



PSB Natural Gas Dryer Regeneration Energy Control Procedure (ECP)

General Information			
Location			
Manufacturer or Equipment Name	PSB Natural Gas Dryer	Applicable for the following Asset Model Numbers	NG-SR-15-3-635-DDP NG-SR-15-3-875-DDP NG-SR-21-3-300 NG-SR-21-3-DDP NG-SR-21-3-DDP-SP NG-SRD-21-3-DDP NG-SR-21-4-DDP NG-SR-21-6-DDP NG-SR-21-6-DDP-CW NG-SR-21-DDP-SP NG-SR-30-4-300-DDP NG-SR-30-4-500-DDP NG-SR-30-4-635-DDP NG-SR-30-4-DDP NG-SR-30-6-DDP NG-SRD-38-4-850-DDP
Hazardous Energy Identification			
<input checked="" type="checkbox"/> Chemical	<input checked="" type="checkbox"/> Electrical	<input type="checkbox"/> Gravitational potential	<input type="checkbox"/> Hydraulic potential <input type="checkbox"/> Kinetic
<input checked="" type="checkbox"/> Mechanical	<input checked="" type="checkbox"/> Pneumatic potential	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Thermal
Personal Protective Equipment Required (Beyond Basic PPE)			
Hard Hat, Gloves, Eye Protection, Hearing Protection, Safety Toe Boots, and High Vis Vest.			
ONLY TRAINED AND AUTHORIZED PERSONNEL SHALL CONDUCT LOCKOUT/TAGOUT.			
Shutdown Overview (Isolation Overview)			
<p>The Energy Control Procedure (ECP) for NGV Fuel Gas Dryer Regeneration outlines a systematic method to safely isolate, control, and verify hazardous energy sources—including electrical, pneumatic, mechanical, and thermal—throughout the regeneration process used to remove moisture from the dryer desiccant. Always wear appropriate PPE and follow each shutdown and isolation step. Use correct verification techniques and adhere to startup instructions, all of which are designed to prevent accidental energy release, maintain compliance with safety standards, and support proper waste management.</p>			

1. Preparation & Notification

- Always Contact Chevron Call Center (**877-872-3966**) before starting work and when finishing work.
- Notify all affected personnel of the intended work and energy isolation.
- Review the system's operating status and ensure all maintenance is scheduled during safe conditions.
- Inspect dryer for any damage before starting work.
- Wear protective clothing when working in and around unit due to burn hazard.
- Never open high voltage panel if natural gas is detectable in the atmosphere.
- Gather required PPE and verify all tools and LOTO devices are available.
- Complete Chevron Start Work Check.
- Loosen heater support bolts before regeneration to prevent thermal stress.
- Always refer to Manufacturers Manual or call PSB at (**814**)-**453-3651** for assistance with troubleshooting.

CAUTION: when draining the blower motor and sump, as they may contain condensate fluid resulting from the regeneration process. This waste material poses risks to the eyes and skin and emits a notably strong odor.

2. De-energizing

Electrical Isolation

- 2.1 Turn Dryer Power Switch to **OFF**.
- 2.2 Disconnect power at main breaker; apply **LOTO**.
- 2.3 **Verify zero voltage on the gas dryer.**
- 2.4 Lock/tag MCC/control panel doors.

3. Depressurizing

Close Process Valves – refer to Fig 1 diagram

- 3.1 **Close** V1 (Inlet Isolation Valve).
- 3.2 **Close** V6 (Outlet Isolation Valve).
- 3.3 **Open** V7 (Bypass Valve).
 - Bypass the dryer if process flow is required during maintenance (note: moisture will not be removed while bypass is open).
- 3.4 **Close** V2 (Pre-filter Isolation Valve).
- 3.5 **Close** V5 (After-filter Isolation Valve).
- 3.6 **Slowly Open** V3 (Regeneration Loop Isolation Valve).
- 3.7 **Slowly Open** V4 (Regeneration Loop Isolation Valve).
- 3.8 **Open** V11 (Sump Tank Valve)

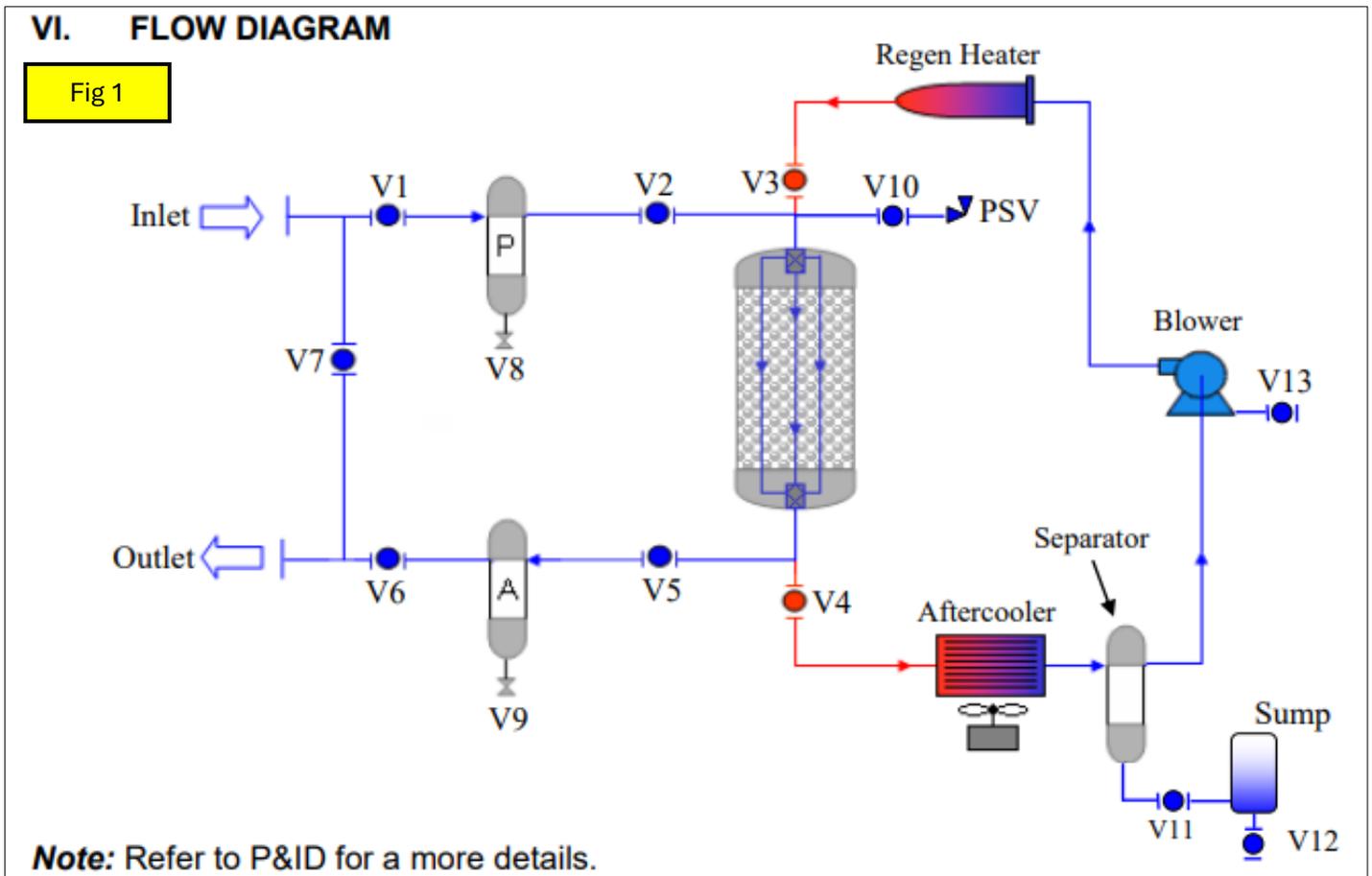
- 3.9 **Close** any instrument valves open to atmosphere.
- 3.10 Ensure block valve at inlet of PRV (V10) is locked open.

Drain and Vent to (10 PSIG)

NOTE: Slowly Drain Pressure. Do Not Exceed 30 PSIG per minute. Draining gas too quickly could result in equipment damage.

CAUTION: Residual condensate may remain from prior regeneration. Connect a chemical grade drain hose to V12 and V13 and use an approved container to drain the blower motor and sump vessel.

- 3.11 **Slowly open** V12 (Separator Sump Drain Valve) to drain pressure to **10 PSIG**. Do Not Exceed 30 PSIG per minute.
- 3.12 Ensure dryer pressure is reduced to **10 PSIG** using valve V12 (Separator Sump Drain Valve).
- 3.13 Slowly open V13 to drain any residual condensate from the previous regeneration.
- 3.14 **Close** V13 when all residual dryer condensate has been drained.



4. Lockout/Tagout (LOTO)

- 4.1 Apply **LOTO** devices to all energy isolation points (electrical disconnect, all closed valves).

4.2 Attach warning tags indicating maintenance is in progress.

Valves Position LOTO List

4.3 **Close V1:** Process Inlet Isolation Valve.

4.4 **Close V2:** Pre-filter Isolation Valve.

4.5 **Open V3:** Regeneration Loop Isolation Valve.

4.6 **Open V4:** Regeneration Loop Isolation Valve.

4.7 **Close V5:** After-filter Isolation Valve.

4.8 **Close V6:** Process Outlet Isolation Valve.

4.9 **Open V7:** Bypass Valve (if used for flow diversion during isolation).

4.10 **Open V11:** Sump Tank Valve.

4.11 **Close V12:** Separator Sump Drain Valve

4.12 **Close V13:** Blower Housing Drain Valve.

4.13 **Open Block Valve** at Pressure Relief Valve (PRV) Inlet - Must be locked open at all times for safety.

5. Verification

5.1 Confirm all pressure gauges **zero** PSIG outside of the regeneration loop.

5.2 Confirm the regeneration loop pressure is set at **10 PSIG** and holding constant.

5.3 Contact Supervisor or Chevron Reliability Engineer to video verify that lockout tag out procedure has properly been applied, and safe work practices are being performed. Once verification has been approved, work can start.

NOTE: If gas pressure rises in the regeneration loop after being drained to 10 PSIG, stop regeneration process and contact your Chevron Reliability Engineer for guidance.

6. Initiate Regeneration

6.1 Remove LOTO from main breaker and turn the dryer breaker **ON**.

6.2 Turn the main breaker **ON**.

6.3 Turn Dryer Power switch **ON**.

6.4 Clear any active alarms using the F3 key on the operator display.

6.5 Enter the 4-digit regeneration code and press/hold F1 key to start the cycle.

6.6 Verify blower, cooler fan, and regeneration heater are operating (monitor temperature rise).

Heating Cycle

6.7 Maintain regeneration inlet temperature between 375°F and 425°F.

6.8 Target outlet temperature of 200°F to 300°F.

6.9 Heating time is typically 6 hours; adjust based on water load and ambient conditions.

ATTENTION: Never leave the dryer unattended during the regeneration cycle.

6.10 Monitor thermocouple readings and alarms throughout the cycle.

Cooling Cycle

6.11 Cooling time is typically 4 hours.

6.12 Outlet temperatures should reach 100°F to 120°F by cycle end.

Completion

6.13 When regeneration completes, **close** valves V3 and V4.

6.14 Slowly **open** process isolation valves V2 and V5, waiting until line pressure stabilizes before opening the next valve.

6.15 Slowly **open** V1 and V6.

6.16 **Close** and Lock V7

6.17 Turn Dryer Power switch **OFF**.

7. Post-Regeneration Condensate Draining & Waste Storage Procedure

CAUTION: Dryer condensate fluid will be present after regeneration cycle. Connect a chemical grade hose to V12 and V13 and use an approved container to drain the blower motor and sump vessel. This waste material poses risks to the eyes and skin and emits a notably strong odor.

Drain Condensate

7.1 Ensure flexible drain hose is unobstructed and drains directly into waste container.

7.2 Ensure that the drain hose is secured into the waste container as the hose will have pressure and may kick out of the container, potentially causing injuries or a waste spill.

7.3 Slowly Open separator sump tank drain valve (V12) to release all accumulated condensate to an approved container.

7.4 Connect the chemical grade drain hose to V13.

7.5 Slowly open V13 to drain any residual condensate from the Blower Moter Vessel into waste container.

ATTENTION: Always report any waste spills to Chevron immediately.

Waste Storage

7.6 Collect condensate in an approved, labeled waste storage container.

7.7 If condensate contains oil or contaminants, follow all applicable hazardous waste handling and disposal regulations.

7.8 Store containers in a designated area and arrange for disposal via authorized waste management provider.

8. Documentation

- Contact Chevron Call Center (**877-872-3966**) to notify personnel on the status of work on-site before leaving.
- Report any abnormal findings or incidents.
- Always report any waste removed from the site on the Chevron AP Renewables Waste Reporting Log.
Link: [AP Renewables - Waste Reporting Log](#)
- Always refer to Manufacturers Manual or call PSB at (**814**)-**453-3651** for assistance with troubleshooting.

NOTICE: Consult Safety Data Sheet (SDS) and all applicable regulations for disposal of desiccant

9. Reference:

- The Manufacturers Manual can be found in the Files Section on Aetos.
- In the search bar enter, “PSB” and select the model number associated with the PSB Dryer being serviced.
- For example: [PSB NG-SR-21-3-500 S-N- 331147 Manual.pdf](#)

Version History and Approvals			
Version #	Date:	Name and Position:	Status: (Created/Approved/Annual Review*)
1.0	11/21/25	Harlan Brodie, Reliability Engineer	Created
1.0	12/02/25	Brent Tesla, Renewables Project Manager	Approved
1.0			

*Procedure must be annually reviewed