pH Adjustment System Alarm Response

ETF Alarm Response Procedure

Effluent Treatment Facility

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

| CHANGE HISTORY (\leq \text{LAST 5 REV-MODS}) |
|-----------------|-----------------|-----------------|
| Rev-Mod | Release Date | Justification | Summary of Changes |
| A-0 | 03/09/2016 | Conversion to WRPS Format | New Procedure; Supersedes ETF-PRO-AR-51380 (ARP-60C-001) |

pH Adjustment System

Alarm

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH ADJ RDY ATTEMPT FAILURE VD135453</td>
<td>2</td>
</tr>
<tr>
<td>PH ADJ OPER ATTEMPT FAILURE VD135455</td>
<td>4</td>
</tr>
<tr>
<td>PH ADJ LAH 60C111 VD135457</td>
<td>6</td>
</tr>
<tr>
<td>PH ADJ LAL 60C111 VD135458</td>
<td>7</td>
</tr>
<tr>
<td>PH ADJ AAHHX 60C103 OR 60C104</td>
<td>9</td>
</tr>
<tr>
<td>PH ADJ AAHX 60C103 OR 60C104</td>
<td>11</td>
</tr>
<tr>
<td>PH ADJ AALLX 60C103 OR 60C104</td>
<td>13</td>
</tr>
<tr>
<td>PH ADJ AALX 60C103 OR 60C104</td>
<td>15</td>
</tr>
<tr>
<td>PH ADJ 60C P1A A OR P1BA</td>
<td>17</td>
</tr>
</tbody>
</table>

RECORDS

No records are generated during the performance of this procedure.
PH ADJ RDY ATTEMPT FAILURE VD135453

DESCRIPTION: PH ADJUSTMENT SYSTEM READY ATTEMPT FAILURE
Setpoint: Logic permissive(s) not met
Alarm Location: Logic generated alarm
Graphic: Alarm Summary 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 procedures.

Automatic Actions:
1. pH Adjustment System will go to SHUTDOWN mode.

Immediate Actions:
[1] CONFIRM Auto setting on handswitches and air-operated valves (AOV) critical for operation (Logic Diagram H-2-89294, Sheet 7).
[2] CHECK for pH adjustment tank level alarms for the following:
   • LAH-60C-111
   • LAL-60C-111.
[3] CONFIRM selected pump 60C-P-1A/B is in AUTO and running.
[4] CONFIRM valve 60G-003, effluent pH adjustment system bypass, is CLOSED.
[5] CONFIRM status of the following AOVs:
   • AOV-60B-074 in AUTO and lined up in recirculation position
   • AOV-60B-080 in AUTO and OPEN.
[6] CONFIRM the following utilities are in OPERATION:
   • Chemical Feed
   • Instrument Air
   • Vessel Off-Gas.

(Continued on Next Page)
PH ADJ RDY ATTEMPT FAILURE
VD135453

DESCRIPTION: PH ADJUSTMENT SYSTEM READY ATTEMPT FAILURE

Setpoint: Logic permissive(s) not met
Alarm Location: Logic generated alarm
Graphic: Alarm Summary Screen
Indications: N/A

Immediate Actions (Cont.):

[8] IF low level alarm is ON, ADJUST tank level to at least 25% per ETF-60-002.
[9] IF high level alarm is ON, LOWER tank level to 50% or less per ETF-60-002.

Possible Causes:

1. System AUTO condition not met.
2. Tank low high or level alarm ON.
3. System AOVs misaligned.
4. Selected pump in alarm or in MANUAL.
5. Utility systems not in OPERATION.

References:

Drawings: H-2-89294, Logic Diagram, Sheet 7, pH Adjustment Auto Condition
Documents: ETF-60-002, Integrated MTT Operation
PH ADJ OPER ATTEMPT FAILURE
VD135455

DESCRIPTION: PH ADJUSTMENT SYSTEM OPERATE ATTEMPT FAILURE

Setpoint: Logic permissive(s) not met
Alarm Location: Logic generated alarm
Graphic: Alarm Summary 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 procedures.

Automatic Actions:
1. pH Adjustment System will go to SHUTDOWN mode.

Immediate Actions:

[1] CONFIRM AUTO setting on handswitches and AOVs critical for operation.
[2] CHECK for pH adjustment tank level alarms for the following:
   • LAH-60C-111
   • LAL-60C-111.
[3] CHECK for pH adjustment tank pH alarms for the following:
   • PH ADJ AAHHX 60C103
   • PH ADJ AAHHX 60C104
   • PH ADJ AALLX 60C103
   • PH ADJ AALLX 60C104.
[4] CONFIRM selected pump 60C-P-1A/B is in AUTO and running.
[5] CONFIRM status of the following AOVs:
   • AOV-60B-074 in AUTO and lined up in recirculation position
   • AOV-60B-080 in AUTO and OPEN.

(Continued on Next Page)
PH ADJ OPER ATTEMPT FAILURE
VD135455

**DESCRIPTION:** PH ADJUSTMENT SYSTEM OPERATE ATTEMPT FAILURE

**Setpoint:** Logic permissive(s) not met

**Alarm Location:** Logic generated alarm

**Graphic:** Alarm Summary Screen

**Indications:** N/A

(Continued)

**Immediate Actions (Cont.):**

[6] **CONFIRM** the following utilities are in OPERATION:
- Chemical Feed
- Instrument Air
- Vessel Off-Gas.

[7] **CHECK** lineup for operation per ETF-60-002.

[8] **IF** low level alarm is ON, **ADJUST** tank level to at least 25% per ETF-60-002.

[9] **IF** high level alarm is ON, **LOWER** tank level to 50% or less per ETF-60-002.

**Possible Causes:**

1. System AUTO condition not met.
2. Tank low or high level alarm ON.
3. pH A-B controller (AIT-60C-103) [AIT-60A-104] is in high or low alarm.
4. System AOVs misaligned.
5. Selected pump in alarm or in MANUAL.
6. Utility systems not in OPERATION.

**References:**

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
PH ADJ LAH 60C111
VD135457

DESCRIPTION:  PH ADJUSTMENT TANK LEVEL HI (LAH-60C-111)
   Setpoint:  pH adjustment tank level at 95%
   Alarm Location:  LT-60C-111
   Graphic:  Alarm Summary 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 procedures.

Automatic Actions:
   1. pH Adjustment System will go to SHUTDOWN.

Immediate Actions:
   [1] ON graphic pH, CHECK LIC-60C-111 indicates greater than 95%.
   [2] CONFIRM 60C-026 (verification water inlet) CLOSED.
   [3] LOWER tank level to 50% or less per ETF-60-002.

Possible Causes:
   1. pH adjustment pump A (B) not operating correctly.
   2. Peroxide decomposer modules (PDM) filters are plugged.
   3. Admittance of verification water into system, 60C-026.
   4. Malfunction of level control valve, LCV-60C-111, or transmitter, LT-60C-111.

References:
   Drawings:  None
   Documents:  ETF-60-002, Integrated MTT Operation
PH ADJ LAL 60C111 VD135458

**DESCRIPTION**: PH ADJUSTMENT TANK LEVEL LO (LAH-60C-111)

- **Setpoint**: pH adjustment tank level at 10%
- **Alarm Location**: LT-60C-111
- **Graphic**: Alarm Summary 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 procedures.

**Automatic Actions:**
1. Pump (60C-P-1A) [60C-P-1B] shuts OFF.
2. pH Adjustment System will go to SHUTDOWN.

**Immediate Actions:**

1. [CONFIRM](60C-026) [60C-P-1B] stopped.
2. [ON graphic pH, CHECK](LI-60C-111 tank level is less than 10%.
3. [REVIEW](historian trends).
4. [CONFIRM](the following valves CLOSED:

<table>
<thead>
<tr>
<th>System Drain Valves</th>
<th>PDM Filter Drain Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>60C-003</td>
<td>60D-461</td>
</tr>
<tr>
<td>60C-004</td>
<td>60D-462</td>
</tr>
<tr>
<td>60C-006</td>
<td>60D-463</td>
</tr>
<tr>
<td>60C-010</td>
<td>60D-464</td>
</tr>
<tr>
<td>60C-012</td>
<td></td>
</tr>
</tbody>
</table>

5. [CONFIRM](60C-090, recycle valve, is OPEN.)

(Continued on Next Page)
pH Adjustment System Alarm Response

PH ADJ LAL 60C111 VD135458

DESCRIPTION: PH ADJUSTMENT TANK LEVEL LO (LAH-60C-111)
Setpoint: pH adjustment tank level at 10%
Alarm Location: LT-60C-111
Graphic: Alarm Summary Screen
Indications: N/A

Immediate Actions (Cont.):

[6] IF PDMs are valved in, CONFIRM the following valves CLOSED:

<table>
<thead>
<tr>
<th>PDM System Drain Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>60D-408</td>
</tr>
<tr>
<td>60D-410</td>
</tr>
<tr>
<td>60D-420</td>
</tr>
<tr>
<td>60D-422</td>
</tr>
</tbody>
</table>

[8] ADD verification water per ETF-60-002 to raise water level in tank above 10%.

Possible Causes:
1. Malfunction of pH adjustment tank level control valve, LCV-60C-111, or transmitter, LT-60C-111.
2. Incorrect valve lineup.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-60-006 Initial MTT Lineup in Configuration 1
PH ADJ AAHHX 60C103 OR 60C104

DESCRIPTION: PH ADJUSTMENT SYSTEM PH A HI-HI (AAHHX 60C103), VD135463, OR
PH ADJUSTMENT SYSTEM PH B HI-HI (AAHHX 60C104), VD135471

Setpoint: pH = 6.0 for Configuration 1
Alarm Location: AT-60C-103 or AT60C-104
Graphic: Alarm Summary 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 procedures.

Automatic Actions:
1. pH Adjustment System goes to blinking READY.

Immediate Actions:
[2] CONFIRM Chemical Feed System is operating per ETF-65C-001.
[3] CHECK chemical metering pumps, 65C-P-8/9, and controllers for proper operation.
[4] IF chemical metering pumps 65C-P-8/9 are in MANUAL control, GO TO step [7].
[7] ADJUST pH per ETF-60-002 to values in applicable process memo.
[8] IF pH returns to normal pH band, CONFIRM process is operating normally per ETF-60-002 AND PLACE system in OPERATION.

(Continued on Next Page)
PH ADJ AAHHX 60C103 OR 60C104

DESCRIPTION: PH ADJUSTMENT SYSTEM PH A HI-HI (AAHHX 60C103), VD135463, OR
PH ADJUSTMENT SYSTEM PH B HI-HI (AAHHX 60C104), VD135471

Setpoint: pH = 6.0 for Configuration 1
Alarm Location: AT-60C-103 or AT60C-104
Graphic: Alarm Summary Screen
Indications: N/A

(Continued)

Possible Causes:

1. Controller failure (A-B Controller, AIC60C103-104).
2. Chemical Feed System failure.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation
ETF-65C-001, Chemical Feed System Operation
PH ADJ AAHX 60C103 OR 60C104

DESCRIPTION: PH ADJUSTMENT SYSTEM PH A HI (AAHX 60C103), VD135464, OR
PH ADJUSTMENT SYSTEM PH B HI (AAHX 60C104), VD135472
Setpoint: pH = 5.5 for Configuration 1
Alarm Location: AT-60C-103 or AT60C-104
Graphic: Alarm Summary 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 procedures.

Automatic Actions:
1. If pH Adjustment System is in OPERATION, there are no automatic actions.
2. If pH adjustment is in READY, pH Adjustment System returns to blinking READY.

Immediate Actions:
[2] CONFIRM Chemical Feed System is operating per ETF-65C-001.
[3] CHECK chemical metering pumps, 65C-P-8/9, and controllers for proper operation.
[4] IF chemical metering pumps 65C-P-8/9 are in MANUAL control, GO TO step [7].
[7] ADJUST pH per ETF-60-002 to values in applicable process memo.

(Continued on Next Page)
**PH ADJ AAHX 60C103 OR 60C104**

**DESCRIPTION:**  
PH ADJUSTMENT SYSTEM PH A HI (AAHX 60C103), VD135464, OR  
PH ADJUSTMENT SYSTEM PH B HI (AAHX 60C104), VD135472

**Setpoint:**  
pH = 5.5 for Configuration 1

**Alarm Location:**  
AT-60C-103 or AT60C-104

**Graphic:**  
Alarm Summary Screen

**Indications:**  
N/A

(Continued)

**Possible Causes:**

1. Controller failure (A-B Controller, AIC60C103-104).
2. Process water exhibits momentarily extremely high or low pH, which causes oscillations in the control mechanism.
3. Chemical Feed System failure.

**References:**

- **Drawings:**  
  None

- **Documents:**  
  ETF-60-002, Integrated MTT Operation  
  ETF-65C-001, Chemical Feed System Operation
PH ADJ AALLX 60C103 OR 60C104

DESCRIPTION: PH ADJUSTMENT SYSTEM PH A LO-LO (AALLX 60C103), VD135466, OR
PH ADJUSTMENT SYSTEM PH B LO-LO (AALLX 60C104), VD135474

Setpoint: pH = 3.0 for Configuration 1
Alarm Location: AT-60C-103 or AT60C-104
Graphic: Alarm Summary 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 procedures.

Automatic Actions:
1. pH Adjustment System goes to blinking READY.

Immediate Actions:
[2] CONFIRM Chemical Feed System is operating per ETF-65C-001.
[3] CHECK chemical metering pumps, 65C-P-10, and controllers for proper operation.
[4] IF chemical metering pumps 65C-P-10 are in MANUAL control, GO TO step [7].
[5] IF pH does not return to normal pH band within one hour, ON graphic pH, SELECT
redundant pH control B (A).
[6] IF pH does not return to normal pH band in redundant control within one hour,
INITIATE manual pump control of 65C-P-10.
[7] ADJUST pH per ETF-60-002 to values in applicable process memo.
[8] IF pH returns to within normal pH band, CONFIRM process is operating normally per
ETF-60-002 AND
PLACE system in OPERATION.

(Continued on Next Page)
PH ADJ AALLX 60C103 OR 60C104

**DESCRIPTION:** PH ADJUSTMENT SYSTEM PH A LO-LO (AALLX 60C103), VD135466, OR
PH ADJUSTMENT SYSTEM PH B LO-LO (AALLX 60C104), VD135474

**Setpoint:** pH = 3.0 for Configuration 1

**Alarm Location:** AT-60C-103 or AT60C-104

**Graphic:** Alarm Summary Screen

**Indications:** N/A

(Continued)

**Possible Causes:**

1. Controller failure (A-B Controller, AIC60C103_104).
2. Chemical Feed System failure.
3. Surge tank metering pump failure, 65C-P-10.

**References:**

- **Drawings:** None
- **Documents:** ETF-60-002, Integrated MTT Operation
  ETF-65C-001, Chemical Feed System Operation
PH ADJ AALX 60C103 OR 60C104

DESCRIPTION: PH ADJUSTMENT SYSTEM PH A LO (AALX 60C103), VD135465, OR
PH ADJUSTMENT SYSTEM PH B LO (AALX 60C104), VD135473

Setpoint: pH = 3.5 for Configuration 1
Alarm Location: AT-60C-103 or AT60C-104
Graphic: Alarm Summary 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 procedures.

Automatic Actions:
1. If pH Adjustment System is in OPERATION, no automatic actions.
2. If pH adjustment is in READY, pH Adjustment System returns to blinking READY.

Immediate Actions:
[2] CONFIRM Chemical Feed System is operating per ETF-65C-001.
[3] CHECK chemical metering pumps, 65C-P-10, and controllers for proper operation.
[4] IF chemical metering pumps 65C-P-10 are in MANUAL control, GO TO step [7].
[6] IF pH does not return to normal pH band in redundant control within one hour, INITIATE manual pump control of 65C-P-10.
[7] ADJUST pH per ETF-60-002 to values in applicable process memo.

(Continued on Next Page)
PH ADJ AALX 60C103 OR 60C104

**DESCRIPTION:** PH ADJUSTMENT SYSTEM PH A LO (AALX 60C103), VD135465, OR
PH ADJUSTMENT SYSTEM PH B LO (AALX 60C104), VD135473

- **Setpoint:** pH = 3.5 for Configuration 1
- **Alarm Location:** AT-60C-103 or AT60C-104
- **Graphic:** Alarm Summary Screen
- **Indications:** N/A

(Continued)

**Possible Causes:**

1. Controller failure (A-B Controller, AIC60C103_104).
2. Process water exhibits momentarily extremely high or low pH, which causes oscillations in the control mechanism.
3. Chemical Feed System failure.
4. Surge tank metering pump failure, 65C-P-10.

**References:**

- **Drawings:** None
- **Documents:** ETF-60-002, Integrated MTT Operation
  ETF-65C-001, Chemical Feed System Operation
PH ADJUSTMENT SYSTEM ALARM RESPONSE

PH ADJ 60C P1A A OR P1B A

DESCRIPTION: PH ADJUSTMENT SYSTEM PUMP A FAILURE (60C-P-1A), 60CP1AA
PH ADJUSTMENT SYSTEM PUMP B FAILURE (60C-P-1B), 60CP1BA

Setpoint: Pump not running when required
Alarm Location: Logic generated alarm
Graphic: Alarm Summary 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 procedures.

Automatic Action

1. pH Adjustment System goes to SHUTDOWN.

Immediate Actions:

[1] CONFIRM pH Adjustment System is shut down.
[3] GO TO ETF-60-002 AND
   INITIATE system operation.
[4] CHECK breaker of pump in alarm for trip condition AND
   TROUBLESHOOT per SOM instruction.
   [4.1] IF troubleshooting was performed, RECORD SOM direction in ETF Control Room Logbook.

Possible Causes:

1. Pump failure.
2. Possible breaker tripped.

References:

Drawings: None
Documents: ETF-60-002, Integrated MTT Operation