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NINE MILE POINT NUCLEAR STATION UNIT 2

OPERATING PROCEDURE

PROCEDURE NO. N2-OP-79

RADIATION MONITORING

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NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE USED AFTER January 1993
SUBJECT TO PERIODIC REVIEW.

N2-OP-79

RADIATION MONITORING SYSTEM

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7.0 Supplemental References

None

8.0 Commitments

None

B. SYSTEM DESCRIPTION

1.0 Digital Radiation Monitoring System (DRMS)

The Radiation Monitoring System (DRMS) collects and processes data from radiation monitoring sensors throughout the plant. It incorporates the functions of an Area Radiation Monitoring System (ARM) and a Process Radiation Monitoring System (PRM).

The area radiation monitors report and record gamma radiation levels in areas where radioactive materials may be stored, transported, or inadvertently introduced. The ARM provides warning alarms for such events as spillage of radioactive liquids and materials, pipe or tank leaks, stored fuel damage or damage to radiation shielding. The Area Radiation Monitoring system does not initiate any protection or control functions.

ARM uses 58 radiation monitors distributed throughout the plant. Most of these monitors are Geiger-Muller tubes, the rest are ionization chambers. Each area radiation monitor sends its output signal to its associated microcomputer data processor. The data processor provides local indication of radiation level and annunciation of conditions of high radiation level or channel failure. The output signal from the data processor is sent to the central computer which collects all the information from the individual data processors and feeds the display terminals in the Control Room and other important stations. These terminals also have alarm capabilities to annunciate high radiation levels and channel failure.

The PRM monitors radiation levels in potentially contaminated liquid process streams, gaseous process streams, and the airborne radioactivity levels in potentially contaminated ventilation ducts and the primary containment.

When the level of radioactivity in the monitored system exceeds predetermined setpoints, the condition is annunciated in the control room and in some cases trip signals automatically close isolation valves to control the release of radioactivity to the environment.

B. SYSTEM DESCRIPTION (Cont'd)

1.0 (Cont'd)

The processing of signals from the PRM radiation detectors is accomplished in the same way as the area radiation monitors. Process radiation monitoring uses the same kinds of data microprocessors feeding the same central processor as ARM. PRM signals are displayed on the same data terminals in the control room and other important stations. The monitors, processors, and display terminals are part of the Digital Radiation Monitoring system whose subsystems are described below.

The DRMS consists of two major subsystems: The Data Acquisition System (DAS), and the Display and Control System (DCS).

The Data Acquisition System consists of eight serially connected chains or loops of radiation monitoring units. Six of these loops are comprised of non-safety related monitors and the other two loops contain the Class 1E or, safety related monitors. These latter two loops, containing the Class 1E units are sometimes referred to as the SRMS (Safety Related Monitoring System).

The Class 1E monitors measure radiation levels in certain areas of the facility which are important for personnel safety and, therefore, have a separate interface to the DCS for electrical isolation and independent communications access between each of these monitors and the DCS. Data collected by the SRMS system is otherwise similar to the data collected from the monitors of the six non-Class 1E serial loops. Because of their safety related status, manipulative control of the Class 1E units is never available to a DCS operator. Separate remote indication and control units (Kaman model KERIC), located in the control room Class 1E cabinets, are used for Class 1E monitor control.

Class 1E Monitor Units have dedicated electrical connections between themselves and the Safety Related Monitoring System (SRMS) interface units, but communications to the 1E Monitor Units are handled by the DCS software just as if the 1E units were also on serial data loops with alternating communication from the minicomputers.

The location of a particular monitor unit within the DAS is specified by the loop number and drop number. The drop number represents the relative position of the monitor within the chain of monitor units on the data loop. The monitor unit's location on the loop is independent of the monitor characteristics, in particular, of the unit's communication address, identification or function. This permits a portable monitor to be attached to an available loop/drop location without regard to the way in which the unit is referenced in the DCS. Monitor units are referenced in the DCS by their monitor number or monitor name.

B. SYSTEM DESCRIPTION (Cont'd)

1.0 (Cont'd)

Only when units are added or swapped is the location on the data loop important. In communication between the DSC and DAS, monitors are addressed by their monitor number.

Every monitoring unit consists of three major components: (1) the monitor itself, consisting of at least a detector, and for process monitors, the associated pumps, plumbing, valves, and other sampling equipment; (2) a microcomputer which, under the control of the computer programs or software it contains, acquires data from the monitor, processes it as appropriate, determines alarm or abnormal conditions computes the radiation and release rate historical data, interfaces with a local operator, and communicates all of this information to the DCS; and (3) an Indiction and Control Unit, either local (Kaman model KELIC), portable (KAMAN model KEPIC), or remote (KAMAN model KERIC) by which an operator can determine the status of the monitor and microcomputer and the current activity of the sample, examine or change the parameters which are being used to process the information from the monitor, and initiate certain control functions (e.g., check source activation).

Each of these monitoring units is a complete stand-alone system. It is capable of collecting and processing the radiation data, sensing and annunciating alarm or failure conditions, controlling the various equipment of the skid, and interacting with a local or remote operator. If the unit is connected with the DCS through one of the serial loops, display and control functions are available to the DCS operator (except for Class 1E units, where only display functions are available to the DCS operator).

Area Monitors

Area monitors use GM tubes or ionization chambers to detect and measure the gross gamma exposure rate present at the location of the monitor. An area channel consists of a detector assembly, a check source assembly (or a "keep-alive" source for ion-chamber detectors), the microcomputer, a local and/or remote indication and control panel, and a remote indication and alarm unit (Kaman model KERIA). The KERIA unit consists of a horn or klaxton, a logarithmic analog radiation rate meter, and a red rotating beacon. The units of radiation display for area monitors are milli-Roentgens per hour (mR/hr.), except for the Drywell High Range Radiation Monitors, which are displayed in Roentgens per hour.

There are four basic types of process monitor sampling channels that may be used, as described in the following paragraphs:

B. SYSTEM DESCRIPTION (Cont'd)

1.0 (Cont'd)

Liquid Channel

A liquid channel measures the gross gamma activity of isotopes dissolved or suspended in a liquid process stream. A liquid channel usually consists of a sampler assembly, a detector assembly (gamma scintillation) with a check source, the associated plumbing and valves for backflushing the sampler and the required housing. A liquid channel may include a pumping system if the plant does not have the necessary pressure to force the effluent or process flow through the sampling system.The normal readout of the liquid channel is in microcuries per milliliter, and if process flow rates are available, the liquid release rate can be calculated in units of microcuries per second.

Gas Channels

A gas channel measures the gross beta activity level of gaseous isotopes present in a gaseous process or ventilation stream. Each gas channel includes a sampler assembly, a detector assembly (beta scintillation), a gas pumping system with isolation and purging capabilities (and in some cases, automatic flow control), a check source assembly, and the necessary cabinet. The normal display readout of this channel is in units of microcuries per cubic centimeter, and if process flow rates are available, the gaseous release rate (with Units of Microcuries per second) can also be calculated. Process flow rates are provided through either analog input to the microcomputer or via a constant.

Particulate Channels

A particulate channel measures the gross beta activity of radioactive isotopes in solid particulate form in a process stream. Each particulate channel includes a particulate sampler assembly which may use either a fixed filter or a moving paper filter, a beta scintillation detector to measure the emissions of the particulates being trapped by the filter, an air pumping system (which may include automatic flow control hardware and electronics), and the necessary cabinet to house the equipment. The normal display units of a particulate channel's activity rate are microcuries per cubic centimeter (uCi/cc). If flow rates of the process stream are available to the microcomputer (either from a process flow transducer analog signal or as a manual input by the operator), calculations of release rates in microcuries per second (uCi/sec) are also made.

Iodine Channels

Iodine channels are not in use at Unit #2, but are available as a future option.

B. SYSTEM DESCRIPTION (Cont'd)

1.0 (Cont'd)

The Display and Control System consists of two redundantly operating, Digital Equipment Corporation, PDP 11/44 Minicomputers and Supporting Peripheral Equipment. The DCS generates displays based on radiation data supplied by the DAS, provides control of monitor functions, logs significant events and periodically records selected data for off-line processing.

The operator has the ability to review the status of all monitors in the DRMS through color-coded displays generated on a CRT. A set of keyboard commands allows an operator to call up displays, acknowledge alarms, initiate certain monitor activities, and enter monitor parameters and other database changes.

In addition to interrogation of the system status by operator command, all significant events are recorded on a printed log as the events occur.

The DCS is capable of semiautomatic recovery from a power failure. This is accomplished through use of standard features of the minicomputer operating system, and by special recovery routines in the applications software. The manual portions of recovery involve placing certain hardware items in an "on-line" state and resetting the date and time.

Dual computers provide redundancy for most major functions of the DCS. One exception is the ability to perform archiving should either the single bus switch or single magnetic tape drive fail. The current database is maintained by both computers guaranteeing full operational capability should one fail.

Alarm conditions, equipment failures, indications of activities in progress, monitor requests for special communications exchanges, and general status indications are passed back in "status words" of the response messages. Certain critical conditions reported by the monitors cause an audible alarm (the annunciator) to be activated at the operator's console, to alert an operator.

2.0 Gaseous Effluent Monitoring System (GEMS)

The Gaseous Effluent Monitoring System (GEMS) provides on-line Isotopic monitoring of gaseous effluents from the main stack and the Radwaste/Reactor Bldg ventilation stack. Each unit provides monitoring capability for particulate, iodine and gases. Indication of gaseous effluent release rate is provided in the control room.

2.0 (Cont'd)

Particulate and iodine samples are collected by standard SAI cartridges which are automatically inserted into the main sample lines, allowed to collect samples for a specified but variable (through computer control) period of time, automatically removed from the lines and directed to counting chambers for measurement of the collected radioactivity levels. Cartridges to be used with the system are SAI Model PE-150 (particulate; paper) and SAI Model CP-100 (iodine; charcoal).

Initially, the sample collection cartridges are loaded into the hopper, located above the sample system, to provide gravity feed. The cartridges are admitted one at a time to the sampling position. The system provides positive "O" ring sealing and easy, quick replacement of worn or damaged "O" ring seals.

At completion of the collection period, the sample line is closed off and purged to the sample return line. The seal collar is retracted and the sample cartridge is released into the track leading to the detector chamber.

Within the detector chamber each cartridge is positioned in front of a liquid nitrogen cooled high-purity germanium detector. Since the detector output pulses vary in height with the energy of the gamma ray sensed, the output pulses are amplified linearily and fed to a Multi-Channel Analyzer (MCA) where they are accumulated according to pulse height.

At the end of the counting period, the sample cartridge is ejected automatically from the counting chamber and the data in the MCA transfers to a PDP 11/44 minicomputer. Each isotope emitting the gamma rays is identified and the quantity of the isotope present is determined. This data is then printed and stored.

The GEMS skid has alternate flow paths which bypass the normal automatic sample channels for particulate and iodine. These alternate flowpaths are initiated either manually or automatically, without annunciation in the Control Room, to ensure continuous sample collection during automatic channel outages. With GEMS sampling accomplished via these alternate flow paths, the GEMS skid is operable (Ref: GEMS file letter NMP62890). CN-23

The noble gas monitor portion is a flow-through type; the gas sample, with particulate and iodine removed, passes through a 6-liter chamber in which a high-purity germanium detector has been mounted. The detector senses the gamma ray emissions from the gas sample and transmits the data for analysis and processing in the same way as the particulate and iodine channels. At high radiation levels the system automatically switches over to a smaller (30 cc) gas chamber to maintain a reasonable count rate in the detector. At still higher levels the system switches in the first stage dilution (200 to 1 dilution ratio). At even higher levels the second stage dilution is started (also 200 to 1 ratio), giving a 40,000 to 1 total dilution. The two chambers and dual dilution give a broad range for the gas system, about 12 orders of magnitude.

B. SYSTEM DESCRIPTION (Cont'd)

2.0 (Cont'd)

The operational ranges of the particulate and iodine systems are also broad, covering approximately 15 orders of magnitude. This is achieved by automatically adjusting the length of the sampling period and counting time in accordance with the amount of activity sensed, together with the two stage dilution.

The system is coupled to Stack and Vent flow-rate sensors to calculate activity release rates.

Detection Limits

Following are generalized upper and lower limits of detectability for GEMS, with dilution capability:

- Minimum Detectabilities
  - Particulate and Iodine (24 hr. collection, 8 hr. count, 1 mR/hr. background from Co-60)

    2×10^{-13} Ci/cc for isotopes of interest
  - Gas (8 hr. count, 1 mR/hr. background from Co-60)

    10^{-7} Ci/cc
- Maximum Detectabilities
  - Particulate and Iodine

    10^{2} Ci/cc
  - Gas

    10^{5} Ci/cc

Manual Control Panel

In order to minimize the probability of GEMS being completely shut down due to a malfunction, a Manual Control Panel is located in the Mainframe Electrical Cabinet. The panel was designed to allow complete manual operation of the monitor in case of a major malfunction, for example the PDP 11/44 computer being down. It is also useful for maintenance diagnostics. Check-source, background and data spectra can be obtained by operation of the Manual Control Panel and Canberra Series 85 Multi-Channel Analyzer. Valves, pumps, cartridge movement, and dilution can be controlled, allowing operation in normal and post-accident modes.

B. SYSTEM DESCRIPTION (Cont'd)

2.0 (Cont'd)

Flow Control

The GEMS flow control system maintains a sample gas flow through each Monitor proportional to the plant Stack or Vent flow. The system is composed of Kurz flow controllers, control valves, and flow sensors.

Velocity sensors in the isokinetic probe send flow information to the GEMS main system flow controller 3FC1 using a 4-20 ma signal proportional to the Stack or Vent flow. In case the flow signal is lost, GEMS automatically sets the flow to a default value of 1.5 cfm. This value (1.5 cfm) is the nominal flow for GEMS to maintain isokinetic flow; based on the design of the probes and nominal flows for the Stack (98 kcfm) and Vent (237 kcfm).

Dilution System

Each GEMS Monitor includes a dual dilution system for reducing the effective radiation level of the incoming gas sample. This capability broadens the sensitivity range to cover the highest levels called out in NRC REG GUIDE 1.97 (Revision 2).

The dilution system is triggered by a control signal based on the count rate in the (Gas) detector. After the sample has been routed through the smaller (30 cc) gas chamber, an increase in count rate above 30,000 cps will trigger the first stage dilution, with a dilution ratio of 200:1. If the count increases above 30,000 cps while in first stage dilution, the second stage dilution will be actuated, also with a ratio of 200:1.

3.0 Main Steam Line Radiation Monitors

The Main Steam Line Radiation Monitoring System is a microprocessor based process radiation monitoring system. The system monitors the gamma radiation level exterior to the main steam lines. The normal radiation level is produced primarily by coolant activation gases plus smaller quantities of fission gases being transported with the steam. In the event of a gross release of fission products from the core, this monitoring system provides channel trip signals to the RPS and primary containment and reactor vessel isolation control system to initiate protective action. It is entirely separate from the Digital Radiation Monitoring System.

B. SYSTEM DESCRIPTION (Cont'd)

3.0 (Cont'd)

The NUMAC Log Rad Monitor (LRM)

Instrument turns on through the application of power. The display is normally turned off but will go on whenever a trip occurs or a front panel key is pressed. Whenever the display is on, instrument mode, trip and alarm status, and self-test status are shown along its top. The remainder of the display will depend on the actions selected by the user. The display is turned off through timeouts when no trips or alarms are on, or by a softkey.

Four pushbutton keys (softkeys) below to the display are used to determine the next display or user action. The specific function of each of these keys will vary with the display shown.

A set of four keys is provided to move a cursor should one be needed for a given display. A set of sixteen keys is used to enter settings and calibration data, or clear data before entry. A "restart" key (unmarked) is located in the center of the cursor keypad.

When the keylock is in the "OPER" position, the front panel is in a "display only" mode, and just the softkeys are operable. The user may select from a graphical presentation of radiation level, a trip setting display, a polarizing voltage display, and "HELP" messages. He may also reset trip displays, where appropriate. If the self-test option is chosen, the user may interrogate the self-test system for diagnostics. As long as the LRM instrument is in the "Operate" mode, the functional microprocessor sends data to the front panel controller, but not vice versa.

When the keylock is in the "INOP" mode, the "INOP" trip is set. The user can then calibrate the instrument and, upon successfully entering a password, change the detector polarizing voltage and trip settings. With the keylock in this position, there is two-way communication between the microprocessors.

"HELP" messages are under firmware control and consist of a set of instructional aids to assist a qualified user in reading, calibrating, changing settings and understanding the operating features of the instrument. The display gives explanatory messages. At any time, the user can depress the designated softkey (display, "HELP") and receive relevant operating information. However, no aid is provided for entering a password.

C. OPERATING REQUIREMENTS

1.0 13.8KV/4160V/600V A.C. Power Distribution
N2-OP-71

2.0 Standby and Emergency AC Distribution
N2-OP-72

3.0 Instrument and Service Air
N2-OP-19

4.0 Reactor Building Closed Loop Cooling Water
N2-OP-13

D. PRECAUTIONS/LIMITATIONS

1.0 Observe standard precautions for handling radioactive material including as necessary the use of finger rings for monitoring extremity dose, and observe ALARA practices to minimize radiation exposure and the spread of contamination. Obtain RWP as necessary.

2.0 Due to the clarity of the vendors manual (P281F Inst. 1.730-5008) with regard to startup, operations, software applications and shutdown of the DCS portion of DRMS, it will be used in conjunction with this procedure to totally encompass operation of the DRMS. This procedure will address the DAS portion of the system.

3.0 Many of the radiation monitors are required by Technical Specifications. Unauthorized changes to radiation monitor operating parameters may result in Tech Spec violations.

4.0 Deenergizing DRMS Process Rad Monitors (Microprocessors) will result in a trip signal being generated for the Rad Monitor. Contact the SSS prior to deenergizing Rad Monitors.

E. STARTUP PROCEDURE

1.0 DRMS

1.1 Perform Power Supply Lineup as applicable per Attachment 3.

E. STARTUP PROCEDURE (Cont'd)

NOTE: DRMS start up may also be performed by the Radiation Protection Dept. per procedure S-RTP-109 in lieu of this procedure.

NOTE: Valve Lineup Attachment 1 is arranged by monitor mark number in system alphabetical order. Each monitor lineup sheet identifies the monitor type (KML, KMG....), and whether the equipment is safety related (*) which require the use of a KERIC (safety related indicating and control unit, 2CEC*PNL880A, B, C or D).

NOTE: All of the equipment, controls and indications are located at the associated radiation monitor skid unless otherwise indicated.

1.2 Monitor type - KMG, KMPG, KM-CAM or KML

1.2.1 Perform the valve lineup for the monitor in accordance with the applicable section of Attachment 1.

NOTE: The following step refers to Liquid and Gas Skid only.

1.2.2 Place or verify local motor starter box breaker in the "ON" position. Verify that the green or red indicating lamp is lit on the local motor starter box.

1.2.3 Ensure that the keyed switch on the KELIC (local indicating and control unit) is selected to "REMOTE".

1.2.4 Turn the KEM (micro-computer) power switch to the "ON" position.

NOTE: Green Light will flash until monitor is brought on line @ DRMS Console.

1.2.5 Verify that the green "POWER COMM" light on the KELIC is lit.

NOTE: The following step refers to liquid and gas skids only.

1.2.6 Ensure motor control switch on local motor starter box is selected to the "AUTO" position.

1.2.7 If monitor has a KERIC (safety related remote indicating and control unit on 2CEC*PNL880 A, B, C or D), select keyed switch to the "DISABLE" position and energize its associated recorder. (Attachment 6.)

1.3 Monitor type - KMA.1 1000, KMA. 1 10, KMA-GM 0.1, KMA-GM 1.0, or KMA-GM0.01

E. STARTUP PROCEDURE (Cont'd)

1.3.1 Turn the KEM (micro-computer) power switch to the "ON" position.

1.3.2 Verify "NORM" indicator on KERIA (remote indicating alarm unit) is lit.

1.3.3 If monitor has a KERIC (safety related remote indicating and control unit on 2CEC*PNL880 A, B, C or D), select keyed switch to the "DISABLE" position and energize its associated recorder. (See Table Attachment 6.)

2.0 GEMS

NOTE: Notify Chemistry Department prior to performing steps 2.1 and 2.2.

2.1 Perform the System Power Supply Lineup in accordance with Attachment 4.

2.2 Perform the Valve Lineup in accordance with Attachment 2.

2.3 GEMS start-up will be performed by the Chemistry Department per N2-CSP-7.

3.0 Main Steamline Radiation Monitors

NOTE: The following steps are to be performed at each Log Rad Monitor:

At PNL 606 Channel A and Channel C
At PNL 633 Channel B and Channel D

3.1 Verify the keylock is in the "OPER" position.

3.2 If required, depress "RESET ALARMS" softkey.

3.3 If display is off, turn on display by depressing any labeled softkey.

3.4 Depress the "ETC" softkey until "DISPLAY TEST STATUS" softkey is displayed.

3.5 Depress the "DISPLAY TEST STATUS" softkey verify the following:

3.5.1 "RUNNING" is displayed.

3.5.2 "OK" is indicated for each module.

3.5.3 "NO ERRORS" is displayed.

3.6 Depress the "EXIT" softkey.

E. STARTUP PROCEDURE (Cont'd)

NOTE: Accessibility to the "DISPLAY OFF" softkey indicated all trips are reset.

3.7 Depress the "ETC" softkey until the "DISPLAY OFF" softkey is displayed.

3.8 Depress the "DISPLAY OFF" softkey.

3.9 Upon completion of Step 3.1 through 3.8 for each channel verify annunciator 603133 "MN STEAM LINE RADIATION HIGH" is clear.

F. NORMAL OPERATION

1.0 DRMS

* *

CAUTION:

Deenergizing DRMS Process Rad Monitors (Microprocessors) will result in a trip signal being generated for the Rad Monitor. Contact SSS prior to deenergizing Rad Monitor.

* *

During normal operation, the DRMS passively monitors the radiation levels at its process and area monitors. Once per hour, it prints out the hourly averages of all monitored stations.

Operations Department will have an interface with the DRMS at the control room keyboard and CRT, and/or at 2CEC*PNL880A, B, C and D as directed in this procedure.

The DRMS will normally be operated by the Radiation Protection Department in accordance with procedure S-RTP-109 and applicable preventative maintenance procedures.

1.1 Indicator Lights and Control Buttons on the Indication and Control Units

1.1.1 As seen in Attachment 10 and enlarged and explained in Attachment 11 the control panel has eight indicator lights, in two rows along the top of the unit. The top row of four indicators consists of combination push button/lights, while the bottom four indicators are lights only. The top four push button/lights are marked "HIGH-ACK", "ALERT-ACK", "RATE-ACK", and "TEST-LK CK". The second row of lights are marked "POWER COMM", "PROC FUNC", "ALARM DISAB", and "EQUIP FAIL". The operation of these lights and light/pushbuttons is described in the following paragraphs.

F. NORMAL OPERATION (Cont'd)

NOTE: This description applies to the RIC and LIC. The PIC has a slightly different layout, but provides the same functions.

1.1.2 The HIGH-ACK red light flashes when the radiation level on any monitor channel exceeds the high radiation alarm setpoint of that channel. The high alarm is acknowledged by pressing the HIGH-ACK button. When depressed (and if the alarm condition still exists), the light changes from a flashing mode to a steady-on mode. If a remote alarm module (RIA) is attached to the monitor, a red beacon and a horn, which are activated by the alarm condition, will continue to annunciate the alarm until an operator also depresses the ACK button on this unit. Only when the radiation level decreases to a value below the high alarm setpoint, and the alarm has been acknowledged by depressing the HIGH-ACK button, will the alarm light be turned off at the local indication and control unit. Silence Remote ARMs, if required.

1.1.3 The ALERT-ACK amber light flashes when the radiation level for any monitor channel exceeds the alert radiation setpoint for that channel. Its operation is similar to the HIGH-ACK button described above, except that the ALERT-ACK light will automatically extinguish (without being acknowledged by depressing the button) if the level of radiation drops below the alert-setpoint.

1.1.4 The RATE-ACK amber light flashes when the rate of increase of the level of radiation for any monitor channel exceeds the rate of increase alarm setpoint for that channel. Its operation is similar to the ALERT-ACK light described above.

1.1.5 The TEST-LT CK button serves a dual purpose. The light is automatically turned on when the checksource of any detector on the monitor is active, when th monitor has been placed in the Calibrate mode by an operator, or when the operator has initiated an ionization chamber detector self-test mode. In addition, this button may be depressed to activate a simultaneous test of all panel lights and LED displays. When pressed, all eight lights on the panel will come on for a period of about three seconds, and the digits of the LED displays will all show the numeral "8", which tests all segments of the LEDs.

1.1.6 The POWER COMM (power and communication indicator) light is on whenever power is supplied to the microcomputer. This light also shows the presence or absence of communications with the monitor. When the monitor is placed in local mode, so that communication with both RIC and the minicomputer is terminated, the POWER COMM light will begin to flash. When the monitor is placed in remote mode, by changing the keyswitch position, the light will change to a steady on condition.

F. NORMAL OPERATION (Cont'd)

1.1.6 (Cont'd)

While in the remote mode, if at any time communications from the minicomputer should cease for a five-second period or more, the POWER COMM light will change to a flashing mode to indicate loss of communications with the minicomputer.

1.1.7 The PROC FUNC white light is on only during special monitor process functions, including a purge or backflush operation. The light is extinguished when the special function terminates. This light is not used on area monitors.

1.1.8 The ALARM DISAB white light is turned on whenever the radiation alarms of the monitor have been disabled by a local operator, a RIC operator, or a minicomputer operator (on non 1E units only). Re-enabling the alarms causes the light to turn off.

1.1.9 The EQUIP FAIL white light is turned on whenever an equipment failure condition is detected by the monitor microcomputer. the operator may then query the monitor to determine the specific failure condition by displaying the values in the failure code table (see parameter 30, Step 1.3.3). Equipment failure conditions include detector failure, low flow, high temperature, and others as described in a later section. When the condition causing the failure no longer exists, the EQUIP FAIL light goes off.

1.2 Display Areas of the Indication and Control Units

1.2.1 The indication and control panels of the monitors have two display areas shown in Attachment 10 and in greater detail in Attachment 12. The first (upper) area is labeled "FUNCT CHAN PARAMETER". The number displayed under "FUNCT" represents the panel function currently being performed. Attachment 7 shows the nine possible functions as related to their appropriate "FUNCT" indicator. The second digit, under "CHAN", show the monitor channel to which the display is currently referring to, and the last two digits, under "PARAMETER", represent the item in the monitor's database currently being displayed. Attachment 8 describes the actions which may be performed with the 13 function keys on the panel.

1.2.2 The second (lower) display area on the panel is simply labeled "VALUE" and gives the current value calculated or stored by the monitor for the function, channel, and parameter shown in the upper display. Until changed by an operator, the default condition continuously displays the current radiation level for the first channel of the monitor, in appropriate units. Optionally, the continuous display may be changed to the current sample flow rate through the monitor (in cfm). The display is presented in an exponential form, e.g., 2.14 E-06. The exponent sign is blanked for positive exponent values.

1.2.3 An attempt by an operator to enter an illegal value, an improper sequence of key strokes, or a command for which the panel is not currently enable, will result in an error display on the upper display area of four "E" characters.

1.3 Keyboard Functions for the Indication and Control Units

Keyboard locations for the various types of indication and control units are shown on Attachment 10 and a detail of the function keys (left half keys) is shown in Attachment 13.

1.3.1 Use of the CHS, ENT and CLR Keys

The CHS (change sign), ENT (enter), and CLR (clear) keys are used for properly entering commands to the microcomputer system. The CHS key changes the sign of the exponent the operator entered when setting a parameter value. "Plus" is assumed unless CHS is pressed, making th value negative. CHS should be pressed after the keystrokes for the exponent value have been pressed, and prior to pressing the ENT key, completing the keystroke sequence.

Pressing the ENT key completes the keystroke sequence for a command, and provides the signal to the microcomputer for processing the command.

The CLR key clears the keystrokes of the command or value so that it is not processed by the system. If CLR is pressed in order to abort a command, the display returns to the normal display of the current radiation level.

1.3.2 Display a Current Value

This command allows an operator to display a current radiation level, or a current parameter for a specific channel. The procedure for entering the command is:

DSP	DSP key (FUNCT display value = 1)
(Chan. No.)	Number of channel whose value is to be displayed
(Param. No.)	Number of parameter to be displayed (see parameter codes for parameter numbers in Attachment 9.)
ENT	ENT key

F. NORMAL OPERATION (Cont'd)

1.3.2 (Cont'd)

Once the ENT key is pressed, the requested value will be displayed in the VALUE display area for about 15 seconds. The display will then return to normal (usually the current radiation level).

A channel number of "1" is the only valid channel number for an area monitor or process monitors which monitor liquid or gas only. Process monitors which monitor systems for gas and particulate use channels "1" and "2" respectively.

1.3.3 Display a Table of Values

Use of the the EXP key allows the operator to display successive entries in a table of values, following display of the first tabular element, as indicated above with instructions for the DSP key. Parameters 24-30, and 34-36, are tabular arrays, containing up to 30 values. To display the elements of a table, the following keystrokes sequence is used:

DSP	DSP key (FUNCT display value = 1)
(Chan. No.)	Number of channel whose values are to be displayed
(Param. No.)	Number of parameter to be displayed (Parameters 24-30, and 34-36, in parameter codes in Attachment 9)
ENT	ENT key
EXP	EXP key
...	....
EXP	EXP key

As soon as ENT is pressed, the first value appears in the VALUE display. Each successive press of the EXP key will cause the next tabular value to be displayed. As wit other display values, the display will remain for 15 seconds, before reverting to the normal display.

Parameters 24-29 and 34-36 are tables of 30 elements each. To display all 30 elements of one of these tables, the EXP key must be pressed 29 times following depression of the ENT key.

F. NORMAL OPERATION (Cont'd)

1.3.3 (Cont'd)

Parameter 30, failure code table contains the numbers of the various failure modes for the monitor. These failure mode numbers are given in channel failure code table in this section. When the FAIL light is on, the operator can query the microcomputer for the specific failures on a given channel. If the first value is 0, there are no failures for that channel. If a non-zero value is displayed, it represents a particular failure; other failures for that channel are displayed by successive depression of the EXP key. With successive depressions of the EXP key, the appearance of a zero indicates the end of failures for that channel.

CHANNEL FAILURE CODES

CODE NO.	FAILURE DEFINITION
1	Detector Failure
2	Detector Saturation
3	Motor Off or Motor Failures
4	High Voltage Failure
5	Check Source Failure
6	Low Sample Flow
7	Particulate Moving Filter Failure
8	Particulate Moving Filter End of Roll
13	High Delta Pressure
14	Low Delta Pressure
16	Temporary Power Failure
18	High Background Setpoint Exceeded

1.3.4 Channel Display Selection

The default channel for continuous display of the radiation rate in the VALUE display is channel one. The operator may change the channel number being displayed by entering the following keystrokes:

FTN	FTN key (FUNCT display value = 7)
(Chan. No.)	Number of the channel for the continuous display
1	Special function code for display channel change
ENT	ENT key

As soon as ENT is pressed, the radiation level of the desired channel will appear in the VALUE display.

1.3.5 Continuous Sample Flow Display

The default continuous VALUE display of the panel consists of the radiation rate for the specified channel (nominally channel 1). The operator may change this value to sample flow rate by entering the following keystroke sequence:

FTN	FTN key (FUNCT display value = 7)
(Chan. No.)	A valid channel number for this monitor
3	Special function code for sample flow display selection
0 to 1	A value of 1 selects sample flow for the display; a value of 0 reverts the display to radiation rate
ENT	ENT key

1.4 DRMS Console Operation

1.4.1 Green Keys

Require no other input on the input line below the green COMMAND bar in the lower left-hand corner of the CRT.

1.4.1.1 Status Grid

A display of the current status of all the monitors and their channels. There is a legend in the lower left of the display which explains the colored number following the monitor in the upper list. A flashing number indicates an unacknowledged alarm. Also available on the display is the system status. This display is updated every 15 seconds.

1.4.1.2 File List

A display which shows the user created files for functional groups, floor plan and schematics, and multi-channel trends.

The STATUS GRID and FILE LIST displays can be used to provide data for other keys to be discussed later or produce displays by use of the SELECT/REMOVE (blue) and FIELD (white) keys. The FIELD keys move the flashing blue cursor on the screen in the direction of the arrow on the white FIELD key. The blue SELECT/REMOVE key causes the event or location by the cursor to be initiated. Certain operations selected on the FILE LIST display will not be allowed to occur if the user is not in the Privileged Mode (Privileged Mode is not used by Operations).

F. NORMAL OPERATION (Cont'd)

1.4.1.3 Help

This is a multi-page display which will tell the user how the system can be used and how the system works.

1.4.1.4 Command Format

This is a multi-page display which will tell the user what the arrangement of input the computer will be looking for to obey the user's request.

The HELP and COMMAND FORMAT displays or other multi-page displays may be paged through by using the PAGE FORWARD or PAGE BACK (white) keys. To go to a specific page of either the HELP or COMMAND FORMAT displays, press a number, then the appropriate function key (HELP or COMMAND FORMAT).

1.4.1.5 Alarm Log

A display of all alarm events.

1.4.1.6 Daily Log

A display of all events for the past 24 hours.

1.4.1.7 Ten Day Log

A display of all events for the past 10 days.

Generally, all logs are multi-page displays and must use the PAGE FORWARD and PAGE BACK (white) keys to view all of the log.

1.4.1.8 Out St Alarm (Outstanding Alarm)

A display of monitors that have alarms which have not had action taken on them or are off-line. This also is a multi-page display.

1.4.1.9 ACK Oldest Alarm (Acknowledge Oldest Alarm)

Self explanatory

1.4.1.10 Cancel Disp

Clears the screen of all displays except the clock, which remains in the lower left of the screen.

F. NORMAL OPERATION (Cont'd)

1.4.1.11 Recall Disp

Recalls the last display that was on the screen before the CANCEL DISP button was pressed or the screen blanked out due to lack of use for a predetermined time period. It is currently set for 15 minutes, but user definable.

1.4.1.12 Enter

Used for entering direct commands from the COMMAND FORMAT display. This is only used for commands not available by the predefined keys.

1.4.1.13 Enter Priv Mode (Not used by Operations)

1.4.1.14 Exit Priv Mode (Not used by Operations)

1.4.2 Yellow Keys

Require a monitor name and channel number to be entered below the COMMAND bar or a monitor name and channel entered in the default location located in the lower right corner of the screen via the Selection Mode (use of white FIELD and blue SELECT/REMOVE) from the STATUS GRID or a monitor name and channel entered in the default location by entering the monitor name and channel below the COMMAND bar and pressing the USE key.

1.4.2.1 Data Base

This display shows all the information about the chosen monitor as to location, status, current and past radiation, alarm and calibration, and current state of the monitor.

1.4.2.2 Integ Rel (Integrated Release Trend) - 10 Min, 1 Hr, 1 Day

This display provides a graphic display of the last 30 chosen time periods for the monitor chosen as previously explained. This display is only good for process monitors and not area monitors. It is a static display and does not update while it is on the screen. To be updated, the button must be pressed again.

1.4.2.3 Rad Trend (Radiation Level Trend) - 1 Min, 1 Hr, 1 Day

This display provides a graphic of the last 30 chosen time periods for area radiation monitors and process monitors. This display will show the alert and alarm levels as vertical lines of the appropriate color. The horizontal bars of the graph will be color-coded for identification of normal (green), alert (yellow), alarm (red), or suspect data (white).

1.4.2.4 Monitor History

This display gives a multi-page log of all events relating to a monitor chosen by one of the previously described methods and is paged through the white PAGE FORWARD and PAGE BACK keys.

1.4.2.5 Sample Flow Diagram

This display shows a schematic drawing of the chosen process monitor skid. It also provides current and update radiation level information while it appears on the screen.

1.4.2.6 Use

This function places the monitor name and channel number typed on the input line, below the green COMMAND bar, into the default position, in the low right of the screen, where it can be used as the selected monitor for other yellow key entries.

1.4.2.7 ACK Unit (Acknowledge Unit)

Acknowledges on a specific monitor name and channel number, which is typed on the input line, below the COMMAND bar or if no monitor is below the COMMAND bar, it uses the default value if one is available.

1.4.3 Orange Keys

Require a file name from the FILES LIST display by means of the Selection mode (using white FIELD keys and blue SELECT/REMOVE key) or from the line below the COMMAND bar. Some keys do not use the FILES LIST, but require input from the keyboard. All seven orange keys will take input from the keyboard if the file name is known for the display requested . The orange keys are the most unique to their function compared with the other keys. Attention must be maintained to get the right file related to the function key to be used. The FILES LIST display will be helpful in keeping this relationship straight. At the bottom of each section of the display is a large block containing the functions which cause the display of functional groups, group history, floor plan and multi-channel trend group. These correspond to the orange key for display when the file name is entered on the input line below the green COMMAND bar. A listing of the files for each group and what each file contains is attached in Attachments 14, 15, and 16.

The following four displays can be accessed by either the FILES LIST in Selection mode or by direct keyboard file name entry on the input line below the COMMAND bar.

F. NORMAL OPERATION (Cont'd)

1.4.3.1 Floor Plan

This display shows the major elevations of the plant with their associated monitors (both area and process). The monitors are displayed in color to reflect the present status of them--green for normal, yellow for alert, red for alarm and white for off-line. Also available on this display is a listing of the monitors on the elevation with their current radiation level which is updated every 15 seconds.

1.4.3.2 Func Group (Function Group)

This display provides the current status of certain predetermined Monitor Group Names (the first column of the FILES LIST display). The radiation levels, associated percentages of alert and high rad alarm, and associated bar graphs are updated every 15 seconds.

1.4.3.3 Group History

This multi-page display shows a graphic display of the current radiation levels with up to 14 monitor channels per page. It uses predetermined group names for the Monitor Group Names section of the FILES LIST. The radiation level, percent of alert and associated bar graph, updates every 15 seconds. This is not a true past history display.

1.4.3.4 Multi CHNL Trend (Multi-Channel Trend)

This is one page display using predetermined groups of monitors from the Multi-Channel Trend Groups section of the FILES LIST (last column on right). Each group can contain up to 5 monitor channels. The display shows the last six time periods with a bar graph display.

If the FILES LIST is used, the time period will be ten minutes. If the file names is typed on the input line below the green COMMAND bar, the time periods that can be selected are 1 minute (M), 10 minutes (T), 1 hour (H) and 1 day (D). These letter time designations follow the file name separated by a space.

The other three displays are keyboard entry displayed below the COMMAND bar to generate their data.

1.4.3.5 Loop Status

This display shows the status of the monitors on one of the eight communications loops (Loop 6 does not have any monitors on it). The display updates itself every 15 seconds while it is on the screen.

F. NORMAL OPERATION (Cont'd)

1.4.3.6 Summary List

This multi-page display summarizes all of the monitors in one of the six requested categories. The categories available are ON-LINE, OFF-LINE, ALARMS, NO ALARMS, INHIBIT and ALL. If no category is specified on the input line, then all monitors are displayed. The categories shall be defined as follows:

ON-LINE - monitors in communication with computer

OFF-LINE - monitors not in communication with computer

ALARMS - monitors with one or more outstanding alarms

NO-ALARMS - monitors without any alarms

INHIBIT - monitors with their alarm reporting inhibited by computer command

ALL - all monitors shall be listed

The display shows the monitor name, location, current level, percent of trip point and channel status. The level is displayed in color to denote current condition. The colors are green for normal, yellow for alert, red for alarm and white for off-line. The level and status are updated every fifteen seconds while the display is on the screen.

1.4.4 Black Keys

Report generation to printer for hardcopy.

1.4.4.1 Print Data Base

This report prints the data base for the monitor entered on the line below the green COMMAND bar from the keyboard or if no monitor is shown, it goes to the one in the default position (lower right) of the screen. If no monitor is found there, it does not print the report.

1.4.4.2 Print 10 Min Avg

This report is produced on demand for all monitors. It can also be produced automatically every ten minutes using a command in the Privileged mode.

1.4.4.3 Print DSP (Display)

Generates a copy of what is on the display screen to the printer.

F. NORMAL OPERATION (Cont'd)

1.4.5 Monitor Function Keys

The Monitor Function keys, which are the yellow keys located to the right of the typewriter style keyboard, are used to perform special functions on the monitors themselves. The two green keys for entering and exiting the Privileged Mode are also located in this area. This group of keys are not used by Operations.

2.0 GEMS

The GEMS will be operated by the Chemistry Department in accordance with N2-CSP-7.

Operations Department will have a passive interface only via GEMS monitor in the control room and vent/stack recorder on P880.

Detailed software operating instructions for operations interface is provided by N2-CSP-7 Appendix G.

3.0 Main Steamline Radiation Monitors

NOTE: The following soft keys are available while in the "OPERATE" mode.

HELP	Operation of this softkey will bring up a brief description of all first level soft keys in the "OPERATE" mode.
DISPLAY OFF	This soft key will only be available if conditions do not exits that require the display to be on. Operation of this soft key will turn the display off.
RESET ALARMS	This soft key will only be available if one or more resettable alarm conditions exits (i.e., an alarm condition exists, but the corresponding trip condition does not). All resettable alarms will be cleared when this key is pressed.
DISPLAY BAR GRAPH	Operation of this soft key will cause the displaying of the graphical representation of the present ion chamber current (on a logarithmic scale). The trip points will also be shown.

F. NORMAL OPERATION (Cont'd)

3.0 (Cont'd)

NOTE: (Cont)

DISPLAY PARAMETERS	Operation of this soft key will cause the displaying of all operational parameters enterable by the user. These will include the trip outputs tested, the trip points, the reset trip points (and the resulting hysteresis values), the requested chamber polarization voltage, and the actual voltage.
DISPLAY TEST STATUS	Operation of this soft key will cause the displaying of self-test status information
ETC	Operation of this soft key will cause the soft key selections to change to another set of menu selections.
EXIT	Operation of this soft key will terminate the activity previously selected, clear the mid-portion of the display, and reinstate the last menu.

NOTE: Display is manually requested by pressing any key, (except the unmarked key (RESTART) in the cursor keypad).

3.1 If required, depress any key to turn on the Rad Monitor.

3.2 Use the applicable softkey to display the desired information.

G. SHUTDOWN PROCEDURE

CAUTION

DE-ENERGIZING DRMS PROCESS RAD MONITORS (MICRO PROCESSORS) WILL RESULT IN A TRIP SIGNAL BEING GENERATED FOR THAT RAD MONITOR. CONTACT SSS PRIOR TO DE-ENERGIZING RAD MONITOR. TCN-23

1.0 DRMS

The DRMS is not normally shutdown. If required to shutdown or de-energize portions of the system, pump controls, moving filter controls, purge/flush controls, check source operation, and activation or deactivation of a channel can be performed from the CRT console, Remote Indication and Control Unit (RIC), or from the Data Acquisition Unit. Notify Radiation Protection Department. (See Off Normal Procedures, Section H. of this procedure.)

F. NORMAL OPERATION (Cont'd)

2.0 GEMS

GEMS is not normally shutdown. If required to be shutdown, notify the Chemistry Department.

3.0 Main Steamline Radiation Monitoring System

Not normally shutdown. Consult Technical Specifications prior to de-energizing a channel.

H. OFF NORMAL PROCEDURE

1.0 DRMS

NOTE: With the exception of display information, the operation and maintenance of DRMS is the responsibility of the Radiation Protection Department. Consult with Radiation Protection Department regarding any off normal condition.

1.1 Loss of DCS/Loss of Communication with the DCS

NOTE: If the Digital Control System communication link is lost, there will be no control room annunciation associated with the NON 1-E monitor(s). In addition, for safety related monitors (1-E monitors), equipment failure status will only be available at 2CEC*PNL880A, B, C and D or at each individual monitors' microprocessor.

1.1.1 1-E Monitors:

2CMS*RE10A	2HVC*RE18A	2SWP*RE146A
2CMS*RE10B	2HVC*RE18B	2SWP*RE146B
2HVR*RE14A	2HVC*RE18C	2RMS*RE1A
2HVR*RE14B	2HVC*RE18D	2RMS*RE1B
2HVR*RE32A	2SWP*RE23A	2RMS*RE1C
2HVR*RE32B	2SWP*RE23B	2SWP*RE1D

NOTES:
1. All 1-E are governed by Tech. Specs.; refer to the applicable operability requirements for any off normal condition.
2. The following Non-1-E Monitors are also governed by Tech. Specs. 2CWS-RE157, 2LWS-RE206, 2RMS-RE140, 2RMS-RE111, 2RMS-RE129, 2GTS-RE105.

a. Dispatch an operator to control room panel 2CEC*PNL880A, B, C and D.

H. OFF NORMAL PROCEDURE (Cont'd)

1.1.1 (Cont'd)

b. Depress the TEST-LT CK pushbutton and verify the following to ensure operable status of local indicating lamps and displays:

1. All eight indicating lamps light.

2. Upper led display indicates "8888."

3. Lower led display indicates "8.88 E-88."

NOTE: If an LED Display does not indicate the complete test pattern, the channel's value can be correctly determined using the recorders located on the lower portion of 2CEC*PNL880. FCN-23

c. Monitor 1-E Monitors at the 880 panels paying particular attention to the following:

1. POWER/COMM green light is steady ON.

2. No other status lights are lit.

3. Current radiation level (lower LED display) is continuously updated (level should update approximately once every second).

d. Radiation Protection is to perform all operating functions at 2CEC*PNL880A, B, C and D until the DCS communications is restored.

1.1.2 Similar functions are available locally at all monitors, including those with a KERIC, using a KELIC or KEPIC.

1.2 Loss of Power to a Channel

In the event that a channel loses power, the Data Acquisition Units store data for up to 24 hours. Grab samples can be taken for determination of activity at the radiochemistry lab, a portable Continuous Air Monitor can be used to analyze ventilation samples, or radiation surveys may be performed to determine radiation levels in the affected areas.

2.0 GEMS

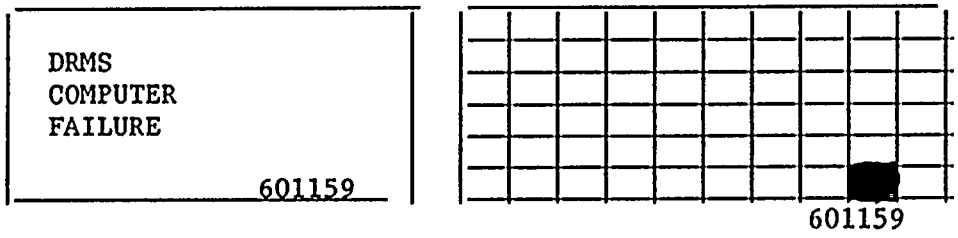
Operation and maintenance of the GEMS is the responsibility of the Chemistry Department (N2-CSP-7).

Notify Chemistry in the event of any off normal condition.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS

1.0 601159 DRMS Computer Failure
REFLASH: NO

TCN-23



TCN-23

1.1

Computer Point	Computer Printout	Source
RMSRC89	DRMS CMPTRS SYS FAILURE	a.Loss of power to both 2CEC-CP851 and CP853 (DRMS CPUs A&B) b.Loss of power to both 2CEC-CP850 and CP854 (DRMS DAS A&B) c.Loss of signals to both 2CEC-CP850 and CP854 (DRMS DAS A&B)

1.2 Automatic Response

a. On loss of power to both DRMS CPUs A&B (2CEC-CP851 and CP853, relay room); (1) All DRMS computer consoles will be inoperable. (2) Access to data will have to be from 2CEC*PNL880A, B, C and D in the control room for class IE monitors and locally for all non-class IE monitors.

b. On loss of power to both DRMS DAS A&B (2CEC-CP850 and CP854, relay room); (1) No data will be available on any DRMS computer console. (2) No data will be available for recording on magnetic tape drive (2CEC-CP852). (3) Access to data will have to be from 2CEC*PNL880A, B, C and D for class IE monitors and locally for all non-class IE monitors. (4) Annunciators 851244, 851246, 851247, 851253, 851254 and 851255 will alarm.

c. On a loss of signals to DRMS DAS A&B (2CEC-CP850 and CP854, relay room); (1) No data will be available on any DRMS computer console. (2) Access to data will have to be from 2CEC*PNL880A, B, C and D for class IE monitors and locally for all non-class IE monitors.

d. Local alarms, controls and indications remain operable for each monitor.

e. Class IE monitors on 2CEC*PNL880A, B, C and D remain operable.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

1.3 Corrective Action

a. Determine the cause of the alarm.

b. If power was lost to any of DRMS, check that the associated breaker is on and connection is made at the receptacle.

1. 2CEC-CP850 (DAS A), 2VBS-PNLC102 breaker 6, 2CEC-RCPT25.
2. 2CEC-CP851 (CPU A), 2VBS-PNLC102 breaker 5, 2CEC-RCPT24.
3. 2CEC-CP852 (Unibus), 2VBS-PNLC102 breaker 4, 2CEC-RCPT23.
4. 2CEC-CP853 (CPU B), 2VBS-PNLC102 breaker 7, 2CEC-RCPT26.
5. 2CEC-CP854 (DAS B), 2VBS-PNLC102 breaker 8, 2CEC-RCPT27.

c. On loss of power to DRMS CPU's A&B, or DAS A&B, or a loss of signals to DAS A&B, periodically check the class IE monitors on 2CEC*PNL880A, B, C and D and the non-class IE monitors locally until power or signals are restored.

d. On a loss of power or signals to DAS A&B, when any local monitor alarms, refer to the procedure for correcting alarms conditions for the associated main control room annunciator (see 851244, 851245, 851246, 851247, 851253, 851254 and 851255) that would alarm if power or signals were available to DAS A&B.

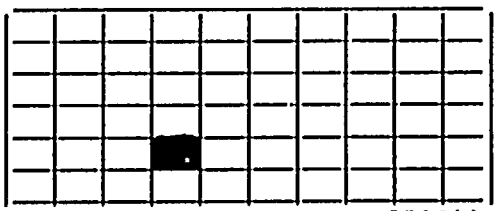
e. Correct cause of alarm and restore to normal.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

2.0 851244 Reactor Building Area Radiation Monitor Activated
REFLASH: NO

TCN-23

REACTOR
BLDG AREA
RADN MON
ACTIVATED
851244



TCN-23

2.1

Computer Point	Computer Printout	Source
RMSRC84	RX BLDG AREA RAD MON ACT	See Table 851244 Below

TABLE 851244

EQUIP. NO.	DESCRIPTION	DETECTOR LOC.
**2RMS*RE1A	DRYWELL HIGH RANGE MONITORS	PC 261
**2RMS*RE1B	DRYWELL HIGH RANGE MONITORS	PC 261
**2RMS*RE1C	DRYWELL HIGH RANGE MONITORS	PC 261
**2RMS*RE1D	DRYWELL HIGH RANGE MONITORS	PC 261
2RMS-RE2A	RCS PUMP INSTRUMENT PANEL A	RX 215
2RMS-RE2B	RCS PUMP INSTRUMENT PANEL B	RX 215
2RMS-RE101	RHS HX EQUIP ROOM, DIV I	RX 175
2RMS-RE102	EQUIP DRAIN SUMPS, EAST	RX 175
2RMS-RE103	RHS HX EQUIP ROOM, DIV II	RX 175
2RMS-RE104	EQUIP DRAIN SUMPS, WEST	RX 175
2RMS-RE105	TIP EQUIP AREA	RX 240
2RMS-RE106	ENTRANCE AREA	RX 261
2RMS-RE108	CRD MAINT. ROOM	RX 289
2RMS-RE109	CONTAMINATED EQUIP STORAGE	RX 328
+**2RMS-RE111	SPENT FUEL REFEULING AREA	RX 353
+2RMS-RE112	SPENT FUEL REFUELING AREA	RX 353
2RMS-RE113	NEW FUEL STORAGE VAULT AREA	RX 353
2RMS-RE114	REFUEL FLOOR EQUIP AREA	RX 353
2RMS-RE139	ABOVE SUPPRESSION POOL	PC 215
**2RMS-RE140	INSIDE NEW FUEL STORAGE VAULT	RX 353
2RMS-RE143	CRD HCU AREA, NORTH	RX 261
2RMS-RE144	CRD HCU AREA, SOUTH	RX 261
2RMS-RE145	SAMPLE SINK	RX 240
2RMS-RE149	RWCU VALVE AREA	RX 328

**TECH. SPEC. MONITORS
+ REFER TO S-EAP-2

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

2.2 Automatic Response

NONE

2.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue).

b. On High Radiation Level -

1. Identify Area affected, and verify level reading.

2. Refer to Emergency Plan Procedure EPP-1.

3. Refer to N2-EOP-SC.

4. Correct the cause and restore to normal operation.

c. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

d. If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

e. If two or more ARMs reach High Alarm setpoint, refer to S-EAP-2.

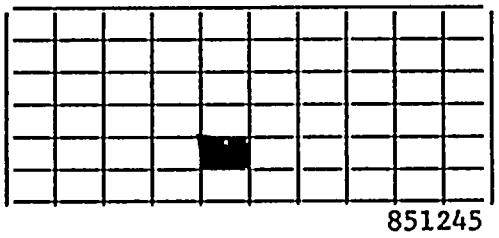
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

3.0 851245 Turbine Building/Main Stack Area Radiation Monitor Activated

REFLASH: NO

TCN-23

TURB BLDG/ MN STACK AREA RADN MON ACTIVATED 851245



851245

TCN-23

3.1

Computer Point	Computer Printout	Source
RMSRC86	TB/MN STACK RADN MON ACT	SEE TABLE 851245 BELOW

TABLE 851245

EQUIP. NO.	DESCRIPTION	DETECTOR LOC.
2RMS-RE3A	TURB BLDG HEATER BAY A	TB 250
2RMS-RE3B	TURB BLDG HEATER BAY B	TB 250
2RMS-RE3C	TURB BLDG HEATER BAY C	TB 250
2RMS-RE116	CONDENSATE PUMP AREA	TB 250
2RMS-RE117	RESIN REGENERATION AREA	TB 250
2RMS-RE118	RADWASTE SAMPLE/PASS RM	TB 261*
2RMS-RE119	TRUCK AISLE AREA NORTH	TB 250
2RMS-RE120	URC FLOW ADJUSTMENT PNL	TB 277
2RMS-RE121	RADWASTE CONTROL ROOM	TB 277
2RMS-RE123	TURB OPERATING FLOOR	TB 306
2RMS-RE135	AIR REMOVAL PUMP AREA	TB 250*
2RMS-RE136	OFG-PNL122 AREA	TB 277
2RMS-RE137	HOT MACHINE SHOP	TB 261
2RMS-RE138	FWS PUMP AREA	TB 250
2RMS-RE141	TURB BLDG SAMPLE RM	TB 250
2RMS-RE150	TURB BLDG RESIN REGEN RM	TB 250
2RMS-RE151	TURB BLDG LP TURB AREA	TB 306
2RMS-RE154	TURB BLDG CONDENSER AREA	TB 250
2RMS-RE191	LOW LEVEL COUNTING ROOM	TB 306
2RMS-RE192	GEM'S, TURB BLDG 306'	TB 306
2RMS-RE193	GEM'S, AT MAIN STACK	MS 261

*DISPLAYED ON TB 250 FLOOR PLAN

3.2 Automatic Response

NONE

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

3.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue).

b. On High Radiation Level -

1. Identify Area affected, and verify level reading.

2. Refer to Emergency Plan Procedure EPP-1.

3. Correct the cause and restore to normal operation.

4. If OPEN, close turbine building roof vents per N2-OP-55.

c. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

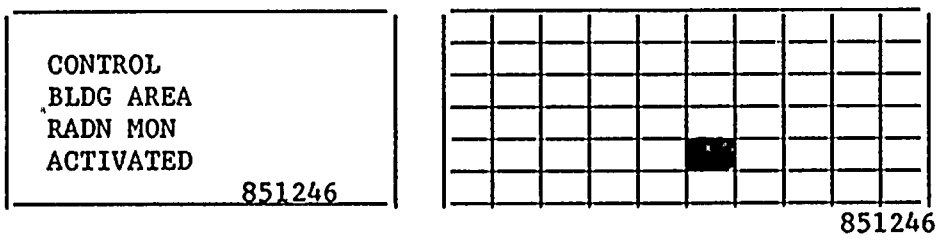
d. If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

e. If two or more ARMs reach their Alarm Setpoint, refer to S-EAP-2.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

4.0 851246 Control Building Area Radiation Monitor Activated
REFLASH: NO

TCN-23



TCN-23

4.1	Computer Point	Computer Printout	Source
	RMSRC87	CN BLDG AREA RAD MON ACT	CONTROL BUILDING AREA MONITORS **(2RMS-RE129, CB 306') (2RMS-RE190, CB 288') *(2RMS-RE130, CB 261') *REMOTE SHUTDOWN ROOM

** Tech. Spec. Monitor

4.2 Automatic Response - None

4.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue).

b. On High Radiation Level -

1. Identify Area affected, and verify level reading.

2. Refer to Emergency Plan Procedure EPP-1.

3. Correct the cause and restore to normal operation.

c. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

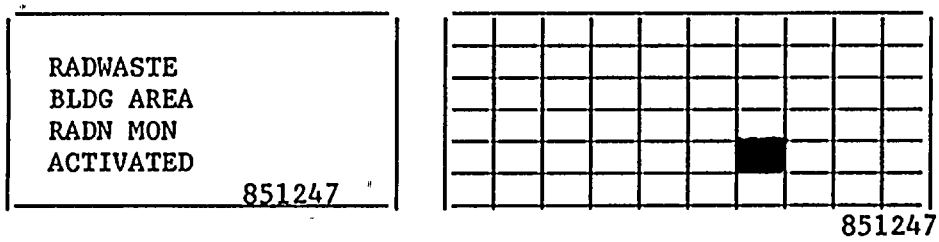
d. If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

e. If two or more ARMs reach high alarm, refer to S-EAP-2.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

5.0 851247 Radwaste Building Area Radiation Monitor Activated
REFLASH: NO

TCN-23



TCN-23

5.1

Computer Point	Computer Printout	Source
RMSRC88	RW BLDG AREA RAD MON ACT	SEE TABLE 851247 BELOW

TABLE 851247

EQUIP	DESCRIPTION	DET. LOC.
2RMS-RE125	TRUCK LOADING DOCK	RW 261
2RMS-RE132	COMPACTED WASTE STORAGE AREA	RW 261
2RMS-RE133	DISTILLATE ROUGHING FILTERS AREA	RW 279
2RMS-RE134	EVAPORATOR SAMPLING AREA	RW 261
2RMS-RE142	NEAR DISTILLATE CONDENSER	RW 279
2RMS-RE146	SPENT RESIN CASK CAPPING ROOM	RW 279
2RMS-RE147	EXTRUDER EVAPORATOR TURNTABLE AREA	RW 291
2RMS-RE148	SOLID RADWASTE SAMPLE PNL AREA	RW 279
2RMS-RE152	RW BLDG FLOOR DRAIN SUMP AREA	RW 240
2RMS-RE153	RW BLDG LWS PUMP AREA	RW 240

5.2 Automatic Response

NONE

5.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue).

b. On High Radiation Level -

1. Identify Area affected, and verify level reading.

2. Refer to Emergency Plan Procedure EPP-1.

3. Correct the cause and restore to normal operation.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

5.3 (Con'td)

c. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

d. If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

e. If two or more ARMs reach High Alarm setpoint, refer to S-EAP-2.

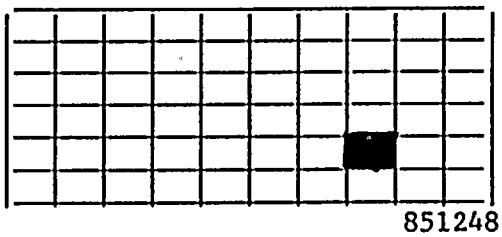
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

6.0 851248 Reactor/Radwaste Building Vent Radiation Monitor Activated

REFLASH: YES

TCN-23

REAC/RADW BLDG VENT EFFLUENT RADN MON ACTIVATED 851248



851248

TCN-23

6.1 Computer Point	Computer Printout	Source
RMSRC97	REAC/RADW RADN MON ACT	1) 2RMS-CAB180 GAS ALERT 2) PARTICULATE ALERT 3) IODINE ALERT 4) PARTICULATE RADN HIGH 5) IODINE RADN HIGH
RMSRC96	REAC/RADW GAS RADN HIGH	1) GAS RADN HIGH (From Report Generation)
RMSRC08	REAC/RADW GAS COUNT HIGH	2) GAS RADN HIGH (From Log Count Rate Signal)

6.2 Automatic Response

NONE

6.3 Corrective Action

a. Perform the following concurrently:

1. Notify Chemistry to investigate the cause of the annunciator and determine if the alert or alarm setpoint has been exceeded.

2. On the SPDS Display determine if alarm or alert setpoint has been exceeded.

3. At 2CEC-PNL882, observe 2RMS-RR170/180 for the vent noble gas release rate in uci/sec. Compare the uci/sec. value with the alert and alarm setpoints indicated on the operator aid.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

6.3 (Cont'd)

b. IF the Alarm Setpoint has been exceeded:

Refer to N2-EOP-RR and Emergency Plan Procedure EPP-1, and Technical Specifications for possible L.C.O. and applicable actions.

c. If the Alert Setpoint has been exceeded:

Notify the SSS, and take appropriate actions to return release rate to normal.

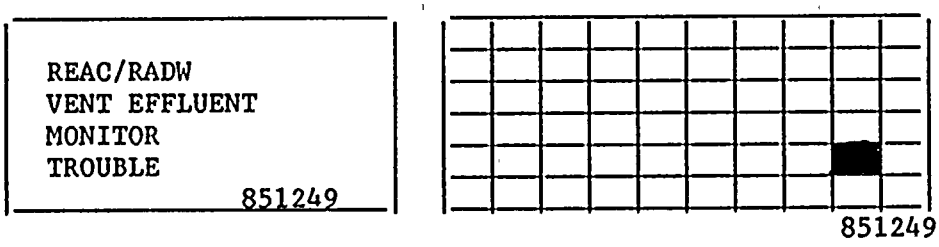
d. At GEMS Monitor have Chemistry confirm radiation parameters (gas, particulate, or iodine) and radiation release rates.

e. If the cause of the annunciator is a condition that makes the GEMS system inoperable, notify Chemistry that they must comply with the actions required by Technical Specification 3.3.7.9.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

7.0 851249 Reactor/Radwaste Building Vent Effluent Monitor Trouble

REFLASH: YES



TCN-23

7.1	Computer Point	Computer Printout	Source
	RMSRC99	REAC/RADW NOB GAS CT LOW	2RMS-CAB180
	RMSRC03	REAC/RADW LOSS COMP PWR	2RMS-PNL200
	RMSRC04	VENT A-B NOT IN RUN PGM	2RMS-CAB180
	RMSRC98	REAC/RADW LOSS AB COMM	2RMS-CAB180
	RMSRC10	REAC/RADW LOSS EFF FLOW	2RMS-CAB180
	RMSRC11	REAC/RADW LOSS SAMP FLOW	2RMS-CAB180
	RMSRC05	VENT SYS NOT IN REMOTE	2RMS-CAB180
	RMSRC95	REAC/RADW LOSS MCA COMM	2RMS-RAK180

7.2 Automatic Response

NONE

7.3 Corrective Action

a. Notify the Chemistry Department to investigate the cause of the annunciator.

b. If the cause of the annunciator is a condition that makes the GEMS system inoperable, notify Chemistry that they must comply with the actions required by Tech. Spec. 3.3.7.9.

c. Receipt of the trouble annunciator with multiple computer points displayed (but not RMSRC03) indicates that the GEMS computer has been de-energized at the back of the computer, vice a complete loss of power at 2RMS-PNL200.

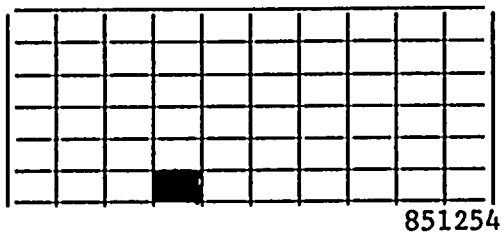
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

8.0 851254 Process Airborne Radiation Monitor Activated

REFLASH: NO

TCN-23

PROCESS AIRBORNE RADN MON ACTIVATED 851254



851254

TCN-23

8.1

Computer Point	Computer Printout	Source
RMSRC76	PROCESS AIR RADN MONT ACT	SEE TABLE 851254 BELOW

TABLE 851254

EQUIP. NO.	AREA MONITORED	AUTO RESPONSE	CORRECTIVE ACTION
**2CMS*CAB10A-1	DW/CONTAINMENT	NONE	8.3.b
**2CMS*CAB10A-2	DW/CONTAINMENT	NONE	8.3.b
**2CMS*CAB10B-1	DW/CONTAINMENT	NONE	8.3.b
**2CMS*CAB10B-2	DW/CONTAINMENT	NONE	8.3.b
**2HVR*CAB14A-1	HVR ABOVE REFUEL FLR	8.2.a	8.3.c
**2HVR*CAB14A-2	HVR ABOVE REFUEL FLR	NONE	8.3.d
**2HVR*CAB14B-1	HVR ABOVE REFUEL FLR	8.2.a	8.3.c
**2HVR*CAB32A-1	HVR BELOW REFUEL FLR	8.2.a	8.3.c
**2HVR*CAB32A-2	HVR BELOW REFUEL FLR	NONE	8.3.d
**2HVR*CAB32B-1	HVR BELOW REFUEL FLR	8.2.a	8.3.c
**2HVC*CAB18A	CONTROL RM INTAKE	8.2.b	8.3.d
**2HVC*CAB18B	CONTROL RM INTAKE	8.2.b	8.3.d
**2HVC*CAB18C	CONTROL RM INTAKE	8.2.b	8.3.d
**2HVC*CAB18D	CONTROL RM INTAKE	8.2.b	8.3.d
**2GTS-CAB105	SGTS DISCHARGE	8.2.c	8.3.d
2HVT-CAB206-1	HVT EXHAUST	NONE	8.3.d,f
2HVT-CAB206-2	HVT EXHAUST	NONE	8.3.d,f
2HVR-CAB229-1	HVR RECIRC MODE	NONE	8.3.d
2HVR-CAB229-2	HVR RECIRC MODE	NONE	8.3.d
2HVR-CAB237-1	RHR A HX ROOM	NONE	8.3.d
2HVR-CAB237-2	RHR A HX ROOM	NONE	8.3.d
2HVR-CAB238-1	RHR B HX ROOM	NONE	8.3.d
2HVR-CAB238-2	RHR B HX ROOM	NONE	8.3.d

TCN-23

**Tech. Spec. Monitors

TABLE Cont'd

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

8.1 (Cont'd)

TABLE 851254 (Cont'd)

EQUIP. NO.	AREA MONITORED	AUTO RESPONSE	CORRECTIVE ACTION
2HVW-CAB195-1	RW EQUIP EXHAUST	NONE	8.3.d
2HVW-CAB195-2	RW EQUIP EXHAUST	NONE	8.3.d
2HVW-CAB196-1	RW TANK VENT	NONE	8.3.d
2HVW-CAB196-2	RW TANK VENT	NONE	8.3.d
2HVW-CAB197-1	RW BLDG VENT	NONE	8.3.d
2HVW-CAB197-2	RW BLDG VENT	NONE	8.3.d
2HVW-CAB199-1	DECON AREA EXHAUST	NONE	8.3.d
2HVW-CAB199-2	DECON AREA EXHAUST	NONE	8.3.d

8.2 Automatic Response

a. Gaseous Rad Level High initiates the following:

1. RX Bldg Vent Emergency *UC413A(B) starts. Shuts Suction Test DMPR*AOD34A(B).

2. Shuts RX Bldg Ventilation Supp Air Isol DMPR *AOD1A(B).

3. Shuts RX Bldg Ventilation Exh Air Isol DMPR *AOD9A(B).

4. Shuts RX Bldg Ventilation Refuel Area Exh Air Isol DMPR *AOD10A(B).

5. Initiates Standby Gas Treatment Filter Train A Start Signal.

b. High Rad Level or Equipment Failure Coincident Chan. A and Chan. C Auto Start 2HVC*FN2A (DIV I.) and close special filter train bypass valve 2HVC*MOV1A. High Rad Level or Equipment Failure Coincident Chan. B and Chan. D Auto Start 2HVC*FN2B (DIV II) and close special filter train bypass valve 2HVC*MOV1B.

c. On High Rad Level Isolation Containment Purge Valves 2CPS*AOV110, 2CPS*AOV111, 2CPS*AOV108, 2CPS*AOV109, 2CPS*SOV120, 2CPS*SOV119, 2CPS*SOV122, 2CPS*SOV121, 2CPS*AOV104, 2CPS*AOV105, 2CPS*AOV106, 2CPS*AOV107 Shut.

8.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue). For applicable alarm response refer to Table 851254. For alert response refer to 8.3.e.

8.3 (Cont'd)

b. If there has been an increase in containment activity as evidenced by an alert or High Rad alarm on the gaseous or particulate channel of CMS*RE10A or B:

1. Notify the SSS.

2. Notify the Rad. Prot. Department.

3. Attempt to identify the cause of the increase, notify Chemistry to sample containment.

4. Verify Reactor Coolant leakage is within Tech. Spec. limits (see Tech. Spec. 3.4.3.2).

c. On High Radiation Level -

1. Verify Automatic Response has occurred, as applicable (See I.8.1, 8.2 this procedure).

2. Identify Area affected, and verify level reading.

3. Refer to Emergency Plan Procedure EPP-1.

4. Refer to N2-EOP-SC.

5. Correct the cause and restore to normal operation.

d. On High Radiation Level -

1. Verify Automatic Response has occurred, as applicable (See I.8.1, 8.2 this procedure).

2. Identify Area affected, and verify level reading.

3. Refer to Emergency Plan Procedure EPP-1.

4. Correct the cause and restore to normal operation.

5. Refer to S-EAP-2.

6. For 2GTS-CAB105, Verify Annunciator 851256 is CLEAR.

e. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

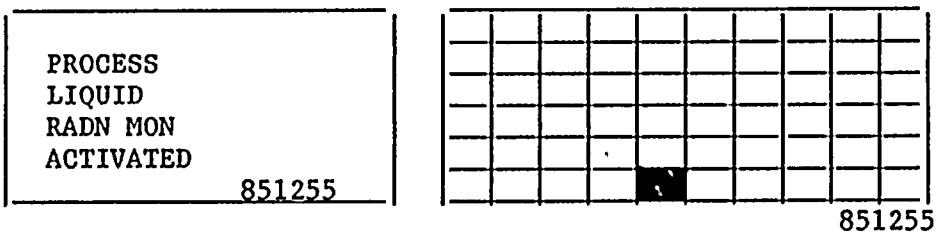
f. If the Turbine Building roof vents are open; then notify the SSS to determine if the roof vents should be closed. TCN-23

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

9.0 851255 Process Liquid Radiation Monitor Activated

TCN-23

REFLASH: NO



TCN-23

9.1

Computer Point	Computer Printout	Source
RMSRC79	PROCESS LIQ RADN MON ACT	LIQUID RADIATION MONITORS RADIATION LEVEL ABNORMAL

TABLE 851255

EQUIP. NO.	DESCRIPTION
2SFC-RE142	SFC PMP DISCHARGE
2CCP-RE115	SFC HX COOLING WTR
2CCP-RE131	WCS NRHX COOL WTR
2CCS-RE152	TBCLC MONITOR
2WSS-RE207	EXTRUD/EVAP MONITOR
2WSS-RE208	EXTRUD/EVAP MONITOR
**2SWP-RE23A	RHS HX SWP, DIV I
**2SWP-RE23B	RHS HX SWP, DIV II

**Tech. Spec. Monitor

9.2 Automatic Response

NONE

9.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue).

b. On High Radiation Level -

1. Refer to Tech Spec for LCO and required action.

2. Notify SSS, Radiation Protection, and take appropriate action to clear high radiation condition.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

9.3 Corrective Action (Cont'd)

c. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition. For SWP*RE23A and B, refer to EPP-1, Section 11.0. TCN-23

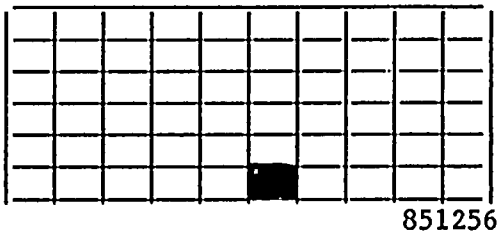
d. If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

10.0 851256 Main Stack Radiation Monitor Activated
REFLASH: YES

TCN-23

STACK EFFLUENT RADN MON ACTIVATED 851256



851256

TCN-23

10.1 Computer Point	Computer Printout	Source
RMSRC80	MAIN STACK RAD MON ACT	1) 2RMS-CAB170 GAS ALERT 2) PARTICULATE ALERT 3) IODINE ALERT 4) PARTICULATE RADN HIGH 5) IODINE RADN HIGH
RMSRC90	MAIN STACK GAS RADN HIGH	1) GAS RADN HIGH (From Report Generation)
RMSRC06	MAIN STACK GAS COUNT HI	2) GAS RADN HIGH (From Log Count Rate Signal)

10.2 Automatic Response

NONE

10.3 Corrective Action

a. Perform the following concurrently:

1. Notify Chemistry to investigate the cause of the annunciator and determine if the alert or alarm setpoint has been exceeded.

2. On the SPDS Display determine if alarm or alert setpoint has been exceeded.

3. At 2CEC-PNL882, observe 2RMS-RR170/180 for the vent noble gas release rate in uci/sec. Compare the uci/sec. value with the alert and alarm setpoints indicated on the operator aid.

b. IF the Alarm Setpoint has been exceeded:

Refer to N2-EOP-RR and Emergency Plan Procedure EPP-1, and Technical Specifications for possible L.C.O. and applicable actions.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

10.3 (Cont'd)

c. If the Alert Setpoint has been exceeded:

Notify the SSS, and take appropriate actions to return release rate to normal.

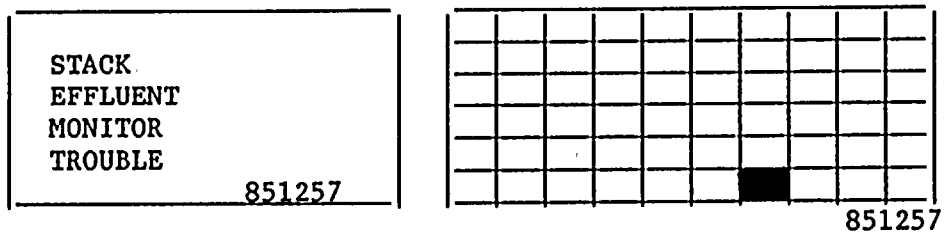
d. At GEMS Monitor have Chemistry confirm radiation parameters (gas, particulate, or iodine) and radiation release rates.

e. If the cause of the annunciator is a condition that makes the GEMS system inoperable, notify Chemistry that they must comply with the actions required by Technical Specification 3.3.7.9.

f. If Turbine Building roof vents are open, notify the SSS to determine if the vents should be closed. TCN-2

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

11.0 851257 Stack Effluent Monitor Trouble
REFLASH: YES



11.1	Computer Point	Computer Printout	Source
	RMSRC81	STACK NOB GAS CT LOW	2RMS-CAB170
	RMSRC91	MAIN STACK LOSS COMP PWR	2RMS-PNL200
	RMSRC92	STACK A-B NOT IN RUN PGM	2RMS-CAB170
	RMSRC94	MAIN STACK LOSS AB COMM	2RMS-CAB170
	RMSRC09	MAIN STACK LOSS EFF FLOW	2RMS-CAB170
	RMSRC07	MAIN STACK LOSS SAMP FLOW	2RMS-CAB170
	RMSRC93	STACK SYS NOT IN REMOTE	2RMS-CAB170
	RMSRC82	MAIN STACK LOSS MCA COMM	2RMS-RAK170

11.2 Automatic Response

NONE

11.3 Corrective Action

a. Notify the Chemistry Department to investigate the cause of the annunciator.

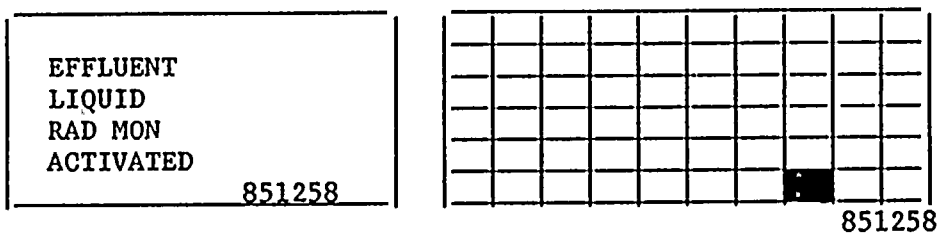
b. If the cause of the annunciator is a condition that makes the GEMS system inoperable, notify Chemistry that they must comply with the actions required by Tech. Spec. 3.3.7.10. *1.

c. Receipt of the trouble annunciator with multiple computer points displayed (but not RMSRC91) indicates that the GEMS computer has been de-energized at the back of the computer, vice a complete loss of power at 2RMS-PNL200.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

12.0 851258 Effluent Liquid Radiation Monitor Activated
REFLASH: NO

TCN-23



TCN-23

12.1

Computer Point	Computer Printout	Source
RMSRC83	EFFL LIQ RADN MON ACT	LIQUID RADIATION MONITORS

EQUIP. NO.	LIQUID MONITORED
2SWP*RE146A	SWP DISCHARGE DIV I
2SWP*RE146B	SWP DISCHARGE DIV II
2CWS-RE157	CWS BLOWDOWN LINE
2LWS-RE206	LIQ. RADWASTE EFFL.

**Tech. Spec. Monitor

12.2 Automatic Response

2LWS-RE206 closes Waste Discharge Valve 2LWS-AOV142 on high rad level or equipment failure.

12.3 Corrective Action

a. Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue).

b. On High Radiation Level -

1. Verify Automatic Response has occurred, if applicable (See I.12.2)

2. Refer to Emergency Plan Procedure EPP-1 and Emergency Operating Procedure N2-EOP-RR.

3. Refer to Tech Spec for LCO and required actions.

4. Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

12.3 Corrective Action (Cont'd)

c. On Alert Radiation Level -

Notify SSS, Radiation Protection, and take appropriate action to correct alert condition.

d. If monitor(s) is in alert, consider displaying the monitor using the DRMS computer DATA BASE function (provides alarm setpoints and most current reading). If the monitor has been in alarm for some time, consider displaying the monitor(s) graphically on the DRMS computer using the RAD TREND function and selecting the last 30 time periods (1 MIN, 10 MIN, 1 HR, 1 DAY) desired to be trended.

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2CCP-CAB115
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CCP-HCV01	Sample Inlet	OPEN			
2CCP-HCV02	Sample Pump Discharge Isolation	OPEN			
2CCP-HCV03	Liquid Sampler Outlet Isolation	OPEN			
2CCP-HCV04	Sample Outlet	OPEN			
2CCP-HCV05	Grab Sampler	SHUT AND CAPPED			
2CCP-HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2CCP-HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2CCP-FCV01	Sample Flow Control Valve	THROTTLED			
2CCP-FV01	Sample Isol For Purging/Test	OPEN			
2CCP-FV02	Purge/Test Valve	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2CCP-CAB131
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CCP-HCV01	Sample HX Outlet Isolation	OPEN			
2CCP-HCV02	Liquid Sampler Inlet Isolation	OPEN			
2CCP-HCV03	Liquid Sampler Outlet Isolation	OPEN			
2CCP-HCV04	Sample Outlet	OPEN			
2CCP-HCV05	Vent/Grab Sample	SHUT AND CAPPED			
2CCP-HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2CCP-HCV07	Calibration Test Connection	SHUT AND CAPPED			
2CCP-FV01	Sample Isol For Purging/Test	OPEN			
2CCP-FV02	High Temp Isolation	OPEN			
2CCP-FV03	Purge/Test Valve	SHUT			
2CCP-CKV01	Purge/Test Check Valve	INSTALLED			
2CCP-DV10	Drain	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2CCS-CAB152
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CCS-HCV01	Sample Inlet	OPEN			
2CCS-HCV02	Sample Pump Discharge Isolation	OPEN			
2CCS-HCV03	Liquid Sampler Outlet Isolation	OPEN			
2CCS-HCV04	Sample Outlet	OPEN			
2CCS-HCV05	Grab Sampler	SHUT AND CAPPED			
2CCS-HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2CCS-HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2CCS-FCV01	Sample Flow Control Valve	THROTTLED			
2CCS-FV01	Sample Isol For Purging/Test	OPEN			
2CCS-FV02	Purge/Test Valve	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2CMS*CAB10A
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CMS*HCV01	Sample Inlet	OPEN			
2CMS*HCV02	Moving Part/Iodine Filters Inlet Isol	OPEN			
2CMS*HCV03	Moving Part/Iodine Filters Outlet Isol	OPEN			
2CMS*HCV04	Stationary Part/Iodine Filter Inlet Isol	SHUT			
2CMS*HCV05	Stationary Part/Iodine Filter Outlet Isol	SHUT			
2CMS*HCV06	Sample Pump Suction Isolation	OPEN			
2CMS*HCV07	Sample Pump Disch Isolation	OPEN			
2CMS*HCV08	Gas Sampler Outlet Isolation	OPEN			
2CMS*HCV09	Sample Outlet	OPEN			
2CMS*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2CMS*CAB10A
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CMS*HCV11	Grab Sample	SHUT AND CAPPED			
2CMS*HCV12	Tritium Tap (Outlet)	SHUT AND CAPPED			
2CMS*HCV13	Tritium Tap (Inlet)	SHUT AND CAPPED			
2CMS*HCV14	Calibration Test	SHUT AND CAPPED			
2CMS*HCV15	Calibration Test	SHUT AND CAPPED			
2CMS*FV01	Sample Isol For Purging	OPEN			
2CMS*FV02	Purge Valve	SHUT			
2CMS*FCV01	Sample Flow Control	THROTTLED			
2CMS*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2CMS*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2CMS*CAB10B
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CMS*HCV01	Sample Inlet	OPEN			
2CMS*HCV02	Moving Part/Iodine Filters Inlet Isol	OPEN			
2CMS*HCV03	Moving Part/Iodine Filters Outlet Isol	OPEN			
2CMS*HCV04	Stationary Part/Iodine Filter Inlet Isol	SHUT			
2CMS*HCV05	Stationary Part/Iodine Filter Outlet Isol	SHUT			
2CMS*HCV06	Sample Pump Suction Isolation	OPEN			
2CMS*HCV07	Sample Pump Disch Isolation	OPEN			
2CMS*HCV08	Gas Sampler Outlet Isolation	OPEN			
2CMS*HCV09	Sample Outlet	OPEN			
2CMS*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2CMS*CAB10B
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CMS*HCV11	Grab Sample	SHUT AND CAPPED			
2CMS*HCV12	Tritium Tap (Outlet)	SHUT AND CAPPED			
2CMS*HCV13	Tritium Tap (Inlet)	SHUT AND CAPPED			
2CMS*HCV14	Calibration Test	SHUT AND CAPPED			
2CMS*HCV15	Calibration Test	SHUT AND CAPPED			
2CMS*FV01	Sample Isol For Purging	OPEN			
2CMS*FV02	Purge Valve	SHUT			
2CMS*FCV01	Sample Flow Control	THROTTLED			
2CMS*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2CMS*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2CWS-CAB157
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2CWS-HCV01	Sample Inlet	OPEN			
2CWS-HCV02	Sample Pump Discharge Isolation	OPEN			
2CWS-HCV03	Liquid Sampler Outlet Isolation	OPEN			
2CWS-HCV04	Sample Outlet	OPEN			
2CWS-HCV05	Grab Sampler	SHUT AND CAPPED			
2CWS-HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2CWS-HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2CWS-FCV01	Sample Flow Control Valve	THROTTLED			
2CWS-FV01	Sample Isol For Purging/Test	OPEN			
2CWS-FV02	Purge/Test Valve	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2GTS-CAB105
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2GTS-HCV01	Sample Inlet	OPEN			
2GTS-HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2GTS-HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2GTS-HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2GTS-HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2GTS-HCV06	Gas Sampler Inlet Isol	OPEN			
2GTS-HCV07	Gas Sampler Outlet Isol	OPEN			
2GTS-HCV08	Sample Outlet	OPEN			
2GTS-HCV09	Grab Sample	SHUT AND CAPPED			
2GTS-HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2GTS-CAB105
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2GTS-HCV11	Calibration Test	SHUT AND CAPPED			
2GTS-HCV12	Calibration Test	SHUT AND CAPPED			
2GTS-FV01	Sample Isol For Purging	OPEN			
2GTS-FV02	Purge Valve	SHUT			
2GTS-FCV01	Sample Flow Control Valve	MANUALLY THROTTLED			
2GTS-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2GTS-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2GTS-CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18A
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV01	Sample Inlet	OPEN			
2HVC*HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2HVC*HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2HVC*HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2HVC*HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2HVC*HCV06	Gas Sampler Inlet Isol	OPEN			
2HVC*HCV07	Gas Sampler Outlet Isol	OPEN			
2HVC*HCV08	Sample Outlet	OPEN			
2HVC*HCV09	Grab Sample	SHUT AND CAPPED			
2HVC*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18A
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV11	Calibration Test	SHUT AND CAPPED			
2HVC*HCV12	Calibration Test	SHUT AND CAPPED			
2HVC*FV01	Sample Isol For Purging	OPEN			
2HVC*FV02	Purge Valve	SHUT			
2HVC*FCV01	Sample Flow Control Valve	THROTTLED			
2HVC*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVC*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVC*CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18B
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV01	Sample Inlet	OPEN			
2HVC*HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2HVC*HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2HVC*HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2HVC*HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2HVC*HCV06	Gas Sampler Inlet Isolation	OPEN			
2HVC*HCV07	Gas Sampler Outlet Isolation	OPEN			
2HVC*HCV08	Sample Outlet	OPEN			
2HVC*HCV09	Grab Sample	SHUT AND CAPPED			
2HVC*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18B
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV11	Calibration Test	SHUT AND CAPPED			
2HVC*HCV12	Calibration Test	SHUT AND CAPPED			
2HVC*FV01	Sample Isol For Purging	OPEN			
2HVC*FV02	Purge Valve	SHUT			
2HVC*FCV01	Sample Flow Control Valve	THROTTLED			
2HVC*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVC*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVC*CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18C
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV01	Sample Inlet	OPEN			
2HVC*HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2HVC*HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2HVC*HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2HVC*HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2HVC*HCV06	Gas Sampler Inlet Isol	OPEN			
2HVC*HCV07	Gas Sampler Outlet Isol	OPEN			
2HVC*HCV08	Sample Outlet	OPEN			
2HVC*HCV09	Grab Sample	SHUT AND CAPPED			
2HVC*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18C
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV11	Calibration Test	SHUT AND CAPPED			
2HVC*HCV12	Calibration Test	SHUT AND CAPPED			
2HVC*FV01	Sample Isol For Purging	OPEN			
2HVC*FV02	Purge Valve	SHUT			
2HVC*FCV01	Sample Flow Control Valve	THROTTLED			
2HVC*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVC*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVC*CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18D
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV01	Sample Inlet	OPEN			
2HVC*HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2HVC*HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2HVC*HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2HVC*HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2HVC*HCV06	Gas Sampler Inlet Isol	OPEN			
2HVC*HCV07	Gas Sampler Outlet Isol	OPEN			
2HVC*HCV08	Sample Outlet	OPEN			
2HVC*HCV09	Grab Sample	SHUT AND CAPPED			
2HVC*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVC*CAB18D
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVC*HCV11	Calibration Test	SHUT AND CAPPED			
2HVC*HCV12	Calibration Test	SHUT AND CAPPED			
2HVC*FV01	Sample Isol For Purging	OPEN			
2HVC*FV02	Purge Valve	SHUT			
2HVC*FCV01	Sample Flow Control Valve	THROTTLED			
2HVC*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVC*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVC*CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2HVR*CAB14A
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV01	Sample Inlet	OPEN			
2HVR*HCV02	Moving Part/Iodine Filters Inlet Isol	OPEN			
2HVR*HCV03	Moving Part/Iodine Filters Outlet Isol	OPEN			
2HVR*HCV04	Stationary Part/Iodine Filter Inlet Isol	SHUT			
2HVR*HCV05	Stationary Part/Iodine Filter Outlet Isol	SHUT			
2HVR*HCV06	Sample Pump Suction Isol	OPEN			
2HVR*HCV07	Sample Pump Disch Isol	OPEN			
2HVR*HCV08	Gas Sampler Outlet Isol	OPEN			
2HVR*HCV09	Sample Outlet	OPEN			
2HVR*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2HVR*CAB14A
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV11	Grab Sample	SHUT AND CAPPED			
2HVR*HCV12	Tritium Tap (Outlet)	SHUT AND CAPPED			
2HVR*HCV13	Tritium Tap (Inlet)	SHUT AND CAPPED			
2HVR*HCV14	Calibration Test	SHUT AND CAPPED			
2HVR*HCV15	Calibration Test	SHUT AND CAPPED			
2HVR*FV01	Sample Isol For Purging	OPEN			
2HVR*FV02	Purge Valve	SHUT			
2HVR*FCV01	Sample Flow Control Valve	THROTTLED			
2HVR*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVR*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR*CKV01	Sample Pump Inlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVR*CAB14B
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV01	Sample Inlet	OPEN			
2HVR*HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2HVR*HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2HVR*HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2HVR*HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2HVR*HCV06	Gas Sampler Inlet Isol	OPEN			
2HVR*HCV07	Gas Sampler Outlet Isol	OPEN			
2HVR*HCV08	Sample Outlet	OPEN			
2HVR*HCV09	Grab Sample	SHUT AND CAPPED			
2HVR*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVR*CAB14B
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV11	Calibration Test	SHUT AND CAPPED			
2HVR*HCV12	Calibration Test	SHUT AND CAPPED			
2HVR*FV01	Sample Isol For Purging	OPEN			
2HVR*FV02	Purge Valve	SHUT			
2HVR*FCV01	Sample Flow Control Valve	THROTTLED			
2HVR*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVR*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR*CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2HVR*CAB32A
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV01	Sample Inlet	OPEN			
2HVR*HCV02	Moving Part/Iodine Filters Inlet Isol	OPEN			
2HVR*HCV03	Moving Part/Iodine Filters Outlet Isol	OPEN			
2HVR*HCV04	Stationary Part/Iodine Filter Inlet Isol	SHUT			
2HVR*HCV05	Stationary Part/Iodine Filter Outlet Isol	SHUT			
2HVR*HCV06	Sample Pump Suction Isolation	OPEN			
2HVR*HCV07	Sample Pump Disch Isolation	OPEN			
2HVR*HCV08	Gas Sampler Outlet Isolation	OPEN			
2HVR*HCV09	Sample Outlet	OPEN			
2HVR*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMPG-MF) 2HVR*CAB32A
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV11	Grab Sample	SHUT AND CAPPED			
2HVR*HCV12	Tritium Tap (Outlet)	SHUT AND CAPPED			
2HVR*HCV13	Tritium Tap (Inlet)	SHUT AND CAPPED			
2HVR*HCV14	Calibration Test	SHUT AND CAPPED			
2HVR*HCV15	Calibration Test	SHUT AND CAPPED			
2HVR*FV01	Sample Isol For Purging	OPEN			
2HVR*FV02	Purge Valve	SHUT			
2HVR*FCV01	Sample Flow Control Valve	THROTTLED			
2HVR*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVR*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR*CKV01	Sample Pump Inlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVR*CAB32B
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV01	Sample Inlet	OPEN			
2HVR*HCV02	Part/Iodine Filter Inlet Isol	OPEN			
2HVR*HCV03	Part/Iodine Filter Outlet Isol	OPEN			
2HVR*HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
2HVR*HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
2HVR*HCV06	Gas Sampler Inlet Isol	OPEN			
2HVR*HCV07	Gas Sampler Outlet Isol	OPEN			
2HVR*HCV08	Sample Outlet	OPEN			
2HVR*HCV09	Grab Sample	SHUT AND CAPPED			
2HVR*HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 2HVR*CAB32B
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR*HCV11	Calibration Test	SHUT AND CAPPED			
2HVR*HCV12	Calibration Test	SHUT AND CAPPED			
2HVR*FV01	Sample Isol For Purging	OPEN			
2HVR*FV02	Purge Valve	SHUT			
2HVR*FCV01	Sample Flow Control Valve	THROTTLED			
2HVR*PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
2HVR*PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR*CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVR-CAB229
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR-HCV01	Sample Inlet	OPEN			
2HVR-HCV02	Sample Outlet	OPEN			
2HVR-HCV03	Grab Sample	SHUT AND CAPPED			
2HVR-HCV04	Grab Sample	SHUT AND CAPPED			
2HVR-HCV05	Purge Isolation	SHUT			
2HVR-FCV01	Sample Flow Control Valve	THROTTLED			
2HVR-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVR-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVR-CAB237
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR-HCV01	Sample Inlet	OPEN			
2HVR-HCV02	Sample Outlet	OPEN			
2HVR-HCV03	Grab Sample	SHUT AND CAPPED			
2HVR-HCV04	Grab Sample	SHUT AND CAPPED			
2HVR-HCV05	Purge Isolation	SHUT			
2HVR-FCV01	Sample Flow Control Valve	THROTTLED			
2HVR-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVR-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVR-CAB238
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVR-HCV01	Sample Inlet	OPEN			
2HVR-HCV02	Sample Outlet	OPEN			
2HVR-HCV03	Grab Sample	SHUT AND CAPPED			
2HVR-HCV04	Grab Sample	SHUT AND CAPPED			
2HVR-HCV05	Purge Isolation	SHUT			
2HVR-FCV01	Sample Flow Control Valve	THROTTLED			
2HVR-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVR-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVR-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVT-CAB206
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVT-HCV01	Sample Inlet	OPEN			
2HVT-HCV02	Sample Outlet	OPEN			
2HVT-HCV03	Grab Sample	SHUT AND CAPPED			
2HVT-HCV04	Grab Sample	SHUT AND CAPPED			
2HVT-HCV05	Purge Isolation	SHUT			
2HVT-FCV01	Sample Flow Control Valve	THROTTLED			
2HVT-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVT-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVT-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVW-CAB195
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVW-HCV01	Sample Inlet	OPEN			
2HVW-HCV02	Sample Outlet	OPEN			
2HVW-HCV03	Grab Sample	SHUT AND CAPPED			
2HVW-HCV04	Grab Sample	SHUT AND CAPPED			
2HVW-HCV05	Purge Isolation	SHUT			
2HVW-FCV01	Sample Flow Control Valve	THROTTLED			
2HVW-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVW-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVW-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVW-CAB196
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVW-HCV01	Sample Inlet	OPEN			
2HVW-HCV02	Sample Outlet	OPEN			
2HVW-HCV03	Grab Sample	SHUT AND CAPPED			
2HVW-HCV04	Grab Sample	SHUT AND CAPPED			
2HVW-HCV05	Purge Isolation	SHUT			
2HVW-FCV01	Sample Flow Control Valve	MANUALLY THROTTLED			
2HVW-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVW-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVW-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVW-CAB197
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVW-HCV01	Sample Inlet	OPEN			
2HVW-HCV02	Sample Outlet	OPEN			
2HVW-HCV03	Grab Sample	SHUT AND CAPPED			
2HVW-HCV04	Grab Sample	SHUT AND CAPPED			
2HVW-HCV05	Purge Isolation	SHUT			
2HVW-FCV01	Sample Flow Control Valve	THROTTLED			
2HVW-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVW-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVW-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMCAM) 2HVW-CAB199
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2HVW-HCV01	Sample Inlet	OPEN			
2HVW-HCV02	Sample Outlet	OPEN			
2HVW-HCV03	Grab Sample	SHUT AND CAPPED			
2HVW-HCV04	Grab Sample	SHUT AND CAPPED			
2HVW-HCV05	Purge Isolation	SHUT			
2HVW-FCV01	Sample Flow Control Valve	THROTTLED			
2HVW-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			5 PSI
2HVW-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
2HVW-CKV01	Iodine Filter Outlet Check Valve	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2LWS-CAB206
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2LWS-HCV01	Sample Inlet	OPEN			
2LWS-HCV02	Sample Pump Discharge Isolation	OPEN			
2LWS-HCV03	Liquid Sampler Outlet Isolation	OPEN			
2LWS-HCV04	Sample Outlet	OPEN			
2LWS-HCV05	Grab Sampler	SHUT AND CAPPED			
2LWS-HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2LWS-HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2LWS-FCV01	Sample Flow Control Valve	THROTTLED			
2LWS-FV01	Sample Isol For Purging/Test	OPEN			
2LWS-FV02	Purge/Test Valve	SHUT			
2LWS-FV03	Purge Outlet to Drain	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 20FG-CAB13A
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
20FG-HCV01	Sample Inlet	OPEN			
20FG-HCV02	Part/Iodine Filter Inlet Isol	OPEN			
20FG-HCV03	Part/Iodine Filter Outlet Isol	OPEN			
20FG-HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
20FG-HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
20FG-HCV06	Gas Sampler Inlet Isol	OPEN			
20FG-HCV07	Gas Sampler Outlet Isol	OPEN			
20FG-HCV08	Sample Outlet	OPEN			
20FG-HCV09	Grab Sample	SHUT AND CAPPED			
20FG-HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 20FG-CAB13A
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
20FG-HCV11	Calibration Test	SHUT AND CAPPED			
20FG-HCV12	Calibration Test	SHUT AND CAPPED			
20FG-FV01	Sample Isol For Purging	OPEN			
20FG-FV02	Purge Valve	SHUT			
20FG-FCV01	Sample Flow Control Valve	MANUALLY THROTTLED			
20FG-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
20FG-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
20FG-CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 20FG-CAB13B
SH. 1 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
20FG-HCV01	Sample Inlet	OPEN			
20FG-HCV02	Part/Iodine Filter Inlet Isol	OPEN			
20FG-HCV03	Part/Iodine Filter Outlet Isol	OPEN			
20FG-HCV04	Alternate Part/Iodine Filter Inlet Isol	SHUT			
20FG-HCV05	Alternate Part/Iodine Filter Outlet Isol	SHUT			
20FG-HCV06	Gas Sampler Inlet Isol	OPEN			
20FG-HCV07	Gas Sampler Outlet Isol	OPEN			
20FG-HCV08	Sample Outlet	OPEN			
20FG-HCV09	Grab Sample	SHUT AND CAPPED			
20FG-HCV10	Grab Sample	SHUT AND CAPPED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KMG) 20FG-CAB13B
SH. 2 of 2

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
20FG-HCV11	Calibration Test	SHUT AND CAPPED			
20FG-HCV12	Calibration Test	SHUT AND CAPPED			
20FG-FV01	Sample Isol For Purging	OPEN			
20FG-FV02	Purge Valve	SHUT			
20FG-FCV01	Sample Flow Control Valve	MANUALLY THROTTLED			
20FG-PCV01	Purge Inlet Instr Air Regulator	THROTTLED			6±1 PSI
20FG-PCV02	Purge Relief Valve	NOT GAGGED			SET 10 PSI
20FG-CKV01	Part/Iodine Filter Outlet Check	INSTALLED			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2SFC-CAB142
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2SFC-HCV01	Sample HX Outlet Isolation	OPEN			
2SFC-HCV02	Liquid Sampler Inlet Isolation	OPEN			
2SFC-HCV03	Liquid Sampler Outlet Isolation	OPEN			
2SFC-HCV04	Sample Outlet	OPEN			
2SFC-HCV05	Vent/Grab Sample	SHUT AND CAPPED			
2SFC-HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2SFC-HCV07	Calibration Test Connection	SHUT AND CAPPED			
2SFC-FV01	Sample Isol For Purging/Test	OPEN			
2SFC-FV02	High Temp Isolation	OPEN			
2SFC-FV03	Purge/Test Valve	SHUT			
2SFC-CKV01	Purge/Test Check Valve	INSTALLED			
2SFC-DV10	Drain	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2SWP*CAB23A
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2SWP*HCV01	Sample Inlet	OPEN			
2SWP*HCV02	Sample Pump Discharge Isolation	OPEN			
2SWP*HCV03	Liquid Sampler Outlet Isolation	OPEN			
2SWP*HCV04	Sample Outlet	OPEN			
2SWP*HCV05	Purge Inlet	SHUT			
2SWP*HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2SWP*HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2SWP*FCV01	Sample Flow Control Valve	THROTTLED			
2SWP*FV01	Sample Isol For Purging/Test	OPEN			
2SWP*FV02	Purge/Test Valve	SHUT			
2SWP*HCV08	2SWP*PI01 Isolation	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2SWP*CAB23B
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2SWP*HCV01	Sample Inlet	OPEN			
2SWP*HCV02	Sample Pump Discharge Isolation	OPEN			
2SWP*HCV03	Liquid Sampler Outlet Isolation	OPEN			
2SWP*HCV04	Sample Outlet	OPEN			
2SWP*HCV05	Purge Inlet	SHUT			
2SWP*HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2SWP*HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2SWP*FCV01	Sample Flow Control Valve	THROTTLED			
2SWP*FV01	Sample Isol For Purging/Test	OPEN			
2SWP*FV02	Purge/Test Valve	SHUT			
2SWP*HCV08	2SWP*PI01 Isolation	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2SWP*CAB146A
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2SWP*HCV01	Sample Inlet	OPEN			
2SWP*HCV02	Sample Pump Discharge Isolation	OPEN			
2SWP*HCV03	Liquid Sampler Outlet Isolation	OPEN			
2SWP*HCV04	Sample Outlet	OPEN			
2SWP*HCV05	Purge Inlet	SHUT			
2SWP*HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2SWP*HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2SWP*FCV01	Sample Flow Control Valve	THROTTLED			
2SWP*FV01	Sample Isol For Purging/Test	OPEN			
2SWP*FV02	Purge/Test Valve	SHUT			
2SWP*HCV08	2SWP*PI01 Isolation	SHUT			

ATTACHMENT 1

VALVE LINEUP

DRMS
(KML) 2SWP*146B
SH. 1 of 1

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2SWP*HCV01	Sample Inlet	OPEN			
2SWP*HCV02	Sample Pump Discharge Isolation	OPEN			
2SWP*HCV03	Liquid Sampler Outlet Isolation	OPEN			
2SWP*HCV04	Sample Outlet	OPEN			
2SWP*HCV05	Purge Inlet	SHUT			
2SWP*HCV06	Calibration/Drain Connection	SHUT AND CAPPED			
2SWP*HCV07	Calibration Test/Vent Connection	SHUT AND CAPPED			
2SWP*FCV01	Sample Flow Control Valve	THROTTLED			
2SWP*FV01	Sample Isol For Purging/Test	OPEN			
2SWP*FV02	Purge/Test Valve	SHUT			
2SWP*HCV08	2SWP*PI01 Isolation	SHUT			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH. 1 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-0V1	Sample Inlet	OPEN			
2RMS-0V2	Sample Return	OPEN			
2RMS-0V3	Normal Sample Mode Inlet	OPEN			
2RMS-0V4	Inlet to First Stage of Dilution	SHUT			
2RMS-0V5	Sample From First Stage of Dilution	SHUT			
2RMS-0V6	Inlet to Second Stage of Dilution	SHUT			
2RMS-0V7	Isokinetic Probe Isolation	OPEN			
2RMS-0V8	1st Stage Dilution Sample Man Flow Control	THROTTLED			
2RMS-0V9	2nd Stage Dilution Sample Man Flow Control	THROTTLED			
2RMS-0V10	Condensate Trap Drain	SHUT AND CAPPED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH 2 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-0V11	1st Stage Dilution Sample Return Chk	INSTALLED			
2RMS-0V12	1st Stage Dilution Sample Check	INSTALLED			
2RMS-0V13	2nd Stage Dilution Sample Check	INSTALLED			
2RMS-0V14	2nd Stage Dilution Sample Return Chk	INSTALLED			
2RMS-0SV1	Sample Purge	SHUT			
2RMS-0SV2	2nd Stage Dilution Air	SHUT			
2RMS-0SV4	1st Stage Dilution Air	SHUT			
2RMS-0FCV1	Dilution Sample Flow Control	THROTTLED			
2RMS-0FCV2	1st Stage Dilution Sample Auto Flow Contrl	THROTTLED			
2RMS-0FCV3	2nd Stage Dilution Sample Auto Flow Contrl	THROTTLED			
2RMS-0FCV4	1st Stage Dilution Air Auto Flow Contrl	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH 3 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-OPR1	Air Supply Regulator	THROTTLED			SET 80 PSIG
2RMS-OPR2	2nd Stage Dilution Air Supply Regulator	THROTTLED			SET 2.0 PSIG
2RMS-OPR3	Purge Air Supply Regulator	THROTTLED			(16.240.-5001B) SET 1.0 PSIG
2RMS-OPR4	1st Stage Dilution Air Supply Regulator	THROTTLED			SET 2.0 PSIG
2RMS-1V1	Particulate Monitor Inlet Isolation	OPEN			
2RMS-1V2	Particulate Monitor Outlet Isolation	OPEN			
2RMS-1V3	Particulate Monitor Bypass	SHUT			MODE DEPENDENT
2RMS-1V4	Bypass Filter Outlet	OPEN			
2RMS-1V5	Bypass Filter Purge	SHUT			
2RMS-1V6	Particulate Cartridge Seal Speed Control	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH 4 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-1V7	Check source Speed Control	THROTTLED			
2RMS-1V8	Purge manual Flow Control	THROTTLED			
2RMS-1V9	New Cartridge Drop Piston Speed Contl	THROTTLED			
2RMS-1V10	Ready Cartridge Drop Piston Speed Contl	THROTTLED			
2RMS-1V11	Used Cartridge Drop Piston Speed Contl	THROTTLED			
2RMS-1V12	Particulate Monitor Purge Manual Isol	OPEN			
2RMS-1SV5	Particulate Monitor Purge Inlet Isol	SHUT			
2RMS-1SV6	Particulate Monitor Purge Outlet Isol	SHUT			
2RMS-1SV7	Particulate Detector Nitrogen Supply	SHUT			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH 5 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-2V1	Iodine Monitor Inlet Isolation	OPEN			
2RMS-2V2	Iodine Monitor Outlet Isolation	OPEN			
2RMS-2V3	Iodine Monitor Bypass	SHUT			
2RMS-2V4	Bypass Filter Outlet	OPEN			
2RMS-2V5.	Bypass Filter Purge Inlet	SHUT			
2RMS-2V6	Iodine Cartridge Seal Speed Control	THROTTLED			
2RMS-2V7	Check source Speed Control	THROTTLED			
2RMS-2V8	Purge manual Flow Control	THROTTLED			
2RMS-2V9	New Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-2V10	Ready Cartridge Drop Piston Speed Cntl	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH. 6 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-2V11	Used Cartridge Drop Piston Speed Contl	THROTTLED			
2RMS-2V12	Iodine Monitor Purge Manual Isol	OPEN			
2RMS-2SV5	Iodine Monitor Purge Inlet Isol	SHUT			
2RMS-2SV6	Iodine Monitor Purge Outlet Isol	SHUT			
2RMS-2SV7	Iodine Detector Nitrogen Supply	SHUT			
2RMS-3V1	Gas Monitor Bypass	OPEN TO GAS MONITOR			
2RMS-3V2	Gas Monitor Purge Outlet Isol	OPEN TO 3V5			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH. 7 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-3V3	6.0L/30cc Gas Chamber Inlet Diversion	OPEN TO 6.0 LITER CHAMBER			
2RMS-3V4	6.0L/30cc Gas Chamber Outlet Diversion	OPEN TO 6.0 LITER CHAMBER			
2RMS-3V5	Future Tritium Monitor Diversion	OPEN TO BYPASS TRITIUM MONITOR			
2RMS-3V6	Future Tritium Monitor Outlet Isol	SHUT			
2RMS-3V7	Gas Grab Sample	SHUT			
2RMS-3V8	Sample Return Line Drain	SHUT			
2RMS-3V9	Iodine Monitor Outlet Cond Trap Drain	SHUT AND CAPPED			
2RMS-3V10	Purge Manual Flow Control	THROTTLED			
2RMS-3V13	Purge Line Check	INSTALLED			
2RMS-3V16	Pump 3P1 Suction Isolation	OPEN			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB170
SH. 8 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-3V17	Pump 3P2 Suction Isolation	OPEN			
2RMS-3V18	30cc Chamber Calibration Gas Inlet	SHUT AND CAPPED			
2RMS-3V19	6.0 liter Chamber Calibration Gas Inlet	SHUT AND CAPPED			
2RMS-3V20	Check Source Speed Control	THROTTLED			
2RMS-3SV5	Gas Monitor Purge Inlet Isol	SHUT			
2RMS-3SV7	Gas Monitor Nitrogen Supply	SHUT			
2RMS-3SV8	Gas Monitor Check Source Actuation	SHUT			
2RMS-2SV8	Iodine Monitor Chk Source Actuation	SHUT			
2RMS-1SV8	Particulate Monitor Chk Source Actuation	SHUT			
2RMS-3FCV1	Sample Flow Control	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 1 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-0V1	Sample Inlet	OPEN			
2RMS-0V2	Sample Return	OPEN			
2RMS-0V3	Normal Sample Mode Inlet	OPEN			
2RMS-0V4	Inlet to First Stage of Dilution	SHUT			
2RMS-0V5	Sample from First Stage of Dilution	SHUT			
2RMS-0V6	Inlet to Second Stage of Dilution	SHUT			
2RMS-0V7	Isokinetic Probe Isolation	OPEN			
2RMS-0V8	1st Stage Dilution Sample Man Flow Contrl	THROTTLED			
2RMS-0V9	2nd Stage Dilution Sample Man Flow Contrl	THROTTLED			
2RMS-0V10	Condensate Trap Drain	SHUT AND CAPPED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 2 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-0V11	1st Stage Dilution Sample Return Chk	INSTALLED			
2RMS-0V12	1st Stage Dilution Sample Check	INSTALLED			
2RMS-0V13	2nd Stage Dilution Sample Check	INSTALLED			
2RMS-0V14	2nd Stage Dilution Sample Return Chk	INSTALLED			
2RMS-0SV1	Sample Purge	SHUT			
2RMS-0SV2	2nd Stage Dilution Air	SHUT			
2RMS-0SV4	1st Stage Dilution Air	SHUT			
2RMS-0FCV1	Dilution Sample Flow Control	THROTTLED			
2RMS-0FCV2	1st Stage Dilution Sample Auto Flow Contrl	THROTTLED			
2RMS-0FCV3	2nd Stage Dilution Sample Auto Flow Contrl	THROTTLED			
2RMS-0FCV4	1st Stage Dilution Air Auto Flow Contrl	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 3 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-OPR1	Air Supply Regulator	THROTTLED			SET 80 PSIG
2RMS-OPR2	Second Stage Dilution Air Supply Regulator	THROTTLED			SET 2.0 PSIG
2RMS-OPR3	Purge Air Supply Regulator	THROTTLED			(16.240.-5001B) SET 1.0 PSIG
2RMS-OPR4	1st Stage Dilution Air Supply Regulator	THROTTLED			SET 2.0 PSIG
2RMS-1V1	Particulate Monitor Inlet Isolation	OPEN			
2RMS-1V2	Particulate Monitor Outlet Isolation	OPEN			
2RMS-1V3	Particulate Monitor Bypass	SHUT			
2RMS-1V4	Bypass Filter Outlet	OPEN			
2RMS-1V5	Bypass Filter Purge	SHUT			
2RMS-1V6	Particulate Cartridge Seal Speed Control	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 4 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-1V7	Check source Speed Control	THROTTLED			
2RMS-1V8	Purge manual Flow Control	THROTTLED			
2RMS-1V9	New Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-1V10	Ready Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-1V11	Used Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-1V12	Particulate Monitor Purge Manual Isol	SHUT			
2RMS-1SV5	Particulate Monitor Purge Inlet Isol	SHUT			
2RMS-1SV6	Particulate Monitor Purge Outlet Isol	SHUT			
2RMS-1SV7	Particulate Detector Nitrogen Supply	SHUT			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 5 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-2V1	Iodine Monitor Inlet Isolation	OPEN			
2RMS-2V2	Iodine Monitor Outlet Isolation	OPEN			
2RMS-2V3	Iodine Monitor Bypass	SHUT			
2RMS-2V4	Bypass Filter Outlet	OPEN			
2RMS-2V5	Bypass Filter Purge Inlet	SHUT			
2RMS-2V6	Iodine Cartridge Seal Speed Control	THROTTLED			
2RMS-2V7	Check source Speed Control	THROTTLED			
2RMS-2V8	Purge manual Flow Control	THROTTLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 6 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-2V9	New Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-2V10	Ready Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-2V11	Used Cartridge Drop Piston Speed Cntl	THROTTLED			
2RMS-2V12	Iodine Monitor Purge Manual Isol	OPEN			
2RMS-2SV5	Iodine Monitor Purge Inlet Isol	SHUT			
2RMS-2SV6	Iodine Monitor Purge Outlet Isol	SHUT			
2RMS-2SV7	Iodine Detector Nitrogen Supply	SHUT			
2RMS-3V1	Gas Monitor Bypass	OPEN TO GAS MONITOR			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 7 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-3V2	Gas Monitor Purge Outlet Isol	OPEN TO 3V5			
2RMS-3V3	6.0L/30cc Gas Chamber Inlet Diversion	OPEN TO 6.0 LITER CHAMBER			
2RMS-3V4	6.0L/30cc Gas Chamber Outlet Diversion	OPEN TO 6.0 LITER CHAMBER			
2RMS-3V5	Future Tritium Monitor Diversion	OPEN TO BYPASS TRITIUM MONITOR			
2RMS-3V6	Future Tritium Monitor Outlet Isol	SHUT			
2RMS-3V7	Gas Grab Sample	SHUT			
2RMS-3V8	Sample Return Line Drain	SHUT			
2RMS-3V9	Iodine Monitor Outlet Cond Trap Drain	SHUT AND CAPPED			
2RMS-3V10	Purge Manual Flow Control	THROTTLED			
2RMS-3V13	Purge Line Check	INSTALLED			

Attachment 2

VALVE LINEUP

GEM 2RMS-CAB180
SH. 8 of 8

VALVE NO.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS & DATE	REMARKS
2RMS-3V16	Pump 3P1 Suction Isolation	OPEN			
2RMS-3V17	Pump 3P2 Suction Isolation	OPEN			
2RMS-3V18	30cc Chamber Calibration Gas Inlet	SHUT AND CAPPED			
2RMS-3V19	6.0 liter Chamber Calibration Gas Inlet	SHUT AND CAPPED			
2RMS-3V20	Check Source Speed Control	THROTTLED			
2RMS-3SV5	Gas Monitor Purge Inlet Isol	SHUT			
2RMS-3SV7	Gas Monitor Nitrogen Supply	SHUT			
2RMS-3SV8	Gas Monitor Check Source Actuation	SHUT			
2RMS-2SV8	Iodine Monitor check Source Actuation	SHUT			
2RMS-1SV8	Particulate Monitor Chk Source Actuation	SHUT			
2RMS-3FCV1	Sample Flow Control	THROTTLED			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CWS-CAB157	Cooling Tower Blowdown Radiation Monitor	2NHS-MCC017	7BL	ON			
2CCS-CAB152	TBCLCW Radiation Monitor	2NJS-PNL101	2	ON			
2LWS-CAB206	Liquid Radwaste Effluent Radiation Monitor	2NJS-PNL101	19	ON			
2OFG-CAB13A	Offgas Pretreatment A Radiation Monitor	2NJS-PNL745	32	ON			
2OFG-CAB13B	Offgas Pretreatment B Radiation Monitor	2NJS-PNL745	37	ON			
2SWP*CAB146A	Service Water Effluent A Radiation Monitor	2EJS*PNL102A	19	ON			
2HVC*CAB18A	Control Room Air Intake A Radiation Monitor	2EJS*PNL102A	25	ON			
2HVC*CAB18C	Control Room Air Intake C Radiation Monitor	2EJS*PNL102A	26	ON			
2CMS*CAB10A	Drywell Atmosphere Radiation Monitor	2EJS*PNL104A	19	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2HVR*CAB14A	Reactor Bldg Above Refuel Floor Radiation Monitor	2EJS*PNL104A	20	ON			
2HVR*CAB32A	Reactor Bldg Below Refuel Floor Radiation Monitor	2EJS*PNL104A	25	ON			
2SWP*CAB23A	RHR Service Water A Radiation Monitor	2EJS*PNL104A	26	ON			
2HVC*CAB18B	Control Room Air Intake B Radiation Monitor	2EJS*PNL301B	20	ON			
2HVC*CAB18D	Control Room Air Intake D Radiation Monitor	2EJS*PNL301B	25	ON			
2SWP*CAB146B	Service Water Effluent B Radiation Monitor	2EJS*PNL301B	26	ON			
2CMS*CAB10B	Drywell Atmosphere Radiation Monitor	2EJS*PNL303B	13	ON			
2HVR*CAB14B	Reactor Bldg Above Refuel Floor Radiation Monitor	2EJS*PNL303B	19	ON			
2HVR*CAB32B	Reactor Bldg Below Refuel Floor Radiation Monitor	2EJS*PNL303B	20	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2SWP*CAB23B	RHR Service Water B Radiation Monitor	2EJS*PNL303B	25	ON			
2SFC-CAB142	SFC Filter Inlet Radiation Monitor	2NJS-PNL201	8	ON			
2CCP-CAB115	RBCLCW A Radiation Monitor	2NJS-PNL201	13	ON			
2CCP-CAB131	RBCLCW B Radiation Monitor	2NJS-PNL201	14	ON			
2GTS-CAB105	Standby Gas Treatment Radiation Monitor	2NJS-PNL901	8	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CEC-CP850 (2CEC-RCPT25)	DRMS DAS A	2VBS-PNLC102	6	ON			
2CEC-CP851 (2CEC-RCPT24)	DRMS CPU A	2VBS-PNLC102	5	ON			
2CEC-CP852 (2CEC-RCPT23)	DRMS Unibus	2VBS-PNLC102	4	ON			
2CEC-CP853 (2CEC-RCPT26)	DRMS CPU B	2VBS-PNLC102	7	ON			
2CEC-CP854 (2CEC-RCPT27)	DRMS DAS B	2VBS-PNLC102	8	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CCP-CAB115	RBCLCW A Radiation Monitor	2VBS-PNLB109	23	ON			
2CCP-CAB131	RBCLCW B Radiation Monitor	2VBS-PNLB109	24	ON			
2CCS-CAB152	TBCLCW Radiation Monitor	2VBS-PNLB107	4	ON			
2CMS*CAB10A	Drywell Atmosphere Radiation Monitor	2VBS*PNL102A	7	ON			
2CMS*RUW10A	Drywell Atmosphere Radiation Monitor	2VBS*PNL102A	17	ON			
2CMS*CAB10B	Drywell Atmosphere Radiation Monitor	2VBS*PNL302B	7	ON			
2CMS*RUW10B	Drywell Atmosphere Radiation Monitor	2VBS*PNL302B	17	ON			
2CWS-CAB157	Cooling Tower Blowdown Radiation Monitor	2VBS-PNLB108	25	ON			
2GTS-CAB105	Standby Gas Treatment Radiation Monitor	2VBS-PNLB109	21	ON			
2HVC*CAB18A	Control Room Air Intake A Radiation Monitor	2VBS*PNL102A	1	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2HVC*CAB18B	Control Room Air Intake B Radiation Monitor	2VBS*PNL302B	1	ON			
2HVC*CAB18C	Control Room Air Intake C Radiation Monitor	2VBS*PNL102A	2	ON			
2HVC*CAB18D	Control Room Air Intake D Radiation Monitor	2VBS*PNL302B	2	ON			
2HVR*CAB14A	Reactor Bldg Above Refuel Floor Radiation Monitor	2VBS*PNL102A	5	ON			
2HVR*RUW14A	Reactor Bldg Above Refuel Floor Radiation Monitor	2VBS*PNL102A	18	ON			
2HVR*CAB14B	Reactor Bldg Above Refuel Floor Radiation Monitor	2VBS*PNL302B	5	ON			
2HVR*RUW14B	Reactor Bldg Above Refuel Floor Radiation Monitor	2VBS*PNL302B	18	ON			
2HVR*CAB32A	Reactor Bldg Below Refuel Floor Radiation Monitor	2VBS*PNL102A	6	ON			
2HVR*RUW32A	Reactor Bldg Below Refuel Floor Radiation Monitor	2VBS*PNL102A	19	ON			
2HVR*CAB32B	Reactor Bldg Below Refuel Floor Radiation Monitor	2VBS*PNL302B	6	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2HVR*RUW32B	Reactor Bldg Below Refuel Floor Radiation Monitor	2VBS*PNL302B	19	ON			
2HVR-CAB229	Reactor Bldg Ventilation Recirc Radiation Monitor	2VBS-PNLB109	26	ON			
2HVR-CAB237	RHR Hx Cubicle Vent North Radiation Monitor	2VBS-PNLB109	27	ON			
2HVR-CAB238	RHR Hx Cubicle Vent South Radiation Monitor	2VBS-PNLB109	28	ON			
2HVT-CAB206	Turbine Bldg Ventilation Radiation Monitor	2VBS-PNLB108	26	ON			
2HVW-CAB195 (2HVW-RCPT1)	Radwaste Equipment Exh Radiation Monitor	2VBS-PNLB107	16	ON			
2HVW-CAB196 (2HVW-RCPT2)	Radwaste Tank Vent Radiation Monitor	2VBS-PNLB107	17	ON			
2HVW-CAB197 (HVW-RCPT3)	Radwaste Bldg Ventilation Radiation Monitor	2VBS-PNLB107	18	ON			
2HVW-CAB199 (2HVW-RCPT4)	Radwaste Equip Service Area Radiation Monitor	2VBS-PNLB107	19	ON			
2LWS-CAB206	Liquid Radwaste Effluent Radiation Monitor	2VBS-PNLB107	8	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2OFG-CAB13A	Offgas Pretreatment A Radiation Monitor	2VBS-PNLB108	24	ON			
2OFG-CAB13B	Offgas Pretreatment B Radiation Monitor	2VBS-PNLB108	23	ON			
2SFC-CAB142	SFC Filter Inlet Radiation Monitor	2VBS-PNLB109	25	ON			
2SWP*CAB23A	RHR Service Water A Radiation Monitor	2VBS*PNL102A	9	ON			
2SWP*CAB23B	RHR Service Water B Radiation Monitor	2VBS*PNL302B	9	ON			
2SWP*CAB146A	Service Water Effluent A Radiation Monitor	2VBS*PNL102A	8	ON			
2SWP*CAB146B	Service Water Effluent B Radiation Monitor	2VBS*PNL302B	8	ON			
2WSS-RUW207	Solid Waste Sludge Feed Radiation Monitor	2VBS-PNLB107	14	ON			
2WSS-RUW208	Waste Concentrate Feed Radiation Monitor	2VBS-PNLB107	15	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-PNL187	HP-2 Console	2VBS-PNLC103	1	ON			
2RMS-RCPT1	Receptacle	2VBS-PNLC103	2	ON			
2RMS-RCPT2 thru RCPT5	Receptacles	2VBS-PNLC103	3	ON			
2RMS-RCPT6 thru RCPT9	Receptacles	2VBS-PNLC103	4	ON			
2RMS-RCPT10 and RCPT11	Receptacles	2VBS-PNLC103	5	ON			
2RMS-RCPT12 and RCPT13	Receptacles	2VBS-PNLA102	15	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	POWER SUPPLY Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS*RE1A	Reactor Bldg Area Radiation Monitor	2VBS*PNL102A	3	ON			
2RMS*RE1B	Reactor Bldg Area Radiation Monitor	2VBS*PNL302B	3	ON			
2RMS*RE1C	Reactor Bldg Area Radiation Monitor	2VBS*PNL102A	4	ON			
2RMS*RE1D	Reactor Bldg Area Radiation Monitor	2VBS*PNL302B	4	ON			
2RMS-RE2A	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	8	ON			
2RMS-RE2B	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	7	ON			
2RMS-RE3A	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	5	ON			
2RMS-RE3B	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	6	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE3C	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	7	ON			
2RMS-RE101	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	10	ON			
2RMS-RE102	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	13	ON			
2RMS-RE103	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	12	ON			
2RMS-RE104	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	11	ON			
2RMS-RE105	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	6	On			
2RMS-RE106	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	2	ON			
2RMS-RE108	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	1	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE109	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	15	ON			
2RMS-RE111	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	19	ON			
2RMS-RE112	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	18	ON			
2RMS-RE113	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	16	ON			
2RMS-RE114	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	20	ON			
2RMS-RE116	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	9	ON			
2RMS-RE117	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	10	ON			
2RMS-RE118	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	1	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE119	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	3	ON			
2RMS-RE120	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	14	ON			
2RMS-RE121	Area Radiation Monitor	2VBS-PNLB107	1	ON			
2RMS-RE123	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	17	ON			
2RMS-RE125	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	7	ON			
2RMS-RE129	Control Bldg Area Radiation Monitor	2VBS-PNLB108	20	ON			
2RMS-RE130	Control Bldg Area Radiation Monitor	2VBS-PNLB108	22	ON			
2RMS-RE132	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	6	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE133	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	11	ON			
2RMS-RE134	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	5	ON			
2RMS-RE135	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	12	ON			
2RMS-RE136	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	15	ON			
2RMS-RE137	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	2	ON			
2RMS-RE138	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	8	ON			
2RMS-RE139	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	9	ON			
2RMS-RE140	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	17	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE141	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	4	ON			
2RMS-RE142	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	9	ON			
2RMS-RE143	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	4	ON			
2RMS-RE144	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	3	ON			
2RMS-RE145	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	5	ON			
2RMS-RE146	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	10	ON			
2RMS-RE147	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	13	ON			
2RMS-RE148	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	12	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE149	Reactor Bldg Area Radiation Monitor	2VBS-PNLB109	14	ON			
2RMS-RE150	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	11	ON			
2RMS-RE151	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	16	ON			
2RMS-RE152	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	2	ON			
2RMS-RE153	Radwaste Bldg Area Radiation Monitor	2VBS-PNLB107	3	ON			
2RMS-RE154	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	13	ON			
2RMS-RE190	Control Bldg Area Radiation Monitor	2VBS-PNLB108	21	ON			
2RMS-RE191	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	18	ON			

Attachment 3

SYSTEM POWER SUPPLY LINEUP

(DRMS)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	POWER SUPPLY Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-RE192	Turbine Bldg Area Radiation Monitor	2VBS-PNLB108	19	ON			
2RMS-RE193	Main Stack Area Radiation Monitor	2VBS-PNLB109	22	ON			

Attachment 4

SYSTEM POWER SUPPLY LINEUP

(GEM)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2RMS-CAB170	Gaseous Effluent Monitoring Panel	2NJS-PNL901	26	ON			
2RMS-CAB180	Gaseous Effluent Monitoring Panel	2VBS-PNLA102	20/22	ON			
2RMS-PNL200	GEM Computer Control Console	2VBS-PNLA102	13	ON			
2RMS-CAB170	Heat Tracing	2LAR-PNLN02	39	ON			
2RMS-CAB170	Heat Tracing	2LAR-PNLN02	41	ON			
2RMS-CAB180	Heat Tracing	2LAT-PNLN04	80	ON			
2RMS-CAB180	Heat Tracing	2LAT-PNLN04	81	ON			
2GTS-CAB105	Heat Tracing	2LAR-PNLN02	40	ON			

Attachment 5

SYSTEM POWER SUPPLY LINEUP

(Main Steam Line Radiation Monitoring Power Supply)

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	POWER SUPPLY Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
D13-K610A	Main Steam Line A Radiation Monitor	2VBS*PNLA103	5	ON			
D13-K610B	Main Steam Line B Radiation Monitor	2VBS*PNLB103	6	ON			
D13-K610C	Main Steam Line C Radiation Monitor	2VBS*PNLA104	1	ON			
D13-K610D	Main Steam Line D Radiation Monitor	2VBS*PNLB104	1	ON			

Attachment 6

KERIC (P880) RECORDERS

Monitor	Recorder Pen Assignment	Description
2CMS*RE10A	2CMS*RRX10A	Drywell Atmosphere Train A Leakage Gaseous Radiation Level
2CMS*RE10A	2CMS*RRY10A	Drywell Atmosphere Train A Leakage Particulate Radiation Level
2CMS*RE10B	2CMS*RRX10B	Drywell Atmosphere Train B Leakage Gaseous Radiation Level
2CMS*RE10B	2CMS*RRY10B	Drywell Atmosphere Train B Leakage Particulate Radiation Level
2HVC*RE18A	2HVC*RR18A	Control Room Air Intake Radiation Level
2HVR*RE14A	2HVR*RRX14A	RX Bldg. above Refueling Floor A Gaseous Radiation Level
2HVR*RE14A	2HVR*RRY14A	RX Bldg. Above Refueling Floor A Particulate Radiation level
2HVC*RE18B	2HVC*RR18B	Control Room Air Intake Radiation Level
2HVR*RE14B	2HVR*RR14B	RX Bldg. Above Refueling Floor B Gaseous Radiation Level
	Spare	

Attachment 6

KERIC (P880) RECORDERS

Monitor	Recorder Pen Assignment	Description
2HVC*RE18C	2HVC*RR18C	Control Room Air Intake Radiation Level
2HVR*RE32A	2HVR*RRX32A	RX Bldg. Below Refueling Floor A Gaseous Radiation Level
2HVR*RE32A	2HVR*RRY32A	RX Bldg. Below Refueling Floor A Particulate Radiation Level
2HVC*RE18D	2HVC*RR18D	Control Room Air Intake Radiation Level
2HVR*RE32B	2HVR*RR32B	RX Bldg. Below Refueling Floor B Gaseous Radiation Level
	Spare	
2SWP*RE23A	2SWP*RR23A	RHR Heat Exchanger Service Water Discharge Radiation Level
	Spare	
2SWP*RE23B	2SWP*RR23B	RHR Heat Exchanger Service Water Discharge Radiation Level
	Spare	
2SWP*RE146A	2SWP*RR146A	Service Water Effluent Loop A Radiation Level
2SWP*FT567	2SWP*FR567	Service Water Effluent Loop A Discharge Flow to Lake

Attachment 6

KERIC (P880) RECORDERS

Monitor	Recorder Pen Assignment	Description
2SWP*RE146B	2SWP*RR146B	Service Water Effluent Loop B Radiation Level
2SWP*FT523	2SWP*FR523	Service Water Effluent Loop B Discharge Flow to Lake
2RMS*RE1A	2RMS*RR1A	RX Bldg. Drywell Area Radiation Level
2RMS*RE1C	2RMS*RR1C	RX Bldg. Drywell Area Radiation Level
2RMS*RE1B	2RMS*RR1B	RX Bldg. Drywell Area Radiation Level
2RMS*RE1D	2RMS*RR1D	RX Bldg. Drywell Area Radiation Level

Attachment 7

FUNCTION CODES

Function	Meaning
1.	Display a value
2.	Set a parameter
3.	Activate a check source
4.	Initiate or terminate a purge or backflush
5.	Turn on or turn off the pump motor
6.	Enable or disable the radiation alarms
7.	Perform a special function
8.	Perform a microcomputer self-test
9.	Step the filter
	N2-OP-79 Page # (New Page)

Attachment 8

FUNCTION KEYS

Key Name	Function
DSP	Display a current value
SET	Set a parameter
ACS	Activate a check source
PRG	Initiate or terminate a purge or backflush
PMP	Turn on or turn off the pump motor
ENA	Enable or disable the radiation alarms
FTN	Perform a special function
EXP	Expand a table display
TST	Initiate the microcomputer self test
STP	Step or clear the filter
CHS	Change the sign of the exponent
ENT	Enter the preceding sequence of keystrokes
CLR	Clear the preceding sequence of keystrokes

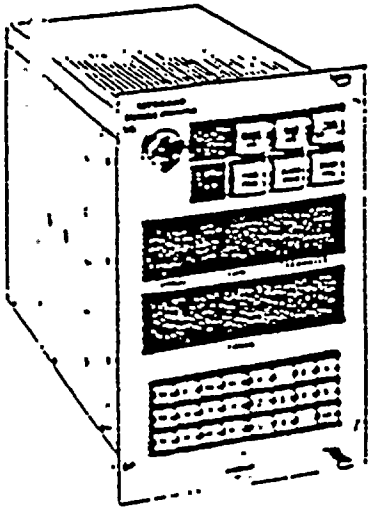
Attachment 9

TABLE VI
PARAMETER CODES

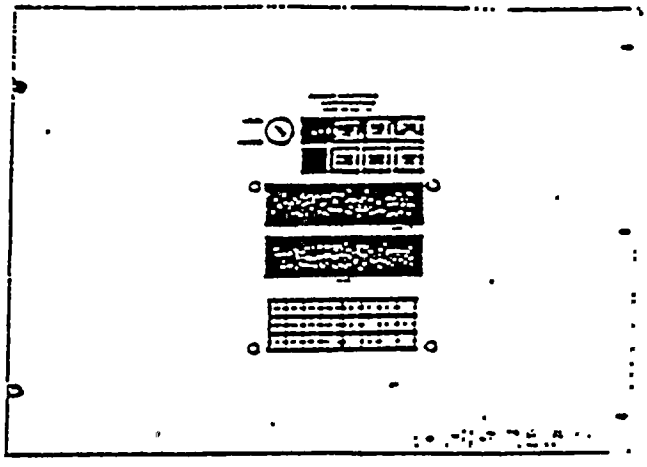
01	High Radiation Trip Value (radiation units, e.g., micro-Ci/cc or mR/hr)
02	Alert Radiation Trip Value (radiation units)
03	Radiation Rate of Change Trip Value (radiation units/sec)
04	Low Flow Trip Value (cfm)
05	High Pressure Trip Value (psi)
06	Low Pressure Trip Value (psi)
07	High Temperature Trip Value (deg-F)
08	Low Temperature Trip Value (deg-F)
09	Radiation Engineering Calibration Factor (radiation units/cpm)
10	Sample Flow Adjustment Factor (unitless, scaling factor)
11	Process Flow Conversion Factor or Constant Process Flow Value (cfm/ma or cfm)
12	Current Background Radiation (radiation units)
13	Expected Check Source Response (radiation units)
14	Check Source Activation Period (Min)
15	Automatic Filter Stepping Period (Min)
16	Purge Period (Sec)
17	Pump Test Interval (Hr - KMG-HRH Only)
*18	Data Filter Time Constant
*19	Sample Flow Rate (Optional Continuous Display Parameter) (Std. cfm)
*20	Process Flow Rate (Std. cfm)
*21	Pressure (psi)
*22	Temperature (deg-F)
*23	Current Radiation Rate (mR/hr, R/hr, or micro-Ci/cc) (Default Continuous Display Parameter)
*24	One-Minute Average Radiation Rate Array (radiation units)
*25	Ten-Minute Radiation Release Rate Array (radiation units)
*26	One-Hour Radiation Release Rate Array (radiation units)
*27	Ten-Minute Radiation Release Rate Array (micro-Ci/sec)
*28	One-Hour Radiation Release Rate Array (micro-Ci/sec)
*29	One-Day Radiation Release Rate Array (micro-Ci/sec)
*30	Failure Code Table
31	Day of Month (1 to 31)
32	Current Hour of Day (0 to 23)
33	Current Minute of the Hour (0 to 59)
*34	One-Day Average Radiation Rate Array (radiation units)
*35	One-Hour Average Sample Flow Array (Std. cfm)
*36	One-Hour Average Process Flow Array (Std. cfm)
*37	Total Sample Flow Value (cu. ft. or gal.)
*38	Filter Speed (0 = stopped; 1 = 1/2"/hr; 2 = 1"/hr; 3 = 2"/hr)
*39	Total Process Flow (cu. ft. or gal.)
40	Current Sample Source (multiple sample units only)
41	Sample time per sample source (multiple sample units only)
42	High flow trip point (cfm where implemented)
*43	Collector start time (date, hrs., min., sec.) (where implemented)
*44	Collector stop time (date, hrs., min., sec.) (where implemented)
*45	Collector total collection time (hrs., mins., secs.) (where implemented)
46	Variable gas channel crossover point (micro Ci/cc where implemented)
*98	Software Version Number
*99	Personality (monitor type)

NOTE: The parameters above following an asterisk are for display purposes only and cannot be set.

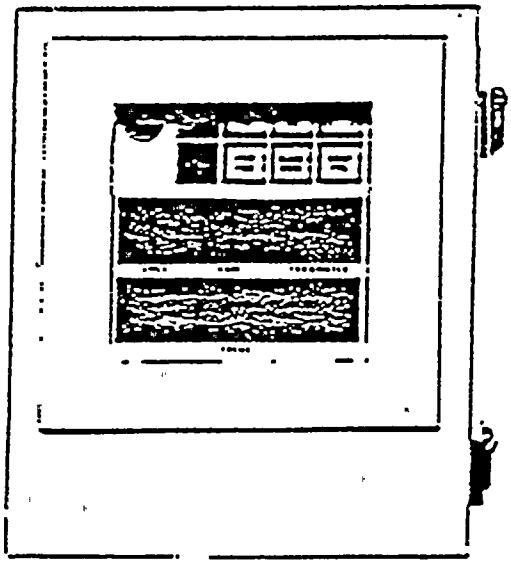
DISPLAY AND CONTROL UNITS



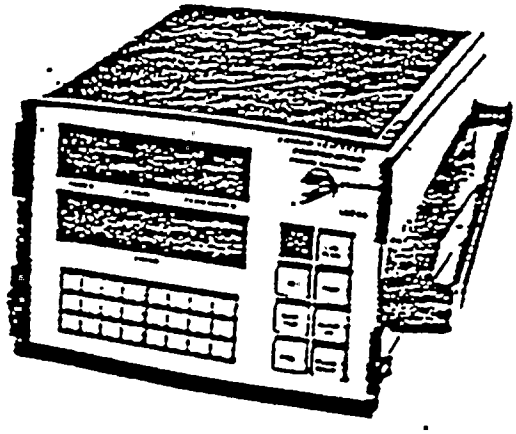
REMOTE INDICATION & CONTROL UNIT (RIC)



PANEL MOUNTED LOCAL INDICATION & CONTROL UNIT (LIC)



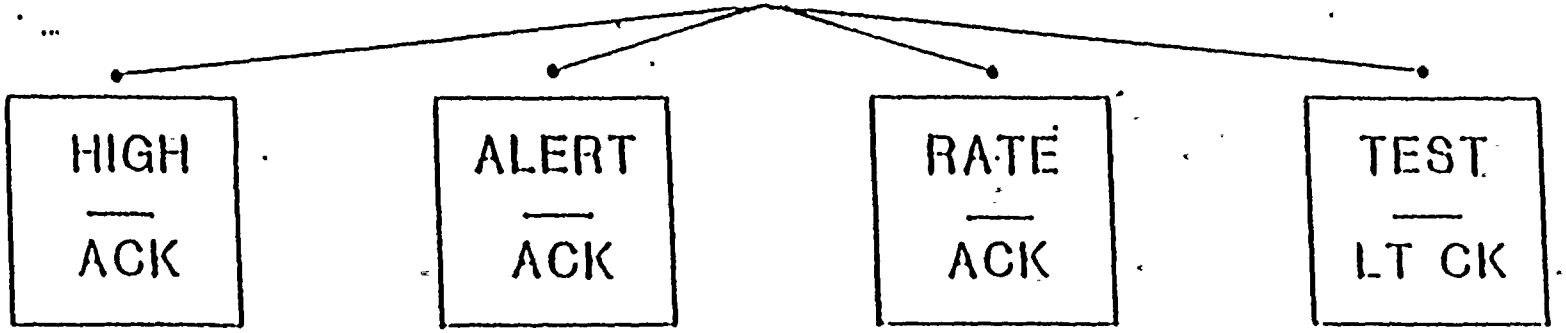
EQ MOUNTED LOCAL INDICATION & CONTROL UNIT (LIC)



PORTABLE INDICATION & CONTROL UNIT (PIC)

Attachment 11

CONTROL BUTTONS WITH LIGHTS

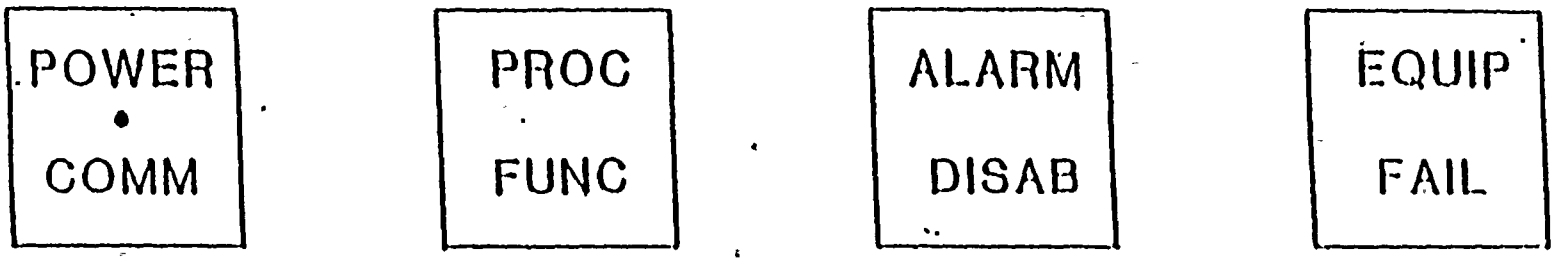


Flashes when radiation rate exceeds trip point. Pressing button acknowledges alarm and illuminates steadily until radiation drops below set point.

Flashes when rate exceeds trip point. Press to acknowledge, then light is steady until radiation drops below set point.

Flashes when radiation rate of change exceeds trip point. Depressing button acknowledges and light stays on steady until rate falls below set point.

Button is depressed to test panel lights and LED display. This light also turns on when check source is activated.



Light is on when power is supplied to display panel (and) microcomputer. In "Local" mode light flashes and "Remote" mode light is steady unless communications with DCS are interrupted for 6 seconds.

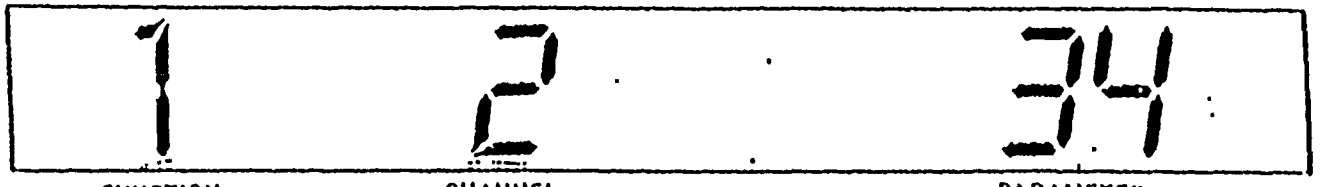
Light illuminates anytime a monitor process function is activated (ie, purging). For HAN monitor light is also on when HAN is in the bypass mode.

Light illuminates when the radiation alarms for the monitor are disabled.

Light is on anytime the microcomputer detects an equipment failure. Cues operator to query the failure code table for specific failure.

INDICATOR LIGHTS

Attachment 12



FUNCTION

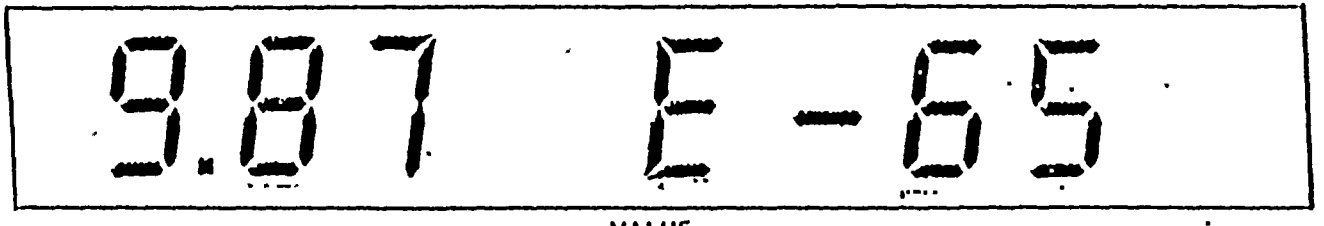
REPRESENTS THE PANEL FUNCTION PERFORMED

CHANNEL

INDICATES THE CHANNEL NUMBER

PARAMETER

INDICATES THE PARAMETER BEING DISPLAYED OR SET, OR SHOWS THE VALUE OF THE SPECIAL PANEL OPERATION.



VALUE

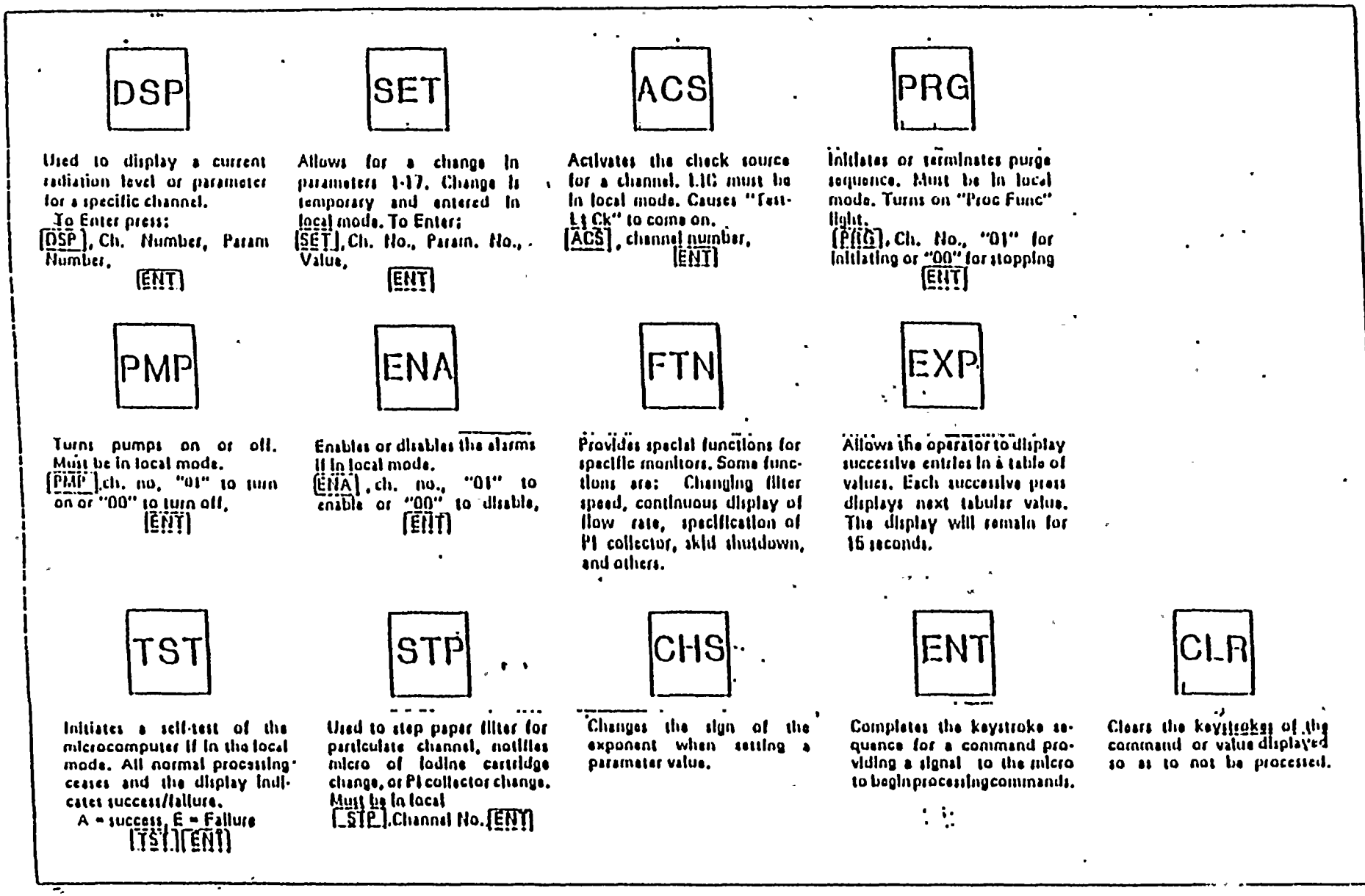
USUALLY INDICATES THE CURRENT RADIATION LEVEL FOR THE CHANNEL DISPLAYED ABOVE. ADDITIONALLY, THE CURRENT FLOW RATE MAY BE DISPLAYED. VALUE IS PRESENTED IN FLOATING POINT FORMAT. (i.e., THE VALUE SHOWN IS 9.87×10^{-65})

DISPLAY AREA

DISPLAY AREA

Attachment 13

KEYBOARD FUNCTION KEYS



Attachment 14

A description of the files in the FILES LIST:

A. Monitor Group Names

Loop 1		
Loop 2		
Loop 3		
Loop 4		Contains the monitors on each communications loop
Loop 5		
Loop 7		
Loop 8		
AREA	-	Contains all area monitors
GAS	-	Contains all gas monitors
LIQU	-	Contains all off-line liquid monitors
CAM	-	Contains all constant air monitors
GASPART	-	Contains all combination gas and particulate monitors
OLIQ	-	Contains all on-line liquid monitors
ALAMRS RELAY 2 RELAY 3	-	Files set up by Kaman for set up testing of the system
TSCAREA	-	Contains area monitors which are of interest to the TSC and it coincides with the status board in the TSC
TSCPRO	-	Same as TSCAREA for process monitors

B. Floor Plan/Schematic Names

INDEX	–	Listing of all available floor plans
TB250		
TB277	–	Turbine Building floor plans
TB306		
RW240		
RW261		
RW279	–	Radwaste Building floor plans
RW291		
RW309		
RX175		
RX196		
RX215		
RX261	–	Reactor Building floor plans
RX289		
RX306		
RX328		
RX353		
RANGES	–	Ranges of all detectors
RMSZONE1	–	Equipment in the area of the
RMSZONE2		area monitors

C. Multi-Channel Trend Groups

RBVENTA	Contains Rx. Bldg. vent monitors above the refuel floor
RBVENTB	Contains Rx. Bldg. vent monitors below the refuel floor
RBRECIRC	Contains Rx. Bldg. recirc vent CAM Standby Gas Treatment monitor
RBCAM	Contains Rx. Bldg. vent CAM's
RBRADL	Contains selected Rx. Bldg. area monitors below El. 261
RBRADH	Contains selected Rx. Bldg. area monitors above El. 261
DW	Contains Drywell high range monitors, Suppression Pool area monitor and Containment Atmosphere Monitor
RPRAD	Contains monitors of interest to Radiation Protection
OFG	Contains Off-Gas monitors