FREEPORT-McMoRan

SAFETY ALERT NOTIFICATION		
	Safety Alert #	SA – 2016 - 10
	IMS #	N/A
	OPERATION:	External
Valve Failure (External Company)	INCIDENT DATE:	12/6/2016
	TIME:	
	TYPE:	Injury
Issued By: **DOHS**	Contact For Additional Details: **Mitch Kruger or Steven Richardson**	

This is NOT an investigation report. It is a NOTIFICATION of a Significant Incident that has taken place outside Freeport-McMoRan, shared by an ICMM member company. The information below is a preliminary assessment and not a formal investigation.

INCIDENT DESCRIPTION

On December 6th 2016, a fatality occurred at a Peru mining operation (Las Bambas). A contractor died after being hit by a sudden release of high pressure water. The water release resulted from the failure of a butterfly valve that was being used as an isolation point at the end of a pipe. This pipe section was part of a minor project to upgrade the process water return pumping system and had been put into service only hours before the incident.

FATAL RISKS	HEALTH AND SAFETY POLICIES
Uncontrolled Release of Energy	Energy Control (LOTOTO)
Choose an item.	Choose an item.
Choose an item.	Choose an item.

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

PROBABLE DIRECT CAUSES

- A key issue was confusion regarding the pressure ratings and naming conventions of butterfly valves. The valve that failed was a rubber-seated butterfly valve with a pressure rating of 150 psi. However, the valve that had been specified was an "ANSI/ASME Class 150" valve, which would have had a pressure rating up to 275 psi. It is often common-place for both of these valves to be generically referred to as "150-pound valves", which can easily lead to confusion regarding the distinction between the two classifications.
- The end-point butterfly valve was a lug-type and was installed without a down-stream flange. While some valve manufacturers allow this type of installation indefinitely without affecting the pressure rating, others stipulate a reduced pressure rating in absence of a downstream flange. The failed valve was a rubber-seated butterfly valve that requires the installation of a downstream flange. Without the downstream flange to secure the seal, the rubber seat material failed and broke free from the valve body, leaving a gap between the metal valve body and the butterfly disk.
  High-velocity water jetted out from around the perimeter of the disk and impacted the individual, causing fatal injuries.

IMMEDIATE CORRECTIVE ACTION(S)

N/A

REQUIRED ACTIONS(S)

- Ensure applicable employees understand the design specifications of the valves they operate and maintain (reference materials/photos are included below).
- Sites should evaluate isolation practices to ensure employees performing maintenance on equipment understand the critical controls required to perform work safely.
- Verify that valves are installed according to manufacturer specifications.

Figure 1 Las Bambas valve involved in the incident. The rubber seat material failed and broke free, leaving a gap between the metal valve body and the butterfly disk.

The following materials are not related to the event and are provided as references only.

Rubber-Seated Butterfly valve
Pressure Rating: 150 psi

These valves typically require flanges on the upstream and downstream sides of the valve. Consult manufacturer specifications for details.

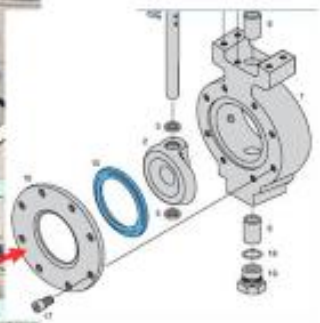
Most rubber-seated butterfly valves must have flanges secured on both the upstream and downstream side in order for the pressure rating to be valid.

ANSI/ASME Class 150 Butterfly Valve

Pressure Rating: Up to 275 psi @ 100°F

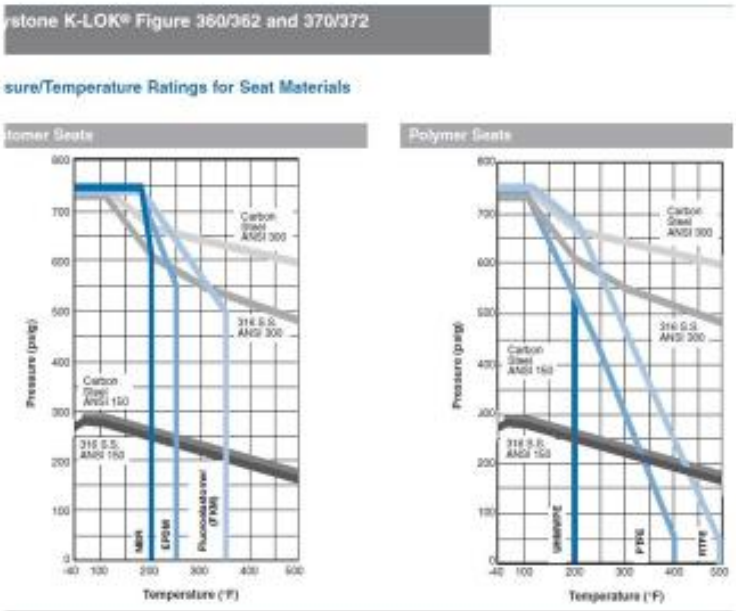
Often referred to as "High Performance"

Pressure rating



These valves typically require a downstream flange if the downstream side of the valve has a seat-retaining plate that must be secured between the flange and the body of the valve. Consult manufacturer specifications for details.

Reference: Example of Pressure rating chart of ANSI/ASME Class 150 and 300



Pressure ratings can be dependent on materials of construction, seat, and temperature.

This is NOT an investigation report. It is a NOTIFICATION of a Significant Incident that has taken place outside Freeport-McMoRan and is being communicated to enhance safety awareness should a similar situation exist. The information above is a preliminary assessment of the event and is not a formal investigation.