1. INTRODUCTION

1.1. WARNING

Do not install, maintain or operate valves before having carefully read this IMO in order to avoid prospective damages to people and property. Always use the valves within the limit of the working conditions as described in International Standard Valve (ISV) technical documents, and/or nameplate.

For your safety and protection, follow essential and best safety practices prior to removing the valve from service and before any disassembly of the valve

1.2. Applicable safety regulations should be followed at all times.

1.3. Never loosen or remove any bolting or fittings while valve is under pressure.

1.4. Keep hands and objects out of the valve if there is a possibility of unexpected valve actuation in order to prevent serious damage or injury.

1.5. For proper handling and disposition, obtain a Material Safety Data Sheet (MSDS) of the media that the valve is exposed to and follow the material handling precautions associated with the media. Immediately contact the proper authority if there is any additional concern.

1.6. Wear protective clothing or equipment regularly required when working with the media involved.

1.7. Depressurize the line and valve as follows prior to removal of the valve or valve parts:

1.7.1. Drain the line while the valve is in the open position.

1.7.2. Close and open the valve to relieve any pressure that may be trapped in the valve body cavity prior to removal from service. Leave the valve in the open position.

1.7.3. Remove the valve from the line carefully.

1.7.4. Carefully open and close the valve several times while the valve bore is in vertical position to drain any remaining media before disassembly.

1.8. ISV assumes no liability for damages, failures, or any other occurrences resulting from unauthorized modification, misuse, or use of non-original manufactured equipment parts.

1.9. Any unauthorized repair or modification may void the product warranty; refer to ISV warranty information for details.

1.10. ISV withholds the right to revise the valve design. This IMO may not exactly represent your valve's construction. If there are any concerns, please contact the ISV Engineering department.

2. STORAGE

2.1. ISV valves are shipped in the full open position with the exception of valves that are equipped with fail-closed actuators. A corrosion inhibitor is applied to all end connections, flanged sealing surfaces and bores (non-stainless steel valves). End protectors are installed to prevent foreign material from entering the body cavity and from scratching and damaging the sealing surfaces of the end connections. This will provide adequate protection for indoor storage.

2.2. Do not remove the end protectors except for inspection or installation.

2.3. If valves require outdoor storage, ISV recommends a clean, dry, covered area off of the ground. Special packaging and additional lubrication may be required.

2.4. Never store the valve in a partially open position. If the valve is left in a partially open position for an extended period of time, the soft seat can be damaged.

3. INSTALLATION

3.1. Use proper handling equipment based on the weight of the valve. To avoid damage to the valve or personnel while handling, use a rig or sling if the weight is over 50lbs.

3.2. Valve can be installed in line bi-directionally.

3.3. With valves that have fittings or extensions, check and tighten before valve is put into service.

3.4. When the valve is ready for installation, remove the end protectors from both ends.

3.5. Inspect the valve internals, valve pipe connections and adjourning pipe to make sure they are free of damage, dirt and debris.

3.6. Install the valve in open position.

3.7. Flanged End Valves:

3.7.1. After confirmation of bolting and gasket material, size and length, align the bolt holes of the valve and pipe flanges.

3.7.2. Insert gasket and bolts.

3.7.2.1. To prevent unbalanced tightening and excessive stress on the bolting, the valve-to-pipeline alignment must be accurate.

3.7.3. Follow standard piping practice regarding the bolting of the valve by tightening the bolting uniformly in a crosswise pattern.

3.7.3.1. Uneven compression of the gasket/o-ring can occur if standard tightening sequences are not followed.

3.7.3.2. Deformation of the gasket /o-ring can cause the valve to leak if the bolting is over-torqued.

3.7.4. After installation, check and retighten bolting if necessary.

3.8. Weld End Valves:

3.8.1. Verify that the weld area is clean. The weld area should be free of oil, dust, rust, paint or any other contaminants that could inhibit the welding process.

3.8.2. Proper valve to pipe alignment should be verified. If necessary, make corrective adjustments.

3.8.3. Any welding should be done by qualified personnel while using properly certified and approved welding procedures in accordance with all related regional codes and regulations

3.8.4. Any weld process related heat applied to the valve body could damage the seat and seals.

3.8.5. Minimize heat generated by welding to prevent damage to seat and seal.

3.8.6. Perform localized post weld-heat treatment (PWHT) if necessary.

3.8.7. Clean and inspect the weld

3.8.8. After the weld is completed, the pipeline and valves should be flushed to remove any foreign contaminants.

3.8.8.1. Use Caution during flushing to avoid trapping debris in the valve cavities that could damage or scratch the sealing surfaces.

3.9. Check with a piping engineer to assure that the pipeline stress is not concentrated on the valve.

3.10. For new construction, valve and line should be flushed to eliminate contaminants and debris prior to cycling the valve.

4. OPERATION

WARNING: To prolong the life of the seats, ensure that the ball valve is either fully OPEN or fully CLOSED. If the ball is left in the half-open position, damage could be caused to the soft seats.

4.1. Make sure the pipeline is clean.

4.2. Verify that the valve bolting is tightened to the proper torque.

4.3. Confirm that the ball is in the OPEN position when doing a pipeline pressure test.

4.4. Maximum permitted shell pressure test is 1.5 times working pressure of the valve.

4.5. Maximum permitted pipeline shell pressure test is 1.1 times working pressure of the valve while the valve is in closed position.

4.6. Directional closing is clockwise for both the lever and gear operated valves.

5. MAINTENANCE

5.1. Maintenance intervals should be established and performed by the operational personnel according to service conditions.

5.2. Routine maintenance consists of tightening the lower stem nut 1/4 turn as needed to compensate for the wear caused by the stem turning against the stem seals. The upper stem nut should be tightened a corresponding amount. Routine maintenance also consists of tightening the valve bolting and checking for leakage.

5.3. Performance observations should be done periodically to ensure safety and function.

5.3.1. More frequent observation is recommended for valves under extreme conditions.

5.4. It is highly recommended to operate the valve at least once a month and generally as often as possible, to avoid torque increase and prevent deposit formations.

6. OVERHAUL MAINTENANCE

6.1. Overhaul maintenance consists of replacing the seats and all seals. Replacement of ball and stem may be required. See Warning, Disassembly and Assembly section for part replacement.

7. DISASSEMBLY

NOTE: If complete disassembly becomes necessary, replacement of all soft goods such as o-rings, gaskets, and packings is recommended. Prior to disassembly, read the complete IMO including the Warning section.

7.1. Verify the valve has been fully drained and depressurized per section 1, and close the valve for disassembly.

7.2. Remove the lever and related hardware.

7.3. Remove the lock washer (14), lower stem nut (13) and the belleville spring washers (16).

7.4. Remove the cap screws (20), stop pin (12), locking plate (21), and gland ring (11).

7.5. Remove the nuts (19).

7.6. Stand the valve on one of the end caps (2). Use caution to not damage the sealing surface.

7.7. Carefully remove the end cap sub-assembly from the top of the valve.

7.7.1. End cap sub-assembly consists of the end cap (2), body-cap gasket (6), and body-cap o-ring (7).

7.7.2. To disassemble the end cap sub-assembly, remove the body-cap gasket (6) and body-cap o-ring (7.)

7.8. Carefully remove the seats (5) and ball (3) and set them on a clean surface using caution to not damage the sealing surfaces.

7.9. To remove the stem sub-assembly, push the stem inward through the body.

7.9.1. Stem sub-assembly consists of the stem (4), stem o-ring (8) and thrust washer (9).

7.9.2. To disassemble the stem sub-assembly, remove the stem o-ring (8) and thrust washer (9).

7.10. Remove the stem packing (10) from the stuffing box.

7.11. Carefully remove the body (1) from the lower end cap (2) and set it on a clean surface. Use caution to not damage the sealing surfaces.

7.12. Remove the studs (18) from the body.

7.13. Disassemble the second end cap sub-assembly.

7.14. Clean all metallic parts with industrial cleaner.

7.15. Inspect all parts for scratches and damages on critical surfaces.

7.16. Only use OEM replacement parts as needed.

8. ASSEMBLY

8.1. Prior to assembly, verify all parts are free of scratches, damages, dirt and debris.

8.2. Lubricate all moving parts and threaded connections.

8.3. Assemble the stem sub-assembly. (see 7.9.1)

8.4. Assemble the end cap sub-assemblies. (see 7.7.1)

8.5. Install the stem packing (10) into the stuffing box.

8.6. Install the locking plate (21) and cap screws (20).

8.7. Install the stem sub-assembly in the closed position.

8.8. Install the gland ring (11), belleville spring washer (16) and lower stem nut (13).

8.9. Install the ball (3) and turn the stem (4) to the open position.

8.10. Install and center one of the seats (5) onto the ball (3) with the sealing surface facing the ball (3).

8.11. Install the studs (18) into the body (1) on the side with the seat (5).

8.12. Carefully lift one of the end cap sub-assemblies and install it onto the valve. Use caution to not damage the sealing surfaces of the end cap (2), body (1) or ball (3).

8.13. Install the nuts (19) and refer to ISV technical document “IS00-BF1E-1200” for recommended torque values.

8.14. Stand the valve on the other end cap so that the body is facing up. Use caution to not damage the flange sealing surface.

8.15. Install and center the remaining seat (5) onto the ball (3) with the sealing surface facing the ball (3).

8.16. Install the remaining studs (18) into the body (1).

8.17. Carefully lift the remaining end cap sub-assembly and install it onto the valve. Use caution to not damage the sealing surfaces of the end cap (2), body (1) or ball (3).

8.18. Install the remaining nuts (19) and refer to the ISV technical document "IS00-BF1E-1200" for recommended torque values.

8.19. Install the stop pin (12) and lock washer (14).

8.20. Install lever and related hardware.

8.21. Verify the fully open and closed stops are set correctly.

8.22. After assembly, valve needs to be pressure tested per owner's specifications.

8.23. After testing, it is recommended to drain and dry the valve completely. Apply corrosive inhibitors to the machined surfaces, use protective end covers, and make sure the valve is in the fully open position.

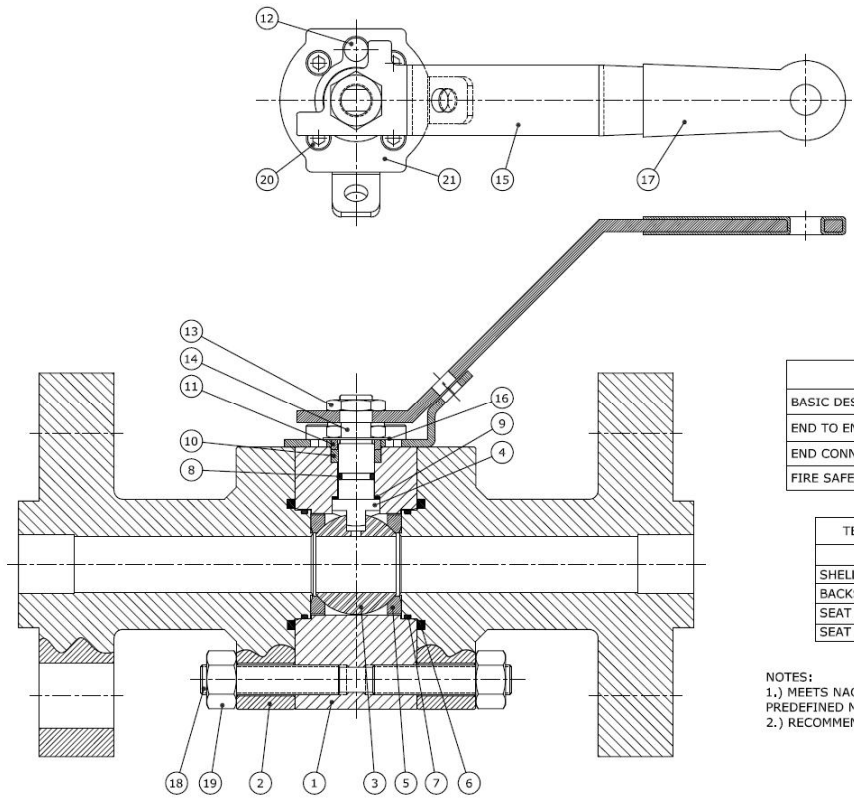
8.24. Valve shall be marked as "repaired".

9. DISPOSAL

9.1. If disposal of the valve is necessary, check with local environment authorities for disposal regulations.

9.2. Remove ISV nameplate, logo and markings before disposal to prevent improper usage.

FIGURE 1 – LEVER OPERATED ISV 3pc BF1E SERIES VALVE



1	BODY
2	END CAP
3	BALL
4	STEM
5	SEAT
6	BODY-CAP GASKET
7	BODY-CAP O-RING
8	STEM O-RING
9	THRUST WASHER
10	STEM PACKING
11	GLAND RING
12	STOP PIN
13	STEM NUT
14	LOCK WASHER
15	LEVER
16	BELLEVILLE SPRING WASHER
17	PLASTIC SLEEVE
18	STUD
19	NUT
20	CAP SCREW
21	LOCKING PLATE

PRODUCT STANDARDS	
BASIC DESIGN:	ASME B16.34, API 6D
END TO END:	ASME B16.10
END CONNECTION:	ASME B16.5
FIRE SAFE TEST:	API 607

TEST STANDARDS: API 6D		
	psi	bar
SHELL:	5575.5	384.5
BACKSEAT	---	---
SEAT (HIGH)	4075.5	281.1
SEAT (LOW)	87	6

NOTES:
1.) MEETS NACE MR-0175/ISO-15156 AND MR-010
PREDEFINED MATERIAL REQUIREMENTS.
2.) RECOMMENDED SPARE PARTS.

*This sketch is provided for reference only. For detailed information contact the ISV Engineering Department.