

14 13 12 11 10 9 8 7 6 5 4 3 2 1

K
J
I
H
G
F
E
D
C
B
A

TABLE 1 LPRM TO APRM ASSIGNMENTS

Table with 5 columns: DET AND LPRM LOCATION, APRM CHANNEL, UNIT NO., and 4 sub-columns for channels A, B, C, D. Rows include locations like 20-61, 28-61, 36-61, etc.

TABLE 1 LPRM TO APRM ASSIGNMENTS (CONT'D)

Table with 5 columns: DET AND LPRM LOCATION, APRM CHANNEL, UNIT NO., and 4 sub-columns for channels A, B, C, D. Rows include locations like 12-21, 20-21, 28-21, etc.

(NOTE 9)

TABLE 3 POWER DISTRIBUTION

Table with 5 columns: DIVISION, and 4 sub-columns for channels A, B, C, D. Rows include SRM CH'S, APRM CH'S, MRBM CH'S, and SRM/APRM/MSV RECORDERS.

TABLE 2 LPRM STRING ASSIGNMENT TO ATIP MACHINES

Table with 6 columns: ATIP A, ATIP B, ATIP C, and 2 sub-columns for LPRM LOC. Rows include positions 1 through 20.

LEGEND:

- - LPRM DETECTOR ASM (52)
+ - CONTROL RODS (205)
□ - SRM DETECTORS (10)
△ - NEUTRON SOURCES (5)
□ - SIGNAL ISOLATION
△ - COMPUTER INPUTS
△ - TRANSIENT TEST PANEL INPUTS
⇒ - DATA TRANSMISSION [VIA OPTIC FIBER]
→ - SINGLE TRANSMISSION

ABBREVIATIONS:

- RPS --- REACTOR PROTECTION SYSTEM
SRNM --- STARTUP RANGE NEUTRON MONITOR
LPRM --- LOCAL POWER RANGE MONITOR
APRM --- AVERAGE POWER RANGE MONITOR
ATIP --- AUTOMATED TRAVELING INCORE PROBE
MRBM --- MULTI-CHANNEL ROD BLOCK MONITOR
UPS --- UNINTERRUPTABLE POWER SUPPLY
NMS --- NEUTRON MONITORING SYSTEM
RC&IS --- ROD CONTROL AND INFORMATION SYSTEM
MCRP --- MAIN CONTROL ROOM PANEL
PMCS --- PERFORMANCE MONITORING CONTROL SYSTEM
APRS --- AUTOMATIC POWER REGULATOR SYSTEM
MSV --- MEAN SQUARE VOLTAGE
ATLM --- AUTOMATED THERMAL LIMIT MONITOR
OPRM --- OSCILLATION POWER RANGE MONITOR
RTIS --- REACTOR TRIP AND ISOLATION SYSTEM

SUPPLEMENTAL DOCUMENTS UNDER THE FOLLOWING IDENTITIES ARE TO BE USED IN CONJUNCTION WITH THIS DRAWING:

- 1. RECIRCULATION FLOW CONTROL SYS. IED
2. PMCS INPUT/OUTPUT LIST
3. PIPING AND INSTRUMENT SYMBOLS DIAGRAM
4. REACTOR PROTECTION SYS. IED
5. ROD CONTROL AND DEFORMATION SYS. IED
6. PMCS IED
7. MCRP SYSTEM IED
8. AUTOMATIC POWER REGULATOR SYS. IED
9. NEUTRON MONITORING SYSTEM IED
10. NEUTRON MONITORING SYS ARRGM'T

MPL NO. table with 2 columns: MPL NO. and values like C81-1040, C90-1080, A10-3030, etc.

NOTES:

- 1. THIS DOCUMENT PRESENTS THE BASIC REQUIREMENTS OF FUNCTIONAL UNITS ALLOCATION OF THE NMS INSTRUMENTS. THEIR BASIC FUNCTIONS AND THEIR INPUT AND OUTPUT REQUIREMENTS TO OTHER SYSTEMS...
2. ALL EQUIPMENTS, INSTRUMENTS AND DISPLAY CONTROL SYSTEM INPUT SIGNALS ARE PREFIXED BY C51- UNLESS OTHERWISE NOTED...
3. AN AREA RADIATION MONITOR IS RECOMMENDED TO BE INSTALLED IN THE TIP DRIVE MECHANISM ROOM, AND THE OUTSIDE OF THE PERSONNEL HATCH DOOR...
4. REMOTE DISPLAY MEANS DISPLAY ON MAIN CONTROL PANEL. FOR DISPLAY DEVICE TYPE, REFER TO C51-5030.
5. REMOTE RECORDING DEVICE SHALL BE BASED ON THAT SPECIFIED IN H11-4010.
6. SRNM NON-COINCIDENT UPSCALE LEVEL TRIP IS ONLY ACTIVATED BY MANUAL SWITCH IN UPS.
7. THESE ARE SAFETY RELATED CORE PLATE DIFFERENTIAL PRESSURE (C81-DPT301A-D) SIGNALS OF THE RFCS ESSENTIAL CORE PLATE DIFFERENTIAL PRESSURE SIGNALS.
8. COMMAND AND CONTROL SIGNALS BETWEEN THE (PLANT COMPUTER) FUNCTIONS AND THE ATIP OTHER THAN ATIP MEASURED DATA ARE TRANSMITTED THROUGH THIS DATA ENTRY POINT.
9. DETECTORS SIGNALS ARE DISTRIBUTED TO FOUR UNITS, IN EACH DIVISION ACCORDING TO TABLE 1 ARRANGEMENT. THE UNIT ASSIGNMENT ONLY DEPENDS ON LPRM STRING LOCATION AND ARE IDENTICAL FOR ALL FOUR DIVISIONS.
10. THE DATA COMMUNICATION FUNCTION (DCF) REFERS TO THE INPUT/OUTPUT FUNCTION OF THE SRNM AND THE APRM. THIS IED DOES NOT SPECIFY THE ACTUAL HARDWARE IMPLEMENTATION OF THIS DCF.
11. FOR DETAIL TRIP SIGNAL FUNCTIONAL INTERFACES WITH RCIS & RPS, REFER TO SUPPL. DOC. 9. THERE SHOULD BE A SEPARATE RCIS AND RPS TRIP LOGIC FUNCTION INDEPENDENT OF EACH INDIVIDUAL SRNM CHANNEL IN THE DIVISION. THE RTIS INTERLOCK SIGNAL IS THE "ATWS PERMISSIVE" SIGNAL.
12. THIS IED INCLUDES ALL MAIN INPUT/OUTPUT SIGNALS REQUIRED TO BE INCLUDED IN THE INSTRUMENT DESIGN. FOR DETAIL BINARY TRIP SIGNALS, REFER TO NMS IBD. SUPPLEMENTAL DOCUMENT 9.
13. THE SIGNAL TRANSMISSION PATH CAN BE THROUGH DEDICATED CONDUCTORS.
14. TRIP SIGNAL FROM THE NMS TO THE PMCS SHALL BE TRANSMITTED VIA DEDICATED CONDUCTORS (E.G. METAL CABLE WITH PROPER ISOLATION) TO AVOID UNNECESSARY TIME DELAY FOR TRIP SEQUENCE RECORDING.
15. THE OPRM IS A FUNCTIONAL SUBSYSTEM OF THE APRM. IT RECEIVES THE SAME LPRM SIGNALS, THE APRM OF THE SAME DIVISION RECEIVES AS INPUT, AS SHOWN IN TABLE 1. THE OPRM LOGIC IS DISCRIBED IN SUPPL. DOC. 9.

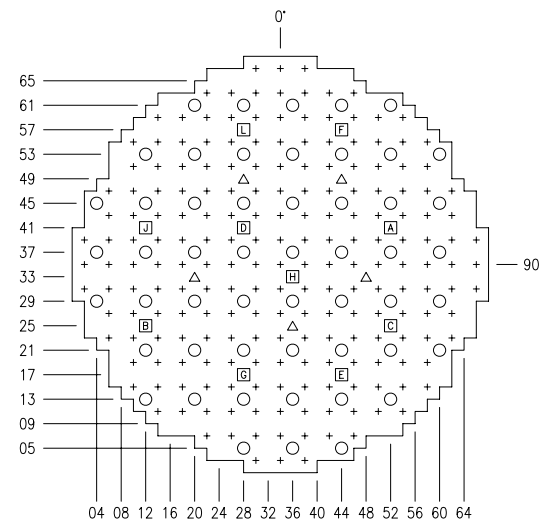
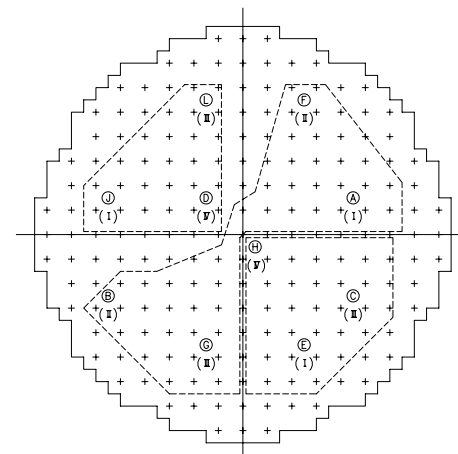


FIGURE 1: DETECTOR AND CONTROL ELEMENT ARRANGEMENT [TOP VIEW OF CORE]



NMS DIVISION I: A, E, J
NMS DIVISION II: B, F
NMS DIVISION III: C, G, L
NMS DIVISION IV: D, H
BYPASS GROUP 1: A, B, F, G
BYPASS GROUP 2: C, E, H
BYPASS GROUP 3: D, J, L

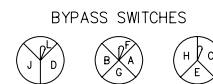


FIGURE 2: SRNM DIVISION & BYPASS GROUP ASSIGNMENTS

MPL NO. C31-1040

Figure 7.6-1 – Neutron Monitoring System IED (Sheet 1 of 4)

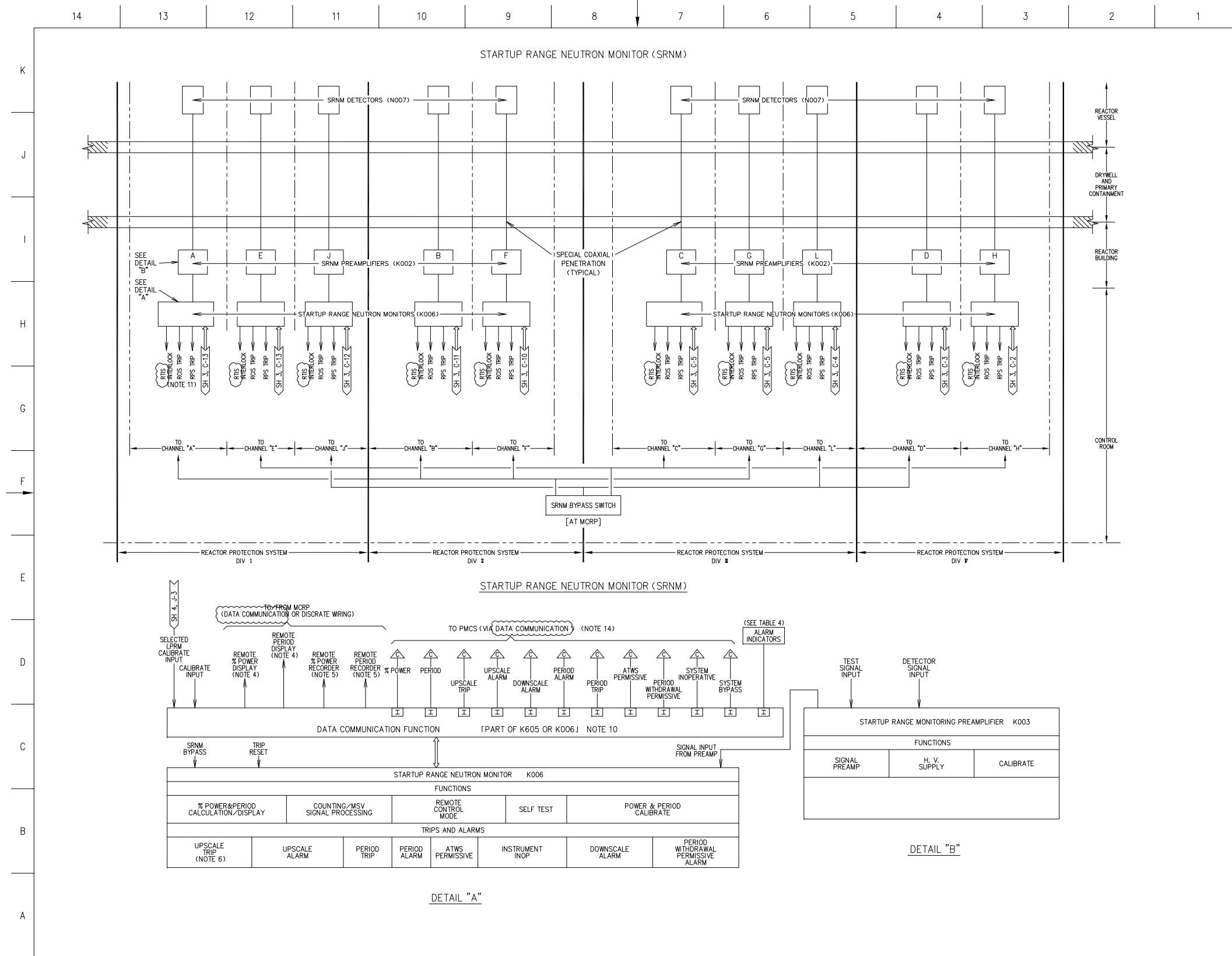


Figure 7.6-1 – Neutron Monitoring System IED (Sheet 2 of 4)

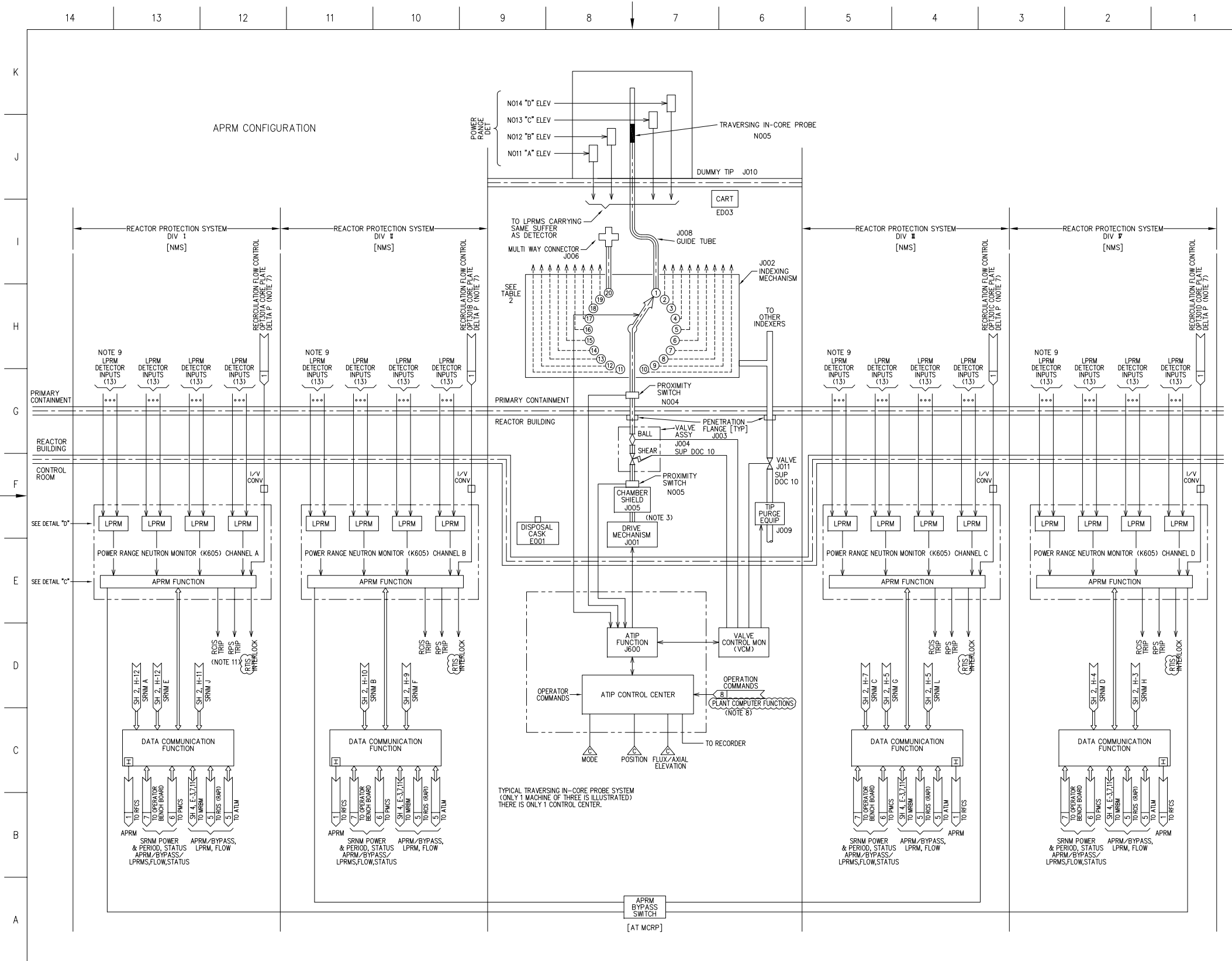


Figure 7.6-1 – Neutron Monitoring System IED (Sheet 3 of 4)

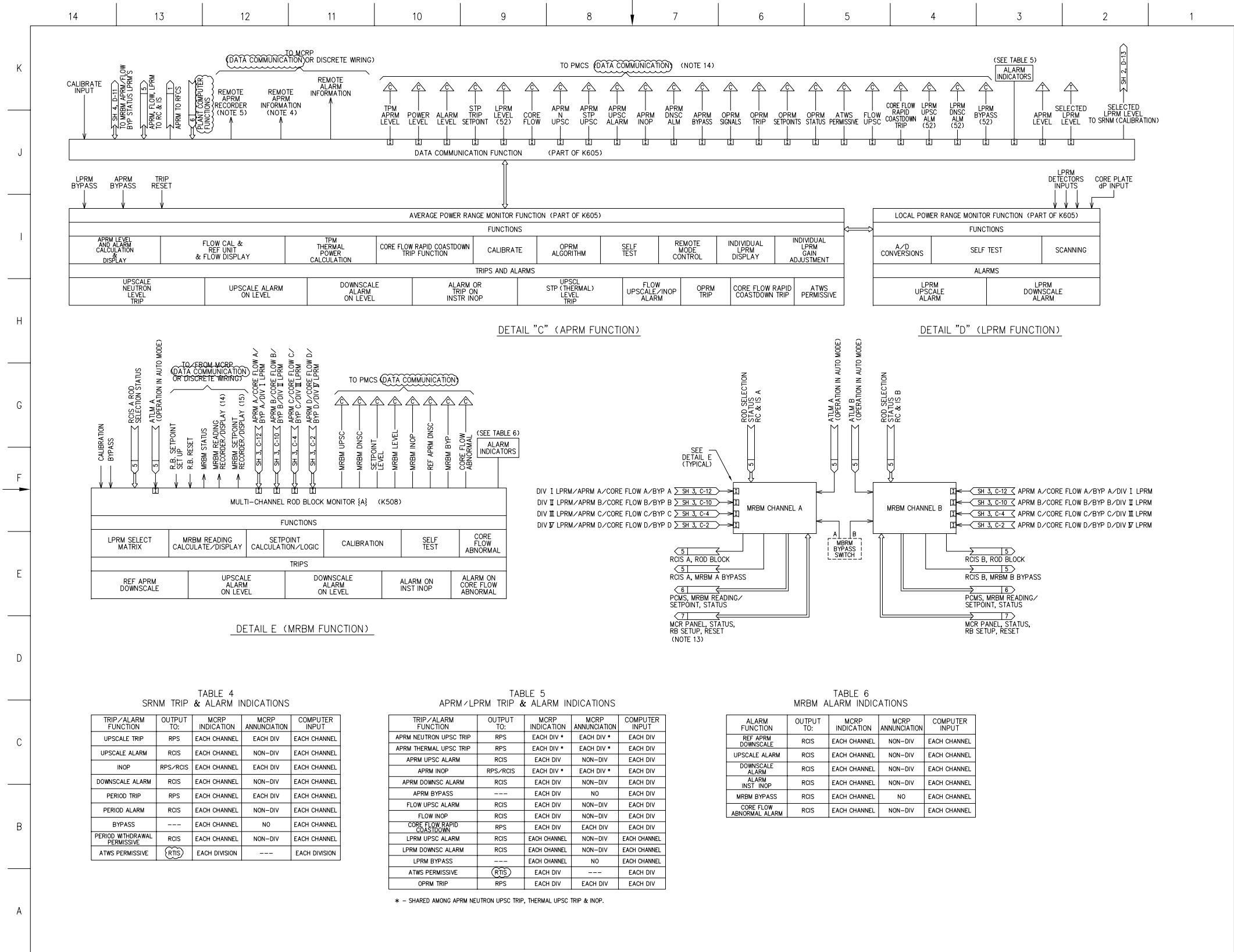


Figure 7.6-1 – Neutron Monitoring System IED (Sheet 4 of 4)

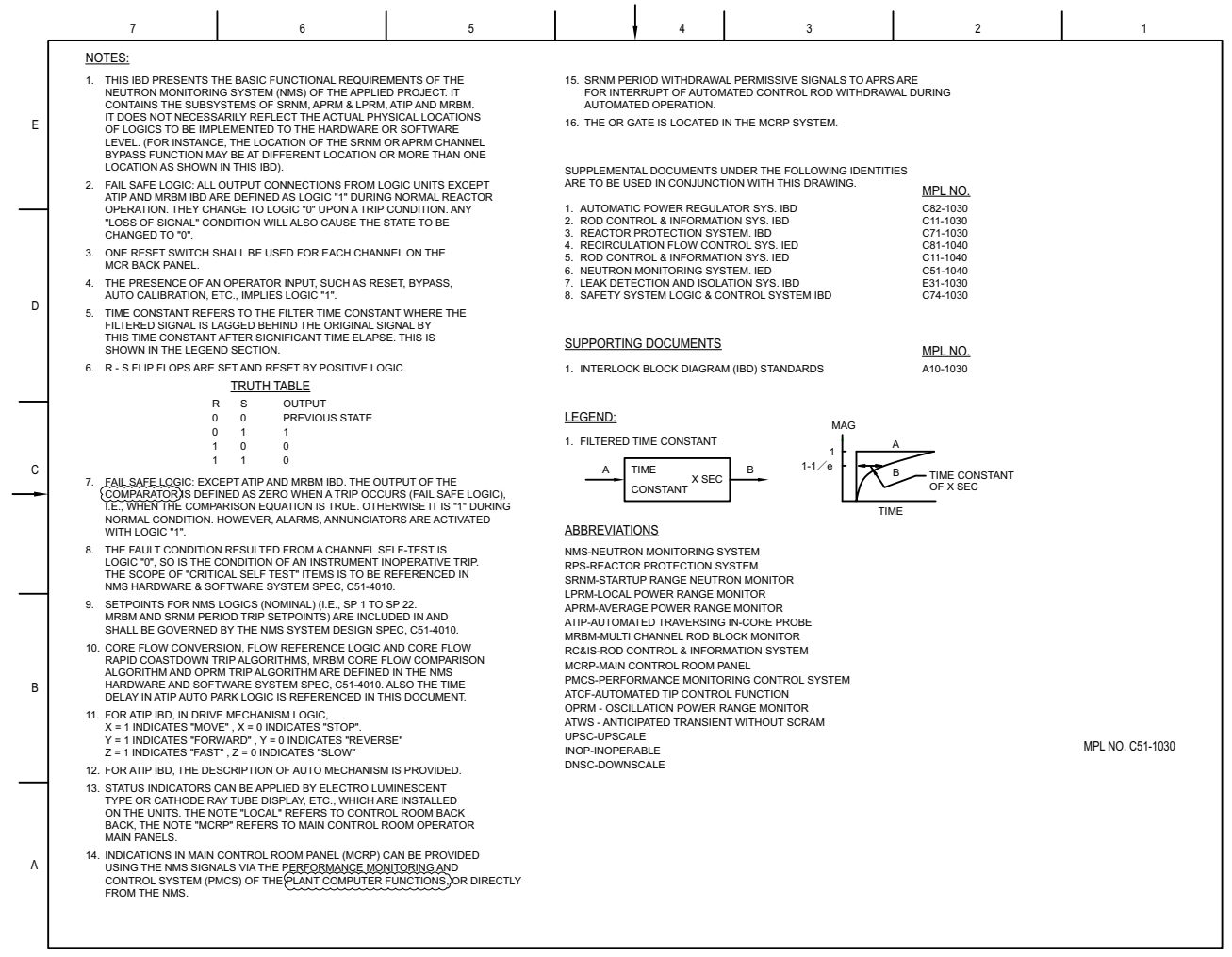


Figure 7.6-2 – Neutron Monitoring System IBD (Sheet 1 of 28)

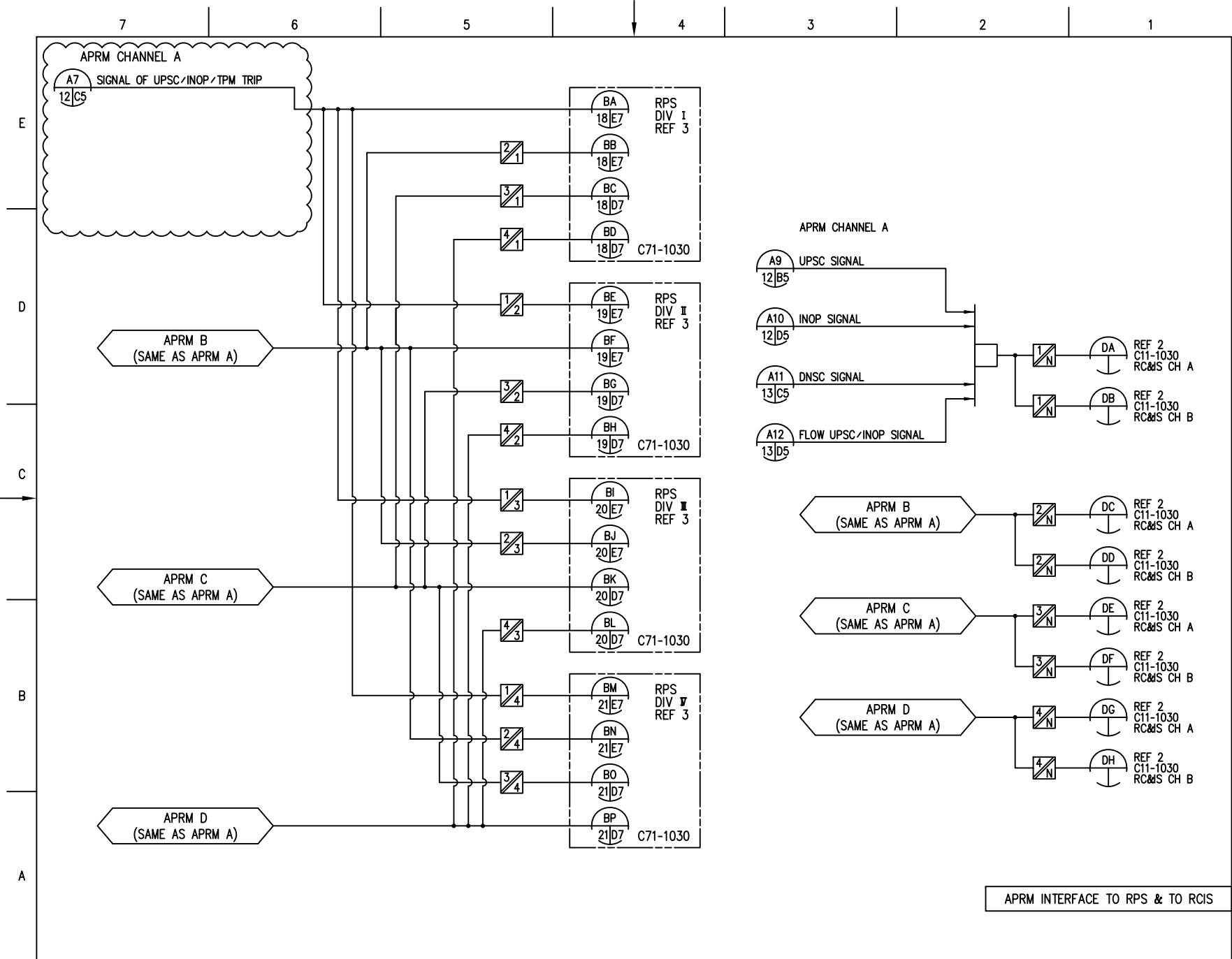


Figure 7.6-2 – Neutron Monitoring System IBD (Sheet 9 of 28)

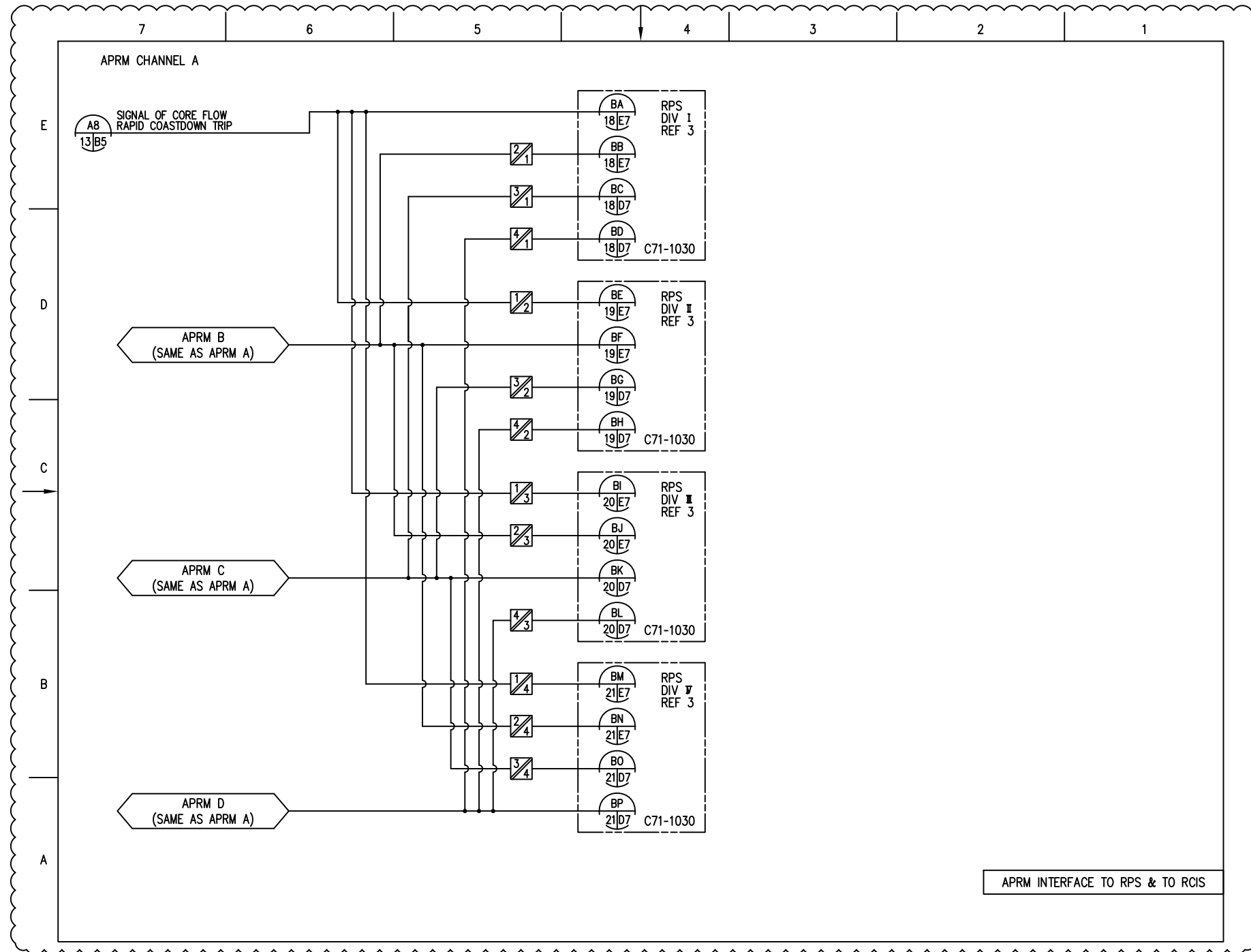


Figure 7.6-2 – Neutron Monitoring System IBD (Sheet 9a of 28)

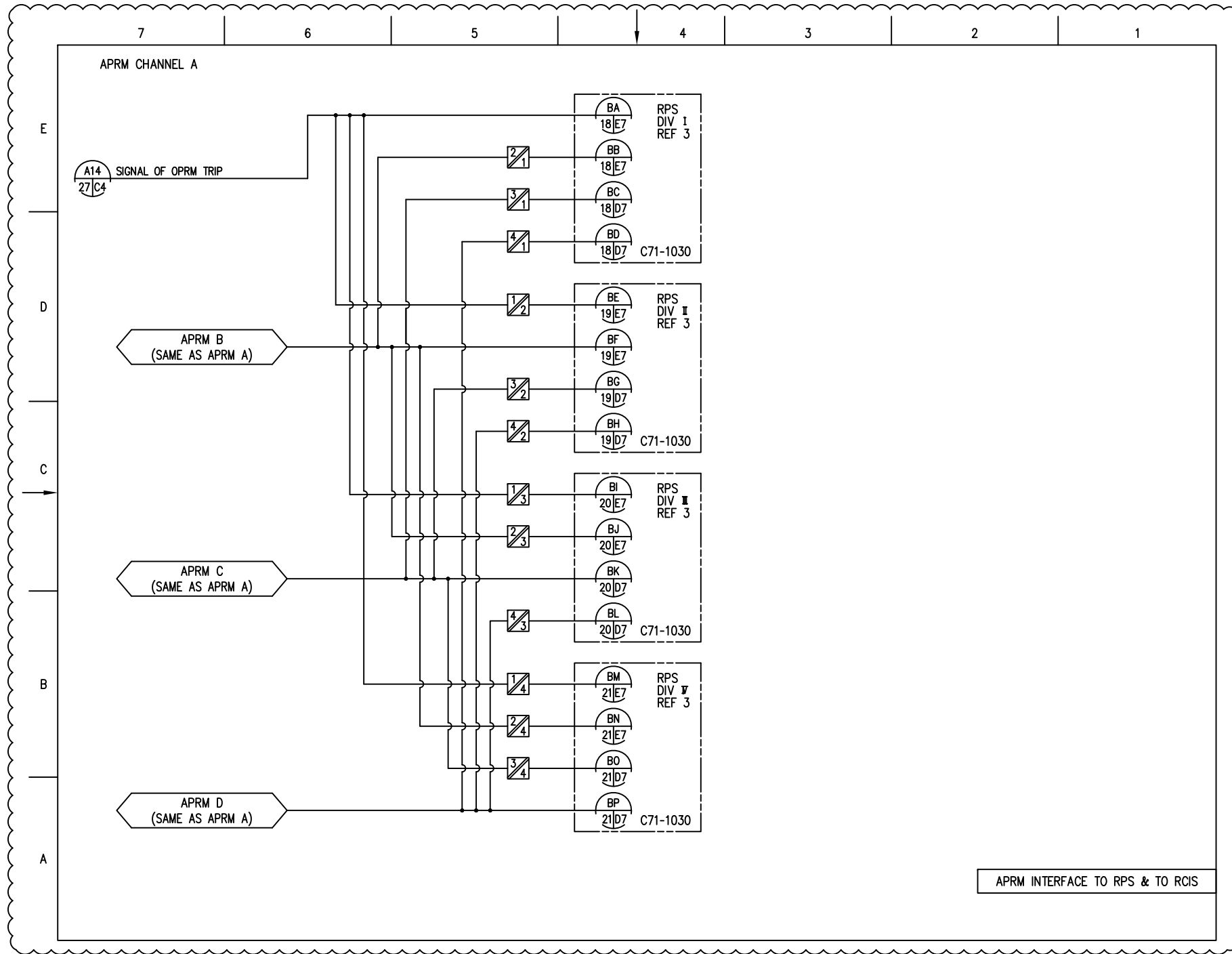


Figure 7.6-2 – Neutron Monitoring System IBD (Sheet 9b of 28)

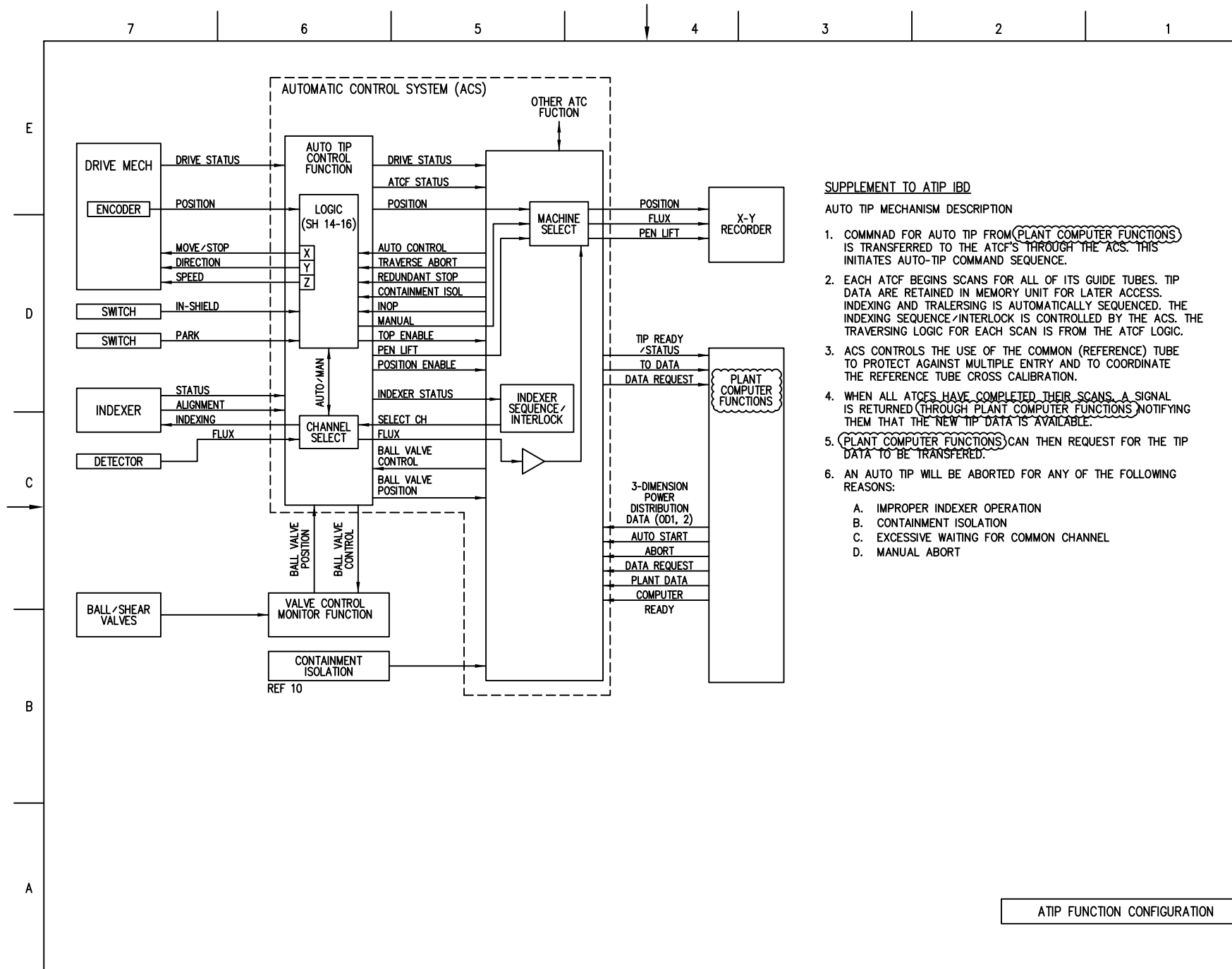


Figure 7.6-2 – Neutron Monitoring System IBD (Sheet 14 of 28)

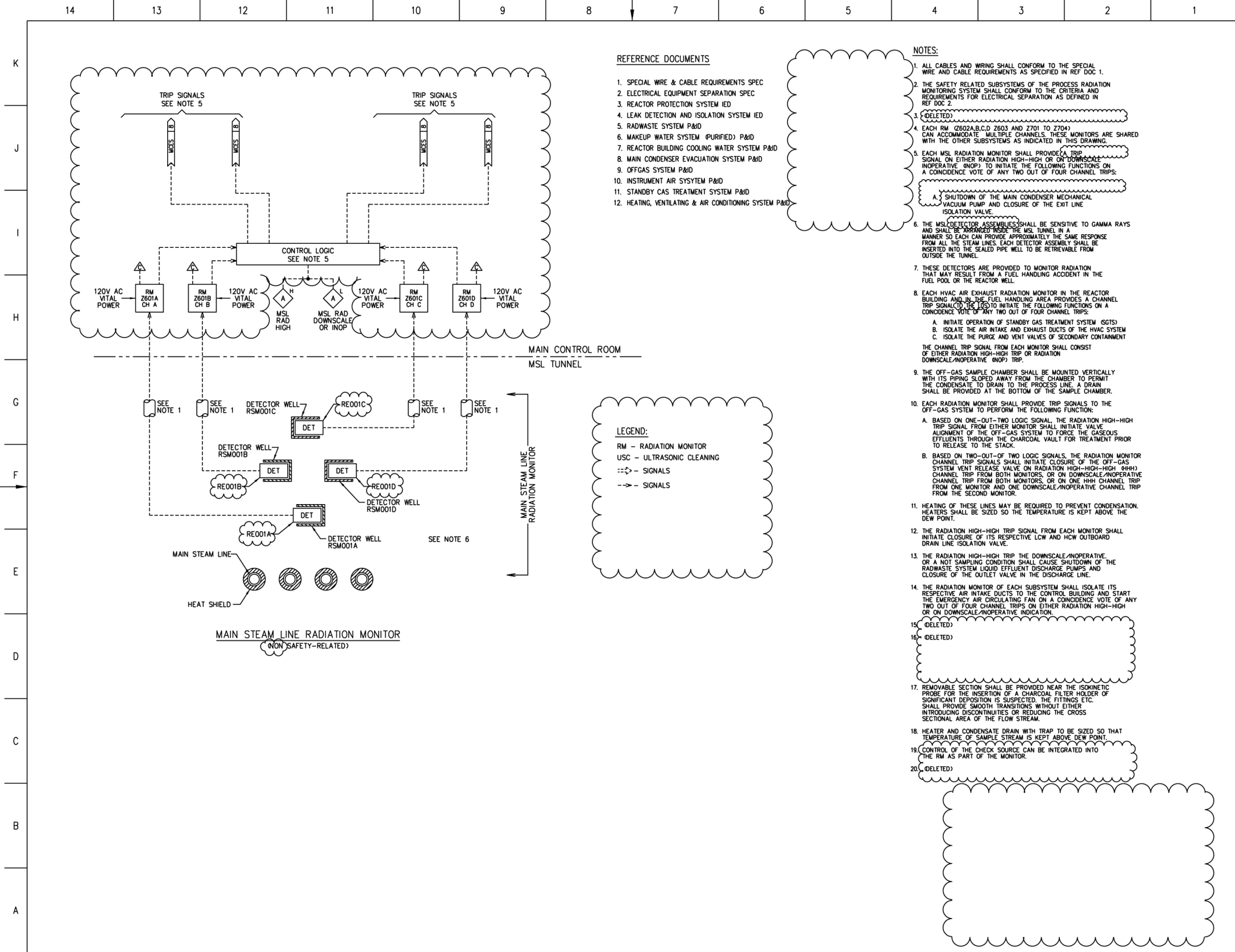


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 1 of 11)

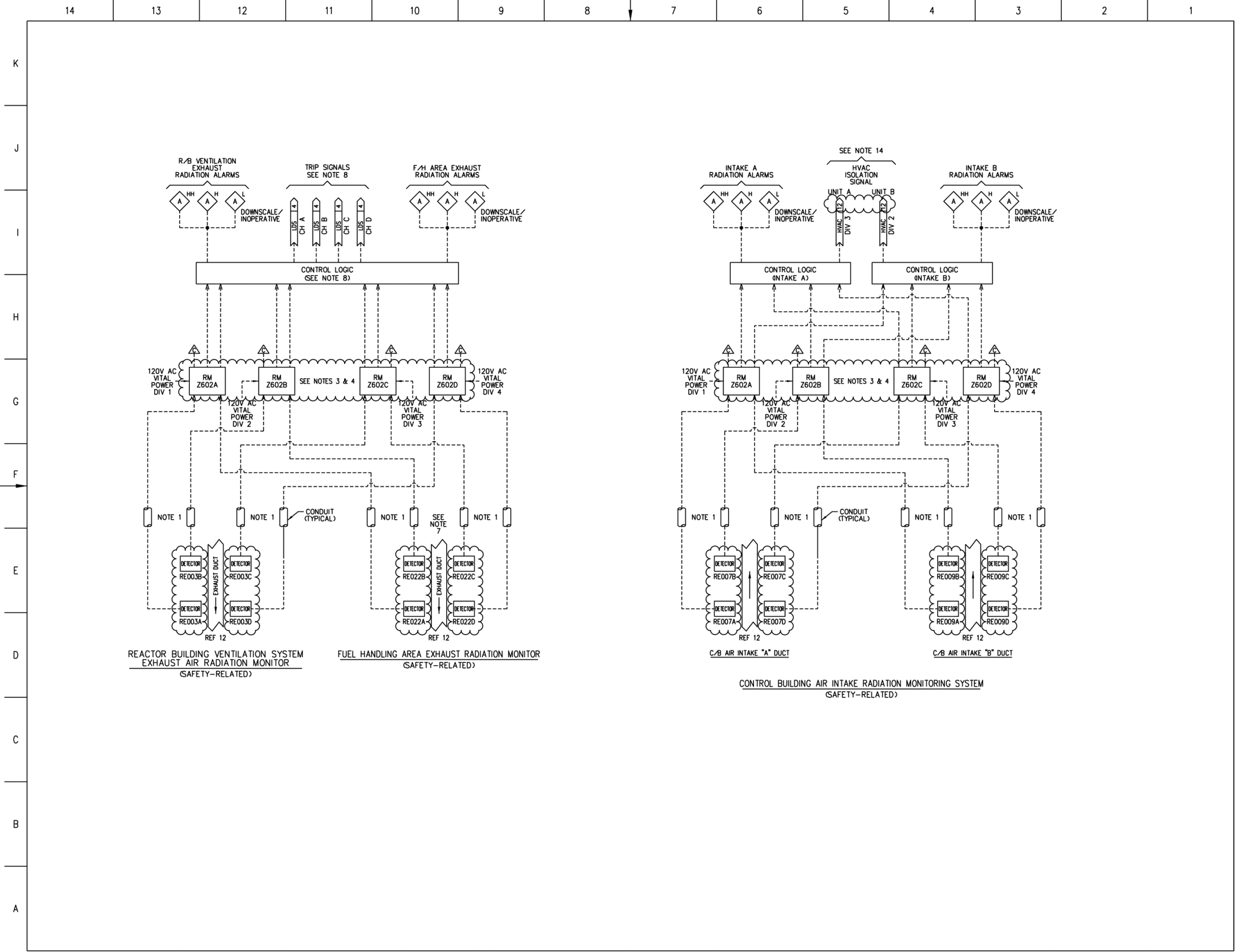


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 2 of 11)

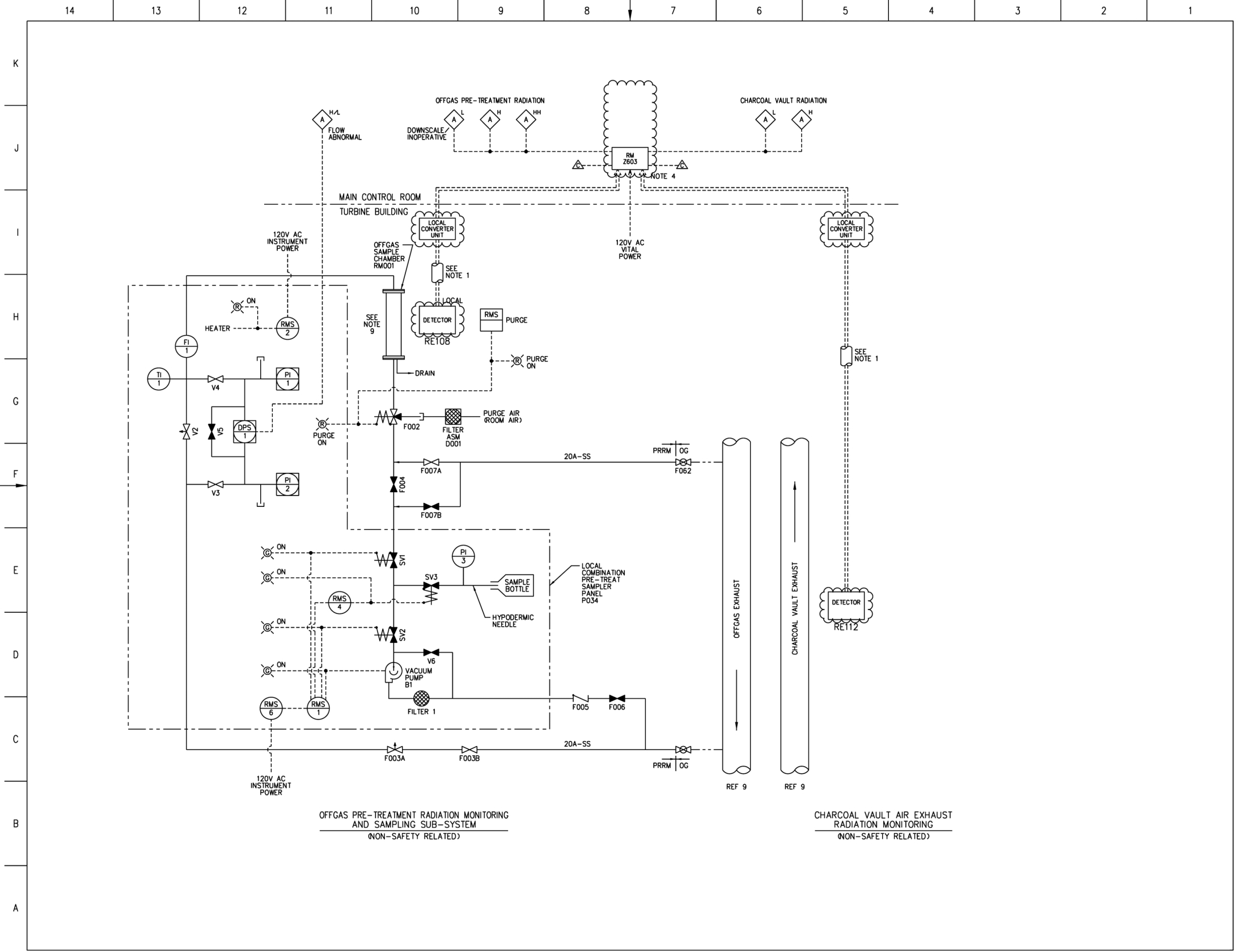


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 3 of 11)

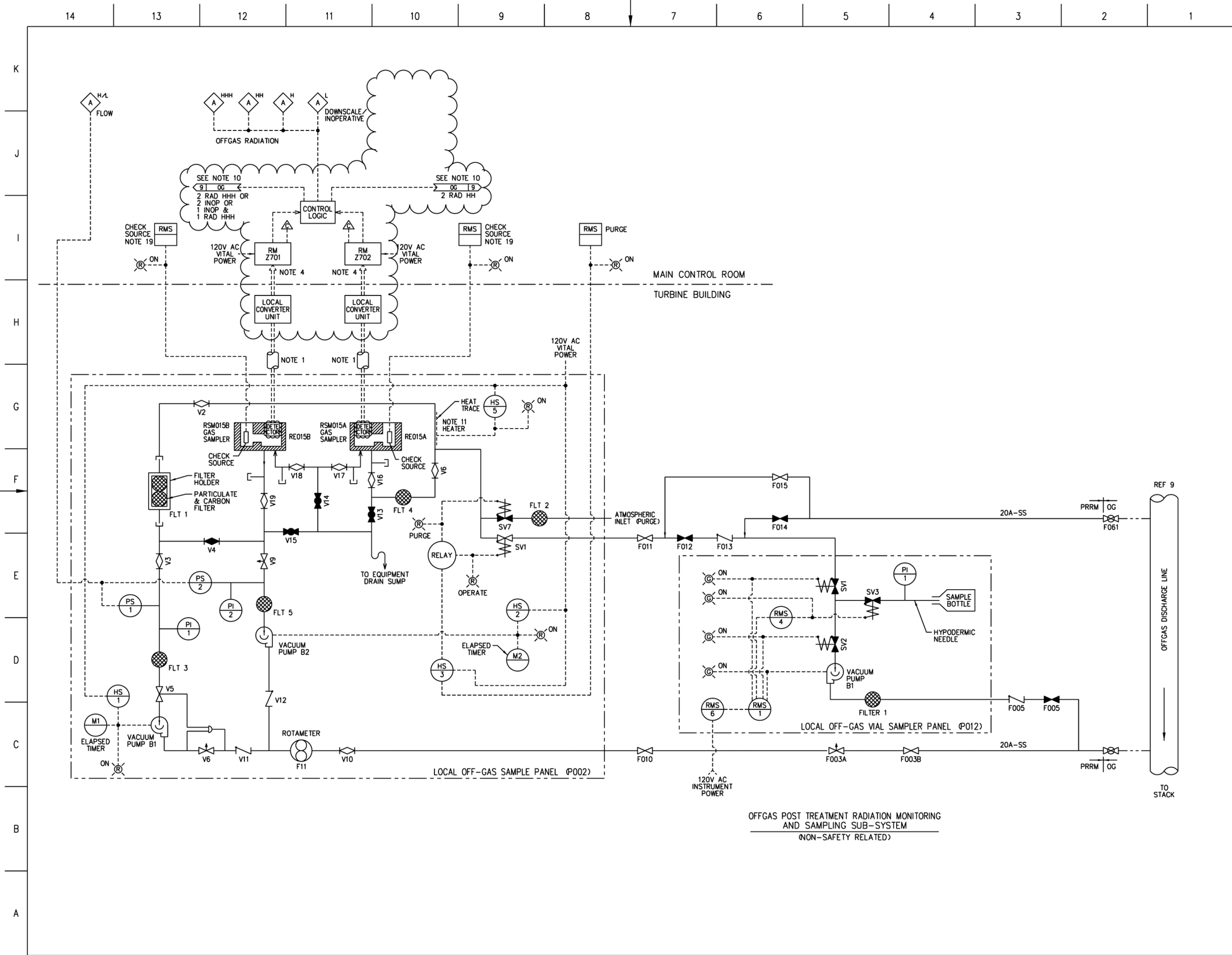


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 4 of 11)

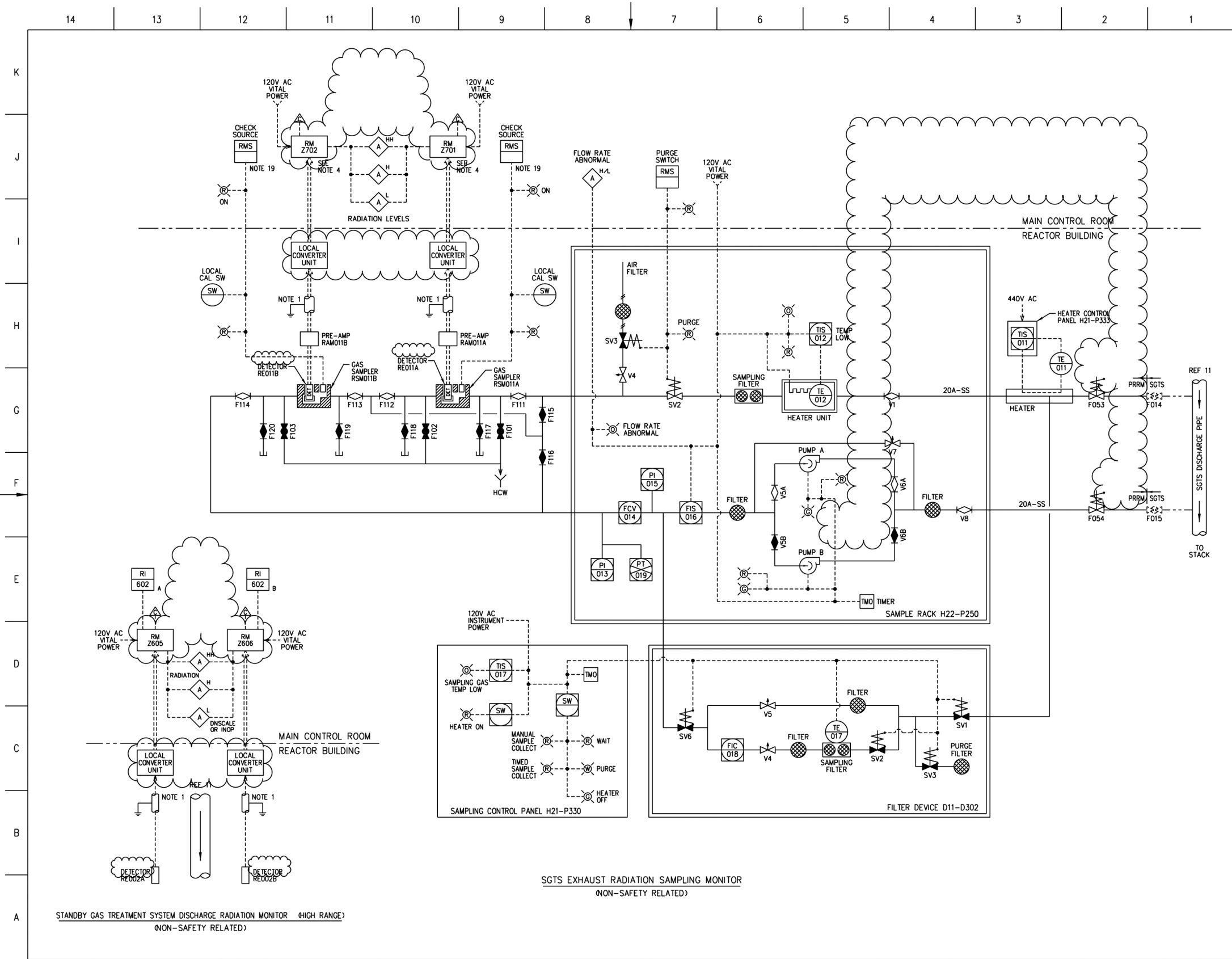


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 5 of 11)

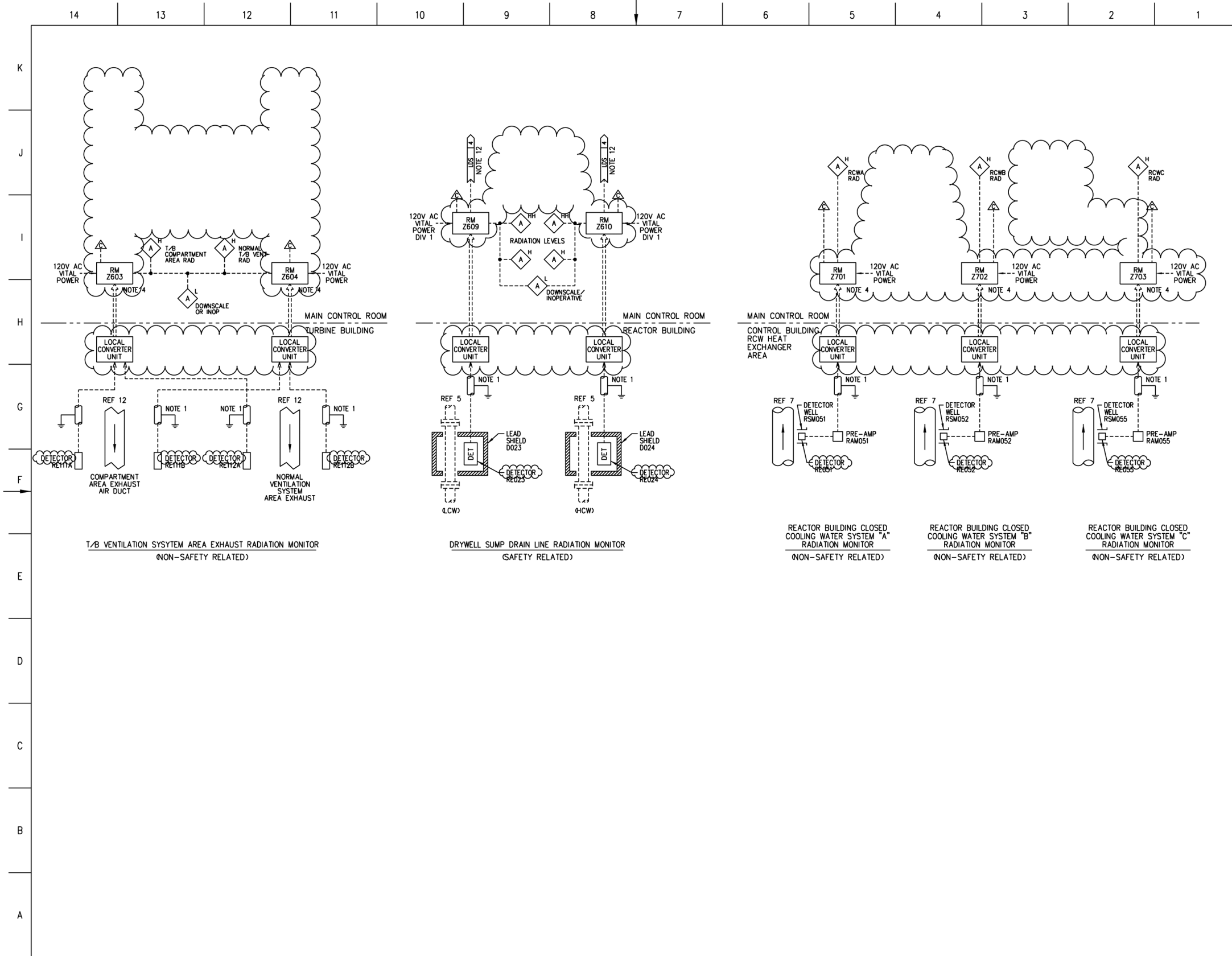


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 6 of 11)

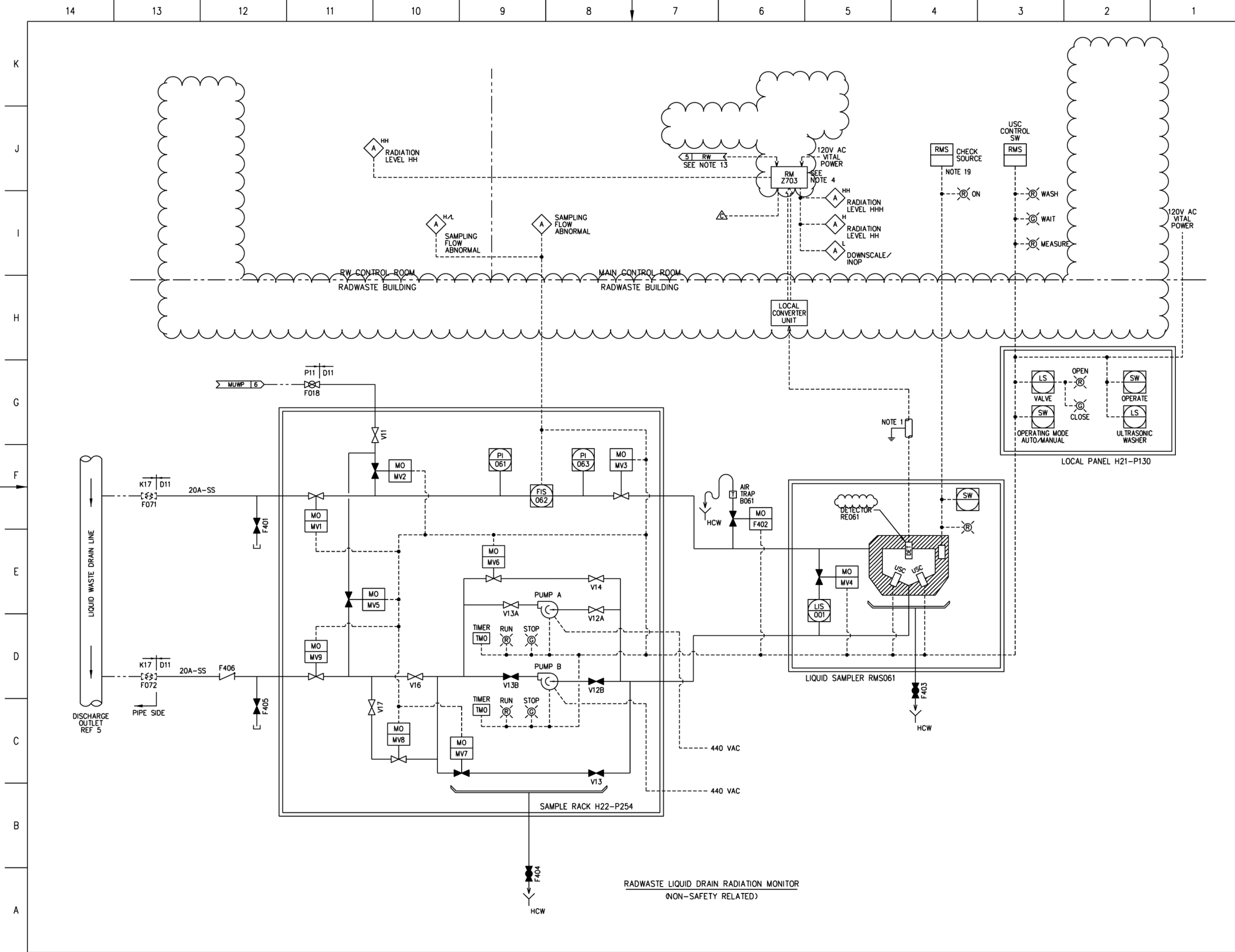


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 7 of 11)

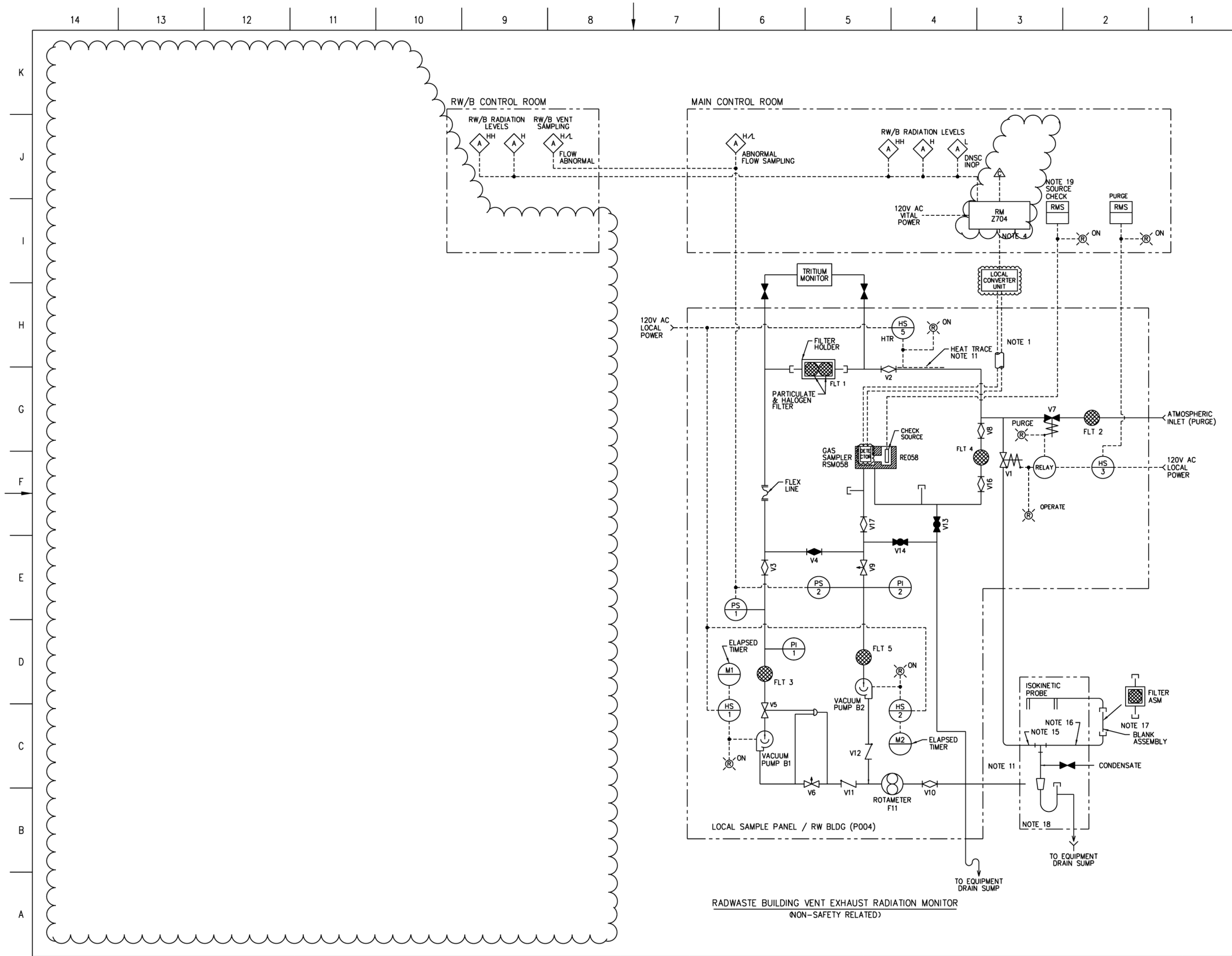
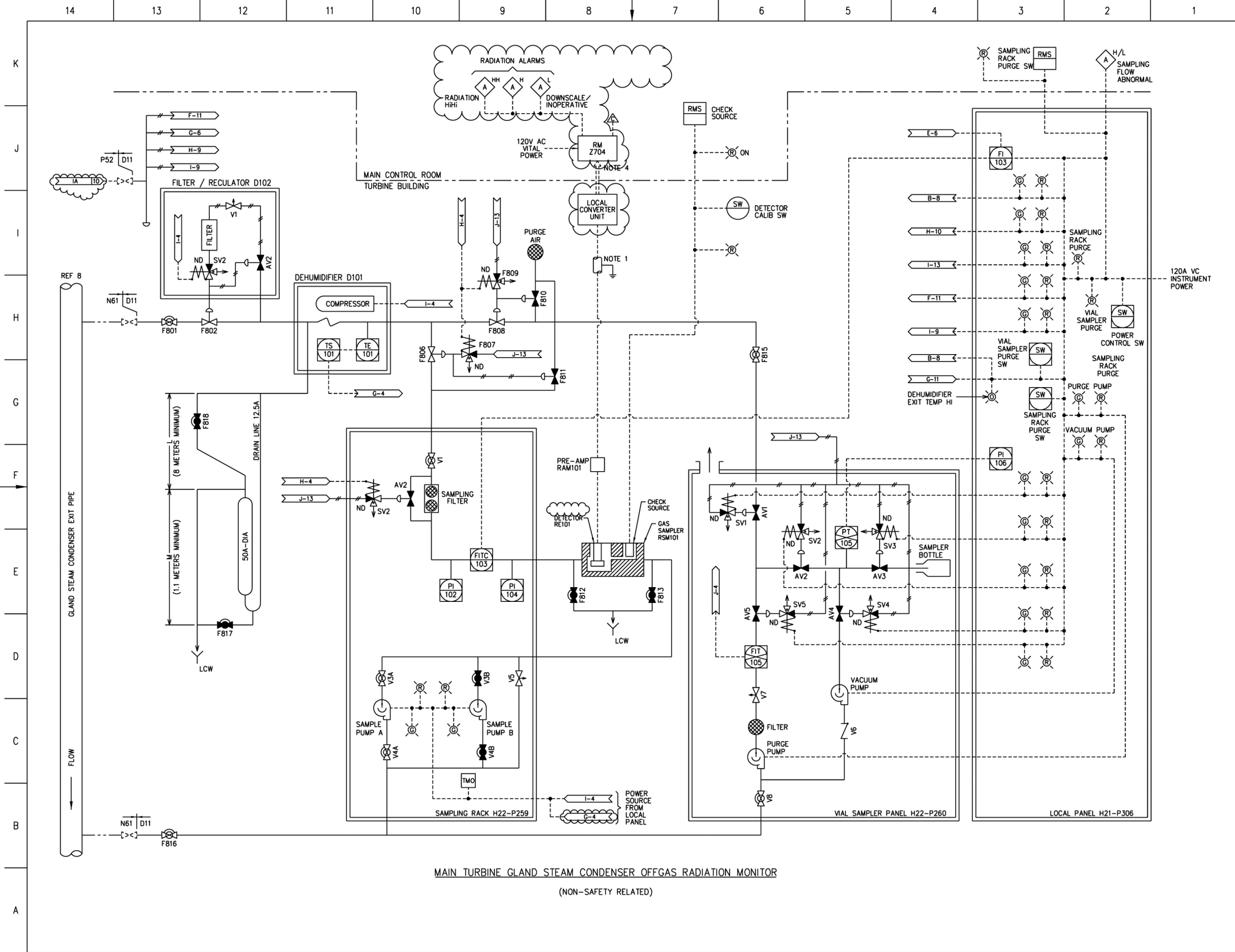


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 8 of 11)



MAIN TURBINE GLAND STEAM CONDENSER OFFGAS RADIATION MONITOR
(NON-SAFETY RELATED)

Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 9 of 11)

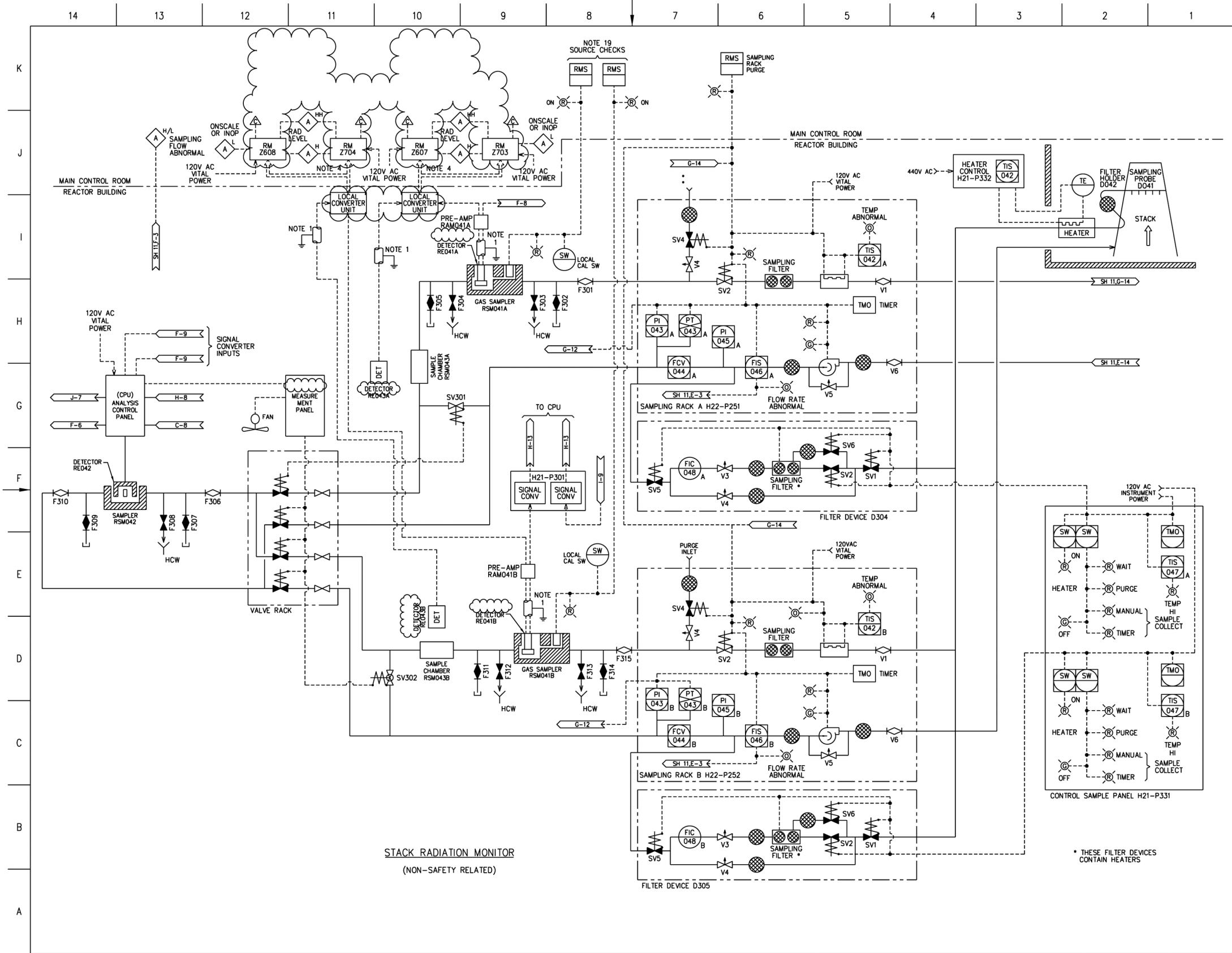


Figure 7.6-5 – Process Radiation Monitoring System IED (Sheet 10 of 11)