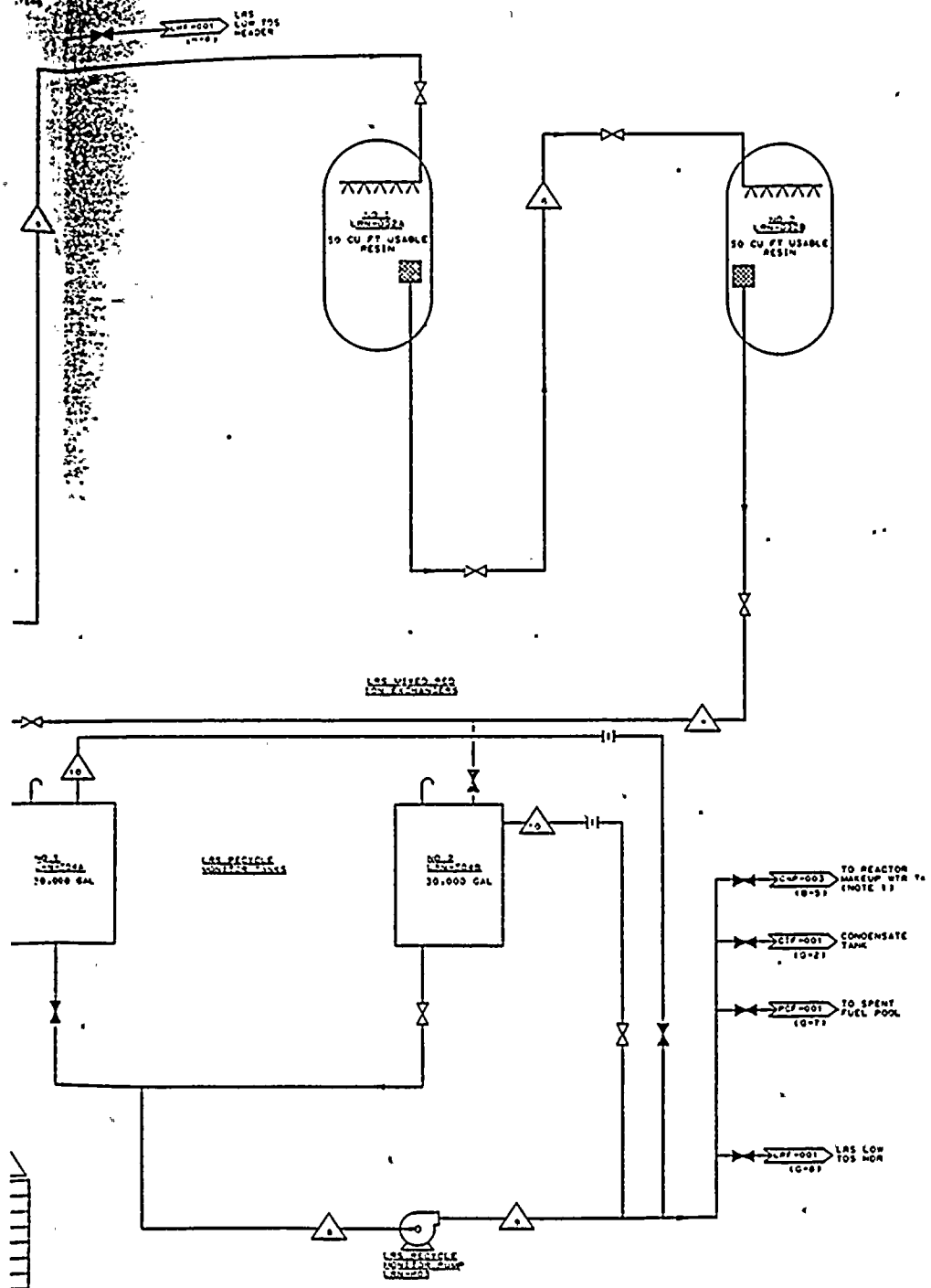

NOTE:

1. [illegible]
2. WHEN CONCENTRATE SOLUTION CONTAINS A CRYSTALINE SLURRY CONCENTRATE MONITOR TANK CONTENTS MUST BE CONTINUOUSLY RECIRCULATED USING THE SAMPLE MODE RETURN LOOP (VIA NODE 43) TO MAINTAIN SUSPENSION OF CRYSTALS IN SOLUTION.
3. GRAVITY FLOW
4. GAL/HR

THE DATA SHOWN ON THIS FLOW DIAGRAM ARE FOR DESIGN PURPOSES ONLY, AND WHILE USEFUL AS GUIDES IN OPERATION, DO NOT REPRESENT EXACT OR GUARANTEED OPERATING CONDITIONS.

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Palo Verde Nuclear Generating Station
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FLOW DIAGRAM
LIQUID RADWASTE SYSTEM
(Sheet 2 of 2)

FIGURE 11.2-1

test of a representative sample of the impregnated activated charcoal is performed to verify iodine removal efficiencies.

Design and testing of ESF filtration systems is consistent with the recommendations of NRC Regulatory Guide 1.52, Design, Testing and Maintenance Criteria for Atmosphere Cleanup System Air Filtration and Adsorption Units of Lightwater-Cooled Nuclear Power Plants, as discussed in section 1.8.

Preoperational testing is performed on systems in accordance with the test descriptions in section 14.2.

6.5.1.4.2 Inservice Testing

Inservice testing of the ESF filtration systems is conducted in accordance with the surveillance requirements of Sections 3/4.6.4.3, 3/4.7.7, 3/4.7.8, 3/4.9.12 of the Technical Specifications. 15

6.5.1.5 Instrumentation Requirements

Controls and instrumentation for the control room and for the fuel building systems are discussed in section 7.3. Each system is designed to function automatically upon receipt of an ESF actuation system signal. Fans can also be controlled from the control room.

The status of the essential ventilation equipment is displayed in the control room during both normal and accident operations.

Section 1.8 addresses the extent to which the recommendations of NRC Regulatory Guide 1.52 are followed with respect to instrumentation.

6.5.1.6 Materials

The materials of construction used in or on the filter systems are given in sections 6.4.2.2 and 9.4.5.2. Each of the materials is compatible with the normal and accident environments postulated in the control room and the fuel building.