Solving challenges.™
CYPHER℠ Seismic-to-Stimulation Service
Delivering enhanced profitability in shale and tight reservoirs through basin knowledge, operational experience, and continuous validation

MAXIMIZE YOUR UNCONVENTIONAL ASSET’S NET PRESENT VALUE WITH CYPHER℠ SERVICE FROM HALLIBURTON

No conventional path leads to top-tier success in the development of unconventional hydrocarbons. Shale and tight reservoirs don’t give up their hydrocarbons easily. It takes insightful basin and reservoir knowledge, flawless planning and delivery, proven processes, plus complete integration and collaboration to discover and recover all that unconventional reservoirs can provide. That’s why Halliburton developed the CYPHER℠ Seismic-to-Stimulation service: to help minimize cost and maximize the net present value of your asset.

EXPERTS WHO WORK WITH YOU

When you engage the CYPHER service, your capabilities are supplemented with some of the best regional and global experience the industry has to offer. Collaboration between your asset team and a local Halliburton Technical Team of experts creates a “holistic” team capable of delivering unparalleled results. Availability of advanced technologies improves the probability of economically reaching, accessing, and producing hydrocarbons profitably from even the most extreme reservoir and logistical conditions.

EVERY STEP OF THE WAY

The CYPHER service is an asset-level workflow that can provide value from exploration through to mature field harvesting. The workflow can be implemented at any time during the life cycle of a field because it encompasses all key modules for field development, from basin modeling through to production analysis and field optimization. The CYPHER service applies geoscience techniques and applied engineering every step of the way to help make sure reservoirs are being developed to maximize profitability for you.

WHATEVER THE SITUATION

Whatever the situation, the CYPHER service facilitates cross-discipline communication through continuous validation. Through the CYPHER service, Halliburton can assist by providing expertise in key areas tailored to your specific needs:

• If there is no earth model, CYPHER service can accelerate asset value by filling this gap with Halliburton’s basin knowledge.

• If there are no processes in place to “look back” and incorporate new learnings into your existing earth model, the CYPHER service can supplement your existing asset team with execution experience.

• If there is limited expertise to develop shale or tight reservoirs, partnering with Halliburton and using the CYPHER service can help address and solve that challenge quickly and profitably.
INCREASED RESERVOIR KNOWLEDGE LEADS TO BETTER DECISIONS

The CYPHER service incorporates applied geoscience and reservoir understanding through the use of:

• Basin and geologic modeling to help define the type and quantity of hydrocarbons in place and map formation surfaces and features regionally through the understanding of the rock’s burial and thermal history

• Geochemistry and core testing to capture rock composition, kerogen content, type and maturity, effective porosity, fluid compatibility, and mechanical properties

• Geomechanics and pore pressure to maximize drilling efficiency by determining the optimum well path and drilling fluid density

• Fracture diagnostic injection testing to validate geomechanical and reservoir properties

• Advanced logging data (magnetic resonance, sonic, geochemical, dielectric) integrated in a detailed petrophysical analysis to compute accurate volumetrics, TOC, kerogen, permeability, brittleness, and 3D stresses

• Fracture treatment design optimization, including appropriate fluids, additives, proppants, injection rates and pressures, to maximize stimulation efficiency

• Earth modeling and reservoir characterization accurately characterizes rock and fluid properties along any wellbore to enable more informed decisions regarding:
  - Wellbore placement
  - Fracture spacing and design
  - Setting realistic production expectations

• Production history-matching to validate production and calibrate the CYPHER service models

COLLABORATIVE PLANNING LEADS TO SUPERIOR RESULTS

Continuous collaboration created through the use of the CYPHER service accelerates the learning curve for planning, drilling, and completing wells. The CYPHER service creates an environment to identify key reservoir attributes, to help ensure the best wells are drilled first, and to maximize asset value and field economics.

Field and well planning and design incorporates rigorous analysis to help define the most appropriate surface and subsurface well locations, optimum well spacing, as well as completion design and fracture spacing:

• DecisionSpace® Well Planning software can reduce well-planning cycles by leveraging automation techniques

• DrillingXpert™ software can deliver wellbores more systematically along with real-time simulation and increased automation

- Perforation placement
- Fracture spacing and design
- Setting realistic production expectations
Fracture design, diagnosis, and validation enables engineers to validate model parameters and assumptions, and make informed decisions on location to help ensure that the desired results are achieved. New fracture modeling technology provided through Halliburton’s advanced and proprietary production enhancement software suite can be used to optimize the fracture treatments based upon net treating pressure. This will help ensure that the desired reservoir volumes are stimulated, and that sufficient fracture area is obtained to deliver the desired production. Production prediction and history-matching can be incorporated with a minimum of the first 90 days of production data to fine tune and calibrate the reservoir and fracture models.

In addition to the production enhancement software suite, other technologies can add significant value to the completion portion of the asset-development process:

- PermStim® fracturing service provides a substantially residue-free fluid system that provides production rates that can normally exceed guar-based fluid-system fracturing results.

- AccessFrac® stimulation service uses unique diverting technology to improve the efficiency of multizone fracturing treatments and helps increase the stimulated reservoir volume.

- The Frac of the Future™ equipment helps improve service quality, reliability, and environmental performance. The ability to operate using a dual fuel system (natural gas and diesel) can be a huge benefit.

- Microseismic and fiber-optic monitoring provide operators improved understanding of downhole conditions, reducing uncertainty and accelerating operational decisions.