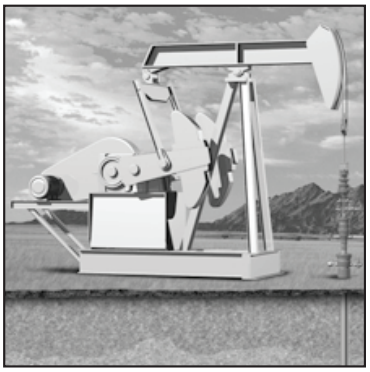
APPLICATION PROFILE

WELLHEAD PROTECTION

INTRODUCTION



The wellhead (Casing Head) is mounted on the surface casing. Each additional casing string and the tubing string are then hung from the wellhead as they are run down the hole. The wellhead also seals off the annular spaces between the strings. Once the well is completed, operating personnel no longer need access to the wellhead. Onshore wellheads are typically located just below ground level, either buried or in cellars.

During the production life of a well, a pressure element requiring consideration will always be present at the wellhead. Pressure is created as the oil and gas is forced to the surface, whether it is influenced by natural causes, or by some artificial lift system, overpressure conditions can arise.

There are various typical wellhead hook ups. The most common are those that produce up the tubing string into a flow line through multiple connections. The well can also be completed to produce from the annulus, between the tubing and casing.

The purpose of this application profile is to provide an understanding of the possible overpressure hazards that exist at the wellhead, and describe possible solutions. This document is intended to be a guideline and is not applicable to all situations. If you have any questions, or a possible application, please contact Fike Oilfield Tools or our sales representative in your area.

THE PROBLEM:

During the production life of the well, the wellhead can easily experience overpressure conditions periodically. These conditions can be caused by various malfunctions that restrict the normal flow of product (oil and gas) from the wellhead. Common circumstances that cause overpressure conditions are:

- Plugged Flow Lines
- Plugged Valves or Other Fittings
- Inadvertently Closed Valves

These overpressure excursions can result in hazardous conditions for workers and may even create unnecessary environmental problems. Under today's common practices, there are no pressure relief devices called for at the wellhead, or within the flow line system. When overpressure occurs, it can go unnoticed for long periods of time without the operator being able to determine where, or what, the actual problem is. Failure modes are different depending on the lift method in use. In this environment, an overpressure condition can shut down a well, create a dangerous environment for workers, and raise environmental concerns.

THE SOLUTION: PROTECTING THE WELLHEAD WITH FIKE CONVENTIONAL PRE-BULGED DISC (CPD)

Pressure relief can easily be installed in most wellhead hook-ups, no matter what type of lift method is being used. The Fike CPD is typically installed within a union type holder device, which can easily be integrated into the pressure system. This provides wellhead overpressure protection, which in turn protects personnel, the environment, and your ability to produce the well.

CPD Discs with Union Type Holder

The rupture disc assembly is typically located in the flow line, after the check valve and routed directly back to the tubing head, which returns the overpressure flow back to the annulus. This connection to the annulus needs to be placed before the check valve, if one exists. See Figure 1. In this application the rupture disc creates an obstruction in this by-pass flow line, until the predetermined pressure of the rupture disc is reached. When this happens, the rupture disc opens (relieving the overpressure condition) and returns the overpressure flow back into the annulus of the well.

Form No. OFAP002

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PROTECTING WELLHEAD HOOK-UPS

The installation of a Fike CPD will protect wellhead hook-ups when flow lines become plugged, or if valves are inadvertently closed. Following is a listing of typical applications, and failure modes that often create potentially dangerous overpressure conditions.

Sucker Rod Pump

- Polished Rod Damage
- Stuffing Box Damage
- Pumping Tee Broken
- Flow Line Damage
- Pump Jack Repair

Electrical Submersible Pump

- Electrical Motor Damage
- Downhole Pump Damage

Progressive Cavity Pump

- Drive-Head Damage
- Rotor-Stator Damage

These examples are just a few of the operational circumstances that can result in downtime, hazardous working conditions, environmental problems, and expenses that can easily be avoided.

FIKE SOLUTIONS FOR THE OILFIELD INDUSTRY

Failure of pressure activation devices is a major problem in the drilling, completion, and production phases of the oil and gas industry. Fike has addressed this and other oilfield problems with the application of rupture discs, some of the industry's most accurate and reliable devices. Whether it is a downhole pressure activation device, or pressure relief on a surface storage tank, Fike provides reliable and comprehensive rupture disc solutions for the oil and gas industry.

Conventional Pre-bulged Disc (CPD) - Fike's standard pre-bulged rupture disc is the most widely used in industry today. The CPD is available in a wide range of burst pressures and is typically installed in standard union type or hammer union holders. Available in stock.

Pressure Activation Device (PAD) - The PAD is offered in two configurations, PAD-A for pressure activation from the annulus and the PAD-I for pressure activation from within the casing/tubing/drill string. The PAD can be used in any application where pressure activation is required. Common applications include downhole completion, perforating, cementing tools, gravel pack, stimulation, drill stem testing and coiled tubing equipment. Stock burst pressure available.

Hydraulic Tubing Drain (HTD) - Provides a positive method to equalize the fluid level in tubing strings, without mechanical manipulations. Standard sizes and pressure are available.

Advanced Engineered Products (AEP) - Application of rupture disc technology for demanding applications is a Fike strength. Fike has produced a number of devices that provide significant improvements to drilling, completion and production phases in the oil and gas industry, and have become standard equipment in those applications. Bring us your difficult or unusual pressure relief and activation problems and we can design a custom solution. Design flexibility, a wide choice of materials, and suitability for narrow-tolerance critical uses, make these devices the best solution for a wide range of sealing, activation, venting, one-time valving, or pressure relief requirements.

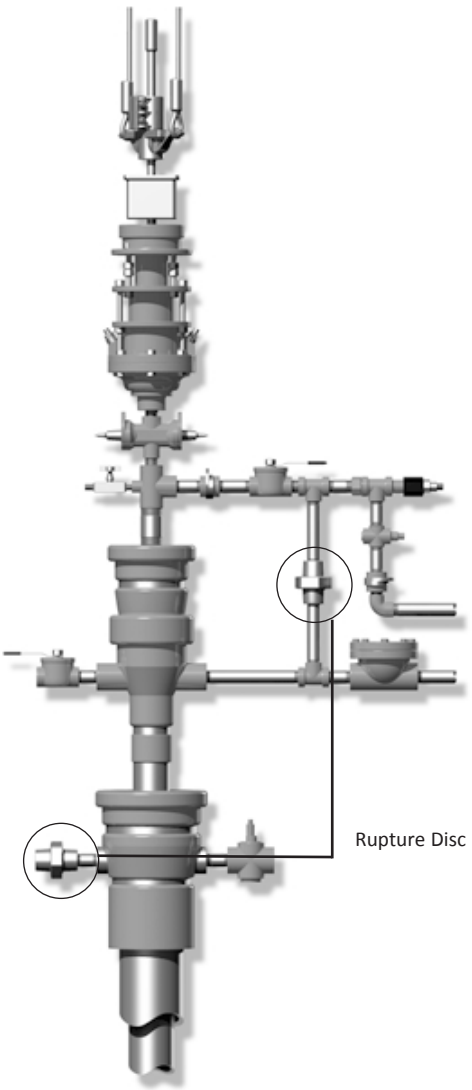
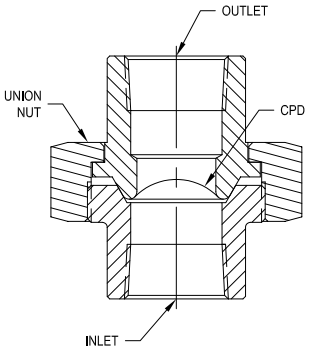


Figure 1 - Typical Wellhead Protection with CPD



Union Type Holder

Form No. OFAP002, December 2005. Specifications are subject to change without notice.