UV/OX System Alarm Response

Tank Farm Plant Operating Procedure
Effluent Treatment Facility

USQ Not Required – ETF is a <Hazard Category 3 Radiological Facility

CHANGE HISTORY (≤ LAST 5 REV-MODS )

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<td>03/30/2016</td>
<td>Conversion to WRPS Format</td>
<td>New Procedure; Supersedes ETF-PRO-AR-51382 (ARP-60D-001)</td>
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UV/OX System

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</tbody>
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**RECORDS**

No records are generated during the performance of this procedure.
UV READY ATTEMPT FAILURE

DESCRIPTION:  UV READY ATTEMPT FAILURE
   Setpoint: Logic permissive(s) not met
   Alarm Location: Logic generated alarm
   Graphic: Alarm Summary Screen or Recent Alarm Display Screen
   Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to SHUTDOWN.
2. pH Adjust and MTT go to SHUTDOWN.

Immediate Actions:
[1] ON graphic UV, ENSURE system shutdown (all lamps OFF).
[2] ON graphic UV, ENSURE status of the following air-operated valves (AOV):
   • AOV-60B074 in AUTO and lined up in RECIRCULATION position
   • AOV-60B080 in auto and OPEN.
[4] RESTART the following systems per ETF-60-002 and ETF-60-006:
   • pH Adjustment System
   • UV System.

Possible Causes:
1. Misalignment of AOV-60B080 and/or AOV-60B074.
2. AUTO conditions not met per logic diagrams.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
PH ADJUSTMENT SYSTEM NOT IN INITIATE READY MODE UV OPERATION ATTEMPT FAILURE VD122116

DESCRIPTION:
UV OPERATION ATTEMPT FAILURE
Setpoint: Logic permissive(s) not met
Alarm Location: Logic generated alarm
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to SHUTDOWN.
2. pH Adjust and MTT go to SHUTDOWN.

Immediate Actions:
[1] ON graphic UV, ENSURE system shutdown (all lamps OFF).
[2] ON graphic UV, ENSURE status of the following AOVs:
   • AOV-60B074 in AUTO
   • AOV-60B080 in AUTO and OPEN.

Possible Causes:
1. Misalignment of AOV-60B074 and/or AOV-60B080.
2. AUTO conditions not met per logic diagrams.
3. pH Adjustment System not in READY mode.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
            ETF-60-006, Initial MTT Lineup in Configuration 1
UV SYSTEM OPERATIONS FAILURE VD313161

DESCRIPTION: UV SYSTEM OPERATIONS FAILURE
Setpoint: Logic permissive(s) not met
Alarm Location: Logic generated alarm
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to READY.

Immediate Actions:
[1] ON graphic UV, ENSURE system is READY.
[2] ON graphic UV, ENSURE status of AOVs:
   • AOV-60B074 in AUTO
   • AOV-60B080 in AUTO and OPEN.
[3] ENSURE UV/pH Adjustment System is in STEADY READY mode per ETF-60-002.
[4] IF peroxide injection is required, ENSURE peroxide module Lockout/Stop handswitch (HS60D399) is in RUN.

Possible Causes:
1. Misalignment of AOV-60B074 and/or AOV-60B080.
2. AUTO conditions not met per logic diagrams.
3. pH Adjustment System not in STEADY READY mode.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV- # EMERGENCY STOP ACTIVATED

DESCRIPTION:

Setpoint:  N/A
Alarm Location:  Emergency stop switch
Graphic:  Alarm Summary Screen or Recent Alarm Display Screen
Indications:  N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to SHUTDOWN.
2. pH Adjust and MTT go to SHUTDOWN.
3. Local lamp line (chamber) main distribution breakers trip.

Immediate Actions:

[1] ON graphic UV, ENSURE system shutdown (all lamps OFF).
[3] (Electrician) ENSURE both chamber main breakers are TRIPPED or OPEN.

Possible Causes:
1. Operator initiated emergency stop of system.
2. Chamber main breaker tripped.

References:

Drawings:  None
Documents:  None
UV-OX System Alarm Response

UV-#x POWER DISTRIBUTION BREAKER

DESCRIPTION: UV-#x POWER DISTRIBUTION BREAKER OPEN (see matrix)
Setpoint: N/A
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

<table>
<thead>
<tr>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
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<th>Chamber (#x)</th>
<th>Tag (###)</th>
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<tr>
<td>1A</td>
<td>VD71405</td>
<td>PR-1 Relay</td>
<td>2A</td>
<td>VD72405</td>
<td>PR-1 Relay</td>
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<td>1B</td>
<td>VD71419</td>
<td>PR-2 Relay</td>
<td>2B</td>
<td>VD72419</td>
<td>PR-2 Relay</td>
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</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   • UV/OX System goes to SHUTDOWN
   • pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.

Immediate Actions:
   [1] ON graphic UV, CHECK system status.
   [2] ON graphic UV, ENSURE all lamps OFF for UV unit in ALARM.
   [3] (Electrician) CHECK physical position of chamber main distribution breakers.

Possible Causes:
1. Chamber main breaker is OPEN.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV- # CONTROL POWER OFF

DESCRIPTION: UV-1 CONTROL POWER OFF, VD71515
              UV-2 CONTROL POWER OFF, VD72515

Setpoint: N/A
Alarm Location: Control Power Switch
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:

[1] ENSURE control power switch on front of unit is ON.
[2] CHECK UV unit vent fan is running.

Possible Causes:
1. Switch misalignment.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV- # CB-1 CIRCUIT BREAKER OPEN

DESCRIPTION: UV-1 CB-1 CIRCUIT BREAKER TRIPPED, VD71516
              UV-2 CB-1 CIRCUIT BREAKER TRIPPED, VD72516

Setpoint: On
Alarm Location: CB-1
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   • UV/OX System goes to SHUTDOWN
   • pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System status does not change.

Immediate Actions:
[1] ON graphic UV, CHECK UV/OX System status.
[2] ON graphic UV, ENSURE all lamps are OFF for UV unit in ALARM.
[3] (Electrician) CHECK UV-# CB-1 breaker position.

Possible Causes:
1. Electrical problem.
2. Breaker is open.

References:
Drawings: None
Documents: None
UV/# UNIT SHUTDOWN

DESCRIPTION: UV-1 SHUTDOWN, VD71404
UV-2 SHUTDOWN, VD72404

Setpoint: Moisture detected by instruments (rupture disk rated to 20 psig)

Alarm Location: Emergency stop, overpressure relief, lamp enclosure moisture

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to SHUTDOWN.
2. pH Adjust and MTT go to SHUTDOWN.

Immediate Actions:
[1] ON graphic UV, ENSURE system shutdown (all lamps OFF).
[2] ENSURE pH adjustment goes to SHUTDOWN.

Possible Causes:
1. Rupture disk failed.
2. Condensate accumulation in piping.
3. Emergency stop switch.
4. Tube leaking moisture into lamp end enclosure.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
UV-/X PRIMARY GROUND FAULT

**DESCRIPTION:** UV CHAMBER #x PRIMARY GROUND FAULT (see matrix)
- **Setpoint:** N/A
- **Alarm Location:** See matrix
- **Graphic:** Alarm Summary Screen or Recent Alarm Display Screen
- **Indications:** N/A

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<tr>
<th>Chamber (#x)</th>
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<tr>
<td>1A</td>
<td>VD71414</td>
<td>ISH-60D193</td>
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<td>1B</td>
<td>VD71428</td>
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<td>2A</td>
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<td>ISH-60D293</td>
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<td>2B</td>
<td>VD72428</td>
<td>ISH-60D295</td>
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</table>

**NOTE** - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

**Automatic Actions:**
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Local lamp line (chamber) main distribution breaker on UV chamber in ALARM trips.

**Immediate Actions:**

[1] **ON** graphic UV, **CHECK** UV System status.

[2] (Electrician) **CHECK** alarmed chamber main circuit breaker is TRIPPED or OPEN.

**Possible Causes:**
1. Ballast failure.
2. Capacitor failure.

**References:**
- **Drawings:** None
- **Documents:** None
UV/OX System Alarm Response

UV-#x SECONDARY GROUND FAULT

DESCRIPTION:
UV CHAMBER #x SECONDARY GROUND FAULT (see matrix)

Setpoint: N/A
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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<th>Chamber (#x)</th>
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<td>1A</td>
<td>VD71415</td>
<td>ISH-60D194</td>
<td>2A</td>
<td>VD72415</td>
<td>ISH-60D294</td>
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<td>1B</td>
<td>VD71429</td>
<td>ISH-60D196</td>
<td>2B</td>
<td>VD72429</td>
<td>ISH-60D296</td>
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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Local lamp line (chamber) main distribution breaker on UV chamber in ALARM trips.

Immediate Actions:
[1] ON graphic UV, CHECK UV System status.
[2] ON graphic UV, ENSURE all lamps OFF for UV unit in ALARM.
[3] (Electrician) CHECK alarmed chamber main circuit breaker is TRIPPED or OPEN.

Possible Causes:
1. Ballast failure.
2. Capacitor failure.

References:
Drawings: None
Documents: None
UV #x EFFLUENT HIGH TEMPERATURE

DESCRIPTION: UV CHAMBER #x WARNING OF HIGH EFFLUENT TEMPERATURE (see matrix)

Setpoint: 145°F
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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<td>1A</td>
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<td>TT-60D105</td>
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<td>1B</td>
<td>VD71135</td>
<td>TT-60D106</td>
<td>2B</td>
<td>VD72135</td>
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</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:

None.

Immediate Actions:

[1] **ON** graphic UV, **ENSURE** setpoints and flows for FIC60D104 (FIC60D204).
[2] **ENSURE** number of lamps operated versus flow per ETF-60-002.
NOTE- If cleaning shuttle has been activated, pause interval may be set too short (less than 700 divided by FIC60D104 (FIC60D204)).
[3] **ON** graphic UV, **CHECK** quartz tube cleaning shuttle information.
[6] **ENSURE** AOV-60B080 is in OPEN position.
[7] **ENSURE** AOV-60B074 is in FEED position.
[8] **ENSURE** TIC-60B004 is in MANUAL and output is 100%.

(Continued on Next Page)
UV/OX System Alarm Response

UV #x EFFLUENT HIGH TEMPERATURE

DESCRIPTION: UV CHAMBER #x WARNING OF HIGH EFFLUENT TEMPERATURE
(see matrix)

Setpoint: 145°F

Alarm Location: See matrix

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

(Continued)

Possible Causes:

1. Low flow through system/too many lamps for flow.
2. Loss of Cooling Water System to UV inlet cooler.
3. Improper valve alignment.
4. Improper quartz tube cleaning shuttle setup.
5. Malfunction of TCV60B004.
6. Malfunction of FIC60D104 (FIC60D204).

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV- #x EFFLUENT HI HI TEMPERATURE

DESCRIPTION: UV CHAMBER #x EFFLUENT HI HI TEMPERATURE (see matrix)
Setpoint: 150°F
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

### Alarm Matrix

<table>
<thead>
<tr>
<th>Chamber (#x)</th>
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<th>Chamber (#x)</th>
<th>Tag (###)</th>
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<tbody>
<tr>
<td>1A</td>
<td>VD71104</td>
<td>TT-60D105</td>
<td>2A</td>
<td>VD72104</td>
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<td>1B</td>
<td>VD71105</td>
<td>TT-60D106</td>
<td>2B</td>
<td>VD72105</td>
<td>TT-60D206</td>
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</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:

1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:

[1] **ON** graphic UV, **CHECK** system status.
[2] **ON** graphic UV-#x, **ENSURE** all lamps in UV chamber in ALARM are turned OFF.
[3] **CHECK** individual chamber temperatures.
[4] **IF** temperature(s) exceed 180°F, **CONTACT** Engineering for evaluation.
[5] **ON** graphic UV, **ENSURE** setpoints and flows for FIC60D104 (FIC60D204).
[6] **ENSURE** number of lamps operated versus flow per ETF-60-002.

(Continued on Next Page)
**UV- #x EFFLUENT HI HI TEMPERATURE**

**DESCRIPTION:** UV CHAMBER #x EFFLUENT HI HI TEMPERATURE (see matrix)  
**Setpoint:** 150°F  
**Alarm Location:** See matrix  
**Graphic:** Alarm Summary Screen or Recent Alarm Display Screen  
**Indications:** N/A

(Continued)

**Immediate Actions (Cont.):**

NOTE - If cleaning shuttle has been activated, pause interval may be set too short (less than 700 divided by FIC60D104 (FIC60D204)).

[7] **ON** graphic UV, **CHECK** quartz tube cleaning shuttle information.

[8] **CHECK** cooling water operation.

[9] **CHECK** valve alignment per ETF-60-002 or ETF-60-006.

[10] **ENSURE** AOV-60B080 is in OPEN position.

[11] **ENSURE** AOV-60B074 is in FEED position.

[12] **ENSURE** TIC60B004 is in MANUAL and output is 100%.

**Possible Causes:**

1. Low flow through system/too many lamps for flow.
2. Loss of Cooling Water System to UV inlet cooler.
3. Improper valve alignment.
4. Improper quartz tube cleaning shuttle setup.
5. Malfunction of TCV-60B004.
6. Malfunction of FIC60D104 (FIC60D204).

**References:**

Drawings: None  
Documents: ETF-60-002, Integrated MTT Operation  
ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV- #x EFFLUENT HI TEMPERATURE

DESCRIPTION: UV CHAMBER #x INFLUENT /EFFLUENT HI TEMPERATURE (see matrix)
Setpoint: 150°F
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

<table>
<thead>
<tr>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
<th>Source</th>
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<tbody>
<tr>
<td>1A</td>
<td>VD71408</td>
<td>TSH-60D-112/113</td>
<td>2A</td>
<td>VD72408</td>
<td>TSH-60D-212/213</td>
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<tr>
<td>1B</td>
<td>VD71422</td>
<td>TSH-60D-141/142</td>
<td>2B</td>
<td>VD72422</td>
<td>TSH-60D-241/242</td>
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</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:
[1] **ON** graphic UV, **CHECK** system status.
[2] **ON** graphic UV-#x, **ENSURE** all lamps in UV chamber in ALARM are turned OFF.
[3] **CHECK** individual chamber temperatures.
[4] **IF** temperature(s) exceed 180°F, **CONTACT** Engineering for evaluation.
[5] **ON** graphic UV, **ENSURE** setpoints and flows for FIC60D104 (FIC60D204).
[6] **ENSURE** number of lamps operated versus flow per ETF-60-002.

(Continued on Next Page)
UV/OX System Alarm Response

UV- #x EFFLUENT HI TEMPERATURE

**DESCRIPTION:** UV CHAMBER #x INFLUENT /EFFLUENT HI TEMPERATURE (see matrix)

**Setpoint:** 150°F

**Alarm Location:** See matrix

**Graphic:** Alarm Summary Screen or Recent Alarm Display Screen

**Indications:** N/A

(Continued)

**Immediate Actions (Cont.):**

**NOTE:** If cleaning shuttle has been activated, pause interval may be set too short (less than 700 divided by FIC60D104 (FIC60D204)).

7. **ON** graphic UV, **CHECK** quartz tube cleaning shuttle information.

8. **ENSURE** cooling water operation.

9. **CHECK** valve alignment per ETF-60-002 or ETF-60-006.

10. **ENSURE** AOV-60B080 is in OPEN position.

11. **ENSURE** AOV-60B074 is in FEED position.

12. **ENSURE** TIC60B004 is in MANUAL and output is 100%.

**Possible Causes:**

1. Low flow through system/too many lamps for flow.
2. Loss of Cooling Water System to UV inlet cooler.
3. Improper valve alignment.
4. Improper quartz tube cleaning shuttle setup.
5. Malfunction of TCV60B004.
6. Malfunction of FIC60D104 (FIC60D204).

**References:**

- **Drawings:** None
- **Documents:** ETF-60-002, Integrated MTT Operation
  ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV #- INFLUENT HIGH TEMP

DESCRIPTION: UV-1 HIGH INFLUENT TEMPERATURE, VD71113
              UV-2 HIGH INFLUENT TEMPERATURE, VD72113

Setpoint: 150°F

Alarm Location: TT-60D160 or TT-60D260

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:

None.

Immedidate Actions:

[1] ON graphic Surge, CHECK surge tank temperature, TT60A011.
[2] ON graphic UV, ENSURE 60B004 (TIC60B004) is in MANUAL and output is 100%.
[4] IF individual chamber temperature(s) exceeds 180°F, CONTACT Engineering for evaluation.

Possible Causes:

1. High temperature from surge tank.
2. Valve misalignment.
3. Cooling water failure to UV inlet cooler.
5. TIC60B004 failure or incorrect output.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
           ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV INLET COOLER HIGH TEMP VD122121

DESCRIPTION: UV INLET COOLER HIGH TEMPERATURE  
Setpoint: 120°F  
Alarm Location: TT-60B004  
Graphic: Alarm Summary Screen or Recent Alarm Display Screen  
Indications: N/A  

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:  
None.

Immediate Actions:  
[1] ON graphic Surge, CHECK surge tank temperature TT60A011.  
[2] ON graphic UV, ENSURE 60B004 (TIC60B004) is in MANUAL and output is 100%.  
[5] IF individual UV chamber temperature(s) exceeds 180°F, CONTACT Engineering for evaluation.

Possible Causes:  
1. High temperature from surge tank.  
2. Cooling water failure to UV inlet cooler.  
3. Valve misalignment.  
5. TIC60B004 failure or incorrect output.

References:  
Drawings: None  
Documents: ETF-60-002, Integrated MTT Operation  
ETF-60-006, Initial MTT Lineup in Configuration 1  
ETF-95C-001, Cooling Water System Operation
UV/OX System Alarm Response

UV INLET COOLER LOW TEMP VD122122

DESCRIPTION: UV INLET COOLER LOW TEMPERATURE
Setpoint: 40°F
Alarm Location: TT-60B004
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:

[1] ON graphic Surge, CHECK surge tank temperature TT60A011.
[2] ON graphic UV, ENSURE 60B004 (TIC60B004) is in MANUAL and output is 100%.

Possible Causes:
1. Low temperature from surge tank.
2. Valve misalignment.
3. Instrument malfunction.
4. TIC60B004 failure or incorrect output.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
P#x# LOW DISCHARGE PRESSURE

DESCRIPTION: UV CHAMBER #x H₂O₂ PUMP #X# LOW DISCHARGE PRESSURE
(see matrix)

Setpoint: 15 psig
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:

[1] FLUSH H₂O₂ injection line(s) with demineralized water per ETF-60D-001.
[2] CONFIRM power has not been lost to H₂O₂ pump (red light on pump LIT).
[3] ON UV graphic LT60D313, CHECK tank H₂O₂ level.
[5] IF H₂O₂ pumps need to be primed, PRIME per ETF-60D-001.
DESCRIPTION: UV CHAMBER #x H2O2 PUMP #X# LOW DISCHARGE PRESSURE
(see matrix)

Setpoint: 15 psig
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

Possible Causes:
1. Pump failure or loss of prime.
2. Leaking check valve.
3. Low tank H2O2 level.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
ETF-60D-001, UV/OX System Infrequent Operations
UV/OX System Alarm Response

P#X# LOW LOW DISCHARGE PRESSURE

DESCRIPTION: UV CHAMBER #x H₂O₂ PUMP #X# LOW LOW DISCHARGE PRESSURE (see matrix)

Setpoint: 1 psig or 15 psig (Specified by process memo depending on waste stream)
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. Associated peroxide pump in SHUTDOWN.

Immediate Actions:
[1] ON graphic UV-#x, DESELECT associated pump.
[2] FLUSH H₂O₂ injection line(s) with demineralized water per ETF-60D-001.
[3] CONFIRM power has not been lost to H₂O₂ pump (red light on pump LIT).
[4] ON UV graphic LT60D313, CHECK tank H₂O₂ level.
[6] IF H₂O₂ pumps need to be primed, PRIME per ETF-60D-001.

(Continued on Next Page)
UV/OX System Alarm Response

P#X# LOW LOW DISCHARGE PRESSURE

DESCRIPTION: UV CHAMBER #x H₂O₂ PUMP #X# LOW LOW DISCHARGE PRESSURE  
(see matrix)

Setpoint: 1 psig or 15 psig (Specified by process memo depending on waste stream)

Alarm Location: See matrix

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

(Continued)

Possible Causes:

1. Pump failure or loss of prime.
2. Leaking check valve.
3. Low tank H₂O₂ level.
4. H₂O₂ piping leaks.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
ETF-60D-001, UV/OX System Infrequent Operations
UV/OX System Alarm Response

P#X# HIGH DISCHARGE PRESSURE

DESCRIPTION: UV CHAMBER #x H₂O₂ PUMP #X# HIGH DISCHARGE PRESSURE (see matrix)

Setpoint: 50 psig
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:
[1] FLUSH H₂O₂ injection line(s) with demineralized water per ETF-60D-001.

Possible Causes:
1. Discharge check valve restricting flow.
2. Valve misalignment.
3. Discharge check valve failure.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
ETF-60D-001, UV/OX System Infrequent Operations
P#x# HI HI DISCHARGE PRESSURE

DESCRIPTION: UV CHAMBER #x H₂O₂ PUMP #X# HIGH HIGH DISCHARGE PRESSURE (see matrix)

Setpoint: 55 psig
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. Associated peroxide pump in SHUTDOWN.

Immediate Actions:
[1] ON graphic UV-#x, DESELECT associated peroxide pump.
[2] FLUSH H₂O₂ injection line(s) with demineralized water per ETF-60D-001.

Possible Causes:
1. Discharge check valve restricting flow.
2. Valve misalignment.
3. Discharge check valve failure.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
ETF-60D-001, UV/OX System Infrequent Operations
P#x# DISCHARGE VALVE NOT OPEN

DESCRIPTION: UV CHAMBER #x H2O2 PUMP P#X# DISCHARGE VALVE NOT FULLY OPEN (see matrix)
Setpoint: N/A
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. Associated peroxide pump in SHUTDOWN.

Immediate Actions:
[1] ON graphic UV-#x, ENSURE pump is in SHUTDOWN.

Possible Causes:
1. Listed valve not fully OPEN.
2. Limit switch malfunction on listed valve.

References:
- Drawings: None
- Documents: None
UV-#PEROXIDE MODULE SWITCH

DESCRIPTION: UV-1 PEROXIDE MODULE LOCKOUT/STOP HANDSWITCH, HS-60D399, NOT ON RUN, VD71417
UV-2 PEROXIDE MODULE LOCKOUT/STOP HANDSWITCH, HS-60D399, NOT ON RUN, VD72417

Setpoint: N/A
Alarm Location: HS-60D399
Graphic: Local Peroxide Module Control Panel
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/pH Adjustment System goes to READY.

Immediate Actions:
[1] ON graphic UV/pH Adjust, ENSURE system goes to READY.

Possible Causes:
1. Peroxide module handswitch, HS-60D399, lockout/stop not set to RUN.

References:
Drawings: None
Documents: None
UV-# OVERPRESSURE RELIEF

DESCRIPTION: UV-1 OVERPRESSURE RELIEF, VD71402
UV-2 OVERPRESSURE RELIEF, VD72402

Setpoint: Moisture detected by instruments (rupture disk rated to 20 psig)
Alarm Location: ASH-60D107 or ASH-60D207
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to SHUTDOWN.
2. pH Adjust and MTT go to SHUTDOWN.

Immediate Actions:
[1] ON graphic UV/pH Adjust, ENSURE system is in SHUTDOWN (all lamps OFF).

Possible Causes:
1. Valve misalignment.
2. Rupture disk failed.
3. Condensate accumulation in piping.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1
## UV- # INFLUENT HIGH PRESSURE

**DESCRIPTION:** UV-1 HIGH INFLUENT WATER PRESSURE, VD71132  
UV-2 HIGH INFLUENT WATER PRESSURE, VD72132  

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<th>Setpoint</th>
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<tr>
<td>Alarm Location</td>
<td>PT-60D103 or PT-60D203</td>
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**NOTE** - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

**Automatic Actions:**
- None.

**Immediate Actions:**

1. **ENSURE** valve alignment per ETF-60-002 or ETF-60-006.
2. **IF** there is valve misalignment, **RESTART** system.

**Possible Causes:**

1. Valve misalignment.

**References:**

- **Drawings:** None
- **Documents:** ETF-60-002, Integrated MTT Operation  
ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV- # INFLUENT HI HI PRESSURE

DESCRIPTION: UV-1 HIGH HIGH INFLUENT WATER PRESSURE, VD71102
               UV-2 HIGH HIGH INFLUENT WATER PRESSURE, VD72102
               
               Setpoint: 22 psig
               Alarm Location: PT-60D103 or PT-60D203
               Graphic: Alarm Summary Screen or Recent Alarm Display Screen
               Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:

1. If no other UV chambers are enabled, then:
   • UV/OX System goes to SHUTDOWN
   • pH Adjust and MTT go to SHUTDOWN.

2. If the other UV unit is enabled, then UV/OX System goes to READY.

3. UV/OX unit in ALARM goes to SHUTDOWN.

Immediate Actions:

[1] ON graphic UV, CHECK system status.
[2] ON graphic UV, ENSURE UV/OX unit in ALARM is in SHUTDOWN.
[4] IF there is valve misalignment, RESTART system.

Possible Causes:

1. Valve misalignment.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
           ETF-60-006, Initial MTT Lineup in Configuration 1
UV-#x LAMP ENCLOSURE MOISTURE

DESCRIPTION: UV CHAMBER #x LAMP ENCLOSURE MOISTURE (see matrix)
   Setpoint: On
   Alarm Location: See matrix
   Graphic: Alarm Summary Screen or Recent Alarm Display Screen
   Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX System goes to SHUTDOWN.
2. pH Adjust and MTT go to SHUTDOWN.

IMMEDIATE ACTIONS:
[1] ON graphic UV/pH Adjust, ENSURE system is in SHUTDOWN (all lamps OFF).
[2] CHECK for leaks from quartz tubes for the lamp end enclosures of chambers in ALARM.

Possible Causes:
1. Tube or seal failure.

References:
   Drawings: None
   Documents: None
UV/OX System Alarm Response

UV-#x LAMP DRIVE ENCLOSE HI TEMP

DESCRIPTION: UV CHAMBER #x LAMP DRIVE HIGH TEMPERATURE (see matrix)
Setpoint: 150°F
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON graphic UV- #x, ENSURE all lamps are OFF for chamber in ALARM.
[3] CONFIRM lamp drive and ballast cooling fans are in OPERATION.
[4] CONFIRM air filter in lamp drive cabinet is clean, unobstructed.

(Continued on Next Page)
UV/OX System Alarm Response

UV-#x LAMP DRIVE ENCLOSE HI TEMP

DESCRIPTION:  UV CHAMBER #x LAMP DRIVE HIGH TEMPERATURE (see matrix)
Setpoint:  150°F
Alarm Location:  See matrix
Graphic:  Alarm Summary Screen or Recent Alarm Display Screen
Indications:  N/A

(Continued)

Possible Causes:

1. Fan failure.
2. Filter dirty/obstructed.
3. Instrument failure or incorrect temperature setting.

References:

Drawings:  None
Documents:  None
UV/OX System Alarm Response

UV-#x LAMP DRIVE ENCLOSURE DOOR

DESCRIPTION: UV CHAMBER #x LAMP DRIVE DOOR OPEN (see matrix)
Setpoint: N/A
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Local lamp line (chamber) main distribution breaker on UV chamber in ALARM trips.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] (Electrician) CONFIRM alarmed chamber main circuit breaker is TRIPPED or OPEN.
[3] ENSURE door of listed chamber is closed and latched.

Possible Causes:
1. Door of listed chamber open.
2. Door limit switch malfunction.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
UV/OX System Alarm Response

UV-#x LAMP END ENCLOSURE DOOR

DESCRIPTION: UV CHAMBER #x LAMP END DOOR OPEN (see matrix)
Setpoint: N/A
Alarm Location: PLC
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   • UV/OX System goes to SHUTDOWN
   • pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON graphic UV- #x, ENSURE lamps in UV chamber in ALARM are turned OFF.
[3] ENSURE door of listed chamber is closed and latched.

Possible Causes:
1. Door of listed chamber open.
2. Door limit switch malfunction.

References:
- Drawings: None
- Documents: ETF-60-002, Integrated MTT Operation
UV/OX System Alarm Response

UV-#x LAMP L # LOW CURRENT

DESCRIPTION:  UV CHAMBER #x LAMP # FAILURE (see matrix)
Setpoint:  15 amps
Alarm Location:  See matrix
Graphic:  Alarm Summary Screen or Recent Alarm Display Screen
Indications:  N/A

<table>
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<tr>
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<th>Tag (###)</th>
<th>Source</th>
<th>Lamp (L#)</th>
<th>Chamber (#x)</th>
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</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:

(Continued on Next Page)
UV/OX System Alarm Response

UV-#x LAMP L # LOW CURRENT

DESCRIPTION: UV CHAMBER #x LAMP # FAILURE (see matrix)
Setpoint: 15 amps
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

Possible Causes:
1. Lamp failure.

References:
- Drawings: None
- Documents: None
UV/OX System Alarm Response

UV-#x LAMP L # LO LO CURRENT

DESCRIPTION: UV CHAMBER #x LAMP # FAILURE (see matrix)
Setpoint: 4 amps
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. Alarmed lamp goes to OFF.

Immediate Actions:
[1] ON graphic UV-#x, ENSURE lamp is OFF.

(Continued on Next Page)
UV/#x LAMP L # LO LO CURRENT

**DESCRIPTION:** UV CHAMBER #x LAMP # FAILURE (see matrix)
  Setpoint: 4 amps
  Alarm Location: See matrix
  Graphic: Alarm Summary Screen or Recent Alarm Display Screen
  Indications: N/A

(Continued)

**Possible Causes:**

1. Lamp failure.

**References:**

  Drawings: None
  Documents: None
UV-OX System Alarm Response

UV-/X LAMP L# SWITCHING FAILURE

**DESCRIPTION:** UV CHAMBER #x LAMP # SWITCHING FAILURE (see matrix)

**Setpoint:** Lamp that should not be energized had >4amp output

**Alarm Location:** See matrix

**Graphic:** Alarm Summary Screen or Recent Alarm Display Screen

**Indications:** N/A

### Alarm Matrix

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</table>

**NOTE** - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

### Automatic Actions:

1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Local lamp line (chamber) main distribution breaker on UV chamber in ALARM trips.

(Continued on Next Page)
UV-OX System Alarm Response

UV-#X LAMP L# SWITCHING FAILURE

DESCRIPTION: UV CHAMBER #x LAMP # SWITCHING FAILURE (see matrix)

Setpoint: Lamp that should not be energized had >4amp output

Alarm Location: See matrix

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

(Continued)

Immediate Actions:

[1] **ON** graphic UV, **CHECK** UV system status.

[2] **CHECK** that there is no power to alarmed system.

[3] (Electrician) **CONFIRM** alarmed chamber main circuit breaker is **TRIPPED** or **OPEN**.

Possible Causes:

1. Electrical failure.

References:

Drawings: None

Documents: None
UV-#x INSUFFICIENT LAMPS

DESCRIPTION: UV-1A INSUFFICIENT LAMPS, VD71681
UV-1B INSUFFICIENT LAMPS, VD71682
UV-2A INSUFFICIENT LAMPS, VD72681
UV-2B INSUFFICIENT LAMPS, VD72682

Setpoint: N/A
Alarm Location: Calculated Value from UV Control System
Graphic: Alarm Summary Screen or Recent Alarm Display Screen/Recent Alarm Window
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:
[1] **ON** graphic UV, **ENSURE** correct number of UV lamps energized for current MTT flow range per ETF-60-002.

Possible Causes:
1. MTT in **OPERATION** with no UV lamps energized on at least one chamber in alarmed UV train.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
UV-# LOW FLOW

**DESCRIPTION:** UV-1 LOW WATER FLOW, VD71109
UV-2 LOW WATER FLOW, VD72109

- **Setpoint:** Lo Lo flow setpoint plus 2 gpm
- **Alarm Location:** FT-60D104 or FT-60D204
- **Graphic:** Alarm Summary Screen or Recent Alarm Display Screen
- **Indications:** N/A

**NOTE** - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

**Automatic Actions:**
- None.

**Immediate Actions:**

1. **ENSURE** valve alignment per ETF-60-002 or ETF-60-006.
2. **ENSURE** flow setpoint and indication on FIC60D104 (FIC60D204).

**Possible Causes:**

1. FIC60D104 (FIC60D204) failure or incorrect setpoint.
2. Valve misalignment.

**References:**

- **Drawings:** None
- **Documents:** ETF-60-002, Integrated MTT Operation
  ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV-# LO LO WATER FLOW

DESCRIPTION:  UV-1 LOW LOW WATER FLOW, VD71189
               UV-2 LOW LOW WATER FLOW, VD72189

Setpoint: 34 gpm or calculated flow that ensures lamp heat removed from unit

Alarm Location: FT-60D104 or FT-60D204

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   • UV/OX System goes to SHUTDOWN
   • pH Adjust and MTT go to SHUTDOWN.
2. If the other UV unit is enabled, then UV/OX System goes to READY.
3. UV/OX unit in alarm goes to SHUTDOWN.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON graphic UV/pH Adjust, ENSURE unit in alarm goes to SHUTDOWN.
[4] ENSURE flow setpoint and indication on FIC60D104 (FIC60D204).

Possible Causes:
1. FIC60D104 (FIC60D204) failure or incorrect setpoint.
2. Valve misalignment.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
           ETF-60-006, Initial MTT Lineup in Configuration 1
UV/OX System Alarm Response

UV- # HIGH FLOW

DESCRIPTION: UV-1 CHAMBER(S) HIGH WATER FLOW VD71111
UV-2 CHAMBER(S) HIGH WATER FLOW VD72111
Setpoint: Hi Hi flow set point minus 5 gpm
Alarm Location: FT-60D104 or FT-60D204
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:
[1] ON the following graphics, ENSURE water flow to each UV chamber is less than the Hi Hi setpoint:
   • UV
   • Graphic display 300.
[2] ENSURE flow setpoint and indication on FIC60D104 (FIC60D204).

Possible Causes:
1. FIC60D104 (FIC60D204) failure or incorrect setpoint.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV- # HI HI FLOW

DESCRIPTION:  UV-1 CHAMBER(S) WATER FLOW TO HIGH FOR EFFECTIVE TREATMENT VD71110 UV-2 CHAMBER(S) WATER FLOW TO HIGH FOR EFFECTIVE TREATMENT VD72110

Setpoint: Variable 30 to 60 gpm
Alarm Location: FT-60D104 or FT-60D204
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON the following graphics, ENSURE water flow to each UV chamber is less than the Hi Hi setpoint:
   - UV
   - Graphic display 300.
[3] ENSURE flow setpoint and indication on FIC60D104 (FIC60D204).

Possible Causes:
1. FIC60D104 (FIC60D204) failure or incorrect setpoint.

References:
Drawings: None
Documents: None
DESCRIPTION: FINE FILTER LOW INLET FLOW
Setpoint: 25 gpm
Alarm Location: FIT-60D007
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:
[1] **ON** graphic Fine, **CHECK** FIT60D007 flow is less than or equal to 25 gpm, indicating FIT failure.
[2] **ON** graphic UV, **CHECK** correct process flow range for MTT operation (FT60D104/FT60D204).

Possible Causes:
1. Failed FIT-60D007.
2. Momentary flow variation during startup.
3. Plugged PDM filters.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV-#x INFLUENT VALVE NOT OPEN

DESCRIPTION: UV CHAMBER #x INFLUENT VALVE NOT FULLY OPEN (see matrix)

Setpoint: N/A

Alarm Location: See matrix

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

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<th>Chamber (#x)</th>
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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON graphic UV-#x, ENSURE system lamps in UV chamber in ALARM are turned OFF.

Possible Causes:
1. Listed valve not fully OPEN.
2. Limit switch malfunction on listed valve.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV-#x EFFLUENT VALVE NOT OPEN

DESCRIPTION: UV CHAMBER #x EFFLUENT VALVE NOT FULLY OPEN (see matrix)
Setpoint: N/A
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   • UV/OX System goes to SHUTDOWN
   • pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON graphic UV-#x, ENSURE system lamps in UV chamber in ALARM are turned OFF.

Possible Causes:
1. Listed valve not fully OPEN.
2. Limit switch malfunction on listed valve.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV-#x AOV-60D###/### FAILURE

DESCRIPTION: UV CHAMBER #x NORMAL FLOW OR REVERSE FLOW VALVE OUT OF POSITION (see matrix)

Setpoint: N/A
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

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<td>1A</td>
<td>VD31386</td>
<td>AOV60D111/114</td>
<td>2A</td>
<td>VD32386</td>
<td>AOV60D211/214</td>
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<tr>
<td>1A</td>
<td>VD31387</td>
<td>AOV60D112/113</td>
<td>2A</td>
<td>VD32387</td>
<td>AOV60D212/213</td>
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<tr>
<td>1B</td>
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<td>AOV60D119/122</td>
<td>2B</td>
<td>VD32398</td>
<td>AOV60D219/222</td>
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<tr>
<td>1B</td>
<td>VD31399</td>
<td>AOV60D120/121</td>
<td>2B</td>
<td>VD32399</td>
<td>AOV60D220/221</td>
</tr>
</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:

1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Tube cleaning is stopped.
4. Tube cleaning timer is reset.

Immediate Actions:

[1] ON graphic UV, CHECK system status.

[2] ENSURE physical position of valves listed below (should be FULL OPEN or FULL CLOSED, depending on flow path).

(Continued on Next Page)
UV/OX System Alarm Response

UV-#x AOV-60D###/### FAILURE

**DESCRIPTION:** UV CHAMBER #x NORMAL FLOW OR REVERSE FLOW VALVE OUT OF POSITION (see matrix)

**Setpoint:** N/A

**Alarm Location:** See matrix

**Graphic:** Alarm Summary Screen or Recent Alarm Display Screen

**Indications:** N/A

(Continued)

<table>
<thead>
<tr>
<th>Normal Flow Path</th>
<th>UV-1A</th>
<th>UV-1B</th>
<th>UV-2A</th>
<th>UV-2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve</td>
<td>Position</td>
<td>Valve</td>
<td>Position</td>
<td>Valve</td>
</tr>
<tr>
<td>AOV-60D111</td>
<td>OPEN</td>
<td>AOV-60D119</td>
<td>OPEN</td>
<td>AOV-60D211</td>
</tr>
<tr>
<td>AOV-60D112</td>
<td>CLOSED</td>
<td>AOV-60D120</td>
<td>CLOSED</td>
<td>AOV-60D212</td>
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<tr>
<td>AOV-60D113</td>
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<td>AOV-60D114</td>
<td>OPEN</td>
<td>AOV-60D122</td>
<td>OPEN</td>
<td>AOV-60D214</td>
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<table>
<thead>
<tr>
<th>Reverse Flow Path</th>
<th>UV-1A</th>
<th>UV-1B</th>
<th>UV-2A</th>
<th>UV-2B</th>
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</thead>
<tbody>
<tr>
<td>Valve</td>
<td>Position</td>
<td>Valve</td>
<td>Position</td>
<td>Valve</td>
</tr>
<tr>
<td>AOV-60D111</td>
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<td>AOV-60D113</td>
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<tr>
<td>AOV-60D114</td>
<td>CLOSED</td>
<td>AOV-60D122</td>
<td>CLOSED</td>
<td>AOV-60D214</td>
</tr>
</tbody>
</table>

**Possible Causes:**

1. Valve failure.
2. Limit switch malfunction.

**References:**

Drawings: None
Documents: None
UV/OX System Alarm Response

UV-#x CHAMBER LOW WATER LEVEL

DESCRIPTION: UV CHAMBER #x LOW WATER LEVEL (see matrix)
Setpoint: Off
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

<table>
<thead>
<tr>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
<th>Source</th>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>VD71410</td>
<td>LSL-60D161</td>
<td>2A</td>
<td>VD72410</td>
<td>LSL-60D261</td>
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<tr>
<td>1B</td>
<td>VD71424</td>
<td>LSL-60D164</td>
<td>2B</td>
<td>VD72424</td>
<td>LSL-60D264</td>
</tr>
</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. If no other UV chambers are enabled, then:
   - UV/OX System goes to SHUTDOWN
   - pH Adjust and MTT go to SHUTDOWN.
2. If other UV chambers are enabled, then UV/OX System goes to READY.
3. Lamps in UV chamber in ALARM are turned OFF.

Immediate Actions:
[1] ON graphic UV, CHECK system status.
[2] ON graphic UV-#x, ENSURE lamps in UV chamber in ALARM are turned OFF.
   [3.1] IF leaks are found, GO TO ETF-ERP-85B-003.

(Continued on Next Page)
UV/OX System Alarm Response

UV-#x CHAMBER LOW WATER LEVEL

DESCRIPTION: UV CHAMBER #x LOW WATER LEVEL (see matrix)
   Setpoint: Off
   Alarm Location: See matrix
   Graphic: Alarm Summary Screen or Recent Alarm Display Screen
   Indications: N/A

(Continued)

Possible Causes:

1. System leaks.
2. Level probe failure.
3. Air trap failure.
4. Valve misalignment.

References:

Drawings: None
Documents: ETF-ERP-85B-003, Emergency Spill or Release at ETF
            ETF-60-002, Integrated MTT Operation
            ETF-60-006, Initial MTT Lineup in Configuration 1
UV- #x TUBE CLEANER LOW AIR PRESS

DESCRIPTION: UV CHAMBER #x LOW AIR PRESSURE (see matrix)
Setpoint: 76 psig
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

<table>
<thead>
<tr>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
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<td>1B</td>
<td>VD71420</td>
<td>PSL-60D133</td>
</tr>
<tr>
<td>2A</td>
<td>VD72406</td>
<td>PSL-60D209</td>
</tr>
<tr>
<td>2B</td>
<td>VD72420</td>
<td>PSL-60D233</td>
</tr>
</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. Tube cleaning cycle is stopped.
2. Tube cleaning timer is reset.

Immediate Actions:
[1] CHECK for instrument air leaks in system.

Possible Causes:
1. Low instrument air pressure.
2. Pressure switch out of calibration or failed.

References:
Drawings: None
Documents: None
UV/OX System Alarm Response

UV-#x TUBE CLEANER TEST SWITCH

DESCRIPTION: UV CHAMBER #x TUBE CLEANER TEST SWITCH (see matrix)

Setpoint: On

Alarm Location: See matrix

Graphic: Alarm Summary Screen or Recent Alarm Display Screen

Indications: N/A

<table>
<thead>
<tr>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
<th>Source</th>
<th>Chamber (#x)</th>
<th>Tag (###)</th>
<th>Source</th>
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<tbody>
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<td>VD72519</td>
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<td>1B</td>
<td>VD71520</td>
<td>Test Switch</td>
<td>2B</td>
<td>VD72520</td>
<td>Test Switch</td>
</tr>
</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. Tube cleaner cycle starts for chamber.

Immediate Actions:
1. [1] ON graphic UV-#x, CONFIRM tube cleaning cycle is in progress.

Possible Causes:
1. Tube cleaning test switch was actuated.

References:

Drawings: None
Documents: None
UV STOP PEROXIDE TANK FILL VD61312

DESCRIPTION: PEROXIDE TANK HIGH LEVEL
Setpoint: 95%
Alarm Location: LT-60D313
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:
[1] STOP transfer from tank truck to peroxide tank per ETF-60D-002.

Possible Causes:
1. Overfilling of peroxide tank from tank truck.
2. Malfunctioning instrument.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
UV REFILL PEROXIDE TANK VD61313

DESCRIPTION: PEROXIDE TANK LOW LEVEL
   Setpoint: 25%
   Alarm Location: LT-60D313
   Graphic: Alarm Summary Screen or Recent Alarm Display Screen
   Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
   None.

Immediate Actions:
   [1] VISUALLY CHECK if H₂O₂ tank level is low.
   [2] NOTIFY Design Authority to order more H₂O₂ solution.
       [3.1] IF leaks are found, GO TO ETF-ERP-85B-003.

Possible Causes:
   1. Normal use of H₂O₂.
   2. System leaks.
   3. Malfunctioning instrumentation.

References:
   Drawings: None
   Documents: ETF-ERP-85B-003, Emergency Spill or Release at ETF
UV STOP PEROXIDE PUMPS (VD61314)

DESCRIPTION:  PEROXIDE TANK LOW-LOW LEVEL
  Setpoint:  7.0%
  Alarm Location:  LT-60D313
  Graphic:  Alarm Summary Screen or Recent Alarm Display Screen
  Indications:  N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
  1. UV/OX System goes to READY.

Immediate Actions:
  [1] ON graphic UV, CHECK system is in READY.
      [2.1] IF leaks are found, GO TO ETF-ERP-85B-003.

Possible Causes:
  1. Malfunctioning instrumentation.
  2. Leaks in system.
  3. Delivery of peroxide not ordered or late arrival.

References:
  Drawings:  None
  Documents:  ETF-ERP-85B-003, Emergency Spill or Release at ETF
UV OX System Alarm Response

UV PEROXIDE TANK SUMP HIGH LEVEL

DESCRIPTION: H₂O₂ TANK SUMP HIGH LEVEL
Setpoint: 1 in.
Alarm Location: LS-20B015
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:

[1] INSPECT H₂O₂ tank and associated equipment for leakage.
[1.1] IF leakage is present, GO TO ETF-ERP-85B-003.

Possible Causes:

1. Leak in H₂O₂ system.
2. Cooling water leak.
3. Safety shower usage.

References:

Drawings: None
Documents: ETF-ERP-85B-003, Emergency Spill or Release at ETF
UV DECOMPOSER SWITCH NOT IN RUN

DESCRIPTION: UV-1 DECOMPOSER SWITCH NOT IN RUN POSITION, VD71524
UV-2 DECOMPOSER SWITCH NOT IN RUN POSITION, VD72524
Setpoint: N/A
Alarm Location: HS60D401
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
None.

Immediate Actions:

Possible Causes:
1. Decomposer handswitch, HS-60D401, lockout/stop not set in RUN.

References:
Drawings: None
Documents: None
UV DECOMPOSER ## SWITCH OFF

**DESCRIPTION:** HAND SWITCH FOR DECOMPOSER # IN OFF POSITION

- **Setpoint:** N/A
- **Alarm Location:** See matrix
- **Graphic:** Alarm Summary Screen or Recent Alarm Display Screen
- **Indications:** N/A

<table>
<thead>
<tr>
<th>Unit (#)</th>
<th>Tag (###)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VD71525</td>
<td>HS60D402-1</td>
</tr>
<tr>
<td>1</td>
<td>VD71526</td>
<td>HS60D403-1</td>
</tr>
<tr>
<td>2</td>
<td>VD72525</td>
<td>HS60D402-2</td>
</tr>
<tr>
<td>2</td>
<td>VD72526</td>
<td>HS60D403-2</td>
</tr>
</tbody>
</table>

**NOTE** - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

**Automatic Actions:**

- None.

**Immediate Actions:**


**Possible Causes:**

1. Switch misaligned.

**References:**

- **Drawings:** None
- **Documents:** None
UV DECOMPOSER ##OVERPRESS RELIEF

DESCRIPTION: UV-#H₂O₂ DECOMPOSER NO.# OVER PRESSURE RELIEF

Setpoint: On
Alarm Location: See matrix
Graphic: Alarm Summary Screen or Recent Alarm Display Screen
Indications: N/A

<table>
<thead>
<tr>
<th>Unit (#)</th>
<th>Tag (###)</th>
<th>Source</th>
<th>Unit (#)</th>
<th>Tag (###)</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>VD71527</td>
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<td>2</td>
<td>VD72528</td>
<td>ASH-60D405-2</td>
</tr>
</tbody>
</table>

NOTE - Alarm response procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or testing procedures.

Automatic Actions:
1. UV/OX unit goes to SHUTDOWN.
2. pH adjust goes to SHUTDOWN.

Immediate Actions:
[1] ON graphic UV/pH Adjust, ENSURE system is in SHUTDOWN (all lamps OFF).
[2] ENSURE the following are in RUN position:
   - HS-60D401
   - HS-60D402
   - HS-60D403.
[4] CONFIRM power to peroxide destruct module panel (check CB-1 in JB60D003 is ON).

Possible Causes:
1. Valve misalignment.
2. Safety valve lifted.

References:
Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006, Initial MTT Lineup in Configuration 1