CERTIFIED MAIL - RETURN RECEIPT REQUESTED

March 9, 2000

Carl Gast, Vice President/Manager
Equilon Pipeline Company LLC
Olympic Pipeline Company
2319 Lind Avenue S.W.
Renton, WA 98057

RE: Corrective Action Order 59505H
Consideration of Operator's Request to Return to Service

Dear Mr. Gast:

The Western Region, Office of Pipeline Safety (OPS), is responding to your correspondence, dated January 14, 2000, requesting permission to return to service the 16-inch Olympic pipeline segment from Ferndale, Washington to Allen Station. This request was supplemented by the Bayview Products Terminal and the Renton Pump Station relief valve capacity calculations dated February 17, 2000 and an implementation plan for addressing the MARMAC Valve Effectiveness Studies recommendations, dated February 11, 2000. After reviewing the documentation which you submitted, OPS has determined that a return to service of the segment is not appropriate at this time.

The Western Region, OPS staff has reviewed the documents submitted to date to determine the completeness of the submission and the adequacy of Olympic Pipeline Company's (Olympic) response to each item as required in the Corrective Action Order (CAO) dated June 18, 1999, and its subsequent amendments set forth in the Compliance Progress File (CPF) 59505H. Based on our evaluation, we have identified deficiencies or omissions in your response to the CAO. These items must be addressed and implemented prior to our being able to reach a decision on returning the pipeline in question to service at a level not to exceed 80 percent of the maximum operating pressure (MOP).

The attachment lists these deficiencies or omissions in detail. Generally, the areas requiring further improvement prior to OPS considering approving a return of the 16-inch pipeline to service include: MARMAC's Valve Effectiveness Studies, Olympic's internal inspection plan (IIP), the controller re-

training, and Olympic's updated procedural manuals. Each relevant CAO item is stated first, followed by OPS analysis, observations, and further direction to achieve compliance with our CAO. One item of particular note is our decision to not approve Olympic's plan for internal inspection unless it includes the use of a transverse flux tool.

Please provide a detailed written response addressing each of the issues raised in the attachment. Additionally, as previously discussed with Olympic personnel, revise and submit a "Detailed Re-Commissioning and Startup Plan" postponing the hydraulic scripts required by the City of Bellingham until completion of the Geometry and magnetic flux leakage (MFL) in-line inspection (ILI) surveys for the 16-inch pipeline from Ferndale to Renton.

This letter represents a preliminary review of your request regarding the re-opening of the Ferndale to Allen pipeline segment. A final determination will be made following a review of your written response to this letter as well as consideration of all other relevant factors. OPS' final determination will be made to you in writing.

If there are any questions concerning this request, please do not hesitate to contact Peter Katchmar or myself at (303) 231-5701. Thank you for your cooperation in this matter.

Sincerely,

Chris Hoidal
Director

cc: The Honorable Mark Asmundson, Mayor of City of Bellingham

Attachment

ATTACHMENT

Olympic Pipeline Preliminary Adequacy Review

The following items must be further addressed, and where noted, implemented.

I. ***Item number 5(a) of the CAO states: Develop a plan with corrective measures that address factors playing a role in the release. The plan must include the following items to the extent that they address factors in the release: (a) - A review of the existing mainline block valves & check valves taking into consideration elevation, population, and environmentally sensitive locations, and plan for additional mainline block valves and check valves to minimize the consequences of a release from the pipeline. The block valves will have remote operation capability as deemed appropriate by the review.***

After review of the MARMAC Block Valve and Check Valve Effectiveness Evaluations and Olympic's preliminary implementation plan, OPS is providing the following observations, comments, and required areas of improvement.

We concur with all the recommended improvements for the 16-inch and 20-inch pipelines presented by MARMAC engineering. Our analysis, however, indicates three areas where additional valve installations may significantly enhance environmental protection or public safety for the 16-inch pipeline. Please address each identified site with respect to the following factors: reduced static drain down for any portion of the pipeline segment adjacent to the proposed valve site, spill response times in these areas, potential for the spill to directly enter or migrate to sensitive environmental areas or waterways, impact on drinking water supplies, and areas likely for land development or excavation activity. The proposed valve installation sites are:

1) 16-inch Ferndale to Allen Pipeline, South Arm of Bear Creek, Milepost (MP) 25.28: Bear Creek flows into Lake Samish, located approximately 1 mile to the northeast of the pipeline. Lake Samish is a popular recreational lake and is a water supply for the local residents. A check valve in this area would prevent static drain down of the line section between MP 26.14 and 25.28 (approximately 4500 feet). We have estimated a reduction in the static drain down for a pipeline release immediately north of the valve to be approximately 1040 barrels.

2) 16-inch Allen to Renton Pipeline, Fisher Slough, MP 48.42: Fisher Slough discharges into the

Skagit River which in turn discharges into Skagit Bay. A check valve in this area would minimize static drain down of the line section between MP 52.77 and 48.42 (approximately 23,000 feet). We have estimated a reduction in static drain down for a pipeline release immediately north of the valve to be approximately 1880 barrels. The effects of valve placement shall also be evaluated for the parallel 20-inch pipeline in this area.

3) 16-inch Allen to Renton Pipeline, Between MP 83 and 84: There appears to be a relatively long downward slope between MP 81.96 and the 8-foot wide creek at MP 84.7. We have estimated a reduction in the static drain down immediately south of a remote controlled block valve to be approximately 2300 barrels. The effects of valve placement shall also be evaluated for the parallel 20-inch pipeline in this area.

OPS also noted two possible omissions to the upgrading of existing valves. Olympic's valve effectiveness study for the 16-inch and 20-inch Allen to Renton pipeline segments typically included the addition of remote actuators on all mainline valves located along longer downslope portions of the pipeline. An obvious deviation from this effective spill mitigation strategy is at the existing hand operated block valves (HOV) near mile post (MP) 27.8 and 33.66.

Your submission did not include the following information. It is needed to supplement our analysis of your plan before OPS can make a decision to return the 16-inch Ferndale to Allen section to limited service (#80% MOP):

1) The installation plan for all valve improvements on the 16 and 20-inch pipelines along with milestone completion dates. The plan should prioritize work based on an approach toward protecting people first and then the environment.

2) An evaluation of all remote actuated valves by your hydraulics consultant, Stoner Engineering, that addresses un-commanded closures considering maximum flow rates with diesel as the transported product. We would expect use of bypass relief piping or pressure switches as appropriate.

3) Evaluation of all Hand Operated Block Valves (HOV) on up-slope locations for retrofitting to RCVs insuring their effectiveness during pipeline startup and shutdown operations and a schedule for augmentation or replacement of ineffective RCV's with check valves.

4) Technical and environmental explanation for not including the check valve near Bear Creek (MP25.28).

You plan for remediation must include implementation of the following prior to restart of the 16-inch Ferndale to Allen section:

1) Installation of remote control actuators on the HOVs at Mileposts (MP) 27.8 and MP 33.66.

2) Use pressure sensors with telemetry to the Olympic Control Center on RCVs. The pressure readings shall be incorporated into Olympic's computer-based leak detection system providing enhanced leak detection modeling capabilities. As necessary thermal sensors shall be installed to supplement leak detection modeling capabilities. All RCVs, as warranted, will be equipped with devices to eliminate over-pressurization events.

3) Absent technical and environmental justification acceptable to OPS for not including the check valve near Bear Creek (MP25.28), the valve shall be installed prior to limited return to service of the 16-inch Ferndale to Allen pipeline segment.

II ***Item number 5(e) of the CAO states: Develop a plan with corrective measures that address factors playing a role in the release. The plan must include the following items to the extent that they address factors in the release: Internal inspection tool surveys & remedial action to assure the integrity of the pipeline. The type of tool used shall be the best available technology appropriate for accessing the system based on the type of failure that occurred on June 10, 1999. (The requirements of CAO Items 15, 16, 23(a), 23(b), and 23(c) are included under this review item).***

In reviewing the Internal Inspection Program (IIP) procedures the following observations, comments, and required improvements are presented. All of the following items should be addressed prior to our decision to return the Ferndale to Renton 16-inch pipeline to limited service (#80% MOP):

1. Procedures for performing the planned in-line inspection (ILI) surveys of both the closed and operating pipeline sections are still pending. We expect that the procedures will include: construction modifications and other preparations necessary for accommodating the selected ILI devices, pipeline refilling, cleaning of the pipeline system prior to performing the ILI tests, minimum pressures and flow to conduct the cleaning and ILI testing, immediate interpretation of the ILI tool results, configuration and sequencing of the ILI devices, provisions for following vendor parameters regarding the minimum and maximum travel speeds of the in-line inspection devices for producing the best possible survey results, as well as any other significant and relevant parameters.

2. We also expect that the procedures for cleaning and ILI testing of the 16-inch pipeline from Ferndale to Renton will include:

   a. Use of diesel or jet fuel, not gasoline.

   b. Provisions for replacing the existing gasoline in the Allen to Renton section at minimum pressures during the cleaning operations.

   c. Cleaning immediately after refilling at minimum required pressures.

   d. Completion of ILI surveys to be done immediately after cleaning and at minimum pressures and flow rates acceptable to providing good data.

   e. Shutdown immediately after receipt of each ILI tool until the next ILI device is staged to be run.

   f. Immediate evaluation of data to identify "critical" anomalies with a determined failure pressure less than or equal to 100 percent of MOP for that pipeline segment.

   g. Excavation and direct evaluation of critical anomalies.

3) OPS concurs with Olympic on their proposal to utilize a high resolution magnetic flux leakage (MFL) tool and a high resolution deformation tool as the most appropriate ILI devices needed to accurately determine the existing condition of their pipeline system. Olympic appears to be utilizing "best available technology" concerning the magnetic flux leakage ILI devices identified for surveying the pipeline. In regard to the "deformation" or "geometry" ILI devices, OPS is concerned that Olympic may not be utilizing "best available technology" as required by the CAO.

   We believe that the BJ Services geometry ILI device is not able to positively or consistently locate the largest deformation of an internal depression in the pipe wall and its longitudinal resolution is less than 20 percent of that provided by the competing ILI device. Therefore, the strain calculations performed as a result of any indications discovered by this device may not be as reliable. If OPS is not satisfied with the results of the survey you are proposing, we may require re-survey with the same or a different ILI device in order to obtain satisfactory results.

4) Olympic's IIP, Table 3 identifies criteria for evaluating mechanical damage from outside forces

such as construction equipment. Table 3 does not include methods of identifying gouges not causing deformations in the internal pipe wall. Consideration shall be given to reviewing MFL metal loss in the 9:00 to 3:00 position clustered or grouped in areas of population, roadways, cultivated agricultural land, and other areas prone to excavation. Additionally, consideration shall be given to reviewing anomalies with10 percent or greater wall loss intersecting a longitudinal seam or girth weld.

5) Olympic's IIP, Table 2 under the goal section does not mention reporting all measurable reductions crossing a longitudinal seam, however, in the repair criteria Olympic does state it will repair all measurable deformations across longitudinal weld seams. The repair criteria does not give consideration to the repair of dents 2 percent or greater of the pipe diameter in regard to the number of pressure cycles the dents will be subjected to over the life of the pipeline.

John F. Kiefner and Christopher R. Alexander's study "Effects of Smooth and Rock Dents on Liquid Petroleum Pipelines" states smooth dents with depths not exceeding 2 percent of the pipe's diameter did not adversely affect the serviceability of the pipes tested within a simulated useful life span of a liquid pipeline. For this purpose they assumed the worst case pressure cycle service would not be more aggressive than the equivalent of 40,000 (half MOP to MOP) cycles (1000 cycles per year for 40 years). The shortest life for a smooth dent tested in this program exceeded 20,000 (half MOP to MOP) cycles. That particular dent contained an ERW seam, and its depth after being pressurized to 65 percent of SMYS was 4.2 percent of the pipe's diameter. The study recommends operators of hazardous liquid pipelines consider the number of pressure cycles dents will be subjected to over the life of the pipeline in considering repair criteria. Olympic's repair procedures need to address this study: either repair all dents greater than 2 percent of the pipe's diameter or consider the number and magnitude of pressure cycles for dents in the range of 2 percent up to 6 percent of the pipe's diameter to support not repairing these dents. The OPS also has knowledge of a recent pipeline failure involving a smooth dent in the top quadrant, with no apparent stress concentrators, of less than 2% of a pipe's diameter that was operating at less than 80% of maximum operating pressure that appears to have been caused by cyclic fatigue. Because of this, the repair procedures should require that all points of deformation be excavated with priority given those in the top quadrants of the pipeline.

Olympic's IIP evaluation and repair procedures should also address the following items;

1) Risk-based prioritization of the analysis of ILI results and repair of anomalies giving consideration to population density and environmentally sensitive areas.

2) The procedures for identifying anomalies for excavation should be more stringent than identifying anomalies for repair. The excavation criterion should compensate for potential instrument error. At a minimum, the excavation criterion shall be at least the error range below the repair criterion. Otherwise, there may be defects that are just below the threshold for excavation that, if exposed, may have required repair. The excavation criteria should be adjusted based on validation of anomaly excavations maintaining a conservative approach for the excavation of anomalies.

3) The overlay goals should include past inspection results and previous pipeline exposures including correlation confirming all previous remedial actions taken since the 1991 surveys.

Further, Olympic's IIP should be revised to address the following critical item prior to our decision to return the pipeline system to full service (#100% MOP):

While Olympic's IIP discusses evaluating the feasibility of using the PII Transverse Field ILI device, there is no commitment made for utilizing the device to survey the pipeline. Because of continued uncertainties of the cause of the failure and concerns about the integrity of the pipeline, OPS has decided that it cannot approve a return to full service without the assurance that use of a transverse type device in all segments of the pipeline system that have not been successfully hydrotested to the requirements of 49 CFR Part 195, Subpart E, since the June 10, 1999, accident. Use of the device must be accompanied by procedures for identifying longitudinal weld seam anomalies including hook cracks, lack of fusion, other types of longitudinal defects, and for the prioritization and mitigation of all discovered anomalies, similar to those required for the MFL and deformation tools, discovered as a result of this survey. All anomalies discovered as a result of internal inspection surveys should be compared and assessed with respect to each other. All areas identified for repair should be completed prior to returning the pipeline system to 100 percent of MOP service.

The investigation into the cause of the June 10, 1999, release is ongoing and the metallurgical examination of the ruptured pipe has repeatedly been postponed, however, some preliminary information concerning the ruptured pipe has been made available to the OPS. The pipe in the area of the failure contained numerous scratches, gouges, and dents. The orientation of the defects have been reported to be approximately thirty degrees from perpendicular to the longitudinal direction of the pipe with some of the gouges containing an axial component (along the longitudinal axis). In 1996, Olympic ran an internal inspection survey with a conventional longitudinal magnetic flux leakage device and in 1997, a geometry or deformation device was run in this segment. Both surveys identified some abnormal indications in the failure area but due to the sensitivity of the survey tools and the orientation of the defects, the indications were not highly prominent. The supplemental use of a transverse MFL device will allow enhanced characterization of similar longitudinal damage or defects and more accurate

assessment of the pipeline's integrity. The transverse MFL tool will also have the added benefit of assessing 1) any short sections of low frequency ERW pipe that Olympic may not have knowledge of and 2) evaluating any longitudinal damage to the high frequency ERW pipe seams in the remaining portions of the system.

III. Item number 13(a-e) of the CAO states: Within 3 months of issuance of the Amendment (10 AUG 99), do the following with respect to persons involved with controlling the operations of the pipeline through the SCADA system: (a) Develop & implement a training program for controllers specific to the SCADA system in use that includes responding to abnormal operations & starting up & shutting down any part of the pipeline system; (b) Review the qualifications of each controller to perform his or her duties & to recognize conditions that are likely to cause emergencies & be able to predict the consequences of facility malfunctions or failures such as those that occurred on June 10, 1999; (c) Provide specific, specialized, technical training to controller personnel responsible for maintenance & operation of hardware & software components of the SCADA system to assure that they can perform the functions needed; (d) Review the qualifications of the personnel responsible for maintenance & operation of hardware & software components of the SCADA system to assure that they can perform the functions needed; (e) In training provided under this item, include classroom & practical exercises & use of a pipeline simulator as appropriate.

In reviewing the controller re-training program, the following observations, comments, and required improvements are detailed below. All of the following items will be reevaluated prior to allowing the 16-inch Ferndale to Allen pipeline segment to return to limited service (#80% MOP):

1) There is inadequate information about SCADA training. Field technical personnel should have copies of the current SCADA display information including each instrumented location and any pressure set-point details and be required to verify the accuracy of the SCADA displays through actual field audits; for the identity, location and settings of critical instrumentation.

2) More thorough examination of controller qualifications is needed. OPS would accept an approach that teamed the best-qualified Controller and the best hydraulic engineer on staff to develop a more thorough examination. Examination must include all the subject matter detailed in Olympic's initial re-training plan and should target particular facets of individual knowledge and skills that need reinforcement.

3) To test the validity of the training, the program should provide for a mandatory one hour overlap during shift changes for a minimum of the first two weeks of returning the pipeline to service.

4) Additionally, the program should require a hydraulic engineer familiar with the OPL system to monitor operations for a two hour period during each Controller's first shift of duty after returning the pipeline to service.

5) Test documentation in the program is currently inadequate for establishing that:

   a) Each Controller has the comprehensive skills and knowledge necessary for superior job performance, and

   b) Each Controller can quickly assess and evaluate operating anomalies, and promptly take decisive actions to maintain and/or restore safe pipeline operating parameters.

IV Item number 17 of the CAO states: Review existing procedures for normal, abnormal, and emergency operations of the Ferndale to Allen segment and make necessary changes to insure that they address operations at the Bayview Products Terminal.

A review of Olympic's updated procedural manuals was performed by OPS. While the updated procedures appear to address the requirements of the CAO, we have identified the following three (3) areas of concern. Olympic must provide the OPS with revised procedures.

1) The information concerning "Unit starts per hour," is not consistently located in all pump station's procedures. It is reasonable to standardize written procedures and explanations across a company's manuals so employees can readily find relevant information. This concern has been discussed with Olympic staff. Olympic needs to re-evaluate all pump station operating procedures for clarity, ease of use and to revise any inconsistent procedures.

2) Another concern with the updated manuals is in regard to scraper/sphere insertion and removal. Under Section 3 - Miscellaneous Operations, Item I, Scraper/Sphere Program, The second to last paragraph states, "All scraper/spheres should be removed from the receivers upon arrival of the first gasoline, with the scraper/sphere condition logged in the scraper log."

   A prerequisite to the above procedure would be a requirement for documenting the condition of

the scraper/sphere before each insertion. Additionally, the amount and constituents of any accumulated debris and/or sludge accompanying the removal of the scraper/sphere must also be recorded. Olympic's procedures need to identify supervisory responsibility for periodically reviewing the scraper/sphere records to identify any situations which may cause concern.

3) The following comments are made in conjunction with this CAO item, however, it is not within the item's specific scope. We are concerned that Olympic has not revised their relief valve maintenance procedures to fully comply with the requirements of 49 CFR Part 195.428(a), as your procedures do not specifically require a flow test during routine annual maintenance of all relief valves. The OPS requires Olympic to include these tests on all relief valves subject to the Department of Transportation (DOT) regulations to, "...determine that it is functioning properly, is in good mechanical condition, and is adequate from the standpoint of capacity and reliability of operation for the service in which it is used."