Procedures for
Preventative Maintenance Treatment
of Pipeline Ball Valves in Natural Gas Pipelines

BACKGROUND

Pipeline Ball Valves are produced by a variety of manufacturers around the world. The manufacturer tests each valve according to specifications as detailed in API 6D (or similar standard) then issues a performance certificate. Tests include a high pressure hydrostatic shell test and seat seal tests that verify the valves ability to hold a hydrostatic seal. For double block and bleed specifications, the ball is cycled to the closed position and each seat is independently tested from 2 to 30 minutes (depending on valve size) followed by a test to both seats simultaneously. The valve must seal with no visible pressure loss for the duration of the test. Other optional tests include air seat tests and backseat tests.

Ball valves are designed NOT to require lubrication for normal operation. Use of lubricants and/or sealants during API hydrostatic testing at the factory is prohibited.

Minor seat damage may occur after the valve is shipped from the factory due to improper handling or because sand/dirt gets into the valve while sitting at the pipeline right-of-way waiting for installation. The valve is usually cycled during installation of actuators and during hydrostatic testing of the pipeline. Dry contaminants can create tiny scratches on the metal seating surfaces and soft insert material, causing minor leak paths. These minor leaks only become obvious after the introduction of high pressure gas into the pipeline.

As detailed in the Sealweld “Destructive Testing of Ball Valve Seals” report it was confirmed that minor seal leaks can be sealed through the introduction of light grade lubricants or sealants such as Sealweld Total-Lube #911, into the standard seat injection fittings provided on pipeline ball valves. More severe leak paths can be reliably sealed through the injection of Sealweld 5050 Ball Valve Sealant. The larger size and variety of PTFE particles used in regular grade 5050 can be safely injected through all types of sealant injection fittings and internal check valves without risk of plugging the check valve mechanism or passages inside the valve.

When the valve is prepared for shipment the valve may be coated with a light varnish coating to protect unplated external surfaces from corrosion. Internal surfaces are coated with a light oil or filled with light grease and end covers installed. The valve is usually equipped with end covers to keep water and airborne contaminants from internal surfaces. The valve may or may not be crated.

The valve is then handled by truckers, fork lift operators, stevedores, deck hands on the vessel, warehouse personnel, and finally delivered to the valve site where it is prepared for installation.

Preparation often consists of uncrating the valve, removing the protective end covers and placing it on the ground to be externally painted or coated before welding into the pipeline.

The pipeline construction crew then pre-heats the pups or closures on each end of the valve prior to welding into the pipeline, welding takes place, the weld is x-ray inspected to verify the integrity of the weld. The weld area is recoated or taped and the valve is buried with the rest of the pipeline.

The pipeline is then filled with water and hydrostatically tested to verify the integrity of the pipe and all welded connections and threaded fittings. The pipeline is de-watered, dried, and prepared for the introduction of high pressure natural gas.

Sand, dirt, pebbles and rocks, sand blasting material, hand tools, timbers, are some of the many contaminants normally discovered in valve bodies, pig receivers and scraper/filter devises after start-up. Minor valve seat leakage is often the result of tiny scratches to the seating surfaces caused by these contaminants.

In many cases, by the time the operator takes possession of the pipeline from the contractor, many of the valves experience minor leakage problems. As testing has proven, a valve with even minor scratches will leak after high pressure gas is introduced. These scratches may continue to erode into larger leak paths if a preventative maintenance program is not in place.

The following paper describes proven steps to prevent valve damage and subsequent leakage from occurring. It is written from the perspective of a professional valve maintenance technician. The steps described have been proven to reduce and/or eliminate the possibility of valve leakage after installation allowing the valve to seal 100% bubble tight for many years.

Proper valve commissioning may also eliminate the need for the operator to purchase many of the recommended spare parts suggested by some valve manufacturers.

PROCEDURES TO BE FOLLOWED AT THE VALVE MANUFACTURING FACTORY

The pipeline operator shall prepare a written specification for the design, manufacture and testing procedures of each valve. Specific instructions should be detailed for re-testing procedures in the event that the valve fails the first test.

Due to the absence of manufacturing standards for sealant injection fittings, the valve manufacturer is allowed to install any type of sealant fitting, usually whatever is cheapest. In order to prevent sub-standard sealant injection fittings being installed at the factory, the engineering specification should clearly identify on the initial inquiry and purchase order that Sealweld Flow Wolf sealant fittings and Flow Wolf inner check valves be installed by the manufacturer. Refer to the Sealweld “Discussion Paper for Modifying Pipeline Engineering Standards for Sealant Injection Fittings in Pipeline Valves” paper for additional information. Each sealant injection fitting is clearly stenciled “SEALWELD FLOW WOLF” on the wrench flats for positive verification.

Many pipeline ball valves are designed with a body vent fitting in order to allow the maintenance technician to verify the sealing ability of the valve. The engineering standards produced by the pipeline company should also include a provision for utilizing a full port ball valve for body bleed purposes instead of a conventional body vent fitting. Many designs of body vent fittings utilize a very small vent passage. This restricts the

flow of gas and may result in a build up of body pressure as the amount of leakage into the body cavity can not be expelled by the small passage.

A pipeline engineer and/or consulting inspector should be present to verify that all testing conforms to API, the valve manufacturer's and the pipeline company's written specification. The inspector should also verify that all test results are well documented and that all written documentation is properly coded and accurate.

The inspector should also perform a thorough visual inspection to verify that good machining and welding practices are followed. Special attention shall be paid to ensure that all machined metal shavings and welding slag has been removed from the valve body, seat ring pockets, stem/trunnion and all threaded connections prior to assembly.

Upon completion of the hydrostatic testing the valve shall be cycled to the full open position. The valve shall be purged of water and dried. The seat sealant system shall be filled by means of injecting a light grade synthetic valve lubricant through the sealant injection fittings such as Sealweld Equa-Lube Eighty or Total-Lube #911.

The valve shall be packaged for shipment with air-tight end closures to prevent shipping grease from leaking out and to prevent air, rain water, sea spray from entering the body of the valve. All body vent/drain valves shall be in the closed position. The crate shall be well labeled with specific handling instructions, how and where to pick-up the valve or crate, how the crate is positioned (i.e. this end up), the weights and dimensions, how to stack, with full identification of the serial number, manufacturers job number and customers order reference number.

UPON ARRIVAL TO THE CONTRACTORS STORAGE FACILITY

Upon receipt of the valve, the shipper/receiver shall re-verify that the crate identification matches the accompanying paperwork and that the crate arrived in undamaged condition. The shipper/receiver shall record all relevant information onto the VALVE LOG record as per attached sample. A VALVE LOG shall be prepared for each and every valve. The VALVE LOG shall be attached to the valve or crate in a waterproof bag and shall remain attached until removed by the Valve Commissioning Technician (VCT).

In the event that the crate has been opened or otherwise damaged, a representative of the manufacturer shall be present to witness the condition of the valve as it is uncrated. A decision shall be made as to the extent of the damage (if any) and what steps shall be taken to re-verify the integrity of the valve.

The valve shall be visually inspected for shipping and handling damage. The shipper/receiver shall verify that the valve arrived in perfect condition or clearly identify any suspect components. The shipper/receiver shall verify that end covers are intact, the shipping grease has not leaked out and that water has not leaked into the valve body. The shipper/receiver shall not remove the end caps unless internal damage is suspected.

The receiving personnel should also be familiar with the valve specification as described by the engineering department to ensure all fitting and external components comply with company specification by looking for the SEALWELD FLOW WOLF stencil on each external sealant fitting. In the event that any fitting or external component does not

comply with company standards the VALVE LOG shall be marked accordingly and this information shall be brought to the attention of the VCT for replacement prior to installation of the valve into the pipeline.

The receiving personnel should ensure that copies of all relevant paperwork, drawings and maintenance manuals, and the VALVE LOG sheet is attached to each valve before it leaves for installation.

Depending on the construction timetable, the valve may remain in storage for some time. It is the responsibility of the shipper/receiver to store the valve together with all attached paperwork in a dry and safe location.

When leaving the warehouse, it is the responsibility of the shipper/receiver to make sure that the valve identification is clearly shown on the outside of the shipping crate and/or shipping tag and that copies of all relevant documentation is firmly attached in a waterproof plastic bag. It is the responsibility of the shipper/receiver to ensure the truck delivering the valve to the site is properly loaded and all valves are properly tied down.

PREPARATION FOR INSTALLATION.

Upon arrival of the valve at the valve site, the VCT shall re-verify that the crate identification matches the accompanying paperwork & VALVE LOG data and that the crate arrived in undamaged condition.

In the event that the crate has been opened or otherwise damaged, the VALVE LOG should clearly identify who open the crate and for what reasons. If the VALVE LOG is not marked properly, a representative of the manufacturer should be present to witness the condition of the valve as it is uncrated. A decision shall be made as to the extent of the damage (if any) and what steps shall be taken to re-verify the integrity of the valve.

The valve shall be uncrated from its original shipping crate. If not already tagged, a metal tag shall be permanently attached to the valve that clearly identifies the valve serial number, job number, valve number and all relevant information.

The VCT shall verify that the valve was handled properly as it was unloaded. The valve shall be lifted by means of external slings attached to the valve at the positions as indicated by the valve manufacturer. It is strictly forbidden to lift the valve by means of inserting a lifting pole or sling through the bore hole in the ball. It is strictly forbidden to lift the valve by means of attaching a sling around the stem or gearset. Do NOT remove the protective end covers from the valve.

The valve must be unloaded from the truck and placed directly on timbers or pallets, up and off the ground. The valve should be positioned with the stem pointing up. It is strictly forbidden to place the valve directly on the ground.

Extreme care must be taken when unloading the valve, that the sealant fittings, body vent fittings, valve stem and/or gearset are not bent, pinched or otherwise damaged during unloading operations.

THE VALVE COMMISSIONING TECHNICIANS (VCT) RESPONSIBILITIES

On arrival at the valve site the VCT shall verify that the valve identification is correct and that all documentation and copies of manuals and the VALVE LOG are attached. The VCT shall assume full responsibility for all on-site documentation until the commissioning procedures are completed.

The VCT shall remove the end cover protectors and visually examine the internal components. The technician shall verify the ball is in the fully open position.

All varnish coatings shall be removed from external surfaces with particular attention paid to exposed valve stems. Special care must be taken to ensure that all plated surfaces are not scratched during varnish removal.

The valve may not be fitted with a manual gearset or power operator at this time. In the event that this is to be done at the installation site, all exposed valve stems shall be cleaned and wrapped with a plastic waterproof covering and taped to secure.

Note: In cases where the power operator was fitted to the valve at an outside facility or when fitted in the field, it is critically important to ensure that steel dowel pin are used in conjunction with the normal flange bolts to prevent the valve and operator from flexing.

The VCT shall verify that all fittings and connections attached are correct, intact and undamaged.

The VCT shall ensure that the stem seal system on each ball valve is energized. For ball valves with buttonhead fittings in the stem seal, injection pressure must not exceed 3,000 psi. The VALVE LOG shall indicate that the stem seal is energized **AND** holding pressure.

The seat sealant fittings shall be visually inspected for compliance with the operators instructions. Non-standard fittings shall be rejected and replaced. The fittings will be tested by injecting a light lubricant/sealant into each seat ring.

The seat sealant system shall be topped up with light grade synthetic lubricant/sealant such as Sealweld Equa-Lube Eighty or Total-Lube #911. As the seat sealant system is filled, the previously injected sealant will be extruded into the valve body adjacent to the ball and seat ring interface. The VCT shall look inside the valve to ensure that sealant is protruding around the circumference of the seat ring. Excess sealant shall smeared around the circumference of the seat ring to fill in the gap between the ball and seat ring and leveled as to not protrude into the inside of the pipeline.

The VCT shall verify that all body vent/drain fittings or full port ball valves are properly installed, lubricated and functioning properly. Plug valves are preferred for body vent purposes on large diameter ball valves, full port ball valves are preferred on small diameter pipeline ball valves.

For buried valves with stem extensions, the piping used to extend the stem shall be internally coated with a plastic epoxy coating at the factory. In cases where the extension is fitted at the valve site, the VCT shall verify that the inside surfaces of the extension have been properly coated with an epoxy paint prior to installation.

The metal components used to extend the stem shall be coated or plated to prevent corrosion. The VCT should verify that this has been applied and is intact and undamaged by transport.

The VCT shall verify that the stem extension is complete with the required bleed/drain or inspection ports. In the case where vent holes have been drilled but not threaded and plugged, the technician shall verify that the internal components are unaffected. The stem riser may be subjected to line pressure in the event of stem leakage. The riser shall be fitted with a small diameter 2000 psi ball valve with relief valve attached. This will warn field personnel of a stem leak while still preventing water from intruding. The ball valve shall be in the open position. The correct pressure setting for the relief valve shall be determined by the engineers of the pipeline company.

For valves with manual gearboxes, the VCT shall be responsible for removing the inspection cover from the gearbox and inspect that water has not entered the gearbox. The gearbox will be filled with a premium anti-sieze lubricant (Sealweld Eterna-Lube 1000) and inspection cover reattached.

The VCT shall be responsible for ensuring the valve is kept free of contamination after arrival at the job site. The end caps shall be firmly reattached and not removed until just prior to welding into the pipeline.

The receiver shall ensure that all handling at the job site is performed in accordance with specification. The valve must be handled and hoisted externally as recommended by the valve manufacturers manual, without placing a wooden pole or metal pipe through the valve bore.

ON INSTALLATION INTO THE PIPELINE

The on-site inspector shall ensure that all welding procedures are performed in accordance with valve manufacturers specification and company specification. Special care to be taken to ensure that the valve body does not overheat and damage valve body castings or internal elastomers such as Teflon seals and o-rings.

Subsequent to welding and weld inspection, the VCT will TOP UP the valves seat sealant system with light sealant. Top up quantities shall be approximately 1/8th of the required quantity to fill the seat sealant system from empty. This will ensure that any welding slag or similar debris that has come in contact with the sealant will be pushed out of the seat pocket.

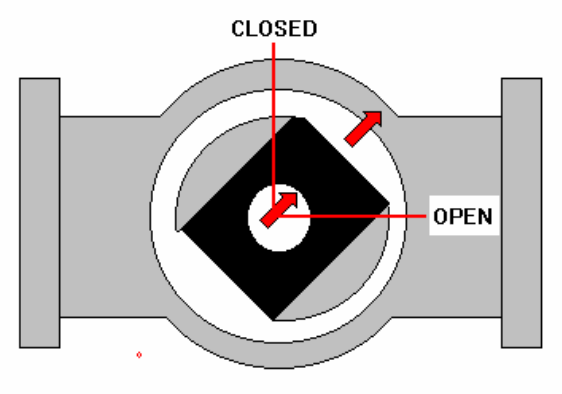
The external surfaces of the valve, stem extension and sealant riser extension must be covered with a protective coating as specified by the construction specification. Special care shall be taken to ensure that all moving parts and external fittings are not coated. The VALVE LOG shall be marked accordingly.

ON HYDROSTATIC TESTING

Hydrostatic testing shall be performed in accordance with the valve manufacturers specification.

The pipeline shall be filled with water with all valves in the fully open position. This will push all construction debris downstream to the end of the test section instead of having the debris fall into the bottom of the valve body where it could plug off the body vent or body bleed fitting. When the pipeline is full of water but before building pressure, the water pumps are to be shut down.

Prior to pressurizing the pipeline, all ball valves shall be rotated to the 1/2 closed/open position as illustrated below. This will prevent the possibility of a pressure differential in the valve body during hydrostatic testing. The VCT shall verify that all valves are in the 1/2 closed/open position prior to achieving full test pressure. The VALVE LOG shall be marked accordingly.



After all valves have been turned ½ open/closed the VCT shall approve the start-up of the hydrostatic test pumps. Pressure will be taken to 50% of MOP, the pumps shall be stopped and every valve, flange and fitting shall be visually inspected for signs of leakage. After all visible leak points have been eliminated the pumps shall be started and the pipeline taken to full test pressure.

During hydrostatic testing the valve shall be visually inspected for evidence of leakage at the stem seal, gearbox seal, body closure seal and all threaded connections. All leak points shall be repaired prior to the introduction of gas into the system.

Upon completion of a successful hydrostatic test, the valve shall be returned to the full open position. The seat sealant system in the valve shall be topped up after the valve is in the full open position. The VALVE LOG shall be marked accordingly.

The valve shall **NOT** be allowed to remain in the 1/2 closed/open position for an extended period of time. This can result in the elastomers in the seat ring to become deformed, resulting in severe seat leakage.

In most cases the pipeline is dewatered by conducting pigging operations. The mainline is pigged which pushes all water downstream. The pig assembly may also include batches of methanol and/or other chemicals between pigs to absorb all water present. Gel type pig trains may be utilized to internally treat the inside of the pipeline for corrosion. The pig “train” is normally propelled by high pressure nitrogen gas or natural gas.

ON BACKFILLING THE PIPELINE

The pipeline construction inspector shall ensure that proper backfilling procedures are followed. No large rocks or sharp stones shall permitted to make contact with the valve body, stem extension or sealant piping extensions. The VCT shall witness the backfilling and mark the valve log accordingly.

ON INSTALLING POWER OPERATORS

The construction contractor shall arrange to have the power operator installed and functioning properly. Installation and calibration shall be performed by the authorized representative of the actuator manufacturer only. The authorized representative shall verify in writing that steel dowel pins have been properly installed between the mounting flange and the power operator. This is to prevent any rotation or flexing between these components.

All automatic fail safe triggering systems (line break controls) shall be installed and functioning properly. These systems shall be disabled during the hydrostatic testing procedures but must be tested and functioning properly when high pressure gas is introduced.

The VCT shall be instructed on all power operator maintenance procedures and acquire copies of all relevant maintenance manuals from the power operator maintenance technician. The Valve Log shall be marked accordingly.

ON HIGH PRESSURE GAS TESTING

At the request of pipeline operator, the pipeline may be tested with gaseous nitrogen at high pressure. This is done to verify that all flanges, valves and connections will hold high pressure gas. Otherwise the pipeline will be pressurized with high pressure natural gas.

The valve shall be cycled to the half closed/open position to pressurize the body cavity and returned to the full open position. The body vent/drain valve shall be opened to drain the water from the body cavity. The valve shall be cycled slightly, just off the full open position in order apply constant pressure to the body cavity and blow all water out of the body cavity.

When all water has been removed, the valve shall be returned to the full open position. The seat sealant system shall be topped up, the VALVE LOG shall be marked accordingly.

With the pipeline under normal operating pressure, the VCT will now inspect the valve for seat leakage. The VCT shall verify that each valve will hold a 100% bubble tight seal in **BOTH** the full open and full closed positions. Note: the Grove B-4C and B-5 ball valves can only be tested in the closed position due to a hole in the top of the ball.

Testing is accomplished by opening the body vent fitting with the ball in the full open position.

Assuming the valve seals 100%, the actuator stops and/or the stem position shall be marked with a permanent marker or punch mark and the VALVE LOG shall be marked accordingly.

In the event that minor leakage persists, the valve shall be topped up and the valve stops adjusted in an attempt to achieve a perfect seal. When the seal is achieved the actuator stops and stem position shall be marked accordingly. In the event that a seal can not be maintained, the valve manufacturers representative shall be consulted for recommendations. In the event that leakage is very minor, a heavier sealant may be injected upon mutual consent of the operator, contractor and valve manufacturer. The VALVE LOG shall be marked accordingly

The valve shall be cycled to the closed position and the body cavity vented to atmosphere.

Assuming the valve seals 100%, the actuator stops and/or the stem position shall be marked and the VALVE LOG shall be marked accordingly.

In the event that minor leakage persists, the valve shall be topped up and the valve stops adjusted in an attempt to achieve a perfect seal. When the seal is achieved the actuator stops and stem position shall be marked accordingly. In the event that a seal can not be maintained, the valve manufacturers representative shall be consulted for recommendations. In the event that leakage is very minor, a heavier sealant may be injected upon mutual consent of the operator, contractor and valve manufacturer. The VALVE LOG shall be marked accordingly.

FINAL ACCEPTANCE PROCEDURES

Upon completion of the commissioning operations, the valve seat sealant system shall be topped up by the VCT. The VALVE LOG shall be marked accordingly.

All valves shall be placed in their normal operating position.

The VCT shall ensure that all VALVE LOG data is complete and accurate and sign-off each VALVE LOG. Every VALVE LOG shall be co-signed by the pipeline inspector for verification.

All VALVE LOGS, record, manuals and reports shall be formally presented to the pipeline operator with written procedures for normal operating procedures and emergency sealing operations.

For a period of up to three years, while the contractors warranty is still in force, each valve should be topped up at three month intervals followed by cleaning the seat sealant system at least once per year.

VALVE REJECTION PROCEDURES

In the event that the valve arrives at the storage facility in a damaged or not as specified condition, the valve manufacturers representative shall be notified that the valve is damaged or otherwise unacceptable. The valve manufacturer may decide, at their option and expense to replace or repair the valve.

In the event that the valve arrives at the job site in a damaged or not as specified condition, the receiver from the storage facility shall be notified and steps taken to repair or replace the valve.

In the event that the valve is installed and fails to pass the hydrostatic or high pressure gas test, the contractor, pipeline operator and valve manufacturer shall be consulted prior to injecting a heavier valve sealant. In the event that heavy sealant is not successful at maintaining a reliable seal a decision will be made by the operator, contractor and valve manufacturer if the valve should be repaired or replaced.

SUMMARY

The pipeline engineering department shall prepare a written specification for the valve manufacturer and consulting inspector to work from. The written specification shall include specific reference to the applicable manufacturing codes with exceptions and additional tests clearly defined.

The specification shall include specific instructions for sealant injection fittings and all external accessories. The manufacturer shall attach a metal tag clearly identifying the function and purpose of each external fitting, i.e. seat sealant fitting, stem sealant fitting, body vent/drain fitting.

The specification shall include specific instructions to each manufacturer specifying that all lifting points, methods of lifting and handling procedures - must be clearly defined on the outside of each crate. The specification shall include reference to the type of protective end covers, crating and marking instructions.

The following personnel shall become familiar with the written specifications:
1) The pipeline purchasing department.
2) The valve manufacturer and their local representative/agent.
3) The Consulting Inspector at the valve factory
4) The shipper/receiver at the receiving warehouse.
5) The Valve Commissioning Technician (VCT).
6) The Pipeline Construction Superintendent.
7) The Pipeline Construction Inspector.

The pipeline purchasing department shall be responsible for advising the valve manufacturer of all written specifications prior to commencement of manufacturing. Written confirmation from the manufacturer regarding their ability to comply with the written specification must be received before the valve is placed on order.

The valve manufacturer and consulting inspector shall be responsible for ensuring all written specifications are followed and test results fully documented.

The shipper/receiver shall be responsible for ensuring the valve arrives and leaves the storage facility in perfect condition and that copies of all documentation including the VALVE LOG are attached to each valve in a waterproof plastic bag.

The Valve Commissioning Technician (VCT) shall be responsible for ensuring the valve is handled and installed properly. That the VALVE LOG is fully completed and all preventative maintenance procedures have been fully completed test results recorded.

The pipeline construction superintendent shall be responsible for ensuring all construction practices are fully documented and written procedures adhered to.

The pipeline construction inspector shall be responsible for ensuring all construction codes and practices are adhered to.

ValvePro® - Valve Maintenance Program

Sealweld Corporation has designed a Windows based computer program for building a database for every valve in the system. This provides a permanent record of every valve and can include such things as all name plate information for the valve and actuator, location information by physical site description or GPS coordinates, scanned images such as “as-built” drawings, valve seat leakage rates, atmospheric leakage verification and information regarding the valve site conditions. Record all maintenance activities, information on personnel, emergency response information. The help menu will aquiant maintenance personnel with routine maintenance procedures and emergency sealing techniques as well as information regarding the sealant capacities of the different types of valves and discharge capacities of sealant pumps.

Written and prepared by:
Dean Chisholm, Sealweld Services - Pipeline Valve Maintenance, Calgary, Canada.

References

The information provided is based on actual field experiences acquired during the past twenty-six years of practicing preventative and emergency valve maintenance in Malaysia, Canada, USA, and numerous other countries.

** Sealweld Paper “Destructive Testing of Ball Valve Seals and Effective Sealing Procedures in High Pressure Natural Gas Pipelines” Published 2-28-95.

*** Sealweld Paper “Discussion Paper for Modifying Pipeline Engineering Standards for Sealant Injection Fittings in Pipeline Valves” Published 8-10-94.

THIS PAGE TO BE COMPLETED BY SHIPPER/RECIEVER

SHIPPER/RECIEVER NAME		**DATE RECIEVED**	
CONDITION OF VALVE		**END COVERS ATTACHED**	

VALVE NUMBER		**SERIAL NUMBER**	
VALVE LOCATION		**MANUFACTURERS JOB NUMBER**	
CONSULTING INSPECTOR		**P.O. NUMBER**	

MANUFACTURER		**COUNTRY OF ORIGIN**	
TYPE		**CLASS**	
SIZE		**END TYPE**	
MODEL		**DATE OF MANUFACTURE**	

BODY MATERIAL		**BALL MATERIAL**	
SEAT MATERIAL		**SEAT ELASTOMERS**	

VALVE STEM EXTENSION ATTACHED	**YES/NO**	**INTERNAL COATING APPLIED**	**YES/NO**

MANUAL GEARSET ATTACHED	**YES/NO**	**HAND WRENCH ATTACHED**	**YES/NO**

MANUALS AND VALVE LOG ATTACHED	**YES/NO**	**LOADED OUT AND SECURED PROPERLY**	**YES/NO**

POWER OPERATOR INFORMATION		**VERIFY - IS THIS THE CORRECT OPERATOR FOR THIS VALVE**	**YES/NO**
SERIAL NUMBER		**DOCUMENTS PROVIDED**	**YES/NO**

Comments & Observations of Shipper:

THIS PAGE TO BE COMPLETED BY VMT - VALVE MAINTENANCE TECHNICIAN

VMT Valve Maintenance Technician - NAME		**DATE RECIEVED**	
CONDITION OF VALVE		**END COVERS ATTACHED**	**YES/NO**

SEAT SEALANT FITTING	**YES/NO**	**FLOW WOLF**	**YES/NO**
		SIZE	
METAL IDENTIFICATION TAG ATTACHED	**YES/NO**	**QUANTITY**	

STEM SEALANT FITTING	**YES/NO**	**FLOW WOLF**	**YES/NO**
		SIZE	
METAL IDENTIFICATION TAG ATTACHED	**YES/NO**	**QUANTITY**	

BODY VENT/DRAIN VALVE ATTACHED	**YES/NO**	**TYPE**	
		SIZE	
METAL IDENTIFICATION TAG ATTACHED	**YES/NO**	**QUANTITY**	

MANUAL GEARSET	**YES/NO**	**MAKE**	
GEARBOX INSPECTED	**YES/NO**	**MODEL**	
GEARBOX LUBRICATED	**YES/NO**	**SERIAL NUMBER**	
BEARINGS LUBRICATED	**YES/NO**	**WERE THE STOP SETTINGS CORRECT**	

POWER OPERATOR	**YES/NO**	**MAKE**	
GEARBOX INSPECTED	**YES/NO**	**MODEL**	
GEARBOX LUBRICATED	**YES/NO**	**SERIAL NUMBER**	
BEARINGS LUBRICATED	**YES/NO**	**OTHER**	

CHECK LIST TO BE COMPLETED BY VCT - VALVE COMMISSIONING TECHNICIAN

ITEM NO.	DESCRIPTION OF CHECK	YES/NO	COMMENTS
	ITEMS CHECKED ON ARRIVAL AT SITE		
1	Unloaded from Truck & Lifted Properly		
2	Set onto Timbers or Pallets		
3	Stem Positioned - Pointing Up		
4	Documents Received		
5	External Examination - Visual - No Damage		
6	Internal Damage - Remove End Caps & Inspect		
7	Ball in Full Open Position		
8	Open & Closed Positions Clearly Marked on top		
9	Inject Total-Lube #911 into seat sealant fittings Approximately 1 oz./inch of valve size Plus riser pipe quantities of 2 oz./foot		
10	Collect shipping grease from inside of valve body		
11	Level space between seat ring & ball with #911		
12	Replace End Caps & secure		
13	Stem seal energized to max. 3,000 psi & holding		
14	Gearbox & Bearings Lubricated with E-1000		
15	All threaded connections lubricated with E-1000		
16	External Coating Applied Properly No Coating Material on Valve Stem No coating material on External Fittings		
	WELDING PROCEDURES		
17	Seat Sealant System Topped Up after Welding		
18	All Metal Caps on Sealant Fittings Tightened		
19	All Body Vent/Drain Fittings Closed		
	POWER OPERATOR INSTALLATION		
	Authorized Representative On-Site		
	Documents/Manuals & Training Received		
	Valve Stops Set Properly & Marked		
	HYDROSTATIC TEST		
	Fill pipeline with water, with all valves in full open position, before building pressure, stop pumps.		
20	Ball Rotated to 1/2 closed/open Position		
	Start water pump and build pressure to 50% MOP		
21	Valve & Flanges Examined for Leakage		
	Start pump and build pressure to full test pressure.		
22	Hydrostatic Test Passed		
23	Pipeline Drained		
24	Body Cavity Drained		
25	Ball Returned to Fully Open Position		
26	Seat Sealant System Topped Up, Caps Tightened		
	BACKFILLING PROCEDURES		
27	Backfilling OK,		

	No Large Rocks against Valve or Riser		
	HIGH PRESSURE GAS TEST		
28	Test Pressure Test Gas Type Test Duration		
ITEM NO.	**DESCRIPTION OF CHECK**	**YES/NO**	**COMMENTS**
	VALVE SEALING TEST		
29	Top Up Seat Sealant System		
30	**OPEN POSITION** - 100% Bubble Tight Seal		
31	Open Position - Valve Stop Positions Correct		
32	Cycle Valve to Full Closed Position		
33			
34	**CLOSED POSITION** - 100% Bubble Tight Seal		
35	Closed Position - Valve Stops Verified		
36	Cycle Valve to Normal Operating Position		
37	Top Up Seat Sealant System, Tighten Caps		

Comments and Observations:

The tests conducted conform to the written specification as detailed in the engineering standards for pipeline commissioning. All information recorded is true and accurate.

Valve Commissioning Technician	Pipeline Inspector
Name (Print):	Name (Print):
Date:	Date:
Signature:	Signature: