



ABEL Engineering/Well Control Co.



10m HP
Solids
Removal
Drum on
UBD job



UBD
Project,
Burgos
Field,
Mexico
2003

UBD Operations / Design



Snubbing
Indonesia 2002



Kuwait 1991

Well Control Project Management

ABEL Engineering/Well Control Co.

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Products and Services:

Non-Well Control Event

Pre-planning, surveys and audits of operations for well control, drilling efficiency, blowout contingency planning (relief well, capping plans, snubbing operations, high risk well operations) and risk assessments.

Well Control Events

Project management for out-of-control well control events, relief well, proximity logging, capping plan and supervision, pump to kill plans, dynamic two-phase calculations (using DYN-X or OGLA2000). Managing partner the Well Control Partnership for special vendors who have useful products for well control support and control.

UBD Drilling Projects

Blowout Advisor for out-of-control well control events, relief well, proximity logging, capping plan and supervision, pump to kill plans, dynamic two-phase calculations (using DYN-X or OGLA5). Organized the Well Control Coalition which of vendors who have useful products for well control support.

Qualifications:

BS Civil Engineering, MBA degrees, 28 years of experience in well control operations, planning, supervision of well control, Kuwait Oil Fires (Abel team capped 41 wells in 70 days with 5-man team), written 200+ Blowout Contingency Plans, author of 34 technical papers, majority author of Firefighting and Blowout Control (540 pages, 1994), designed underbalanced drilling completion operations and built for purpose UBD drilling rig.

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eUBD™ COMMENTARY

Abel Engineering has agreements with various vendors that provide capabilities necessary for UBD projects. These companies have a proven history of superior service and when combined have a synergistic and unique service for Under Balanced Drilling (UBD) projects. These capabilities are far superior to the competition in UBD operations. The field services are managed by ABEL Engineering who has overall project responsibilities into the areas shown below:

Project Management – ABEL Engineering

- Field management
- well design
- operational guidelines

Wellhead Pressure Control – Bobcat Pressure Control

- Wellhead pressure management (snubbing techniques)
- Field operation of wellhead/BOP equipment

BOPE – Schooner Petroleum Services

- BOPs, HP separation, chokes, valves, flow lines
- BOPE maintenance and field operation

Gas Handling – Pacific Process Systems

- 3-phase separation
- Flow measurement
- Flaring and gas handling and field operation

Instrumentation and Control – Pason Systems

- PVT measurement and data collection
- BOPE maintenance and field operation

Directional Drilling / Data Collection – Scientific Drilling Inc

- Directional drilling tools
- Downhole measurement and data collection

Combining these unique services and experience in pressure control and drilling operations yields a capability unmatched in the industry in capacity and ability. For example using proven snubbing technology allows the ABEL UBD Team to work at wellhead pressures

Field Supervision – Plaster and Wald

- Field Supervisors Drilling & Completion Operations

3-Phase Analysis – Scanpower and PetroFlow

- Transient 3-phase flow calculations
- Reservoir simulations
- Analysis of temperature profiles drilling parameters
- Using OGLA5 and Scanpower modules

Specialized Fluid Additives – Impact

- Non-invasive fluid additives (LCP2000)
- Special fluid products for UBD operations

Leak Intervention – Seal-Tite International

- Products for leak intervention
- Tools and guidelines for implementation on site

Operational Control – TechDrill International

- Drilling Engineering Calculations
- Operational Control and reporting
- Interfacing to measured data for well report

OPERATIONAL PARAMETERS for the ABEL eUBD technique can be implemented at any wellhead pressure or type of wellbore fluids. Our operational capabilities are:

- Wellhead pressures up to 12,500 psi
- Corrosive and toxic affluent (H₂S, CO₂, etc.)
- Hi-temp Hi-pressure downhole conditions
- Zero discharge criteria
- High volume flowrates (oil, gas or water)



ABEL Engineering/Well Control Company

Company Profile: ABEL Engineering is a Texas based consulting concern that provides drilling engineering and project management services. We are a small group of engineers with experience in most types of drilling operations in locations worldwide. We specialize in the unique and difficult type well. Our staff consists of engineers and operational savvy experts who are proficient in the following areas:

Extreme Underbalanced Drilling (E-UBD) Operations:

- Feasibility studies (engineering and operations)
- Equipment specifications and design for UBD operations
- Project management of UBD operations in the field (see UBD commentary)
- UBD equipment through multiple business alliances
- Supervision of UBD operations

Well Control Services:

- Risk assessments for well control events
- Contingency Planning for worst case scenario
- Relief Well Planning and Supervision
- Well Capping Operations through business alliances

Equipment for Pressure Control:

- High Pressure Shooting Nipple
- Rotating BOP equipment
- Choke manifolds
- High pressure and low pressure 3-phase separators

Engineering and Operational Audits:

- Drilling Operations
- Planning and Engineering of Drilling Operations
- Risk assessments for insurance purposes

Special Projects:

- Hovercraft support for drilling operations in swamps and arctic conditions
- Equipment design for quick rig up for logging operations
- Special snubbing equipment for high pressure operations

Snubbing Operations:

- Planning and design of operations and equipment
- Supplier of snubbing equipment through business alliances

Wellsite Supervision of drilling, testing and completion operations

- HTHP Exploration and Development Projects
- Onshore and offshore type operations

Drilling optimization planning and implementation for::

- (HTHP (High Temperature High Pressure) exploration projects
- Development wells (infield drilling, gas and oil prospects)
- Toxic gas (H₂S) handling

ABEL Engineering Clients and Projects

Client	Location(s)	Type work performed
TOTAL (Elf)	Paris, Congo, Indonesia, Myanmar, Thailand, Argentina, China, Angola, Russia, Bolivia, Abu Dhabi, N. Sea, Africa, Brunei	well intervention of blowouts, 3x relief wells, 2s capping operations, contingency planning, snubbing operations, drilling optimization, platform firefighting plans
Schlumberger IPM*	Mexico, USA	Well intervention for underground blowout, training and contingency planning
Anadarko Petroleum Co..	Alaska, USA, Tunisia	Blowout Contingency Planning for arctic and desert operations
HBS International	Audits, Drilling Plans, Optimization	Egypt, Tunisia
Shell Exploration	New Orleans, USA	Blowout Contingency Planning for deepwater high risk
Shell International	Norway, Germany, Venezuela, Holland, Thailand	Blowout Contingency Planning jackup, land, floating operations
Mobil Oil Co. (now ExxonMobil)	USA, Nigeria, Indonesia	Blowout Contingency Planning, Snubbing Training
British Gas	Shallow gas blowout(s)	Tunisia, Thailand, Egypt
Kuwait Oil Company	Firefight and well capping services	Kuwait 1991 (41 wells in 71 days)
MEDCO E&P	HTHP Design and Implementation	Sumatra, Indonesia Hi-Risk HTHP Wildcat Well 14000 feet, 410 °F BHT
Pakistan	Lloyd's Underwriters	Risk Assessment, Blowout Contingency Planning
Lloyds Companies	Risk assessment & operator audits	Alegria, Indonesia, N. Sea, Canada, Dubai, Syria, Vietnam
USA based oil companies x 40	Drilling programs, snubbing operations,	Texas, Kansas, New Mexico, Louisiana, Oklahoma
Various legal firms	Expert witness testimony	Texas, Louisiana, Tennessee, London, Norway
Lapindo Brantas	Relief Well Snubbing Re-entry	East Java, Indonesia
Schlumberger IPM	Relief Well Snubbing Re-entry	Burgos Basin, Northern Mexico
MEDCO E&P	HTHP eUBD Design	Sumatra, Indonesia Hi-Risk HTHP Wildcat Well 12000 feet, 410 °F BHT
Schlumberger IPM	Snubbing Re-entry	Waddell Ranch W. Texas

***Note:** ABEL has a contract to provide well control services for IPM operated well in North and South America 6 projects so far with BCP, 5 underground blowouts and UBD project in Burgos Basin plus one relief well.