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Planning is the Key to Effectively Managing a Plug & Abandonment Project

Tactics, tips and tricks to stay on budget and avoid downtime

By David Wright, Rodger Williamson, and Greg Hampton, Wright's Well Control Services

The management team at Wright's Well Control Services outline eight steps needed to properly prepare for a plug and abandonment (P&A). Their recommendations for careful planning at the beginning of a proposed P&A will result in cost savings, the avoidance of delays during operations, and well-control issues in the future.

Good project management is essential in the planning of a P&A (decommissioning). Proper coordination and scheduling is critical in the start-up phase and, when coupled with on-site expertise and supervision, will lead to smoother overall execution of the job. Planning a P&A is serious business, as only at the end of a well's lifecycle is it left without the protection of a tree or blow out preventers (BOP). A lack of planning and execution can lead to a well that starts to bubble; an ongoing well-control problem for the operator; environmental, pollution, and health issues; and additional expenditures to rework the P&A.

Finding in-house professionals and/or a contractor with extensive P&A knowledge is vital for all phases of the operation. An upfront investment in a veteran P&A team will help steer the operator clear of potential pitfalls and their added cost and downtime. For example, lost productivity and extra transportation expenditures due to hotshots, and dock and crane fees for additional tools and equipment overlooked during the planning phase can quickly accumulate.

The following steps outline the best practices for preparing for a P&A project:

Step 1 – Terminate Production

The first step in the planning process is to terminate production operations. The operator designs a plan to safely discontinue production and secure the platform and well until the actual plug and abandonment operations can commence. This shut-down plan is also implemented to allow the P&A to proceed without the threat of a pollution incident.

Step 2 – Conduct Preliminary Well-Site Work

Diagnostic preliminary well-site work such as checking the annuli and tubing integrity by pumping kill weight fluid; checking injection rates and pressure; running wire-line to check for paraffin and tubing deviations; retrieving valves; and making gauge runs to ensure that the electric line will have no problems during the P&A process will provide a true picture of existing well conditions.

Step 3 – Planning a Well P&A

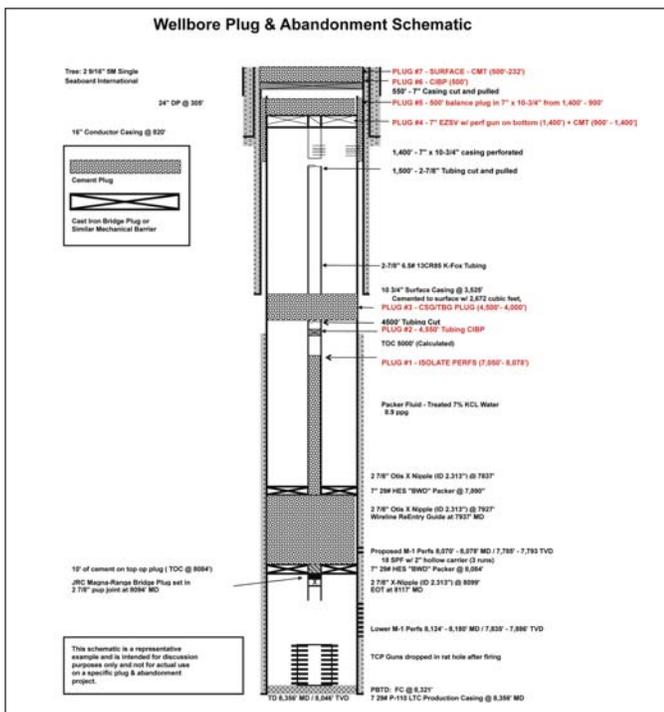
When an operator identifies a well to P&A, a review is conducted of the well design along with records of past work, tubing details/schematics, the well's past performance, and geological and reservoir conditions. Detailed and accurate recordkeeping throughout the life of the well will pay off when it is time to plan for its P&A. The operator investigates all items that may require protection for health and safety issues as well as meeting regulatory requirements. The operator then designs a P&A program based on existing wellbore and reservoir conditions with the goal of preventing future leakage and preserving the remaining natural resources.

A preliminary wellbore/wellhead inspection and survey is performed and the present condition documented. All of the valves on the wellhead and tree are checked to ensure operability, and inoperable valves are hot-tapped. A slickline unit is rigged up and used to check for wellbore obstructions, to verify measured depths and to gauge the internal diameter (ID) of the tubing and pull safety valves as needed. The slickline unit is then rigged down, and a well service pump is rigged up to fill annuli and tubing with seawater to establish an injection rate into perforations and/or to pressure up tubing to check for integrity. The casing annuli are also pressure tested and charts are made to check for communication problems between strings and to record the test pressures over time.

Step 4 – Look for Additional Cost Savings during the Planning Phase

Cost savings are realized by planning for multiple P&As during the same deployment. If several wells scheduled for P&A are in close proximity, the crew can readily perform work on a well and then move to the next one without the expense of repeated mobilizations. A contractor that offers small-footprint, rigless P&A services executed from a vessel of opportunity can further accelerate this multi-well strategy and hold overall costs down.

When decommissioning a platform, pipeline or other facilities,



This wellbore schematic shows the placement of cement barriers and cast iron bridge plugs (CIBP) or other mechanical barriers used for plug and abandonments. A proper P&A will have at least six barriers and include both cement and CIBPs. The seven barriers used in this diagram are noted in red beginning at the deepest point with PLUG #1 and rising to the surface cement at PLUG #7.

the initial P&A operations can further be leveraged as an opportunity to conduct prep work for the eventual removal. For example, the platform legs can be sounded and jetted with some of the same equipment and crews used for the P&A. Effective scheduling and coordination of all activities and processes results in little or no downtime, which translates into additional cost savings for the overall project.

Step 5 – Evaluate P&A Techniques and Options

Cementing

Like anything else, cementing materials perform only as well as they are designed to handle. Good cementing practices have been present elsewhere on many occasions, except on P&A projects.

The use of specialized cement of varying classes is dictated by the well profile. The cement used to P&A a well is just as critical as the technique used to cement casings during the drilling phase. The correct use of cement during the abandonment phase ensures not having to return to the well to repair any leaks.

In most cases, Class H is the primary cement used for P&As. Class H is the basic cement intended for use to 8,000 ft. WD and 200° F and is compatible with accelerators or retarders used over the complete range of cement Classes A through E. For deeper wells in the 10,000 ft. to 15,000 ft. WD range with a bottom-hole pressure of more than 3,500 psi and a temperature greater than 200° F, Class D cement is applied.

Class A or H can be used for intermediate and surface cement plugs. However, neither of these types of cement are designed to hold any tension from tubing or casing. To add strength to any cement plug, the use of silica flour and other additives provides resistance to high pressures or temperature changes over time.

Cast Iron Bridge Plug or Cement Retainer

The major enemies of a good abandonment are contamination of cement, temperatures and time. The operator needs to consider how long the abandonment is to last when selecting techniques for the job.

Cast Iron Bridge Plugs (CIBPs) are the best long-term insurance that a well will not leak. The CIBP provides a mechanical seal that will not crack or allow a micro annulus leak over time.

Step 6 – Develop P&A Procedures and Schematics

Salt water and cement are not enough to properly secure a well for plug and abandonment. The use of six or more layers of cement, kill weight fluid, and CIBPs to create multiple barriers is necessary to prevent the well from bubbling in the future. When these barriers are in place, pressure in the well should be less below the barriers than above. Schematics should clearly note the number of plugs, type of plug, and their depth.

Step 7 – Apply for Government Permits

The key here is to learn the exact requirements and procedures expected by the Bureau of Safety and Environmental Enforcement (BSEE) or the appropriate state agency. Correctly submitting procedures and schematics the first time will reduce the risk of a permit being returned to the operator for corrections or modifications which will only delay the start of the project. Once permits are approved the operator and contractor can develop a schedule and hold a spud meeting to prepare the mobilization and begin the P&A work.

Step 8: The Spud Meeting

All parties involved in the project should attend including engi-

neers; representatives from the operator; the P&A team; logistics managers; crews for the jack up boat, rig, motor vessel, and E-line/slickline equipment; and any other third-party companies involved.

At the spud meeting, the parties participating will decide who is required to bring each piece of equipment. This group also needs to determine if all the equipment is compatible to minimize confusion and downtime once the project starts. Safety policies and any special procedures or precautions should also be discussed to ensure no one is blindsided by these rules once on location.

The parties can verify they have the proper personnel with the necessary training, experience and PPE (personal protective equipment) to run the project. Taking the time in the spud meeting to avoid sending the wrong personnel will help eliminate costly and time consuming problems once offshore.

Government requirements, well-control issues, special equipment requirements and deck-space load ratings are also reviewed. Equipment footprints and specs can be examined at this time too.

The more everyone involved in the project knows before operations starts, the better chance the operator will experience a smooth, cost-efficient project from mobilization to demobilization.

Conclusion

The P&A of a well is one of the primary stages of a facility decommissioning planning program. An effective P&A procedure is critical for the proper sealing of an oil and/or gas wellbore to safely secure it from future leakage. Techniques used to accomplish the process are based on industry experience, research and conformance with regulatory compliance standards and requirements. The synthesis of practical knowledge, current technology, and going beyond government regulation results in the most efficient well bore P&A possible. Only by planning ahead can an operator greatly increase the likelihood of success with a P&A program while effectively managing its cost.

David Wright, President

David Wright is the president of Wright's Well Control Services (WWCS) where he holds several patents for offshore technologies. Founded in 2006, WWCS offers well control, P&A, and subsea intervention services for clients in the Gulf of Mexico. He has 25 years of offshore experience including work at major energy service companies and an operator.



Rodger Williamson, Sr. Supervisor

Rodger Williamson has over 30 years of experience in the Gulf of Mexico working in supervisory and operational positions for well control and prominent energy services companies. Williamson was one of the first employees and managers to help start WWCS in 2006.



Greg Hampton, Operations Manager

Greg Hampton has nearly 30 years of offshore industry experience with an extensive background as a P&A supervisor and wireline operator in the Gulf of Mexico and internationally. Hampton has served in operational and management roles at WWCS since the company was founded in 2006.



INTRODUCING THE WRIGHT APPROACH TO RIGLESS PLUG & ABANDONMENT

Wright's Well Control Services' subsea BOP system includes a lower package and lubricator with pressure control assembly to perform rigless plug and abandonments on vertical and horizontal trees. The system enables the running of wireline during P&As with the use of a highly effective grease head that creates a seal around the E-line or slickline during the open bore phase of BOP operations. With a small foot print—the complete 3" kit can fit on the back of a MSV with room to spare—the Wright approach is the cost effective choice for abandonments and also thru-tubing completions.

To learn more about
Wright's Well Control Services'
Rigless Plug & Abandonment and
Well Intervention Solutions
call +1 281-446-0273
or visit www.wwcs911.com

