

The image features a large, intricate piece of blue industrial equipment, likely a subsea wellhead or intervention tool. It has a central vertical shaft with several horizontal arms extending outwards, each equipped with various mechanical components like valves and actuators. The background is a gradient of blue, suggesting an underwater environment. The text is positioned in the upper right quadrant.

# Texas Oil Tools

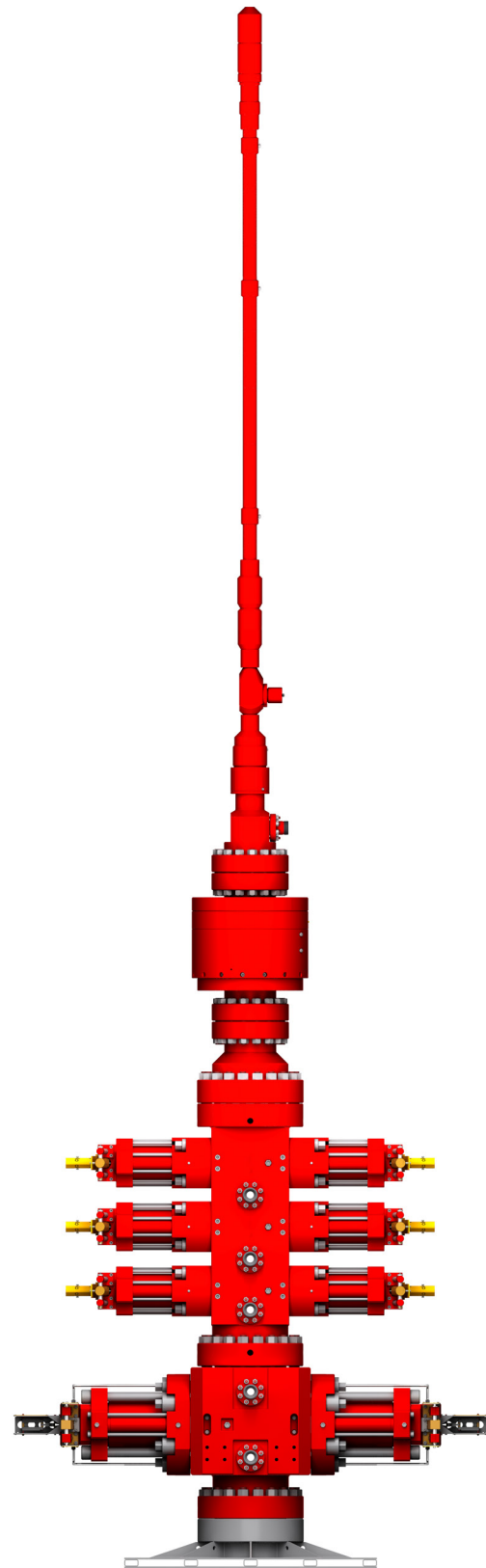
## Subsea Well Intervention Equipment



## Leading specialty manufacturers and suppliers of pressure control equipment

At NOV, we've come a long way in establishing ourselves as one of the leading specialty manufacturers and suppliers of pressure control equipment. While you respond to your industry challenges, we're working to develop new and more efficient solutions to your problems. Our subsea products are designed against the most stringent standards, for total control and safety during subsea well interventions in today's demanding global environment.

We understand just how important uptime is to overall success. That's why we built a state-of-the-art service and repair facility that can get your equipment back into the field as quickly as possible. From simple redress to full recertification, our proven track record of excellence in design, manufacturing and service will help you keep your operations running at maximum efficiency, 24/7.



Our subsea products can help you save time and money during subsea well interventions. In this configuration we have both an ET series single safety head and an EIA series triple wireline BOP. The safety head is a blind shear ram that meets the requirements of Norsok D002 for a safety head. The EIA triple BOP meets the requirements of ISO 13628-7 for a subsea well intervention BOP.

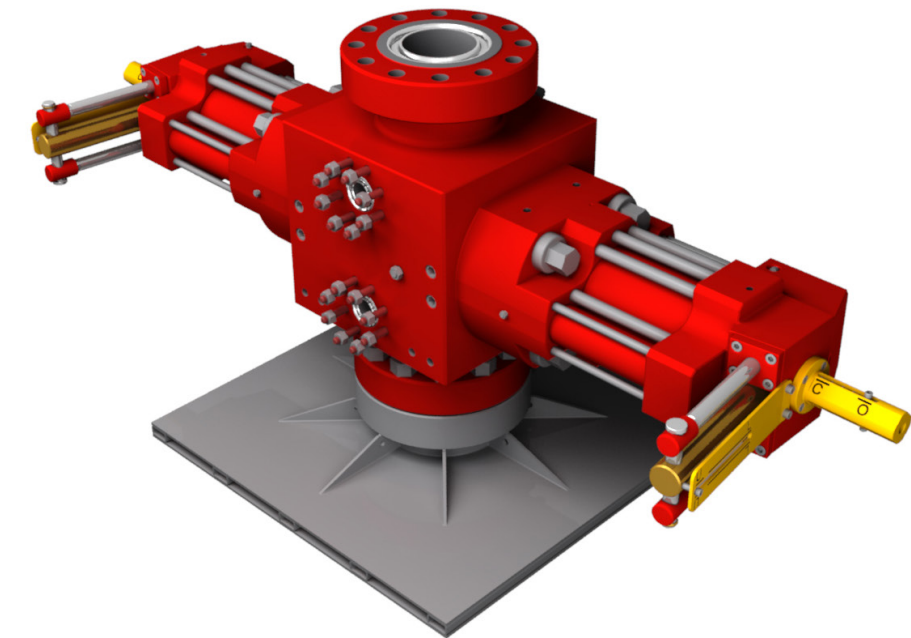
The subsea well intervention stack shown is used for riserless well intervention on an offshore well. This system has been used in major subsea markets including the Gulf of Mexico, North Sea, West Africa and Southeast Asia. The main benefit of a system such as this is to provide an economical method for wireline well intervention in subsea wells. The biggest savings is that a smaller vessel can be used to perform this well intervention.

**Applications**

- All riserless coiled tubing and wireline subsea well interventions
- Subsea (up to 10,000 feet in depth)
- Working pressure up to 15,000 psi
- -4°F to 300°F
- Explosive decompression resistant seals
- Currently developing subsea equipment to meet HPHT requirements

**Components of the Subsea Stack**

- Subsea wireline pack-off
- Subsea stripper packer
- Subsea wireline wiper assembly
- Subsea grease head with multiple flow tube assemblies
- Subsea head catcher with ball check assembly
- Subsea hydraulic quick latch assembly
- Subsea tooltrap
- Triple wireline BOP
- Single safety head BOP



The EIA actuators are well control components used during a subsea well intervention. There are two sets of rams: blind shear rams and grip seal rams. Blind shear rams are designed to cut the coiled tubing and/or wireline to form a blind seal. Grip seal rams are designed to grab, hold and seal around the coiled tubing. The EIA series BOP is an integral component of the lower wellhead riser package. It features a single line hydraulic system and an automatic, wedge-type, autolock actuator system. The autolock system secures the rams in the closed position in the event of a hydraulic failure or an emergency situation that requires disconnecting from the subsea wellhead.

Each EIA series BOP can be built to your specific design requirements, including a dual-bore valve block with a combination of blind shear and grip seal ram assemblies. The combi rams offer increased functionality and the ability to use a wide range of coiled tubing and wireline sizes in a field-proven, compact design. All pressure ratings and service applications are available, including certification for use in the North Sea.

**Features**

- SSR or GSR configuration for coil and wire
- 3,000 - 5,000 psi hydraulic operating pressure
- Single or dual circuit
- Hydraulic ram change (quick change rods)
- Metal-to-metal bonnet gaskets
- Hydraulic wedgelock
- Ram and wedgelock position indicators

**Tested Benefits**

- Hyperbaric tested to 10,000 ft
- Actuators and seals qualified from 32°F to 311°F

**Specifications: EIA**

Model	Bore	Working Pressure	Tubing Range
EIA56	5.12"	15,000 psi	1.25" to 3.50"
EIA74	7.06"	10,000 psi	1.25" to 3.50"
EIA74	7.38"	10,000 psi	1.25" to 3.50"

## Subsea Quick Latch

The subsea quick latch is a rugged connector designed for multiple subsea latch and unlatch connections. The latch can be stabbed at an angle due to the tapered design that guides the stinger into the connector and into the seal bore during the stab operation. The quick latch is hydraulically operated and uses a set of locking dogs to lock the two pieces of equipment together.

The locking dogs work independently and are not affected by the wellbore pressure. A spring mechanism holds the piston and tool in the locked position and is unaffected by water depth. A visual indicator and lock prevents the tool from accidentally opening during unintended loss of hydraulic pressure.

### Features

- Working pressure of 5,000, 10,000 and 15,000 psi
- Working temperature of -4°F to 250°F (with options for 300°F)
- Elastomer wellbore seals
- Bore sizes: 5.12", 7.06" and 7.375"
- Hydraulically operated
- Visual indicators
- Fail-safe closure

### Benefits

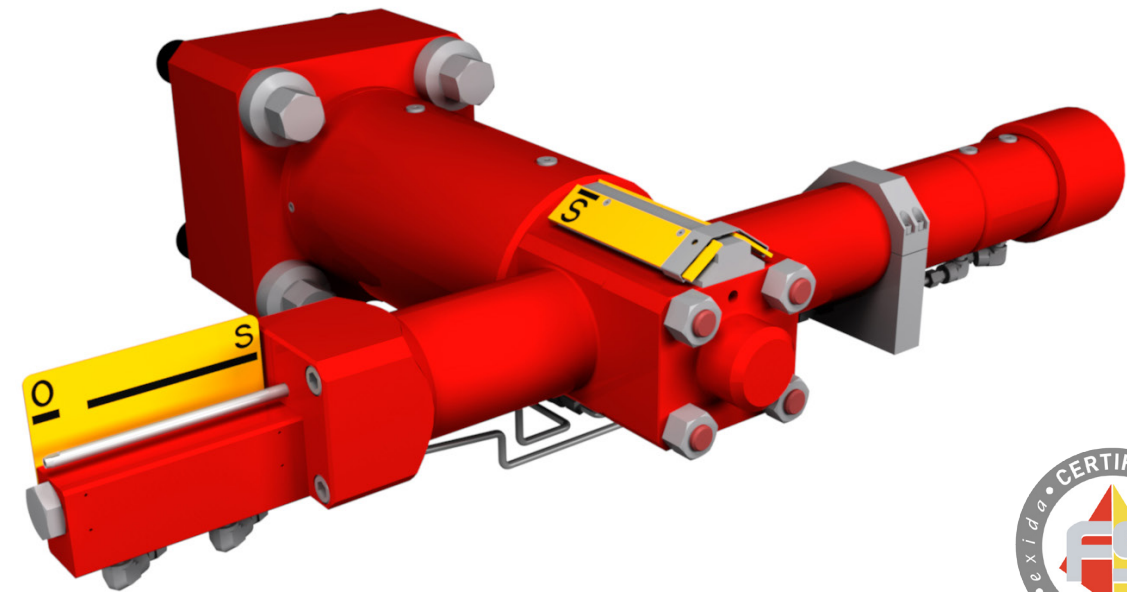
- Quick subsea installation
- Safe and reliable connection
- Allows multiple connections in subsea environment
- Provides a connection so that subsea wireline tools can be run into the well

### Options

- Metal-to-metal wellbore seals
- Manual locking mechanism
- Inconel inlay
- Rotational alignment



## Subsea Actuators (EI Series)



The EI series BOPs are well control components used during a subsea well intervention. There are two sets of rams: blind shear rams and grip seal rams. Blind shear rams are designed to cut the coiled tubing and/or wireline to form a blind seal. Grip seal rams are designed to grab, hold and seal around the coiled tubing. The EI series is an integral component of the lower wellhead riser package. The EI features a single line hydraulic system and an automatic, wedge-type, autolock actuator system. The autolock system secures the rams in the closed position in the event of a hydraulic failure or an emergency situation requires disconnecting from the subsea wellhead.

Each EI BOP can be built to your specific design requirements, including a dual-bore valve block with a combination of blind shear and grip seal ram assemblies. The combi rams offer increased functionality and the ability to use a wide range of coiled tubing and wireline sizes in a field-proven, compact design.

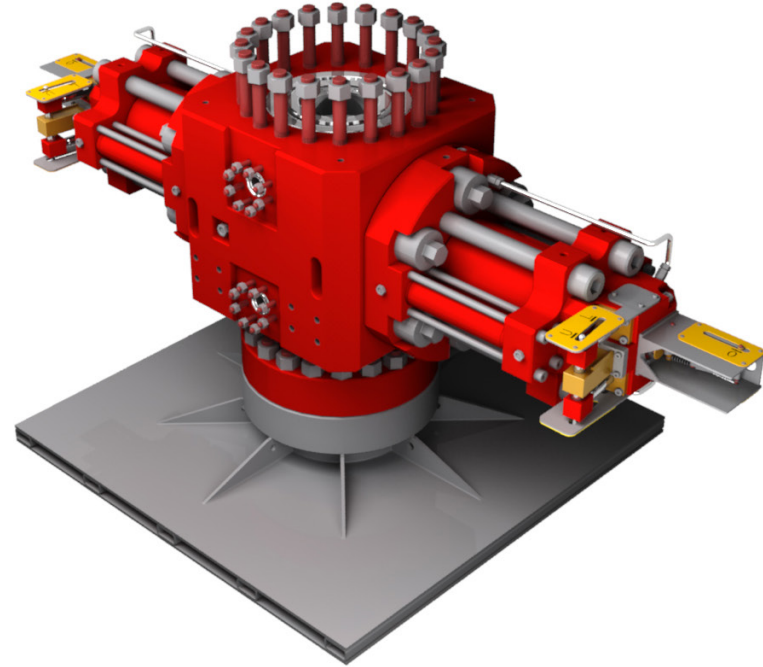
All pressure ratings and service applications are available, including certification for use in the North Sea.

### Features

- SSR or GSR configuration for coiled tubing or wireline operations
- 3,000 or 5,000 psi hydraulic operating pressure
- Single circuit design
- Metal-to-metal bonnet gaskets
- Hydraulic wedgelock
- Ram and wedgelock position indicators
- SIL 3 certified

### Specifications: Subsea BOP

Bore	Working Pressure	Tubing Range
3.06"	10,000 psi	1.00" to 1.75"
4.06"	10,000 psi	1.00" to 2.37"
5.12"	10,000 psi	1.00" to 2.87"
5.12"	15,000 psi	1.00" to 2.87"
6.38"	10,000 psi	1.00" to 3.50"
7.06"	10,000 psi	1.00" to 3.50"
7.06"	15,000 psi	1.00" to 3.50"
7.38"	10,000 psi	1.00" to 3.50"



The ET series safety head BOP is certified to API/ISO/NORSOK standards and is an integral component of the lower wellhead riser package. It features a single-line hydraulic system and an automatic, wedge-type, autolock actuator system. The autolock system secures the rams in the closed position in the event of a hydraulic failure or an emergency situation that requires disconnecting from the subsea wellhead. Each ET BOP is built to your specific design requirements and can include a single-bore valve block with a blind shear ram assembly. The shear rams offer increased functionality and the ability to use a wide range of coiled tubing and wireline sizes in a field proven, compact design. All pressure ratings and service applications are available, including certification for use in the North Sea.

**Specifications: Safety Head**

Model	Bore	Working Pressure	Tubing Range
ET76	7.06"	10/15,000 psi	NORSOK
ET7C	7.37"	10/15,000 psi	NORSOK

**Features**

- Multi-shear blind ram 10,000 psi or 15,000 psi working pressure
- Hydraulic ram change
- Metal-to-metal bonnet gaskets
- Hydraulic wedgelock
- Ram and wedgelock position indicators
- Subsea safety head blind shear rams meeting shear requirements of NORSOK D002 for a safety head

**NORSOK Shear Tests**

- 0.108" slickline without tension, 1 strand
- 0.108" slickline, 10 strands
- 0.438" cable without tension
- 0.438" 5 core cables without tension, 10 strands
- 1.25", 0.109" wall coiled tubing, 10 strands
- 3 parallel strings of heavy wall 1.5", 1.75" and 2.0" coiled tubing with 7/16" cable inside
- 2.0" sinker bar, ans 4230 steel
- 3.5" drill pipe S-135, 226.2 N/m (15.5 lb/ft)
- 4" tubing 13 chrome I-80
- 4.5" perforating gun
- 4.5" 184.0 N/m (12.6 lb/ft) tubing
- 4 7/8" gravel pack screen with 2 3/8" wash pipe inside

The DZA4 subsea modular three window stripper packer is designed to pack-off on coiled tubing as it is stripped in and out of the well at working pressures up to 10,000 psi. This design provides three independent hydraulically actuated packers within the same body, allowing you to utilize one packer while the others are held in reserve. When the first packer is unable to effect a seal, the second packer is actuated. Once the second cannot effect a seal, the third packer is actuated.

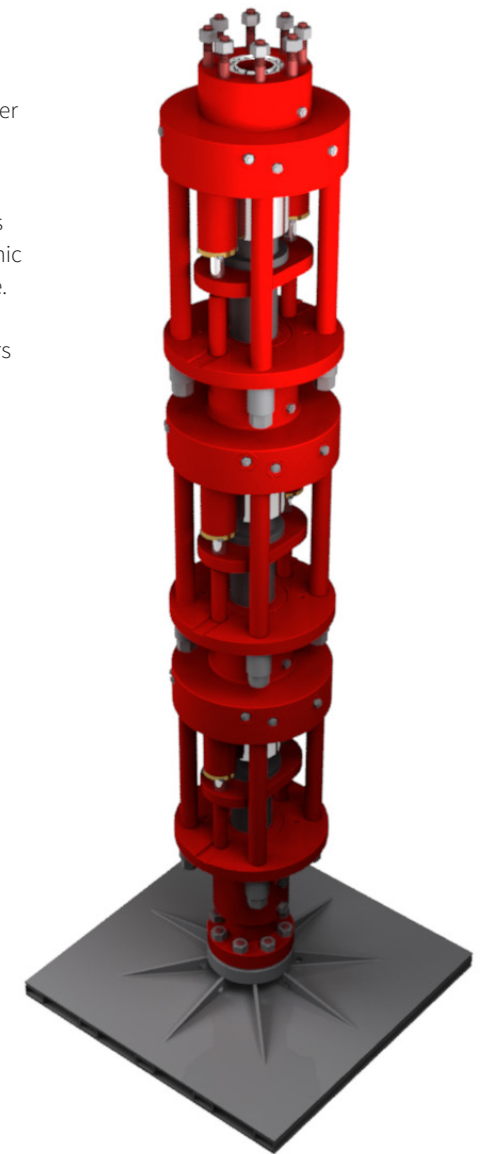
This effectively triples the time between packer changes and is particularly advantageous when changing packers with tubing in the well. The stripper is designed to create a dynamic seal around the work string while maintaining 10,000 psi full differential wellbore pressure. With the appropriate packing element and bushings, the stripper will be compatible with pipe sizes ranging from 1" to 2 7/8". With our unique modular design, any additional packers can be easily added into the stack.

**Features**

- Triple packer arrangement
- Extended life packers
- CRA materials for dynamic and static sealing areas
- CRA hydraulic ports
- Rated for 10,000 ft water depth
- Expanded access for packer replacement

**Qualifications**

- API PR2 Qualification
- API hyperbaric tested to 10,000 ft water depth





We have developed a 6,000 square foot state-of-the-art high-pressure, high-temperature test facility. This engineering lab (E-Lab) is capable of providing large-sample testing (20 tons) at high-pressure and temperatures safely within its subsurface vault. The vault measures 12' wide x 35' long x 12' deep and features electric-operated armor steel covers as a barrier. Along with the armored covers, the vault features remote explosion-proof cameras, which enable real-time monitoring of samples during testing, as well as the capability to be flooded entirely with water. It also includes multiple umbilical feed-thru ports to allow for use with a wide range of control and data cable interfaces.

Current subzero testing capability includes the use of a 100-ton chiller unit utilized to flow water-based glycol mixtures/solutions for use in reduced temperature testing down to -30°F in complete submersion of the test sample.

Our high-temperature testing capability is a "through sample capable" flow system utilizing a 35Kw heat skid capable of flowing hot oil to maximum 450°F (media dependent). High-pressure testing capabilities are currently at 45,000 psi hydrostatic testing and 30,000 psi nitrogen gas. Hydraulic control systems up to 10,000 psi can be operated through our standard control panel. We also have a 40-gallon accumulator system rated to 5,000 psi used in timed shearing operations, ram cycle fatigue testing and more.

All data is recorded via digital data acquisition systems that are capable of capturing up to 30 channels of equipment performance in both pressure and temperature parameters. Our above ground, free standing, 10 ft x 10 ft test bay is used to conduct hydraulic function testing and hydrostatic testing up to 30,000 psi.



**Capabilities**

- 12 ft wide x 35 ft long x 12 ft deep
- 45,000 psi hydrostatic high-pressure
- 30,000 psi nitrogen gas high-pressure
- -30°F to 450°F (media dependant) temperature range
- 3,000 psi to 10,000 psi hydraulic control
- Digital data acquisition, 30 channels simultaneous, pressure/temperature data recording
- 20-ton lifting capacity



Our state-of-the-art service and repair facilities were created solely to support world-class repair and maintenance services.

**Service and Repair**

Our service and repair department provides everything from simple redress to full recertification for our customers. This department has provided a direct link to our customers for technical support to the field.

With increasingly stringent industry standards on the documentation and recertification of well control equipment, service companies have had to change their approach on product maintenance and recertification. In response to these changes, we have allocated additional resources to our service and repair department.

**Training**

As part of our commitment to provide a safe and reliable workforce, we offer an array of training programs throughout the year covering all types of well intervention and stimulation equipment. Along with these scheduled courses, we partner with our customers to integrate training packages and equipment tailored to fit your needs.

Whether you are looking to gain knowledge on your equipment's functionality or improve the safety of your operations, our goal is to ensure that you leave the course with the confidence and skills to keep even the most demanding jobsites running at maximum efficiency, 24/7.

**Parts**

The life cycle of your equipment is important to us. To ensure your critical parts are on hand when you need them, our global facilities are continuously replenishing inventory while providing 24/7 technical support. With our deep knowledge of your processes, we will meet your demand like no other supplier.

We provide genuine OEM-supplied parts that preserve the integrity of your asset. Made of the same high-quality material as the original equipment, our 100% OEM spare parts are designed to fit your needs with every delivery. We offer a true collaboration that helps improve your jobsite's performance, reliability and safety in no time.

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