# EStB – Coil Tubing BOP System

## Coil Tubing BOP System

For the purpose of the EStB evaluation, the Coil Tubing BOP System is classified as both a barrier element and a mitigator. The barrier element components are limited to all pressure containing components that may serve as part of a barrier envelope when required.

### Parts and Components (Barrier Elements), *i.e., Description of pressure containing parts and components that serve as part of a primary or secondary barrier envelope when required.*

Body - Provides a frame and structural support for the associated components and sealing elements (e.g., valves, rams, etc.).

Sealing Ram(s) – Components intended to close on the wellbore or tubular to isolate fluid (e.g., blind, blind/shear, shear-seal, fixed-size pipe, and pipe/slip rams).

Valves – Components intended to close to isolate fluids. This is inclusive of the choke and kill valves that are located at the end of the high-pressure choke/kill lines, and check valves including the dual check valve located at the bottom of the coil tubing string.

Coil Tubing String – The coil tubing string is continuous metal non-jointed pipe.

Seals – Components used to close off or secure against fluid (e.g. elastomeric, metal-to-metal, gaskets).

Spools –Pipe with end connectors (e.g. flanges) and potentially side outlets used to connect between barrier elements (e.g., spacer or adapter spools).

Coil Tubing Connector - Component used to attach the bottom hole assembly to the coil tubing string.

### Parts and Components (Mitigators), *i.e., Description of fluid wet components or components used to directly prevent escalation of events required for system to work as a mitigator. These are components that apply mitigation directly to the hazard. This should not include control systems.*

Shear/Seal Valve – Components equipped with an adjustable aperture to control the rate of flow of fluid (e.g., choke).

Non-Sealing Ram(s) - Components intended to close on the wellbore or tubulars that perform functions other than sealing (e.g., shear and slip).

## Scope

Analysis on coil tubing systems will be limited to the period in which the equipment must perform as a barrier, from installation until removal from service. The equipment starts at the connection to the surface tree, wellhead, or BOP.

## Assumptions

- The equipment is field proven.
- The equipment is,
  - Manufactured according to specification
  - Installed as per Original Equipment Manufacturer guidelines
  - Maintained as required
  - Functioning properly
  - Verified as needed
  - Regularly tested
- Throughout the equipment's lifecycle, the equipment is utilized within its prescribed applicable performance envelope (e.g., pressure, longevity, environment) and operated within design limits.

## Performance Requirements for Public Comments

| Barriers | |
|---|---|
| **Part/Component** | **Performance Requirement** |
| Body | (1) Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |
| Sealing Rams | (1) Must cut any tubing (excluding bottom hole assemblies) and anything run inside the tubing (e.g., electric-, wire-, and slick-line to be used in the well) run across the shearing ram.Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |
| Valves | (1) Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |
| Coil Tubing String | (1) Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |
| Seals | (1) Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |
| Spools | (1) Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |
| Coil Tubing Connector | (1) Must seal (i.e., prevent flow of fluids and transmission of pressure) in direction(s) of flow under all anticipated conditions.<br>(2) Must remain sealed if operating power is lost. |

| Mitigators | |
|---|---|
| **Part/Component** | **Performance Requirement** |
| Shear/Seal Valve | Must cut any tubing (excluding bottom hole assemblies) and anything run inside the tubing (e.g., electric-, wire-, and slick-line to be used in the well) run across the shearing ram. |
| Non-Sealing Rams | Must cut any tubing (excluding bottom hole assemblies) and anything run inside the tubing (e.g., electric-, wire-, and slick-line to be used in the well) run across the shearing ram. |