Appendix V

Olympic Procedures

[redacted]

OLYMPIC PIPE LINE COMPANY

OPERATIONS MANUAL FOR CONTROLLERS

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STATEMENT OF OLYMPIC PIPE LINE COMPANY RELEASE POLICY:

Each Olympic Pipe Line Company employee has the responsibility to: 1.) **prevent** releases, and 2.) if a release does occur, to minimize its consequences. Meeting agreed upon pipeline schedules and minimizing costs are also important responsibilities, but neither take precedence over the safety of employees, the public and the environment. If there is any reason to believe that a release might occur or has occurred, the pipeline system should be immediately shut down and promptly investigated.

5.0 ABNORMAL PROCEDURES

Although abnormal operations are very infrequently encountered, the Controller is expected to recognize and understand these conditions and react quickly. The Controller is expected to be familiar with the following abnormal procedures. In some cases, the Controller's best judgement will need to be exercised before these procedures are followed. It is also recognized that no manual can cover all abnormal operations that could occur.

5.1 UNINTENDED MAINLINE VALVE CLOSURE

Whenever a valve closes against an operating pipeline abnormally high pressures can result. The potential exists for adverse effects on the pipeline system. The following procedures will assist the Controller in determining the appropriate action if this condition should occur:

1. Upon receipt of an alarm for high pressure or other information that indicates a potentially blocked line, the Controller will immediately begin emergency shutdown procedures, by first stopping the nearest pumps upstream of the high pressure condition followed by stopping all pumps at the originating station and then continuing downstream from the origin until all pumps are stopped.

2. After the line has been shut down, the Controller will investigate the cause of the high pressure by using all information available to find the cause and determine the level and duration of the high pressure reported by the equipment. The Controller should then call his supervisor to discuss the situation. The Controller will <u>not</u> restart the pipeline without concurrence from his supervisor. If the pressure exceeded 110% of the maximum allowable operating pressure (MAOP), reporting to DOT as a "safety related condition" might be required. This condition should be reported to the Olympic Pipe Line Manager for determination of reporting requirements.

3. If conditions indicate that a loss of fluid from the pipeline might have occurred, the pipeline will remain down and appropriate employees will be sent to investigate. The pipeline will be blocked in segments to minimize any potential release. If a release is confirmed, the Controller will implement local release response procedures outline in Emergency Manual.

4. If a loss of fluid from the pipeline is not apparent a static pressure test by segment is required. The test pressure will be no more than 1/2 MAOP lasting at least 30 minutes and the test will be done after the pipeline pressures have stabilized. If pressure is lost in any segment, the pipeline will remain down and the appropriate employees sent to investigate. If pressure is not lost, the pipeline may be restarted with concurrence from the supervisor.

5. If the decision is made to restart a pipeline, the line balance calculations will be monitored at more frequent intervals than normal for at least 8 hours after start up. If the line balance indicates a consistent loss trend, the pipeline will be shut down as soon as the trend is apparent and appropriate investigative steps will be taken. Imbalances immediately after start up are a result of line pack and should be expected, but should not continue after the line pressure stabilizes.

6. As soon as a loss of fluid is suspected and the field employees are dispatched, district management will be informed of the situation.

5.2 UNINTENDED SHUTDOWN

An unintended shutdown of a pump unit or pumping station could be caused by pressure changes inside the pipeline or by equipment failure. The Controller response to this occurrence will be different depending on the probable cause. This procedure is intended to assist the Controller in responding to the first occurrence of an unintended shutdown. In multi-station pipelines, other station shutdowns can be caused by the first shutdown.

A pump unit shutdown caused by pressure changes such as high discharge, high case or low suction should immediately be investigated by the Controller to determine the cause for the pressure change. Data such as computer trends, protective device settings, and computer alarm limits will provide needed information to determine probable cause.

High discharge or case could indicate a blockage in the pipeline. If this should occur, the Controller will begin shut down of the pipeline and follow the procedures outlined in Section 5.1 for addressing a valve closure.

FOUR (4) HOUR RESPONSE (TO BE CHECKED EVERY FOUR HOURS)

NON-OPERATING FACILITY
Anacortes - Texaco
Anacortes - Shell
Cherry Point
Delivery Facility
Mainline Junction
Other Non-Operating Facilities

TWENTY-FOUR (24) HOUR RESPONSE

Block Valves - check out daily during daylight hours
Portland Jct. Block Valves - Check out daily during daylight hours and as needed.

Return to Normal Operations. Following an abnormal event, the Operations Controller (and field operations personnel, if appropriate) is to check and monitor the system at sufficient critical locations to determine the integrity of the system and that operations are normal and safe.

7.22 DOCUMENTATION AND REVIEW OF ABNORMAL EVENTS. Any operation that deviates from the normal mode of operations must be documented by the Operations Controller and by the field personnel involved. This information must include the best and most accurate information available and contain a description of: operations prior to the event, the abnormal event, corrective and final action taken. This information is invaluable to prevent the same situation from occurring again and to assist personnel in rectifying this event.

The Supervisor of Operations will periodically review the response of operations personnel to determine the effectiveness of the procedures controlling abnormal operations and take corrective action where deficiencies are found.

7.23 NOTIFICATION OF SUPERVISOR. Whenever an abnormal situation arises in which, in the judgment of the Operations Controller (and local area operating personnel, if appropriate) a continued safe operation cannot be assured, the Supervisor of Product Movement is to be notified immediately.

7.24 OPERATIONS CONTROLLER'S RESPONSIBILITY AND AUTHORITY. It is the Operations Controller's responsibility to take immediate corrective action when abnormal situations occur to assure a safe continued pipeline operation.

There should be no hesitation on the Operations Controller's part to shutdown a line or facility, alleviate pipeline pressures, isolate tanks or line segments, request assistance from field personnel, other personnel in the Product Movements Section and Maintenance personnel, if necessary in an abnormal situation.

The Operations Controller has the authority in abnormal circumstances to perform the above actions; however, the Supervisor of Product Movement should be notified of such actions as soon as possible.

7.25 IMMEDIATE RESPONSE LOCATIONS. Certain pipeline facilities of the Olympic system are located in areas that would require an immediate response to prevent hazards to the public if there were a pipeline related failure or malfunction. By Department of Transportation definition, a pipeline facility is new and existing pipe, rights-of-way, and any equipment, facility or building used in the transportation of hazardous liquids.

The following pages list, by mile-post marker, locations on the Olympic system requiring immediate response by appropriate company personnel.

Olympic PIPE LINE COMPANY
4140 MERIDIAN ST.
SUITE 210
BELLINGHAM, WA 98226
(360) 733-9715

November 24, 1999

Peter Katchmar
US Department of Transportation
Western Region Pipeline Safety
12600 W Colfax Ave, Suite A-250
Lakewood CO 80215-3736

Re: DOT Pipeline Compliance Manual

Enclosed is a copy of the Texaco DOT Pipeline Compliance Manual that Olympic adopted early this year.

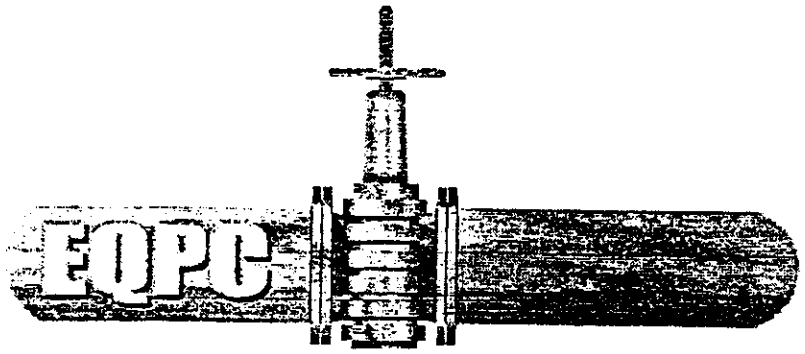
If you have any questions or comments regarding this document, please call me at (360) 733-9715.

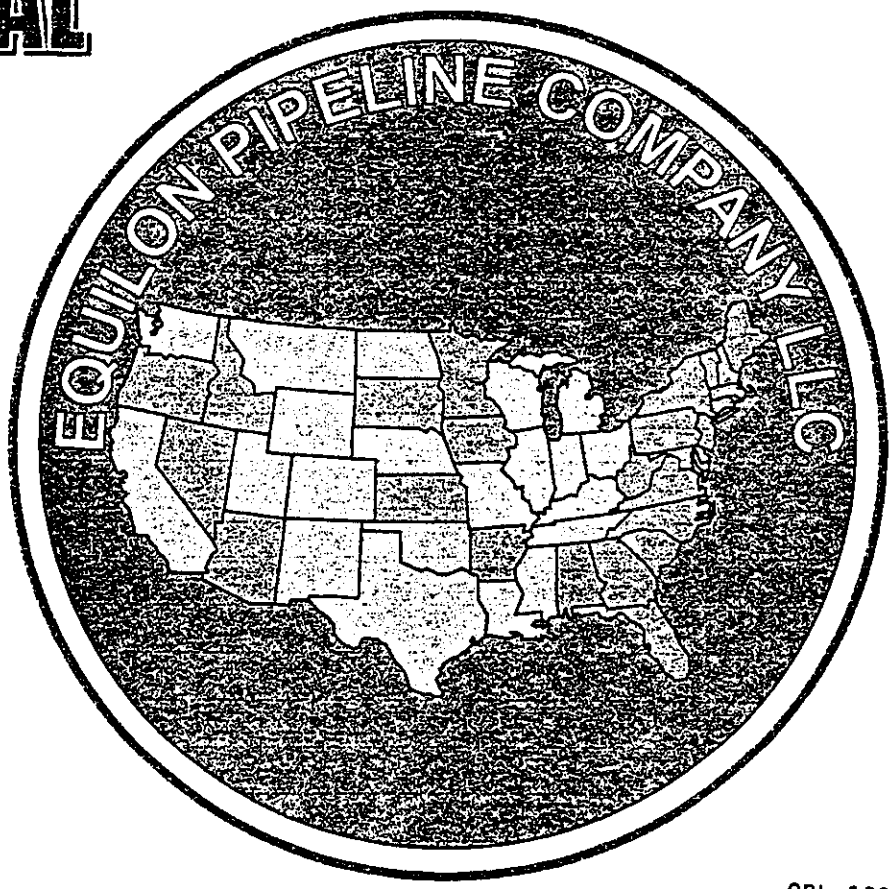
Sincerely,

Sandra M. Conlan
Whatcom Creek Project
Olympic Pipe Line Company

cc: Allan Beshore, NTSB

DOT PIPELINE COMPLIANCE MANUAL





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General Operations, Maintenance & Emergency Procedures

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This Manual interprets and clarifies the regulations set forth in 49 CFR Parts 194 and 195.

- 49 CFR Part 194 covers the oil spill response plan requirements for pipeline facilities.

- 49 CFR Part 195 covers the design, construction, operation, maintenance, and emergency requirements for pipeline facilities.

In some cases, a Company pipeline facility may be subject to Part 194 and not subject to Part 195. An example of this would be a gathering system in a rural area. In other cases, a facility may be subject to both Parts 194 and 195. An example of this would be a high pressure mainline.

Questions regarding the applicability of Company pipeline facilities to 49 CFR Parts 194 or 195 should be referred to the area TTTI environmental coordinator.

If a Company pipeline facility is only subject to Part 194, the facility only needs to comply with the sections in the Manual which pertain to Part 194. Regulatory citations are provided in each section to designate whether a section pertains to Part 194 or 195.

49 CFR Parts 194 and 195 are developed and enforced by the U.S. Department of Transportation (DOT). In some states, the DOT has delegated the 49 CFR Part 195 program to an authorized state agency.

Section 15. Abnormal Operations

Introduction

This section provides directions for responding to ***abnormal operating conditions.***

Note! These guidelines do not cover all abnormal operating conditions which can occur; however, they do cover the most common.

Unintended Closure of Valves

[§195.402(d)(1)(i)]

An unintended valve closure indication may be an abnormal operating condition. An indication of an unintended valve closure may be caused by many factors including human error, equipment malfunction, a power interruption, or a communications glitch.

Note! An unintended valve closure may be detected by:

- A SCADA alarm
- A drop in flow rate and pressure downstream of the valve
- An increase in pressure and decrease in flow rate upstream of the valve

In the event of an unintended valve closure indication, the controller should:

1. Determine if the indication is true.

Important Point! If the controller cannot explain or correct the indication and the indication could create an unsafe or emergency condition, the indication is an abnormal condition.

2. If the indication of the unintended valve closure is confirmed, reverse travel to fully open valve.
3. If the valve cannot be opened, shut down the line immediately if other actions (such as diverting the stream) cannot be taken to prevent excessive pressure.
4. Determine the cause of the unintended valve closure and take corrective action.

Loss of Communications

[§195.402(d)(1)(iii)]

Partial and total loss of communications on a pipeline system is an abnormal operating condition. A loss of communications may be caused by many factors including weather, fire, excavation damage, and equipment failure.

Note! A loss of communications may be detected by:

- A SCADA alarm
- A delay in updating the monitoring parameters on the console

---

Whenever communications are lost, the following procedures must be followed:

1. Check for indications of abnormal pressure and flow rates at all locations on the system that do not have a communications failure.
2. If flow and pressure appear normal, continue operations. If flow and pressure do not appear normal, shut down the pipeline system.
3. If communications loss is sustained beyond a reasonable time period, personnel should be sent to critical stations (such as originating and terminating stations).
4. Take corrective action.

Activation of Safety Devices/Alarms

[§195.402(d)(1)(iv)]

Activation of a safety device or an alarm may be an abnormal condition.

The chart below lists some of the more common alarms found on a pipeline system. This chart also lists the probable causes for each alarm.

Unintended Station Shutdowns

[§195.402(d)(1)(i)]

An unintended station shutdown indication may be an abnormal operating condition. Unintended station shutdown indications may be caused by many factors including:

- Activation of an automatic shutdown safety device such as low suction pressure and high discharge pressure
- Power failures
- Activation of station emergency shutdown switch
- Communications glitch

Note! An unintended station shutdown will most likely be detected by a SCADA alarm.

In the event of an unintended station shutdown indication, the controller should:

1. Determine if the indication is true.

Important Point! If the controller cannot explain or correct the indication and the indication could create an unsafe or emergency condition, the indication is an abnormal condition.

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2. If the indication is true, verify that the remainder of the line is operating normally.
3. If a leak is suspected or if an unsafe condition exists, shut down the pipeline system in a controlled manner that minimizes surges and line drainage.
4. Determine the cause of the unintended station shutdown and take corrective action.

Flow/Pressure Deviations From Normal Operations

[§195.402(d)(1)(ii), (3)]

An unexplained deviation in flow and pressure may be an abnormal operating condition. Unexplained deviations may be caused by many factors including a leak, electrical equipment malfunction, meter failure or human error.

Note! Flow and pressure deviations on a pipeline system may be detected by:

- Set point alarms at console
- Safety devices
- Over/short calculations
- Direct observation at the site

In the event of a flow/pressure deviation, the controller should:

1. Determine if the deviation is true.

   Important Point! If the controller cannot explain or correct the cause of the deviation and the deviation could create an unsafe or emergency condition, the deviation is an abnormal condition.

2. If the deviation is true, immediately investigate the cause of the deviation by closely rechecking all valve line-ups, meter readings, pressure readings and other available data to verify the suspected condition.
3. If a leak is suspected, shut down the pipeline system in a manner that minimizes surges and line drainage.
4. Take corrective action.

TYPES AND CAUSES OF ALARMS

Type of Alarm		Probable Cause	
Line Alarm	High Line Pressure	• Power interruption • Equipment failure • Line blockage downstream • Unintended valve closure downstream	• Too many pumps on line • Change in specific gravity or viscosity • Shut down of downstream pump
Station Alarms	High Discharge Pressure	*See High Line Pressure*	
	High Sump	• High liquid level in the sump tank • Power interruption • Equipment failure	• Pump seal failure • Relief valve open
	High Tank Level	• High tank level • Power interruption	• Equipment failure
	Fire Detection	• Fire in the area • Power interruption • Equipment failure	• Lightning • Welding in the area
	Relief Valve Operation	• Overpressure of system • Power interruption	• Equipment failure
	Pig Sig	• Incoming pig • Outgoing pig	• Power interruption • Equipment failure
	Power Failure	• Anything that causes commercial AC power failure (weather, vehicle accidents, fire, excavation damage)	• Power company power outage • Open fuses on company property • Equipment failure
	Communications Failure	• Anything that causes loss of communications	(weather, fire, excavation damage)
Unit Alarms	Low Suction Pressure	• Not enough fluid flow (upstream leak, plugging of suction line, plugged strainer, shutdown of upstream pump) • Power interruption	• Lack of net positive suction head • Change in specific gravity or viscosity • Equipment failure
	Low Flow	*See Low Suction Pressure*	
	High Case Pressure	*See High Line Pressure*	
	High Case Temperature (pump)	• Power interruption • Equipment failure • Not enough fluid flow to cool pump	• Fluid too hot coming into pump • Change in specific gravity or viscosity
	Motor Winding Temperature (motor)	• Power interruption • Equipment failure • Excessive current draw	• Dirty air filter • Dirty motor windings • Low voltage (will cause excessive current draw and heat)
	High Bearing Temperature (pump and motor)	• Power interruption • Equipment failure • Faulty bearing	• Low on lube oil • Lack of flow through oil cooling line (pump) • Dirty air filter (motor)
	Excessive Vibration (pump and motor)	• Power interruption • Equipment failure • Bearing failure	• Units out of alignment • Faulty coupling
	Incomplete Sequence	• Anything that prevents the unit from going through the correct "start-up" or "shut-down" sequence • Power interruption • Equipment failure	• Suction valve not going full open or closed • Discharge valve not going full open or closed • Motor not starting for whatever reason
	Seal Failure (pump)	• Faulty mechanical seal • Power interruption • Equipment failure	• Inadequate flush/cooling flow • Change in specific gravity or viscosity

Note! Alarms will be displayed on console screens and/or station control panel.

Whenever an alarm is activated, the following procedures must be followed:

1. Determine if the alarm is true.

Important Point! If the controller cannot explain or correct the alarm and the alarm could create an unsafe or emergency condition, the alarm is an abnormal condition.

2. If the alarm is true, monitor pressures, flow rates and other pertinent data.
3. If a leak is suspected or if an unsafe condition exists, shut down the pipeline system in a manner that minimizes surges and line drainage.
4. Determine the cause of the alarm and take corrective action.

Note! Depending on the configuration of equipment, activation of an alarm may automatically result in system, station, or pump shut down. Some alarms may also result in lock-out and cannot be reset by the controller.

Malfunction of Operating Equipment

[§195.402(d)(1)(v)]

Malfunction of operating equipment which is necessary for the safe operation of a pipeline system is an abnormal operating condition. Malfunction of operating equipment may be caused by many factors including weather, lack of maintenance, and equipment failure.

Note! Equipment malfunction may be detected by field maintenance personnel, safety devices, and SCADA system.

When responding to equipment malfunction, personnel must use discretion in determining the proper action to lessen the effects of the malfunction.

Human Error

[§195.402(d)(1)(v)]

Human error which could affect the safe operation of a pipeline system is an abnormal condition.

Note! Human error may be detected by personnel, safety devices, and SCADA system.

When responding to a human error, personnel must use discretion in determining the proper action to lessen the effects of the error.

Notifying Company Personnel of Abnormal Conditions

[§195.402(d)(4)]

Appropriate Company personnel must be notified of all abnormal operating conditions.

Important Point! Certain abnormal operating conditions will require management notification. Each district is responsible for determining the notification process.

Continuing Operations after an Abnormal Operating Condition

[§195.402(d)(2)]

Following any abnormal operating condition, the controller should closely monitor pressure and flow rate for any deviations from normal.

If the pipeline was shut down (either automatically or manually) due to an abnormal operating condition, the pipeline may only be restarted after obtaining approval from district manager or designee. Upon restart, the operator should closely monitor pressure and flow rate until stabilization has been reached and operations have returned to normal.

Documentation

The following daily operating records must be maintained for three years:

- Discharge pressure at all pump stations.
- Indication of all abnormal and emergency conditions

[§195.404(b)(1-2)]

Reference

Regulations

49 CFR 194.107(d)(1)(iii)
49 CFR 195.402(d)(1-4)
49 CFR 195.404(b)

Section 16. Start Up/Shut Down Procedures

Introduction

[§195.402(c)(7) and (8)]

This section describes general procedures for starting up or shutting down a pipeline system.

Important Point! Starting up or shutting down any part of a pipeline system must be done in a controlled manner that ensures MOP is not exceeded.

Starting Up a Pipeline System

The following steps must be taken whenever starting up a pipeline:

- Coordinate with scheduling
- Know what commodity is to be pumped
- Coordinate with personnel at the delivery point
- Assure proper valve alignment
- Start up in the proper sequence and in a controllable manner to prevent surges in the pipeline system

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Important Point! If a pipeline is not equipped to ***fail safe***, pressures during start-up must be monitored from an attended location until steady pressure and flow conditions exist. This is to prevent exceeding MOP.

Shutting Down a Pipeline System

The following steps must be taken when performing a controlled shut down of a pipeline system:

- Coordinate with scheduling
- Know what commodity is in the line
- Coordinate with personnel at the delivery point
- Assure proper valve alignment
- Shut down all stations in the proper sequence and in a controllable manner to prevent surges in the pipeline system

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Important Point! If a pipeline is not equipped to fail safe, pressures during shut-down must be monitored from an attended location until steady pressure and flow conditions exist. This is to prevent exceeding MOP.

Reference

Regulations

49 CFR 195.402(c)(7) and (8)

Function and General Description

Bayview Terminal operates as; A) Receiving terminal and storage facility for the Anacortes and Ferndale refinery products destined downstream. B) Independent Booster pumping stations for Anacortes and Ferndale 16" pipelines to Allen Station. Product streams may be directed to five 100,000-barrel tanks for storage. Products from all tanks may be directed to either the Ferndale or the Anacortes 16" lines.

Bayview Terminals pumping equipment consists of three 1250-horsepower electric/centrifugal units connected in parallel. Unit 1 (P-201) is dedicated to the Ferndale line. Unit 3 (P-203) is dedicated to the Anacortes line. Unit 2 (P-202) can operate as a spare for either line, or may operate in series with Unit 1 or Unit 3. A Grove ball control valve is located downstream of the pumping units to control maximum discharge pressures and flow rates.

A 10,000-barrel transmix tank is provided for interfaces arriving from the incoming Anacortes and Ferndale lines. The interface material is disposed of by injection into either the Anacortes or Ferndale 16" main lines. A 30-barrel sump which pumps into the transmix tank is provided for quality control purposes.

Scraper traps and launchers capable of handling spheres, scrapers or smart pigs are installed on both the incoming and outgoing pipelines.

Surge relief valves are strategically located to provide protection of the lower ANSI class rated flanges and valves.

Revised: 11/23/98

BAYVIEW PRODUCTS TERMINAL

DATA CIRCUITS	
PUMPS	BINGHAM
MOTORS	TECO
AUTOMATIC PUMP OILER	
PROTECTIVE DEVICES	MULTILIN
STORAGE TANKS	MORSE CONSTRUCTION, FIXED ROOF W/ INTERNAL FLOATING PAN
TANK TRANSIT PUMP	DYNAFLOW
INJECTION PUMP	POWER SERVICE INC
SUMP TANK	SPRINGS FABRICATION, 35-BARREL, UNDERGROUND
SUMP PUMP	GOULDS
WEIR COLLECTION SUMP	UTILITY VAULT
MIXERS	JENSEN
TANK GAUGES	VAREC
INSTRUMENTATION/CONTROLLERS	GE 9070 PLC
VALVE - CONTROL	GROVE W/ THUNDERCO ACTUATOR
VALVE - CHECK	KF SERIES 35
VALVE - OPERATORS	EIM
VALVES	COOPER CAMERON W/ EIM ACTUATORS ORBIT TRU SEAL W/ EIM ACTUATORS
THERMAL RELIEF	DRESSER INDUSTRIES
SCRAPER TRAP	SAGEBRUSH
INTERFACE DETECTOR - SONIC	COLUMBINE CONTROL CO.
INTERFACE DETECTOR - GRAVITY	AUTOMATION PRODUCTS

PRODUCT SAMPLER	CALTROL
METER	SMITH
STRAINER	WEAMCO
PRESSURE TRANSMITTER	ROSEMOUNT
TEMPERATURE TRANSMITTER	ROSEMOUNT
PRESSURE SWITCHES	HYDRAULIC COMPONENTS CO
FLOW SWITCHES	FLOW AND LEVEL CONTROL
MOTOR CONTROLS & TRANSFORMER	WESCO
FIRE EYES	OMNIGUARD
SPRINKLER SYSTEM	
FIRE SYSTEM	ANSEL
SURGE RELIEF SYSTEM	8" BROOKS

Local OMI Alarm and Remote Indications

NOTE: Any LOCKOUT requires correction of the malfunction and reset from terminal panel before resumption of normal operations may continue.

1. POWER FAILURE. UPS will continue to power the supervisory control system and OMI computer, until exhausted. When AC power is restored the control valve motor will not restart. All other motors will remain shut down until reinitiated to start. Renton supervisory alarms, displays and logs appropriate SHUTDOWN indications.

2. EMERGENCY POWER DISCONNECT. Local OMI and Renton supervisory alarms, displays and logs EMERGENCY POWER DROP and the following additional alarms. A power disconnect is initiated when any of the following occurs

2.1 Initiation of EMERGENCY POWER DISCONNECT from Local OMI, terminal panel or from the Renton Control Center..

2.2 Feeder Management Relay: OMI and Renton supervisory alarms, displays and logs FEEDER MULTILIN TRIP.

a. Line undervoltage

b. Line overvoltage

c. Time overcurrent

d. Instantaneous overcurrent

2.3 UNIT STOP FAILURE. Anytime a pump motor fails to stop or runs when not commanded and after expiration of a preset amount of time, the incoming power breaker will trip. Local OMI and Renton supervisory alarms, displays and logs UNIT STOP FAILURE.

NOTE: When the UNIT STOP FAILURE condition exists, do not attempt to restore power to the facility until a technician has investigated, corrected any problem and given the approval to resume operations.

3. TERMINAL LOCKOUT. A terminal lockout condition is initiated when any of the following occurs: Local OMI and Renton supervisory alarms, displays and logs TERMINAL LOCKOUT, FERNDALE INCOMING SHUTDOWN, ANACORTES INCOMING SHUTDOWN,. FERNDALE OUTGOING SHUTDOWN,. ANACORTES OUTGOING SHUTDOWN appropriate pump shutdowns and the following additional alarms.

3.1 Local initiation of TERMINAL LOCKOUT from Local OMI, terminal panel, from any of the pole positions in the yard or from the Renton Control Center. Local OMI and Renton supervisory alarms, displays and logs BPT STATION LOCKOUT.

3.2 High-high sump level. OMI alarms when liquid level in sump rises to the preset level. Local OMI and Renton supervisory alarms, displays and logs HI HI SUMP and will have previously alarmed, displayed and logged HIGH SUMP LEVEL.

3.3 HIGH-HIGH TANK. OMI alarms when HI-HI level switch for any tank is tripped. Local OMI and Renton supervisory alarms, displays and logs HI HI TANK (number) and will have previously alarmed, displayed and logged HI-TANK (number)

3.4 FIRE EYES. when a change of light density is detected for a specified time duration, a fire eyes alarm is initiated. Local OMI and Renton supervisory alarms, displays and logs FIRE EYES ALARM. When the FIRE EYES protection is disabled, a FIRE EYES DISARMED alarm is generated to both local OMI and Renton supervisory.

When a TERMINAL LOCKOUT occurs, the following actions are performed:

a. Ferndale Incoming Shutdown.

b. Anacortes Incoming Shutdown.

c. Ferndale Outgoing Shutdown.

d. Anacortes Outgoing Shutdown.

e. Main Line Units shutdown and are inhibited from starting

f. Sump Pump, Injection Pump and Transfer Pump shutdown and are inhibited from starting in Auto. Will operate from Hand Position

4. FERNDALE INCOMING SHUTDOWN. A Ferndale Incoming Shutdown is initiated when any of the following occurs: Local OMI and Renton supervisory alarms, displays and logs FERNDALE INCOMING SHUTDOWN appropriate pump shutdowns and the following additional alarms.

4.1 Terminal lockout

4.2 Initiation of FERNDALE INCOMING SHUTDOWN from Renton Control Center or from Local OMI.

4.3 FERNDALE INCOMING INCOMPLETE SEQUENCE TANK MANIFOLD. More than one Ferndale Tank Inlet manifold valve is open or partially open after a preset time duration. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. FERNDALE INLET MAN.

4.4 FERNDALE PUMP FEED INCOMPLETE SEQUENCE. Ferndale Normal Pump Feed (V-2000) and Ferndale Tight Line Pump Feed (V-2007) valve is open or partially open. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. FERNDALE INCOMING MAN. , INC. SEQ. FERNDALE OUTLET MAN.

4.5 HIGH LOOP PRESSURE. When pressure in Ferndale Incoming loop rises to actuate upstream pressure switch set at specified pressure. Local OMI and Renton supervisory alarms, displays and logs HI LOOP PRESS. FERNDALE INLET MAN

When a FERNDALE INCOMING SHUTDOWN occurs, the following actions are performed:

a. Motor to control valve (CV-1904) and (CV-1951) is shutdown after 4-5 minutes following initiation of Shutdown and inhibited from starting.

b. Ferndale Receiver Inlet (V-1902) or Ferndale Receiver By-Pass (V-1903) (whichever is open) closes.

c. After above Receiver valves are closed, close the Ferndale Tight Line Pump Feed (V-2007) or Ferndale Inlet Manifold valves (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035).

5. ANACORTES INCOMING SHUTDOWN A Anacortes Incoming Shutdown is initiated when any of the following occurs: Local OMI and Renton supervisory alarms, displays and logs FERNDALE ANACORTES INCOMING SHUTDOWN appropriate pump shutdowns and the following additional alarms.

5.1 Terminal lockout

5.2 Initiation of ANACORTES INCOMING SHUTDOWN from Renton Control Center or from Local OMI.

5.3 ANACORTES INCOMING INCOMPLETE SEQUENCE TANK MANIFOLD. More than one Anacortes Tank Inlet manifold valve is open or partially open after a preset time duration. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES INLET MAN.

5.4 ANACORTES PUMP FEED INCOMPLETE SEQUENCE Anacortes Normal Pump Feed (V-1999) and Anacortes Tight Line Pump Feed (V-2008) valve is open or partially open. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES INCOMING MAN. , INC. SEQ. ANACORTES OUTLET MAN.

5.5 HIGH LOOP PRESSURE. When pressure in Anacortes Incoming loop rises to actuate upstream pressure switch set at specified pressure. Local OMI and Renton supervisory alarms, displays and logs HI LOOP PRESS. ANACORTES INLET MAN

ANACORTES INCOMING SHUTDOWN. On Shutdown, the following occurs:

a. Motor to control valve (CV-1916) and (CV-1946) is shutdown after 4-5 minutes following initiation of Shutdown and inhibited from starting.

b. Anacortes Receiver Inlet (V-1914) or Anacortes Receiver By-Pass (V-1915) (whichever is open) closes.

c. After above Receiver valves are closed close the Anacortes Tight Line Pump Feed (V-2008) or Anacortes Inlet Manifold valves (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041).

6. FERNDALE OUTGOING SHUTDOWN . Ferndale Outgoing is initiated when any of the following occurs: Local OMI and Renton supervisory alarms, displays and logs FERNDALE OUTGOING SHUTDOWN appropriate pump shutdowns and the following additional alarms.

6.1 Terminal lockout

6.2 Initiation of FERNDALE OUTGOING SHUTDOWN from Renton Control Center or from Local OMI.

6.3 FERNDALE OUTGOING INCOMPLETE SEQUENCE TANK MANIFOLD. More than one Ferndale Tank Outlet manifold valve is open or partially open after a preset time duration. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. FERNDALE INLET MAN.

6.4 FERNDALE PUMP FEED INCOMPLETE SEQUENCE. Ferndale Normal Pump Feed (V-2000) and Ferndale Tight Line Pump Feed (V-2007) valve is open or partially open. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. FERNDALE INCOMING MAN. , INC. SEQ. FERNDALE OUTGOING MAN.

FERNDALE OUTGOING SHUTDOWN. On Shutdown, the following occurs:

a. The main line unit (U1), (U2) if pumping for Ferndale and injection pump if pumping for Ferndale are shut-down and inhibited from starting.

b. Ferndale Launcher Outlet (V-1926) or Ferndale Launcher By-Pass (V-1925) (whichever is open) closes.

c. Close the Ferndale Normal Pump Feed (V-2000) and Ferndale Outlet Manifold valves (V-2048, V-2049, V-2050, V-2051, V-2052).

7. ANACORTES OUTGOING SHUTDOWN . Anacortes Outgoing is initiated when any of the following occurs: Local OMI and Renton supervisory alarms, displays and logs ANACORTES OUTGOING SHUTDOWN appropriate pump shutdowns and the following additional alarms.

7.1 Terminal lockout

7.2 Local initiation of ANACORTES OUTGOING SHUTDOWN from Renton Control Center or from Local OMI.

7.3 ANACORTES OUTGOING INCOMPLETE SEQUENCE TANK MANIFOLD. More than one Anacortes Tank Outlet manifold valve is open or partially open after a preset time duration. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES OUTGOING MAN.

7.4 ANACORTES PUMP FEED INCOMPLETE SEQUENCE Anacortes Normal Pump Feed (V-1999) and Anacortes Tight Line Pump Feed (V-2008) valve is open or partially open. Local OMI and Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES INCOMING MAN. , INC. SEQ. ANACORTES OUTLET MAN.

ANACORTES OUTGOING SHUTDOWN. On Shutdown, the following occurs:

a. The main line unit (U3), (U2) if pumping for Anacortes and injection pump if pumping for Anacortes are shut-down and inhibited from starting..

b. Anacortes Launcher Outlet (V-1935) or Anacortes Launcher By-Pass (V-1934) (whichever is open) closes.

c. Close the Anacortes Normal Pump Feed (V-1999) and Anacortes Outlet Manifold valves (V-2042, V-2043, V-2044, V-2045, V-2046).

8. FACILITY RESETS.

Resetting a terminal lockout will release the following facilities to be individually reset.

8.1 FERNDALE INCOMING RESET. Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs FERNDALE INCOMING RESET. On Reset, the following occurs:

a. Ferndale Receiver Inlet (V-1902) or Ferndale Receiver By-Pass (V-1903) released to open after Ferndale Tank Inlet (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035) or Ferndale Tight Line Pump Feed (V-2007) is open.

b. Ferndale Tight Line Pump Feed (V-2007) and Ferndale Inlet Manifold valves (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035). released to open

8.2 ANACORTES INCOMING RESET . Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs ANACORTES INCOMING RESET. On Reset, the following occurs:

a. Anacortes Receiver Inlet (V-1914) or Anacortes Receiver By-Pass (V-1915) released to open after Anacortes Tank Inlet (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041) or Anacortes Tight Line Pump Feed (V-2008) is open.

b. Anacortes Tight Line Pump Feed (V-2008) and Anacortes Inlet Manifold valves (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041) released to open

8.3 FERNDALE OUTGOING RESET . Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs FERNDALE OUTGOING RESET. On Reset, the following occurs:

a. The injection pump and main line unit are released for normal operation for Ferndale.

b. Ferndale Launcher Inlet (V-1927) or Ferndale Launcher By-Pass (V-1925) released to open.

c. Ferndale Normal Pump Feed (V-2000) and Ferndale Outlet Manifold valves (V-2048, V-2049, V-2050, V-2051, V-2052) released to open.

8.4 ANACORTES OUTGOING RESET . Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs ANACORTES OUTGOING RESET. On Reset, the following occurs:

a. The injection pump and main line unit are released for normal operation for Anacortes..

b. Anacortes Launcher Inlet (V-1936) or Anacortes Launcher By-Pass (V-1934) released to open

c. Anacortes Normal Pump Feed (V-1999) and Anacortes Outlet Manifold valves (V-2042, V-2043, V-2044, V-2045, V-2046). released to open

9. UNIT #1 LOCKOUT initiates a UNIT SHUTDOWN a Local OMI and Renton supervisory alarms, displays and logs UNIT #1 LOCKOUT, UNIT #1 SHUTDOWN, and the following additional alarms. A unit lockout condition is initiated when any of the following occurs:

9.1 Multilin Trip. OMI and Renton supervisory alarms, displays and logs UNIT #1 MULTILIN TRIP

a. Acceleration. On UNIT START, the electrical current has exceeded the full load current for a time period longer than the permitted acceleration time.

b. Stator RTD. Any one of RTDs 1 through 5 has exceeded the trip limit.

c. Bearing/case RTD. Any one of the RTDs 6 through 10 has exceeded the trip limit.

d. Ground fault. The unit "current-to-ground" has exceeded the ground fault trip level for a time period longer than the delay time.

e. Hi Amp.

f. Overload. The unit thermal capacity exceeded 100% for a time period longer than the lockout time.

g. Rapid trip. Mechanical jam.

h. Short circuit. The electrical current exceeded the Short Circuit trip level for a time period longer than the delay time.

i. Single phase. The unit electrical current unbalanced exceeded 30% for a time period greater than 4-seconds.

j. Unbalanced current. The electrical current unbalance has exceeded the unbalance trip level for a period of time greater than 5 seconds.

9.2 Motor vibration. Motor vibration exceeds preset lockout level for a preset time duration. OMI alarms, displays and logs UNIT #1 MOTOR VIBRATION Renton supervisory alarms, displays and logs UNIT #1 VIBRATION

9.3 Pump vibration. Pump vibration exceeds preset lockout level for a preset time duration. OMI alarms, displays and logs UNIT #1 PUMP VIBRATION Renton supervisory alarms, displays and logs UNIT #1 VIBRATION

9.4 Seal leak. The level in the seal leak pot has reached the preset lockout level. OMI and Renton supervisory alarms, displays and logs UNIT #1 SEAL LEAK

9.5 Incomplete sequence. On unit start sequence the unit suction and discharge valves did not get full open and or unit running status did not happen within the delay time. OMI and Renton supervisory alarms, displays and logs UNIT #1 INC SEQ.

10. UNIT #2 LOCKOUT is the same as Unit #1 above with the following addition:

10.6 Incomplete Sequence-Drain/Fill Pump Unit. If unit drain/fill valves do not get full closed within specified time period. OMI and Renton supervisory alarms, displays and logs UNIT #2 DRAIN/FILL INC SEQ.

11. UNIT #3 LOCKOUT is the same as Unit #1:

12. UNIT #1 START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit suction valve (V-1981) begins to open.

b. Incomplete sequence timer begins timing.

c. When pump unit suction valve is open, pump unit discharge valve (V-1983) begins to open.

d. When pump unit discharge valve starts open, the motor starts.

e. When motor starts and suction and discharge valves are fully open, incomplete sequence time is reset.

13. UNIT #1 SHUTDOWN. Unit #1 Shutdown is indicated on OMI. Renton supervisory displays and logs UNIT #1 SHUTDOWN and the following additional alarms.

13.1 Initiation of Unit Shutdown from local OMI, the supervisory systems from the pole position

13.2 LOW UNIT #1 SUCTION PRESSURE. When pump unit is running and the unit suction pressure drops below specified pressure the unit shuts down. When LOW SUCTION is clear, unit can be restarted. Supervisory systems alarm, display and log UNIT #1 LOW SUCTION

13.3. UNIT NO FLOW. When pump unit is running and the unit flow switch indicates no flow for preset time the unit shuts down. The unit can be restarted. Supervisory systems alarm, display and log UNIT #1 NO FLOW

13.4 HIGH FERNDALE CONTROL PRESSURE. The pump unit is shutdown if the station control pressure rises to specified pressure. Supervisory systems alarm, display and log FERNDALE HI CONTROL.

When a UNIT #1 SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.

b. Suction (V-1981) and discharge (V-1983) valves close.

14. UNIT #2 FERNDALE START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit Ferndale suction valve (V-1986) begins to open.

b. Incomplete sequence timer begins timing.

c. Pump unit drain/fill sequence is inhibited from operation.

d. When pump unit Ferndale suction valve open, pump unit Ferndale discharge valve (V-1990) begins to open.

e. When pump unit Ferndale discharge valve starts open the motor starts.

f. After 30 sec of unit start Ferndale Unit 2 bypass valve(V-1985) begins to close.

g. When motor starts and Ferndale suction and Ferndale discharge valves are fully open, incomplete sequence time is reset.

h. Anacortes Unit #2 suction valve (V-1987) and discharge valve (V-1989) are inhibited from operating.

15. UNIT #2 ANACORTES START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit Anacortes suction valve (V-1987) begins to open.

b. Incomplete sequence timer begins timing.

c. Pump unit drain/fill sequence is inhibited from operation.

d. When pump unit Anacortes suction valve open, pump unit Anacortes discharge valve (V-1989) begins to open.

e. When pump unit Anacortes discharge valve starts open, the motor starts.

f. When motor starts and Anacortes suction and Anacortes discharge valves are fully open, incomplete sequence time is reset.

g. Ferndale Unit #2 suction valve (V-1986) and discharge valve (V-1990) are inhibited from operating.

16. UNIT #2 FERNDALE SHUTDOWN. is the same as Unit #1 with the following addition:

16.4 HIGH FERNDALE CONTROL PRESSURE. The pump unit is shutdown if the station control pressure rises to specified pressure. Supervisory systems alarm, display and log FERNDALE HI CONTROL.

17. UNIT #2 ANACORTES SHUTDOWN. is the same as Unit #1 with the following addition.:

17.4 HIGH ANACORTES CONTROL PRESSURE. The pump unit is shutdown if the station control pressure rises to specified pressure. Supervisory systems alarm, display and log ANACORTES HI CONTROL.

When a UNIT #2 SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.

b. Bypass (V-1985) valve open if closed (Ferndale only).

c. After Ferndale bypass (V-1985) valve is open suction (V-1986) and discharge (V-1990) valves close or Anacortes suction (V-1987) and discharge (V-1989) valves close.

d. Ferndale Unit #2 suction (V-1986) valve and discharge (V-1990) are released.

e. Anacortes Unit #2 suction (V-1987) valve and discharge (V-1989) are released.

18. UNIT #3 START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit suction valve (V-1992) begins to open.

b. Incomplete sequence timer begins timing.

c. When pump unit suction valve is open, pump unit discharge valve (V-1994) begins to open.

d. When pump unit discharge valve starts open, the motor starts.

e. After 30 sec of unit start Anacortes Unit 3 bypass (V-1991) valve begins to close.

f. When motor starts and suction and discharge valves are fully open, incomplete sequence time is reset.

19. UNIT #3 SHUTDOWN. is the same as Unit #1.:

When a UNIT #3 SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.

b. Bypass (V-1991) valve open.

c. After bypass (V-1991) valve is open suction (V-1992) and discharge (V-1994) valves close.

20. DRAIN/FILL PUMP #2 SEQUENCE. Pump drain/fill sequence can be initiated from local OMI or from the Renton Control Center. When the drain sequence is initiated, the pump unit is inhibited from starting until the fill sequence is complete. The drain/fill sequence is inhibited if the pump unit suction or discharge valves (V-1986, V-1990, V-1987, V-1989) are open or partially open. Status (drain or fill) is indicated on local OMI. NOTE: The drain status indication remains until the "fill" cycle is complete. Renton supervisory displays and logs status (drain or fill).

Pump drain sequence -

a. Pump vent (V-2217) valve opens and the "vent drain" timer is started.

b. Pump drain valve (V-2215) open.

d. When the "vent drain" timer times out the vent and drain valves close.

Pump fill sequence -

a. Pump vent (V-2217) valve opens and the "vent fill" timer is started.

b. Pump fill valve Anacortes (V-2216) or Ferndale (V-2214) opens.

c. When the "vent fill" timer times out, the vent valve and fill valve close and

the pump unit is released for normal operation.

21. HIGH LEVEL TANK. OMI alarms when utility tank liquid level rises to specified high level. Renton supervisory alarms, displays and logs and HI-TANK (number).

22. T209 TANK MIXER START. Tank mixer start when the Ferndale line injection valve (V-1996) or the Anacortes line injection valve (V-1997) are opened or can be initiated from the pole position. If the start is from the pole position, the Tank mixer will not automatically shutdown at the specified Low Utility Tank Level and will override facility shutdown or lockout. Tank Mixer Status is indicated on OMI display and Renton supervisory.

23. T209 TANK MIXER SHUTDOWN. If injection pump pole switch is in the "hand" position, the Tank mixer does not automatically shutdown. Tank Mixer Status is indicated on OMI display and Renton supervisory.

23.1 Initiation of Tank mixer shutdown from the pole position.

23.2 When injection valve (V-1996 and V-1997) are closed.

23.3 When utility tank liquid level drops to specified low level.

24. T209 TANK MIXER RUNNING ALARM. OMI alarms when low level tank mixer is running and utility tank liquid level drops to specified. Renton supervisory alarms, displays and logs T209 MIXER RUNNING alarm.

25. INJECTION PUMP START. Injection pump start can be initiated from the pole position, local OMI or from the Renton Control Center. Injection amount set point prior to initiation. If the start is from the pole position, the injection pump will not automatically shutdown at the specified Low Utility Tank Level and will override facility shutdown or lockout. Injection Pump Start is indicated on OMI display. OMI and Renton supervisory displays and logs INJECTION PUMP START.

a. Open injection valve (V-1996 , V-1997). After specified time if injection pump not running injection valves will close.

b. Enter setpoint amount to inject.

c. Start pump command.

26. INJECTION PUMP SHUTDOWN. If injection pump pole switch is in the "hand" position, the injection pump does not automatically shutdown. OMI and Renton supervisory displays and logs INJECTION PUMP SHUTDOWN, and the following additional alarms.

26.1 Initiation of injection pump shutdown from local OMI, the supervisory systems or from the pole position

26.2 INJECTION PUMP HIGH PRESSURE. when pressure on discharge side of injection pump rises to specified pressure. Renton supervisory alarms, displays and logs INJ. HI PRESS

26.3 The injection set point amount has pumped

26.4 LOW LEVEL TRANSMIX TANK when utility tank liquid level drops to specified low level.

26.5 Product going into the transmix tank indicated by flow switch.

26.6 No injection valve fully open (V-1996 and V-1997).

26.7 Shutdown of facility pump injecting to.

27. HIGH LEVEL SUMP. OMI alarms when sump liquid level rises to specified high level. Renton supervisory alarms, displays and logs HIGH SUMP indications.

28. SUMP PUMP START. Sump Pump Start can be initiated from the pole position, local OMI or from the Renton Control Center. If the start is from the pole position, the sump pump will not automatically shutdown at the specified Low Sump Tank Level and will override terminal lockout. On initiation, if the sump level is above low level, the sump pump starts. Sump Pump Start indicated on OMI display. Renton supervisory displays and logs SUMP PUMP START.

a. Pump discharge valve (V-2155) begins to open.

b. When pump discharge valve is open, the sump motor starts.

29. SUMP PUMP SHUTDOWN. If the sump pump pole switch is in the "hand" position, the sump pump will not shutdown automatically. Sump Pump Shutdown is indicated on OMI display. Renton supervisory displays and logs SUMP PUMP SHUTDOWN.

29.1 Initiation of sump pump shutdown from local OMI, the supervisory systems or from the pole position

29.2 When sump tank liquid level drops to specified low level.

29.3 SUMP PUMP NO FLOW. OMI alarms, sump pump will shutdown and discharge valve (V-2155) closes if the flow switch located on discharge side of sump pump does not detect positive flow in specified time. Renton supervisory alarms, displays and logs SUMP PUMP NO FLOW indications.

When a SUMP PUMP SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.

b. Discharge (V-2155) valves close.

30. TANK TRANSFER PUMP START. Sump Pump Start can be initiated from the pole position. Tank Transfer Pump Start indicated on OMI display. Renton supervisory displays and logs TANK TRANSFER PUMP START.

31. TANK TRANSFER PUMP SHUTDOWN. Tank Transfer pump will not shutdown automatically. Tank Transfer Pump Shutdown is indicated on OMI display. Renton supervisory displays and logs TANK TRANSFER PUMP SHUTDOWN.

32. SCRAPER PASSAGE. OMI alarms and counter on local OMI is advanced when sphere arrival actuates Pig-Sig. Renton supervisory alarms, displays and logs SCRAPER IN or SCRAPER OUT indication.

33. SURGE FLOW SWITCH. OMI alarms when pressure in delivery loop rises to specified pressure to open surge valve and detect flow. The surge valve close when drops below open setting . Local OMI and Renton supervisory alarms, displays and logs indication of flow.

34. FIRE EYES DISARMED. OMI and Renton Control Center display and log FIRE EYES DISARMED when the fire eyes disarm switch is initiated. The station is inhibited from lockout due to fire eyes detection.

35. SAMPLER HI POT. OMI alarms when sampler pot liquid level rises to specified high level. Renton supervisory alarms, displays and logs SAMPLER ALARM and HI POT.

36. SAMPLER RESET. Sampler Reset can be initiated from local OMI. Sampler Reset indicated on OMI display. Renton supervisory displays and logs SAMPLER RESET

37. SAMPLER START. Sampler Start can be initiated from local OMI or from the Renton Control Center. Sampler must be reset and sample batch size amount must be set point prior to initiation. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER SEQSTART

38. SAMPLER FLUSH. Automatic sequence after 950 barrels. The sampler block valve opens sampler flush valve opens for 20 sec. to flush line. Sampler Flush indicated on OMI display.

39. SAMPLER SAMPLING. Automatic sequence after 1000 barrels and flush sequence done. The metering valve starts putting product samples in sample pot. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER SAMPLING and percent done.

40. SAMPLER DONE. Automatic sequence 1000 barrels before end of batch. The sampler block valve close sampler flush valve closes and sampler pot valve close. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER DONE.

41. SAMPLER ALARM. If sampler is stopped before completing automatic sequence. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER ALARM.

42. FIRE CONTROL SMOKE/FIRE ALARM. Control building fire alarm system. Should a fire or smoke detector be activated, the local Fike fire system alarms. Renton supervisory displays and logs FIRE CONTROL SMOKE/FIRE ALARM.

43. FIRE SYSTEM GENERAL ALARM. General alarm that is activated under the following conditions:

a. Manual fire pull station active.

b. 3" foam system H2O pressure activated.

c. Fire building sprinkler system flow activated.

d. Water to Tank foam system pressure activated. (No independent alarm)

The local Fike fire system alarms. Renton supervisory displays and logs FIRE SYSTEM GENERAL ALARM.

44. FIRE SYSTEM COMMON TROUBLE. Common trouble alarm is activated under the following conditions:

a. Internal-Loss of A/C power to the panel, low battery or supervisory self test.

b. External-Loss of A/C power to the fire building.

Low air 3" foam system.

Low temperature fire building.

Loss of A/C power to horn.

Local Fike fire alarm system alarms. Renton supervisory displays and logs FIRE SYSTEM COMMON TROUBLE.

45. FIRE PULL STATION ACTIVE. (Manually operated only) When one or more of the fire pull station located around the piping and pump area are activated, the Fike fire alarm system alarms, Renton supervisory displays and logs FIRE PULL STATION ACTIVE.

46. 3" H2O FOAM PRESSURE ACTIVE. When the system water pressure has been directed to the 3" sprinkler system through the differential pressure control valve after having lost air pressure in the 3" system The Fike fire alarm system alarms. Renton supervisory displays and logs 3" H2O FOAM PRESSURE ACTIVE (The 3" water system piping is dry and maintains approx. 50 psi air)

47. FIRE SYSTEM LOW AIR PRESSURE 3" FOAM. When the dry system air pressure drops below approximately 25 psi, the air compressor is no longer running or is running and not able to keep up with the volume of air being released from the system. The Fike fire alarm system alarms. Renton supervisory displays and logs FIRE SYSTEM LOW AIR PRESSURE 3" FOAM.

48. STATION FIRE BUILDING A/C POWER FAILURE. When the Fire House power is tripped, the Fike fire alarm system alarms. Renton supervisory displays and logs STATION FIRE BUILDING A/C POWER FAILURE.

49. FIRE BUILDING LOW TEMPERATURE. When the temperature in the Fire House drips below 45 - 50 degrees, the Fike fire alarm system alarms. Renton supervisory displays and logs FIRE BUILDING LOW TEMPERATURE.

50. FIRE BUILDING SPRINKLER SYSTEM. When the Fire House sprinkler system is activated, the Fike fire alarm system alarms. Renton supervisory displays and logs FIRE BUILDING SPRINKLER SYSTEM.

51. STORM DRAIN SUMP LEL % (tank area drain). When the LEL % reaches 10% the local OMI and Renton supervisory displays and logs STORM DRAIN SUMP LEL %.

52. STORM DRAIN SUMP PRODUCT LEVEL. When the product level rises above the S.D.S.W.L. by an increment of .05 feet, the local OMI and Renton supervisory displays and logs STORM DRAIN SUMP PRODUCT LEVEL.

53. STORM DRAIN SUMP WATER LEVEL. When the water level rises to a specified level, the local OMI and Renton supervisory displays and logs STORM DRAIN SUMP WATER LEVEL.

54. PAD DRAIN SUMP LEL %. When the pad drain pump LEL % reaches 10%, the local OMI and Renton supervisory displays and logs V-212 PAD DRAIN LEL %.

55. PAD DRAIN SUMP LEVEL. When the water level drops below the outlet line, this indicates product accumulation above the water, sinking the float. Local OMI and Renton supervisory displays and logs PAD DRAIN SUMP LEVEL.

Revised March 15, 1999

Protective Devices

Device	Number	Variable Component	Set Point
CONTROL VALVES			
Ferndale Inlet	CV-1904	Pressure	Psi 100-1600, F 0-16000
Anacortes Inlet	CV-1916	Pressure	Psi 50-1600, F 0-16000
Anacortes Back Pressure	CV-1946	Pressure	Psi 35 Min. 0-600
Ferndale Back Pressure	CV-1951	Pressure	Psi 35 Min. 0-600
Ferndale Discharge	CV-1963	Pressure	Psi 0-1600, F 0-16000
Anacortes Discharge	CV-1969	Pressure	Psi 0-1600, F 0-16000
SURGE RELIEF VALVES			
Ferndale Inlet	RV-1919	Pressure	650 psig
Anacortes Inlet	RV-1923	Pressure	650 psig
Ferndale Discharge	RV-1932	Pressure	650 psig
Anacortes Discharge	RV-1941	Pressure	650 psig
Ferndale Donut Manifold	RV-2002	Pressure	250 psig
Anacortes Donut Manifold	RV-2005	Pressure	250 psig
TK-202 Inlet	RV-2065	Pressure	200 psig
TK-204 Inlet	RV-2072	Pressure	200 psig
TK-205 Inlet	RV-2077	Pressure	200 psig
TK-203 Inlet	RV-2082	Pressure	200 psig
TK-206 Inlet	RV-2088	Pressure	200 psig
THERMAL RELIEF VALVES			
Ferndale Receiver R-201	RV-1910	Pressure	1480 psig
Anacortes Receiver R-202	RV-1917	Pressure	1480 psig
Ferndale Launcher L-201	RV-1939	Pressure	1480 psig
Anacortes Launcher L-202	RV-1949	Pressure	1480 psig
Ana Incoming Strainer	RV-1953	Pressure	740 psig
Ana Incoming Strainer Outlet	RV-1955	Pressure	740 psig
Fern Incoming Strainer	RV-1964	Pressure	740 psig
Fern Incoming Strainer Outlet	RV-1965	Pressure	740 psig
Fern Outgoing Meter Outlet	RV-1970	Pressure	740 psig
Fern Outgoing Strainer Outlet	RV-1976	Pressure	740 psig
Fern Outgoing Strainer	RV-1978	Pressure	740 psig
Fern Outgoing Strainer Inlet	RV-1982	Pressure	740 psig
Ana Outgoing Meter Outlet	RV-1993	Pressure	740 psig
Ana Outgoing Strainer Outlet	RV-2004	Pressure	740 psig
Ana Outgoing Strainer	RV-2009	Pressure	740 psig
Ana Outgoing Strainer Inlet	RV-2011	Pressure	740 psig
P-201 Discharge	RV-2013	Pressure	740 psig

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P-202 Discharge	RV-2020	Pressure	740 psig
P-203 Discharge	RV-2025	Pressure	740 psig
P-205 Discharge	RV-2057	Pressure	285 psig
P-206 Discharge	RV-xxxx	Pressure	590 psig
Ferndale Inlet Manifold	RV-2058	Pressure	740 psig
Anacortes Inlet Manifold	RV-2060	Pressure	740 psig
TK-202 Transfer Line	RV-2064	Pressure	285 psig
TK-204 Transfer Line	RV-2070	Pressure	285 psig
TK-205 Transfer Line	RV-2076	Pressure	285 psig
TK-203 Transfer Line	RV-2081	Pressure	285 psig
TK-206 Transfer Line	RV-2087	Pressure	285 psig
MISCELLANEOUS RELIEF VALVES			
Product Sump V-211	RV-2102	Pressure	2.6 in H20 pressure/ 0.865 in H20 vacuum
TK-202 Floating Roof	RV-2192A	Pressure	+/- 1/2" WC
TK-202 Floating Roof	RV-2192B	Pressure	+/- 1/2" WC
TK-202 Floating Roof	RV-2192C	Pressure	+/- 1/2" WC
TK-202 Floating Roof	RV-2192D	Pressure	+/- 1/2" WC
TK-204 Floating Roof	RV-2193A	Pressure	+/- 1/2" WC
TK-204 Floating Roof	RV-2193B	Pressure	+/- 1/2" WC
TK-204 Floating Roof	RV-2193C	Pressure	+/- 1/2" WC
TK-204 Floating Roof	RV-2193D	Pressure	+/- 1/2" WC
TK-205 Floating Roof	RV-2194A	Pressure	+/- 1/2" WC
TK-205 Floating Roof	RV-2194B	Pressure	+/- 1/2" WC
TK-205 Floating Roof	RV-2194C	Pressure	+/- 1/2" WC
TK-205 Floating Roof	RV-2194D	Pressure	+/- 1/2" WC
TK-203 Floating Roof	RV-2195A	Pressure	+/- 1/2" WC
TK-203 Floating Roof	RV-2195B	Pressure	+/- 1/2" WC
TK-203 Floating Roof	RV-2195C	Pressure	+/- 1/2" WC
TK-203 Floating Roof	RV-2195D	Pressure	+/- 1/2" WC
TK-206 Floating Roof	RV-2196A	Pressure	+/- 1/2" WC
TK-206 Floating Roof	RV-2196B	Pressure	+/- 1/2" WC
TK-206 Floating Roof	RV-2196C	Pressure	+/- 1/2" WC
TK-206 Floating Roof	RV-2196D	Pressure	+/- 1/2" WC
TK-209 Floating Roof	RV-2197A	Pressure	+/- 1/2" WC
TK-209 Floating Roof	RV-2197B	Pressure	+/- 1/2" WC
TK-209 Floating Roof	RV-2197C	Pressure	+/- 1/2" WC
TK-209 Floating Roof	RV-2197D	Pressure	+/- 1/2" WC
PRESSURE SWITCHES			
High Inlet - Ferndale	PS-1911	Pressure	700 psig

High Inlet - Anacortes	PS-1929	Pressure	700 psig
High Discharge - Ferndale	PS-1979	Pressure	700 psig
High Discharge - Anacortes	PS-2010	Pressure	700 psig
Low Suction - P-201	PS-2016	Pressure	2 psig Decr. 16 npsha
Low Suction - P-202	PS-2022	Pressure	2 psig Decr. 16 npsha
Low Suction - P-203	PS-2028	Pressure	2 psig Decr. 16 npsha
Injection Pump P-206	PS -	Pressure	600 psig
FLOW SWITCHES			
Low Flow - P-201 Suction	FS-2015	Flow	26 gpm
Low Flow - P-202 Suction	FS-2021	Flow	26 gpm
Low Flow - P-203 Suction	FS-2027	Flow	26 gpm
Flow to Relief Header	FS-2099	Flow	26 gpm
TANK LEVEL			
High Level - TK-202		Level	42.10'
High Level - TK-204		Level	42.10'
High Level - TK-205		Level	42.10'
High Level - TK-203		Level	42.10'
High Level - TK-206		Level	42.10'
High Level - TK-209		Level	26.00'
High Level - Product Sump		Level	4.00'
High Level - Sump Containment	LS-2107	Level	0.5'
High High Level - TK-202	LS-2066	Level	43.67'
High High Level - TK-204	LS-2073	Level	43.67'
High High Level - TK-205	LS-2078	Level	43.67'
High High Level - TK-203	LS-2083	Level	43.67'
High High Level - TK-206	LS-2089	Level	43.67'
High High Level - TK-209	LS-2112	Level	34.25'
High High Level - Product Sump	LS-2105	Level	5.00'
Low Mixer Level - TK-209		Level	6.50'
Low Injection Level - TK-209		Level	6.00'
Low Level - Product Sump		Level	1.00'
High Level - P-201 Seal Pot	LS-2126	Level	
High Level - P-202 Seal Pot	LS-2127	Level	
High Level - P-203 Seal Pot	LS-2128	Level	
TIMERS			
Unit Fail to Stop		Time	10 Seconds
Main Line Unit Incomplete Sequence		Time	135 Seconds
Multilin Settings (See Multilin)			
Main Line Unit No Flow		Time	70 Seconds

Main Line Unit Low Suction		Time	1 Seconds
Unit #2 Pump drain Sequence		Time	____ Seconds
Unit #2 Pump Fill Sequence		Time	____ Seconds
High Discharge Pressure		Time	1 Seconds
High Control Pressure		Time	1 Seconds
Fire Eyes		Time	1 Seconds
Fire System Water Pressure		Time	0 Seconds
Building Smoke Detectors		Time	0 Seconds
Foam System (Manual)		Time	0 Seconds
Hydrant System (Manual)		Time	0 Seconds
Motor/Pump Vibration Start up		Time	10 Seconds
Sump Pump No Flow		Time	30 Seconds
Incomplete Seq. Drain/Fill		Time	15 Seconds
Incomplete Seq. Ferndale / Anacortes Inlet Manifold		Time	140 Seconds
Incomplete Seq. Ferndale / Anacortes Outlet Manifold		Time	140 Seconds

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Valve Functions

1. Ferndale Receiver Inlet (V-1902)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless a Ferndale Tank Inlet (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035) or Ferndale Tight Line Pump Feed (V-2007) is open.

Cannot close unless Ferndale Receiver By-Pass (V-1903) is open except on Ferndale Incoming Shutdown.

2. Ferndale Receiver By-Pass (V-1903)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless a Ferndale Tank Inlet (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035) or Ferndale Tight Line Pump Feed (V-2007) is open.

Cannot close unless Ferndale Receiver Inlet (V-1902) and Ferndale Receiver Outlet (V-1907) is open except on Ferndale Incoming Shutdown.

3. Ferndale Receiver Outlet (V-1907)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Ferndale Receiver By-Pass (V-1903) is open.

4. Anacortes Receiver Outlet (V-1912)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Anacortes Receiver By-Pass (V-1919) is open.

5. Anacortes Receiver Inlet (V-1914)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless a Anacortes Tank Inlet (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041) or Anacortes Tight Line Pump Feed (V-2008) is open.

Cannot close unless Anacortes Receiver By-Pass (V-1915) is open except on Anacortes Incoming Shutdown.

6. Anacortes Receiver By-Pass (V-1915)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless a Anacortes Tank Inlet (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041) or Anacortes Tight Line Pump Feed (V-2008) is open.

Cannot close unless Anacortes Inlet Receiver (V-1914) and Anacortes Receiver Outlet (V-1912) is open except by 16"/20" Station Lockout on Ferndale Incoming Shutdown.

7. Ferndale Launcher By-Pass (V-1925)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Ferndale Launcher Inlet (V-1927) and Ferndale Launcher Outlet (V-1926) is open except on Ferndale Outgoing Shutdown.

8. Ferndale Launcher Outlet (V-1926)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Ferndale Receiver By-Pass (V-1925) is open except on Ferndale Outgoing Shutdown.

9. Ferndale Launcher Inlet (V-1927)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Ferndale Receiver By-Pass (V-1925) is open.

10. Anacortes Launcher By-Pass (V-1934)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Anacortes Launcher Inlet (V-1936) and Anacortes Launcher Outlet (V-1935) is open except on Ferndale Outgoing Shutdown.

11. Anacortes Launcher Outlet (V-1935)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Anacortes Launcher By-Pass (V-1934) is open except on Anacortes Outgoing Shutdown.

12. Anacortes Launcher Inlet (V-1936)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot close unless Anacortes Launcher By-Pass (V-1934) is open.

13. Anacortes Incoming Prover Bypass (V-1947)

Control: Local OMI, Valve operator,

Renton supervisory - open/close

Sequence: NONE

14. Ferndale Incoming Prover Bypass (V-1952)

Control: Local OMI, Valve operator,

Renton supervisory - open/close

Sequence: NONE

15. Ferndale Outgoing Prover Bypass (V-1961)

Control: Local OMI, Valve operator,

Renton supervisory - open/close

Sequence: NONE

16. Anacortes Outgoing Prover Bypass (V-1967)

Control: Local OMI, Valve operator,

Renton supervisory - open/close

Sequence: NONE

17. Unit #1 Suction (V-1981)

Control: Valve operator only.

Sequence: Opens when Unit #1 is initiated to start. Closes following shutdown of Unit #1.

18. " Unit #1 Discharge (V-1983)

Control: Valve operator only.

Sequence: Opens when Unit #1 Suction (V-1981) is open following initiation of Unit #1 Unit to start. Initiated motor to start when unseated from closed position. Closes following shutdown of Unit #1.

19. Ferndale Unit #2 Bypass (V-1985)

Control: Valve operator only.

Sequence: Opens when Ferndale Unit #2 is initiated to shutdown. Closes when Ferndale Unit #2 is initiated to start.

20. Ferndale Unit #2 Suction (V-1986)

Control: Valve operator only.

Sequence: Opens when Ferndale Unit #2 is initiated to start. Closes following shutdown of Ferndale Unit #2.

21. Anacortes Unit #2 Suction (V-1987)

Control: Valve operator only.

Sequence: Opens when Anacortes Unit #2 is initiated to start. Closes following shutdown of Anacortes Unit #2.

22. Anacortes Unit #2 Discharge (V-1989)

Control: Valve operator only.

Sequence: Opens when Anacortes Unit #2 Suction (V-1986) is open following initiation of Anacortes Unit #2 Unit to start. Initiated motor to start when unseated from closed position. Closes following shutdown of Anacortes Unit #2.

23. Ferndale Unit #2 Discharge (V-1990)

Control: Valve operator only.

Sequence: Opens when Ferndale Unit #2 Suction (V-1986) is open following initiation of Ferndale Unit #2 Unit to start. Initiated motor to start when unseated from closed position. Closes following shutdown of Ferndale Unit #2.

24. Unit #3 Bypass (V-1991)

Control: Valve operator only.

Sequence: Opens when Unit #3 is initiated to shutdown. Closes when Unit #3 is initiated to start.

25. Unit #3 Suction (V-1992)

Control: Valve operator only.

Sequence: Opens when Unit #3 is initiated to start. Closes following shutdown of Unit #3.

26. Unit #3 Discharge (V-1994)

Control: Valve operator only.

Sequence: Opens when Unit #3 Suction (V-1992) is open following initiation of Unit #3 Unit to start. Initiated motor to start when unseated from closed position. Closes following shutdown of Unit #3.

27. Ferndale Injection (V-1996)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Will not open if Anacortes Injection (V-1997) is open or partially open or Ferndale Outlet Shutdown

28. Anacortes Injection (V-1997)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Will not open if Ferndale Injection (V-1996) is open or partially open or Anacortes Outlet Shutdown

29. Anacortes Normal Pump Feed (V-1999)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when Anacortes Tight Line Pump Feed (V-2008) is opened

30. Ferndale Normal Pump Feed (V-2000)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when Ferndale Tight Line Pump Feed (V-2007) is opened

31. Ferndale Tight Line Pump Feed (V-2007)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when Ferndale Normal Pump Feed (V-2000) is opened. Closes when any Ferndale Inlet manifold valve (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet (V-1902) and Ferndale Receiver Bypass (V-1903) is closed.

32. Anacortes Tight Line Pump Feed (V-2008)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when Anacortes Normal Pump Feed (V-1999) is opened. Closes when any Anacortes Inlet manifold valve (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V-1914) and Anacortes Receiver Bypass (V-1915) is closed.

33. Ferndale T-202 Inlet (V-2030)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 202 (V-2055) or Ferndale Tank 202 Outlet (V-2048) and Fern Norm Pump Feed (V-2000) valves are open:

Closes when Ferndale Tight Line Pump Feed (V-2007) or when any other Ferndale Inlet manifold valve (V-2031, V-2032, V-2033, V-2034, V-2035) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet

(V- 1902) and Ferndale Receiver Bypass (V- 1903) is closed.

34. Ferndale T-203 Inlet (V-2031)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 203 (V-2059) or Ferndale Tank 203 Outlet (V-2049) and Fern Norm Pump Feed (V-2000) valves are open:

Closes when Ferndale Tight Line Pump Feed (V-2007) or when any other Ferndale Inlet manifold valve (V-2030, V-2032, V-2033, V-2034, V-2035) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet (V- 1902) and Ferndale Receiver Bypass (V- 1903) is closed.

35. Ferndale T-204 Inlet (V-2032)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 204 (V-2063) or Ferndale Tank 204 Outlet (V-2050) and Fern Norm Pump Feed (V-2000) valves are open:

Closes when Ferndale Tight Line Pump Feed (V-2007) or when any other Ferndale Inlet manifold valve (V-2030, V-2031, V-2033, V-2034, V-2035) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet (V- 1902) and Ferndale Receiver Bypass (V- 1903) is closed.

36. Ferndale T-205 Inlet (V-2033)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 205 (V-2063) or Ferndale Tank 205 Outlet (V-2051) and Fern Norm Pump Feed (V-2000) valves are open:

Closes when Ferndale Tight Line Pump Feed (V-2007) or when any other Ferndale Inlet manifold valve (V-2030, V-2031, V-2032, V-2034, V-2035) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet (V- 1902) and Ferndale Receiver Bypass (V- 1903) is closed.

37. Ferndale T-206 Inlet (V-2034)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 206 (V-2071) or Ferndale Tank 206 Outlet (V-2052) and Fern Norm Pump Feed (V-2000) valves are open:

Closes when Ferndale Tight Line Pump Feed (V-2007) or when any other Ferndale Inlet manifold valve (V-2030, V-2031, V-2032, V-2033, V-2035) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet (V- 1902) and Ferndale Receiver Bypass (V- 1903) is closed.

38. Ferndale T-209 Inlet (V-2035)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when Ferndale Tight Line Pump Feed (V-2007) or when any other Ferndale Inlet manifold valve (V-2030, V-2031, V-2032, V-2033, V-2034) is opened or on Ferndale Incoming Shutdown after Ferndale Receiver Inlet (V- 1902) and Ferndale Receiver Bypass (V- 1903) is closed.

39. Anacortes T-202 Inlet (V-2036)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 202 (V-2055) or Anacortes Tank 202 Outlet (V-2042) and Ana Norm Pump Feed (V-1999) valves are open:

Closes when Anacortes Tight Line Pump Feed (V-2008) or when any other Anacortes Inlet manifold valve (V-2037, V-2038, V-2039, V-2040, V-2041) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V- 1914) and Anacortes Receiver Bypass (V- 1915) is closed.

40. Anacortes T-203 Inlet (V-2037)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 203 (V-2059) or Anacortes Tank 203 Outlet (V-2043) and Ana Norm Pump Feed (V-1999) valves are open:

Closes when Anacortes Tight Line Pump Feed (V-2008) or when any other Anacortes Inlet manifold valve (V-2036, V-2038, V-2039, V-2040, V-2041) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V- 1914) and Anacortes Receiver Bypass (V- 1915) is closed.

41. Anacortes T-204 Inlet (V-2038)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 204 (V-2063) or Anacortes Tank 204 Outlet (V-2044) and Ana Norm Pump Feed (V-1999) valves are open:

Closes when Anacortes Tight Line Pump Feed (V-2008) or when any other Anacortes Inlet manifold valve (V-2036, V-2037, V-2039, V-2040, V-2041) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V- 1914) and Anacortes Receiver Bypass (V- 1915) is closed.

42. Anacortes T-205 Inlet (V-2039)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 205 (V-2067) or Anacortes Tank 205 Outlet (V-2045) and Ana Norm Pump Feed (V-1999) valves are open:

Closes when Anacortes Tight Line Pump Feed (V-2008) or when any other Anacortes Inlet manifold valve (V-2036, V-2037, V-2038, V-2040, V-2041) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V- 1914) and Anacortes Receiver Bypass (V- 1915) is closed.

43. Anacortes T-206 Inlet (V-2040)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Cannot open unless Tank 206 (V-2071) or Anacortes Tank 206 Outlet (V-2046) and Ana Norm Pump Feed (V-1999) valves are open:

Closes when Anacortes Tight Line Pump Feed (V-2008) or when any other Anacortes Inlet manifold valve (V-2036, V-2037, V-2038, V-2039, V-2041) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V- 1914) and Anacortes Receiver Bypass (V- 1915) is closed.

44. Anacortes T-209 Inlet (V-2041)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when Anacortes Tight Line Pump Feed (V-2008) or when any other Anacortes Inlet manifold valve (V-2036, V-2037, V-2038, V-2039, V-2040) is opened or on Anacortes Incoming Shutdown after Anacortes Receiver Inlet (V- 1914) and Anacortes Receiver Bypass (V- 1915) is closed.

45. Anacortes T-202 Outlet (V-2042)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2043, V-2044, V-2045, V-2046) is opened.

46. Anacortes T-203 Outlet (V-2043)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2042, V-2044, V-2045, V-2046) is opened.

47. Anacortes T-204 Outlet (V-2044)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2042, V-2043, V-2045, V-2046) is opened.

48. Anacortes T-205 Outlet (V-2045)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2042, V-2043, V-2044, V-2046) is opened.

49. Anacortes T-206 Outlet (V-2046)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2042, V-2043, V-2044, V-2045) is opened.

50. Ferndale T-202 Outlet (V-2048)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2049, V-2050, V-2051, V-2052) is opened.

51. Ferndale T-203 Outlet (V-2049)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2048, V-2050, V-2051, V-2052) is opened.

52. Ferndale T-204 Outlet (V-2050)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2048, V-2049, V-2051, V-2052) is opened.

53. Ferndale T-205 Outlet (V-2051)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2048, V-2049, V-2050, V-2052) is opened.

54. Ferndale T-206 Outlet (V-2052)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: Closes when any other manifold valve (V-2048, V-2049, V-2050, V-2051) is opened.

55. T-202 Tank (V-2055)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: None

56. T-203 Tank (V-2059)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: None

57. T-204 Tank (V-2063)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: None

58. T-205 Tank (V-2067)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: None

59. T-206 Tank (V-2071)

Control: Local panel - open/close

Renton supervisory - open/close

Sequence: None

60. Sump Pump Discharge (V-2155)

Control: Valve operator only.

Sequence: Opens when Sump is initiated to start. Closes following shutdown of Sump.

61. Ferndale Unit #2 Fill (V-2214)

Control: Valve operator only.

Sequence: Opens when Unit#2 is initiated to fill from Ferndale Line. Closes following fill sequence.

62. Unit #2 Drain (V-2215)

Control: Valve operator only.

Sequence: Opens when Unit#2 is initiated to drain. Closes following drain sequence.

63. Anacortes Unit #2 Fill (V-2216)

Control: Valve operator only.

Sequence: Opens when Unit#2 is initiated to fill from Anacortes Line. Closes following fill sequence.

64. Unit #2 Vent (V-2217)

Control: Valve operator only.

Sequence: Opens when Unit#2 is initiated to fill or drain . Closes following fill or drain sequence.

65. Ferndale Inlet Control Valve (V-1904)

Control: Local panel - pressure and flow rate set point

Renton supervisory - pressure and flow rate set point

Automatic - minimum incoming pressure, maximum meter pressure and maximum flow rate.

Sequence: Opens or closes to maintain desired pressure and flow setting. Ferndale Inlet Shutdown, motor to valve shuts down. Motor starts on Ferndale Inlet Reset.

66. Ferndale Back Pressure Control Valve (V-1951)

Control: Local panel - desired pressure

Renton supervisory - pressure set point

Automatic - minimum meter pressure.

Sequence: Opens or closes to maintain desired pressure and flow setting. Ferndale Inlet Shutdown, motor to valve shuts down. Motor starts on Ferndale Inlet Reset.

67. Anacortes Inlet Control Valve (V-1916)

Control: Local panel - pressure and flow rate set point

Renton supervisory - pressure and flow rate set point

Automatic - minimum incoming pressure, maximum meter pressure and maximum flow rate.

Sequence: Opens or closes to maintain desired pressure and flow setting. Ferndale Inlet Shutdown, motor to valve shuts down. Motor starts on Ferndale Inlet Reset.

68. Anacortes Back Pressure Control Valve (V-1946)

Control: Local panel - desired pressure

Renton supervisory - pressure set point

Automatic - minimum meter pressure.

Sequence: Opens or closes to maintain desired pressure and flow setting. Ferndale

Inlet Shutdown, motor to valve shuts down. Motor starts on Ferndale Inlet Reset.

69. Ferndale Outlet Control Valve (V-1963)

Control: Local panel - pressure and flow rate set point

Renton supervisory - pressure and flow rate set point

Automatic - minimum incoming pressure, maximum meter pressure and maximum flow rate.

Sequence: Opens or closes to maintain desired pressure and flow setting. Ferndale Inlet Shutdown, motor to valve shuts down. Motor starts on Ferndale Inlet Reset.

70. Anacortes Outlet Control Valve (V-1969)

Control: Local panel - pressure and flow rate set point

Renton supervisory - pressure and flow rate set point

Automatic - minimum incoming pressure, maximum meter pressure and maximum flow rate.

Sequence: Opens or closes to maintain desired pressure and flow setting. Ferndale Inlet Shutdown, motor to valve shuts down. Motor starts on Ferndale Inlet Reset.

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Bayview Terminal

Local OMI Alarm and Remote Indications

NOTE: Any LOCKOUT requires correction of the malfunction and reset from terminal panel before resumption of normal operations may continue.

Local terminal horn sounds on each alarm.

1. POWER FAILURE. OMI alarms if AC power is lost for preset time duration. UPS will continue to power the supervisory control system and OMI computer, until exhausted. When AC power is restored the control valve motor will restart. All other motors will remain shut down until reinitiated to start. Renton supervisory alarms, displays and logs POWER FAILURE and appropriate SHUTDOWN indications.

2. EMERGENCY POWER DISCONNECT. Local OMI and Renton supervisory alarms, displays and logs POWER FAILURE, EMERGENCY POWER DROP and the following additional alarms. A power disconnect is initiated when any of the following occurs

2.1 Initiation of EMERGENCY POWER DISCONNECT button from Local OMI, from pole positions in the yard or from the Renton Control Center.. Local OMI and Renton supervisory alarms, displays and logs EMERGENCY POWER DROP COMMAND.

2.2 Feeder Management Relay: OMI and Renton supervisory alarms, displays and logs FEEDER MULTILIN TRIP.

a. Line undervoltage
b. Line overvoltage
c. Time overcurrent
d. Instantaneous overcurrent
e.

2.3 UNIT STOP FAILURE. Anytime a pump motor fails to stop or runs when not commanded and after expiration of a preset amount of time, the incoming power breaker will trip. Local OMI and Renton supervisory alarms, displays and logs UNIT STOP FAILURE.

NOTE: When the UNIT STOP FAILURE condition exists, do not attempt to restore power to the facility until a technician has investigated, corrected any problem and given the approval to resume operations.

3. TERMINAL LOCKOUT.A station lockout condition is initiated when any of the following occurs: Local OMI and Renton supervisory alarms, displays and logs TERMINAL LOCKOUT, FERNDALE INCOMING SHUTDOWN, ANACORTES INCOMING SHUTDOWN,. FERNDALE OUTGOING SHUTDOWN,. ANACORTES OUTGOING SHUTDOWN appropriate pump shutdowns and the following additional alarms.

3.1 Local initiation of TERMINAL LOCKOUT button from Control panel or from any of the pole positions in the yard. Local OMI and Renton supervisory alarms, displays and logs LOCAL L/O

3.2 High-high sump level. OMI alarms when liquid level in sump rises to the preset level. Local OMI and Renton supervisory alarms, displays and logs HI HI SUMP and will have previously alarmed, displayed and logged HIGH SUMP LEVEL.

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3.3 HIGH-HIGH TANK. OMI alarms when HI-HI level switch for any tank is tripped. Local OMI and Renton supervisory alarms, displays and logs HI HI TANK (number) and will have previously alarmed, displayed and logged HI-TANK (number)

3.4 FIRE EYES. when a change of light density is detected for a specified time duration, a fire eyes alarm is initiated. Local OMI and Renton supervisory alarms, displays and logs FIRE EYES ALARM #(zone number). When the FIRE EYES protection is disabled, a FIRE EYES DISARMED alarm is generated to both local OMI and Renton supervisory.

When a STATION LOCKOUT occurs, the following actions are performed:

a. Ferndale Incoming Shutdown.
b. Anacortes Incoming Shutdown.
c. Ferndale Outgoing Shutdown.
d. Anacortes Outgoing Shutdown.
e. Main Line Units shutdown and are inhibited from starting
f. Sump Pump, Injection Pump and Transfer Pump shutdown and are inhibited from starting in Auto. Will operate from Hand Position

4. FACILITY SHUTDOWNS

FERNDALE INCOMING SHUTDOWN. Shutdown can be initiated from OMI display or from the Renton Control Center. Shutdown is indicated on OMI display. Renton supervisory displays and logs FERNDALE INCOMING SHUTDOWN. On Shutdown, the following occurs:

a. Motor to control valve (CV-1904) and (CV-1951) is shutdown after 4-5 minutes following initiation of Shutdown and inhibited from starting.
b. Ferndale Receiver Inlet (V-1902) or Ferndale Receiver By-Pass (V-1903) (whichever is open) closes.
c. After above valves closed close the Ferndale Tight Line Pump Feed (V-2007) or Ferndale Inlet Manifold valves (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035).

ANACORTES INCOMING SHUTDOWN . Shutdown can be initiated from OMI display or from the Renton Control Center. Shutdown is indicated on OMI display. Renton supervisory displays and logs ANACORTES INCOMING SHUTDOWN. On Shutdown, the following occurs:

a. Motor to control valve (CV-1916) and (CV-1946) is shutdown after 4-5 minutes following initiation of Shutdown and inhibited from starting.
b. Anacortes Receiver Inlet (V-1914) or Anacortes Receiver By-Pass (V-1915) (whichever is open) closes.
c. After above valves closed close the Anacortes Tight Line Pump Feed (V-2008) or Anacortes Inlet Manifold valves (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041).

FERNDALE OUTGOING SHUTDOWN . Shutdown can be initiated from OMI display or from the Renton Control Center. Shutdown is indicated on OMI display. Renton supervisory displays and logs FERNDALE OUTGOING SHUTDOWN. On Shutdown, the following occurs:

a. The main line unit (U1), (U2) if pumping for Ferndale and injection pump if pumping for Ferndale are shut-down and inhibited from starting..
b. The motor to control valve (CV-1963) is shutdown after 4-5 minutes following initiation of Shutdown and inhibited from starting.
c. Ferndale Launcher Outlet (V-1926) or Ferndale Launcher By-Pass (V-1925) (whichever is open) closes.
d. Close the Ferndale Normal Pump Feed (V-2000) and Ferndale Outlet Manifold valves (V-2048, V-2049, V-2050, V-2051, V-2052).

ANACORTES OUTGOING SHUTDOWN . Shutdown can be initiated from OMI display or from the Renton Control Center. Shutdown is indicated on OMI display. Renton supervisory displays and logs ANACORTES OUTGOING SHUTDOWN. On Shutdown, the following occurs:

a. The main line unit (U3), (U2) if pumping for Anacortes and injection pump if pumping for Anacortes are shut-down and inhibited from starting..
b. The motor to control valve (CV-1969) is shutdown after 4-5 minutes following initiation of Shutdown and inhibited from starting.
c. Anacortes Launcher Outlet (V-1935) or Anacortes Launcher By-Pass (V-1934) (whichever is open) closes.
d. Close the Anacortes Normal Pump Feed (V-1999) and Anacortes Outlet Manifold valves (V-2042, V-2043, V-2044, V-2045, V-2046).

5. FACILITY RESETS.

FERNDALE INCOMING RESET. Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs FERNDALE INCOMING RESET. On Reset, the following occurs:

a. Motor to control valve (CV-1904) and (CV-1951) is starts.
b. Ferndale Receiver Inlet (V-1902) or Ferndale Receiver By-Pass (V-1903) released to open after a Ferndale Tank Inlet (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035) or Ferndale Tight Line Pump Feed (V-2007) is open.

c. Ferndale Tight Line Pump Feed (V-2007) and Ferndale Inlet Manifold valves (V-2030, V-2031, V-2032, V-2033, V-2034, V-2035). released to open

ANACORTES INCOMING RESET . Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs ANACORTES INCOMING RESET. On Reset, the following occurs:

a. Motor to control valve (CV-1916) and (CV-1946) starts.
b. Anacortes Receiver Inlet (V-1914) or Anacortes Receiver By-Pass (V-1915) released to open after a Anacortes Tank Inlet (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041) or Anacortes Tight Line Pump Feed (V-2008) is open.

c. Anacortes Tight Line Pump Feed (V-2008) and Anacortes Inlet Manifold valves (V-2036, V-2037, V-2038, V-2039, V-2040, V-2041). released to open

FERNDALE OUTGOING RESET . Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs FERNDALE OUTGOING RESET. On Reset, the following occurs:

a. The motor to control valve (CV-1963) starts.
b. The sump pump and main line unit are released for normal operation for Ferndale..
b. Ferndale Launcher Inlet (V-1927) or Ferndale Launcher By-Pass (V-1925) released to open
c. Ferndale Normal Pump Feed (V-2000) and Ferndale Outlet Manifold valves (V-2048, V-2049, V-2050, V-2051, V-2052). released to open

ANACORTES OUTGOING RESET . Reset can be initiated from OMI display or from the Renton Control Center. Reset is indicated on OMI display. Renton supervisory displays and logs FERNDALE INCOMING ANACORTES OUTGOING RESET. On Reset, the following occurs:

a. The motor to control valve (CV-1969) starts.
b. The sump pump and main line unit are released for normal operation for Anacortes..
b. Anacortes Launcher Inlet (V-1936) or Anacortes Launcher By-Pass (V-1934) released to open

c. Anacortes Normal Pump Feed (V-1999) and Anacortes Outlet Manifold valves (V-2042, V-2043, V-2044, V-2045, V-2046). released to open

6. UNIT #1 LOCKOUT initiates a UNIT SHUTDOWN a Local OMI and Renton supervisory alarms, displays and logs UNIT #1 LOCKOUT, UNIT #1 SHUTDOWN, and the following additional alarms. A unit lockout condition is initiated when any of the following occurs:

6.1 Multilin Trip. OMI and Renton supervisory alarms, displays and logs UNIT #1 MULTILIN TRIP
a. Acceleration. On UNIT START, the electrical current has exceeded the full load current for a time period longer than the permitted acceleration time.
b. Stator RTD. Any one of RTDs 1 through 5 has exceeded the trip limit.
c. Bearing/case RTD. Any one of the RTDs 6 through 10 has exceeded the trip limit.
d. Ground fault. The unit "current-to-ground" has exceeded the ground fault trip level for a time period longer than the delay time.
e. Hi Amp.
f. Overload. The unit thermal capacity exceeded 100% for a time period longer than the lockout time.
g. Rapid trip. Mechanical jam.
h. Short circuit. The electrical current exceeded the Short Circuit trip level for a time period longer than the delay time.
i. Single phase. The unit electrical current unbalanced exceeded 30% for a time period greater than 4-seconds.
j. Unbalanced current. The electrical current unbalance has exceeded the unbalance trip level for a period of time greater than 5 seconds.

6.2 Motor vibration. Motor vibration exceeds preset lockout level for a preset time duration. OMI alarms, displays and logs UNIT #1 MOTOR VIBRATION Renton supervisory alarms, displays and logs UNIT #1 VIBRATION

6.3 Pump vibration. Pump vibration exceeds preset lockout level for a preset time duration. OMI alarms, displays and logs UNIT #1 PUMP VIBRATION Renton supervisory alarms, displays and logs UNIT #1 VIBRATION

6.4 Seal leak. The level in the seal leak box has reached the preset lockout level. OMI and Renton supervisory alarms, displays and logs UNIT #1 SEAL LEAK

6.5 Incomplete sequence. On unit start sequence the unit suction and discharge valves did not get full open and or unit running status did not happen within the delay time. OMI and Renton supervisory alarms, displays and logs UNIT #1 INC SEQ

7. UNIT #2 LOCKOUT is the same as Unit #1 above with the following addition:

6.1 Incomplete Sequence-Drain/Fill Pump Unit. If unit drain/fill valves do not get full closed within specified time period. OMI and Renton supervisory alarms, displays and logs UNIT #2 DRAIN/FILL INC SEQ

8. UNIT #3 LOCKOUT is the same as Unit #1:

9. UNIT #1 START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit suction valve (V-1981) begins to open.
b. Incomplete sequence timer begins timing.
c. When pump unit suction valve is open, pump unit discharge valve (V-1983) begins to open.
d. When pump unit discharge valve is 70% - 75%, motor starts.
e. When motor starts and suction and discharge valves are fully open, incomplete sequence time is reset.

10. UNIT #1 SHUTDOWN.,. Unit #1 Shutdown is indicated on OMI. Renton supervisory displays and logs UNIT #1 SHUTDOWN and the following additional alarms.

10.1Initiation of Unit Shutdown from local OMI, the supervisory systems from the pole position

10.2 LOW UNIT #1 SUCTION PRESSURE. When pump unit is running and the unit suction pressure drops below specified pressure the unit shuts down. When LOW SUCTION is clear, unit can be restarted. Supervisory systems alarm, display and log UNIT #1 LOW SUCTION

10.3. UNIT NO FLOW. When pump unit is running and the unit flow switch indicates no flow for preset time the unit shuts down. The unit can be restarted. Supervisory systems alarm, display and log UNIT #1 NO FLOW

When a UNIT #1 SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.
b. Suction (V-1981) and discharge (V-1983) valves close.

11. UNIT #2 FERNDALE START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit Ferndale suction valve (V-1986) begins to open.
b. Incomplete sequence timer begins timing.
c. Pump unit drain/fill sequence is inhibited from operation.
d. When pump unit Ferndale suction valve open, pump unit Ferndale discharge valve (V-1990) begins to open.
e. When pump unit Ferndale discharge valve is 70% - 75%, motor starts.
f. Ferndale Unit 2 bypass valve(V-1985) begins to close.
g. When motor starts and Ferndale suction and Ferndale discharge valves are fully open, incomplete sequence time is reset.

12. UNIT #2 ANACORTES START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit Anacortes suction valve (V-1987) begins to open.
b. Incomplete sequence timer begins timing.
c. Pump unit drain/fill sequence is inhibited from operation.
d. When pump unit Anacortes suction valve open, pump unit Anacortes discharge valve (V-1989) begins to open.
e. When pump unit Anacortes discharge valve is 70% - 75%, motor starts.
f. When motor starts and Anacortes suction and Anacortes discharge valves are fully open, incomplete sequence time is reset.

13. UNIT #2 SHUTDOWN. is the same as Unit #1.:

When a UNIT #2 SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.
b. Bypass (V-1985) valve open if closed.
c. Suction (V-1992, V-1987) and discharge (V-1994, V-1989) valves close.

14. UNIT #3 START. Unit Start operation can be initiated from the local OMI or Renton Control Center.

a. Pump unit suction valve (V-1992) begins to open.
b. Incomplete sequence timer begins timing.

c. When pump unit suction valve is open, pump unit discharge valve (V-1994) begins to open.
d. When pump unit discharge valve is 70% - 75%, motor starts.
e. Anacortes Unit 3 bypass valve begins to close.
f. When motor starts and suction and discharge valves are fully open, incomplete sequence time is reset.

15. UNIT #3 SHUTDOWN. is the same as Unit #1.:

When a UNIT #3 SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.
b. Bypass (V-1991) valve open.
c. Suction (V-1992) and discharge (V-1994) valves close.

16. DRAIN/FILL PUMP #2 SEQUENCE. Pump drain/fill sequence can be initiated from local OMI or from the Renton Control Center. When the drain sequence is initiated, the pump unit is inhibited from starting until the fill sequence is complete. The drain/fill sequence is inhibited if the pump unit suction or discharge valves (V-1986, V-1990, V-1987, V-1989) are open or partially open. Status (drain or fill) is indicated on local OMI. NOTE: The drain status indication remains until the "fill" cycle is complete. Renton supervisory displays and logs status (drain or fill).

Pump drain sequence -

a. Pump vent valve opens and the "vent drain" timer is started.
b. Pump drain valve (V-2215) open.
d. When the "vent drain" timer times out the vent and drain valves close.

Pump fill sequence -

a. Pump vent valve opens and the "vent fill" timer is started.
b. Pump fill valve Anacortes (V-2216) or Ferndale (V-2214) opens.
c. When the "vent fill" timer times out, the vent valve and fill valve close and the pump unit is released for normal operation.

17. INCOMPLETE SEQUENCE TANK MANIFOLD. OMI alarms when a preset time duration lapses on timer and:

a. More than one Ferndale Tank Inlet manifold valve is open or partially open. Initiates Ferndale Incoming Shutdown.
Renton supervisory alarms, displays and logs INC. SEQ.FERNDALE INLET MAN. and FERNDALE INCOMING SHUTDOWN indication.

b. More than one Anacortes Tank Inlet manifold valve is open or partially open. Initiates Anacortes Incoming Shutdown.
Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES INLET MAN. and ANACORTES INCOMING SHUTDOWN indication.

c. More than one Ferndale Tank Outlet manifold valve is open or partially open. Initiates Ferndale Outgoing Shutdown.
Renton supervisory alarms, displays and logs INC. SEQ.FERNDALE OUTLET MAN. and FERNDALE OUTGOING SHUTDOWN indication.

d. More than one Anacortes Tank Outlet manifold valve is open or partially open. . Initiates Anacortes Outgoing Shutdown.
Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES OUTLET MAN. and ANACORTES OUTGOING SHUTDOWN indication.

e. Anacortes Normal Pump Feed (V-19991234) and Anacortes Tight Line Pump Feed (V-2008) valve is open or partially open.

Renton supervisory alarms, displays and logs INC. SEQ. ANACORTES INCOMING MAN. , INC. SEQ. ANACORTES OUTLET MAN. , ANACORTES INCOMING SHUTDOWN and ANACORTES OUTGOING SHUTDOWN indication.

f. Ferndale Normal Pump Feed (V-2000) and Ferndale Tight Line Pump Feed (V-2007) valve is open or partially open.
Renton supervisory alarms, displays and logs INC. SEQ. FERNDALE INCOMING MAN. , INC. SEQ. FERNDALE OUTLET MAN. , FERNDALE INCOMING SHUTDOWN and FERNDALE OUTGOING SHUTDOWN indication.

18 HIGH LOOP PRESSURE.

a. When pressure in Ferndale Incoming loop rises to actuate upstream pressure switch set at specified pressure. Initiate Ferndale Incoming Shutdown.
Renton supervisory alarms, displays and logs HI LOOP PRESS. FERNDALE INLET MAN. and FERNDALE INCOMING SHUTDOWN indication.

b. When pressure in Anacortes Incoming loop rises to actuate upstream pressure switch set at specified pressure. Initiate Anacortes Incoming Shutdown.
Renton supervisory alarms, displays and logs HI LOOP PRESS. ANACORTES INLET MAN. and ANACORTES INCOMING SHUTDOWN indication.

19. HIGH FERNDALE CONTROL PRESSURE. The pump unit is shutdown if the station control pressure rises to specified pressure. Supervisory systems alarm, display and log UNIT #1 SHUTDOWN, UNIT #2 SHUTDOWN if pumping for Ferndale and FERNDALE HI CONTROL.

20. HIGH ANACORTES CONTROL PRESSURE. OMI displays and the pump unit is shutdown if the station discharge pressure rises to specified pressure. Supervisory systems alarm, display and log UNIT #3 SHUTDOWN, UNIT #2 SHUTDOWN if pumping for Anacortes and ANACORTES HI CONTROL.

21. HIGH LEVEL TANK. OMI alarms when utility tank liquid level rises to specified high level. Renton supervisory alarms, displays and logs and HI-TANK (number), close appropriate tank valve.

22. INJECTION PUMP START. Injection pump start can be initiated from the pole position, local OMI or from the Renton Control Center. Injection amount set point prior to initiation. If the start is from the pole position, the injection pump will not automatically shutdown at the specified Low Utility Tank Level and will override facility shutdown. Injection Pump Start is indicated on OMI display. OMI and Renton supervisory displays and logs INJECTION PUMP START.

23. INJECTION PUMP SHUTDOWN. If injection pump pole switch is in the "hand" position, the injection pump does not automatically shutdown. OMI and Renton supervisory displays and logs INJECTION PUMP SHUTDOWN, and the following additional alarms.

23.1 Initiation of injection pump shutdown from local OMI, the supervisory systems or from the pole position

23.2 INJECTION PUMP HIGH PRESSURE. when pressure on discharge side of injection pump rises to specified pressure. Renton supervisory alarms, displays and logs INJ. HI PRESS

23.3 Injection amount set point is pumped

23.4 LOW LEVEL TRANSMIX TANK when utility tank liquid level drops to specified low level.

24. HIGH LEVEL SUMP. OMI alarms when sump liquid level rises to specified high level. Renton supervisory alarms, displays and logs HIGH SUMP indications.

25. SUMP PUMP START. Sump Pump Start can be initiated from the pole position, local OMI or from the Renton Control Center. If the start is from the pole position, the sump pump will not automatically shutdown at the specified Low Sump Tank Level and will override terminal lockout. On initiation, if the sump level is above low level, the sump pump starts. Sump Pump Start indicated on OMI display. Renton supervisory displays and logs SUMP PUMP START.

26. SUMP PUMP SHUTDOWN If the sump pump pole switch is in the "hand" position, the sump pump will not shutdown automatically. Sump Pump Shutdown is indicated on OMI display. Renton supervisory displays and logs SUMP PUMP SHUTDOWN.

26.1 Initiation of sump pump shutdown from local OMI, the supervisory systems or from the pole position

26.2 When sump tank liquid level drops to specified low level.

26.3 SUMP PUMP NO FLOW. OMI alarms, sump pump will shutdown and discharge valve (V-2155) closes if the flow switch located on discharge side of sump pump does not detect positive flow in specified time. Renton supervisory alarms, displays and logs SUMP PUMP NO FLOW indications.

When a SUMP PUMP SHUTDOWN occurs, the following actions are performed:

a. The pump unit is shutdown.
b. Discharge (V-2155) valves close.

27. SCRAPER PASSAGE. OMI alarms and counter on local OMI is advanced when sphere arrival actuates Pig- Sig. Renton supervisory alarms, displays and logs SCRAPER IN or SCRAPER OUT indication.

28. HIGH PRESSURE SURGE RELIEF. OMI alarms when pressure in delivery loop rises to specified pressure to open surge valve and detect flow. The surge valve close when drops below open setting . Renton supervisory alarms, displays and, status of high pressure surge relief valve and indication of flow.

29. FIRE EYES DISARMED. OMI and Renton Control Center display and log FIRE EYES DISARMED when the fire eyes disarm switch is initiated. The station is inhibited from lockout due to fire eyes detection.

30. SAMPLER HI POT. OMI alarms when sampler pot liquid level rises to specified high level. Renton supervisory alarms, displays and logs SAMPLER ALARM and HI POT.

31. SAMPLER START. Sampler Start can be initiated from local OMI or from the Renton Control Center. Sampler reset and sample batch size amount must be set point prior to initiation. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER START

32. SAMPLER FLUSH. Automatic sequence after 950 barrels. The sampler block valve opens sampler flush valve opens and enough samples are taken to flush line. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER FLUSH

33. SAMPLER SAMPLING. Automatic sequence after 1000 barrels and flush sequence done. The sampler flush valve closes, sampler pot valve opens start putting product samples in sample pot. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER SAMPLING and percent done.

34. SAMPLER DONE. Automatic sequence 1000 barrels before end of batch. The sampler block valve close sampler flush valve closes and sampler pot valve close. Sampler Start indicated on OMI display. Renton supervisory displays and logs SAMPLER DONE

Bayview Terminal Valves

1. 16" Ferndale Receiver Inlet (V-1902)
   Control: Local OMI open / close
   Renton supervisory open / close
   Sequence: Closes on Ferndale Incoming Shutdown

2. 16" Ferndale Receiver Outlet (V-1907)
   Control: (same as V-1902)
   Sequence: Cannot close unless 16" Ferndale receiver bypass (V-1903) is open.

3. 16" Ferndale Receiver Bypass (V-1903)
   Control: (same as V-1902)
   Sequence: Cannot close unless 16" Ferndale receiver outlet (V-1907) is open.
   Closes on Ferndale Incoming Shutdown

4. 16" Anacortes Receiver Inlet (V-1914)
   Control: Local OMI open / close
   Renton supervisory open / close
   Sequence: Closes on Anacortes Incoming Shutdown

5. 16" Anacortes Receiver Outlet (V-1912)
   Control: (same as V-1914)
   Sequence: Cannot close unless 16" Anacortes receiver bypass (V1915) is open.

6. 16" Anacortes Receiver Bypass (V-1915)
   Control: (same as V-1914)
   Sequence: Cannot close unless 16" Ferndale receiver outlet (V-1912) is open.
   Closes on Anacortes Incoming Shutdown

7. 16" Ferndale Launcher Outlet (V-1926)
   Control: Local OMI open / close
   Renton supervisory open / close
   Sequence: Closes on Ferndale Outgoing Shutdown

8. 16" Ferndale Launcher Inlet (V-1927)
   Control: (same as V-1926)
   Sequence: Cannot close unless 16" Ferndale Outgoing bypass (V-1925) is open.

9. 16" Ferndale Launcher Bypass (V-1925)
   Control: (same as V-1926)
   Sequence: Cannot close unless Ferndale Launcher Inlet (V-1927) is open.
   Closes on Ferndale Outgoing Shutdown

10. 16" Anacortes Launcher Outlet (V-1935)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: Closes on Anacortes Outgoing Shutdown

11. 16" Anacortes Launcher Inlet (V-1936)
    Control: (same as V-1935)
    Sequence: Cannot close unless Anacortes Launcher bypass (V-1934) is open.

12. 16" Anacortes Launcher Bypass (V-1934)
    Control: (same as V-1935)
    Sequence: Cannot close unless Anacortes Launcher Inlet (V-1936) is open.
    Closes on Anacortes Outgoing Shutdown

13. 16" Ferndale Inlet Prover Bypass (V-1952)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: None

14. 16" Anacortes Incoming Prover Bypass (V-1947)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: none

15. 16" Ferndale Outgoing Prover bypass (V-1961)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: none

16. 16" Anacortes Outgoing Prover Bypass (V-1967)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: none

17. 16" Ferndale Tank 202 Inlet Manifold (V-2030)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
    16" FE TK 206 Inlet Man. (V-2034)
    16" FE TK 203 Inlet Man. (V-2031)
    16" FE TK 204 Inlet Man. (V-2032)
    16" FE TK 205 Inlet Man. (V-2033)
    16" FE TK 209 Inlet Man. (V-2035)

18. 16" Ferndale Tank 206 Inlet Manifold (V-2034)
    Control: Local OMI open / close
    Renton supervisory open / close
    Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
    16" FE TK 202 Inlet Man. (V-2030)
    16" FE TK 203 Inlet Man. (V-2031)
    16" FE TK 204 Inlet Man. (V-2032)
    16" FE TK 205 Inlet Man. (V-2033)
    16" FE TK 209 Inlet Man. (V-2035)

19. 16" Ferndale Tank 203 Inlet Manifold (V-2031)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" FE TK 202 Inlet Man. (V-2030)
16" FE TK 206 Inlet Man. (V-2034)
16" FE TK 204 Inlet Man. (V-2032)
16" FE TK 205 Inlet Man. (V-2033)
16" FE TK 209 Inlet Man. (V-2035)

20. 16" Ferndale Tank 204 Inlet Manifold (V-2032)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" FE TK 202 Inlet Man. (V-2030)
16" FE TK 206 Inlet Man. (V-2034)
16" FE TK 203 Inlet Man. (V-2031)
16" FE TK 205 Inlet Man. (V-2033)
16" FE TK 209 Inlet Man. (V-2035)

21. 16" Ferndale Tank 205 Inlet Manifold (V-2033)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" FE TK 202 Inlet Man. (V-2030)
16" FE TK 206 Inlet Man. (V-2034)
16" FE TK 203 Inlet Man. (V-2031)
16" FE TK 204 Inlet Man. (V-2032)
16" FE TK 209 Inlet Man. (V-2035)

22. 16" Ferndale Tank 209 Inlet Manifold (V-2035)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" FE TK 202 Inlet Man. (V-2030)
16" FE TK 206 Inlet Man. (V-2034)
16" FE TK 203 Inlet Man. (V-2031)
16" FE TK 204 Inlet Man. (V-2032)
16" FE TK 205 Inlet Man. (V-2033)

23. 16" Anacortes Tank 202 Inlet Manifold (V-2036)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" AA TK 206 Inlet Man. (V-2040)
16" AA TK 203 Inlet Man. (V-2037)
16" AA TK 204 Inlet Man. (V-2038)
16" AA TK 205 Inlet Man. (V-2039)
16" AA TK 209 Inlet Man. (V-2041)

24. 16" Anacortes Tank 206 Inlet Manifold (V-2040)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" AA TK 202 Inlet Man. (V-2036)
16" AA TK 203 Inlet Man. (V-2037)
16" AA TK 204 Inlet Man. (V-2038)
16" AA TK 205 Inlet Man. (V-2039)
16" AA TK 209 Inlet Man. (V-2041)

25. 16" Anacortes Tank 203 Inlet Manifold (V-2037)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" AA TK 202 Inlet Man. (V-2036)
16" AA TK 206 Inlet Man. (V-2040)
16" AA TK 204 Inlet Man. (V-2038)
16" AA TK 205 Inlet Man. (V-2039)
16" AA TK 209 Inlet Man. (V-2041)

26. 16" Anacortes Tank 204 Inlet Manifold (V-2038)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" AA TK 202 Inlet Man. (V-2036)
16" AA TK 206 Inlet Man. (V-2040)
16" AA TK 203 Inlet Man. (V-2037)
16" AA TK 205 Inlet Man. (V-2039)
16" AA TK 209 Inlet Man. (V-2041)

27. 16" Anacortes Tank 205 Inlet Manifold (V-2039)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" AA TK 202 Inlet Man. (V-2036)
16" AA TK 206 Inlet Man. (V-2040)
16" AA TK 203 Inlet Man. (V-2037)
16" AA TK 204 Inlet Man. (V-2038)
16" AA TK 209 Inlet Man. (V-2041)

28. 16" Anacortes Tank 209 Inlet Manifold (V-2041)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes after a predetermined time when any of the following are initiated to open, this valve will after predetermined time, will close:
16" AA TK 202 Inlet Man. (V-2036)
16" AA TK 206 Inlet Man. (V-2040)
16" AA TK 203 Inlet Man. (V-2037)
16" AA TK 204 Inlet Man. (V-2038)
16" AA TK 205 Inlet Man. (V-2039)

29. 20" Ferndale Tank 202 Outlet Manifold (V-2048)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" FE TK 206 Outlet Man. (V-2052)
20" FE TK 203 Outlet Man. (V-2049)
20" FE TK 204 Outlet Man. (V-2050)
20" FE TK 205 Outlet Man. (V-2051)

30. 20" Ferndale Tank 206 Outlet Manifold (V-2052)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" FE TK 202 Outlet Man. (V-2048)
20" FE TK 203 Outlet Man. (V-2049)
20" FE TK 204 Outlet Man. (V-2050)
20" FE TK 205 Outlet Man. (V-2051)

31. 20" Ferndale Tank 203 Outlet Manifold (V-2049)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" FE TK 202 Outlet Man. (V-2048)
20" FE TK 206 Outlet Man. (V-2052)
20" FE TK 204 Outlet Man. (V-2050)
20" FE TK 205 Outlet Man. (V-2051)

32. 20" Ferndale Tank 204 Outlet Manifold (V-2050)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" FE TK 202 Outlet Man. (V-2048)
20" FE TK 206 Outlet Man. (V-2052)
20" FE TK 203 Outlet Man. (V-2049)
20" FE TK 205 Outlet Man. (V-2051)

33. 20" Ferndale Tank 205 Outlet Manifold (V-2051)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" FE TK 202 Outlet Man. (V-2048)
20" FE TK 206 Outlet Man. (V-2052)
20" FE TK 203 Outlet Man. (V-2049)
20" FE TK 204 Outlet Man. (V-2050)

34. 20" Anacortes Tank 202 Outlet Manifold (V-2042)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" AA TK 206 Outlet Man. (V-2046)
20" AA TK 203 Outlet Man. (V-2043)
20" AA TK 204 Outlet Man. (V-2044)
20" AA TK 205 Outlet Man. (V-2045)

35. 20" Anacortes Tank 206 Outlet Manifold (V-2046)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" AA TK 202 Outlet Man. (V-2042)
20" AA TK 203 Outlet Man. (V-2043)
20" AA TK 204 Outlet Man. (V-2044)
20" AA TK 205 Outlet Man. (V-2045)

36. 20" Anacortes Tank 203 Outlet Manifold (V-2043)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" AA TK 202 Outlet Man. (V-2042)
20" AA TK 206 Outlet Man. (V-2046)
20" AA TK 204 Outlet Man. (V-2044)
20" AA TK 205 Outlet Man. (V-2045)

37. 20" Anacortes Tank 204 Outlet Manifold (V-2044)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" AA TK 202 Outlet Man. (V-2042)
20" AA TK 206 Outlet Man. (V-2046)
20" AA TK 203 Outlet Man. (V-2043)
20" AA TK 205 Outlet Man. (V-2045)

38. 20" Anacortes Tank 205 Outlet Manifold (V-2045)
Control: Local OMI open /close
Renton supervisory open / close
Sequence: Closes after predetermined time, following initiation to open and when any of the following are initiated to open, this valve after predetermined time will close.
20" AA TK 202 Outlet Man. (V-2042)
20" AA TK 206 Outlet Man. (V-2046)
20" AA TK 203 Outlet Man. (V-2043)
20" AA TK 204 Outlet Man. (V-2044)

39. 20" Ferndale Normal Pump Suction (V-2000)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Cannot open unless one of the 20" Ferndale Tank Outlet Valves is open: TK 202 (V-2048), TK 206 (V-2052), TK 203 (V-2049), TK 204 (V-2050), TK 205 (V-2051). Closes when 16" Ferndale Tightline pump suction valve (V-2007), after predetermined time, is initiated to open.

40. 16" Ferndale Tightline Pump Suction (V-2007)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes when 20" Ferndale Normal pump suction valve (V-2000), after predetermined time, is initiated to open.

41. 20" Anacortes Normal Pump Suction (V-1999)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Cannot open unless one of the 20" Anacortes Tank Outlet Valves is open: TK 202 (V-2042), TK 206 (V-2046), TK 203 (V-2043), TK 204 (V-2044), TK 205 (V-2045). Closes when 16" Anacortes Tightline pump suction valve (V-2008), after predetermined time, is initiated to open.

42. 16" Anacortes Tightline Pump Suction (V-2008)
Control: Local OMI open / close
Renton supervisory open / close
Sequence: Closes when 20" Anacortes Normal pump suction valve (V-1999), after predetermined time, is initiated to open.

Bayview Terminal Check List

Performed By: _____ Date: _____

Local (OMI indicated by >)	OK	Maint Rpt	Remarks	Control Center Indication
1.0 > Power Failure				Power Failure
2.0 > Emergency Power Disconnect				Power Failure, Emergency Power Drop
2.1 > Emergency Power Disconnect				Emergency Power Drop Command
2.2 > Feeder Management Relay				Feeder Multilin Trip
2.3 > Unit Stop Failure				Unit Stop Failure
3.0 > Terminal Lockout				Terminal Lockout, FE Inc. S/D, AA Inc. S/D, FE Out. S/D, AA Out S/D
3.1 > Terminal Lockout (Pole Positions)				Local L/O
3.2 > Hi-Hi Sump level				Hi-Hi Sump
3.3 > Hi-Hi Tank				Hi-Hi Tank (number)
3.4 > Fire Eyes				Fire Eyes Alarm (zone number)
4.0 Facility Shutdowns				—
4.1 > Ferndale Incoming Shutdown				Ferndale Incoming Shutdown
4.2 > Anacortes Incoming Shutdown				Anacortes Incoming Shutdown
4.3 > Ferndale Outgoing Shutdown				Ferndale Outgoing Shutdown
4.4 > Anacortes Outgoing Shutdown				Anacortes Outgoing Shutdown
5.0 Facility Resets				—
5.1 > Ferndale Incoming Reset				Ferndale Incoming Reset
5.2 > Anacortes Incoming Reset				Anacortes Incoming Reset
5.3 > Ferndale Outgoing Reset				Ferndale Outgoing Reset
5.4 > Anacortes Outgoing Reset				Anacortes Outgoing Reset
6.0 > Unit #1 Lockout				Unit #1 Lockout, Unit #1 Shutdown
6.1 > Multilin Trip				Unit #1 Multilin Trip
a. Acceleration on Unit Start				
b. Stator RTD, RTD's 1 through 5 has exceeded the trip limit.				
c. Bearing / Case RTD, RTD's 6 through 10 exceed trip limit.				
d. Ground Fault, Current to ground exceeded longer than time delay.				

e. Hi Amp				
f. Overload. Thermal capacity exceeded 100% for time period longer than lockout time.				
g. Rapid Trip. Mechanical jam				
h. Short circuit. Electrical current exceeded trip level for time period longer than delay time.				
i. Single phase. Unbalanced current exceeded 30% for a time period greater than 4 seconds.				
j. Unbalanced current. Electrical current unbalance has exceeded the unbalanced trip level for a time period greater than 5 seconds.				
6.2 > Unit #1 Motor Vibration				Unit #1 Vibration
6.3 > Unit #1 Pump Vibration				Unit #1 Vibration
6.4 > Unit #1 Seal Leak				Unit #1 Seal Leak
6.5 > Unit #1 Inc Seq				Unit #1 Inc Seq
7.0 Unit #2 Lockout				Unit #2 Lockout Unit #2 Shutdown
7.1 > Multilin Trip				Unit #2 Multilin Trip
a. Acceleration on Unit Start				
b. Stator RTD, RTD's 1 through 5 has exceeded the trip limit.				
c. Bearing / Case RTD, RTD's 6 through 10 exceed trip limit.				
d. Ground Fault, Current to ground exceeded longer than time delay.				
e. Hi Amp				
f. Overload. Thermal capacity exceeded 100% for time period longer than lockout time.				
g. Rapid Trip. Mechanical jam				
h. Short circuit. Electrical current exceeded trip level for time period longer than delay time.				
i. Single phase. Unbalanced current exceeded 30% for a time period greter than 4 seconds.				
j. Unbalanced current. Electrical current unbalance has exceeded the unbalanced trip level for a time period greater than 5 seconds.				
7.2 > Unit #2 Motor Vibration				Unit #2 Vibration
7.3 > Unit #2 Pump Vibration				Unit #2 Vibration

7.4 > Unit #2 Seal Leak				Unit #2 Seal Leak
7.5 > Unit #2 Inc Seq				Unit #2 Inc Seq
7.6 > Unit #2 Drain/Fill Inc Seq				Unit #2 Drain/Fill Inc Seq
8.0 > Unit #1 Lockout				Unit #3 Lockout, Unit #3 Shutdown
8.1 > Multilin Trip				Unit #3 Multilin Trip
a. Acceleration on Unit Start				
b. Stator RTD, RTD's 1 through 5 has exceeded the trip limit.				
c. Bearing / Case RTD, RTD's 6 through 10 exceed trip limit.				
d. Ground Fault, Current to ground exceeded longer than time delay.				
e. Hi Amp				
f. Overload. Thermal capacity exceeded 100% for time period longer than lockout time.				
g. Rapid Trip. Mechanical jam				
h. Short circuit. Electrical current exceeded trip level for time period longer than delay time.				
i. Single phase. Unbalanced current exceeded 30% for a time period greter than 4 seconds.				
j. Unbalanced current. Electrical current unbalance has exceeded the unbalanced trip level for a time period greater than 5 seconds.				
8.2 > Unit #1 Motor Vibration				Unit #3 Vibration
8.3 > Unit #1 Pump Vibration				Unit #3 Vibration
8.4 > Unit #1 Seal Leak				Unit #3 Seal Leak
8.5 > Unit #1 Inc Seq				Unit #3 Inc Seq
9.0 > Unit #1 Start				Unit #1 Start
10.0 > Unit #1 Shutdown				Unit #1 Shutdown
10.1 Shutdown from OMI, pole position				
10.2 > Low Unit #1 Suction Pressure				Unit #1 Low Suction
10.3 > Unit #1 No Flow				Unit #1 No Flow
11.0 > Unit #2 Ferndale Start				Unit #2 Ferndale Start
12.0 > Unit #2 Anacortes Start				Unit #2 Anacortes Start
13.0 > Unit #2 Shutdown				Unit #2 Shutdown

14.0 > Unit #3 Start				Unit #3 Start
15.0 > Unit #3 Shutdown				Unit #3 Shutdown
16.0 > Drain/Fill Pump #2 Sequence				Drain / Fill
17.0 Incomplete Sequence Tank Manifold				—
17.a >Inc. Seq. Ferndale Inlet Man.				Inc. Seq. Ferndale Inlet Man. Ferndale Incoming Shutdown
17.b >Inc. Seq. Anacortes Inlet Man.				Inc. Seq. Anacortes Inlet Man. Anacortes Incoming Shutdown
17.c > Inc. Seq. Ferndale Outlet Man.				Inc. Seq. Ferndale Outlet Man. Ferndale Outgoing Shutdown
17.d > Inc. Seq. Anacortes Outlet Man.				Inc. Seq. Anacortes Outlet Man Anacortes Outgoing Shutdown
17.e Anacortes Normal Feed and Tight Line Feed open or partially open.				Inc. Seq. AA Incoming Man. Inc. Seq. AA Outlet Man. Anacortes Incoming Shutdown Anacortes Outgoing Shutdown
17.f Ferndale Norman Feed and Tight Line Feed open or partially open.				Inc. Seq. FE Incoming Man. Inc. Seq. FE Outlet Man. Ferndale Incoming Shutdown Ferndale Outgoing Shutdown
18.0 High Loop Pressure				—
18.a Ferndale Inlet Man.				Hi Loop Press. FE Inlet Man. Ferndale Incoming Shutdown
18.b Anacortes Inlet Man				Hi Loop Press. AA Inlet Man. Anacortes Incoming Shutdown
19.0 High Ferndale Control Pressure				Unit #1 Shutdown (if pumping) Unit #2 Shutdown (if pumping) Ferndale Hi Control
20.0 High Anacortes Control Pressure				Unit #3 Shutdown (if pumping) Unit #2 Shutdown (if pumping) Anacortes Hi Control
21.0 > High Level Tank (number)				Hi-Tank (number)
22.0 > Injection Pump Start				Injection Pump Start
23.0 > Injection Pump Shutdown				Injection Pump Shutdown
23.1 From OMI or Pole Position				—
23.2 > Injection Pump High Pressure				Inj. Hi Press.
23.3 Injection Pump set point is pumped				—
23.4 > Low Level Transmix Tank				—
24.0 > High Level Sump				High Sump
25.0 > Sump Pump Start				Sump Pump Start
26.0 > Sump Pump Shutdown				Sump Pump Shutdown
26.1 Initiation from OMI or pole position				—

26.2 When sump liquid level drop to specified level.				—
26.3 > Sump Pump No Flow				Sump Pump No Flow
27.0 > Scraper Passage				Scraper In or Scraper Out
28.0 > High Pressure Surge Relief				High Pressure Surge Relief
29.0 > Fire Eyes Disarmed				Fire Eyes Disarmed
30.0 > Sampler Hi Pot				Sampler Alarm, Hi Pot
31.0 > Sampler Start				Sampler Start
32.0 > Sampler Flush				Sampler Flush
33.0 > Sampler Sampling				Sampler Sampling and % done
34.0 > Sampler Done				Sampler Done

Bayview Terminal Check List

Performed By: _____ Date: _____

Local (OMI indicated by >)	Initials OK	Maint Rpt	Remarks	Control Center Indication
1.0 > Power Failure				Power Failure
2.0 > Emergency Power Disconnect				Power Failure, Emergency Power Drop
2.1 > Emergency Power Disconnect				Emergency Power Drop Command
2.2 > Feeder Management Relay				Feeder Multilin Trip
a. Line undervoltage				
b. Line overvoltage				
c. Time overcurrent				
d. Instantaneous overcurrent				
2.3 > Unit Stop Failure				Unit Stop Failure
3.0 > Terminal Lockout				Terminal Lockout, FE Inc. S/D, AA Inc. S/D, FE Out. S/D, AA Out S/D, M.L. pumps S/D, Sump, Injection & Transfer pump S/D.
3.1 > Terminal Lockout (Control Panel or Pole Positions in yard)				Local L/O
3.2 > Hi-Hi Sump level				Hi-Hi Sump
3.3 > Hi-Hi Tank				Hi-Hi Tank (number)
3.4 > Fire Eyes				Fire Eyes Alarm (zone number)
4.0 > Ferndale Incoming Shutdown				Ferndale Incoming Shutdown
4.1 Terminal Lockout				Ferndale Incoming Shutdown
4.2 Ferndale Incoming Shutdown (Control Panel, Local OMI, Renton supervisory)				Local L/O
4.3 > Ferndale Incoming Incomplete Sequence Tank Manifold				Inc. Seq Ferndale Inlet Man.
4.4 > Ferndale Pump Feed Incomplete Sequence				Inc. Seq. Ferndale Incoming Man., Inc. Seq. Ferndale Outlet Man.
4.5 > High Loop Pressure				Hi Loop Press. Ferndale Inlet Man.
Ferndale Incoming Shutdown				
a. Ferndale Incoming Motor Control Valves shut down				Shuts down after 4-5 minutes
b. Ferndale Receiver Inlet or Ferndale Receiver Inlet Bypass				Closes
c. Ferndale Tightline Feed or Ferndale Inlet Manifold valve(s)				Closes

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5.0 > Anacortes Incoming Shutdown				Anacortes Incoming Shutdown
5.1 Terminal Lockout				Anacortes Incoming Shutdown
5.2 Anacortes Incoming Shutdown (Control Panel, Local OMI, Renton supervisory)				Local L/O
5.3 > Anacortes Incoming Incomplete Sequence Tank Manifold				Inc. Seq Anacortes Inlet Man.
5.4 > Anacortes Pump Feed Incomplete Sequence				Inc. Seq. Anacortes Incoming Man., Inc. Seq. Anacortes Outlet Man.
5.5 > High Loop Pressure				Hi Loop Press. Anacortes Inlet Man.
Anacortes Incoming Shutdown				
a. Anacortes Incoming Motor Control Valves shut down				Shuts down after 4-5 minutes
b. Anacortes Receiver Inlet or Anacortes Receiver Inlet Bypass				Closes
c. Anacortes Tightline Feed or Anacortes Inlet Manifold valve(s)				Closes
6.0 > Ferndale Outgoing Shutdown				Ferndale Outgoing Shutdown
6.1 Terminal Lockout				Ferndale Outgoing Shutdown
6.2 Ferndale Outgoing Shutdown (Control Panel, Local OMI, Renton supervisory)				Local L/O
6.3 > Ferndale Outgoing Incomplete Sequence Tank Manifold				Inc. Seq Ferndale Outgoing Man.
6.4 > Ferndale Pump Feed Incomplete Sequence				Inc. Seq. Ferndale Incoming Man., Inc. Seq. Ferndale Outlet Man.
Ferndale Outgoing Shutdown				
a. Ferndale M.L. unit (U1), (U2) if FE pump & Inj. pump to FE				Shutdown and inhibited from pumping
b. Ferndale Outgoing Motor Control Valves shut down				Shuts down after 4-5 minutes
c. Ferndale Launcher Outlet or Ferndale launcher Outlet Bypass				Closes
d. Ferndale Normal Pump Feed and Ferndale Outlet Manifold valve(s)				Closes
7.0 > Anacortes Outgoing Shutdown				Anacortes Outgoing Shutdown
7.1 Terminal Lockout				Anacortes Outgoing Shutdown
7.2 Anacortes Outgoing Shutdown (Control Panel, Local OMI, Renton supervisory)				Local L/O
7.3 > Anacortes Outgoing Incomplete Sequence Tank Manifold				Inc. Seq Anacortes Outgoing Man.
7.4 > Anacortes Pump Feed Incomplete Sequence				Inc. Seq. Anacortes Incoming Man., Inc. Seq. Anacortes Outlet Man.

Anacortes Outgoing Shutdown				
a. Anacortes M.L. unit (U3), (U2) if AA pump & Inj. pump to AA				Shutdown and inhibited from pumping
b. Anacortes Outgoing Motor Control Valves shut down				Shuts down after 4-5 minutes
c. Anacortes Launcher Outlet or Anacortes Launcher Outlet Bypass				Closes
d. Anacortes Normal Pump Feed and Anacortes Outlet Manifold valve(s)				Closes
8.0 Facility Reset				—
8.1 > Ferndale Incoming Reset				Ferndale Incoming Reset
a. Motor to Control Valves start				
b. FE Rec. Inlet or FE Rec. Bypass after FE TK Inlet Man. Valve is open or FE Tight Line Pump Feed is open				
c. FE Tight Line Pump Feed or FE TK Inlet Man. Valve is open				
8.2 > Anacortes Incoming Reset				Anacortes Incoming Reset
a. Motor to Control Valves start				
b. AA Rec. Inlet or AA Rec. Bypass after AA TK Inlet Man. Valve is open or AA Tight Line Pump Feed is open				
c. AA Tight Line Pump Feed or AA TK Inlet Man. Valve is open				
8.3 > Ferndale Outgoing Reset				Ferndale Outgoing Reset
a. Motor to Control Valve start				
b. Sump pump and M.L. unit released to operate for Ferndale				
c. FE Launcher. Outlet or FE Outlet Bypass released to open				
d. FE Normal Pump Feed and FE Oulet Man. valve is released to open				
8.4 > Anacortes Outgoing Reset				Anacortes Outgoing Reset
a. Motor to Control Valve start				
b. Sump pump and M.L. unit released to operate for Anacortes				
c. AA Launcher. Outlet or FE Outlet Bypass released to open				
d. AA Normal Pump Feed and AA Outlet Man. valve is released to open				

9.0 > Unit #1 Lockout				Unit #1 Lockout, Unit #1 Shutdown
9.1 > Multilin Trip				Unit #1 Multilin Trip
a. Acceleration on Unit Start				
b. Stator RTD, RTD's 1 through 5 has exceeded the trip limit.				
c. Bearing / Case RTD, RTD's 6 through 10 exceed trip limit.				
d. Ground Fault, Current-to-ground exceeded longer than time delay.				
e. Hi Amp				
f. Overload. Thermal capacity exceeded 100% for time period longer than lockout time.				
g. Rapid Trip. Mechanical jam				
h. Short circuit. Electrical current exceeded trip level for time period longer than delay time.				
i. Single phase. Unbalanced current exceeded 30% for a time period greater than 4 seconds.				
j. Unbalanced current. Electrical current unbalance has exceeded the unbalanced trip level for a time period greater than 5 seconds.				
9.2 > Unit #1 Motor Vibration				Unit #1 Vibration
9.3 > Unit #1 Pump Vibration				Unit #1 Vibration
9.4 > Unit #1 Seal Leak				Unit #1 Seal Leak
9.5 > Unit #1 Inc Seq				Unit #1 Inc Seq
10.0 Unit #2 Lockout				Unit #2 Lockout Unit #2 Shutdown
10.1 > Multilin Trip				Unit #2 Multilin Trip
a. Acceleration on Unit Start				
b. Stator RTD, RTD's 1 through 5 has exceeded the trip limit.				
c. Bearing / Case RTD, RTD's 6 through 10 exceed trip limit.				
d. Ground Fault, Current to ground exceeded longer than time delay.				
e. Hi Amp				
f. Overload. Thermal capacity exceeded 100% for time period longer than lockout time.				

g. Rapid Trip. Mechanical jam				
h. Short circuit. Electrical current exceeded trip level for time period longer than delay time.				
i. Single phase. Unbalanced current exceeded 30% for a time period greater than 4 seconds.				
j. Unbalanced current. Electrical current unbalance has exceeded the unbalanced trip level for a time period greater than 5 seconds.				
10.2 > Unit #2 Motor Vibration				Unit #2 Vibration
10.3 > Unit #2 Pump Vibration				Unit #2 Vibration
10.4 > Unit #2 Seal Leak				Unit #2 Seal Leak
10.5 > Unit #2 Inc Seq				Unit #2 Inc Seq
10.6 > Unit #2 Drain/Fill Inc Seq				Unit #2 Drain/Fill Inc Seq
10.7 > Incomplete Seq.-Drain/Fill Pump Unit				Unit #2 Drain/Fill Inc. Seq.
11.0 > Unit #3 Lockout				Unit #3 Lockout, Unit #3 Shutdown
11.1 > Multilin Trip				Unit #3 Multilin Trip
a. Acceleration on Unit Start				
b. Stator RTD, RTD's 1 through 5 has exceeded the trip limit.				
c. Bearing / Case RTD, RTD's 6 through 10 exceed trip limit.				
d. Ground Fault, Current to ground exceeded longer than time delay.				
e. Hi Amp				
f. Overload. Thermal capacity exceeded 100% for time period longer than lockout time.				
g. Rapid Trip. Mechanical jam				
h. Short circuit. Electrical current exceeded trip level for time period longer than delay time.				
i. Single phase. Unbalanced current exceeded 30% for a time period greater than 4 seconds.				
j. Unbalanced current. Electrical current unbalance has exceeded the unbalanced trip level for a time period greater than 5 seconds.				
11.2 > Unit #3 Motor Vibration				Unit #3 Vibration

11.3 > Unit #3 Pump Vibration				Unit #3 Vibration
11.4 > Unit #3 Seal Leak				Unit #3 Seal Leak
11.5 > Unit #3 Inc Seq				Unit #3 Inc Seq
12.0 > Unit #1 Start				Unit #1 Start
a. Pump unit Suction opens				
b. Incomplete sequence timer begins timing				
c. When pump unit suction valve opens, pump discharge valve begins to open.				
d. When pump unit discharge valve is 70% – 75% motor starts				
e. When motor starts and suction and discharge valve is open timer resets				
13.0 > Unit #1 Shutdown				Unit #1 Shutdown
13.1 Shutdown from OMI, pole position				
13.2 > Low Unit #1 Suction Pressure				Unit #1 Low Suction
13.3 > Unit #1 No Flow				Unit #1 No Flow
13.4 >High Ferndale Control Pressure				Ferndale Hi Control
a. Pump unit is shutdown				
b. Suction and discharge valves close				
14.0 > Unit #2 Ferndale Start				Unit #2 Ferndale Start
a. Pump unit FE suction valve begins to open				
b. Incomplete sequence timer begins				
c. Pump unit drain/fill sequence is inhibited				
d. When pump unit FE suction valve open, pump unit FE discharge valve begins to open				
e. When pump unit FE discharge valve is 70% -75% motor starts				
f. FE unit 2 bypass valve begins to close				
g. When motor starts and FE suct. & disch. Valves are fully open incomplete seq. Timer is reset.				
15.0 > Unit #2 Anacortes Start				Unit #2 Anacortes Start
a. Pump unit AA suction valve begins to open				

b. Incomplete sequence timer begins				
c. Pump unit drain/fill sequence is inhibited				
d. When pump unit AA suction valve open, pump unit AA discharge valve begins to open				
e. When pump unit AA discharge valve is 70% -75% motor starts				
f. When motor starts and AA suct. & disch. Valves are fully open incomplete seq. Timer is reset.				
16.0 > Unit #2 Ferndale Shutdown				Unit #2 Ferndale Shutdown
16.1 Shutdown from OMI, pole position				
16.2 > Low Unit #2 Suction Pressure				Unit #2 Low Suction
16.3 > Unit #2 No Flow				Unit #2 No Flow
16.4 >High Ferndale Control Pressure				Ferndale Hi Control
a. Pump unit shutdown				
b. Bypass valve opens if closed				
c. Suction and Discharge valve closes				
17.0 > Unit #2 Anacortes Shutdown				Unit #2 Anacortes Shutdown
17.1 Shutdown from OMI, pole position				
17.2 > Low Unit #2 Suction Pressure				Unit #2 Low Suction
17.3 > Unit #2 No Flow				Unit #2 No Flow
17.4 >High Anacortes Control Pressure				Anacortes Hi Control
a. Pump unit shutdown				
b. Suction and Discharge valve closes				
18.0 > Unit #3 Start				Unit #3 Start
a. Pump unit Suction opens				
b. Incomplete sequence timer begins timing				
c. When pump unit suction valve opens, pump discharge valve begins to open.				
d. When pump unit discharge valve is 70% – 75% motor starts				
e. Anacortes Unit #3 bypass valve begins to close				
f. When motor starts and suction and discharge valve is open				

timer resets				
19.0 > Unit #3 Shutdown				Unit #3 Shutdown
19.1 Shutdown from OMI, pole position				
19.2 > Low Unit #1 Suction Pressure				Unit #1 Low Suction
19.3 > Unit #1 No Flow				Unit #1 No Flow
19.4 >High Ferndale Control Pressure				Ferndale Hi Control
a. Pump unit is shutdown				
b. Bypass valve open				
c. Suction and discharge valves close				
20.0 > Drain/Fill Pump #2 Sequence				Drain / Fill
Pump drain sequence				
a. Pump vent valve opens and vent drain timer is started				
b. Pump drain valve open				
c. When the vent drain timer times out the vent and drain valve close				
Pump fill sequence				
a. Pump vent valve opens and the vent fill timer is started				
b. Pump fill valve AA or FE opens				
c. When the vent fill time times out the vent valve and fill valve close and the pump unit is released for normal operation				
18.0 High Loop Pressure				—
a. Ferndale Inlet Man.				Hi Loop Press. FE Inlet Man. Ferndale Incoming Shutdown
b. Anacortes Inlet Man				Hi Loop Press. AA Inlet Man. Anacortes Incoming Shutdown
19.0 High Ferndale Control Pressure				Unit #1 Shutdown (if pumping) Unit #2 Shutdown (if pumping) Ferndale Hi Control
20.0 High Anacortes Control Pressure				Unit #3 Shutdown (if pumping) Unit #2 Shutdown (if pumping) Anacortes Hi Control
21.0 > High Level Tank (number)				Hi-Tank (number)
22.0 > Injection Pump Start				Injection Pump Start
23.0 > Injection Pump Shutdown				Injection Pump Shutdown
23.1 From OMI or Pole Position				—

23.2 > Injection Pump High Pressure				Inj. Hi Press.
23.3 Injection Pump set point is pumped				—
23.4 > Low Level Transmix Tank				—
24.0 > High Level Sump				High Sump
25.0 > Sump Pump Start				Sump Pump Start
26.0 > Sump Pump Shutdown				Sump Pump Shutdown
26.1 Initiation from OMI or pole position				—
26.2 When sump liquid level drop to specified level.				—
26.3 > Sump Pump No Flow				Sump Pump No Flow
a. The pump unit is shutdown				
b. Discharge valve close				
27.0 Scraper Passage				Scraper In or Scraper Out
28.0 > High Pressure Surge Relief				High Pressure Surge Relief
29.0 > Fire Eyes Disarmed				Fire Eyes Disarmed
30.0 > Sampler Hi Pot				Sampler Alarm, Hi Pot
31.0 > Sampler Start				Sampler Start
32.0 > Sampler Flush				Sampler Flush
33.0 > Sampler Sampling				Sampler Sampling and % done
34.0 > Sampler Done				Sampler Done

Revised December 1, 1998

A. GENERAL.

Operations Controllers in Renton are responsible for executing the instructions of the schedulers. They perform operations to remotely control the pipe line system, issue necessary instructions concerning operations that must be performed locally by field personnel and maintain data sheets, logs and other information on which calculations and instructions are recorded.

B. REPORTS TO/FROM OPERATIONS CONTROL.

1. REFINERY PERSONNEL TO OPERATIONS CONTROL - PRE-PUMPING NOTIFICATION. At least one hour before a batch is to pump from a refinery, the Renton Operations Controller is to be furnished the following information:
2. Tank number(s) from which the pumping is to be made.Type of product.
3. Tank gauge.
4. Net available product in tank.
5. Gravity
6. Tank temperature
7. The results of certain laboratory tests.

GASOLINE:

1. Color
2. Lead content
3. RVP (Test certification results faxed to Operations Controller prior to shipment during Federal regulated time periods.)

DISTILLATES

1. Color
2. Flash

AVIATION JET FUEL DESTINED FOR SEA-TAG

1. Color
2. Flash
3. Millipore results
4. At least one hour prior to shipment a copy of "Inspection data on aviation turbine fuels (Form: ASTM D1655) is to be received at Olympic Pipeline receiving station.

h. The "OK" that refinery manifold valves and tank valves are in readiness to pump product to pipe line.

2. OPERATIONS CONTROL TO TERMINAL PERSONNEL - PRE-DELIVERY NOTIFICATION. The Operations Controller in Renton will verify the following information with terminal personnel.

a. Batch information, including at least shipper identification, product cod1ng, tender number, barrel volume of tender to be delivered from the pipe line.

b. The latest calculated time of batch arrival or start-up.

c. Line fill push-out flow rates, estimate of time for such and meter update as needed for terminal personnel to

set counter.

d. Names or initials of terminal personnel involved to be logged on operations daily log sheet.

The Olympic Operations Controller is responsible for notifying a terminal of any pipe line change affecting the terminal's operations, such as line shut-down, flow rate changes, start-ups into a terminal and completion of deliveries.

In some instances, a local Area Operator may be handling a start-up from the pipe line into a terminal or a product batch change with terminal personnel. If so, that Area Operator will be responsible for verifying the above information with the terminal personnel and updating the Operations Controller as required. The Operations Controller is responsible for providing current line information to Area Operators and terminal personnel that may affect those changes locally performed.

3. TERMINAL PERSONNEL TO OPERATIONS CONTROL - PRE-DELIVERY NOTIFICATION. At least one (1) hour before a pipe line delivery is to be made into a terminal, the Renton Operations Controller is to be furnished the following information from the terminal:

a. Total net barrel available room for product and interface delivery.

b. The "OK" that the terminal manifold and tank valve are open and tank(s) is ready to receive product.

c. Specific approval must be given to Olympic by responsible terminal personnel before delivery of a pipe line tender into a tank with less than one foot (1') of product above the fill line OR into a floating roof tank which has its roof resting on the legs.

d. Terminal personnel will notify the Olympic Operations Controller prior to any terminal operation that could affect the pipe line operation (such as splitting the product stream into more than one tank, filling a tank from the pipe line to or above the "red line" fill height, repair of lines or valves during a pipe line receipt, tank changes, etc.)

e. Request notification of interface arrival.

f. Request estimated flow rate to aid in making tank changes when more than one tank is required.

Terminal personnel will be responsible for all product line displacements, interface cuts, and batch changes within the terminal and notification to Olympic as soon as possible following tank changes with verification that product is flowing into the correct tank(s). Terminal personnel will use Olympic's latest published schedule and confirmed telephone changes to such schedules as a basis for planning the pipe line deliveries to be made.

A complete understanding of the actual transaction to occur between the pipe line and terminal personnel is essential for safe and efficient operations.

4. AREA OPERATORS TO OPERATION CONTROL CENTER - PERIODIC REPORTS. During normal remote operation of the system, data acquisition, command processing and alarm surveillance functions are handled automatically between remote terminal units at pipe line locations and the Renton master supervisory control operations computers. Consequently, frequent periodic reports to the operations control center from Area Operators are not required. However, Operations Controllers may request that particular information be reported by Area Operators. This information may include meter readings, tank gauges, pressures, API gravity, temperature and other data. When the supervisory control equipment or communications channels are inoperative for extended periods of time, Area Operators will report requested data to the control center and locally operate the equipment as directed by the Operations Controller.

REPORTING IN:

a. The first action to be taken by an operator when he/she enters a facility is to report in to Renton Control Center.

b. Turn the following information to the Operations Controller.

1. Gravity(s) of product at facility.

2. Temperature's - meter, prover, Motorola.

3. Pressures.

4. Sump Tank and Utility Tank Gauges.

5. General Appearance.

c. Any abnormalities in station equipment should be reported to the Operations Controller as well as the Area Chief. (i.e., meter noise, pump seal leakage, etc.)

REPORTING OUT:

a. The last action before leaving a station is to notify the Operations Controller and request a time update for any manned batch changes prior to 0800 hours the following day, and log yourself out at that time.

b. Station on remote, controller on external-automatic.

MANNED OPERATIONS - REPORTS TO OPERATIONS CONTROLLER

a. The area operator will read and report the following HOURLY AND AS REQUESTED.

1. Station suction pressure.

2. Station discharge pressure.

3. Station control pressure.

4. Meter readings.

5. Pump unit voltage and amps.

6. Main incoming voltage.

7. Line temperature and gravity.

8. Batch change information (time, gravity, temperature, appearance).

9. Any other information requested.

b. The Operator will report the following IMMEDIATELY:

1. Unusual pressure changes.

2. Leaks or reports of leaks.

3. Malfunctions or failure of equipment.

4. Emergency shutdowns or lockouts.

5. Any emergency or hazardous condition at or near station.

6. Routine work by company and outside personnel that may tend to affect operations.

7. Any other information that will affect operation of the station or line.

5. AREA OPERATORS TO OPERATIONS CONTROL - SCHEDULED REPORTS. When an Area Operator is scheduled to make a batch change which will involve a third party (refinery or terminal), the operator is to be on location one and one-half (1-1/2) hours prior to the indicated batch change time. Upon arrival, the Area Operator is to report to the Operations Controller and obtain all information which is necessary and pertinent to the event about to occur. If terminal or refinery tank information has not already been received by the Operations Controller, the Area Operator is to obtain the neccesary data and inform the terminal or refinery that the change will be handled locally and that calls regarding it should be directed to the local facility.

The Area Operator will also notify a refinery or terminal upon completion of a batch change. Unless otherwise instructed, the Area Operator will retain all information regarding the change until the completion at which time he/she will relay the data to the Control Center.

Area Operators scheduled for batch changes or other work not involving a refinery or terminal, are to be on duty at location one (1) hour prior to the event time.

When leaving a location, an Area Operator is to contact the Operations Controller and verify that the facility is operating normally in the remote mode.

To reduce the number of incoming calls to the control center, it is not necessary for an Area Operator to report to the Operations Controller upon arrival at a location when the operator has been on duty at and just departed a near-by facility.

6. SPECIAL REPORTS TO OPERATIONS CONTROL. Reports to Operations Control that are to be given priority and handled immediately are those concerning, but not limited to, (1) unusual pressure or flow changes or any other irregularity in operations; (2) leak or report of leak; (3) malfunction or failure of any equipment; (4) information concerning a batch change; (5) unscheduled shut-down or lockout; (6) any emergency or hazardous condition at or near the pipe line or a facility; and (7) any information that might affect the normal operation of the pipe line system.

7. REPORTS TO OPERATIONS CONTROL CONCERNING MAINTENANCE WORK. Prior to beginning any maintenance work at a pipe line facility or on a pipe line segment, operation or maintenance personnel must secure an "OK" from the Operations Controller to proceed. The nature of the work to be done, equipment to be tagged, the operations equipment involved in the maintenance procedure and an estimate of the down time, if any, should be reported. Following completion of the work, the Operations Controller is to be advised that the facility or line is ready for normal operation.

If such maintenance work involves drain-up, repressuring, opening/closing valves which could impair quality control of product, work affecting the normal operation of the line, or if requested, the Area Chief Operator must be notified PRIOR to beginning work.

The Operations Controller also is to be notified when it is necessary to operate the Local/Remote switch, any valve "hand/off/auto" switch or any protective device which in any way may change the normal operating status of a facility.

C. OPERATIONS CONTROL RECORDS.

In addition to the data log and event log records which are printed by the supervisory control computer, the Operations Controllers maintain pertinent records regarding the movement, measurement, quality and accountability of the products transported. They are as listed below:

SUPERVISORY CONTROL PRINTED RECORDS

1. Delivery and Batch Reports

2. Proving Reports

3. Meter Factor Data Tables

4. Hourly Line Status (Mainline Log)

5. Accumulator/Net Barrel Log (OLLOG)

6. Analogs in Violation

7. Communications Status

8. Sea-Tac over/short

9. Mainline over/short

OPERATIONS CONTROLLER GENERATED REPORTS AND LOGS

1. Line Inventory

2. Maintenance Logs

3. Emergency Logs

4. Outage Reports

5. Sea-Tac Over/Short

6. Batch Tracking

7. Miscellaneous Operations Notes (Spiral Notebook)

8. MOV - Mainline block valve log

9. Facility Temperature Check Verification

10. DRA Injection Logs

11. Interface Injection

12. Valve and Equipment (LOCK-OUT/TAG-OUT) - Software tagged On-Hand Breakers Pulled, during construction and maintenance periods.

D. REFINERY AND TERMINAL TANK INFORMATION.

It is the responsibility of the Operations Controller to record the product availability at refineries prior to pumping and product storage room at terminals prior to making a delivery.

In the event of a meter failure, the original tank tables are located in Operations Controller room, which are calculated from certified strappings. These tank tables are to be used as necessary for custody transfer purposes.

E. INJECTIONS FROM UTILITY TANKS.

Under normal operating conditions, and provided guidelines are followed, injections from utility tanks may be made into both leaded and unleaded regular gasolines.

The total volume that may be injected from utility tanks must be less than 1/2 of 1% of the total gasoline volume. This maximum (1/2 of 1% by volume) applies to injections at all locations as opposed to individual facilities.

Every effort is to be made to reduce utility tank volumes to low levels during each injection cycle. At some locations this may not be possible without exceeding the maximum allowable injections. In this case, the Area Chief Operator and Supervisor of Product Movement will be notified so that trucking or other disposal arrangements may be considered.

Utility tank injection guidelines (listed below) have been established and are to be followed. In some instances, for example as gasoline/fuel ratios change, it may not be possible to dispose of utility tank volumes to the low level. In such cases, the Supervisor of Product Movement may develop a different injection pattern guideline. However, under no circumstances will the maximum percentage of injections be exceeded without prior approval from the Supervisor of Operations.

LOW LEVEL UTILITY TANKS

Do not pump utility tanks below 4' (5' Renton Tank) without approval. Anytime the stream is to be turned into a utility tank with the liquid level below 3', contact Control Center Supervisor or Supervisor of Product Movement for maximum delivery rate.

UTILITY TANK MIXER OPERATION

When the "hand/off/auto switch" is in the "auto" position, the mixer will start when the tank outlet valve is opened and will stop when the same valve is closed. Do not pump any utility tank below 4' while the mixer is running because it is possible to create static electricity with the mixer if the propeller does not have sufficient liquid cover.

INTERFACE INJECTION GUIDE - maximum injection = 1/2 of 1% (.0050)

Allen Utility Tank

Inject into BP leaded regular grade gasoline destined for Renton D.F. only.

Renton Utility Tank

Start Renton interface injection two (2) hours after unleaded regular has arrived in Renton following fuel (Max. 1/2 of 1% for balance of tender) and shut down interface injection two (2) hours prior to fuel arrival at Renton Station (Max. 1/2 or 1% for portion of last tender injected into). Example: Last tender 60,000 - last 2 hours = 15,000 Barrels - tender amount for injection is 45,000.

Inject from Renton utility tank into all regular (leaded & unleaded) gasoline tenders destined for Seattle D.F. and Renton D.F., except for product that has been injected into at Allen.

Base Rate Renton Injection

7200 BPH (SE) at 1/2 of 1% = 36 BPH. If flow rate to Seattle is less than base rate, or volume to be injected is less than 1/2 of 1%, injection will be shut down prior to tender finish.

Seattle Utility Tank

Inject into regular leaded or unleaded gasoline. In order to inject at Seattle you must bypass tender injection from Renton utility tank.

Tacoma Utility Tank

Inject into regular leaded or unleaded gasoline not positioned next to fuel receipts.

Olympia Utility Tank

No injection - haul back to Renton.

Vancouver Utility Tank

Inject into regular leaded or unleaded gasoline not positioned next to fuel receipts if possible.

Portland Utility Tanks

Start Portland Interface Injection three (3) hours after unleaded has arrived at Portland D.F. following fuel (Max. 1/2 of 1% for balance of tender) and shut down interface injection three (3) hours prior to fuel arrival at Portland D.F. (Max. 1/2 or 1% for portion of last tender injected into). Example: Last tender 60,000 barrels - 3 hours = 19,000 barrels - tender amount for injection is 41,000 barrels.

Inject from Portland utility tank into all regular (leaded and unleaded) gasolines into Portland D.F.

Base Rate Portland Injection

6500 BPH at 1/2 of 1% = 33 BPH. If flow rate is less than base rate, or volume to be injected is less than 1/2 of 1%, injection will be shut down prior to tender finish.

DRA INJECTION - (Drag Reducing Agent)

Olympic Pipe Line currently has two (2) DRA injection points "Olympia Station and Castle Rock Station".

The Scheduling Department will schedule DRA injection start and stops with instructions to Operations Controllers.

A maximum accumulative level of 25 PPM will be allowed to flow into pipe line. DRA will be only injected into Diesel type product and must be shut down 5000 Bbls. prior to arrival of another type product or started at least 5000 Bbls. deep into diesel product.

A log sheet will be completed by Operations Controller showing DRA start and stop times, meter readings, DRA volume injected and tenders injected into.

F. SAMPLES.

It is generally the Area Operators responsibility to obtain pipe line samples following established procedures. There may be times that samples be pulled at the request of Controller, Quality Control Supervisor or when a field operator observes an unusual gravity, flash, color, or presence of water or other material is detected. In such cases, a one-gallon sample should be pulled and retained for thirty days. Information regarding the sample (batch identification, point 1n batch at which sample was taken, etc.) should be noted on the facility Daily Log and relayed to the Operations Controller so that It may be noted on the Log Sheet and passed on to terminals involved in receiving the product.

As a standard procedure, samples are pulled and retained from refinery liftings of jet fuel destined for Sea-Tac for product testing.

Samples are pulled and retained for Reed Vapor Pressure (RVP) compliance monitoring program during Federal RVP regulation periods.

When the need arises to truck product from an Olympic facility due to tank transfer, cleaning, leak, etc. the Area Chief Operator will insure that proper sampling and product accountability is done.

Compartments of trucks should always be checked to insure that they are empty and free of foreign matter before the truck is loaded.

Water cuts will be made as necessary on each truck and sample(s) taken to properly identify the product type and volume. Clean cans will be used for sampling; retaining the sample for thirty days unless otherwise directed. All samples must be properly labeled for identification.

In some cases, it may be necessary to ship samples to an independent laboratory for testing. If so, proper shipping containers must be used. The volume of such samples and the sample source will depend on the event necessitating the sample. When in doubt, sample and sample properly. It is better to have an excess of product sample rather than

not enough.

G. DRAIN-UP AND REPRESSURE OPERATIONS

Specific procedures will be written by the Supervisor of Product Movement, Supervisor of Maintenance and responsible Area Chief for any major or unusual drain-up and repressuring operation. A Control Center coordinator will be assigned to assist during these procedures.

For drain-ups and repressuring operations involved in routine maintenance such as valve, prover or meter repairs, the following guidelines should be followed unless otherwise instructed.

1. A field operations person must be present to make any necessary valve realignments, perform the drain-up/ repressuring operation, and ensure proper lock-out tagout procedures.

2. Within confined areas (meter runs, provers, pump loops, etc.) drain-up and repressuring operations will be done using regular unleaded gasoline unless prior approval from the Supervisor of Product Movement is obtained. Line drain-up and repressuring operations will be done using diesel fuel unless otherwise instructed by the Supervisor of Product Movement.

H. QUALITY CONTROL OF PRODUCT.

The control of product quality to meet rigid specifications must be maintained. The following examples illustrate tnat a small amount of contamination can cause the product to be off specification.

1. Octane Number of Gasolines. The octane rating of premium grade gasoline is measurably reduced by the introduction of regular grade gasoline.

The octane rating of both premium and regular grade gasolines is significantly reduced by the introduction of any distillate product.

2. Distillation End Point of Gasolines. One barrel of kerosine type product in 100 barrels of gasoline may raise the gasoline end point by 15°F.

One barrel of diesel fuel in 100 barrels of gasoline may raise the gasoline end point by 33°F.

3. Flash Point of Distillates. Two barrels of gasoline in 1000 barrels of diesel fuel may lower the diesel flash point 10°F.

A volume in a 35-barrel sump tank may be enough to completely contaminate 30000 barrels of distillate product.

Monitoring Sumps for Quality Control

The following procedure will be used for filling and pumping of sumps into the pipe line stream with the exception of the Anacortes - Texaco and Shell (5) barrel sumps during normal operations.

1. Prior approval must be received by Operations personnel before sumps are pumped.

2. Sumps will be pumped into leaded regular gasoline when possible.

3. Drain-ups or purging of main line units will be done with unleaded gasoline when possible.

4. Sumps filled with unleaded gasoline may be pumped into unleaded regular.

5. If a sump is filled with fuel oil or leaded regular gasoline, every effort should be made to distribute its contents into as many regular grade (leaded and unleaded) tenders as possible.

6. Excessive fillings of a sump due to leakage or other problems with fuel oil or leaded gasoline may require trucking of the product to a facility utility tank. Our primary concern is to be able to dispose of interface material into regular grade gasolines without appreciably affecting the quality of the product. This can only be done by controlling the amount of injections from origin to destination. Therefore, Operations personnel must consider, not only the amount of interface that has been injected into a tender, but also scheduled injections to be made prior to a tender termination.

Quality Control - Aviation Turbine Fuel Jet A

Monitoring of Jet Fuel destined for Sea-Tac and Sea-Tac terminal storage is outlined in Sea-Tac manual: "Fungible Aviation Turgine Fuel Jet A Specifications - SeaTac Terminal".

I. BATCH CHANGES.

Olympic employs three methods of determining batch changes:

a. change in API gravity;
b. change in color; and
c. volume displacement.

The Renton Operations Controller will make remote batch changes when such batch changes are gasoline to gasoline and fuel to fuel and when one of the following applies:

1. Change in API gravity is greater than one degree.

2. Stub line volume displacement may be used when not stripping through from one batch into another at the main line junction point. (Line segment volume displacement - Vancouver Junction to Portland, for example - may be used for remote batch changes at Portland.)

3. Batch volume displacement may be used when neither API gravity nor color change is detectable and the change is between two batches of the same type product, such as R23 to B-23 or T-9 to S-9.

No remote batch changes will be made when the change is between gasoline to fuel, fuel to gasoline, or gasoline to gasoline with buffer interface that drops six degrees API. Operations Controller will check such changes at Allen Station and notify terminal personnel concerning these changes.

ALL FUEL TO FUEL AND GASOLINE TO GASOLINE BATCH CHANGES WHICH INVOLVE NO INTERFACE WILL BE CUT AT MID-POINT GRAVITY AND TICKET PRINTED ACCORDINGLY.

Receipts from ARCO refinery - When you are given a tank gravity from Arco, ask for gravity of the product which is between the tank and manifold.

Receipts from BP. TEXACO. SHELL refineries - Prior to any start-up on tenders at Ferndale or Anacortes that have been laid down previously, check back to see what the gravity was on that particular tank and use this information for future batch change reference.

NOTE: The gravity reported by the refinery is the gravity of the tank. The product in the line between the manifold and the tank may be of a different gravity.

Some batch changes start out with a small amount of head-end gravity difference (MICKEY) that washes out travelling through the pipe line. Operations Controllers are to take gravity changes into consideration when making batch changes at various terminals. It is the Operations Controller's responsibility to flag these batch changes by printing a hard copy and posting these CRT gravity trends to properly make batch change. (Hard copy will be printed on all gasoline to gasoline changes at origin point and/or Allen Station.)

On 14" destination batch changes, notify the Area Chiefs that gravity change on the North end was not distinguishable and batch change may need to be manned. Tentative manpower will be scheduled at this time with final determination made by the Operations Controller after batch change passes through Renton Station.

IN ALL CASES, IF YOU ARE UNCERTAIN WHERE THE BATCH CHANGE IS, THE CHANGE WILL HAVE TO BE MANNED AT APPROPRIATE SAMPLE LOCATIONS.

J. TERMINAL TANK ALARM. (Also see Sec. 6 [B-4])

During deliveries to participating terminals and upon receipt of a tank alarm, the Renton Operations Controller will immediately initiate an Emergency call to Terminal and a shutdown to stop the flow of product into the affected terminal. The times required to stop flow have been furnished to the terminals as follows:

Location	Time Required to Stop Flow
Renton	5 minutes
Seattle	5 minutes
Tacoma	3 minutes
Olympia	2 minutes
Vancouver	5 minutes
Linnton	5 minutes
Portland	5 minutes

On receipt of an Olympic Pipe Line equipment or communication failure alarm, the Operations Controller will immediately notify the affected terminal location; delivery of product into such a terminal, however, will continue.

The terminals participating in this service have agreed to furnish one telephone number to be called by Olympic as necessary to carry out the above and insure that personnel are available to expedite resumption of deliveries to minimize down time of pipe line facilities. Terminals are urged to set the level at which the tank alarm is transmitted to allow time for Olympic to make a shutdown of the necessary system thus preventing an over-fill condition.

Current participating receiving terminals are listed below:

LOCATION	TERMINAL
Renton	BP
Seattle	Shell Texaco
Tacoma	BP
Olympia	Texaco
Portland	Shell Texaco

K. SCRAPER / SPHERE PROGRAM

The scraper program has been developed to maintain a clean pipe line and reduce the amount of rust and particle build-up in main line and stub line segments. Spheres will also be launched in the event water was induced into pipe line or other non-compatible interface material. Scrapers are to be positioned and launched a minimum of 5000 bbls

deep in the fuel. The scraper launch will be coordinated by field operations (both stations and deliveries) through the control center. It may also be necessary to utilize station utility tanks for removal of such interface depending on situation and volume already in specified tank. Controller will notify the Control Center Supervisor in the event a sphere or scraper is needed to be launched for product integrity.

The Operations Controller will record the loading and removing of scraper/spheres, the position of scraper/spheres in the system, and other information pertinent to the procedure, on the line sheets.

All scrapers/spheres should be removed from the incoming traps upon arrival of the first unleaded regular grade gasoline, with scraper/sphere condition logged in the station scraper log book. Use the Enduro Pig Data Forms to record all conditions and findings. The are supervisors will review Pig Log Book recordings to verify proper inspection.

Provers will be bypassed prior to arrival of scraper at each delivery facility and at Renton D.F. prior to anticipated arrival of scraper cloud from 16" or 20" scraper arrival at Renton. Junction lines will be closed prior to arrival of scraper and cloud passage.

Scraper clouds will be monitored by field operations personnel. Samples will be pulled at the darkest portion of the cloud and tagged. The quality control advisor will be notified of the observed interface. If a scraper is in a fuel that will be delivered at Portland to the Portland Junction line. The cloud must be taken to the utility tanks.

16" Sphere/Scraper Launch Program

Anacortes - Bayview	3rd Cycle	1 per month
Bayview - Allen	3rd Cycle	1 per month
Allen - Renton	3rd Cycle	1 per month

12" Sphere/Scraper Launch Program

Renton - Seattle	3rd Cycle	1 per month
Renton - Sea-Tac	3rd Cycle	1 per month

These scrapers will be launched after the arrival of the Allen to Renton scraper.

Vancouver Jct - Vancouver DF	2nd and 4th Cycle	2 per month

This scraper will be launched after the passing of the Renton to Portland scraper.

20" Sphere/Scraper Launch Program

Cherry Point - Ferndale	2nd and 4th Cycle	2 per month
Ferndale - Bayview	2nd and 4th Cycle	2 per month
Bayview - Allen	2nd and 4th Cycle	2 per month
Allen - Renton	2nd and 4th Cycle	2 per month
Renton - Portland	2nd and 4th Cycle	2 per month

8" Sphere/Scraper Launch Program

Tacoma Jct - Tacoma DF	2nd and 4th Cycle	2 per month

This scraper will be launched after the passing of the Renton to Portland scraper.

6" Sphere/Scraper Launch Program

Olympia Jct - Olympia DF	2nd and 4th Cycle	2 per month

This scraper will be launched after the passing of the Renton to Portland scraper.

L. CLOCK SYNCHRONIZATION.

The master clock in the Renton Operations Control Center will be considered the official time, expressed in 24-hour (military) units. Clocks at all Olympic facilities should be synchronized as needed with this clock. All clocks are to be reset going to daylight savings time and then again back to standard time.

When an operator is out at a location, synchronize the Daniel 2502 Flow Computer clock with Operations Control Center.

To set clock on the Daniel Flow computer, operator must:

1. Enter password
2. Page through to SET SET/TIME
3. Enter date and time as: DD-MM-YYYY HH-MM
4. Press enter to start clock at entered time.

NOTE: Entry must include complete date and time or input error will result.

M. DATA COMMUNICATIONS - CONTROL CENTER (also see Sec 6 [B-6])

There are currently (8) eight data communication circuits being utilized to communicate between remoted facilities and Renton Master. They are as listed below:

CIRCUIT I.D.	REMOTE FACILITIES
#1 - 2FDDA6082	Cherry Point - Ferndale - Anacortes
#2 - 2FDDA6081	Allen #1 - MP #56 - MP #89 - Woodinville
#3 - 2FDDA6080	Allen #2 - MP #46 - MP #66 - MP #110
#4 - FDEC641280	Olympia Jct. - Portland - Renton #2 - Vancouver Jct.
#S - 2FDDA6084	Renton #1 - Sea-Tac #1 - Seattle - Henderson St. B.V.
#6 - 2FDDA6083	Sea-Tac #2 - Spokane St. B.V. - Tacoma DF
#7 - FDDC163088	Tacoma Jct. - Tacoma Sta. - Castlerock
#8 - FDEC641278	Olympia DF - Vancouver DF - Linnton - Portland Jct.

CIRCUITS #1,2,3,5,6 US WEST COMMUNICATIONS CIRCUITS

Circuit repair call numbers: Seattle 346-9900

Portland (S03) 242-7700 CIRCUITS #4,7,8 AT&T CIRCUITS

Circuit repair call number: 1-800-833-3803

VOICE COMMUNICATIONS - CONTROL CENTER Private line (SS-4 system)

Olympic Pipe Line has installed a private party line telephone system known as the SS-4 system. This system is utilized for daily operations between field operating personnel and Operations Controller.

Telephone Circuit Number: 4DP2410 (AT&T) Telephone Circuit Repair Number: 1-800-833-3803

EQUIPMENT

All telephone equipment that is located at Woodinville Station and North is maintained by Olympic Pipe Line. All equipment malfunctions will be repaired by OPL Electrical Department or their appointed contractor.

All telephone equipment that is located at Renton Station and South is owned and maintained by US West Communications.

Telephone Equipment Repair Number: 1-800-833-3803

N. LINE FILLS AND DISPLACEMENTS

Mainline Base Volume Calculations

"0" Pressure & 60°F

16" Cherry Point - Ferndale Booster	6088
16" Ferndale Booster - Allen	45402
16" Anacortes - Allen	10259
16" Allen - Woodinville	60052
Woodinville - Renton	31663 91715
20" Allen - Renton	148486
14" Renton - Tacoma Station	27715
Tacoma Station - Olympia Jct	20620
Olympia Jct. - Castle Rock	42036
Castle Rock - Portland	46701 137072

BASE VOLUME CAPACITIES

Line	Segment From	To	Length Miles	Inside Diameter Inches	Barrels / Mile	Line Fill 60° F O Pressure
16"	FE	AL	37.38	15.3750	1,212.68	45,330
16"	AL	WN	49.52	15.3750	1,212.68	60,052
20"	AL	WN	46.97	19.5000	1,950.68	91,623
20"	AL	WN	0.07	19.4375	1,938.20	136
20"	AL	WN	2.02	19.3750	1,925.75	3,890
20"	AL	WN	0.46	19.0000	1,851.93	852
16"	WN	RE	26.11	15.3750	1,212.68	31,663
20"	WN	RE	25.39	19.5000	1,950.68	49,528
20"	WN	RE	0.91	19.4375	1,938.20	1,764
20"	WN	RE	0.36	19.3750	1,925.75	693
14"	RE	TJ	19.97	13.4375	926.31	18,498
14"	TJ	TA	9.95	13.4375	926.31	9,217
14"	TA	OJ	22.26	13.4375	926.31	20,620
14"	OJ	CR	45.38	13.4375	926.31	42,036
14"	CR	VJ	43.19	13.4375	926.31	40,007

14"	VJ	LI	5.38	13.4375	926.31	4,984
14"	VJ	LI	0.85	13.0000	866.97	737
14"	LI	PO	1.05	13.4375	926.31	973
16"	CP	FB	5.02	15.3750	1,212.68	6,088
16"	FB	FE	0.06	15.2500	1,193.05	72
16"	AA	AL	8.46	15.3750	1,212.68	10,259
16"	AS	AA	1.51	15.5000	1,232.48	1,861
16"	AT	AA	1.12	15.5000	1,232.48	1,380
12"	RE	SE	12.43	12.1875	761.99	9,472
12"	RE	ST	5.54	12.1875	761.99	4,221
8"	TJ	TA	3.72	8.2500	349.16	1,299
6"	OJ	OL	14.90	6.2500	200.39	2,986
12"	VJ	VA	4.23	12.1875	761.99	3,223

O. PUMP AND MOTORS - STATION OPERATIONS

Pump Unit Drains and Fills

The drain pumps which are used to drain main line pumps are not designed for high pressure and the drain sequence must not be initiated following shut down of main line pump until the suction and discharge valves have closed.

Drain and Fill Sequence

To eliminate the possibility of overlooking the drain and fill sequence of all shut-down main line pumps at the beginning of each fuel cycle, the following procedures will be followed:

1. One (1) hour before fuel displaces gasoline in the station loop, the Operations Controller/Area Operator will drain main line pumps that will be shut down when gasoline/fuel interfaces passes.

2. Operations Controller/Area Operator will observe sump gauge before and after drain sequence to insure drain function worked.

3. As soon as possible after fuel has displaced gasoline in the station loop, the Operations Controller/Area Operator will initiate the pump fill sequence.

4. In the event a unit is not drained/filled upon the arrival of fuel, the unit will be software tagged by Operations Controller and not used until unit has been drained and filled.

NOTE: ALL UNITS CAN BE INITIATED FOR MORE THAN (1) ONE DRAIN AND FILL IF NEEDED.

Motor - Unit Starts

After two (2) consecutive starts, do not attempt third until:

			Idle	Running
500 HP	1800 RPM	NEMA 2 Motor	45 min.	18 min.
500 HP	1800 RPM	TEFC Motor	40 min.	15 min.
1000 HP	3600 RPM	NEMA 2 Motor	40 min.	20 min.
1500 HP	3600 RPM	NEMA 2 Motor	30 min.	15 min.
2000 HP	3600 RPM	NEMA 2 Motor	55 min.	30 min.
2500 HP	3600 RPM	NEMA 2 Motor	55 min.	30 min.

Running time on unit cancels previous start. Example: 2000 HP 3600 RPM motor

You have started this unit and twice it has shut down. This unit must stay shut down for 55 min. before another start attempt is made.

You attempt to start this unit again, and unit shuts down. Again this unit must remain down for another 55 min. before another start attempt.

After 55 min. has elapsed, you start unit again and unit remains running for 40 min. and you shut down unit. As this condition cancels all previous starts, you can again make two consecutive starts before idle time is required.

Pumping Facility Loop Bypass Valves

Woodinville Station Tacoma Station Olympia Station Castle Rock Station

At the above pumping facilities the normal operating position of loop bypass valve will be in open position when pump units are running at station.

The Operations Controller will close loop bypass when units are not running to insure that station loop is flushed out and there will not be product contamination.

Be sure the loop bypass valve is open prior to any sphere passage.

P. SEA-TAC OPERATIONS

Over/Short

Sea-Tac over/short net barrels are to be calculated at least once per hour.

Set forth below are MAXIMUM net barrel over/shorts for a given 24 hour time (0000 to 2359) frame and Controllers instructions when the maximum limits are exceeded.

#1 Sea-Tac tanks to truck rack (4) and undergrounds (4)

100 NET BARRELS

#2 Pipe line into Sea-Tac storage tanks.

150 NET BARRELS PER TANK

250 NET BARRELS (If more than one tank)

When Maximum Limits are Exceeded

#1 above - Isolate and close on-line tank outlet to airport.

#2 above - Shut down pipe line and close in Sea-Tac delivery facility.

Operations Controller to call Area Chief (or Designate) for operator response to airport. Operator to check for problems and run Sea-Tac operational over/short, check tank volume, meter calculations, stations piping, etc.

Once problem is resolved and Controller is satisfied, the Controller may start up pipeline, taking 15 min. checks for over/short calculations. If, after two (2) consecutive 15 minute checks, the over/short trend continues, again isolate the affected area and notify Area Chief and Control Center Supervisor or Supervisor of Products Movement.

NOTE: Controller to flag Sea-Tac receipt tank changes on controller sheets for accountants to compare total meter receipts vs tank gauge receipts.

Sea-Tac Operations to Controller

Sea-Tac Operator will report and verify a temperature check with Controllers on each tank prior to receipt and verify temperature of on-line tank to airport facilities (normal work days). A maintenance log will be submitted if tank temperature is -/+ 1.0 degrees of temperature.

Sea-Tac Operator will inform Controller of next tank(s) to be put on line to airport, gravities and approximate time this will take place.

Controller will update tank status on CRT and gravity as needed.

Controllers Responsibility

1. Operations Controller will make all tank changes to airport. Set on-line tank low level to 05.02 and swing to next tank assigned by Sea-Tac Operator. Print log at swing time for future use, if needed.

2. Run terminal over/short.

Sea-Tac 5 Barrel Sump Pump

If, in the event the 5 barrel sump pump at Sea-Tac indicates "ON" for more than 30 minutes, there may be problems with the float device. Controller to call Area Chief (or Designate) for operations response.

NOTE: Controller to monitor recovery tank level during this period of time for abnormal rise in fluid level.

Sea-Tac Industrial Waste Water Pump

Occasionally Controller may receive an Industrial Waste Water Pump Run indication at Sea-Tac #2. This condition is mostly caused from ground water being pumped to pond. There is no need to call out Operations Personnel for this event.

Operational Procedure - Sea-Tac Alarms

In the event Controller receives a MSTR/SUBMSTR PLC comm. alarm, select a Mater Comm. Reset on Sea-Tac #2 format. If the alarm does not reset, Sea-Tac personnel will have to be called to respond to alarm.

If Controller receives a "RTU POWER" or "RTU MEMORY" or "DART DANMASTER COMM." alarm, Sea-Tac personnel will have to be called out to respond to alarm.

If Controller receives a Rack Primary (Danmaster) alarm, no one needs to be called out unless there are problems at the airport with fuelers receiving product.

NOTE: If Comm. Failure is valid, it will reset for 1-1/2 minutes then fail again.

Sea-Tac Truck and Underground Facilities

Operations Controller receives indications of motor running on all four (4) systems at Sea-Tac. Controller also receives indications in the event of Truck Rack Lockout.

Sea-Tac Truck Rack and Skid Lock-out Instructions

The following instruction are for the time frame of:

2200 until Sea-Tac Operator arrives the following day.

SKID LOCK-OUT

Reset the following day.

ONE (1) ARM OF TRUCK RACK LOCKED OUT

Reset the following day.

TWO (2) ARMS OF TRUCK RACK LOCKED OUT

Call Area Chief during weekdays or Designate on weekends and they will reset the truck rack arms.

Prior to 2200 time, all Truck Rack arms will be reset by SeaTac Operator and skid lock-outs will be reset by Sea-Tac Operator as deemed necessary. (Certain low-volume skids can remain locked out at Operators discretion.)

NOTE: In the event a skid is locked out and you do receive skid meter counts, close tank outlet to airport and notify Area Chief (or designate) of pending problem.

Sea-Tac Operations - Surge Relief

Surge relief into the Sea-Tac facility will be directed into either Tank #114 or Tank #115 through their respective tank inlet valves. One of the tank inlet valves will be left open at all times. The Operations Controller will be responsible for proper alignment of the correct tank inlet valve dependent upon the following conditions:

1. Tank on line or scheduled to be on line next will not be used for surge relief.

2. Tank on line to the incoming mainline stream will be filled to a level not to exceed 42.10 feet.

3. If a certified tank must be used as a surge relief destination and a surge condition occurs from the incoming stream, the tank must be tagged for retest and appropriate personnel notified.

Sea-Tac Tank Movement Alarms

When the Controller receives a Sea-Tac TANK DEVIATION ALARM from an inactive tank (tank inlet and outlet closed), please make note of the alarm. Record the following information in batch tracker, Sea-Tac O/S section.

TIME TANK # *EXPLANATION FOR CHANGE

If a Sea-Tac Operator is not present, the recovery tank movement will also be logged in the same manner as above.

Should any information need to be brought to the attention of the Control Center Supervisor, please log the message in the Operations Controller log book.

NOTE: If change is due to temperature please log temp with other information.

Sea-Tac Counters

If the CRT counters for the Truck Rack and Skids should clear, then have the Sea-Tac Operator give you the meta-meter and PLC readings. Record this information on the line status for junctions and deliveries sheet with the current tanks and meters.

Q. PRORATION POLICY

1. Purpose of Policy.

The purpose of this Proration Policy is to enable Olympic Pipe Line Company to comply with its statutory obligations as a pipeline common carrier under Part I of the Interstate Commerce Act (49 U.S.C. §§ 1-26) during any period of time when the aggregate volume of petroleum products, which all Shippers desire to transport through Olympic's pipeline facilities, exceeds Olympic's available pipeline throughput capacity. This Proration Policy is designed to equitably allocate space in the Olympic pipeline facilities among all Shippers desiring at any time to ship petroleum products through the pipeline system of Olympic.

2. Definitions.

"Forecast Month"	the month next following the current month
"Forecast Volume"	the volume of petroleum products which a Shipper desires to transport through the Olympic facilities, on a gasoline equivalent basis
"Total Forecast Volume"	the aggregate volume of petroleum products which all Shippers desire to transport through the Olympic facilities for a Forecast Month
"Segment"	an operational portion of the Olympic pipeline facilities as further defined below by destination points
"Segment 1 Destination Points"	Olympic delivery facilities at Bayview, Renton, Seattle, and Sea-Tac
"Segment 2 Destination Points"	Olympic delivery facilities at Tacoma, Spanaway, and Olympia
"Segment 3 Destination Points"	Olympic delivery facilities at Vancouver, Linnton, and Portland

3. Forecast Volumes.

In order for Olympic to determine if it is necessary to allocate pipeline space in any portion of Olympic's facilities, Shippers are required to furnish monthly forecasts of volumes to be received by the 10th of each month for the next month's product movement. If the Shipper makes such forecast by telephone, it shall promptly confirm the forecast to Olympic in writing (or by facsimile transmittal in case of emergency). Olympic will carefully examine Forecast Volumes to insure that they are true and realistic and will challenge any Forecast Volume which appears to be inflated.

If it appears to Olympic that it will be necessary to allocate pipeline space for an extended period of time, Olympic will request Shippers to furnish monthly forecasts of volumes during the forward three calendar months.

4. Proration Procedure.

When the verified Total Forecast Volume for any month exceeds the capacity available in any Segment, the following procedure will be enacted:

a) All Shippers tendering on the affected line Segment will be notified of Olympic's intent to prorate pending verification of Forecast Volumes from all Shippers. At this time, a Shipper must confirm to Olympic its intent to move the volume specified in its original forecast, or a lower volume, but a Shipper cannot change it original forecast to increase its forecasted movements in excess of its original Forecast Volume.

b) The verified Total Forecast Volume will be divided into the capacity to determine the "Proration Factor." Each Shipper's allocation shall be determined by multiplying its verified Forecast Volume by the applicable Proration Factor. Such allocation, as it may be reduced by application of paragraph "c)" below, is hereafter called the "Allocated Volume." If the Allocated Volume for any Shipper is less than the minimum batch requirement set forth in Olympic's tariff, such Allocated Volume may be increased at Olympic's option to equal the minimum batch requirements.

c) The forecast schedule for each month will be sent to each Shipper by the 2Oth day of the current month, showing planned product movements to begin on the first day of the Forecast Month. If a Shipper fails to move its Allocated Volume, such Shipper's Allocated Volume for the first prorated Forecast Month occurring after the next scheduling month (if such prorated month occurs within the next six scheduling months) will be reduced by the difference between its Allocated Volume and actual shipments for the month - except to the extent that such failure is, in the sole opinion of Olympic, due to causes reasonably beyond Shipper control.

d) Allocated Volume of one Shipper may not be assigned, conveyed, or used by another Shipper during such time as prorationing may be in effect.

e) If a product is not available at the time allocated in the schedule, it will be dropped from the schedule and may not be carried forward into any subsequent month. In such event, Olympic may redistribute unused Allocated Volume among other Shippers to efficiently utilize the pipeline capacity.

R. 16" LINE START AND STOP

1. OPERATIONS CONTROLLER PRESTART CHECK LIST

a. Verify that all work started during the line shut down period is complete, documented and untagged. (Reference Operations Controllers log book, daily notes and repair reports.)

b. Check pumping schedule for product to be pumped and delivered. Verify that Controller sheets and the flow computer are accurate and that all the latest schedule changes have been incorporated.

c. Recalculate times posted on Operation Control sheets and notify refineries, terminals and Olympic area operators of these estimated times. Obtain and record tank information and personnel out times.

d. Open appropriate refinery valve and verify that the divider valve opens (if applicable). Check that the booster display is free of alarms.

e. Reset pump station(s) shut down(s) and reinitiate pressure set point(s). Open station valves (concerned with flow through the station). Check that the pump station display(s) is free of alarms. Be aware of line sphere location and that it may be necessary to open the loop bypass valve (on stations with sphere by-pass configurations) prior to starting a pump.

f. Check the status of all intermediate block valves. (Block valve format isn't normally displayed, but is a valuable tool to monitor line pressure changes during the line startup).

g. Reset the delivery facility shut down and reinitiate the flow rate and/or pressure set point(s). Open the appropriate customer manifold valve and verify that the proper divider valve opens. All delivery facility valves should be properly aligned, except the delivery facility inlet valve will be opened just prior to the line restart.

h. It will be necessary to prepare and post tank change, batch change and interface injection records, DRA starts and stops, if these functions occur shortly after the line is restarted.

i. Double check all of the above functions. If anything appears to be wrong or reacts in an inconsistent manner, the line will remain shut down until problem is corrected or until Operations Controller is satisfied that the pipeline can be operated in a Safe and Efficient manner.

16" LINE SCHEDULED RESTART

Originating Refinery - Anacortes Texaco

Destination - Seattle D.F.

Product in Line - All Gasoline

Shut Down Pressures:

Anacortes Suction	50# PSI
Anacortes Discharge	200# PSI
Allen 16" Suction	214# PSI
Allen 16" Discharge	450# PSI
Woodinville Suction	317# PSI
Woodinville Discharge	317# PSI
Renton 16" Incoming	450# PSI
Seattle D.F. Incoming	455# PSI

Power-op steady state rate = 7200 BPH

Units to be Started:

(a) Texaco Refinery Booster

(b) Texaco Booster

(c) Anacortes #1,#2

(d) Allen 16" #1,#3

(e) Woodinville #1,#2

Useful CRT Displays: Anacortes 16" Segment I Start-up

Block Valves

Line Status (2)

Step by Step Restart Guidelines

1. Complete prestart Checklist. (1)
2. Open Seattle D.F. Inlet valve (V-702) and enter 1000 BPH flow rate set point (2). (Opening time approx. 1 minute)
3. When Seattle D.F. Flow rate is established, initiate Texaco Booster start. (Starting time approx. 10 sec.)
4. When Anacortes suction pressure increases, initiate Anacortes Unit #2 start. (Starting time approx. 45 sec.)
5. When Anacortes unit #2 starts, increase Seattle D.F. flow set point to 2000 BPH and have Texaco Refinery start their booster pump.
6. When Allen 16" suction pressure increases, initiate Allen 16" Unit #3 start. (Starting time approx. 45 sec.)
7. When Allen 16" Unit #3 starts (2),increase Seattle D.F. flow set point to 3000 BPH.
8. When Woodinville suction pressure increases to 400 PSI, initiate Woodinville Unit #2 start (1). (Starting time approx. 45 sec.)
9. When Woodinville Unit #2 starts, increase Seattle D.F. flow set point to 4000 BPH and open Woodinville Loop Bypass (V-1521).
10. When Renton 16" incoming pressure increases (from Woodinville unit start), increase Seattle D.F. flow set point to 5000 BPH.
11. Start Anacortes Unit #1. (Starting time approx. 45 sec.)
12. When Allen 16" suction pressure increases and Anacortes flow rate decreases due to line pack, enter Allen 16" discharge pressure set point that is slightly lower than the actual station discharge pressure.
13. When the Allen 16" control is actually throttling (differential pressure - discharge vs control) initiate Allen 16" Unit #I start (2). (Starting time approx. 45 sec.)
14. Increase Allen 16" discharge pressure set points as necessary (3).
15. When 16" line is sufficiently packed and Woodinville suction is at least 360 PSI, start Woodinville Unit #1. (Starting time approx. 45 sec.)
16. When Woodinville Unit #1 starts (3), increase Seattle D.F. flow set point to 6000 BPH.
17. When Renton 16" pressure increases, from Woodinville unit start, increase Seattle D.F. flow set point to 7000 BPH. As 16" line is packed, increase flow rate set point to 8000 BPH (Full open position.)
    1. Special attention should be given to any work completed during a shut down period. Monitor pressures, equipment, sumps and utility tanks at these locations
    2. Monitor transitional line pressure changes on block valve format or line status format. If line status format is used, sump and utility tanks can be monitored also.
    3. Set point increments of up to 30 PSI should be sufficient. Maintain adequate suction pressure and Anacortes flow rate need not exceed 8000 BPH. Continue set points until control valve is fully open and set point is returned to maximum station discharge set point.

3. 16" LINE SCHEDULED SHUTDOWN

Originating Refinery - Anacortes (Texaco) Destination - Seattle Delivery Facility

Product in Line - All Gasoline

Shut Down Pressures (Goal)

Anacortes Discharge	300# - 400# PSI
Allen 16" Discharge	400# - 500# PSI
Renton 16" Incoming	400# - 500# PSI
Seattle D.F. Incoming	400# - 500# PSI

Power-op steady state rate (prior to shutdown) = 7200 BPH

Units To Be Shutdown

Texaco refinery booster

Texaco Booster

Anacortes #1, #2

Allen 16" #1, #3

Woodinville #1, #2

Useful CRT Displays: Anacortes 16" Segment I start-up

Block Valves

Line Status (2)

Step by Step Shutdown Guidelines:

a. Decrease Seattle Delivery Facility flow set point to 7000 BPH.
b. Enter Woodinville discharge pressure set point slightly lower than the actual station discharge pressure. Slowly decrease discharge pressure set points (30 PSI increments should be sufficient) until discharge vs control pressure equals PSI put up by Unit #1. (Approx. 250 PSI)
c. Shutdown Woodinville Unit #1. (2) Enter discharge pressure set point for maximum station discharge.
d. Decrease Seattle Delivery Facility flow set point to 6000 BPH.
e. Enter Anacortes discharge pressure set point slightly lower that the actual station discharge pressure. Slowly decrease discharge pressure set points (1) (10 - 20 PSI increments should be sufficient) until discharge pressure vs control pressure equals PSI put-up by Unit #1. (approximately 160# PSI)
f. Shutdown Anacortes Unit #1. Enter discharge pressure set point for maximum station discharge pressure.
g. Decrease Seattle Delivery Facility flow set point to 5000 BPH.
h. Enter Allen 16" discharge pressure set point slightly lower than the actual station discharge pressure. Slowly decrease discharge pressure set points (1) (30 PSI increments should be sufficient) until discharge pressure vs control pressure equals PSI put up by Unit #1. (approx. 520 PSI)
i. Shut down Allen 16" Unit #1. (2) Enter discharge pressure set point for maximum station discharge pressure.
j. Decrease Seattle Delivery Facility flow set point to 4000 BPH.
k. Shutdown Woodinville Unit #2 (2) and close loop bypass (V-1521) approx. 200 Bbls ahead of line shutdown meter reading.

l. Shutdown Allen 15" Unit #3 (2) approx. 50 Bbls ahead of line shutdown meter reading.
m. Shutdown Anacortes station and Texaco Booster (3) on line shutdown meter reading.
n. Decrease Seatle Delivery Facility flow set point, as necessary, to achieve shutdown pressure criteria.
o. When Seattle Delivery Faclilty flow set point is at "0", close Renton 16" Seattle manifold (V-667) and Seattle Delivery Facility inlet (V-702).

(1) Increase interval between set points to keep Anacortes flow rate above 4000 BPH.

(2) Monitor transitional pressure changes on block valve format. If line status format is used, sump and utility tanks can be monitored also.

(3) Texaco Refinery Booster should shutdown on a "no flow" situation. Verify with refinery personnel that unit has shutdown.

4. OPERATIONS CONTROLLER POST SHUTDOWN CHECKLIST FOR SCHEDULE SHUTDOWN

a. Notify refinery, terminal and concerned Olympic Pipe Line employees of shutdown time.
b. Close refinery manifold valve (if applicable).
c. Close appropriate station valves to isolate station and initiate station shutdown at all intermediate pump stations.
d. Initiate delivery station shutdown(s) and close receiving customer valve(s).
e. Print necessary flow computer deliver and batch reports.
f. Record shutdown information on Operations Controller sheets and balance.
g. Update batch tracker and line inventory.
h. Document all work and tagged equipment on work started during line shutdown. Keep Operations Controller log book, daily notes and repair reports updated.

Revised - February 2, 1999

A. PURPOSE OF PROCEDURES.

Conditions can develop in the operations of the Olympic Pipe Line system that are not anticipated and that are not immediately identified as emergencies. These conditions are abnormal and if allowed to continue without corrective action can develop into emergencies. Situations of this type must be considered serious in nature and investigative and corrective actions must be taken immediately.

Procedures to be followed in dealing with abnormal conditions are outlined in this section and in other sections of this manual which cover specific Olympic facilities. Deviation from these procedures should be taken only when additional corrective action is required to assure a continued safe operation.

Personnel responsible for facility operations and Operations Controllers responsible for remote control of facility operations are to be familiar with normal operations of valves, pumps, pressure limits, control valve and protective device settings in order for abnormal conditions to be recognized and corrective action to be taken.

B. ABNORMAL OPERATIONS AND CORRECTIVE ACTIONS.

1. Abnormal Line Volume Overages and Shortages.

One of two basic surveillance methods of determining the integrity of the pipeline system is comparison of the volume received into the pipeline to the volume delivered out of the system. Differences between receipts and deliveries are referred to as overages or shortages.

A shortage can be caused by a line leak, increased pressure, temperature change, meter malfunction, fluid change, valve leakage and errors in calculating volumes.

An overage can be caused by a reduction in operating pressure, temperature change, meter malfunction, fluid change and errors in calculating volumes.

Both overages and shortages should be analyzed with serious concern. If a significant overage or shortage is occurring, the Operations Controller iS to shutdown the system, initiate actions to isolate the system segments and notify the supervisor.

The following are steps the Operations Controller will take in determining the causes for overages and shortages.

a. Compare tank gauges meter readings.

b. Prove meters.

c. Analyze pressure and temperature changes.

d. Review historical data of system operating under similar conditions.

e. Shut down intermediate delivery facilities to aid in the process of elimination.

f. Confirm remotely transmitted information with field personnel at facilities.

g. Check or have checked all valve alignments and relief systems.

2. Abnormal Pressure Changes.

As mentioned in Section 1 above, one basic method of determining the integrity of the pipeline system is over/short surveillance. The other basic method is pressure surveillance.

Hydraulic changes in a system gives immediate indication of variation in flow rate and can be used for line integrity check. That is why "rate of change" of conditions are important to the Controller. Changes in flow and pressure indications following a line break will depend on the operating conditions at each station at the time of the break. The location of interfaces between batches, whether or not the station control valve is throttling, and other transient conditions on the line must

be considered in analyzing a leak condition. In general, the conditions listed below could be expected to follow a line break assuming that all units remain in operation.

At the First Station Upstream from the Leak

1. Flow rate would increase

2. Discharge, case, and suction pressures would be reduced if the station was not "controlling" on suction or discharge pressures.

3. If the station was controlling on discharge pressure the discharge pressure may not reduce; however, the suction and case pressures would reduce. If the condition continued until the station was not longer controlling on discharge pressure, the discharge pressure would then be reduced.

4. If the station was controlling on low suction pressure the suction pressure may not reduce (if the control valve cannot hold the set pressure because of the leak), however, the discharge pressure would reduce. The case pressure would be reduced by the loss in pump head at the increased flow rate.

At the First Station Downstream from the Leak

1. Flow rate would decrease.

2. Suction, case, and discharge pressures would be reduced if the station was not controlling on low suction pressure.

3. If the station was "controlling" or throttling on low suction pressure the suction pressure would not necessarily reduce due to reduction in flow but discharge would reduce due to the control valve closing to hold the suction at control point.

Generally speaking, the pressures and flow at stations upstream from a break will be affected less than those on the downstream side. The station immediately upstream would have a noticeable fluctuation of pressures. As this fluctuation is distributed to the remaining upstream stations, it becomes progressively less. All stations on the downstream side of the break will show about the same changes in pressures due to the reduced flow.

A pressure change can be caused by a leak, a throughput rate change, changes in fluid viscosity and gravity, pump changes, changes in receiving and delivery locations, control valve functions and line blockage.

When an abnormal pressure change occurs that cannot be justified due to current circumstances, the Operations Controller will initiate an investigation to determine the cause and if corrective action is required. The following steps are to be used in analyzing the situation.

a. If the pressure change is an increase, the Operations Controller should determine:

1) Have the fluid characteristics changed?

2) Have any restrictions such as pump shutdowns or changes in manifold alignment occurred downstream?

3) Have any control valve adjustments or malfunctions occurred downstream of the pressure increase? If the cause of the pressure increase cannot be corrected and the pressure continues to increase, the Operations Controller will reduce or shutdown the system until the problem can be resolved.

b. If the pressure change is a loss of pressure, the Operations Controller should determine:

1. Is the volume over/short reflecting a shortage?

2. Have the fluid characteristics changed?

3. Have any restrictions such as pump shutdowns or changes in pumps or manifold alignment occurred upstream.

4. Have control valve adjustments or malfunctions occurred upstream of the pressure loss?

If the cause of the pressure loss cannot be determined, the Operations Controller will shutdown and isolate the system until the problem testing can be resolved. Procedures for pressure testing are located in the Emergency Procedures Manual, Section IV and the DOT Liquids Manual, Section VI.

3. Unscheduled Facility Lockout/Shutdown Conditions.

Any unanticipated shutdown of a facility creates a situation that requires immediate corrective action. Regardless of the nature of the shutdown, the Operations Controller must immediately initiate corrective action required to hydraulically balance the system in order to minimize line surges and prevent the shutdown of additional facilities. As soon as pressures and flow rates have stabilized, the Operations Controller must analyze line operations for assurance that a continued safe operation is being achieved.

After the system has been adjusted and it has been determined that operations are normal under the current circumstances, the Operations Controller will initiate action to resume pre-facility shutdown operations.

Olympic's facilities have a number of protective devices that function to accomplish safe pipeline operations. A detailed explanation of these devices is included in this manual (Section 1 – A through X) for each pipe line facility. Also included in each section is a guide to the level of response for each such device.

Some devices provide "lockout" protection which inhibit further operation of the affected facility or device until corrective action is taken by a local area operator following an on-site investigation and analysis of the cause of the lockout. Some devices initiate a "shutdown" of a facility or device, requiring the Operations Controller to investigate, analyze and take corrective action before operation of the affected facility or device is resumed. Some devices monitor and provide information regarding the operation of a facility or device.

For specific details concerning protective devices at a particular facility refer to the Section 1,A through X of this manual.

a. General Causes of Facility Lockout.

NOTE: At pumping stations, a facility lockout begins a series of events, which terminate with the main incoming electrical power breaker being tripped. Operations Controller will receive a mechanical and electrical alarm in the Control Center.

1) Emergency Lockout Button. Emergency Lockout Buttons are installed at all facilities and are activated by on-site personnel at anytime an unsafe situation exists which has not been recognized and acted on by other protective devices.

2) High-High Sump Level. Each facility is equipped with a reservoir (sump tank) to which various drain and thermal relief lines are connected. A sump pump is installed at each facility to pump the fluid into the stream of product passing the facility or into an interface tank at certain locations. Failure of the sump pump, high liquid level switch or flow in excess of the sump pump capacity will result in a facility lockout.

3) Fire Eyes Sensor. Pumping facilities are equipped with devices, which detect high ultraviolet radiation for a specified time duration. Activation of this device initiates a facility lockout.

4) Gas Concentration Detectors (Woodinville and Tacoma Pump Stations). Vallen gas detectors are installed at the above facilities in pump and motor rooms. If the alarm point (setting of 60) is reached, station lockout occurs.

5) Valve Incomplete Sequence. In the event that you have manifold, divider or other valve incomplete sequence and malfunction in a manner that could lead to product contamination:

a) Shut down pipeline as needed to complete isolation of area affected.

b) Call appropriate personnel, obtain meter readings, gravity, flash, pressure and any other information that may be helpful.

c) Field personnel will check actual status of valves(s) involved, status of product and report to Operations Controller. If valve(s) have completed correct travel when operator arrives to check them, operator will then check to make sure valve(s) in question is not leaking and product is okay.

d) In case of contaminated product, if possible, it will be moved out as soon as possible to minimize further contamination. Consult Supervisor for specific instructions.

6) High Loop Pressure. Operations controller response – Isolate facility, initiate corrective action to hydraulically balance pipe line or shut down pipe line as necessary. Notify Area Chief (or designate) for investigation of problem, cause and determine what correction action is needed.

In the event of a delivery lockout involving high pressure, utilize the following procedure.

If lock-out was high loop pressure caused by turning against a closed receiving terminals gate valve, the Operations Controller will also notify appropriate terminal personnel to physically inspect their terminal yard and manifolding. The terminal personnel should notify the Operations Controller upon completion of inspection prior to line restart. The Operations Controller will log the name(s) of terminal personnel notified.

The Olympic operations personnel that arrives at the facility to reset the station should first:

a) Make a complete visual inspection of the facility yard.

b) Note and report all flag drops and pertinent motorola chart information to Operations Controller office for review and comparison.

c) Under direction from the Operations Controller, the facility should be realigned to the proper shipper by the operator and final visual check of all facility equipment made at the time.

d) If the lock-out was caused by the line being turned against a closed shipper gate, the Operator will also need to make a visual inspection of the line between Olympic Pipe Line manifold and the shipper involved.

After the Olympic Operator has completed his inspections, the line will be turned back to the Operations Controller for normal start.

When the pipeline is restarted and resumption of desired rate and pressures are achieved, the Operator will make a final complete inspection of facility yard and piping, as well as the line up to and 1ncluding the shippers manifold. (The shipper may inspect and report the condition of terminal manifold and piping after restart if desired.)

NOTE: On all above lockout conditions, refer to Section 1, A through X of this manual for data regarding a specific location.

b. General Causes of Unit Lockout

Unit protective devices monitor items in the following mechanical and electrical categories and initiate a lockout of the affected unit.

1) Low nitrogen pressure to the protective system monitoring temperatures of bearings, the

pump case and seal leakage.

2) Motor overcurrent / Motor high winding temperature.

3) Incomplete starting sequence.

4) Unbalanced current.

5) High vibration.

6) Incomplete sequence drain / fill operation.

7) Low lube pressure.

8) Fan Blower operation.

9) Unit lockout - In the event of a unit lockout, the Controller is to notify Area Chief (or designate) for corrective action. Controller to adjust line hydraulic balance configuration due to loss of unit or units or shut down line or segment of line as necessary.

Once Area Operations personnel has arrived at the designated station, contacted Operations Controller and identified problem, corrective action is to be determined between Controller and area operations. This may include consultation with electrical/mechanical technician or on-site response. In some cases area operations personnel may be able to make repairs locally. Evaluation of effects of prolonged outage to be reported to Control Center Supervisor or Supervisor of Product Movements for determination of needs for repairs and the overall effects on pipe line operations.

There may be some cases where the unit lockout may occur during off hours and repairs may not need to be completed until normal day of operations.

c. General Cause of Facility Shutdown.

At pumping facilities, a facility shutdown may be caused by Low Suction Pressure due to a hydraulic imbalance in which the affected facility is attempting to deliver more volume than is being supplied from the upstream source. Reasons for this type situation can be:

1) Volume restriction upstream due to a line rupture, upstream station shutdown, viscosity changes in fluid, equipment malfunction, or improper configuration of pumping equipment.

2) Changes in the downstream configuration, which permits the affected facility to outpump upstream stations. Examples of such change are line rupture, shorter distance, or larger pipe size.

3) Low Suction. If a facility shutdown is caused by low suction, the Renton supervisory alarms, displays and logs station mechanical and station shutdown indications. Mechanical alarm will reset when suction at station is above suction pressure switch minimum. Facility station shut down may be re-set at this time. As the Control center displays do not generate a low suction alarm it is the Controller's responsibility to be aware of cause such a loss of pump upstream, control valve over reaction, unit starts, etc. In the event Controller will call Area Chief (or designate) for facility check. Controller may restart facility after assuring normal operations can be achieved.

d. General Causes of Unit Shutdown.

At pumping facilities, individual units may be shutdown due to High Discharge Pressure and High Control Pressure.

1) High Discharge Pressure is a result of pressure build up or surge downstream of control valve. High discharge pressure is normally caused by:

a) Loss of unit(s) downstream of facility with pressure surge back to facility.

b) Valve closure downstream of facility.

c) Unit start at facility with control valve not responding to control for discharge pressure.

Controller to adjust line hydraulic balance configuration due to loss of unit(s) or shut down line or segment of line as necessary.

In the event a unit(s) is shut down on high discharge pressure, the Renton supervisory alarms, displays and logs station mechanical and unit shutdown indication. Once discharge pressure is relieved and below pressure switch limits, mechanical alarm clears and controller may restart unit. As the control center displays do not generate a high discharge pressure alarm, it is the Controller's responsibility to be aware of cause such as is listed above. In the event Controller is unsure of unit shutdown cause, Controller will call Area Chief (or designate) for facility check. Controller may restart unit after assuring normal operations can be achieved.

REPORTING SAFETY-RELATED CONDITIONS (DOT 195.55)

In the event the below stated condition occurs, the Controller is to immediately notify Supervisor of Products Movements or Control Center Supervisor for corrective action.

ANY MALFUNCTION OR OPERATING ERROR THAT CAUSES THE PRESSURE OF A PIPELINE TO RISE 110% OF ITS MAXIMUM OPERATING PRESSURE.

2) High control pressure is a result of pressure buildup between downstream pump and upstream side of facility control valve. High control pressure is normally caused by:

a) Head pressure change due to product change.

b) Capacity in head feet of pump.

c) Improper use of control valve.

d) Controller controlling for discharge or suction pressure.

e) Increased suction pressure from upstream station.

f) Valve closure upstream or downstream of facility.

g) Loss of downstream unit.

Controller to adjust line hydraulic balance configuration due to loss of unit or units or shutdown line or segment of line as necessary.

In the event a unit(s) is shut down on high control pressure, the Renton supervisory alarms, displays and logs station mechanical and unit shutdown indication. Once control pressure is relieved and below pressure switch limits, mechanical alarm clears and controller may restart unit. As the control center displays do not generate a high control pressure alarm, it is the Controller's responsibility to be aware of cause such as is listed above. In the event Controller is unsure of unit shutdown cause, Controller will call Area Chief (or designate) for facility check. Controller may restart unit after assuring normal operations can be achieved.

e. High Pressure Surge Relief Valves.

1) Renton Station – Main line 16" and 20" surge protection.

Two surge relief valves are located within Renton Station to protect the 16" and 20" main lines due to the terrain elevation just north of Renton Station.

When activated, due to pressure build-up downstream, the valve(s) will open and relieve pressure to Renton Utility Tank (10,000 BBLs Capacity) and Controller will receive valves status as open "ALARM".

Controller will initiate line shutdown on appropriate line and use the following procedure.

a. Check Renton utility tank level.

b. Check incoming 16" and 20" line pressures.

c. Call Area Chief (or designate) if equipment malfunctions to check out problem and maintenance personnel as required.

An overflow condition could occur (depending on relief time, flow, tank level at start, etc.) in utility tank. To stop this flow, the motor operated valve immediately upstream of the respective relief valve will have to be closed.

Have the first available person on the site close this valve as soon as possible following line shutdown.

NOTE: If the affected pipe line is shutdown, the Controller operating this line may close valve and second Controller on duty will monitor pipe line conditions.

2) Delivery Facility Surge Relief Valves

Location

Seattle Delivery Facility

Sea-Tac Delivery Facility

Tacoma Delivery Facility

Olympia Delivery Facility

Vancouver Delivery Facility

Portland Delivery Facility

In the event that any of the above Delivery Facility High Pressure Surge Relief Valves are activated, the Controller will receive open status of valve and product will flow to facility utility tank.

At this point, the Operations Controller will monitor facility very closely. If pressure is not fully relieved and valve continues to stay open, Controller may shut down appropriate line segment(s). Pressure may build up in loop causing facility shutdown. In any event, it is up to the Controller to monitor the facility, product being received into utility tank and take appropriate action. Area Chief (or designate) is to be called for area response to check out problem.

NOTE: As the high pressure surge relief valves at Tacoma and Olympia Delivery Facilities are located downstream of meter, it will be necessary for Controller to credit amount received into utility tank to appropriate shipper.

4. Tank Liquid Level Alarms

a. Olympic Facilities

At Olympic facilities with utility tanks, fluid level is monitored for a high level which causes a mechanical alarm and Facility shutdown indications to the Operations Control Center. The cause of the high level alarm must be determined immediately and corrective action taken to prevent an overfill condition.

At Olympic's Renton and Sea-Tac facilities, an additional high-high level monitor initiates a lockout of the facility.

b. Non-Olympic Facilities – Terminal Tank Alarm

An alarm point provides the capability for the Operations Controller to receive an indication of a high liquid level from the receiving terminal's facilities.

All participating terminals will have signed a "Hold Harmless Agreement" with Olympic Pipe Line prior to connection of communications to Olympic Pipe Line Control Center.

During deliveries to participating terminals and upon receipt of tank alarm, the Renton Operations Controller will immediately initiate an emergency call to Terminal and a shutdown to stop the flow of product into the affected terminal. The times required to stop flow have been furnished to the terminals as follows:

Location	Time Required To Stop Flow
Renton	5 minutes
Seattle	5 minutes
Tacoma	3 minutes
Olympia	2 minutes
Vancouver	5 minutes
Linnton	5 minutes
Portland	5 minutes

On receipt of an Olympic Pipe Line equipment or communication failure alarm, the Operations Controller will immediately notify the affected terminal location; delivery of product into such a terminal however, will continue.

The terminal participating in this service have agreed to furnish one telephone number to be called by Olympic as necessary to carry out the above and insure that personnel are available to expedite resumption of deliveries to minimize down time of pipe line facilities. Terminals are urged to set the level at which the tank alarm is transmitted to allow time for Olympic to make a shutdown of the necessary system, thus preventing an overfill condition.

Current participating receiving terminals and respective emergency telephone numbers are listed below:

Location	Terminal	Emergency Telephone
Renton	BP	994-5212 (Beeper)
Seattle	Shell	682-4706 or 997-0041(Beeper)
	Texaco	224-0489 or 587-9837(Pager)
Tacoma	BP	994-5212 (Beeper)
Olympia	Texaco	1-357-4418
Portland	Shell	1-503-224-0319
	Texaco	1-503-226-3573 (Also this number will take messages.)

High tank alarms for respective terminals and tanks should be based on no less than 5 minutes of product receipt at stated maximum rates for terminal locations listed below:

Location	Maximum Rates
Renton D.F.	8600 BPH
Seattle D.F.	7200 BPH
Tacoma D.F.	3600 BPH
Olympia D.F.	1600 BPH
Portland D.F.	6500 BPH

5. Unauthorized Operation of Valves.

While block valves are an absolute necessity in pipeline operations, the opening or closing of a block valve at a time when operations dictate that it be in the opposite mode can create situations that rapidly develop into emergencies.

If valves are motor-operated, false signals can initiate a valve operation. If personnel are involved, incorrect identification of valves can cause errors in valve selection and operation. There are other reasons why valve operation errors occur, but regardless of the reason, corrective action must be taken immediately to prevent damage such as over-pressuring of facilities, over-fill of tankage or contamination of fluids.

If a valve closes and blocks the upstream flow in a pipeline, the upstream pump stations must be shutdown immediately to prevent over-pressuring.

If a valve opens, causing the fluid flow to be diverted into another tank or destination, the upstream pump station must be shutdown to prevent contamination, misdirected deliveries and/or tank over-fils.

Valve malfunctions are to be reported to the Supervisor of Product Movements and a Maintenance Log written regarding the malfunction.

6. Communications

A loss of communications which reduces the capability of the Operations Controller to remotely control and monitor the operations of the system creates a situation that requires caution and certain

corrective actions on the part of the Operations Controller to assure a safe continued operation.

When the loss of communications has been determined to be non-transient, the Operations Controller is to notify the proper telephone company personnel and request that immediate corrective action be taken. The Operations Controller is also to assess the operations of the system to determine which facilities will require local area operator assistance and to initiate action to obtain this assistance.

Section 3, part B-4 of the Operations and Maintenance Procedures Manual contains information regarding the reporting of data to the Operations Control Center by local area operators.

DATA COMMUNICATIONS – CONTROL CENTER

There are currently (8) eight data communications circuits being utilized to communicate between remote facilities and Renton Master. They are as listed below:

Circuit I.D.	Remote Facilites
#1 – 2FDDA6082	Cherry Point – Ferndale - Anacortes
#2 – 2FDDA6081	Allen #1 – MP#56 – MP#89 - Woodinville
#3 – 2FDDA6080	Allen #2 – MP#46 – MP#66 – MP#110
#4 – FDEC641280	Olympia Jct. – Portland – Renton #2 Vancouver Jct.
#5 - 2FDDA6084	Renton #1 - Sea-Tac #1 - Seattle Henderson St B.V.
#6 - 2FDDA6083	Sea-Tac #2 - Spokane St B.V. - Tacoma DF
#7 - FDDC163088	Tacoma Jct. - Tacoma Sta. – Castle Rock
#8 - FDEC641278	Olympia DF. - Vancouver DF. - Linnton Portland Jct.

Circuits #1, 2, 3, 5, 6 US WEST Communications circuits.

Circuit repair call numbers: Seattle 346-9900 - Portland (503)242-7700

Circuits #4, 7, 8 AT&T circuits

Circuit repair call number: 1-800-833-3803

During periods of time when a data circuit is out-of-service it may become necessary to maintain communications with the Renton Control Center by using long distance telephone, SS-4 system, radio or radio telephone (mobile) facilities.

In the event there is loss of communications on any of the above communications circuits, Operations Controller is to call appropriate telephone company and report problem. The telephone company will record your trouble report and issue a trouble report ticket number to be referenced until all repairs are complete. After trouble report has been made and you are issued a ticket number, request from telephone company personnel an hourly status report concerning trouble and estimated time for completion of repairs and telephone call back number.

NOTE: Sometimes you may experience problems of getting the telephone company to accept responsibility for communication outages or telephone company may call back and say that "The Problem Is Not Theirs".

Use the following guidelines for calling for technical support:

1. Two telephone calls have been made and it is still not clear which company has a problem. (There may be more than one telephone company involved in problem.)

2. One hour has been spent trying to report an outage.

3. The work load will not permit lengthy conversations with telephone company personnel.

4. You have reported problem and can not receive the proper response (no time updates, no communications from telephone company, etc.)

When updating the Olympic technician, please include the following information:

1. Time(s) the problem was reported.

2. Company and telephone number contacted.

3. Name and response of person(s) contacted.

4. Trouble report ticket numbers(s).

LOSS OF COMMUNICATIONS – FIELD SUPPORT

Listed below are guidelines to be used in the event you have loss of communication at an Olympic Pipe Line location. The hour(s) limitations which are established to operate without communications are maximum. If a location, in your opinion, needs to be checked out or manned prior to these maximum hours of communication loss, do not hesitate to call for help.

Please notate in outage report book all loss of communications failures.

ONE (1) HOUR RESPONSE

OPERATING FACILITES

Ferndale

Anacortes

Allen

Delivery Facility - no longer than one hourly reading and the man facility until repairs are complete.

THREE (3) HOUR RESPONSE

OPERATIING FACILITES

Intermediate pump stations - then man facility until repairs are complete.

FOUR (4) HOUR RESPONSE (TO BE CHECKED EVERY FOUR HOURS)

NON-OPERATING FACILITY

Anacortes – Texaco

Anacortes – Shell

Cherry Point

Delivery Facility

011152

Mainline Junction

Other Non-Operating Facilities

TWENTY-FOUR (24) HOUR RESPONSE

Block Valves – check out daily during daylight hours

Portland Jct. Block Valves – Check out daily during daylight hours and as needed.

7. Return to Normal Operations.

Following an abnormal event, the Operations Controller (and field operations personnel, if appropriate) is to check and monitor the system at sufficient critical locations to determine the integrity of the system and that operations are normal and safe.

C. DOCUMENTATION AND REVIEW OF ABNORMAL EVENTS.

Any operation that deviates from the normal mode of operations must be documented by the Operations Controller and by the field personnel involved. This information must include the best and most accurate information available and contain a description of: operations prior to the event, the abnormal event, corrective and final action taken. This information is invaluable to prevent the same situation from occurring again and to assist personnel in rectifying this event.

The Supervisor of Operations will periodically review the response of operations personnel to determine the effectiveness of the procedures controlling abnormal operations and take corrective action where deficiencies are found.

D. NOTIFICATION OF SUPERVISOR.

Whenever an abnormal situation arises in which, in the judgment of the Operations Controller (and local area operating personnel, if appropriate) a continued safe operation cannot be assured, the Supervisor of Product Movement is to be notified immediately.

E. OPERATIONS CONTROLLER'S RESPONSIBILITY AND AUTHORITY.

It is the Operations Controller's responsibility to take immediate corrective action when abnormal situations occur to assure a safe continued pipeline operation.

There should be no hesitation on the Operations Controller's part to shutdown a line or facility, alleviate pipeline pressures, isolate tanks or line segments, request assistance from field personnel, other personnel in the Product Movements Section and Maintenance personnel, if necessary in an abnormal situation.

The Operations Controller has the authority in abnormal circumstances to perform the above actions; however, the Supervisor of Product Movement should be notified of such actions as soon as possible.

F. IMMEDIATE RESPONSE LOCATIONS

Certain pipeline facilities of the Olympic system are located in areas that would require an immediate response to prevent hazards to the public if there were a pipeline-related failure or malfunction. By Department of Transportation definition, a pipeline facility is new and existing pipe, rights-of-way, and any equipment, facility or building used in the transportation of hazardous liquids.

The following pages list, by mile-post marker, locations on the Olympic system requiring immediate response by appropriate company personnel.

CITY AND RIVER CROSSINGS

Segment	Start M.P.	End M.P.	Description
16" North	5.70	5.75	Nooksack River Crossing
16" North	14.00	17.00	Bellingham
16" North	21.90	22.00	Samish Lake
16" North	32.85	32.90	Samish River Crossing
16" North	36.00	37.00	Outside Avon by Allen Station
16"& 20" N	41.35	41.45	Skagit River Crossing
16"& 20" N	55.90	55.95	Pilchuck Creek Crossing
16"& 20" N	57.50	57.55	Stillaquamish River Crossing
16"& 20" N	60.00	61.00	Snohomish County near Arlington
16"& 20" N	67.80	68.80	Marysville
16"& 20" N	74.00	74.10	Ebey Slough Crossing
16"& 20" N	75.80	75.85	Ebey Slough Crossing
16"& 20" N	77.70	77.80	Snohomish River Crossing
16"& 20" N	80.70	82.00	Snohomish County near Mill Creek
16"& 20" N	85.00	88.00	Snohomish County near Woodinville
16"& 20" N	88.40	89.15	Woodinville
16"& 20" N	89.40	89.45	Samish River Crossing
16"& 20" N	89.90	90.20	King County near Woodinville
16"& 20" N	93.05	96.50	Redmond
16"& 20" N	104.00	107.50	King County near Renton
16"& 20" N	107.50	112.70	Renton
16"& 20" N	109.55	109.60	Cedar River Crossing
14" South	114.70	120.20	Kent
14" South	119.45	119.50	Green River Crossing
14" South	120.20	121.80	Auburn
14" South	121.80	128.70	King County near Auburn
14" South	128.70	129.70	Milton
14" South	130.20	132.00	Fife
14" South	132.60	132.70	Puyallup River Crossing

14" South	133.00	142.00	Pierce County near Tacoma
14" South	155.55	155.60	Nisqually River Crossing
14" South	156.00	161.00	Yelm
14" South	171.10	171.15	Skookumchuck River Crossing
14" South	185.20	185.25	Newaukum River Crossing
14" South	197.50	197.60	Cowlitz River Crossing
14" South	204.10	204.15	Toutle River Crossing
14" South	218.10	218.15	Coweeman River Crossing
14" South	225.60	225.65	Kalama River Crossing
14" South	238.00	250.00	Ridgefield
14" South	238.50	238.70	Lewis River Crossing
14" South	248.20	248.25	Green Lake
14" South	248.65	248.85	Curtis Lake
14" South	248.90	248.95	Lake River Crossing
14" South	253.05	253.55	Columbia River Crossing
14" South	257.30	257.45	Multnomah River Crossing
14" South	257.50	260.50	Portland (Industrial Area)
Anacortes. Lat.	3.05	3.20	Swinomish Channel Crossing
Anacortes. Lat.	4.00	4.15	Telegraph Slough Crossing
Seat. Lat.	0.00	1.80	Renton
Seat. Lat.	1.80	4.30	King County near Seattle
Seat. Lat.	4.30	12.40	Seattle (includes all delivery lines)
Seat. Lat.	11.30	11.45	East Waterway Crossing (on bridge)
Sea-Tac Lat.	1.00	1.05	Green River Crossing
Sea-Tac Lat.	1.00	2.50	Tukwila
Sea-Tac Lat.	2.50	6.00	King Co. near Airport (includes Delivery lines)
Tacoma Lat.	0.00	2.20	Fife
Tacoma Lat.	2.20	4.00	Tacoma (includes all delivery Lines)
Tacoma Lat.	3.00	3.10	Puyallup River Crossing (on Bridge)
Olympia Lat.	7.00	15.00	East Olympia inside city

Vancouver Lat.	3.80	4.20	Vancouver (includes all delivery Lines)
Portland Delivery	0.00	4.00	Portland (Industrial Area) Lines

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