

WELL SERVICES

# THRU-TUBING WELL REJUVENATION SOLUTIONS

Revive wells at a fraction of the  
cost of workovers



**Weatherford**<sup>®</sup>

# REVOLUTIONARY APPROACH TO WELLBORE REJUVENATION

Weatherford's Renaissance system of safety valves offers a revival for troubled wells—expanding horizons for a productive well life and building a bridge for more profitable reservoir management.

The Renaissance safety-valve system originated from Weatherford's Optimax™ valve technology—proven to be the toughest valves in the industry. The Renaissance system combines recent advances in valve technology with patent-pending new technology, providing an integrated, single-source approach to renew wells suffering from four types of safety-valve-related problems:

## DAMAGED CONTROL LINES

Control lines for subsurface safety valves (SSSVs) could leak, break or plug up, closing the valve and shutting in production. In the past, the only way to remedy this situation in offshore workovers was to pull the tubing, an expensive operation. The Renaissance **WDCL (Weatherford damaged control line)** safety valve can restore safe operation and bring the well back on line without a workover—significantly reducing costs. The Renaissance WDCL also can be used to retrofit safety valves on wells that currently do not have safety valves—thus meeting new environmental standards at a significantly reduced cost.

## DAMAGE TO SAFETY-VALVE LANDING NIPPLES OR SEALBORES

Installing a new wireline SSSV can be impossible if the sealbore of the safety-valve landing nipple has been gouged or grooved, preventing the new valve from sealing. Today, the Renaissance **WDB (Weatherford damaged bore)** safety valve provides a simple fix without a workover.

## APPLICATION OF PRODUCTION-ENHANCING CHEMICALS

Production-enhancing chemicals can solve problems, such as liquid loading, salt and mineral buildup, and corrosion. However, until now the only way to get chemicals into a well with a surface-controlled safety valve was to pull and replace existing tubing. The Renaissance **WCS (Weatherford capillary system)** safety valve offers a retrofit solution that provides a capillary-injection system and a surface-controlled safety valve without a workover.

## COMBINE PLUNGER-LIFT TECHNOLOGY WITH A WIRELINE-RETRIEVABLE SAFETY VALVE

When foamers and surfactants are ineffective, the SafetyLift™ system offers efficient and commonly used plunger-lift technology coupled with a wireline-retrievable safety valve. Energy generated by the well is used to lift the fluids and mitigate liquid-loading issues, making the SafetyLift system an ideal solution for offshore applications.

## RETROFITTING FOR RESERVOIR RECOVERY

The Renaissance system of safety valves is engineered for optimal, reliable performance, providing a **custom-fit solution for each well**. In addition, each valve offers the benefits of simplicity, safety, cost reduction and overall extended reservoir recovery.



### ELIMINATES WORKOVERS

Components of the Renaissance system work together faultlessly to provide customized solutions to reduce the need for costly workovers. Depending on the location, the cost of a workover can exceed US\$10 million.

### EXTENDS RESERVOIR PROFITABILITY BY EXTENDING RECOVERABLE LIFE

The Renaissance system:

- Solves well safety-valve problems that could otherwise force the well to be plugged and abandoned. Even better, the Renaissance system's retrofit solutions can often be installed in a day.
- Installs SSSVs easily in wells that do not have SSSVs, thus meeting environmental requirements and enabling old wells to stay in production.
- Makes it possible to install a capillary chemical-injection line in a well with a safety valve without pulling the tubing. Gas wells in particular can be unloaded and kept producing by foamers injected downhole.
- Can add safety shut-in systems without a workover operation to wells where government regulations now require safety valves be installed. A situation that historically meant that wells would either be pulled or abandoned.
- Allows the combination of plunger lift and safety valve.

### ENSURES OPTIMAL PRODUCTION

When compared to standard wireline valves with concentric pistons, the new technology used by the Renaissance system has a larger standard flow area—resulting in a minimal reduction in flow area compared to standard wireline valves.

### WITHSTANDS CORROSIVE ENVIRONMENTS

Renaissance valves are based on the Weatherford Optimax™ series of valves that have the best reliability record in the industry. Features of Optimax and Renaissance valves include:

- Flapper soft-seal provides excellent heat and chemical resistance for a reliable low-pressure seal.
- Valves use field-proven, metal-to-metal, through-the-flapper equalizing technology for ultimate durability and reliability to protect persons, property and the environment.
- The temperature rating of the valve is 300°F (149°C) and is rated to 5,000 psi (34 MPa) with a burst pressure of 7,500 psi (52 MPa).

### SIMPLE INSTALLATION AND RETRIEVAL

Renaissance systems can be installed by standard wireline and capillary string units (WDB requires wireline only). Weatherford offers a small-footprint, skid-mounted, cap-string/slickline unit engineered for 1/4- and 3/8-in. strings, keeping installation fast and inexpensive. The unit's design allows for small platform cranes to make required lifts without the need for additional crane capacity. Weatherford is the only service company that has the capability to use the smaller lifting capacity—differentiating us from all others.

### AVAILABLE FROM A SINGLE SOURCE

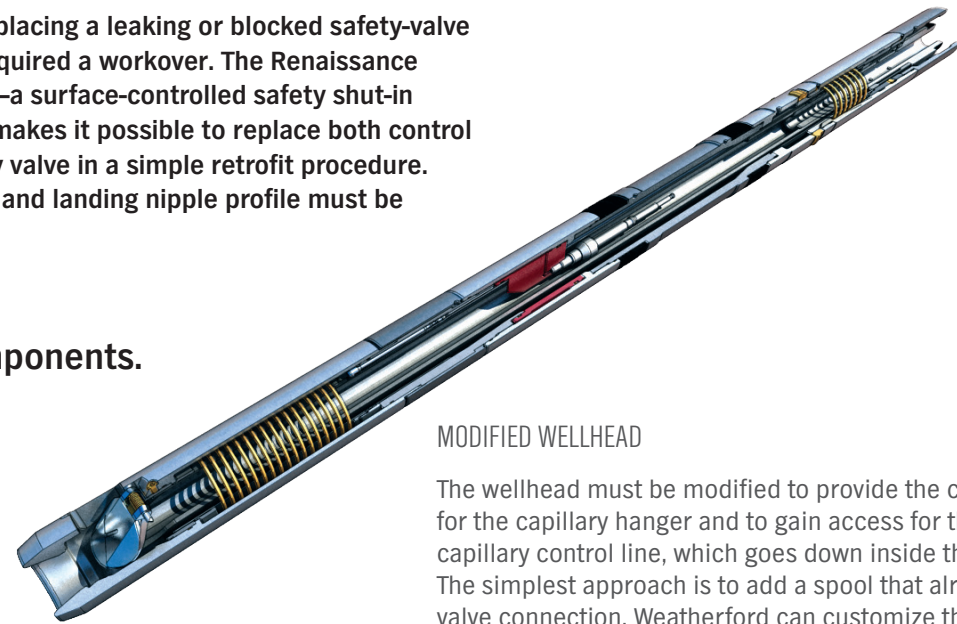
The Renaissance system is fully integrated, and Weatherford offers everything related to the system—wellheads, capillary systems, safety systems, wireline and chemicals—parts and installation. We are the only company that offers all these comprehensive services—a true single-source provider.



## RENAISSANCE WDCL VALVE

In the past, replacing a leaking or blocked safety-valve control line required a workover. The Renaissance WDCL system—a surface-controlled safety shut-in system—now makes it possible to replace both control line and safety valve in a simple retrofit procedure. The sealbores and landing nipple profile must be undamaged.

### WDCL components.

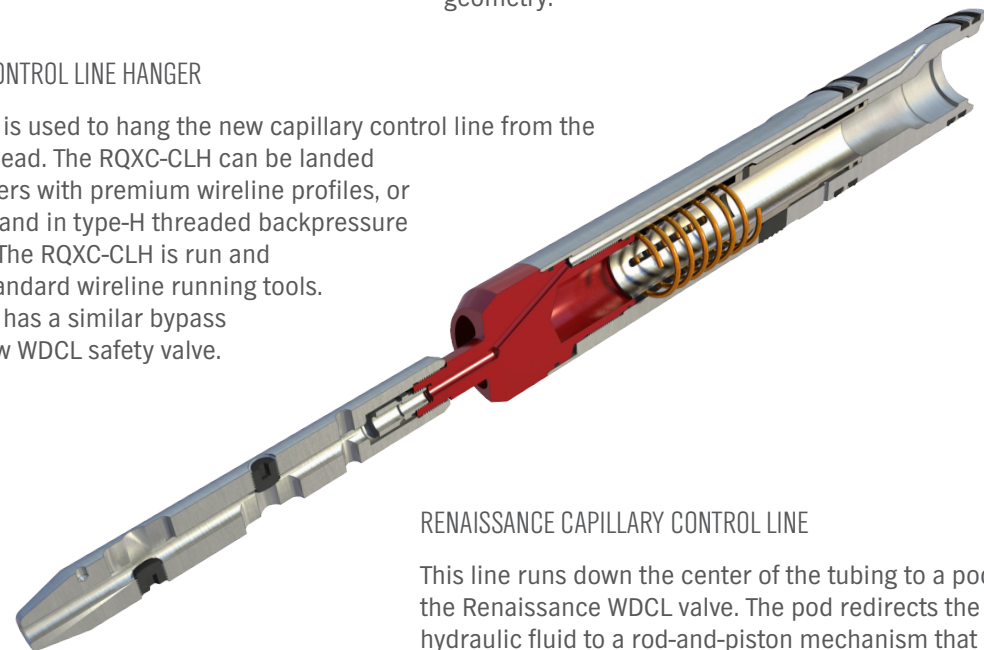


MODIFIED WELLHEAD

The wellhead must be modified to provide the correct profile for the capillary hanger and to gain access for the new capillary control line, which goes down inside the tubing. The simplest approach is to add a spool that already has the valve connection. Weatherford can customize the penetration when well bay and flowline constraints dictate. Weatherford has developed a new wellhead penetration REN GATE™ system that is installed in situ without changing the original wellhead geometry.

### RENAISSANCE CONTROL LINE HANGER

The RQXC-CLH is used to hang the new capillary control line from the modified wellhead. The RQXC-CLH can be landed in tubing hangers with premium wireline profiles, or configured to land in type-H threaded backpressure valve profiles. The RQXC-CLH is run and landed with standard wireline running tools. The RQXC-CLH has a similar bypass area as the new WDCL safety valve.



RENAISSANCE CAPILLARY CONTROL LINE

This line runs down the center of the tubing to a pod on the Renaissance WDCL valve. The pod redirects the flow of hydraulic fluid to a rod-and-piston mechanism that activates the safety valve. The capillary sizes are 1/4 or 3/8 in. for all standard metallurgies and wall thicknesses.

### RENAISSANCE STINGER

At the end of the capillary line is a weighted and centralized stinger with the female end of a unique Weatherford wet-connect that will join the capillary to the mating connection in the pod attached to the valve. The wet-connect is unique: it can be mated and unmated, so the capillary can be removed if necessary, and it is hydraulically locked in place when pressure is applied to the capillary string.

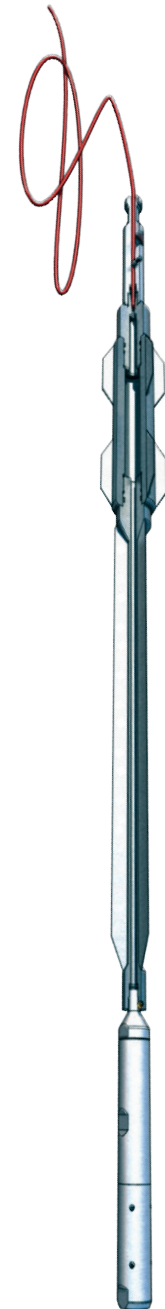
Design of the wet-connect eliminates the complications and additional leak paths that a hydraulically operated latch would create. The stinger also features dual-back check valves that prevent backflow through the capillary line, a key safety feature.

### RENAISSANCE WDCL POD

This special WDCL device contains the male end of the wet-connect, and it reroutes the flow of hydraulic fluid from the centralized capillary sting to a flow path within the outer perimeter of the valve.

### RENAISSANCE WDCL SSSV

Based on the advanced technology of Weatherford's Optimax™ safety valves, the new Renaissance SSSV is engineered to land in the safety-valve landing nipple from a previous wireline valve, or to land inside an existing tubing-mounted safety valve. This design, combined with the rod-piston actuated flapper valve, maintains 80 percent of the maximum flow area of conventional wireline retrievable valves that are currently on the market.



## WDCL RUNNING SEQUENCE

Using the REN GATE™ wellhead modification, the Renaissance WDCL can usually be installed in a day.

Installation includes:

- Retrieve existing wireline safety valve or lock open existing tubing valve (no communication needed)
- Block existing control line
- Install required barriers in tubing
- Modify to REN GATE wellhead
- Retrieve barriers
- Run WDCL safety valve
- Run and space out capillary string
- Run capillary string with cap-string hanger
- Land cap-string hanger and wet mate
- Test WDCL safety valve and bring well on line



## WDB VALVE

The Renaissance WDB is engineered to seal a replacement safety valve in place when the sealbore or landing nipple has been damaged to a degree that traditional solutions will not work or oversized packing will not seal it. In the past, there were two ways to resolve the problem:

- Pull the tubing and replace it, which is not cost effective; or
- Use two retrievable packers to straddle the damaged sealbores and a ported sub to provide control fluid access to the safety valve, an expensive and complex solution.

### How it works

The secret to the WDB is a unique activated packing system:

#### Renaissance activating pistons

Pistons located above and below each set of packing energizes the packing stacks and causes them to expand into the damaged sealbore, forming a pressure-tight seal.

#### Soft (low-durometer) seals

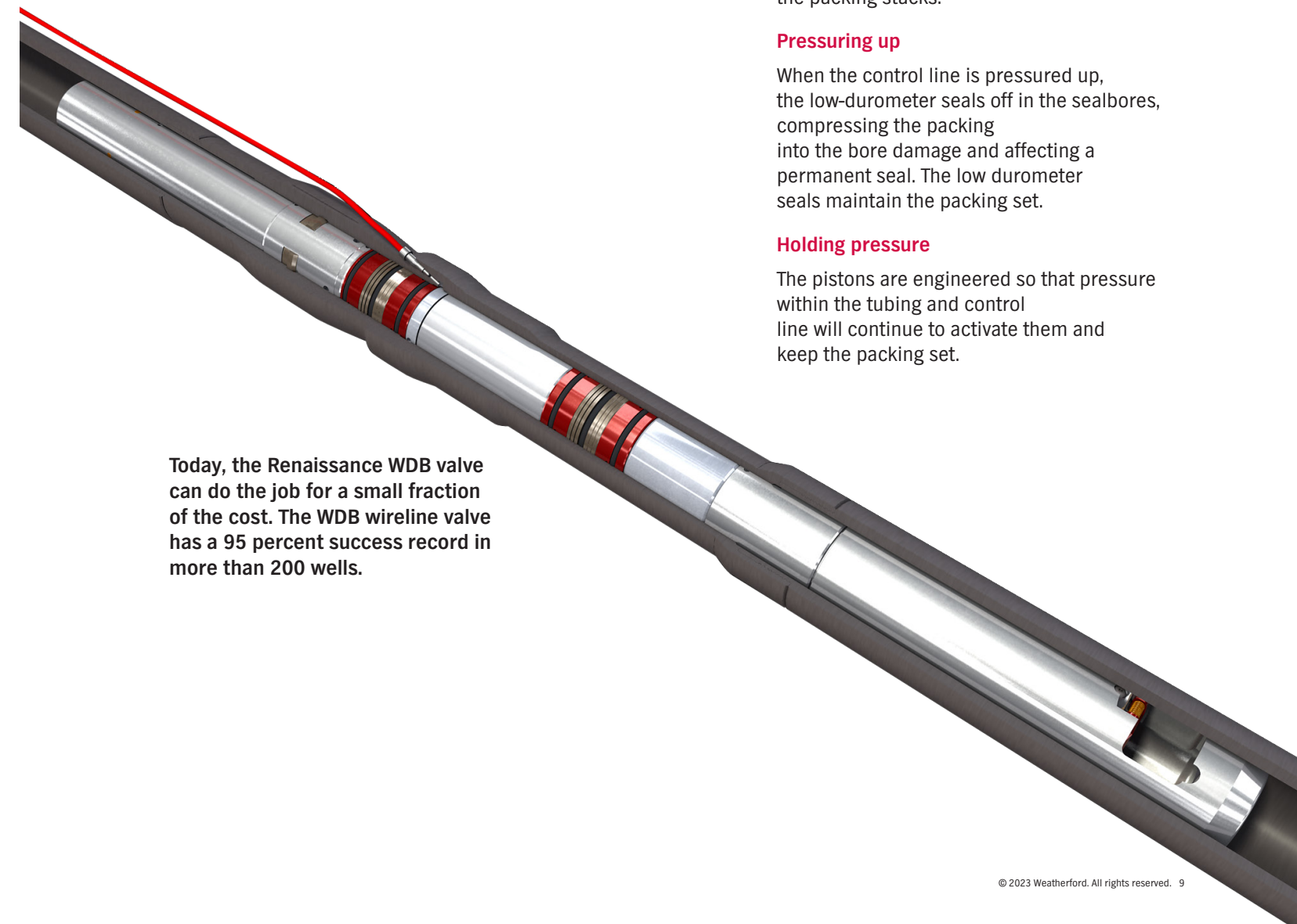
Low-durometer seals are mounted on the activating pistons to form an initial seal and enable the pistons to energize the packing stacks.

#### Pressuring up

When the control line is pressured up, the low-durometer seals off in the sealbores, compressing the packing into the bore damage and affecting a permanent seal. The low durometer seals maintain the packing set.

#### Holding pressure

The pistons are engineered so that pressure within the tubing and control line will continue to activate them and keep the packing set.



Today, the Renaissance WDB valve can do the job for a small fraction of the cost. The WDB wireline valve has a 95 percent success record in more than 200 wells.

## WidePak™ Deep Gas Lift System (DGL)

Delivers gas lift regardless of completion packer setting depth

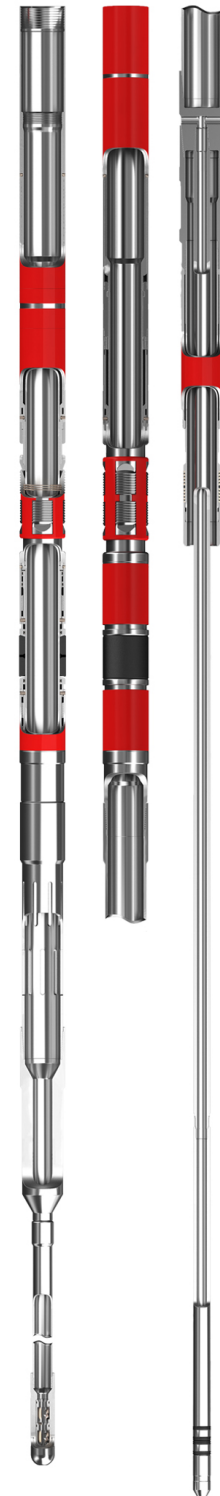
The Weatherford WidePak DGL system enables lift gas to be pumped deeper into the well to boost production. Set across an existing gas lift mandrel, it can be used to straddle a punched hole within a completion to allow a well to be converted to gas lift without the need to perform a workover on the well. It consists of a lower WidePak packer with slotted joint and polished bore receptacle (PBR).

### Applications

- Extending the reach of lift gas deep beyond the setting depth of the completion packer
- Converting well to gas lift without need of a rig workover

### Features and Benefits

- Enables deeper gas injection than is conventionally possible, delivering lift gas closer to the perforations for increased production and extended life of the well
- Coiled tubing installation makes this a rigless solution that helps lower operational costs
- Optimized flow areas reduce back pressure for increased production
- Tested in accordance with ISO 14310 V0 standards for regulatory compliance in gas wells
- Fully retrievable design enables future interventions



## Inverse Gas Lift System (IGLS)

Facilitates gas lift installation in wells not previously configured for such systems

The inverse gas lift system uses an insert string for gas injection, while production is routed through the annulus between the insert string and the existing completion. The IGLS installation does not rely on annular integrity, and the gas can be injected at any depth in the well. The system can be supplied in several configurations, materials, and sizes to suit different applications. It is installed using traditional intervention techniques and does not require a rig or workover, making it a cost-effective option to other interventions.

### Applications

- Extending the economic life of wells
- Installing gas lift when annular integrity issues prevent gas injection via casing
- Providing gas injection below the production packer

### Features and Benefits

- Compatible with industry standard tools
- Tree replacement is not necessary and the system imposes only minimal topside modification
- A calibrated pump-out plug facilitates pressure testing of potential leak paths in the upper completion
- A shear-able centralizer on the seal stinger provides positive space-out verification
- The dual-flow hanger features a low-stress slip system, which is suited to mature wellbores
- Metal-to-metal seals on the dual flow safety valve are qualified to API 14A standards



## Combi Subsurface Safety Valve

Facilitates installation of a chemical injection system without a workover

The Weatherford Combi subsurface safety valve is part of the Renaissance® family of valves for reviving problem wells. This valve provides the functionality of the WCS Opti-Chem™ chemical-injection safety-valve system, enabling operators to actuate the safety valve and chemical-injection system through an existing control line. The Combi subsurface safety valve is installed riglessly to establish chemical injection in wells with damaged control lines or in wells not originally designed for chemical injection.

### Applications

- Wells experiencing production problems such as liquid loading, H2S and CO2 production, or corrosion, wax, or scale deposition
- Wells requiring chemical injection, not originally designed to accommodate injection systems

### Features and Benefits

- Enables chemical flow between the surface and the surface safety valve (SSV) through the existing control line
- Fluids used for chemical injection also operate the safety valve.
- Installation does not require alteration of emergency shutdown (ESD) procedures or alteration of the ESD control panel
- Insert safety valve is compliant with API 14A specifications for subsurface safety valve
- Riglessly installed to restore production to mature, end-stage wells whose production lifetime would not justify the cost of a workover



## WellConnect™ Chemical-Delivery System

Allows chemical or hydraulic fluids into wellbore without tree modification

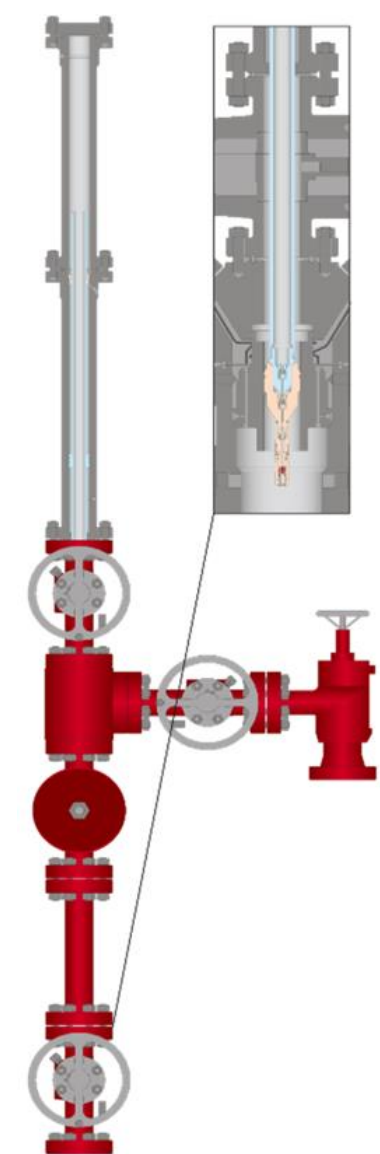
The Weatherford WellConnect chemical-delivery system is an ISO BA validated system that connects directly to the wellhead for simplified fluid injections without tree modification. The system provides a simplified means for wellhead fluid injections, added efficiency, and OPEX savings. WellConnect is established without plugging the tubing for easy installation of new control lines inside the tubing. The system is ideal for replacing safety valves that have a burst or blocked control line to the existing TRSSV (tubing-retrievable subsurface safety valve).

### Applications

- Chemical and hydraulic-fluid injections
- WDCL (Weatherford damage control line) and valve systems
- WCS (Weatherford capillary systems)
- Control-line installations
- Retrofitting chemical injections
- Onshore and offshore wells

### Features and Benefits

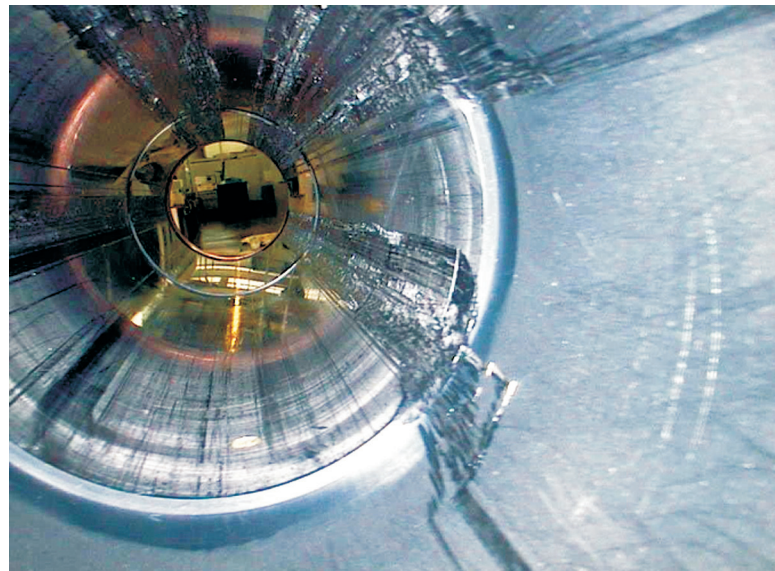
- WCS adaptability provides access without a tree or lower master valve modification
- Large bore provides optimized flow area for maximized production
- Nonobstructive converter allows injections without penetrations
- Bolt-on device adds simplicity
- Universal design prevents tree removal



## PROOF: WDB SSSV SUCCESS

To simulate the damaged nipple in actual completions, Weatherford took a 3.813-in. (96.85-mm) nipple and damaged it with the following longitudinal scratches inside:

- One set of four grooves of 0.0059 in. (0.15 mm) deep
- One gouge 0.0197 in. (0.50 mm) deep by 0.5118 in. (13 mm) wide
- One gouge 0.0256 in. (0.65 mm) deep by 0.5905 in. (15 mm) wide
- One gouge 0.0315 in. (0.80 mm) deep by 0.6299 in. (16 mm) wide
- One gouge 0.0394 in. (1.00 mm) deep by 0.7087 in. (18 mm) wide



After running a standard valve inside the damaged nipple, Weatherford could not prevent the hydraulic oil from leaking.



Installation of a Renaissance WDB SSSV solved the problem. Even with such severe sealbore damage, the valve held 6,500 psi (44.8 MPa) in the control-line pressure and 7,000 psi (48.3 MPa) (nitrogen) in the tubing.

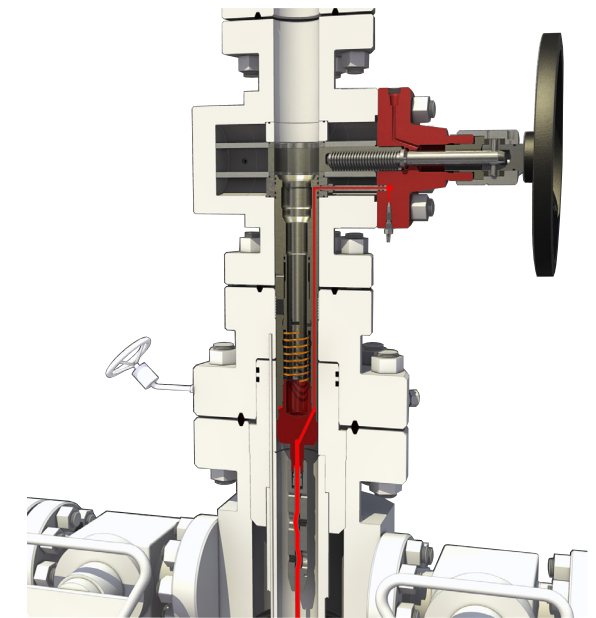
## WCS OPTI-CHEM™ SYSTEM

The Renaissance system now makes it possible to add chemical injection to a well while maintaining surface safety-valve control—without the need for a workover if the sealbores, landing-nipple profiles and original control line are undamaged.

### WCS components

#### Modified wellhead

The wellhead must be modified to gain access for the new capillary line and to provide the correct profile for the capillary hanger. The simplest approach is to add a spool that already has the valve connection. Weatherford has developed a new wellhead penetration REN GATE system that is installed in situ without changing the original wellhead geometry. In addition, Weatherford customizes wellheads when wellhead configuration or size is constrained.



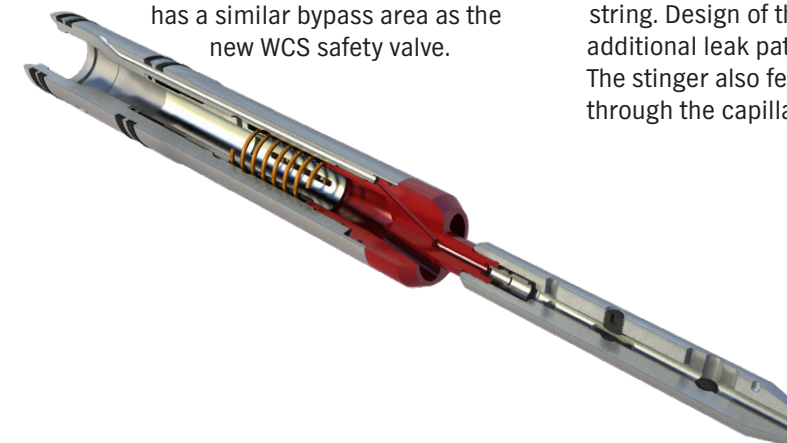
The REN GATE™ modified wellhead with capillary hanger in place.

#### Renaissance control line hanger

The RQXC-CLH is used to hang the new capillary control line from the modified wellhead. The RQXC-CLH can be landed in tubing hangers with premium wireline profiles, or configured to land in type-H threaded backpressure valve profiles. The RQXC-CLH is run and landed with standard wireline running tools. The RQXC-CLH has a similar bypass area as the new WCS safety valve.

#### Renaissance stinger

At the end of the capillary line is a centralized stinger with a unique Weatherford wet-connect that joins the capillary to the mating connection in the pod. The wet-connect is unique: it can be both mated and unmated, so the capillary can be removed if necessary; and it is hydraulically locked in place when pressure is applied to the capillary string. Design of the wet-connect eliminates the complications and additional leak paths that a hydraulically operated latch would create. The stinger also features dual-back check valves that prevent backflow through the capillary line, a key safety feature.



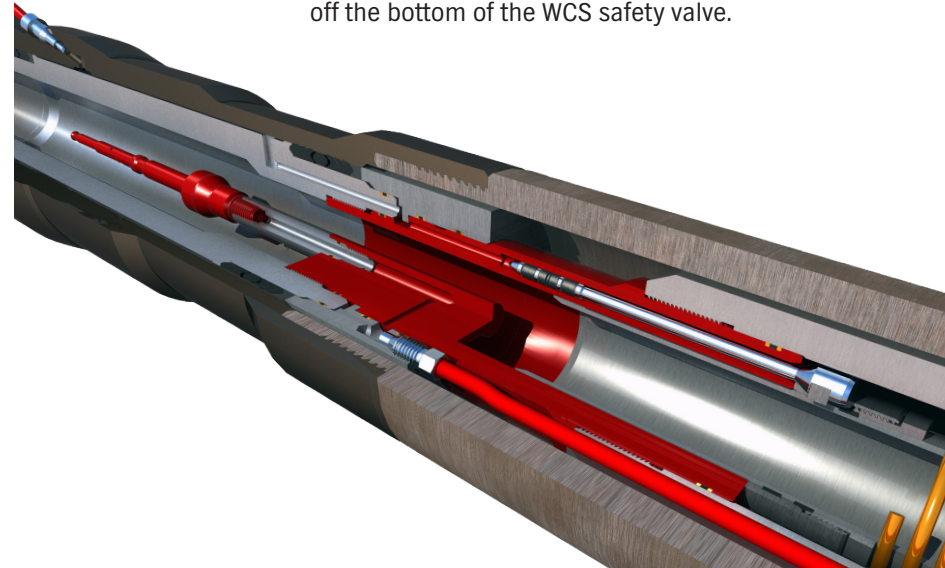
#### Renaissance capillary

This line runs down the center of the tubing to a pod on the Renaissance WCS. This pod directs the flow of chemicals through the valve to the injection line below. The capillary sizes are 1/4, 3/8 or 1/2 in.



**Renaissance WCS POD**

The WCS POD is an integral part of the WCS safety valve. The POD mates with the upper capillary tubing via the control-line stinger and directs the flow of fluids through the WCS bypass to the capillary tubing suspended off the bottom of the WCS safety valve.



**Original safety valve, locked open**

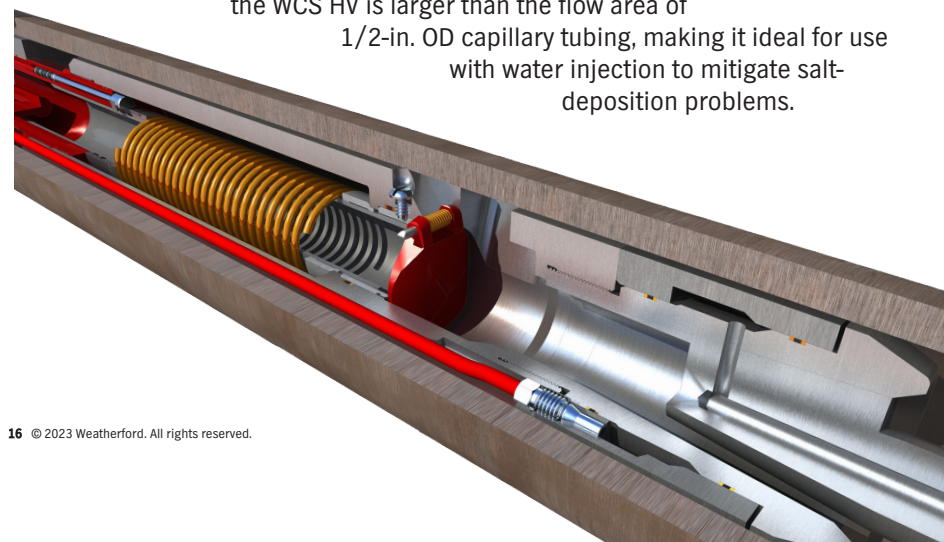
The original safety valve remains and is locked open. A new path is created between the original control line and the Renaissance valve inside the original valve.

**Renaissance WCS Opti-Chem™ SSSV**

Based on the advanced technology of Weatherford's Optimax™ safety valves, the new Renaissance WCS SSSV is engineered to mount inside an existing safety-valve landing nipple or tubing-mounted safety valve. This direct-mount design maintains the maximum possible flow area.

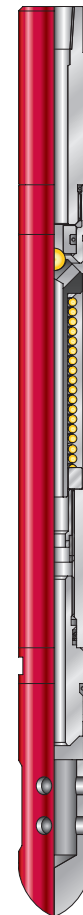
**High-volume water injection**

Weatherford's unique WCS-HV tool provides the ability to pump large volumes of fluid around the WCS safety valve. The bypass area through the WCS HV is larger than the flow area of 1/2-in. OD capillary tubing, making it ideal for use with water injection to mitigate salt-deposition problems.



**Capillary-injection valve**

Run at the very bottom of the chemical injection capillary line, Weatherford's CCI-1 chemical injection valve is a proven injection system for the toughest environments. The capillary-injection valve enables precise chemical-injection volumes and prevents chemical siphoning.

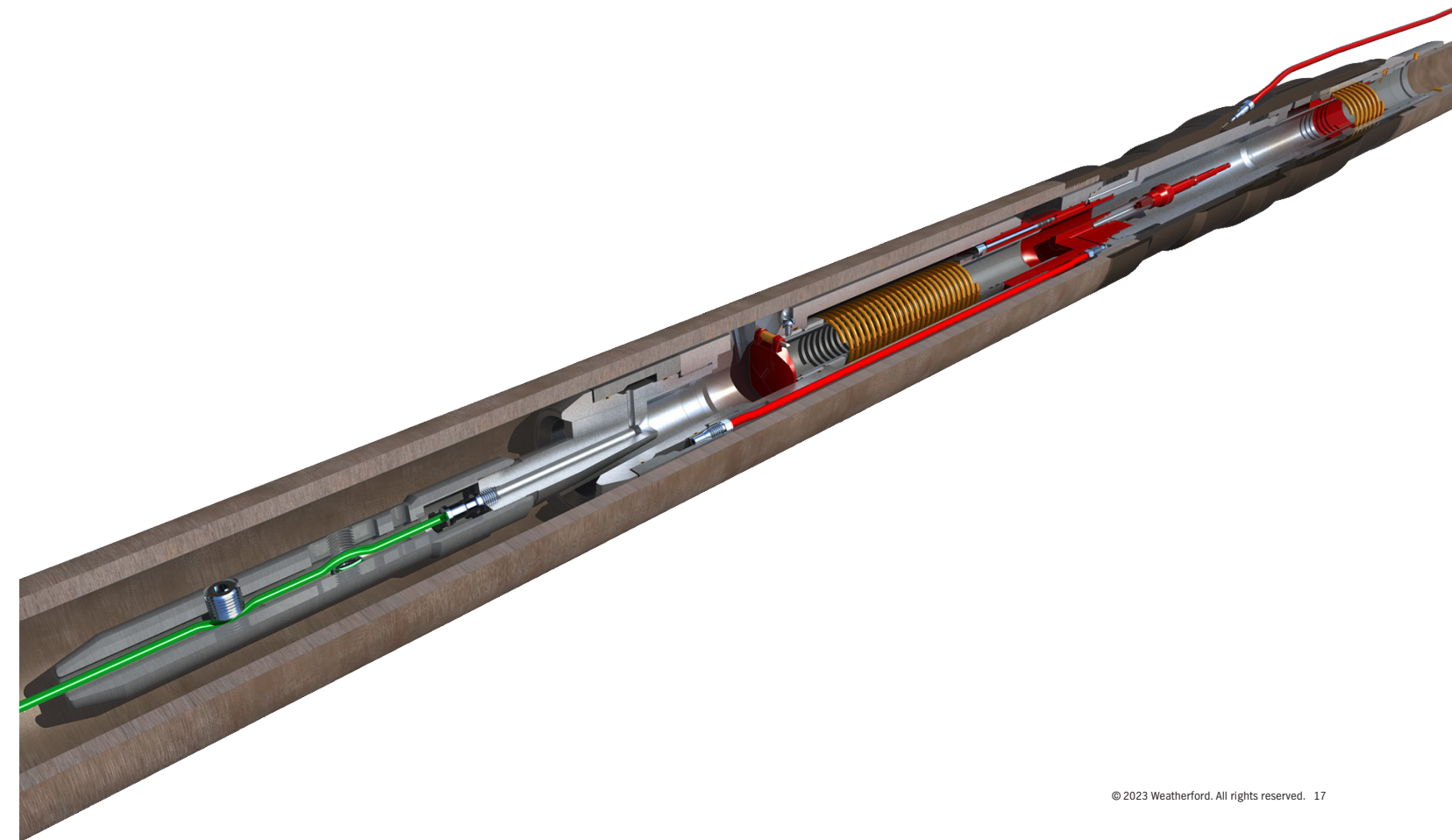


**WCS RUNNING SEQUENCE**

Using the REN GATE™ wellhead modification, the Renaissance WCS can typically be installed in a day.

Installation includes:

- Retrieve existing wireline safety valve or lock open and communicate existing tubing-mounted safety valve
- Install required barriers in tubing
- Modify wellhead with REN GATE conversion
- Retrieve barriers
- Run chemical injection valve and lower capillary string
- Install WCS safety valve on top of lower capillary string
- Land and lock in WCS and lower capillary string
- Test safety valve through original control line
- Run and space out upper capillary string
- Run upper capillary string with cap-string hanger
- Land cap-string hanger and wet mate
- Conduct chemical injection tests and bring well on line



## RENAISSANCE SAFETYLIFT™ PLUNGER-LIFT SYSTEM

Another revitalizing innovation from Weatherford is the SafetyLift plunger-lift system, which enables plunger-lift operations in wells that have SSSVs. The SafetyLift system mitigates the tubing ID restriction of SSSVs and enables effective deliquification, reduces operational costs and ultimately increases reservoir recovery.

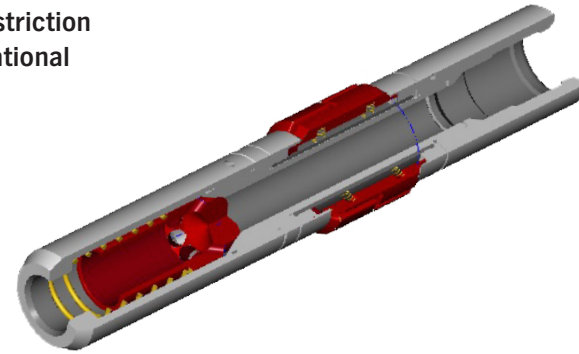
### Applying the technology

Current plunger technology is used efficiently worldwide to unload liquid-loading gas wells by cycling a plunger the entire length of the production tubing to remove accumulated liquids. When a well is completed with a safety valve, conventional plunger lift is no longer applicable because of the ID restriction associated with the SSSV.

In many applications, the SSSV is located within a few hundred feet of the surface. The SafetyLift plunger travels the length of the production tubing between the end of the tubing to just under the SSSV. Through gas expansion and velocity, the fluid is lifted the remaining distance out of the wellbore. Fluid not removed during the initial plunger arrival is trapped by an MP-1 pump-through standing valve threaded directly onto the bottom of the SSSV.

This fluid will be delivered during the initial high-rate gas of the next cycle.

In offshore applications where the SSSV is set deeper in the well, a second bumper spring can be installed above the SSSV, enabling plunger-lift operations from the top of the SSSV to surface.



### Major Benefits

- No changes to wellhead configuration
- Complete installation occurs on slickline with one day of operation
- Plunger operation not impacted by fluid type (lifts oil and water)
- Extremely low comparative artificial-lift intervention cost versus workover, coiled tubing or other forms of artificial lift



Shown in the open flow-through position

Lower bumper spring with holddown notch shown

## SAFETYLIFT™ SYSTEM RUNNING SEQUENCE

### BOTTOM BUMPER ASSEMBLY RUNNING SEQUENCE

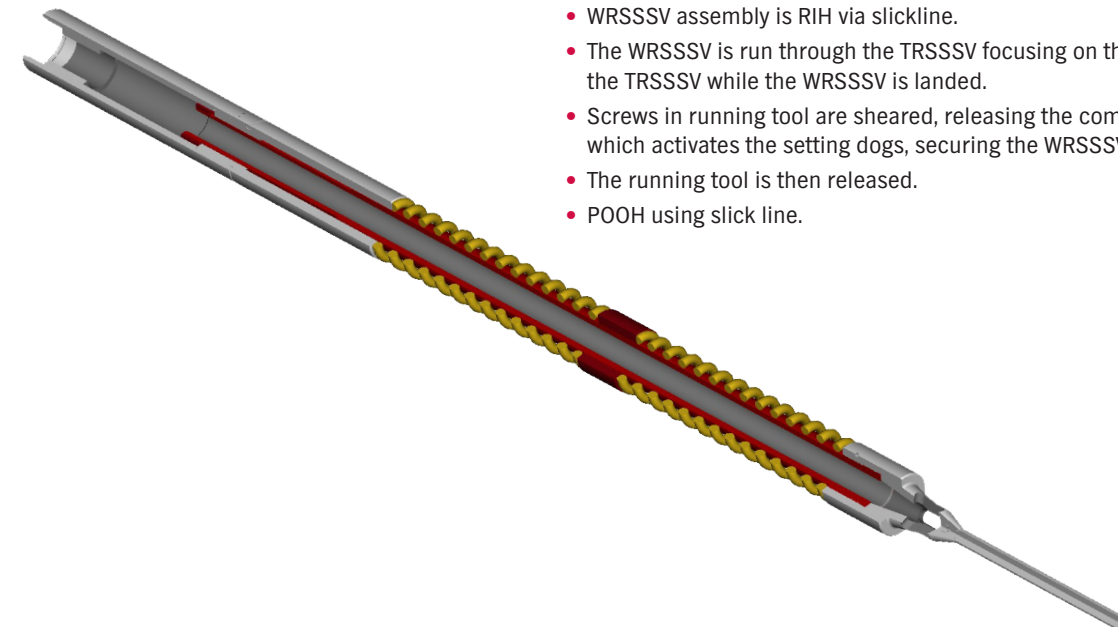
- The bottom bumper spring assembly is RIH via slickline.
- The assembly is RIH through the tubing-retrievable subsurface safety valve (TRSSSV) and set in the tubing nipple near the bottom of the tubing.
- POOH using slick line.

### PLUNGER SETTING SEQUENCE

- The plunger is RIH via slickline.
- Approach the TRSSSV with caution.
- The plunger pads will retract while being pushed through the TRSSSV.
- Continue to RIH until reaching the bottom bumper spring assembly, set down slowly and shear off running tool.
- POOH using slick line.

### UPPER BUMPER SPRING/WIRELINE-RETRIEVABLE SAFETY VALVE (WRSSSV) RUNNING SEQUENCE

- WRSSSV assembly is RIH via slickline.
- The WRSSSV is run through the TRSSSV focusing on the stops inside the TRSSSV while the WRSSSV is landed.
- Screws in running tool are sheared, releasing the compression spring which activates the setting dogs, securing the WRSSSV in place.
- The running tool is then released.
- POOH using slick line.



## RENAISSANCE SYSTEM RETROFITS WELLHEADS

To install a Renaissance system safety valve, the wellhead must be modified to allow access to the new control line.

The modified wellhead provides the correct profile for the capillary hanger. Because Weatherford's modified wellhead designs were engineered as part of the Renaissance system, they offer the same benefits of simplicity, safety and cost reduction.

### Eliminates workovers

Weatherford's REN GATE™ patent-pending wellhead modification design requires no workover rig. Our customized solutions reduce the need for costly workovers and reduce risk by requiring fewer personnel on the wellsite.

### Maintains wellbore integrity

The wellhead modification maintains the capability to set backpressure valves and packers and maintains the wellbore's overall integrity.

### Custom-fit design

Weatherford's REN GATE wellhead penetration enables experienced technicians to modify block or stack trees on any OEM's wellhead. In addition, the modification can be custom-designed to fit your specific wellhead configuration, type of safety valve installation and overall well objectives. It adheres to API and ISO quality standards.



## Weatherford's wellhead systems

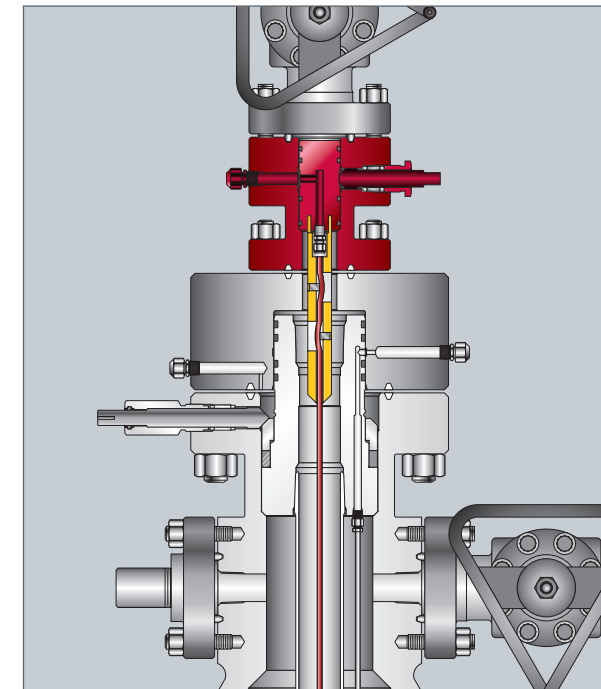
Weatherford designs and manufactures reliable, safe and easy-to-maintain wellhead equipment with an extended service life:

- A complete selection of trees and wellheads including conventional surface wellheads and specialty wellhead systems
- A selection of chokes, manifolds, unions and swivels to meet all your needs

Every wellhead features high-quality design and engineering, finite-element analysis, precision manufacturing, after-sales service and is backed by Weatherford's strength and reputation.

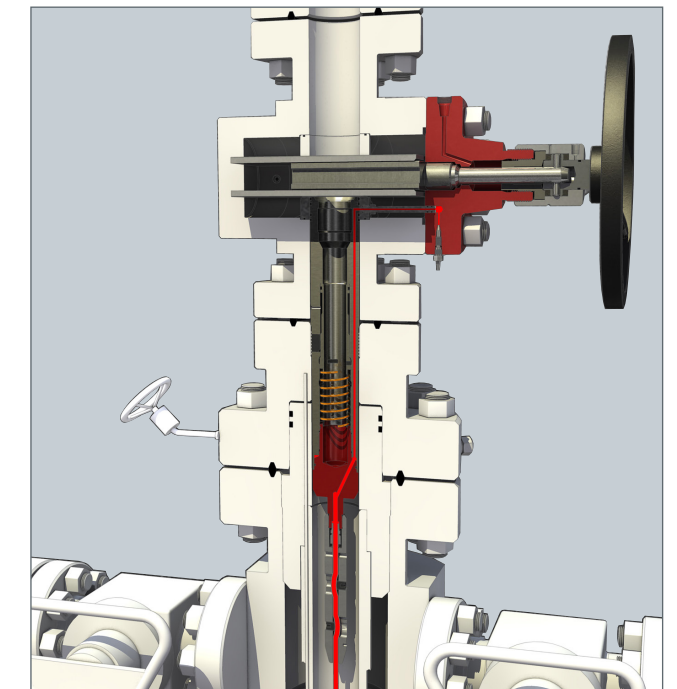
## WELLHEAD OPTIONS

While numerous options exist for retrofit wellheads, examples of the most common wellhead modifications are provided.



### Stacked-Tree Insert Spool

- No welding, cutting or invasive procedures
- Completely reversible
- 12-in. spool inserted below wellhead
- Spool piece prepped with injection port and lock-down pin to accept capillary injection hanger
- Requires additional wellhead height



### REN GATE™ Master Valve Injection Port

- No wellhead removal
- No additional height
- Tree remains intact
- No welding, cutting or invasive procedures
- Completely reversible
- As simple as routine valve maintenance
- Modified master valve bonnet
- Modified seat assembly in valve

## FUTURE PRODUCTION-ENHANCING CHEMICAL INJECTION

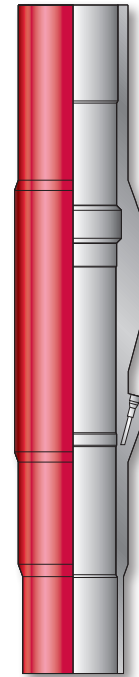
**Plan for the future. Install a cut-to-communicate (CtC) injection nipple for future production-enhancing chemical injection.**

Weatherford recommends adding an additional externally banded capillary-injection string with the control line for the tubing-retrievable safety valve (TRSSSV). This additional capillary tubing is attached to the CtC injection nipple, which is located at a point below the TRSSSV. Until it is communicated, the CtC injection nipple acts the same as the tubing string, allowing an operator to conduct normal procedures such as fracs.

Before chemical injection, the CtC injection nipple is cut to open communication with the capillary tubing, enabling continuous injection of production-enhancing chemicals. Once communicated, the installation procedures include:

- Pick up the injection valve and run in the hole with the capillary-injection tubing to the preengineered depths.
- Cut the cap string and pick up modified lock body with internal capillary-injection tubing hanger. This entire assembly is run in the hole on slickline and landed in the injection sub.
- Once landed, production-enhancing chemicals can be injected through the wellhead and down the second externally banded cap string to the injection sub, where it enters the tubing and hanger and is sent downhole to the injection valve at or near the end of the production tubing or production perforations.

Weatherford recommends the use of a new wellhead with additional ports for future production.



This system enables the TRSSSV to remain in full operation.



## CAPILLARY INJECTION UNIT

Weatherford has the largest capillary injection unit fleet in the industry with equipment in Europe, Middle East, Latin America and the Asia-Pacific regions. Some features and advantages of our capillary injection unit include:

### Newest unit in the fleet

- Modular unit for smallest possible footprint
- Specifically built for small platforms
- Components are weight specific for platform crane-lifting limitations
  - Components are less than 2,000 lb (900 kg) each
- Heavy-duty slickline capabilities

### Multiple installation packages available

- Land-based units: onshore
- Trailer-mounted units: onshore/inland waters
- Skid-mounted units: offshore/inland waters

### Roller-injector head

- 5,000 psi (34.5 MPa) snubbing and pulling force
- Less potential damage to tubing versus chain driveheads

### 10K blowout preventer (BOP) standard on all units

- Dual hydraulic rams
- Blind/sheer rams and pipe rams
- Standard BOP sizes from 1-1/2 to 5-1/8 in.

### Standard safety package includes

- Proximity switch for weight control
- Automatic shutdown for injector head
- All-weather cabin
- Working packoff for snubbing
- Redundant line counters: mechanical and electronic





## DISCOVER PREMIUM PERFORMANCE.

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Troubled wells can be a problem of the past with the innovation of Weatherford's Renaissance safety-valve system. Damaged nipple bores, damaged control lines or production-enhancing chemical requirements—Weatherford has the solutions for your well's renewal. For more details on the Renaissance system, contact your local Weatherford representative today at [renaissance@weatherford.com](mailto:renaissance@weatherford.com), or visit [weatherford.com](http://weatherford.com).

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