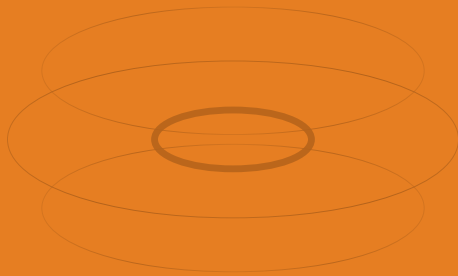


OWNER

# Tie-in, Hot Tap Coordination and Purging

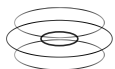


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TORUS

[REDACTED], [REDACTED] County, [REDACTED]

ISSUE SUMMARY AND APPROVAL

This page records each issue of SPC-SPC-012. The preparer, reviewer and approver sign for each revision.

| Rev. | Date       | Issue purpose     | Description |
|------|------------|-------------------|-------------|
| A    | 2026-09-29 | Issued for Review | First issue |
|      |            |                   |             |
|      |            |                   |             |

Contributors

| Rev. | Discipline     | Prepared by | Reviewed by | Approved by |
|------|----------------|-------------|-------------|-------------|
| A    | Specifications |             |             |             |
|      |                |             |             |             |

SECTION PC-SPC-012

## TIE-IN, HOT TAP COORDINATION AND PURGING

### PART 1 GENERAL

#### 1.01 SUMMARY

A. Section includes:

1. Coordination of the Contractor's work with the hot tap that (the receiving pipeline operator) will make on its 24 in trunkline (HOLD H-04), including schedule, site access, excavation interfaces and standby.
2. Construction of the outlet lateral terminal spool and the flanged connection to the outlet flange of the tap valve. The outlet lateral is about 96 ft of buried NPS 12 pipe from IJ-102 plus the riser (final length by survey, HOLD H-04).
3. Tie-in of the station to the Owner's upstream 12 in lateral at IJ-101. The upstream lateral is a separate Owner project; the tie-in joint at IJ-101 is in this section.
4. Isolation, lockout and permits to work for all tie-ins.
5. Nitrogen purging of the dried station and outlet lateral (air to nitrogen), nitrogen pre-pressurization, and gas-in (nitrogen to natural gas) under 49 CFR 192.629.
6. Staged pressurization with leak checks at each stage.
7. Communication with the Owner's gas control and the receiving pipeline operator's gas control during gas-in and the first opening of the tap valve.
8. Records of the purge, gas-in and tie-in.

B. Related sections:

1. SPC-SPC-001, General Requirements and Definitions.
2. SPC-SPC-006, Piping Fabrication and Installation (bolted joint assembly to ASME PCC-1).
3. SPC-SPC-007, Welding (restrictions near the tap).
4. SPC-SPC-011, Hydrostatic Testing, Dewatering and Drying (drying and nitrogen blanket before gas-in).
5. SPC-SPC-018, Pre-commissioning, Commissioning and Startup.
6. SPC-SPC-019, Inspection and Test Plan.

C. Work by others (receiving pipeline operator):

1. Design, material, welding and installation of the hot tap fitting on the trunkline, in-service welding on the trunkline, pressure testing of the fitting, the tap valve, operation of the hot tap machine and coupon retrieval, coating and cathodic protection of its own facilities, and its remote terminal unit and remote shutoff at the tap.

2. Operation of the tap valve and of any valve owned by the receiving pipeline operator. The Contractor shall not operate these valves.
3. Excavation of the bell hole on the trunkline, unless the Interconnect and Operating Agreement assigns it to the Owner (HOLD H-01). If assigned, the Contractor shall perform it under the direction and permits of the receiving pipeline operator, paid as force-account work under pay item 01.06.

D. The hot tap follows the receiving pipeline operator's own procedures and API RP 2201. This section does not state or assume the content of those procedures. Every requirement that depends on them is marked HOLD H-01 or H-04 and shall be confirmed in writing by the receiving pipeline operator before the construction issue.

## 1.02 REFERENCES

### A. Codes, regulations and guidance:

1. 49 CFR 192.605, procedural manual for operations, maintenance and emergencies (the gas-in procedure becomes an operating procedure).
2. 49 CFR 192.627, tapping pipelines under pressure (work of the receiving pipeline operator).
3. 49 CFR 192.629, purging of pipelines.
4. 49 CFR 192.751, prevention of accidental ignition.
5. 49 CFR 192 Subpart N, qualification of pipeline personnel.
6. API RP 2201, Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries (reference for the work of the receiving pipeline operator).
7. API 1104, 22nd Edition, Annex B, In-service Welding (reference only).
8. AGA XK0101, Purging Principles and Practice.
9. NFPA 56-2023, Standard for Fire and Explosion Prevention During Cleaning, Purging, and Flushing of Pipe Systems.
10. ASME PCC-1-2022, Pressure Boundary Bolted Flange Joint Assembly.
11. 29 CFR 1910.146 (permit-required confined spaces), 1910.147 (lockout and tagout) and 1926 Subpart P (excavations).
12. Undergound Facilities Damage Prevention Act, 63 O.S. Section 142.1 and following (OKIE811).

### B. Project documents:

1. GEN-DB-001, Basis of Design (interfaces, operating envelope, overpressure shutdown system, holds).
2. PRO-DWG-101 to PRO-DWG-111, Piping and Instrumentation Diagrams.
3. PRO-CAL-008, Blowdown, Vent Header and Vent Stack Calculation (section volumes, nitrogen quantities, purge velocities, vent rates, dispersion).
4. PIP-DWG-004, Tie-in and Outlet Lateral 1042 Plan and Profile; MEC-LST-004, Tie-in List.



5. PIP-DWG-001 to PIP-DWG-003, Piping General Arrangement.
6. INS-LST-004, Cause and Effect Matrix; SAF-SRS-001, Safety Requirements Specification.
7. CP-CAL-001, Cathodic Protection Design.
8. CON-RPT-001, Construction Execution Plan; CON-RPT-003, Construction HSE Plan.

### 1.03 DEFINITIONS

- A. Tap valve: the full-bore valve on the hot tap fitting, owned by the receiving pipeline operator. Its outlet flange is the physical boundary between the Owner's and the receiving pipeline operator's facilities.
- B. Terminal spool: the Owner's prefabricated, pre-tested spool that connects the outlet lateral to the tap valve outlet flange.
- C. Purge: displacement of air with nitrogen until oxygen is below 2 % at every vent.
- D. Nitrogen pre-pressurization: raising a nitrogen-filled section to a set pressure before gas is admitted, so that gas throttled into it does not chill the piping below its minimum design metal temperature.
- E. Gas-in: displacement of nitrogen by natural gas until the gas concentration exceeds 90 % at every vent, followed by staged pressurization.
- F. Commissioning Lead: the Owner's single point of authority for gas-in, who issues every go and stop instruction.
- G. Operator's representative: the field representative designated by the receiving pipeline operator as the single point of contact for all of its actions.
- H. Combustible gas indicator (CGI): an instrument reading percent of lower explosive limit (LEL), percent gas by volume and oxygen, calibrated and bump-tested daily.

### 1.04 SUBMITTALS

- A. The Contractor shall submit the items in Table 1-1.

**Table 1-1: Submittal Schedule**

| No.   | Submittal                                                                                                                                                                                                                                                                                            | Timing                          | Action                                                              |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------|
| 12-S1 | Tie-in and gas-in procedure: sequence, isolation list, lockout points, purge and vent points, nitrogen quantities, purge velocities, the gas-in method and pre-pressurization pressure, pressurization steps and rates, leak check method, monitoring, communications plan, abort criteria and roles | 30 days before the first tie-in | EOR approval;<br>Owner transmits to the receiving pipeline operator |

| No.   | Submittal                                                                                                                                                                                      | Timing                                        | Action                                         |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------|
| 12-S2 | Excavation plan within the right-of-way and within 25 ft of the trunkline: locates, potholing, hand and vacuum dig zone, spoil placement, equipment exclusion, shoring and crossing mats       | 21 days before excavation in the right-of-way | Owner and receiving pipeline operator approval |
| 12-S3 | Nitrogen supply plan: supplier, purity certificate, vaporizer or tube-trailer capacity for pre-pressurization to at least 510 psig, outlet temperature control, pressure regulation and relief | 14 days before the purge                      | Owner review                                   |
| 12-S4 | Terminal spool fabrication and pre-test records, gasket and bolting certificates, and the ASME PCC-1 assembly procedure for the tap valve flange                                               | 14 days before the tie-in                     | EOR approval                                   |
| 12-S5 | Operator qualification records for all persons performing covered tasks, and CGI calibration certificates                                                                                      | 7 days before the purge                       | Owner review                                   |
| 12-S6 | Pre-tie-in meeting minutes                                                                                                                                                                     | Within 2 days of the meeting                  | Information                                    |
| 12-S7 | Purge and gas-in record QF-12-01, leak check record QF-12-02, flange joint record QF-12-03, communications log QF-12-04                                                                        | Within 48 hours of gas-in                     | Owner and EOR approval                         |

## 1.05 QUALITY ASSURANCE

- A. Every person who purges, operates valves, performs leak surveys or makes tie-ins after the station is connected to a gas source shall be qualified for that covered task under the Owner's operator qualification program (49 CFR 192 Subpart N).
- B. A pre-tie-in meeting shall be held on site at least 14 days before the terminal spool is bolted to the tap valve, and a short-form briefing on the day of gas-in. Attendance: Owner Commissioning Lead, Owner's inspector, EOR or delegate, Contractor superintendent and HSE lead, the operator's representative, and the nitrogen supplier's lead. The meeting shall cover, and the minutes shall record:
  1. The scope split, single points of contact, who authorizes each step, and the communications plan including both gas control centers.
  2. The requirements of the receiving pipeline operator (HOLD H-01 and H-04): tap valve flange data, gasket and bolting, witness, notice periods, its permits, and its qualification requirements for work in the right-of-way.
  3. The isolation list, lockout points and valve position lists for purge and gas-in.
  4. A walk-through of the purge and gas-in procedure, including the gas-in method for the expected supply condition, vent locations, exclusion zones, CGI monitoring, weather limits and abort criteria.
  5. Emergency response: shutdown pushbuttons HS-201 to HS-204, the upwind muster point, emergency numbers, the nearest hospital and fire department notification.
  6. Nitrogen hazards (asphyxiation at vents and in excavations) and cold burns.

- C. Hold and witness points shall be as listed in 3.12 and in SPC-SPC-019. Activities involving the receiving pipeline operator require 72 hours' notice.

## 1.06 MEASUREMENT AND PAYMENT

- A. Pay item 12.01, Tie-in to the tap valve, nitrogen purge and gas-in: lump sum. The price shall include terminal spool installation and bolt-up, the IJ-101 tie-in, excavation and potholing within the right-of-way for the Owner's lateral, isolation and lockout, nitrogen and equipment including pre-pressurization, temporary vents, purging, gas-in, staged pressurization, leak checks, communications, records and attendance at meetings. It excludes the hot tap work, the Owner's gas supply, and the bell hole on the trunkline unless assigned (then pay item 01.06).
- B. Pay item 12.02, Standby crew during the hot tap or a delay caused by the receiving pipeline operator: unit price per crew hour as listed in the bid form, for standby of the tie-in crew and equipment when the Owner directs it to wait. The first 4 hours of each such delay are included in pay item 12.01. Delays caused by the Contractor are not paid.

## PART 2 PRODUCTS

### 2.01 TERMINAL SPOOL AND FLANGED CONNECTION

- A. The terminal spool shall be Class 600 raised face, with bore and facing to match the tap valve (size, facing and bolting to be confirmed by the receiving pipeline operator, HOLD H-04). Line pipe is Owner-furnished; fittings and flanges are Contractor-furnished. The spool shall be pre-tested with test section TS-02 or as a pre-tested unit under SPC-SPC-011.
- B. The gasket at the tap valve flange shall be spiral wound, 316 stainless steel and flexible graphite, with inner and outer rings to ASME B16.20, Class 600, unless the receiving pipeline operator requires otherwise (HOLD H-04).
- C. Bolting shall be ASTM A193 Grade B7 studs with ASTM A194 Grade 2H nuts, coated per PIP-SPC-001.
- D. An insulating flange kit shall be installed at the tap valve only if the receiving pipeline operator requires electrical isolation in addition to IJ-102 (HOLD H-04), to the requirements of CP-CAL-001.

### 2.02 NITROGEN AND PURGE EQUIPMENT

- A. Nitrogen shall be 99.5 % pure or better, supplied as liquid with a vaporizer or from tube trailers, in the quantity given by PRO-CAL-008 plus 50 %. The supply shall be able to pre-pressurize the largest section to at least 510 psig.
- B. The vaporizer shall control its outlet at 40 °F or warmer and shall have a low-temperature cutout, because cold nitrogen can chill the piping as effectively as throttled gas.

- C. Temporary vent stacks shall be NPS 2 minimum, vertical, discharging at least 10 ft above grade and above any operator platform within 25 ft, with a rain cap that does not turn the flow downward, bonded and grounded, and with an isolation valve and sample point at the base.

## 2.03 INSTRUMENTS AND TOOLS

- A. CGIs reading LEL, percent gas and oxygen: two per vent location plus one spare, calibrated per the manufacturer and bump-tested at the start of each shift.
- B. Pressure gauges calibrated within 30 days: one at each pressurization point and one at the far end of each section.
- C. Contact thermometers for the throttle valve body and the downstream pipe wall.
- D. Leak detection solution, non-corrosive and suitable for the ambient temperature.
- E. Radios on a dedicated channel, intrinsically safe where used in classified areas.
- F. An optical gas imaging camera is recommended for the leak survey at operating pressure.

## PART 3 EXECUTION

### 3.01 SEQUENCE

- A. The work shall follow the sequence in Table 3-1, which CON-RPT-001 develops in detail.

**Table 3-1: Tie-in and Gas-in Sequence**

| Step | Activity                                                                                                                                                  | Responsible                                     |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 1    | Tap location, trunkline data and requirements confirmed (HOLD H-04); Interconnect and Operating Agreement executed (HOLD H-01)                            | Owner, receiving pipeline operator              |
| 2    | Hot tap made: fitting, test, tap valve, tap, coupon retrieval; tap valve closed and blinded; coating                                                      | Receiving pipeline operator                     |
| 3    | Station test sections and the outlet lateral (TS-02, against a temporary test head) built and tested under SPC-SPC-011; no test pressure on the tap valve | Contractor                                      |
| 4    | Drying and nitrogen blanket under SPC-SPC-011                                                                                                             | Contractor                                      |
| 5    | Terminal spool bolted to the tap valve outlet flange, tap valve closed and locked                                                                         | Contractor; operator's representative witnesses |
| 6    | Station inlet tie-in at IJ-101; upstream lateral isolated at its mainline valve and blinded or double blocked and bled                                    | Contractor, Owner                               |
| 7    | Air-to-nitrogen purge of any section opened after blanketing                                                                                              | Contractor                                      |
| 8    | Pre-commissioning and validation of the overpressure shutdown system complete under SPC-SPC-018                                                           | Contractor, Owner, EOR                          |
| 9    | Nitrogen pre-pressurization, gas-in from the upstream lateral, staged pressurization to supply pressure, leak checks                                      | Owner Commissioning Lead, Contractor            |

| Step | Activity                                                                                                                    | Responsible                                    |
|------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 10   | Pressure equalized across the tap valve; tap valve opened on authorization of the receiving pipeline operator's gas control | Receiving pipeline operator                    |
| 11   | Tap valve flange leak checked at operating pressure; startup and first delivery under SPC-SPC-018                           | Contractor, Owner, receiving pipeline operator |

B. Gas shall not be admitted to any part of the station until step 8 is released under hold point HP-12-06. The tap valve shall not be opened until SDV-102 and the station emergency shutdown are proven and in service.

### 3.02 PERMITS TO WORK, ISOLATION AND LOCKOUT

- A. All tie-in, purge and gas-in work shall proceed under the Owner's permit-to-work system, with excavation, hot work, confined space, lockout and line-break permits as applicable. Excavation within the right-of-way or within 25 ft of the trunkline shall also be under the permit of the receiving pipeline operator if it requires one (HOLD H-04). Bell holes deeper than 4 ft shall be evaluated as permit-required confined spaces, because nitrogen or gas can collect in them.
- B. Positive isolation from live gas shall be in place during every line break or tie-in:
1. At the tap: tap valve closed and locked by the receiving pipeline operator, with its blind flange in place until the terminal spool is bolted.
  2. At the inlet: the Owner's upstream mainline valve closed and locked, plus a second isolation (a blind, or a double block and bleed with the bleed open and monitored) before work on the IJ-101 tie-in.
  3. Within the station: valves that separate nitrogen-blanketed sections from any gas source locked and tagged per the isolation list.
- C. Every lock and tag shall be recorded on the isolation register and removed only by the person who applied it, or under the documented supervisor override procedure.

### 3.03 EXCAVATION NEAR THE LIVE TRUNKLINE

- A. An OKIE811 locate request and notice to the receiving pipeline operator shall precede any excavation. The receiving pipeline operator marks its line and attends.
- B. The trunkline shall be exposed by vacuum excavation to verify its position and depth before any mechanized digging within 25 ft of it.
- C. Excavation within 5 ft of the verified edge of the trunkline, or within any larger distance the receiving pipeline operator requires, shall be by hand or vacuum only.
- D. No equipment, spoil or crane outriggers shall be placed over the trunkline without crossing mats or an approved crossing plan, and no heavy equipment shall be parked in the right-of-way.
- E. The outlet lateral shall clear the trunkline and any foreign line by 12 in minimum, or more if the receiving pipeline operator requires (HOLD H-04), with dielectric separation where CP-CAL-001 requires it.

### 3.04 WELDING RESTRICTIONS NEAR THE TAP

- A. The Contractor shall not weld, cut or grind on any facility of the receiving pipeline operator.
- B. The terminal spool shall be fabricated and tested before it is placed. No welding shall be done within 10 ft of the tap valve without a hot work permit that includes continuous CGI monitoring at the tap valve and the written acceptance of the receiving pipeline operator.
- C. After gas-in, any welding on Owner piping containing gas is in-service welding. It is outside this contract unless a separate procedure is qualified under SPC-SPC-007 and released by the EOR.

### 3.05 FLANGED CONNECTION TO THE TAP VALVE

- A. The receiving pipeline operator shall confirm that the tap valve is closed, locked and holding, by a bleed check through the body bleed observed by the Contractor, before its blind flange is removed (who removes the blind is HOLD H-04).
- B. The Contractor shall inspect the tap valve flange face and report any damage before proceeding.
- C. The joint shall be assembled to ASME PCC-1 under SPC-SPC-006, with a new gasket, lubricated studs, a calibrated torque tool, the specified tightening pattern and a final check pass, and recorded on QF-12-03 with torque values, tool serial number and assembler qualification.
- D. The joint shall be leak tested with nitrogen at 100 psig with the tap valve closed (soap solution, 10 min hold, no bubbles), and again at operating pressure after the tap valve opens (3.09).

### 3.06 AIR-TO-NITROGEN PURGE

- A. The station and lateral are nitrogen blanketed after drying, so the purge normally applies only to the terminal spool and the IJ-101 tie-in area, and to any other section opened after blanketing.
- B. Nitrogen shall be introduced at the upstream end of the section and vented at the far end, and at each dead leg, high point and instrument connection in turn, at no less than the minimum purge velocity of PRO-CAL-008 to limit mixing and stratification.
- C. The purge is complete when oxygen reads 2 % by volume or less on three consecutive readings 5 min apart at every vent point. The section shall then be held at 10 to 15 psig of nitrogen until gas-in.

### 3.07 GAS-IN

- A. The gas source shall be the Owner's upstream lateral, admitted through the SDV-101 equalizing bypass (line 1103, PRO-DWG-101) or a temporary NPS 2 pressurization assembly approved by the EOR (Class 600 throttling globe or needle valve with a block valve, gauge and thermometer well).
- B. Before gas is admitted, the Contractor shall complete part A of QF-12-01: hold point HP-12-06 released; all valves in the positions of the valve position list; H-101 burner and pilot off; no hot work within 100 ft; vent exclusion zones set; weather within the limits of 3.10; CGIs bump-tested;

communications checked with both gas control centers; two 30 lb ABC extinguishers at the throttle point and at each vent.

- C. Throttling gas from supply pressure into a section at low pressure cools it by the Joule-Thomson effect. Table 3-2 gives the throttled gas temperature for the design gas composition, calculated with the GERG-2008 equation of state for an isenthalpic expansion. Winter supply at 1,150 psig and 45 °F throttled to atmospheric pressure reaches -52 °F, far below the -20 °F minimum design metal temperature of the station piping, and does not reach 0 °F until the section is above about 510 psig.

**Table 3-2: Temperature of Gas Throttled into a Depressurized Section**

| Supply condition           | Downstream at 0 psig, °F | Downstream at 100 psig, °F | Downstream at 250 psig, °F | Downstream at 500 psig, °F |
|----------------------------|--------------------------|----------------------------|----------------------------|----------------------------|
| 1,150 psig, 45 °F (winter) | -52.1                    |                            | -22.0                      | -0.5                       |
| 1,050 psig, 70 °F          | -6.3                     | 2.5                        | 15.2                       |                            |
| 1,000 psig, 60 °F          | -16.4                    | -7.1                       | 6.1                        |                            |
| 900 psig, 60 °F            | -8.1                     | 0.8                        | 13.6                       |                            |

Note 1: Design gas composition of GEN-DB-001. A blank cell was not evaluated.

- D. Gas shall be admitted only when the throttled gas temperature, for the actual supply condition and the actual pressure in the section, is -10 °F or warmer, which keeps 10 °F of margin above the minimum design metal temperature. Two methods are permitted:
1. Method A, the base method: after the air-to-nitrogen purge, the section shall be pre-pressurized with nitrogen from the vaporizer to the pressure at which the criterion is met for the supply condition on the day, and to at least 510 psig for the winter case. The nitrogen shall then be displaced by gas at pressure, flowing through to VS-101 through the section blowdown valve and restriction orifice. The pre-pressurization pressure and the temperature calculation shall be recorded on QF-12-01. This is the base method because it protects the piping for any supply condition the Owner's upstream facility may deliver.
  2. Method B, only if the supply qualifies: gas may be admitted directly into a section at 10 to 15 psig of nitrogen when the Owner holds the upstream lateral at 900 psig or less with gas at 60 °F or warmer, for which the throttled temperature at 0 psig is -8.1 °F.
- E. Any supply condition outside Method B requires Method A. Metal temperature at the throttle valve body and 3 ft downstream shall be measured every 5 min during the first stage, and gas admission shall stop if either reaches 0 °F.
- F. Gas shall be admitted at a moderately rapid and continuous rate, as 49 CFR 192.629 requires, venting to VS-101 through the blowdown valve of the section being displaced and at the far-end temporary vent, at a displacement velocity between the minimum and maximum of PRO-CAL-008. Sections shall be displaced one at a time and in flow order: inlet (PR-101 and V-101), each meter run in turn with the other isolated, heater section and bypass, each control valve

branch in turn, outlet section, and the outlet lateral to the terminal spool vent with the tap valve closed. One section at a time is required because the vent stack is sized for a single section.

- G. Displacement is complete when the gas concentration is 90 % by volume or more and oxygen is 1 % or less on three consecutive readings 2 min apart at every vent point, including dead legs, instrument connections, sampler lines and the fuel gas branch to FG-101.

### 3.08 STAGED PRESSURIZATION AND LEAK CHECKS

- A. Each section shall be brought to supply pressure in the stages of Table 3-3, with the leak check shown at each hold.

**Table 3-3: Pressurization Stages**

| Stage | Section pressure, psig                 | Maximum rate                                                            | Hold   | Leak check                                                                                                        |
|-------|----------------------------------------|-------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------|
| 1     | 50                                     | 10 psi/min                                                              | 15 min | Every flanged, threaded and tubing joint by soap solution and CGI; valve stem packings; PR-101 and V-101 closures |
| 2     | 250                                    | 25 psi/min                                                              | 15 min | Every joint by CGI; soap on any indication above 1 % LEL at 1 in                                                  |
| 3     | 500                                    | 50 psi/min                                                              | 15 min | As stage 2                                                                                                        |
| 4     | Supply pressure, normally 900 to 1,150 | 100 psi/min, and never faster than the temperature limit of 3.07 allows | 30 min | Every joint by CGI and optical gas imaging where available; all indications recorded                              |

- B. If a leak is found, the Contractor shall stop, report, and depressurize the affected section to 0 psig through VS-101 before repairing it. Pressurized flanges shall not be tightened. After the repair the section shall be re-purged if it was opened to air, and the stage repeated. Stricter vendor limits on pressurization rate for meters, analyzers and actuators shall govern (HOLD H-15).

### 3.09 OPENING THE TAP VALVE

- A. Before the tap valve is opened, the Contractor shall complete part B of QF-12-01: station at supply pressure and leak-free; SDV-102 and SDV-103 closed, with SDV-102 having passed its full-stroke test (4 s or less) and partial-stroke test; PT-133A, PT-133B and PT-133C in service and voting; station emergency shutdown in service; FCV-131 and FCV-132 closed; meter runs aligned per the startup plan of SPC-SPC-018; and the receiving pipeline operator's gas control notified and its authorization received.
- B. The outlet lateral shall be pressurized from the station through the SDV-103 equalizing bypass (line 1171) to within the differential the receiving pipeline operator specifies (HOLD H-04; 50 psi if none is specified), at the stage rates of Table 3-3, with the tap valve flange leak checked at 250 psig and at final pressure.

- C. The receiving pipeline operator will open the tap valve. The Contractor shall not touch it.
- D. The tap valve flange joint, terminal spool and IJ-102 shall be leak checked at operating pressure by CGI, soap and optical gas imaging, and recorded on QF-12-02 and QF-12-03.
- E. Delivery shall begin only under SPC-SPC-018, with the authorization of the receiving pipeline operator's gas control.

### 3.10 WEATHER AND ABORT CRITERIA

- A. Work shall not start, or shall stop and be made safe, under any condition in Table 3-4.

**Table 3-4: Abort Criteria**

| Condition                                                                      | Action                                                                                   |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Lightning within 10 miles                                                      | Stop venting; close vents; hold                                                          |
| Wind below 2 mph at vent height (poor dispersion) or above 30 mph              | Do not start; if in progress, hold with vents closed                                     |
| Throttle or downstream metal temperature at or below 0 °F                      | Stop gas admission; wait for recovery; review the supply condition and the gas-in method |
| Oxygen above 2 % in a gas-in section after displacement began                  | Stop; re-purge that section with nitrogen                                                |
| CGI reading of 10 % LEL or more outside a vent exclusion zone                  | Stop; close vents; clear the area; investigate                                           |
| Gas detector GD-205, GD-206 or GD-207 alarm, or a leak that cannot be isolated | Activate the station emergency shutdown (HS-201 to HS-204); go to the muster point       |
| Unexplained pressure change in an isolated section                             | Stop; investigate                                                                        |
| Loss of communication with either gas control center during tap valve steps    | Hold at the current state                                                                |
| Overpressure shutdown or emergency shutdown not available                      | Do not open the tap valve; hold                                                          |
| A person unaccounted for, or an uncontrolled ignition source within 100 ft     | Stop; make safe                                                                          |

### 3.11 VENTING PRACTICE

- A. Venting shall be to VS-101 through the section blowdown valves and restriction orifices wherever possible, one section at a time. Temporary vents shall be located per PRO-CAL-008, at least 50 ft from H-101, B-101, B-102, G-101 and the fence, and outside the right-of-way unless the receiving pipeline operator accepts otherwise.
- B. Each vent shall have a 50 ft exclusion zone during venting, signed and monitored by CGI at its boundary.
- C. Vented volumes shall be recorded for the Owner's emission records ( REG-CAL-001).

D. Nitrogen shall not be vented into excavations. Oxygen shall be monitored in bell holes and trenches, and entry shall require at least 19.5 % oxygen.

### 3.12 FIELD QUALITY CONTROL

A. The records in Table 3-5 shall be kept and turned over under SPC-SPC-020.

**Table 3-5: Records**

| Form               | Content                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QF-12-01           | Purge and gas-in record: preconditions (parts A and B), valve position list, gas-in method and nitrogen pre-pressurization pressure with the temperature calculation, nitrogen volumes, times, CGI and oxygen readings at each vent with instrument serial numbers, throttle and metal temperatures, pressures by stage |
| QF-12-02           | Leak check record: each joint, stage, method, result and repair                                                                                                                                                                                                                                                         |
| QF-12-03           | Flange joint record for the tap valve flange, the IJ-101 tie-in and every line-break joint: gasket, bolting, torque sequence and values, tool calibration, assembler and witness                                                                                                                                        |
| QF-12-04           | Communications log: every call with either gas control center, with times and authorizations                                                                                                                                                                                                                            |
| Isolation register | Every lock and tag                                                                                                                                                                                                                                                                                                      |
| Meeting minutes    | Pre-tie-in meeting and day-of briefing                                                                                                                                                                                                                                                                                  |

B. The hold and witness points in Table 3-6 apply. Party codes: C Contractor, O Owner, E EOR, W receiving pipeline operator; H hold, W witness, R review, S surveillance, P perform.

**Table 3-6: Hold and Witness Points**

| ID       | Activity                                                                                                                                                                                       | C | O | E | W | Record                          |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---------------------------------|
| HP-12-01 | Tie-in and gas-in procedure approved, and the receiving pipeline operator's requirements confirmed in writing (HOLD H-01, H-04)                                                                | P | R | H | R | Approved procedure              |
| HP-12-02 | Excavation plan in the right-of-way approved; locates and potholing complete before mechanized excavation within 25 ft of the trunkline                                                        | P | H | - | H | 12-S2, locate tickets           |
| HP-12-03 | Pre-tie-in meeting held and minuted                                                                                                                                                            | P | H | - | W | 12-S6                           |
| HP-12-04 | Terminal spool bolted to the tap valve flange, tap valve verified closed and holding                                                                                                           | P | H | - | W | QF-12-03                        |
| WP-12-01 | IJ-101 tie-in to the upstream lateral                                                                                                                                                          | P | W | - | - | QF-12-03                        |
| HP-12-05 | Air-to-nitrogen purge accepted, oxygen at or below 2 %                                                                                                                                         | P | H | - | - | QF-12-01                        |
| HP-12-06 | Gas-in release: drying and blanket accepted, pre-commissioning complete, overpressure shutdown function validated, emergency shutdown tested, qualification records, part A of QF-12-01 signed | P | H | H | W | QF-12-01 A, SPC-SPC-018 release |

| ID       | Activity                                                                                                                                                                                               | C | O | E | W | Record               |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|----------------------|
| HP-12-09 | Gas-in method confirmed: Method A nitrogen pre-pressurization reached and the temperature calculation for the day's supply signed, or Method B supply at 900 psig or less and 60 °F or warmer verified | P | H | R | - | QF-12-01             |
| HP-12-07 | Nitrogen-to-gas displacement accepted, and the leak check at each pressurization stage                                                                                                                 | P | H | - | - | QF-12-01, QF-12-02   |
| HP-12-08 | Tap valve opening: part B of QF-12-01, pressure equalized, gas control authorization                                                                                                                   | P | H | - | H | QF-12-01 B, QF-12-04 |
| WP-12-02 | Leak check of the tap valve flange at operating pressure                                                                                                                                               | P | W | - | W | QF-12-02, QF-12-03   |

### 3.13 ACCEPTANCE

A. The tie-in, purge and gas-in are accepted when every criterion in Table 3-7 is met and the records are signed.

**Table 3-7: Acceptance Criteria**

| Parameter                                 | Criterion                                                                                                                                          | Method                                    |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Air-to-nitrogen purge                     | Oxygen at or below 2 % on three consecutive readings 5 min apart at every vent                                                                     | CGI oxygen cell                           |
| Nitrogen                                  | 99.5 % purity or better; injection at 40 °F or warmer                                                                                              | Certificate; vaporizer outlet thermometer |
| Gas-in start condition                    | Method A pre-pressurization to the pressure at which throttled gas is -10 °F or warmer, or Method B supply at 900 psig or less and 60 °F or warmer | Calculation on QF-12-01                   |
| Metal temperature during gas-in           | Above 0 °F at the throttle body and 3 ft downstream at all times                                                                                   | Contact thermometer, 5 min log            |
| Displacement                              | Gas 90 % or more and oxygen 1 % or less on three consecutive readings 2 min apart at every vent                                                    | CGI                                       |
| Pressurization rate                       | Stage limits of Table 3-3 not exceeded                                                                                                             | Gauge and time log                        |
| Leak checks                               | No bubbles in 1 min of soap observation; no CGI indication above 1 % LEL at 1 in from any joint; no optical gas imaging plume                      | Soap, CGI, camera                         |
| Tap valve flange                          | Assembled to ASME PCC-1 with record; no leak at 100 psig nitrogen or at operating pressure                                                         | QF-12-03, soap, CGI                       |
| Equalization before opening the tap valve | Within 50 psi of trunkline pressure, or the value the receiving pipeline operator specifies (HOLD H-04)                                            | Gauges on both sides                      |
| Records                                   | QF-12-01 to QF-12-04 complete and signed by the Contractor, the Owner and, where it witnessed, the receiving pipeline operator                     | Review                                    |

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**END OF SECTION**

