ENGINEERING CHANGE NOTICE

1. ECN 636386

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Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedeure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. D. A. Bragg/74100/S5-05/ 373-2899	4. USQ Required? [X] Yes [] No TF-97-731 Rev 3	5. Date November 21, 1997
12a. Modification Work [] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Complete N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date
13a. Description of Change See page 3 of this ECN for changes made to HNF-1529, Rev 1.			
14a. Justification (mark one) Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const ☐ Const. Error/Omission ☐ Design Error/Omission ☐			
14b. Justification Details The above changes are made to improve operations of the MICON control system for the W-030 Ventilation Upgrade and ensure the setpoint document is in agreement with OSD-T-151-0019.			
15. Distribution (include name, MSIN, and no. of copies) D. A. Bragg S5-05 W. M. Harty S5-13 G. P. Hopkins S5-03 G. R. Tardiff S5-05 W. D. Winkelman R2-12 <i>proj. file R1-29</i>			

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The following changes were made to HNF-1529 Rev 1, and are present in HNF-1529 Rev 2.

- 1) Page 8: FI-AZK1-3 PV STACK FLOW:
Change Alarm High flow rate from 1,000 scfm to 1,050 scfm.
- 2) Pg 18: PDI-AZK14-1A, PDI-AZK14-1B, PDI-AZK14-2A, PDI-AZK14-2B: Change Alarm Hihi of 5.0 INCH (H2O) to Interlock of 5.0 INCH (H2O)
- 3) Pg 19: PDI-AZK19-1. Change Alarm Hihi from 9.5 INCH (H2O) to 15.0 INCH (H2O). Added new Hi alarm of 10.0 INCH (H2O).
- 4) Pg 21: PDI-AZK110-1A & PDI-AZK110-1B. Change hi alarm from 2.0 to 2.5 INCH (H2O). Change hihi from 2.25 to 3.0 INCH (H2O).
- 5) Pg 24: RAH-AZK19-1. Change Alarm High from 500 mrem/hr to 300 mrem/hr.
- 6) Pg 25: RAH-AZK1-1. Change Alarm hi from 10 dpm/ft³ to 300 dpm/ft³ for slow alarm concentration, and from 600 dpm/ft³ to 7,000 dpm/ft³ for fast alarm concentration. Add 3,000 CPM (Beta Net Count Rate).
- 7) Pg 26: TAL-AZK18-1B. Added information to show temperature is taken from the airstream outlet, not the condenser cooling coil, and added Lolo alarm of 35 degrees F.
- 8) Page 28: TDIC-AZ-K12-1B. Change low alarm from 5 degrees F to 17 degrees F, and changed controller setpoint from 17 to 25 degrees F.
- 9) Page 30: TI-AZK12-3A & TI-AZK12-3B. Added Alarm Max to both alarms and added alarm low to TI-AZK12-1B.

Historical Basis For Analog Input Setpoints, 241-AY & 241-AZ Tank Farm MICON Automation System

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U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: ECN ⁶³⁴³⁸⁶~~644182~~ UC: 2030
Org Code: 74100 Charge Code: E57230
B&R Code: EW3130010 Total Pages: ^{146/17}33

Key Words: Analog Input, Alarm Set Point, MICON, Project W-030,
241-AZ-702 Ventilation Facility

Abstract: This document describes the original basis for selection of the analog input setpoints for the MICON Automation System. In most cases the setpoints were based on vendor supplied information and design requirements. However, some setpoints were also established based on engineering judgement. These setpoints are subject to change as more experience with operation of the ventilation system is obtained. Revision 1 incorporates minor changes to ensure the document setpoints accurately reflect limits established in OSD-T-151-00019, Rev B-0.

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Date

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**Historical Basis For Analog Input Setpoints,
241-AY & 241-AZ Tank Farm
MICON Automation System**

PURPOSE

The purpose of this document is to establish the basis by which the process variable alarm setpoints to the 241-AY & 241-AZ Ventilation System were initially selected.

INTRODUCTION

Project W-030 replaces the existing Aging Waste Facility (AWF) ventilation system which removes the heated exhaust air and vapor from the tank vapor spaces. The replacement of the ventilation system is required to update the facility to the most recent operating standards, and to support a new design load of 7 million BTU/hr from the AWF waste tanks. The new ventilation system is governed by a control and monitoring system called the MICON Automation System (MICON).

The MICON contains alarm setpoints, which if exceeded, annunciate and generate interlocks to provide ventilation system control, and alarm warning.

Process variables are measured by the MICON system as Analog Inputs (AI). In most cases the alarm setpoints are connected directly to the AI variables. In some cases, the setpoints are realized in logic functions. This is done in cases where a time delay is required to prevent spurious alarms during transients. A few alarms are based on digital signals collected through digital input modules. These are generated from local setpoints located in the instruments.

In most instances the MICON process variable alarm setpoints were based upon vendor supplied information and design requirements. However, some setpoints were also determined based solely upon engineering judgement.

The authors of this document anticipate changes will and should occur in some of the setpoints as experience operating the new ventilation system is obtained. This document will periodically be revised to reflect these refinements to the alarm setpoints.

SCOPE

This document defines the basis by which each of approximately 93 MICON process variable setpoints were created.

Alarm and Controller Set Points

241-AZ-702 Ventilation Facility
(Project W-030)

* Misc #1	<p>AUTOMATIC TRANSFER SWITCHES - TRANSFER TIME, STANDBY TO NORMAL POWER</p> <p>Controller Set Point: 5 minutes</p> <p>Controller Set Point Basis: Each Automatic Transfer Switch has an adjustable, internal time delay associated with the transfer time back to the normal power source. Originally, the delay was set at 30 minutes. However, during testing the lengthy delay lead operations to believe the Automatic Transfer Switch was not functioning properly. According to KEH design, there was not a technical reason for the 30 minute setting; rather they recommend not less than a setting of 5 minutes.</p>
FI-702K3-1	<p>BLDG STK MONITOR SAMPLE FLOW (H-2-826394, Sh 3; H-2-826456 Sh 3; TMACS-702-13)</p> <p>Alarm Low : 0.30 SCFM</p> <p>TMACS Alarm Low: 0.50 SCFM</p> <p>Alarm Set Point Basis: See instrument FI-AZ-K1-1.</p> <p>TMACS Alarm Set Point Basis: See instrument FI-AZ-K1-1.</p>
FI-702K3-2	<p>BLDG STK RECORD SAMPLE FLOW (H-2-826394, Sh 3; H-2-826456, Sh 3; TMACS-702-13)</p> <p>Alarm Low : 0.30 SCFM</p> <p>TMACS Alarm Low: 0.50 SCFM</p> <p>Alarm Set Point Basis: See instrument FI-AZ-K1-1.</p> <p>TMACS Alarm Set Point Basis: See instrument FI-AZ-K1-1.</p>

FI-702K3-3	<p>BLDG STACK FLOW (H-2-826384, Sh 1; H-2-826394, Sh 3; H-2-826449 Sh 3; H-2-826451, Sh 3; H-2-826457, Sh 1; TMACS-702-13)</p> <p>Alarm Low : 700 SCFM</p> <p>TMACS Alarm High: 1050 SCFM Low: 200 SCFM</p> <p>Interlock Low: 200 SCFM</p> <p>Alarm Set Point Basis: Low alarm is based on providing enough flow maintain adequate cooling of equipment housed in ventilation building (refer to Engineering Calculations W-030-028 and W-030-029).</p> <p>TMACS Alarm Set Point Basis: Should the stack sampling system fail to operate, an alarm is sent to TMACS. The alarm is only valid if the ventilation system is operating. The logic diagrams consider the ventilation system operating if FI-702-K3-3 lies between its High and Low TMACS alarm values. These values serve only to distinguish an operating system from a non-operating system. Refer to Logic Diagram Y-097. Other related Logic Diagrams that show this alarm include: Y-036, and Y-908.</p> <p>Interlock Set Point: Should the flow rate drop below 200 SCFM, the system will switch to standby fan. The value of 200 SCFM serves to indicate a failed fan (zero flow). A low flow value of 200 SCFM is encoded into the Logic Diagrams (Y905).</p>
FI-AY1EWR-1	<p>4" EWR-AY1305-M4 FLOW (H-2-826426, Sh 2; H-2-826427, Sh 2)</p> <p>Alarm Low : 170 GPM</p> <p>Interlock Low : 100 GPM (Pump Switch)</p> <p>Alarm Set Point Basis: Procurement Specification W-030-P14 and the KEH Process System Description document both identify coolant flow rate as 192 gpm. Flow rate will be manually set using valves HV-AY101EWS-1A2. To maintain adequate tank cooling per design, flow rate should be set at 192 gpm or higher. Alarm being set at 90 % of design flow rate.</p> <p>Interlock Set Point Basis: Should the flow rate fall below 100 GPM, the operating recirculation pump will be shut down, and the standby pump started. Doing allows a failing pump to be automatically taken out of service. The set point is arbitrary; it is a threshold value for no flow rate or a significantly degraded flow rate. The flow value of 100 GPM is encoded into the Logic Diagrams (Y400, Y402, Y404, Y406, Y408, Y410, Y412 and Y414).</p>

FI-AY1K1-1	<p>TK-AY101 AIR INLET FLOW (H-2-826412, Sh 1)</p> <p>Alarm High: 550 SCFM Low : 50 SCFM</p> <p>Alarm Set Point Basis: Tank in-flow is dependent upon tank inleakage (tanks are to be sealed as best is achievable). Once operating experience is established (and the degree of sealing determined), the low and high alarms can be adjusted. Initially, the alarms are being set at the extremes of the gauges. Note, 50 SCFM is encoded into the Logic Diagram (e.g., Y196). Instrumentation range (transmitter) is 80-600 SCFM. Flow rates less than approximately 80 SCFM are reported as 0 SCFM. Since the alarm setting is below the minimum detectable flow rate of 80 SCFM, and flow rate below the transmitter's range will result in an alarm.</p>
FI-AY1K1-2	<p>TK-AY-101 PV AIR FLOW (H-2-826376, Sh 1; H-2-826405, Sh 1; H-2-826420 Sh 5)</p> <p>Alarm High: 650 SCFM Low : 50 SCFM</p> <p>Alarm Set Point Basis: Design flow is 100 SCFM per tank (Recirculation and Bypass Configuration) and 500 SCFM for two tanks (High Heat Configuration). Tank inlet heaters and filters are sized for 500 SCFM. Therefore nominal operating flows are between 100 SCFM and 500 SCFM. However, tank inlet flow (through inlet filter) is nominally 100-500 SCFM. With a worst case inleakage of 100 CFM, the outlet flow may be as high as 600 SCFM (500 SCFM + 100 SCFM). The instrumentation range (transmitter range) is 0-700 SCFM.</p> <p>Related Logic Diagrams that show this alarm include: Y-13 and Y-152.</p>
FI-AY2EWR-1	<p>4" EWR-AY2305-M4 FLOW (H-2-826428, Sh 2; H-2-826429, Sh 2; H-2-826443, Sh 2)</p> <p>Alarm Low : 170 GPM Interlock Low : 100 GPM (Pump Switch)</p> <p>Related Logic Diagrams that show this alarm include: Y-404 and Y-406.</p> <p>Alarm Set Point Basis: See instrument FI-AY1-EWR-1.</p> <p>Interlock Set Point Basis: See instrument FI-AY1-EWR-1.</p>

FI-AY2K1-1	<p>TK-AY102 AIR INLET FLOW (H-2-826412, Sh 1)</p> <p>Alarm High: 550 SCFM Low : 50 SCFM</p> <p>Alarm Set Point Basis: See instrument FI-AY1-K1-1.</p>
FI-AY2K1-2	<p>TK-AY-102 PV AIR FLOW (H-2-826376, Sh 1; H-2-826405, Sh 1; H-2-826420 Sh 7)</p> <p>Alarm High: 650 SCFM Low : 50 SCFM</p> <p>Related Logic Diagrams that show this alarm include: Y-013 and Y-152.</p> <p>Alarm Set Point Basis: See instrument FI-AY1-K1-2.</p>
FI-AZCWR-1	<p>2" CWR-AZ205-M4 FLOW (H-2-826382, Sh 1; H-2-826422, Sh 2; H-2-826423 Sh 2; H-2-826424, Sh 2; H-2-826425 Sh 1)</p> <p>Alarm Low : 100 GPM Interlock Low : 85 GPM (Pumps Switch/Shutdown) LoLo : 78 GPM (Chiller Shuts Off)</p> <p>Alarm Set Point Basis: Procurement Specification W-030-P14 and Process System Description both identify design coolant flow rates as 115 gpm. Flow rate will be manually set using valve HV-AZCWS-1A2. To maintain adequate gas cooling per design, flow rate should be set at 115 gpm or higher. Alarm being set at approximately 90% of design flow rate.</p> <p>Interlock Set Points Bases: The chiller manufacturer recommends a minimum glycol flow rate of 78 GPM to prevent freeze up in the coils. An attempt is made to switch to the standby recirculation pump before this limit is reached. The specific switching value of 85 is arbitrarily chosen; it is approximately half way between Low Flow alarm Setting and the chillers Shut Down Interlock setting. The interlock values of 85 and 78 GPM are encoded into the Logic Diagrams (Y300, Y302 and Y304). See also Logic Diagram Y-031.</p>

FI-AZK1-1	<p>PV STACK MONITOR SAMPLE FLOW (H-2-826394, sh 3; H-2-826406, sh 1; TMACS-702-11)</p> <p>Alarm Low : 0.30 SCFM</p> <p>TMACS Alarm Low: 0.50 SCFM</p> <p>Alarm Set Point Basis: Low alarm should indicate no flow. Ideally the alarm should occur whenever the sample flow deviates from the equivalent stack flow (i.e., non-isokinetic sampling). However such a situation requires a varying set point. Therefore, the set point is chosen to indicate a failure of the sample pump, plugging of the sample lines, or other conditions where no flow would occur. The low flow alarm is being set to alarm at an isokinetic flow rate less than the minimum allowable stack flow rate (200 SCFM) as defined by instrument FI-AZ-K1-3 (i.e., less than 0.36 SCFM). Note, that the AMS-4 CAM unit's low flow alarm also should be loaded with the above set point (the AMS-4 contains independent set points from the MCS; these set points are set in the field directly into the AMS-4 unit). Keeping the MCS set point and the AMS-4 set point the same guarantees that alarms both at the MCS and locally in the Stack Monitoring Room will occur simultaneously.</p> <p>TMACS Alarm Set Point Basis: Refer to Logic Y097.</p>
FI-AZK1-2	<p>PV STACK RECORD SAMPLE FLOW (H-2-826394, sh 3; H-2-826406, sh 1; TMACS-702-11)</p> <p>Alarm Low : 0.30 SCFM</p> <p>TMACS Alarm Low: 0.50 SCFM</p> <p>See also Logic Diagram Y-153.</p> <p>Alarm Set Point Basis: See instrument FI-AZ-K1-1.</p> <p>TMACS Alarm Set Point Basis: See instrument FI-AZ-K1-1.</p>

FI-AZK1-3	<p>PV STACK FLOW (H-2-826394, Sh 3; H-2-826398, Sh 3; H-2-826402 Sh 3; H-2-826406, Sh 1; TMACS-702-11)</p> <p>Alarm High: 1050 SCFM Low : 200 SCFM</p> <p>TMACS Alarm High: 1100 SCFM Low: 200 SCFM</p> <p>Alarm Set Point Basis: High alarm corresponds to upper range of flow instrumentation capability. Low Alarm corresponds to low tank exhaust rates for the sum of the four tanks (see instruments FI-AV1-K1-2, FI-AV2-K1-2, FI-AZ1-K1-2 and FI-AZ2-K1-2). Note, this value of 200 SCFM is consistent with Logic Diagrams (e.g., Y097).</p> <p>TMACS Alarm Set Point Basis: The stack sampling system will adjust its sampling flow rate based on the stack's exhaust flow rate. Above or below specific exhaust flow rates, the stack sampling system becomes ineffective at measuring the stack exhaust radiation level. Refer to Logic Diagram Y-097. Related Logic Diagrams that show this alarm include: Y-110, Y-121, and Y-153.</p>
FI-AZ1EWR-1	<p>4" EWR-AZ1305-M4 FLOW (H-2-826430, Sh 2; H-2-826431, Sh 2; H-2-826444, Sh 1)</p> <p>Alarm Low : 295 GPM Interlock Low : 100 GPM (Pump Switch)</p> <p>See also Logic Diagram Y-408.</p> <p>Alarm Set Point Basis: See instrument FI-AV1-EWR-1. Design flow rate is 327 gpm.</p> <p>Interlock Set Point Basis: See instrument FI-AV1-EWR-1.</p>
FI-AZ1K1-1	<p>TK-AZ101 AIR INLET FLOW (H-2-826412, Sh 1)</p> <p>Alarm High: 550 SCFM Low : 50 SCFM</p> <p>Alarm Set Point Basis: See instrument FI-AV1-K1-1.</p>
FI-AZ1K1-2	<p>TK-AZ-101 PV AIR FLOW (H-2-826369, Sh 1; H-2-826403, Sh 1; H-2-826421, Sh 5)</p> <p>Alarm High: 650 SCFM Low : 50 SCFM</p> <p>See also Logic Diagram Y-150.</p> <p>Alarm Set Point Basis: See instrument FI-AV1-K1-2.</p>

FI-AZ2EWR-1	<p>4" EWR-AZ2305-M4 FLOW (H-2-826432, Sh 2; H-2-826433, Sh 2; H-2-826444, Sh 2)</p> <p>Alarm Low : 170 GPM Interlock Low : 100 GPM (Pump Switch)</p> <p>Related Logic Diagrams that show this alarm include: Y-412 and Y-414.</p> <p>Alarm Set Point Basis: See instrument FI-AY1-EWR-1.</p> <p>Interlock Set Point Basis: See instrument FI-AY1-EWR-1.</p>
FI-AZ2K1-1	<p>TK-AZ102 AIR INLET FLOW (H-2-826412, Sh 1)</p> <p>Alarm High: 550 SCFM Low : 50 SCFM</p> <p>Alarm Set Point Basis: See instrument FI-AY1-K1-1.</p>
FI-AZ2K1-2	<p>TK-AZ-102 PV AIR FLOW (H-2-826369, Sh 1; H-2-826403, Sh 1; H-2-826421, Sh 7)</p> <p>Alarm High: 650 SCFM Low : 50 SCFM</p> <p>See also Logic Diagram Y-150.</p> <p>Alarm Set Point Basis: See instrument FI-AY1-K1-2.</p>
II-AZK15-1A	<p>AZ-K1-5-1A, PV FAN 1A % LOAD</p> <p>Alarm High: 100% LOAD</p> <p>Set Point Alarm Basis: Vendor information relevant to Procurement Specification W-030-P3 specifies a maximum current draw of 20 amps at 100% load.</p>
II-AZK15-1B	<p>AZ-K1-5-1B PV FAN 1B % LOAD</p> <p>Alarm High: 100% LOAD</p> <p>Set Point Alarm Basis: See instrument II-AZ-K15-1A.</p>
LAH-AZPCSP-1 LAL-AZPCSP-1	SEAL POT LEVEL

<p>LALL-AZ-EPRTK LAL-AZ-EPRTK</p>	<p>DIESEL FUEL TANK LEVEL ALARM (H-2-826393, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>See also Logic Diagram Y-095.</p> <p>Low : 60% LoLo: 10%</p> <p>Arbitrary setting</p>
<p>PDAH-AY1K1-1</p>	<p>AY-101 TANK INLET FILTERS - DIFFERENTIAL PRESSURE (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 3 inches(H2O)</p> <p>Alarm Set Point Basis: The High Alarm is consistent with high alarms for the primary exhaust HEPA filters (see instrument PDI-AZK14-1A) and building exhaust HEPA filters (PDI-702K33-1A). The alarm indicates a need to initiate a JCS work package for filter replacement. Note that this alarm corresponds to the sum of the pre-filter differential pressure and the HEPA filter differential pressure; either or both filters may require replacement when this alarm activates. Bounding this alarm set point is the limit of tank pressure. Since the relative tank pressure is equal to the sum of pre-filter and HEPA filter differential pressure plus any other head loss along the flow's inlet path, the alarm set point should be less than or equal to the absolute value of the tank's limiting pressure (i.e., the maximum tank vacuum). In addition, this alarm is well below the manufacturer's rated limits (refer to PDI-AZK1-1A and PDI-702-K33-1A for limits and adjust ratings to the inlet filters rated flow rate).</p>
<p>PDAH-AY1WF-2</p>	<p>AY-101 TOWER BAG FILTER DIFFERENTIAL PRESSURE</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 15 psi</p> <p>Alarm Set Point Basis: Vendor information for Procurement Specification W-030-P5 identifies differential pressures of 15 psi (100 kPa) or greater as requiring bag changed-out.</p>

PDAH-AY2K1-1	<p>AY-102 TANK INLET FILTERS - DIFFERENTIAL PRESSURE (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 3 inches(H2O)</p> <p>Alarm Set Point Basis: See instrument PDAH-AY1K1-1.</p>
PDAH-AY2WF-2	<p>AY-102 TOWER BAG FILTER DIFFERENTIAL PRESSURE</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 15 psi</p> <p>Alarm Set Point Basis: See instrument PDAH-AY1WF-2.</p>
PDAH-AZ1K1-1	<p>AZ-101 TANK INLET FILTERS - DIFFERENTIAL PRESSURE (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 3 inches(H2O)</p> <p>Alarm Set Point Basis: See instrument PDAH-AY1K1-1.</p>
PDAH-AZ1WF-2	<p>AZ-101 TOWER BAG FILTER DIFFERENTIAL PRESSURE</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 15 psi</p> <p>Alarm Set Point Basis: See instrument PDAH-AY1WF-2.</p>
PDAH-AZ2K1-1	<p>AZ-102 TANK INLET FILTERS - DIFFERENTIAL PRESSURE (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 3 inches(H2O)</p> <p>Alarm Set Point Basis: See instrument PDAH-AY1K1-1.</p>
PDAH-AZ2WF-2	<p>AZ-102 TOWER BAG FILTER DIFFERENTIAL PRESSURE</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm High: 15 psi</p> <p>Alarm Set Point Basis: See instrument PDAH-AY1WF-2.</p>

PDI-702K2-2	<p>FILTER ROOM A - PRESSURE (H-2-826383, sh 1; H-2-826455, sh 1; H-2-826455, sh 2)</p> <p>Alarm Low : - 0.20 inches(H2O)</p> <p>Alarm Set Point Basis: Design pressure for the Zone II type room is -0.25 inch(H2O). Pressure should not approach pressures of Zone IV rooms (which while near atmospheric pressure could vary between +0.05 and -0.10 inch(H2O). Refer to Logic Diagram Y035.</p>
PDI-702K2-3	<p>FILTER ROOM B - PRESSURE (H-2-826383, sh 1)</p> <p>See also Logic Diagram Y-035.</p> <p>Alarm Low : - 0.20 inches(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-702K2-2.</p>
PDI-702-K2-7	<p>ROOM DIFFERENTIAL PRESSURE - FILTER ROOMS TO CELL (H-2-826383, sh 1)</p> <p>This is a virtual analog (VA) alarm derived internal to the MICON.</p> <p>Alarm High: - 0.10 inch(H2O) Low : Eliminated</p> <p>Alarm Set Point Basis: The purpose of the room differential alarms is to indicate a potential back flow of contaminated air into the filter rooms. The cell is Zone I type room; the filter rooms A and B are Zone II rooms. Refer to Design Guide for Department of Energy Nuclear Facilities, published by ASHRAE. The cell may range from -1.40 to -1.60 inch(H2O) (see instrument PDI-702-K3-1). However during upset conditions (such as when doors are open), the ventilation system maybe slow to react. In addition, delays are included for PDI-702-K3-1, PDI-702-K2-2 and PDI-702-K2-3 so that nuisance alarms do not occur during anticipated upset conditions. The value for the room differential alarm based on an assumed instrument error of 0.04 inch(H2O); the additional 0.06 inch(H2O) allows a margin of safety and early indication. Refer to Logic Diagram Y035.</p>

PDI-702K2-8	<p>ROOM DIFFERENTIAL PRESSURE - STACK MONITOR ROOM TO FILTER ROOMS(H-2-826383, sh 1; H-2-826455, sh 1)</p> <p>This is a virtual analog (VA) alarm derived internal to the MICON.</p> <p>Alarm High: - 0.10 inch(H2O) Low : Eliminated</p> <p>Alarm Set Point Basis: The purpose of the room differential alarms is to indicate a potential back flow of contaminated air from the filter room to the stack monitor room/insrumnt room/environment. The filter rooms A and B are Zone II rooms; the stack monitor is a Zone IV rooms. Refer to Design Guide for Department of Energy Nuclear Facilities, published by ASHRAE. The filter rooms may range from -0.20 to -0.30 inch(H2O) (see instrument PDI-702-K3-2 and PDI-702-K3-3). However during upset conditions (such as when doors are open), the ventilation system maybe slow to react. In addition, delays are included for PDI-702-K2-2 and PDI-702-K2-3 so that nuisance alarms do not occur during anticipated upset conditions. The value for the room differential alarm based on an assumed instrument error of 0.04 inch(H2O); the additional 0.06 inch(H2O) allows a marin of safety and early indication. Refer to Logic Diagram Y035.</p>
PDI-702K24-1	<p>ZONAL HEPA FILTER, ROOM A (HEPA AZ702-K2-4-1) (H-2-826383, sh 1)</p> <p>Alarm High: 0.60 inch(H2O)</p> <p>Alarm Set Point Basis: HEPA filter between the cell and the filter rooms is rated at 1000 SCFM, but is operated at only 200 SCFM by design. Therefore, the HEPA filter is sized to produce an approximate, maximum 0.20 inch(H2O) pressure drop when clean. For the primary ventilation system (1000 SCFM), the high differential pressure alarms annunciates at 3.0 inch(H2O) (see instrument PDI-AZ-K14-1A, -1B, 2A, and 2B), or 3 times the initial maximum rating of 1.0 inch(H2O). For the zonal filter, 3 times the initial rating equates to 0.60 inch(H2O). This value also accommodates the control valve's differential pressure. And, since the difference in pressure between the cell and the filter room is determined in part by the HEPA filter, the maximum allowable differential pressure across the filter does not exceed the maximum allowable difference in the pressures of the rooms. Refer to instrument PDI-702K2-7. Also refer to Logic Diagram Y035.</p>

PDI-702K24-2	<p>ZONAL HEPA FILTER, ROOM B (HEPA AZ702-K2-4-2) (H-2-826383, sh 1)</p> <p>Alarm High: 0.60 inch(H2O)</p> <p>See also Logic Diagram Y-035.</p> <p>Alarm Set Point Basis: See instrument PDI-702K24-1.</p>
PDI-702K3-1	<p>PRIMARY VENT CELL - PRESSURE(H-2-826384, sh 1)</p> <p>Alarm Low: - 1.40 inch(H2O)</p> <p>Alarm Set point Basis: Design pressure for the Zone I type room is -1.50 inch(H2O). Pressure should remain below pressure of Filter Rooms A and B. Pressure should coincide with differential pressure alarm between the cell and filter rooms (refer to instrument PDI-702K2-7). Also refer to Logic Diagram Y035.</p>
PDI-702K33-1A	<p>AZ702-K3-3-1A DELTA P (H-2-826448, sh 3: H-2-826457, sh 1)</p> <p>Alarm HiHi: 0.5 INCH(H2O) High: 0.3 INCH(H2O) Low: -0.25 INCH(H2O)</p> <p>Interlock High: 0.5 INCH(H2O)</p> <p>Alarm Set Point Basis: High Alarm corresponds to differential pressure at which a JCS work package should be initiated to change out filter. HiHi alarm corresponds to the maximum rated differential pressure per the filter manufacturer. According to FARR vendor, their FARR 30/30 prefilter has a maximum differential pressure of 0.90 inches(H2O) and a clean differential pressure of 0.28 inches(H2O) when subjected to a velocity of 500 feet per minute. The building ventilation system has a nominal volumetric flow rate of 1000 SCFM. At 1000 SCFM, the face velocity of the 24" x 24" filter is 250 feet per minute. Therefore, the equivalent maximum differential pressure at the system's 1000 SCFM is approximately 0.45 inches(H2O). The equivalent differential pressure of a clean filter when operated at the system's 1000 SCFM is approximately 0.14 inches(H2O). The Low alarm represents failure of the alarm.</p> <p>Interlock Set Point Basis: At the interlock set point, the operating bank will switch to the secondary filter bank. Doing so precludes excessive differential pressure across the pre-filter. The interlock value is encoded into the Logic Diagrams (Y904).</p>

PDI-702K33-1B	<p>AZ702-K3-3-1B DELTA P(H-2-826457, sh 1)</p> <p>Alarm HiHi: 0.5 INCH(H2O) High: 0.3 INCH(H2O) Low: -0.25 INCH(H2O)</p> <p>Interlock High: 0.5 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-702-K33-1A.</p> <p>Interlock Set Point Basis: See instrument PDI-702-K33-1A.</p>
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PDI-702K34-1A	<p>AZ702-K3-4-1A DELTA P (H-2-826448, sh 3; H-2-826457, sh 1)</p> <p>Alarm HiHi: 2.5 INCH(H2O) High: 2.0 INCH(H2O) Low: -0.75 INCH(H2O)</p> <p>Interlock: 2.5 INCH(H2O)</p> <p>Alarm Set Point Basis: The high alarm corresponds to a differential pressure when a JCS work package for filter replacement should be initiated. When the HiHi alarm annunciates, the filtration unit should be taken out of service. The header pressure upstream of the HEPA filter is maintained constant at -2.0 inch(H2O) (see instrument PI-AZ702K35-1). Per CVI-22525-115, the peak of the building system's fan curve occurs at approximately 5 inch(H2O) (which is approximately 500 to 1000 CFM). Therefore, the maximum differential pressure across the filtration unit (prefilter, HEPA filter, and two 12" valves) will be 3 inch(H2O). The maximum pressure differential across the prefilter is 0.5 inch(H2O) (see instrument PDI-702-K33-1A). Ignoring losses across the two 12" valves, the pressure differential across the HEPA filter should not exceed 2.5 inch(H2O). Therefore, the HiHi alarm is set at 2.5 inch(H2O). When clean, the HEPA filter will have a maximum pressure drop of 1.0 inch(H2O) when operated at 1000 SCFM. At lower flow rates of 800 to 900 SCFM, the initial pressure differential will be several tenths less. Setting the High alarm at 2.0 inch(H2O) will allow the filter to load by as much as 1.0 to 1.5 inch(H2O) above the pressure differential of a clean filter. The loading should be gradual since the filter is part of the building ventilation system. Therefore, the 0.5 inch(H2O) difference between the High and HiHi alarm should allow adequate time to replace the filters. The Low alarm represents failure of the alarm.</p> <p>Interlock Set Point Basis: At the interlock set point, the operating bank will switch to the secondary filter bank. Doing so precludes excessive differential pressure across the HEPA filter. The interlock value is encoded into the Logic Diagrams (Y904).</p>
PDI-702K34-1B	<p>AZ702-K3-4-1B DELTA P (H-2-826457, sh 1)</p> <p>Alarm HiHi: 2.5 INCH(H2O) High: 2.0 INCH(H2O) Low: -0.75 INCH(H2O)</p> <p>Interlock: 2.5 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-702-K34-1A.</p> <p>Interlock Set Point Basis: See instrument PDI-702-K34-1A.</p>

PDI-AY1K45-1	<p>AY101 RECIRCULATION FAN DP</p> <p>Alarm High: 24.0 INCH(H2O)</p> <p>Alarm Set Point Basis: By way of the pump's performance curves, the high alarm should correspond to the minimum flow rate through the recirculation loop. Insufficient vendor information is available to accurately determine the value. The set point is initially being taken as the maximum instrument range minus the approximate instrument deadband. Set point should be adjusted based on operational experience.</p>
PDI-AY1K48-1	<p>AY101-K4-8-1 (CONDENSER) DELTA P(H-2-826414, sh 2)</p> <p>Alarm High: 11.0 INCH(H2O) Interlock Low: 2 INCH(H2O)</p> <p>Alarm Set Point Basis: Procurement Specification W-030-P14 delineates a maximum pressure differential across the shell side of the heat exchanger as 0.4 psi. Converting 0.4 psi to inches(h2O) yields approximately 11 inches(H2O). The flow rate corresponding to the 0.4 psi differential was verified to be within 5% of the flow rate described in the KEH Process System Description document.</p> <p>Interlock Set Point Basis: A differential pressure of less than the set point indicates little or no flow through the recirculation loop. The fan will turn off should the differential pressure across the shell side of the condenser drop below the set point. The interlock set point is encoded into Logic Diagram Y204. See also Logic Diagram Y-200.</p>
PDI-AY2K45-1	<p>AY102 RECIRCULATION FAN DP</p> <p>Alarm High: 24.0 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-AY1-K45-1.</p>
PDI-AY2K48-1	<p>AY102-K4-8-1 (CONDENSER) DELTA P(H-2-826415, sh 2)</p> <p>Alarm High: 11.0 INCH(H2O) Interlock Low: 2 INCHS(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-AY1-K48-1. Even though AZ-101 has a larger heat load, the basis was verified as still valid.</p> <p>See also Logic Diagram Y-202.</p> <p>Interlock Set Point Basis: See instrument PDI-AY1-K48-1.</p>

PDI-AZK14-1A	<p>AZ-K1-4-1A DELTA P (H-2-826370, sh 1)</p> <p>Alarm Hihi: 5.0 INCH(H2O) Hi: 3.0 INCH(H2O) Low: -0.75 INCH(H2O) Interlock: 5.0 INCH(H2O)</p> <p>Alarm Set Point Basis: The high alarm corresponds to a differential pressure when a JCS work package for filter replacement should be initiated (this differential value is based on operating experience with other Tank Farm ventilation systems). When the HiHi alarm annunciates, the filtration unit should be taken out of service. The initial maximum rating of a clean filter is 1.0 inch(H2O) (reference, Flander's catalog). The High alarm corresponds to 3 times the initial maximum rating. The interlock (5.0 IN H2O) corresponds to the logic value used in initiating a filter bank switchover (reference Logic Diagram Y003). Both the High Alarm set point and the interlock are bounded by Flander's rated limit of 10 inches(H2O) (reference, Flander's catalog). The Low alarm represents failure of the alarm.</p>
PDI-AZK14-1B	<p>AZ-K1-4-1B DELTA P</p> <p>Alarm Hihi: 5.0 INCH(H2O) Hi: 3.0 INCH(H2O) Low: -0.75 INCH(H2O) Interlock: 5.0 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-K14-1A.</p>
PDI-AZK14-2A	<p>AZ-K1-4-2A DELTA P (H-2-826370, sh1)</p> <p>Alarm Hihi: 5.0 INCH(H2O) Hi: 3.0 INCH(H2O) Low: -0.75 INCH(H2O) Interlock: 5.0 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-K14-1A.</p>
PDI-AZK14-2B	<p>AZ-K1-4-2B DELTA P</p> <p>Alarm Hihi: 5.0 INCH(H2O) Hi: 3.0 INCH(H2O) Low: -0.75 INCH(H2O) Interlock: 5.0 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-K14-1A.</p>

PDI-AZK18-1	<p>AZ-K1-8-1 VAPOR DELTA P</p> <p>Alarm High: 11.0 INCH(H2O) Low: -2.50 INCH(H2O)</p> <p>Procurement Specification W-030-P14 delineates a maximum pressure differential across the shell side of the heat exchanger as 0.4 psi. Converting 0.4 psi to inches(h2O) yields approximately 11 inches(H2O). The flow rate corresponding to the 0.4 psi differential was verified to be within 5% of the flow rate described in the KEH Process System Description document. The Low alarm represents failure of the alarm.</p>
PDI-AZK19-1	<p>AZ-K1-9-1 VAPOR DELTA P(H-2-826378, sh 2)</p> <p>Alarm Hihi: 15.0 INCH(H2O) Hi: 10.0 INCH(H2O) Low: -1.25 INCH(H2O)</p> <p>See also Logic Diagram Y-017.</p> <p>Alarm Set Point Basis: The pressure drop across the HEME is initially 9.0 to 11.0 inches w.g. at 1,000 scfm when the HEME is clean and saturated. The HEME can tolerate higher differential pressures without damage to the filter media; the maximum allowed pressure drop for the filter is 20 inches w.g. Therefore, a pressure drop of 15 inches w.g. was selected as the upper limit allowed for operation when the HEME is dirty. The operating range of the instrumentation is 0 to 20 inches w.g.</p> <p>The low alarm represents alarm failure.</p>

PDI-AZRWF-1	<p>AZ-RW-F-1 DELTA P</p> <p>Alarm High: 9.0 PSID Low: -1.25 INCH(H2O)</p> <p>Alarm Set Point Basis: High Alarm should correspond to maximum operating pressure of the strainer. KEH Design suggests 9.0 psid. The low alarm represents alarm failure.</p>
PDI-AZ1K45-1	<p>AZ101 RECIRCULATION FAN DP</p> <p>Alarm High: 24.0 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-AY1-K45-1.</p>
PDI-AZ1K48-1	<p>AZ101-K4-8-1 (CONDENSER) DELTA P_(H-2-826416, sh 2)</p> <p>Alarm High: 11.0 INCH(H2O) Low: 2.0 INCH(H2O)</p> <p>See also Logic Diagram Y-204.</p> <p>Alarm Set Point Basis: See instrument PDI-AY1-K48-1.</p> <p>Interlock Set Point Basis: See instrument PDI-AY1-K48-1.</p>
PDI-AZ2K45-1	<p>AZ102 RECIRCULATION FAN DP</p> <p>Alarm High: 24.0 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-AY1-K45-1.</p>
PDI-AZ2K48-1	<p>AZ102-K4-8-1 (CONDENSER) DELTA P_(H-2-826417, sh 2)</p> <p>Alarm High: 11.0 INCH(H2O) Alarm Low: 2.0 INCH(H2O)</p> <p>See also Logic Diagram Y-206.</p> <p>Alarm Set Point Basis: See instrument PDI-AY1-K48-1.</p> <p>Interlock Set Point Basis: See instrument PDI-AY1-K48-1.</p>

PDI-AZK110-1A	<p>AZ-K1-10-1A DELTA P</p> <p>Alarm HiHi: 3.00 INCH(H2O) Alarm High: 2.50 INCH(H2O) Alarm Low: -0.63 INCH(H2O)</p> <p>Alarm Set Point Basis: Flanders absorbers have an initial pressure drop of 1.25 inches w.g. when operated at 1,000 cfm. The differential pressure will not increase as the HEGA absorbs non-condensable gases. However, the differential pressure will increase as the HEGA absorbs moisture. Although the maximum structural design limit for a HEGA is 10 inches w.g., a limit of 3.0 in w.g. was selected to provide an adequate capacity for moisture absorption should the chilled water condenser or electric heater become inoperative.</p> <p>Since the HEGA is downstream of a HEPA filter, any increase in resistance will indicate failure of the upstream HEPA filter. The High alarm indicates a potential problem is occurring with the HEGA filter. When the High alarm occurs, the operators should switch operation to the standby train. The HiHi alarm indicates the filter's loading is increasing and the filter should be taken out-of-service. The HiHi set point is the same as the OSD limit of allowable HEGA differential pressure. The HiHi alarm corresponds to the logic value used in initiating a filter bank switchover (reference Logic Diagrams Y003 and Y108). The Low alarm represents alarm failure.</p>
PDI-AZK110-1B	<p>AZ-K1-10-1B DELTA P</p> <p>Alarm HiHi: 3.00 INCH(H2O) Alarm High: 2.50 INCH(H2O) Alarm Low: -0.63 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PDI-AZK110-1A.</p>
PI-AY1K1-1	<p>TK-AY-101 PRESSURE(H-2-826394, Sh 1; H-2-826407, Sh 1; TMACS-702-3)</p> <p>Alarm HiHi: -0.05 INCH(H2O) High: -0.50 INCH(H2O) Low: -3.50 INCH(H2O) LoLo: -4.00 INCH(H2O)</p> <p>Alarm Set Point Basis: HiHi and LoLo alarms are incorporated to maintain tank pressure between 0.0 and -4.0 INCH (H2O). Refer to Logic Diagram Y097.</p>

PI-AY2K1-1	<p>TK-AY-102 PRESSURE(H-2-826394, sh 1; H-2-826407, sh 1; TMACS-702-4)</p> <p>Alarm HiHi: 0.05 INCH(H2O) High: -0.50 INCH(H2O) Low : -3.50 INCH(H2O) LoLo: -4.00 INCH(H2O)</p> <p>See also Logic Diagram Y-154.</p> <p>Alarm Set Point Basis: See instrument PI-AY1-K1-1.</p>
PI-AZK1-1A	<p>10" V-AZ103-M9 PRESSURE(H-2-826398, sh 3; H-2-826402, sh 3; H-2-826404, sh 1)</p> <p>Alarm High: -7.0 INCH(H2O) Low : -32.0 INCH(H2O) LoLo: -37.0 INCH(H2O) Interlock: -5.0 INCH(H2O)</p> <p>High Alarm Set Point Basis: The value of -7 was based on experience gained during pre-operational testing. Header pressure more positive than -7 inches(H2O) did not provide adequate suction to maintain a minimal flow of 100 SCFM from each tank.</p> <p>Low Alarm Set Point Basis: KEH Design suggested an initial Low value of -32. Per Certified Vendor Information 22525-113, -32 inch(H2O) corresponds to the peak of the fan curve at approximately 100% fan speed (3895 rpm). Header pressures less than -32 in w.g. would indicate overspeeding of the fan.</p> <p>LoLo Alarm represents failure of the alarm.</p> <p>Interlock Set Point Basis: A value of -5.0 is encoded into the Logic Diagrams (Y110) for switching capacity. Switching is based on a two out of three voting scheme; at least two of the following three signals must be low: PI-AZ-K1-1A, PI-AZ-K1-1B and FI-AZ-K1-3. Such a scheme prevents a single instrument failure from shutting off the primary ventilation system. The value of -5.0 was provided by KEH design and represents a condition of a failed fan.</p> <p>See also Logic Diagrams Y-110, Y-121, and Y-151.</p>

PI-AZK1-1B	<p>10" V-AZ102-M9 PRESSURE(H-2-826398, Sh 3; H-2-826402, Sh 3; H-2-826404, Sh 1; H-2-826406, Sh 2)</p> <p>Alarm High: -7.0 INCH(H2O) Low : -32.0 INCH(H2O) LoLo: -37.0 INCH(H2O)</p> <p>Interlock: -5.0 INCH(H2O)</p> <p>See also Logic Diagrams Y-110, Y-121, Y-151, and Y-153.</p> <p>Alarm Set Point Basis: See instrument PI-AZ-K1-1A.</p> <p>Interlock Set Point Basis: See instrument PI-AZ-K1-1A.</p>
PI-AZRW-1	<p>2" RW-AZ401-M5 PRESSURE</p> <p>Alarm Low : 20.0 PSI</p> <p>Alarm Set Point Basis: Line pressure is reduced to 50 psig by PCV-AZRW-1. Pressure in 2"RW-AZ401-M5 should remain high enough to adequately fill towers (especially) when conductivity probe opens drain line). For normal operation, water feed pressure to cooling towers should be 15 to 50 psig. Note, that there will be pressure loss due to piping and valving between gauge PI-AZ-RW-1 and towers. Pressure loss is dependent upon flow rate to towers.</p>
PI-AZ1K1-1	<p>TK-AZ-101 PRESSURE(H-2-826394, Sh 2; TMACS-702-8)</p> <p>Alarm HiHi: -0.05 INCH(H2O) High: -0.50 INCH(H2O) Low : -3.50 INCH(H2O) LoLo: -4.00 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PI-AY1-K1-1.</p>
PI-AZ2-K1-1	<p>TK-AZ-102 PRESSURE(H-2-826394, Sh 2; TMACS-702-9)</p> <p>Alarm HiHi: -0.05 INCH(H2O) High: -0.50 INCH(H2O) Low : -3.50 INCH(H2O) LoLo: -4.00 INCH(H2O)</p> <p>Alarm Set Point Basis: See instrument PI-AY1-K1-1.</p>

<p>PI-AZ702K35-1</p>	<p>BUILDING VENTILATION HEADER PRESSURE, 12" V-AZ702-02 and 12" V-AZ702-04</p> <p>Alarm High: - 1.75 inch(H2O) Low: - 2.25</p> <p>Alarm Set Point Basis: The controller set point is 2.0 inch(H2O). Per CVI-22525-115, the peak of the building system's fan curve occurs at approximately 5 inch(H2O) (which is approximately 500 to 1000 CFM). As the exhaust filters load up, the differential pressure across the filtration unit (prefilter, HEPA filter and two 12" valves) will vary between 0 and 3 inch(H2O) while still maintaining the 2 inch(H2O) header pressure. Once the differential pressure across the filtration unit exceeds 3 inch(H2O), the header pressure will no longer be held constant; the fan's inlet vanes will be wide open and the header pressure will decrease below 2 inch(H2O). In this case, the control valve MK-AZ702K3-1 will open to compensate for increased loading of the filtration unit. The opening of MK-AZ702K3-1 will result in degradation of cell pressure control which is undesirable.</p>
<p>RAH-AZK19-1 (Note that H-2-826381, Sh 3, calls out this tag number as RI-AZK19-1A)</p>	<p>HEME/CELL RAD LEVEL ALARM(H-2-826381, Sh 3)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>See also Logic Diagram Y-024.</p> <p>Alarm High: 300 mrem/hr</p> <p>Alarm Set Point Basis: The setpoint is based on the HNF-IP-1266, Section 5.18.C.1.a limit of 300 mrem/hr reading on a hand held instrument at the location of the canning plate of the detector tube for the HEME Gamma monitor.</p>
<p>RAH-702K3-1</p>	<p>BUILDING STACK RAD LEVEL, AZ-702 (H-2-826394, Sh 3; H-2-826448, Sh 3; H-2-826450, Sh 3; TMACS-702-12)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>See also Logic Diagram Y-907.</p> <p>Alarm High : 6 dpm/ft³ (Slow Alarm Concentration) 600 dpm/ft³ (Fast Alarm Concentration)</p> <p>Alarm Set Point Basis: Calculated alarm values were bounded by alarm values of the primary exhaust stack. For consistencies, the alarm settings are the same for both the primary stack CAM unit and the building stack CAM unit (refer to RAH-AZK1-1).</p>

<p>RAH-AZK1-1</p> <p>This tag number was formerly called RIAS-AZK1-1.</p>	<p>K1 STACK RAD LEVEL (H-2-826394, Sh 3; H-2-826397, Sh 3; H-2-826401, Sh 3; TMACS-702-10)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>See also Logic Diagrams Y-108 and Y-119.</p> <p>Alarm High: 300 dpm/ft³ (Slow Alarm Concentration)/ 60 minutes 7,000 dpm/ft³ (Fast Alarm Concentration)/60 seconds 3,000 CPM (Beta Net Count Rate)</p> <p>Alarm Time Interval: 60 min (Slow Alarm Concentration Interval) 1 min (Fast Alarm Concentration Interval)</p> <p>Alarm Set Point Basis: The AMS-4 CAM unit utilizes two alarm settings: a slow concentration and a fast concentration (refer to Vendor Information 22525-63). The fast concentration alarm provides indication of rapid increases (spikes) in the stack radiation level. The slow concentration alarm provides an indication of slowly increasing radiation levels. These alarms annunciate locally at the AMS-4 unit (Stack Sampling Room in the 241-AZ-702 building). Alarm values were provided by the Environmental Organization (Refer to DSI entitled REVISION 2 TO W-030 EBERLINE AMS4 CAM ALARM SET POINT DETERMINATION, G.M. Crummel to S.R. Pierce, dated April 10, 1997).</p> <p>Note: Due to design deficiencies, loss of CAM power or simply turning off the CAM does not generate a failure alarm. Surveillance of the CAM is required to preclude this. A failure alarm (RI-AZK1-1) annunciating at the MCS indicates an open circuit in the loop between the CAM unit and the MCS. This alarm indicates an break in the signal line; it does not indicate a loss of power.</p>
<p>TAL-AY1K12-1</p>	<p>AY-101 TANK INLET FILTERS - TEMPERATURE ALARM (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm Low : 35 degrees Fahrenheit</p> <p>Alarm Set Point Basis: Inlet heaters prevent frost from developing on the tank's inlet filters. The heater's controller activates at 40 degrees Fahrenheit (refer to instrument TIC-AY101K102-1). The alarm is set below the controller's set point but above the freezing point of water.</p>

TAL-AY2K12-1	<p>AY-102 TANK INLET FILTERS - TEMPERATURE ALARM (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm Low : 35 degrees Fahrenheit</p> <p>Alarm Set Point Basis: See instrument TAL-AY1K12-1.</p>
TAL-AZ1K12-1	<p>AZ-101 TANK INLET FILTERS - TEMPERATURE ALARM (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm Low : 35 degrees Fahrenheit</p> <p>Alarm Set Point Basis: See instrument TAL-AY1K12-1.</p>
TAL-AZ2K12-1	<p>AZ-102 TANK INLET FILTERS - TEMPERATURE ALARM (H-2-826412, Sh 1)</p> <p>This is a Discrete Input (DI) alarm.</p> <p>Alarm Low : 35 degrees Fahrenheit</p> <p>Alarm Set Point Basis: See instrument TAL-AY1K12-1.</p>
TAL-AZK18-1B	<p>CONDENSER AZ-K1-8-1: AIRSTREAM OUTLET TEMPERATURE</p> <p>This is a "local" (LOC) alarm.</p> <p>Alarm Low : 38 degrees Fahrenheit</p> <p>Alarm Lolo: 35 degrees Fahrenheit</p> <p>Alarm Set Point Basis: Ice Build-up could occur on the condenser coils within the primary exhaust train. Maintaining the condenser's airstream outlet temperature above 35 F will prevent water in the primary exhaust from freezing.</p>

TDIC-AZK12-1A	<p>AZ-K1-2-1A HEATER DELTA TEMP^(H-2-826404, sh 2)</p> <p>This is a "local" (LOC) alarm.</p> <p>See also Logic Diagram Y-151.</p> <p>Controller Set Point: 25 degrees Fahrenheit</p> <p>Low Alarm: 17 degrees</p> <p>Controller Set Point Basis: The purpose of the electric heater is to prevent moisture buildup on the HEPA filter media and moisture absorption by the charcoal in the HEPA. The exhaust stream entering the electric heater is likely to be saturated (100% relative humidity) after it has passed through a condenser and mist eliminator. The electric heater raises the temperature of the exhaust stream, which reduces the relative humidity. With an outlet temperature of 200F (the maximum allowed), a 17F temperature rise across the heater will reduce the relative humidity to 70% or less before it enters the filter train, as required by ASME/ANSI N509. If the exhaust stream were to remain saturated, condensation will occur on the HEPA filter media and the charcoal in the HEPA will absorb moisture.</p> <p>Alarm Set Point Basis: The low alarm indicates inadequate heating of the air stream. Heating is performed to lower the relative humidity of the air stream entering the HEPA filters; operation of the HEPA's at 100% relative humidity for extended periods of time can lead to filter failure (reference, Flanders catalog). The KEH Process System Description document describes the maximum stream condition (upset condition) at the heater inlet as 175 degrees Fahrenheit fully saturated. Raising the air stream temperature by 5 degrees yields 180 degree air at approximately 90% relative humidity (which could easily become saturated again with changing air stream temperatures). Normal operation yields 40 degree Fahrenheit fully saturated at the heater inlet. A 5 degree Fahrenheit increase in temperature will yield 45 degree Fahrenheit air at approximately 80% relative humidity.</p>
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TDIC-AZ-K12-1B	<p>AZ-K1-2-1B HEATER DELTA TEMP(H-2-826406, Sh 3)</p> <p>This is a "local" (LOC) alarm.</p> <p>Controller Set Point: 25 degrees Fahrenheit</p> <p>Alarm Set Point: 17 degrees Fahrenheit</p> <p>Controller Set Point Basis: See instrument TDIC-AZ-K12-1A.</p> <p>Alarm Set Point Basis: See instrument TDIC-AZ-K12-1A.</p>
TI-702-K2-1	<p>STACK MONITOR ROOM TEMP(H-2-826452, Sh 2)</p> <p>Alarm HiHi: 110 DEG F High: 90 DEG F Low: -41.25 DEG F</p> <p>See also Logic Diagram Y-912.</p> <p>Alarm Set Point Basis: The logic diagram (Y912) describes 110 degree Fahrenheit as the temperature at which the wall dampers open allowing passive ventilation of the room. The High Alarm is set below this value to warn the operator of the impending action. The HiHi Alarm is set at the activation temperature. The Low alarm represents an instrument failure alarm.</p>
TI-702-K2-2	<p>E/I ROOM A TEMP(H-2-826453, Sh 2)</p> <p>Alarm HiHi: 110 DEG F High: 90 DEG F Low: -41.25 DEG F</p> <p>See also Logic Diagram Y-913.</p> <p>Alarm Set Point Basis: See instrument TI-702-K2-1. Also, Procurement Specification W-030-P3 requires the K1-5-1A and K1-5-1B variable speed drives to be operable at ambient temperatures of up to 120 degrees Fahrenheit. The Low alarm represents an instrument failure alarm.</p>
TI-702-K2-3	<p>E/I ROOM B TEMP (H-2-826454, Sh 2)</p> <p>Alarm HiHi: 110 DEG F High: 90 DEG F Low: -41.25 DEG F</p> <p>See also Logic Diagram Y-914.</p> <p>Alarm Set Point Basis: See instrument TI-702-K2-2.</p>

TI-702-K2-4	<p>PV FLTR ROOM A TEMP</p> <p>Alarm High: 120 DEG F Low: -41.25 DEG F</p> <p>Alarm Set Point Basis: Procurement Specification W-030-P3 requires operation of the entire Air Clean-Up trains (bought under that procurement specification) to operate in temperatures up to 140 degrees Fahrenheit. The Low alarm represents an instrument failure alarm.</p>
TI-702-K2-5	<p>PV FLTR ROOM B TEMP</p> <p>Alarm High: 120 DEG F Low: -41.25 DEG F</p> <p>Alarm Set Point Basis: See instrument TI-702-K2-4.</p>
TI-AZ-K12-1A	<p>AZ-K1-2-1A INLET TEMP_(H-2-826404, sh 2)</p> <p>Alarm High: 175 DEG F Low: -31.25 DEG F</p> <p>See also Logic Diagram Y-151.</p> <p>Alarm Set Point Basis: The KEH Process System Description identifies the maximum air stream conditions at the heater's inlet as 175 degrees Fahrenheit with loss of cooling.</p>
TI-AZ-K12-1B	<p>AZ-K1-2-1B INLET TEMP_(H-2-826406, sh 3)</p> <p>Alarm High: 175 DEG F Low: -31.25 DEG F</p> <p>See also Logic Diagram Y-153.</p> <p>Alarm Set Point Basis: See instrument TI-AZ-K12-1A.</p>

<p>TI-AZK12-3A</p>	<p>AZ-K1-1A FILTER BANK OUTLET TEMP(H-2-826395, sh 3; H-2-826396, sh 3; H-2-826397, sh 3; H-2-826404, sh 2)</p> <p>Alarm Max: 245 DEG F HiHi: 230 DEG F High: 195 DEG F Low: -31.25 DEG F Interlock: 245 DEG F</p> <p>Alarm Set Point Basis: The outlet temperature for the exhaust stream leaving the electrical heater must not exceed 200F. This limit protects the HEGA, which has a maximum allowable inlet of temperature of 200F; the limit also protects the HEPA filters, which have a maximum allowable air inlet temperature of 250F. The filter manufacturer Flanders states their filters (when specifically designed NOT for high temperature applications) can withstand periodic temperatures up to 250 degrees Fahrenheit. A lower limit of 230 degrees Fahrenheit is considered a good engineering practice. The HiHi corresponds to this limit. The High alarm corresponds to a value less than this and is encoded in the logic (Logic Diagrams Y101) to switch to the redundant train. Although switching to the redundant train should guarantee that the HiHi alarm is never received, failure of the train to switch or overriding the switching capability could allow operation of the train above 230 degrees Fahrenheit. The interlock is encoded in the logic (see Y107 and Y108). If the air temperature in the filter bank rises above 245 degrees Fahrenheit, a fire is assumed to be occurring in the filter bank. Both the upstream and downstream isolation valves close thereby removing the oxygen source from fire. See also Logic Diagram Y-151.</p>
<p>TI-AZK12-3B</p>	<p>AZ-K1-1B FILTER BANK OUTLET TEMP(H-2-826399, sh 3; H-2-826400, sh 3; H-2-826401, sh 3; H-2-826406, sh 3)</p> <p>Alarm Max: 245 DEG F HiHi: 230 DEG F High: 195 DEG F Low: -31.25 DEG F Interlock: 245 DEG F</p> <p>See also Logic Diagrams Y-112, Y-118, Y-119, and Y-153.</p> <p>Alarm Set Point Basis: See instrument TI-AZ-K12-3A.</p>

TIC-AY1K12-1	<p>AY-101 TANK INLET FILTERS - TEMPERATURE CONTROLLER</p> <p>This is a discrete (DI) alarm.</p> <p>Controller Set Point: 40 degrees Fahrenheit</p> <p>Controller Set Point Basis: Inlet heaters prevent frost from developing on the tank's inlet filters. The heater's controller activates at a temperature above which frost is likely to occur. See also instrument TAL-AYK12-1.</p>
TIC-AY2K12-1	<p>AY-102 TANK INLET FILTERS - TEMPERATURE CONTROLLER</p> <p>This is a discrete (DI) alarm.</p> <p>Controller Set Point: 40 degrees Fahrenheit</p> <p>Controller Set Point Basis: See instrument TIC-AY101K102-1.</p>
TIC-AZ1K12-1	<p>AZ-101 TANK INLET FILTERS - TEMPERATURE CONTROLLER</p> <p>This is a discrete (DI) alarm.</p> <p>Controller Set Point: 40 degrees Fahrenheit</p> <p>Controller Set Point Basis: See instrument TIC-AY101K102-1.</p>
TIC-AZ2K12-1	<p>AZ-102 TANK INLET FILTERS - TEMPERATURE CONTROLLER</p> <p>This is a discrete (DI) alarm.</p> <p>Controller Set Point: 40 degrees Fahrenheit</p> <p>Controller Set Point Basis: See instrument TIC-AY101K102-1.</p>