# Operate AN-241 Annulus Ventilation Systems (VTA)

## Tank Farm Plant Operating Procedure

**USQ # GCX-2**

## Change History (≤ Last 5 Rev-Mods)

<table>
<thead>
<tr>
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<tr>
<td>G-4</td>
<td>02/27/2018</td>
<td>Operations request</td>
<td>Page 27 Data Sheet 2 changed second signature line from “Performed by” to “Review by” Section 5.3 page 10 Added Caution and note regarding butterfly valves being open greater than 1/4 of the way. Page 12 note before 5.3.7.4 changed damper arm pointer position from right to left. Page 13 added valve numbers to Step 5.3.7.10. Added new step 5.3.7.11 &quot;ADJUST AN241-VTA-V-115 and/or AN241-VTA-V-118 UNTIL the DT between AN241-VTA-T1-802 and AN241-VTA-T1-801 (AN241-VTA-T1-702 and AN241-VTA-T1-701) is ≥ 5°F.” Section 5.5 page 17 Added Caution and note regarding butterfly valves being open greater than 1/4 of the way. Step 5.5.2 struck out “Fully” Page 18 added new step 5.5.9 “ADJUST AN241-VTA-V-115 and/or AN241-VTA-V-118 UNTIL the DT between AN241-VTA-T1-802 and AN241-VTA-T1-801 (AN241-VTA-T1-702 and AN241-VTA-T1-701) is ≥ 5°F.” Added Data Sheet 1 to procedure. At the end of sections 5.3, 5.4, 5.5 and 5.8 added Steps “RECORD operating data, for both fans per TF-OR-DR-ANCOMPLETE Data Sheet 1 thirty minutes (30) after start-up AND ENSURE all operating data is within normal range. IMMEDIATELY NOTIFY Shift Manager if any data is not within specified range. (RPP-11413, RPP-16922) CHECK filter access doors and gauge fittings for evidence of leakage. IF unable to stop leaks, NOTIFY Shift Manager.” Updated Records Section.</td>
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<td>G-3</td>
<td>02/12/2018</td>
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<td>01/17/2018</td>
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<td>Page 4: CHANGE - Step 3.1.1 TVIS-AW-001 to TVIS-AN-001 Page 4: CHANGE - Step 3.1.1.1 TVIS-AW-001 to TVIS-AN-001</td>
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<td>G-1</td>
<td>05/01/2017</td>
<td>Change to wording of TFC-PLN-167. Reflect change to equipment status in the field.</td>
<td>Reference to CAM removed from procedure. White Label wording changed to match changes to TFC-PLN-167. Clarified Record Sampler steps and Figure 2.</td>
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<td>G-0</td>
<td>10/06/2016</td>
<td>Periodic review comment resolution</td>
<td>Updated Radcon statement. Added a (First and Last) to name on records. Moved Caution statement to applicable Step.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for startup, operation, and shutdown of the 241-AN ventilation tank annulus (VTA) exhauster system.

1.2 Scope

This procedure applies to 241-AN tank farm annulus exhauster system and associated components.

2.0 INFORMATION

2.1 Terms and Definitions

\[ \text{dP - Term for Differential Pressure. Throughout this procedure dPs are referred to as negative or positive depending upon the label or convention used on gauges or recorder charts.} \]
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Switching or starting fans that have been down for an extended period, may cause condensate to be blown out of the stack. Personnel notifications need to be done to clear the immediate area PRIOR to switching or startup of the system to avoid potential personnel contamination.

**WARNING** - Failure to don proper PPE before operating electrical circuit breakers, disconnects, and/or pilot devices may result in personnel injury.

3.1.1 Operations performed under this procedure are controlled by TVIS-AN-001 and SEG 1 or if performing procedure with no primary ventilation - SEG 4. When primary ventilation is inoperable, respiratory protection in conjunction with IHT monitoring is required.

3.1.1.1 Minimum required respiratory protection and voluntary upgrade is identified in TVIS-AN-001.

3.1.1.2 Monitoring and/or sampling requirements will be specified in the Industrial Hygiene Sample plan (IHSP).

3.1.2 Personnel trained in the operation of breakers and disconnects will wear the following PPE as a minimum:

- Non-melting (untreated natural fiber) long-sleeved shirt
- Safety glasses
- Leather or insulating gloves
- Hearing protection.

3.1.3 Non-electrical worker accessing electrical enclosures must ensure the following:

- The enclosure must have a white label indicating that it has been evaluated.
- The work activity within the enclosure does not involve:
  - Reaching around or moving electrical equipment
  - Contacting electrical connectors/connections
  - By-passing protective shielding/barriers.

3.1.3.1 Stop and notify management if these conditions cannot be met, or if discrepancies exist (e.g. conflicting or missing labels, missing or damaged protective barriers).
3.2 Equipment Safety

**CAUTION** - If all seven annuli are to be ventilated with only one of the annulus exhausters, the inlet butterfly valve of the exhauster to be started should be partially closed to prevent inadvertent motor overcurrent and fan shutdown caused by excessive air flow through the system.

3.3 Radiation and Contamination Control

3.3.1 When this procedure is worked in radiological areas, an approved radiological work permit (RWP) is required. If radiological conditions or work performed falls outside the scope of the RWP, all work activities must be discontinued until a new or revised RWP has been issued in accordance with TFC-ESHQ-RP_RWP-C-03.

3.3.2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radiological area, then an approved work package must be developed which is reviewed by Radiological Control per ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.

3.4 Environmental Compliance

3.4.1 To ensure reporting requirements are met, all planned and unplanned outages of Tank Farm ventilation systems, abatement control equipment, and exhaust monitoring systems, including portable exhausters, must be immediately reported to Environmental per the Environmental On-Call List in accordance with TFC-ESHQ-ENV_FS-C-01. Required abatement equipment for the 241-AN Annulus Ventilation System are HEPA filters, Fan, De-entrainer, and Heater.

3.5 Limits

**OPERATING SPECIFICATION DOCUMENT**

OSD-T-151-00007, Operating Specifications for the Double-Shell Storage Tanks

RPP-11413, Ventilation System In-Service Requirements

RPP-16922, Environment Specification Requirements
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Allen wrench for heater/controller panel
- Waterproof gloves
- Goggles or face shield
- Absorbent rags
- 2-way radio
- Container for seal pot water
- Farm access keys.

4.2 Performance Documents

The following procedures may be needed to perform this procedure:

- TF-OPS-005, DST Daily CAM and Record Sampler Inspections
- TF-OR-DR-AN, AN Daily Rounds

4.3 Field Preparation

NOTE - Steps in this section may be performed in any order or concurrently.

4.3.1 CHECK Shift Manager has verified all maintenance work is complete before attempting start-up.

4.3.2 REQUEST Shift Manager authorize startup or shutdown of 241-AN annulus ventilation system.

4.3.3 REVIEW TMACS Exhauster Log AND

CONFIRM annulus exhaust system has not been off-line (out of service) for more than 30 days. (OSD-T-151-00007)

Date last operated: ____________________________
Operate AN-241 Annulus Ventilation Systems (VTA)

4.3 Field Preparation (Cont.)

4.3.4 **IF** annulus exhaust system has been off-line (out-of-service) for more than 30 days **NOTIFY** Shift Manager/OE of loss of OSD T 151 00007 controls. (OSD-T-151-00007)

**NOTE** - With the exception of aerosol testing of filters (using a work package), all required Calibrations/Tests must be current to start an exhauster.

- If aerosol testing of the filters is not current, then it shall be performed upon restart of the exhauster, except for restart to perform maintenance retest activities.

4.3.5 **IF** performing an exhauster start-up after a greater than 30 day shutdown, **CONFIRM** the following calibrations/tests are current: (RPP-16922, RPP-11413)

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<th>Sub-System Equipment Id. Number (EIN)</th>
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<th>(√ or OS) If Calibrations/Tests are current or Out of Service/Specifications (N/A) If Not Applicable</th>
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_________________________ / __________________________ / __________________________
Signature Print (First and Last) Date
Shift Manager /OE

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5.0 PROCEDURE

NOTE - Subsections within Section 5.0 of this procedure may be accomplished in any logical order at the direction and authorization of the Shift Manager/OE after verification of applicable prerequisites. Sub-steps within each section shall be accomplished in sequential order unless otherwise specified or directed.

- If this procedure is to be used for activities (i.e. maintenance) resulting in short term shutdown and startup, only sections 5.7 and 5.8 need to be performed.

5.1 Collect Operating Data

NOTE - Steps within Section 5.1 of this procedure may be accomplished in any order at the direction and authorization of the Shift Manager after verification of applicable prerequisites. Sub-steps shall be accomplished in sequential order unless otherwise specified or directed.

5.1.1 RECORD data as required by TF-OR-DR-AN AND CIRCLE readings on operating systems that are out-of-specified limits.

5.1.2 CHECK Round Action Tracking List (RATL) for red circled readings AND RECORD on data sheet.

5.1.3 IF directed by Shift Manager/OE, ADD 1-2 gallons of water to seal pot AN241-VTA-SP-102 (under annulus B-Train inlet plenum).
### 5.2 Perform Pre-Start Check of Annulus Systems For Startup

**NOTE** - Steps within Section 5.2 of this procedure may be accomplished in any logical order at the direction and authorization of Shift Manager/OE after verification of applicable prerequisites. Sub-steps shall be accomplished in sequential order unless otherwise specified or directed.

- The annulus A-Train and B-Train systems are essentially identical. Both fans are intended to be operated at all times.

5.2.1 **IF** both AN241-VTA-EF-003 (A-Train) and AN241-VTA-EF-004 (B-Train) fans are off, and Record Sampler system was de-energized **PERFORM** the following to place back in service:

5.2.1.1 **ENSURE** filter paper is loaded in record sampler.

5.2.2 **CHECK** the following openings are secured:
- All filter access doors are shut
- Bellows connections between fans and the last HEPA compartment and between fan and the annulus stack are undamaged
- De-Entrainers access doors are shut
- De-Entrainers flushing gate valves AN241-VTA-V-701 for 241-AN A-Train De-entrainer and AN241-VTA-V-801 for 241-AN B-Train De-entrainer are CLOSED.

**NOTE** - Dampers AN101-VTA-V-201 through AN103-VTA-V-203 need to be in the same position (i.e., all three approximately \( \frac{1}{4} \) open) to ensure equal flows through tank 101-AN, 102-AN, and 103-AN annuli.

- Dampers AN104-VTA-V-204 through AN107-VTA-V-207 need to be in the same position (i.e., all four approximately \( \frac{1}{4} \) open) to ensure equal flow through tank 104-AN, 105-AN, 106-AN and 107-AN annuli).
- Once positioned, these valves should only be adjusted during two-fan operation (both AN241-VTA-EF-003 (A-Train) and AN241-VTA-EF-004 (B-Train) operating).

5.2.3 **ENSURE** annulus intake butterfly valves AN101-VTA-V-201 through AN107-VTA-V-207 are all at least partially open. **(OSD-T-151-00007)**

5.2.4 **IF** both fans are OFF, and both fans are to be started, **GO TO** Section 5.3.

5.2.5 **IF** both fans are OFF, and only one fan will be started, **GO TO** Section 5.4.
5.3 Startup Both Annulus Ventilation Fans

5.3.1 IF ventilation has been down for 30 days or more, CONFIRM Step 4.3.5 has been performed prior to proceeding with this section. (RPP-16922, RPP-11413)

5.3.2 ENSURE crossover valve AN241-VTA-V-120 is CLOSED.

CAUTION

Inlet butterfly valves should be partially closed to prevent inadvertent motor current and fan shutdown caused by excessive air flow through the system.

NOTE - Valves should not be greater than ¼ open at start-up to prevent fan motor over current and fan shutdown from excessive airflow.

5.3.3 OPEN the following inlet butterfly valves
- AN241-VTA-V-115
- AN241-VTA-V-118.

5.3.4 PRIOR to switching or starting fans, CLEAR all non-essential personnel from immediate area.

5.3.5 START A-Train exhaust fan AN241-VTA-EF-003 as follows:

5.3.5.1 IF circuit breaker AN241-EDS-BKR-118 is not in the ON position AND

IF directed by Shift Manager, PERFORM the following:

WARNING

Failure to don proper PPE before operating electrical circuit breakers, disconnects, and/or pilot devices may result in personnel injury.

a. ENSURE personnel trained in the operation of breakers and disconnects dons PPE (See Section 3.1).

b. POSITION breaker AN241-EDS-BKR-118 to “ON”.
5.3 Startup Both Annulus Ventilation Fans (Cont.)

5.3.5.2 NOTIFY Shift Manager and TMACS operator A-Train exhaust fan (AN241-VTA-EF-003) will be started.

5.3.5.3 PRESS A-Train exhaust fan start button until red “motor run” lamp illuminates.

NOTE - Damper arm pointing up indicates damper is open. Damper arm pointing to right indicates damper is closed.

5.3.5.4 CHECK fan outlet damper has fully OPENED.

5.3.5.5 CHECK fan is running without vibration or excessive noise.

5.3.5.6 WAIT approximately 5 minutes, to ensure there are no alarms AND

INFORM Shift Manager of present alarm status.

5.3.5.7 CONFIRM record sampler vacuum pump is operating.

5.3.5.8 PERFORM inspection of record sampler per TF-OPS-005 AND

IF record sampler fails inspection, NOTIFY Shift Manager.

5.3.5.9 NOTIFY Shift Manager and TMACS operator A-Train exhaust fan (AN241-VTA-EF-003) has been started.

5.3.6 PRIOR to switching or starting fans, CLEAR all non-essential personnel from immediate area.
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5.3 Startup Both Annulus Ventilation Fans (Cont.)

5.3.7 START B-Train exhaust fan AN241-VTA-EF-004 as follows:

5.3.7.1 IF circuit breaker AN241-EDS-BKR-119 is not in the ON position AND

IF directed by Shift Manager, PERFORM the following:

WARNING
Failure to don proper PPE before operating electrical circuit breakers, disconnects, and/or pilot devices may result in personnel injury.

a. ENSURE personnel trained in the operation of breakers and disconnects dons PPE (See Section 3.1).

b. POSITION Breaker AN241-EDS-BKR-119 to “ON”.

5.3.7.2 NOTIFY Shift Manager and TMACS operator B-Train exhaust fan (AN241-VTA-EF-004) will be started.

5.3.7.3 PRESS B-Train Exhaust Fan start button until red Motor Run lamp illuminates.

NOTE - Damper arm pointing up indicates the damper is open. Damper arm pointing to the left indicates the damper is closed.

5.3.7.4 CHECK fan outlet damper has opened fully.

5.3.7.5 CHECK fan is running without vibration or excessive noise.

5.3.7.6 WAIT approximately 5 minutes, to ensure there are no alarms AND

INFORM Shift Manager of present alarm status.

5.3.7.7 CONFIRM record sampler vacuum pump is operating.

5.3.7.8 PERFORM inspection of record sampler per TF-OPS-005 AND

IF record sampler fails inspection, NOTIFY Shift Manager.
5.3 Startup Both Annulus Ventilation Fans (Cont.)

5.3.7.9 **NOTIFY** TMACS operator and Shift Manager B-Train exhaust fan (AN241-VTA-EF-004) has been started.

5.3.7.10 **WHEN** dP’s stabilize, **GRADUALLY OPEN** inlet butterfly valves (AN101-VTA-V-201 through AN107-VTA-V-207) until annulus stack volume gauge AN296-VTA-PDI-901 dP reading stabilizes between 0.2 and 0.4 in. WG.

5.3.7.11 **ADJUST** AN241-VTA-V-115 and/or AN241-VTA-V-118 **UNTIL** the ΔT between AN241-VTA-T1-802 and AN241-VTA-T1-801 (AN241-VTA-T1-702 and AN241-VTA-T1-701) is ≥ 5°F.

5.3.8 **COMPLETE** Data Sheet 1 thirty minutes (30) after start-up **AND** **ENSURE** all operating data is within normal range.

5.3.8.1 **IMMEDIATELY NOTIFY** Shift Manager if any data is not within specified range. *(RPP-11413, RPP-16922)*

5.3.8.2 **CHECK** filter access doors and gauge fittings for evidence of leakage.

a. **IF** unable to stop leaks, **NOTIFY** Shift Manager.
Operate AN-241 Annulus Ventilation Systems (VTA)

5.3 Startup Both Annulus Ventilation Fans (Cont.)

NOTE - The following step is only required to trim the annulus flows allowing correct operation of the Annulus fan radial inlet dampers. This step shall only be performed with concurrence of the engineer.

- Annulus inlet dampers (AN101-VTA-V-201 through AN107-VTA-V-207) should never be positioned greater than $\frac{1}{2}$ open unless balancing of air flows between the tank annuli is required.

- Operation of the annulus fan inlet damper is very slow. Once adjustments are made, allow 2-3 minutes before checking the inlet damper position.

5.3.9 If it is required to trim the annulus flows to allow correct operation of the Annulus fan radial inlet dampers, OBTAIN Engineering concurrence to perform the following.

5.3.9.1 DO NOT POSITION annulus inlet dampers (AN101-VTA-V-201 through AN107-VTA-V-207) to greater than $\frac{1}{2}$ open unless balancing of air flows between the tank annuli is required.

5.3.9.2 EQUALLY ADJUST dampers: (OSD-T-151-00007)

- AN101-VTA-V-201 through AN102-VTA-V-203,

OR

- AN104-VTA-V-204 through AN105-VTA-V-207,

UNTIL associated annulus fan radial inlet damper is approximately 50% open.
5.4 Start One Annulus Fan to Ventilate all Seven AN Annuli if Both Annulus Fans Off

5.4.1 IF ventilation has been down for 30 days or more, ENSURE Step 4.3.5 has been performed prior to proceeding with this section. (RPP-16922, RPP-11413)

5.4.2 IF all the following are true:
- AN241-VTA-EF-003 (A-Train) and AN241-VTA-EF-004 (B-Train) exhaust fans are OFF,
- Only one of these systems will be started to ventilate all seven annuli,

PERFORM the following:

5.4.2.1 OPEN crossover valve AN241-VTA-V-120.

5.4.2.2 CLOSE appropriate inlet butterfly valve identified below for system that will be off.
- AN241-VTA-V-115 for AN241-VTA-EF-003 (A-Train)
- AN241-VTA-V-118 for AN241-VTA-EF-004 (B-Train)

CAUTION
If all seven annuli are to be ventilated with only one of the annulus exhausters, the inlet butterfly valve of the exhauster to be started should be partially closed to prevent inadvertent motor overcurrent and fan shutdown caused by excessive air flow through the system.

5.4.2.3 OPEN appropriate inlet butterfly valve identified below no more than \( \frac{1}{4} \) open for system to be started.
- AN241-VTA-V-115 for AN241-VTA-EF-003 (A-Train)
- AN241-VTA-V-118 for AN241-VTA-EF-004 (B-Train)
5.4 **Start One Annulus Fan to Ventilate all Seven AN Annuli if Both Annulus Fans Off (Cont.)**

5.4.2.4 **IF** breaker listed in Step 5.4.2.4.b for fan to be placed in service is not in the ON position **AND**

**IF** directed by Shift Manager, **PERFORM** the following:

---

**WARNING**

Failure to don proper PPE before operating electrical circuit breakers, disconnects, and/or pilot devices may result in personnel injury.

---

a. **ENSURE** personnel trained in the operation of breakers and disconnects dons PPE (See Section 3.1).

b. **POSITION** breaker for fan to be placed in service to “ON”.

<table>
<thead>
<tr>
<th>AN241-EDS-MCC-002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FAN</strong></td>
</tr>
<tr>
<td>AN241-VTA-EF-003 (A-Train)</td>
</tr>
<tr>
<td>AN241-VTA-EF-004 (B-Train)</td>
</tr>
</tbody>
</table>

5.4.3 **NOTIFY** Shift Manager and TMACS operator of pending exhauster startup.

5.4.4 **PRIOR** to switching or starting fans, **CLEAR** all non-essential personnel from immediate area.
5.4 Start One Annulus Fan to Ventilate all Seven AN Annuli if Both Annulus Fans Off (Cont.)

5.4.5 PRESS START button of fan to be started until red lamp is illuminated.

NOTE - Damper arm pointing up indicates damper is open. Damper arm pointing to right indicates damper is closed.

5.4.6 CHECK fan outlet dampers have fully OPENED.

5.4.7 WAIT approximately 5 minutes, to ensure there are no alarms AND INFORM Shift Manager of present alarm status.

5.4.8 CONFIRM record sampler vacuum pump is operating.

5.4.9 PERFORM inspection of record sampler per TF-OPS-005 AND IF record sampler fails inspection, NOTIFY Shift Manager.

5.4.10 NOTIFY Shift Manager and TMACS operator exhaustor has been started AND SPECIFY AN241-VTA-EF-003 (A-Train) fan or AN241-VTA-EF-004 (B-Train) fan.

5.4.11 WHEN dP’s stabilize, GRADUALLY OPEN inlet butterfly valve until annulus stack volume gauge AN296-VTA-PDI-901 dP reading stabilizes between 0.2 and 0.4 in. WG.

5.4.12 COMPLETE Data Sheet 1 thirty minutes (30) after start-up AND ENSURE all operating data is within normal range.

5.4.12.1 IMMEDIATELY NOTIFY Shift Manager if any data is not within specified range. (RPP-11413, RPP-16922)

5.4.12.2 CHECK filter access doors and gauge fittings for evidence of leakage.

a. IF unable to stop leaks, NOTIFY Shift Manager.
5.5 With One Annulus Fan Running, Start Additional Annulus Fan

5.5.1 CLOSE crossover valve AN241-VTA-V-120.

**CAUTION**

Inlet butterfly valves should be partially closed to prevent inadvertent motor current and fan shutdown caused by excessive air flow through the system.

NOTE - Valves should not be greater than $\frac{1}{4}$ open at start-up to prevent fan motor over current and fan shutdown from excessive airflow.

5.5.2 OPEN the following inlet butterfly valves:
- AN241-VTA-115
- AN241-VTA-118.

5.5.3 IF breaker listed in Step 5.5.3.2 for fan to be placed in service is not in the ON position AND IF directed by Shift Manager, PERFORM the following:

**WARNING**

Failure to don proper PPE before operating electrical circuit breakers, disconnects, and/or pilot devices may result in personnel injury.

5.5.3.1 ENSURE personnel trained in the operation of breakers and disconnects dons PPE (See Section 3.1).

5.5.3.2 POSITION breaker for fan to be placed in service to ON.

<table>
<thead>
<tr>
<th>AN241-EDS-MCC-002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FAN</strong></td>
</tr>
<tr>
<td>AN241-VTA-EF-003 (A-Train)</td>
</tr>
<tr>
<td>AN241-VTA-EF-004 (B-Train)</td>
</tr>
</tbody>
</table>
5.5 With One Annulus Fan Running, Start Additional Annulus Fan (Cont.)

5.5.4 NOTIFY Shift Manager and TMACS operator of pending exhauster startup.

5.5.5 PRIOR to switching or starting fans, CLEAR all non-essential personnel from immediate area.

5.5.6 PRESS START button of fan to be started until red lamp is illuminated.

NOTE - Damper arm pointing up indicates the damper is open. Damper arm pointing to the right indicates the damper is closed.

5.5.7 CHECK fan outlet damper has fully OPENED.

5.5.8 NOTIFY Shift Manager and TMACS operator exhauster has been started up AND

SPECIFY AN241-VTA-EF-003 (A-Train) fan OR AN241-VTA-EF-004 (B-Train) fan.

5.5.9 ADJUST AN241-VTA-V-115 and/or AN241-VTA-V-118 UNTIL the ΔT between AN241-VTA-T1-802 and AN241-VTA-T1-801 (AN241-VTA-T1-702 and AN241-VTA-T1-701) is ≥ 5°F.

5.5.10 COMPLETE Data Sheet 1 thirty minutes (30) after start-up AND ENSURE all operating data is within normal range.

5.5.10.1 IMMEDIATELY NOTIFY Shift Manager if any data is not within specified range. (RPP-11413, RPP-16922)

5.5.10.2 CHECK filter access doors and gauge fittings for evidence of leakage.

a. IF unable to stop leaks, NOTIFY Shift Manager.
5.5 With One Annulus Fan Running, Start Additional Annulus Fan (Cont.)

NOTE - The following step is only required to trim annulus flows allowing correct operation of Annulus fan radial inlet dampers. This step shall only be performed with concurrence of the engineer.

- Annulus inlet dampers (AN101-VTA-V-201 through AN107-VTA-V-207) should never be positioned greater than $\frac{1}{2}$ open unless balancing of air flows between tank annuli is required.

- Operation of annulus fan inlet damper is very slow. Once adjustments are made, allow 2-3 minutes before checking inlet damper position.

5.5.11 IF it is required to trim the annulus flows to allow correct operation of the Annulus fan radial inlet dampers, OBTAIN Engineering concurrence to perform the following.

5.5.11.1 DO NOT position annulus inlet dampers (AN101-VTA-V-201 through AN107-VTA-V-207) to greater than $\frac{1}{2}$ open unless balancing of air flows between the tank annuli is required.

5.5.11.2 EQUALLY ADJUST dampers: (OSD-T-151-00007)

- AN101-VTA-V-201 through AN102-VTA-V-203,
  
  OR

- AN104-VTA-V-204 through AN105-VTA-V-207,

UNTIL associated annulus fan radial inlet damper is approximately 50% open.
5.6  Shut Down Annulus Systems

5.6.1  NOTIFY Shift Manager and TMACS operator the annulus exhauster systems will be shut down. (OSD-T-151-00007)

5.6.2  PRESS STOP button of system(s) to be shut down.

5.6.3  REQUEST Shift Manager NOTIFY Environmental On-Call 241-AN annulus ventilation systems has been shut down.

NOTE - Damper arm pointing up indicates the damper is open. Damper arm pointing to the right indicates the damper is closed.

5.6.4  ENSURE outlet damper of each shutdown annulus fan, AN241-VTA-EF-003 (A-Train) and/or AN241-VTA-EF-004 (B-Train), have FULLY CLOSED.

CAUTION

If all seven annulus systems are to be ventilated with only one of the annulus exhausters, the inlet butterfly valve of the exhauster to be started should be partially closed to prevent inadvertent motor over current and fan shutdown caused by excessive air flow through the system.

NOTE - If only one of the annulus exhaust fans is running, that system will be used for ventilating all seven annulus systems.

5.6.5  IF only one annulus exhaust fan is running, CLOSE inlet butterfly valve of shutdown system:

- AN241-VTA-V-115 for annulus A Train
- AN241-VTA-V-118 for annulus B Train

AND

CLOSE DOWN inlet butterfly valve of running exhauster until it is approximately ¼ open.
5.6 Shut Down Annulus Systems (Cont.)

5.6.6 IF one annulus fan is to remain operating, **PERFORM** the following:

5.6.6.1 **OPEN** crossover valve AN241-VTA-V-120.

5.6.6.2 **ADJUST** inlet butterfly valve of running exhauster gradually until annulus stack volume gauge AN296-VTA-PDI-901 stabilizes between 0.02 and 0.05 in. WG.

5.6.7 **NOTIFY** Shift Manager and TMACS operator AN241-VTA-EF-003 (A-Train) and/or AN241-VTA-EF-004 (B-Train) has been shut down.

5.6.8 IF both A and B annulus fans are shutdown, **CONTACT** HPT to shutdown effluent record sampler.
5.7 **Short Term Shutdown of Annulus Fan(s)**

5.7.1 **NOTIFY** Shift Manager and TMACS Operator, annulus fan(s) will be shut down. (OSD-T-151-00007)

5.7.2 **PRESS** STOP button of fan(s) being shut down.

5.7.3 **REQUEST** Shift Manager **NOTIFY** Environmental On-Call of 241-AN fan(s) have been shut down.

**NOTE** - Damper arm pointing up indicates the damper is open. Damper arm pointing to the right/left indicates the damper is closed.

5.7.4 **ENSURE** outlet damper of each shutdown annulus fan, AN241-VTA-EF-003 (A-Train) and/or AN241-VTA-EF-004 (B-Train), have FULLY CLOSED.
5.8 Re-Start after Short Term Shutdown of Annulus Fan(s)

NOTE - This section is intended for re-start after maintenance or other short term activities, and will be used in conjunction with section 5.7.

5.8.1 IF ventilation has been down for 30 days or more, ENSURE Step 4.3.5 has been performed prior to proceeding with this section. (RPP-16922, RPP-11413)

5.8.2 NOTIFY Shift Manager and TMACS annulus fan(s) will be started.

5.8.3 PRIOR to switching or starting fans, CLEAR all non-essential personnel from immediate area.

5.8.4 PRESS START button of fan(s) to be started until red “motor run” lamp illuminates.

NOTE - Damper arm pointing up indicates damper is open. Damper arm pointing to right/left indicates damper is closed.

5.8.5 CHECK fan(s) outlet damper(s) have fully OPENED.

5.8.6 CHECK that fan(s) are running without vibration or excessive noise.

5.8.7 WAIT approximately 5 minutes, to ENSURE there are no alarms AND INFORM Shift Manager of present alarm status.

5.8.8 NOTIFY Shift Manager and TMACS operator annulus fan(s) are running

5.8.9 COMPLETE Data Sheet 1 thirty minutes (30) after start-up AND ENSURE all operating data is within normal range.

5.8.9.1 IMMEDIATELY NOTIFY Shift Manager if any data is not within specified range. (RPP-11413, RPP-16922)

5.8.9.2 CHECK filter access doors and gauge fittings for evidence of leakage.

a. IF unable to stop leaks, NOTIFY Shift Manager.
5.9 Records

5.9.1 **PERFORM** the following for records identified within this procedure.

5.9.1.1 **RECORD** the number of times the record was generated in applicable column

**OR**

**PLACE** a check mark (✓) in the N/A column.

5.9.1.2 **SUBMIT** the package to the central shift office.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.3 Field Preparation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 4.3.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 4.3.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data Sheet</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sheet 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FWS/OE/Shift Manager **SEND** the completed records to the Central Shift Office for records retention.

_________________________ / _______________________ / __________________
Signature Print (First and Last) Date

FWS/OE/Shift Manager

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
### Operate AN-241 Annulus Ventilation Systems (VTA)

#### Data Sheet 1

<table>
<thead>
<tr>
<th>Component Number/Description/Instruction (PMID)</th>
<th>Normal Range</th>
<th>Limit (Basis)</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN241-VTA-EF-003, (K2-5-1) * A Train Fan Running (ET-005488)</td>
<td>ON / OFF</td>
<td>(OSD-7)</td>
<td></td>
</tr>
<tr>
<td>AN241-VTA-EF-004, (K2-5-2) * B Train Fan Running (ET-005488)</td>
<td>ON / OFF</td>
<td>(OSD-7)</td>
<td></td>
</tr>
<tr>
<td><strong>241-AN A Train Filter Bank (EF-003 Fan)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AN241-VTA-PDI-701, (DPI-20) * K2-1 System Moisture Separator Pressure Drop (ET-001212)</td>
<td>0.0” to 1.0” WG</td>
<td>(RPP-16922, Sec. 2)</td>
<td></td>
</tr>
<tr>
<td>AN241-VTA-TI-701, (TI-3) Blast Heater K2-2-1 IN TEMP (ET-001211)</td>
<td>35 °F to 120 °F</td>
<td>(RPP-16922, Sec. 2)</td>
<td></td>
</tr>
<tr>
<td>AN241-VTA-TI-702, (TI-4) Blast Heater K2-2-1 OUT TEMP (ET-002439)</td>
<td>45 °F to 120 °F</td>
<td>≤ 200 °F (RPP-16922, Sec. 2) (RPP-11413)</td>
<td></td>
</tr>
<tr>
<td>(AN241-VTA-TI-702) - (AN241-VTA-TI-701) (TI-4) - (TI-3) Blast Heater delta T</td>
<td>≥ 5 °F</td>
<td>(RPP-16922, Sec. 2)</td>
<td></td>
</tr>
<tr>
<td>AN241-VTA-PDI-703, (DPI-23) 2nd HEPA Filter K2-4-9 DP (ET-001604)</td>
<td>0.2” to 2.0” WG</td>
<td>4.0” WG (RPP-16922, Sec. 2) (RPP-11413)</td>
<td></td>
</tr>
<tr>
<td>AN241-VTA-PDI-702, (DPI-17) 1st HEPA Filter K2-4-8 DP (ET-002342)</td>
<td>0.2” to 4.0” WG</td>
<td>5.9” WG (RPP-16922, Sec. 2) (RPP-11413)</td>
<td></td>
</tr>
<tr>
<td>(AN241-VTA-PDI-702) + (AN241-VTA-PDI-703) (DPI-17) + (DPI-23)</td>
<td>0.2” to 4.0” WG</td>
<td>5.9” WG (RPP-16922, Sec. 2) (RPP-11413)</td>
<td></td>
</tr>
</tbody>
</table>
## Operate AN-241 Annulus Ventilation Systems (VTA)

### Data Sheet 1 (Cont.)

#### 241-AN B Train Filter Bank (EF-004 Fan)

<table>
<thead>
<tr>
<th>Description</th>
<th>Pressure Range</th>
<th>Temperature Range</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN241-VTA-PDI-803, (DPI-24) 2nd HEPA Filter K2-4-10 DP (ET-001605)</td>
<td>0.2” to 2.0” WG</td>
<td>4.0” WG</td>
<td>(RPP-16922, Sec. 2) (RPP-11413)</td>
</tr>
<tr>
<td>AN241-VTA-PDI-802, (DPI-18) 1st HEPA Filter K2-4-11 DP (ET-002343)</td>
<td>0.2” to 4.0” WG</td>
<td>5.9” WG</td>
<td>(RPP-16922, Sec. 2) (RPP-11413)</td>
</tr>
<tr>
<td>(AN241-VTA-PDI-802) + (AN241-VTA-PDI-803) (DPI-18) + (DPI-24)</td>
<td>0.2” to 4.0” WG</td>
<td>5.9” WG</td>
<td>(RPP-16922, Sec. 2) (RPP-11413)</td>
</tr>
<tr>
<td>AN241-VTA-TI-802, (TI-6) Blast Heater OUT TEMP (ET-002436)</td>
<td>45 °F to 120 °F</td>
<td>≤ 200 °F</td>
<td>(RPP-16922, Sec. 2)</td>
</tr>
<tr>
<td>AN241-VTA-TI-801, (TI-5) Blast Heater IN TEMP (ET-001213)</td>
<td>35 °F to 120 °F</td>
<td></td>
<td>(RPP-16922, Sec. 2)</td>
</tr>
<tr>
<td>(AN241-VTA-TI-802) - (AN241-VTA-TI-801) (TI-6) - (TI-5) Blast Heater delta T</td>
<td>≥ 5 °F</td>
<td></td>
<td>(RPP-16922, Sec. 2)</td>
</tr>
<tr>
<td>AN241-VTA-PDI-801, (DPI-21) System Moisture Separator Pressure Drop (ET-002363)</td>
<td>0.0” to 1.0” WG</td>
<td></td>
<td>(RPP-16922, Sec. 2)</td>
</tr>
</tbody>
</table>

**Date** **Time**

**Performed by:**

Signature __________________________ / __________________________ Print (First & Last)

**Reviewed by:**

Signature __________________________ / __________________________ Print (First & Last)
Figure 1 - 241-AN Tank Farm Annulus Ventilation System
Operate AN-241 Annulus Ventilation Systems (VTA)

Figure 2 - 241-AN Tank Farm HVAC Equipment Pad, Annulus