Consequences of the Wrong Assumptions

In the oil and gas industry, the wrong assumptions can lead to billion-dollar mistakes. In some cases, pipelines are developed, roads are built, and entire towns are created on the assumption that millions of barrels of oil or gas will come out of the ground easily. Therefore, an operator must know precisely how each well is going to intercept the reservoir, where the efficiency and effectiveness of reservoir will flow into the wellbore.

The tests we do at the Advanced Perforating Flow Lab give our customers precise answers on the exact depth of penetration into the formation at different points of rock, and also what the crush zone and skin value of the perforations are expected to be. These insights help identify or develop the best perforating system for any given well conditions.
Understand Downhole Performance

Breakthrough Technologies Help Better Understand Downhole Performance

State-of-the-Art Facility Provides Unparalleled Insight

The Advanced Perforating Flow Laboratory at Halliburton’s Jet Research Center is an industry leader in perforating system research, development, and test programs. For more than ten years, we have conducted tests tailored specifically for our clients’ needs to help them better understand actual downhole conditions and perforating system performance.

To meet our customers’ developing challenges, Halliburton has expanded the Advanced Perforating Flow Laboratory with leading-edge vessels and technologies. These vessels will provide our customers with the most accurate information possible in regard to the effects of perforations in different formations and in different environments. This facility gives us an edge in the real world as you can get in a laboratory setting.

Advanced Flow Vessels Raise the Bar

Our facility includes three new testing vessels that do more than any other facility in the industry. They include:

- 25,000-psi vessel – Allows Halliburton to conduct tests at pressures higher than any other testing facility in the industry.
- 25,000-psi vessel – Can rotate up to 180 degrees, enabling Halliburton to perform gravity- and fluid-induced studies to better understand the effects of perforating and fracturing in horizontal wells.
- 50,000-psi vessel – Allows Halliburton to test perforating capabilities in high temperatures.

As Close as You Can Get to Real-World Conditions

We can find better ways to:

- Use better-performing metals
- Evaluate alternative perforation methods
- Assess new explosive compounds
- Maximize production
- Clean up perforations more effectively
- Assess new explosive compounds
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Consequences of the Wrong Assumptions
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These vessels give us the ability to operate beyond our clients’ most challenging environments – exceeding the capability of all competitors.

As Close as You Can Get to Real-World Conditions

The Advanced Perforating Flow Lab helps us understand how perforators actually perform under extreme downhole conditions. It can simulate realworld conditions that account for overburden stress, reservoir pore pressure, wellbore rock type, and inclination.

As Close as You Can Get to Real-World Conditions

The Advanced Perforating Flow Lab gets you as close to the real world as you can get in a laboratory setting.

Wide Range of Applications Tailored for Specific Reservoir Conditions

Testing and research at the Advanced Perforating Flow Lab have found that perforation and performance of a perforating system in formation and under extreme conditions are much different than performance in a test unit. In fact, many times the results from these tests can mislead, because the best system in a test unit may not be the best system in real-world conditions. The tests we conduct here at the Advanced Perforating Flow Lab are conducted with actual cores provided by our clients, allowing better inflow evaluations for project approval and the ability to identify and refine the latest approach for an optimized well completion.

Perforations in Cement and Rock Do Not Correlate Linearly

Case Study

Increased Production in Mature Well – Operator’s Largest Producing Field in the World

In the Caspian Sea, perforation and completion techniques damaged perforations in an operator’s largest field. In response, Halliburton developed a specialized shaped charge that could maximize downhole penetration specific to the recovered wellbore environment. After testing at the Advanced Perforating Flow Lab, the charge resulted in a 45% increase in clean perforation tunnels and a 36% increase in radial core penetration depth.

As Close as You Can Get to Real-World Conditions

The Triple-Jet™ perforating system works by firing a set of three shaped charges in a specific focal point in the formation. Once detonated, the converging jets intersect, resulting in a shockwave that significantly reduces the energy of the cratered zone and dramatically increases effective perforated depth. Extensive testing in a variety of downhole conditions at the Advanced Perforating Flow Lab confirmed that the Triple-Jet system can greatly improve well productivity.

As Close as You Can Get to Real-World Conditions

Perforating in Cement and Rock Do Not Correlate Linearly

Case Study

Dominator® Charge Gives 21% Greater Penetration in Challenging North Sea Field

A major operator wanted Halliburton to optimize its gas system for use in a marginal gas condensate field in the North Sea. Tests at the Advanced Perforating Flow Lab helped create a charge specific to the field’s characteristics and reservoir conditions, resulting in deeper penetration and efficient tunnel cleanup for the operator’s specific application. These combined efforts led to a 23% increase in rock penetration and a 12% productivity increase over benchmark conventional charges.

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Only CT Scanner in the Industry

Our expanded facility includes an integrated command and control center, a core preparation laboratory, an extensive core analysis laboratory for post-test evaluation, and an extensive core analysis laboratory for post-test evaluation. This laboratory enables us to conduct the most advanced perforated core analysis in the industry. We conduct these tests using the latest imaging systems adapted from the medical industry for use in oil and gas environments. Our lab is the only one in the world with such dedicated equipment, allowing us to evaluate reservoir inflow at the structural level.

Take Charge of Your Reservoir

Use the Advanced Perforating Flow Laboratory at Halliburton’s Jet Research Center.

Optimizing Production

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 and are subject to the laws of the United States of America and the state of Texas and applicable international laws.

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