



EXPRO

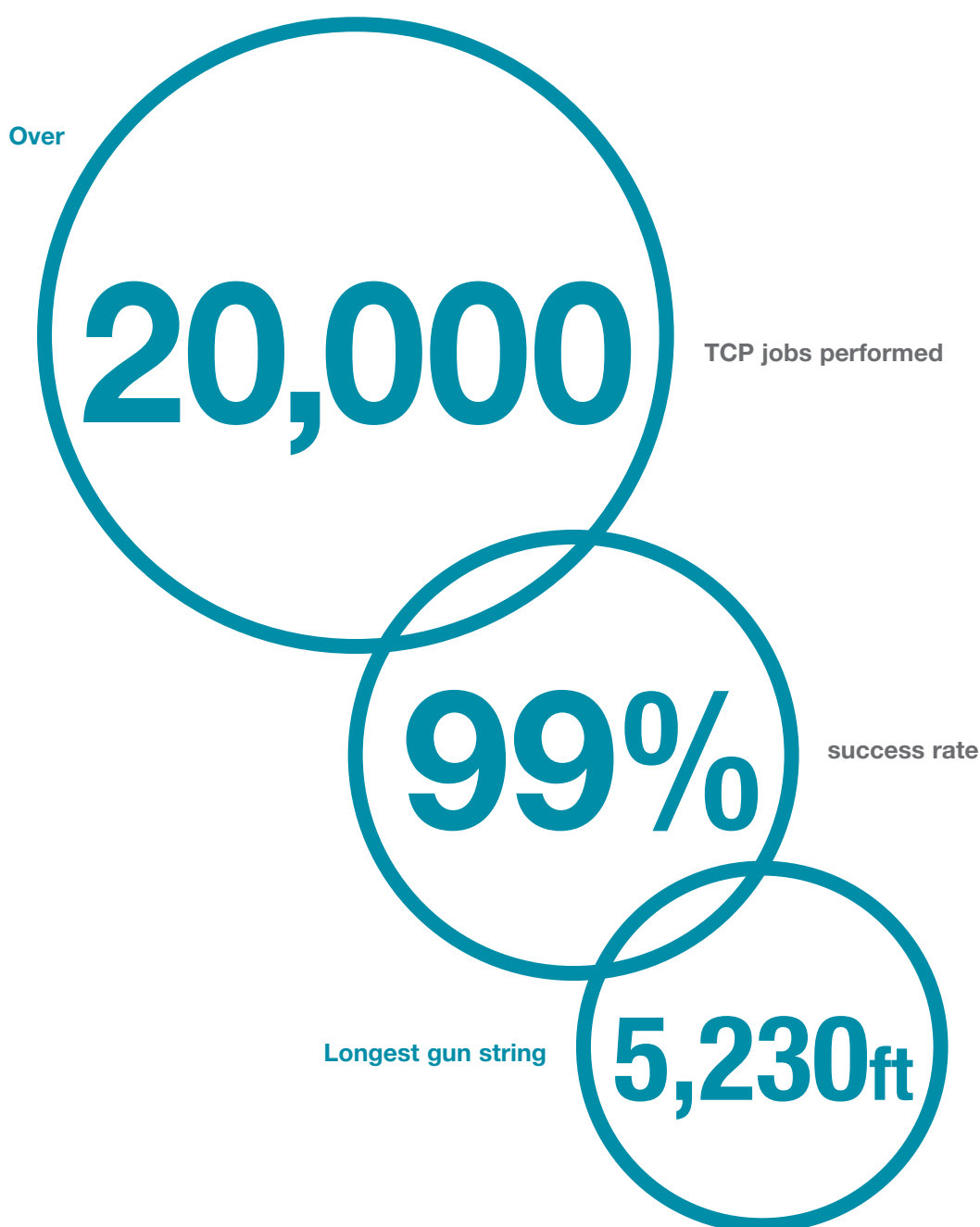
WELL FLOW MANAGEMENT™

Expro Perforation Services



Expro provide **reservoir optimised perforation solutions.**

From modelling, through to design, operations and validation, Expro provide a **full package** of services to enhance your reservoir productivity.





Our unique position

Expro are independent suppliers of perforation services. We have in-house class leading perforation initiation systems, but are not tied to any one gun supplier therefore can offer the best solution to fit your requirements.

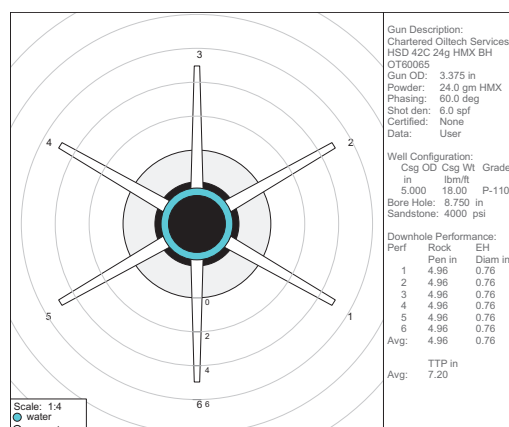
When working with you, we can:

- Review expected reservoir conditions
- Model application options
- Propose the best perforation system from a selection of gun suppliers
- Validate the selection by performing shoot-off tests in API RP 19b section 4 labs
- Perform the perforation operation
- Verify the outcome with fast sample gauges and further analysis

Our EGIS group of reservoir engineers are on hand to perform:

- Nodal Analysis (WEM)
- Perforation Modelling (GEM)
- Pulsefrac™ modelling
- Dynamic Underbalance (DUB)
- Gun shock (packer modelling)
- Torq and Drag (T&D)

Expro sit on the API RP19b committee and are key committee members of the International Perforation Symposium. We also provide executive advice for the newly created Perforating Safety Forum.



Operationally we have been in the perforation business for over 30 years, running over 20,000 jobs. We pride ourselves on rapid response, personal levels of service and the best service quality record in the industry. Our personal touch and engineered service have helped our clients achieve production goals across the globe.

Expro provide Reservoir Optimised Perforation

From Modelling, through design and operations and a full package of services to enhance your reservoir

Over **20,000** TCP jobs performed since May 2000

Drill stem testing
Completion
Frac
Stim
Abandon

Gulf of Mexico
USA shale
Alaska
Africa
Asia
Europe

5,230ft horizontal zone

Reservoir modelling

Reservoir optimised perforating solutions

Nodal analysis

Perforation tunnel modelling

Solutions



on to validation – Expro provide productivity

Over **99%**
success
record

Over 20 firing
systems in a
single string

HP/HT
deepwater

Best in class
reliability

Mechanical
hydraulic
electronic

Full range
of in-house
designed firing
systems and
accessories

Vents
hangers
gun drop

Toe sleeves
clean & perf
EXcape®

Perforating applications across the wells spe

Exploration & appraisal

Key drivers:

- Efficiency
- Flexibility
- Data acquisition
- Modelling perforating or development wells

Perforating options:

- Intelligent systems
- Selective firing
- Fast gauges

Well Completions

Key drivers:

- Well productivity
- Multiple zones
- Long intervals
- Optimising cased hole gravel packs
- Future well intervention

Perforating options:

- SUB - DUB - EOB
- TCP shoot'n'pull
- TCP shoot'n'drop
- Live well deployment
 - Oriented guns
 - Gun hangers
- Stackable guns
 - Wireline



Stimulation

Key drivers:

- Enhanced productivity

Perforating techniques:

- Exothermal liners
 - TriStim®
- StimGun™

Well abandonment

Key drivers:

- Facilitate optimum cementation
- Limited penetration to casing annuli
 - Pipe retrieval

Options:

- Cluster guns
- Strip guns
- Oriented guns
- Explosive cutting
- Non-explosive cutting
- Plug'n'Cut

Fracking

Key drivers:

- Reduced trips in hole
- Time & cost saving
- Reduced horsepower and frac fluids

Systems:

- Clean'n'perf
- Plug'n'perf
 - EXcape®
- Toe sliding sleeves

Well types & environments

- | | | |
|---------------------------|------------------|------------------------|
| ▪ Oil producers | ▪ Extended reach | ▪ Offshore |
| ▪ Gas producers | ▪ HP/HT | ▪ Offshore deepwater |
| ▪ Aquifer producers | ▪ Ultra HP/HT | ▪ Conventional wells |
| ▪ Water and gas injectors | ▪ Land | ▪ Unconventional wells |

Delivering perforating solutions to our clients

Safety & reliability

Successful multiple horizontal well campaign with a client in North America where the entire interval in excess of 3,200ft is shot at once.

Well performance

Specially engineered 'big hole' shaped charge design to yield a narrow dimensional tolerance to casing entrance hole geometry for a super-major in the Gulf of Mexico. Successful deployment and performance of TCP strings over 1,500ft per well.

Operating efficiency

Novel gun handling equipment designed in-house yielding 50% time savings on gun make up, often greater than 12 hours rig time on long horizontal well gun assemblies.

Supplier relationships

Expro's independent status allows us to present optimum solutions to our clients. Our relationships with best-in-class ballistics suppliers means we can tailor our service to meet the key project drivers.

Technology & innovation

EXact™ tool – combined multicycle ball and circulating valve developed for DST and underbalanced shoot & pull TCP applications including deepwater. Fast-cycling and high circulating rates save rig time and add value in high cost operating environments.

Adaptable & responsive

A robust supply chain, mobility of service personnel, and forward planning on licensing and logistics has allowed Expro secure work at short notice on a global scale.



Expro's mission is **well flow management**. We provide services and products that **measure, improve, control** and **process** flow from high-value oil and gas wells, from exploration and appraisal through to mature field production optimisation and enhancement.

With a specific focus on **offshore, deepwater** and other **technically challenging environments**, we provide a range of mission critical services across **three key areas**:

- Well Test & Appraisal Services
- Subsea, Completion & Intervention Services
- Production Services

Our vision is to be the **market leader** in well flow management, using the industry's best people, to deliver the highest standards of **safety, quality** and **personalised customer service**.

Expro's **40+ years** of experience and innovation empowers the company to offer **tailor-made solutions** for customers across the energy sector. With 4,500 employees in over 50 countries, Expro offers a **truly global service solution**.



For more information contact:

DST-TCP@exprogroup.com

Or visit **www.exprogroup.com/contact**