Solving challenges.™
Why should Boots & Coots be your preferred choice for Relief Well Contingency Planning, Project Management and Execution?

Boots & Coots Services, provides unparalleled knowledge, global experience and worldwide support to address the industry’s most difficult relief well challenges.

Even with the most thorough preemptive planning to prevent well control incidents, emergencies still occur. However, help is only a phone call away. Boots & Coots has built its reputation by applying the wealth of knowledge its team of engineers possess and can bring the collective experience to relief well challenges, ranging from contingency planning to emergency mitigation.

Accurate target well interception and successful well killing operations are highly challenging; flawless execution depends on a combination of technology, experience and resources and the critical tasks involved require high levels of competency in engineering and project management.

Integrating all the products available to Halliburton is a team effort. Boots & Coots has access to a comprehensive range of services to manage your relief well project, including:

- Relief Well Contingency Planning
- Relief Well Project Management
- Relief Well Execution
- Relief Well Directional Planning
- Dynamic Kill Analysis
- Casing and Tubular Design and Analysis
- Survey Management
- Magnetic Ranging Services
- Advanced Milling Techniques
- Perforating and Charges

**RELIEF WELL PROJECT MANAGEMENT**

Our engineers have unmatched expertise in the most essential skill sets, including Integrated Relief Well Project Management, Relief Well Casing Design, Directional Well Planning and Dynamic Kill Analysis.

Boots & Coots relief well project managers work in unison with other Halliburton services, such as Survey Management, Active and Passive Ranging, and Rig Auditing, to seamlessly deliver all aspects of preemptive Well Control Contingency Planning and Relief Well Drilling in a synergistic approach.

Innovative techniques to identify target well proximity and establish hydraulic communication between wells is provided by adapting and developing new and existing technology and by applying new techniques.
Key Benefits of Relief Well Project Management are:

- Project managers with accredited PMI certification
- Rapid implementation in an emergency
- Seamless integration of Halliburton services or client incumbent service provider
- Years of experience available to draw on
- Optimization of all facets of relief well drilling allowing for the best chance of success
- Able to develop detailed and comprehensive plans

RELIEF WELL DIRECTIONAL PLANNING

Boots & Coots engineers utilize Landmark’s COMPASS™ and WELLPLAN™ software to design the directional component of the relief well. We will work with your company to develop the best Relief Well Plan to meet your needs.

COMPASS™ software is a commonly available directional well path planning program. Our engineers utilize the latest and most up to date software versions and releases. Collaborative well design is made simpler as information is shared quickly and easily by the import/export options available.

During relief well drilling operations, Boots & Coots engineers work closely with the ranging team to interpret ranging data and adjust the Relief Well Plan according to the new data received.

Components of a Successful Relief Well Directional Plan Include:

- Interception point selection
- Surface location selection
- Ranging strategy
- Survey management
DYNAMIC KILL MODELING

Drillbench Blowout Control, powered by the OLGA™ multiphase flow simulator, allows the performance of dynamic kill analysis for different blowout scenarios.

The information gathered from the analysis is then used to determine the following:

- Kill fluid weight
- Kill fluid volume
- Dynamic kill pump rate
- Dynamic kill pump pressure
- Kill pumping requirements

This information is used to develop a comprehensive relief well kill plan.

Dynamic Kill Analysis Software

Based on our experience in well control and the industry’s need to better understand the variable conditions that occur during the execution of well kill operations, Boots & Coots has developed a proprietary Dynamic Kill Analysis software. The versatile hydraulic, reservoir and fluid model program allows for both customized steady state and dynamic kill analysis. Besides its use in dynamic kill analysis, the software can be used for many applications including bullheading risk analysis or analyzing relief well plug and abandonment operations.

CASING AND TUBULAR DESIGN AND ANALYSIS

The Boots & Coots relief well team uses Landmark’s WELLCAT™ and StressCheck™ software, which is a comprehensive and modular suite of applications that work together to address a wide variety of relief well related casing and tubing challenges.

WELLCAT software is an oil and gas industry standard used globally by Halliburton and customers alike. WELLCAT software is used for deep water HPHT, whereas StressCheck software is used for land or shallow water wells that are not complex.

Key Benefits of Casing and Tubular Design Analysis are:

- Detects potentially crippling relief well design flaws
- Optimizes the wellbore configuration
- Facilitates pre-planning, thus making the time intensive comprehensive casing review necessary for offshore permitting immediately available in case of emergency
- Meets critical needs for well design in high-pressure / high-temperature or salt formations

Drillbench Blowout Control

Contingency planning for relief and well and dynamic kill operations

WELLCAT - Advanced casing design and complex completion analysis software
SURVEY MANAGEMENT

Sperry Drilling services provides a collaborative range of Survey Management tools, with technology that provides expert data analysis to reduce survey uncertainty in both the relief well and target well. Reducing uncertainty is essential when drilling a relief well since precise alignment is required for direct interception.

The Boots & Coots relief well team works closely with Sperry’s expert data analysts to further refine relief well plans using real-time data. This joint effort reduces the number of sidetracks and plugbacks often necessary without the aid of accurate survey management.

Key Benefits of Relief Well Survey Management are:

- Reduces the potential for costly plugbacks and sidetracks
- Reduces the number of required ranging runs
- Expedites the mitigation of costly emergencies

MAGNETIC RANGING SERVICES

Finding and intercepting another well thousands of feet underground is technically challenging – Sperry Magnetic Ranging Services make it possible. For over 30 years Sperry has used both active and passive ranging techniques to intersect blowout wellbores.

The Sperry Drilling Access Independent Magnetic Ranging toolkit, a unique Halliburton service, consists of the WellSpot™ and WellSpot™ RGR tools and WellSpot™ at Bit and Passive Magnetic Ranging services.

These tools and techniques have proven to be the most accurate and allow for the greatest range of detectability.

Key Benefits of Magnetic Ranging Services are:

- Detects wellbores up to 150 ft away depending on formation resistivity
- Provides azimuthal and offset distance information critical for relief well drilling
- A variety of tools available for many relief well needs
- Proven technology of over 30 years

INTERCEPTION TECHNOLOGIES

When planning a relief well, the intercept is planned first. Other components of a Relief Well Plan, such as the Dynamic Kill Analysis software or the Relief Well Directional Plan, rely on the Intercept Plan. The Boots & Coots relief well team has the expertise to choose the proper depth of intercept and check that choice using dynamic kill analysis and proximity ranging planning. Boots & Coots engineers also have the expertise to select the proper mill configuration, hole angle, and milling strategy that will allow the relief well to successfully establish hydraulic communication with the target well.
MILLRITE®
Sperry Drilling has developed a new hydraulic communication method that utilizes existing multilateral technology. MillRite® milling system creates precise milling from the relief well to the target well, through the casing strings of both wells.

PERFORATING AND CHARGES
Perforating solutions from Halliburton’s Wireline and Perforating product service line encompass the industry’s leading technologies, tools and techniques for critical perforation operations.

The Boots & Coots relief well team utilizes Halliburton’s PerfPro® software model to pick the best perforation gun and charge combination for the task at hand.

Key Benefits of Halliburton’s Perforating Solutions are:
• Increase the chance for fluidic communication with the target well
• Provide specialized tools necessary for uncommon situations

WHY CHOOSE BOOTS & COOTS FOR RELIEF WELL CONTINGENCY PLANNING & PROJECT MANAGEMENT?
When you combine competent people with excellent tools and services, success is the natural result.

Integrated Solution
We work with our customers to provide a customized and integrated solution. We have the benefit of collaborating and bringing in other necessary Halliburton services. This gives us the opportunity to manage the project from start to finish.

Safety
Ask our employees and they will tell you we live and breathe a culture of safety, doing whatever it takes to implement and execute our proven and proactive Health, Safety and Environment (HSE) programs. We concentrate our efforts on eliminating all potential HSE incidents through the implementation of our Risk Management Plan.

Experience
Boots & Coots engineers have relief well planning and implementation experience and the skills necessary to make your relief well project a successful one.

Key Services:
• Reliability
• Efficiency
• Engineering support and experience
• Comprehensive range of tools
• Access to a wide range of Halliburton services

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Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.