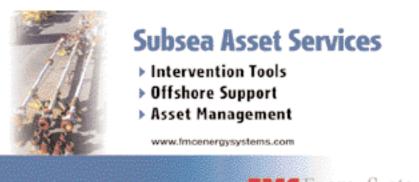


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0 6 4 9 A, B, C, D, E

300K 0 1

60K 1 1 1 1 1 1 C



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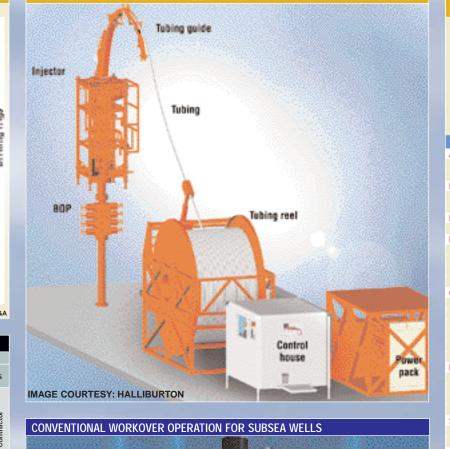
Snipper Overshot Fish-Calc

KB Straddle Pack-Off

Cobra Frac<sup>SM</sup>
Cobra Pac<sup>SM</sup>
Pressure Set Pro<sup>SM</sup>
Crimson Completion Svs
Depth Pro<sup>SM</sup>

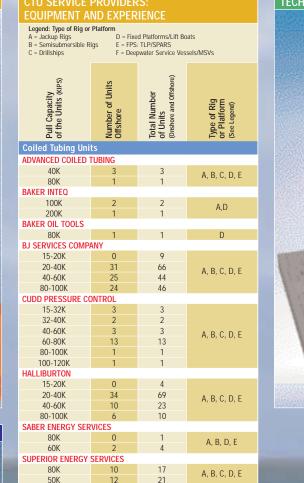
Superior Ultra Set Cmt.

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Monobore 7"-18 3/4" 10,000 10,000

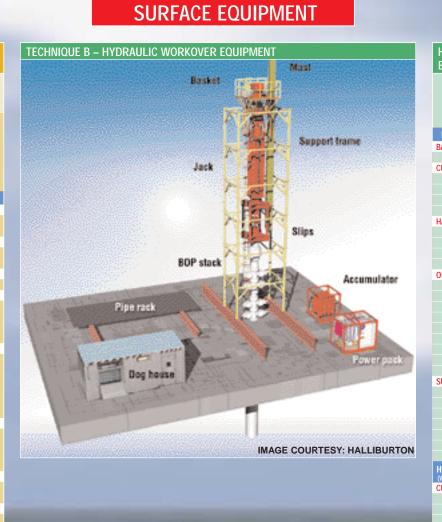
2 Y 20+ GOM



1 A, B, C, D, F

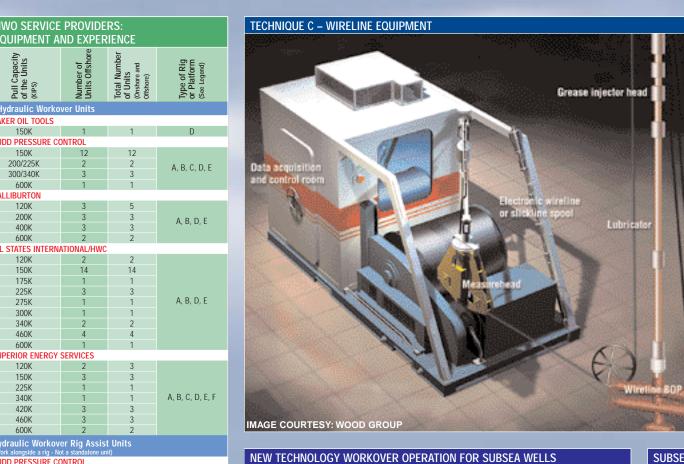
GLOBAL SUBSEA WELLS (Note 10.1)

Osabble (by 2007) precing



SUBSEA SYSTEMS

DOWNHOLE APPLICATIONS



Riser with buoyancy

emulsifiers, etc. Note 3.9: Owns a heavy lift vessel that can be converted to a MPSV.

Note 1.2: For low differential pressure (100 psi), using a bailer. Note 1.3: For short intervals. Note 1.4: Can be accomplished for highly deviated or horizontal wells with

Note 1.5: Difficult and costly for deviation angle greater than 50 degrees. Note 1.6: High Pressure CT is may be used as it provides time savings compared to HWO. Note 1.7: Tubing change out is a major workover where HWO competes Note 1.8: Possible with new technology tools, such as E-Fire. Note 3.1: Confidentiality agreement with BJ Services to develop Riserless DEMO 2000, Statoil and Norske Shell.

Note 3.2: Joint venture between ABB Offshore and Subsea Intervention AS to provide subsea systems and MPSV, respectively. Note 3.3: Provides "Landing Strings": Assembly of piping & safety valves between a subsea wells and risers provided during drilling workover activities. Note 3.4: Alliance between Oceaneering International and Superior Energy Services to develop a subsea lubricator system. Note 3.5: Provided as a package on the vessel for subsea well intervention. Note 3.6: Rental tools managed on the MPSV as an integrated package. Note 3.7: Leases BOP, surface safety equipment, pipe, etc.. Note 3.8: Provides chemicals sucs as corrosion inhibitors,

Note 3.10: Owned by Subsea 7, a joint partnership of Halliburton and Note 4.1: Some HWO units can be modified for Rig Assistance. Note 6.1: In design phase.

Note 6.2: Reconstructed in 2001. Note 6.3: Dependent on the subsea wireline system. Note 6.4: Under Construction.

Note 8.1: Detailed engineering complete. Awaiting building prospects for tubing system, RICTIS (see Note 3.1). Note 8.3: Subsea Lubricators are owned by Schlumberger. Note 10.1: Contains both producing and injection wells.

Note 10.2: Number of subsea wells operational at end of year 2002. Note 10.3: Subsea wells either under construction or planned to be stage of evaluation.

Chitwood, J.E.: "Subsea Intervention Requirements," paper OTC 8729 presented at the 1998 Offshore Technology Conference in Houston, Texas, 4-7 May. Larimore, et al.: "Case History: First Diverless Subsea Slickline Well Intervention Performed in Offshore Vietnam," paper OTC 8589 presented at the 1998 Offshore

McGennis, E.: "Coiled Tubing Performance Underlines Advances in Intervention Vessels," Offshore Magazine, February 1998. Scott, R.A.: "Multi-Service Vessels for Deepwater Subsea Well Interventions," paper OTC 12947 presented at the 2001 Offshore Technology Conference in Houston, Texas, 30 April – 3 May.

Growing Market," Offshore Magazine, June 2001, p 84.

USEFUL WEBSITE www.icota.com International Coiled Tubing Association (ICoTA)

not to participate in this poster. We make no guarantee that as possible, by acting as a neutral party and integrator of information. We have collected information from personal interviews, phone interviews, and company supplied information. Neither authors nor Granherne. Inc. nor Offshore Magazine guarantees or POSTER assumes any responsibility or liability for any reliance on the information presented. BOP Blow-Out Preventer CT Coiled Tubing CTU Coiled Tubing Units DP Dynamic Positioning DP2 Redundant dynamic positioning system

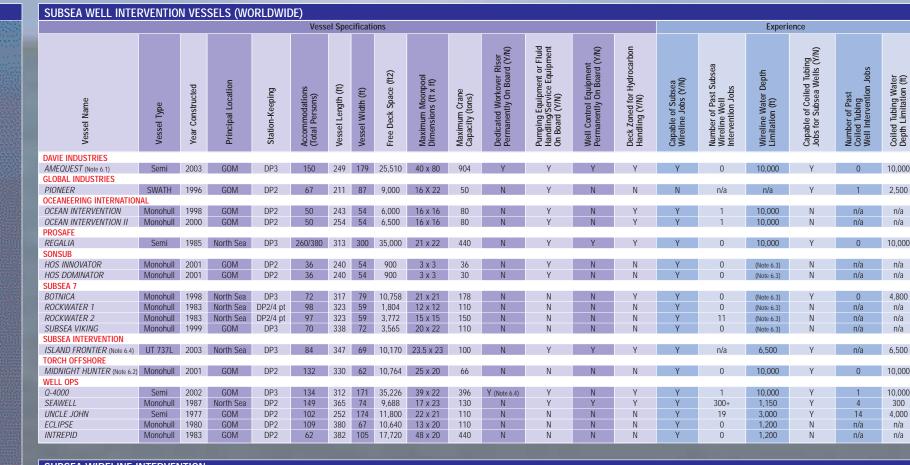
vev. In some cases the company was not included because

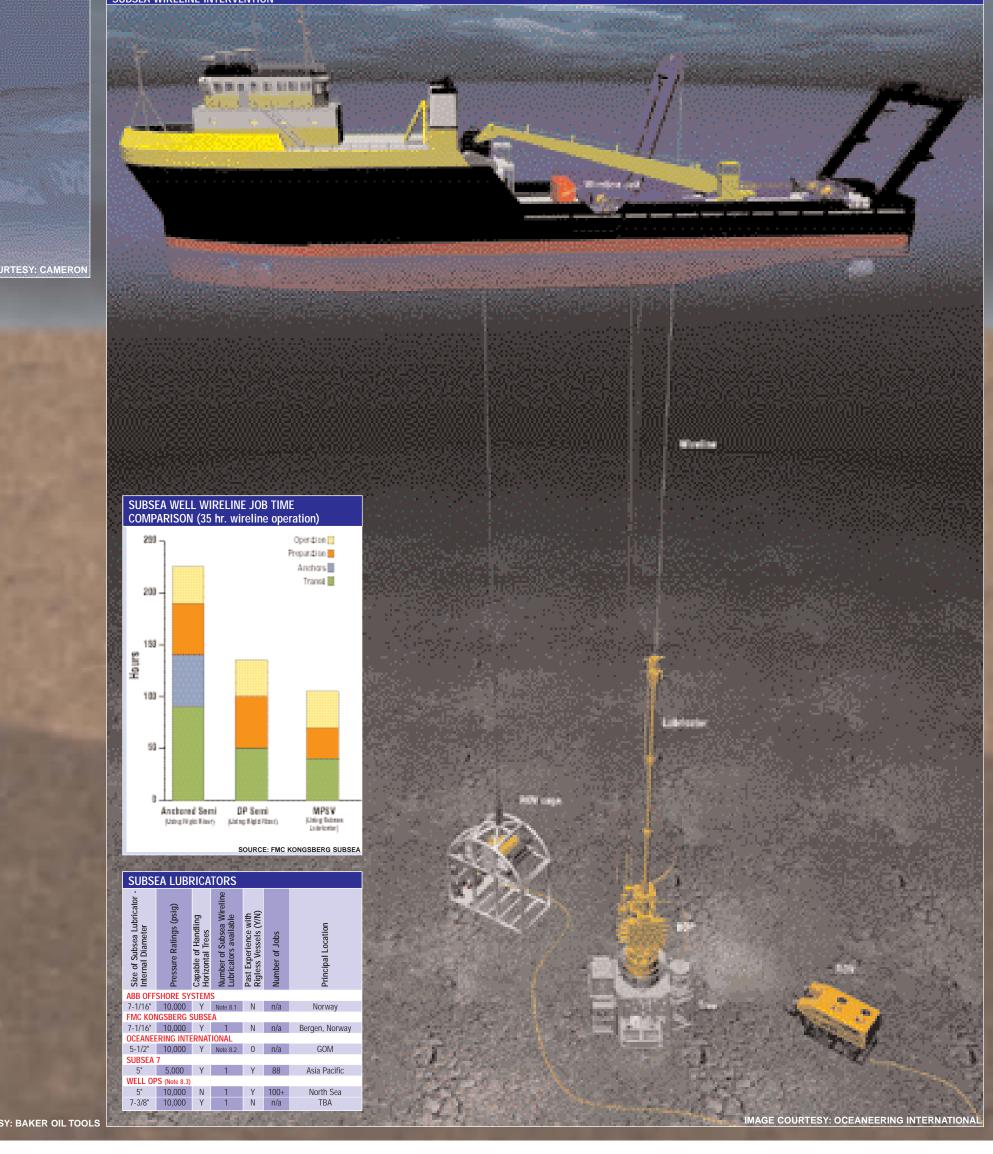
information was not supplied in time, or because they chose

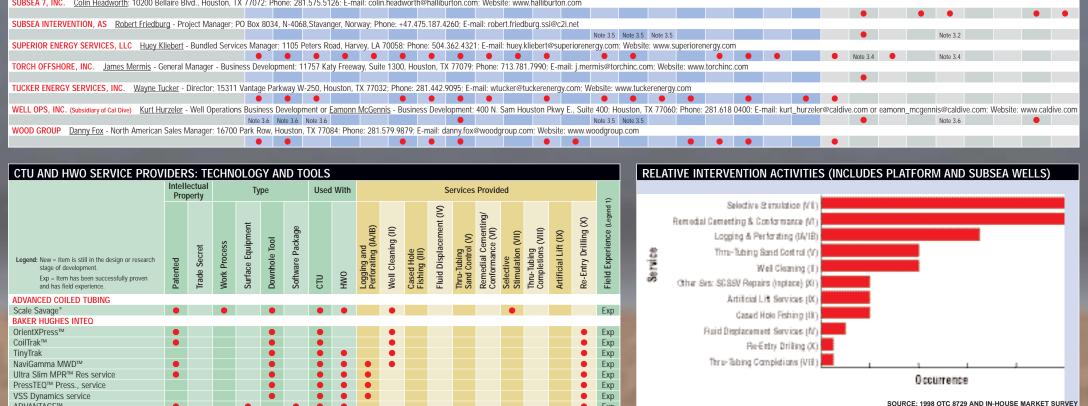
HP/HT High Pressure and High Temperature HWO Hydraulic Workover MPSV Multi-Purpose Service Vessel Maksoud, J.: "Well Intervention: New Well Intervention, Installation Vessels Aimed a ROVs Remotely Operated Vehicles SCSSV Surface Controlled Subsurface Safety Valve WRSV Wireline Safety Valve

GOM Gulf Of Mexico

DP3 Dual redundant dynamic positioning system







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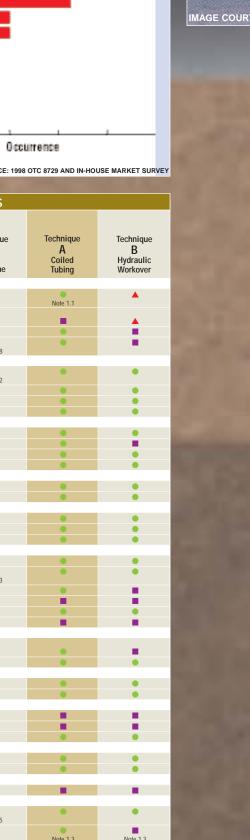
ş.	Fie	Other Ses: SCSSV Repairs (Inpla	ca) (O)			
		Artificial Lift Servi	ous (IX)			
	Exp	Cased Hoto Fish	ion (III)			
•	Exp	Ruid Displacement Servi				
	Exp Exp	Re-Entry Dril	Bing (X)			
	Exp	Ters-Tataing Completion	rs (VIII)			
·	Exp			0		
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•	Exp					
•	Exp			SOURCE: 1998	OTC 8729 AND IN-HOL	USE MARKET SURVEY
	Exp					
	Exp	<b>GUIDELINES FOR RIGLESS DO</b>	WNHOLE APPL	ICATIONS		
	Exp					
	Exp	Land - Va				
	Exp	Legend: • Yes A No	Technique	Technique	Technique	Technique
	Exp	■ Not Economical	C1	C2	Α	В
•	Exp				Coiled	Hydraulic
•	Exp	Service	Electric Line	Slickline	Tubing	Workover
•	Exp	IA/IB CASED HOLE PRODUCTION LOGGING &				
	Exp Exp	Production Logging (surface readouts)	•	<b>A</b>	Note 1.1	<b>A</b>
	Exp	Running Memory Gauges			Note 1.1	
	Exp	(incl. bottom hole pressure & temp, & flows)	<b>A</b>	•		<b>A</b>
	Exp	Well Diagnostics: Caliper Run	•	•	•	•
	Exp	Perforating Casing	•	Nets 1.0	•	
	Exp	II WELL CLEANING		Note 1.8		
	Exp	Sand Clean out or sand washing		•	•	•
	Exp	22 Start out of Sand Washing		Note 1.2		
	Exp	Paraffin & Asphaltene Removal	•	•	•	•
	Exp Exp	Scale Removal	<b>A</b>	<b>A</b>	•	•
	Ехр	Underreaming & Drilling	<b>A</b>	<b>A</b>		•
	Exp	III CASED HOLE FISHING				
	Exp	Tool Recovery Tubing Cutting - Chemical	•		•	•
		Tubing Cutting - Chemical Tubing Cutting - Mechanical				•
•	Exp	Milling		<u> </u>		
	Exp	IV FLUID DISPLACEMENT SERVICES	_	_		
	Exp	Nitrogen Jetting/Lifting	<b>A</b>	<b>A</b>	•	•
	Exp	Liquid Displacement	<b>A</b>	<b>A</b>	•	•
	Exp Exp	V THRU-TUBING SAND CONTROL SERVICE				
	Ехр	Sand placement as filter media	<u> </u>	<u> </u>	•	•
	Exp	Running Screens	<u> </u>	•	•	•
	New	Inject Resin Materials  VI REMEDIAL CEMENTING/CONFORMANCE	_	_		
•	Exp	Cement/chemical shut-off & profile control	<u> </u>	<b>A</b>	•	•
		Spotting Isolation Plugs	•	•	•	•
	Exp		Note 1.3	Note 1.3		
	Exp	Setting mechanical plugs	•	•	<u> </u>	
	Exp	Sleeve Shifting Penairing Casing and Tubing Leaks	<u> </u>	<b>A</b>	•	
	Exp Exp	Repairing Casing and Tubing Leaks Tubing punching				
	Exp	VII SELECTIVE STIMULATION		•	-	_
•	Ехр	Remedial Stimulation by pumping fluids				
		(acids, solvents, surfactants)	<b>A</b>	<b>A</b>	•	
	Exp	Fracturing (using propants)	<b>A</b>	<b>A</b>		•
	Exp	VIII THRU-TUBING COMPLETIONS		•		
	Exp	Velocity or Siphon & Injection Strings Production String	<u> </u>	<b>A</b>	•	
	New	IX ARTIFICIAL LIFT SERVICES				
	Exp Exp	Gas Lift valve Installation/pulling/retrieving		•		
	Exp	Servicing an Artificial lift Pump Inplace	_	•		
	Ехр	Setting/Retrieval of Artificial lift pumps	<u> </u>	•	•	•
	Exp	X RE-ENTRY DRILLING				
		Side Tracking	<b>A</b>	<b>A</b>	•	•
•	New	Deepening	<b>A</b>	<b>A</b>		•
	Exp	XI OTHER SERVICES	_			_
		SCSSV Repair (inplace lockout & WRSV installation)		•	•	•
	Exp	QUALIFICATIONS  Highly deviated wells	•	•	•	•
	Firm	Highly deviated wells	Notes 1.4,1.5	Note 1.5		•
	Exp	Work in Horizontal Wells	•	<u> </u>	•	
	Exp Exp		Note 1.7		Note 1.3	Note 1.3
	Ехр	High Pressure workovers	<b>A</b>	<b>A</b>	Note 1.6	•
	Exp	Tubing Change Out (Note 1.7)	<b>A</b>	<b>A</b>	Note 1.0	•
		3		_		

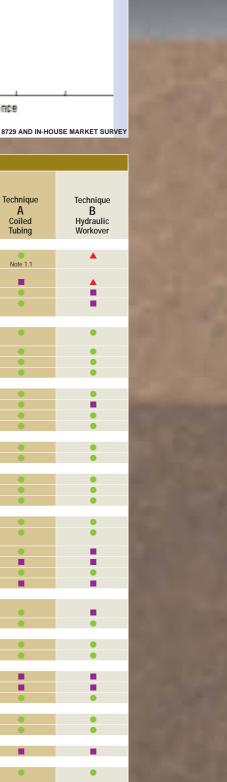
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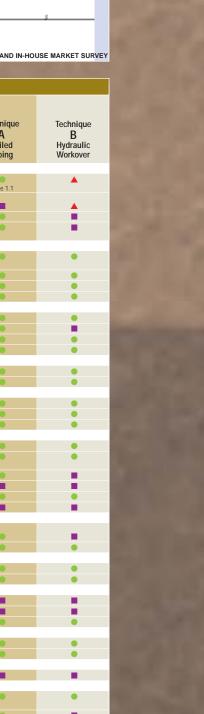
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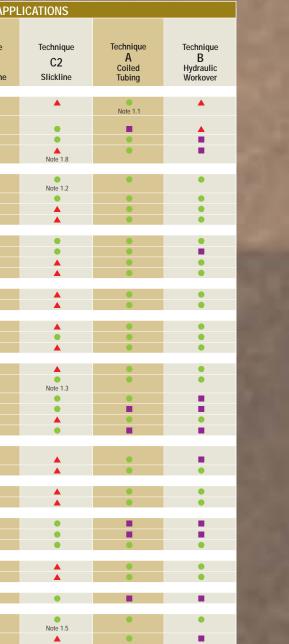
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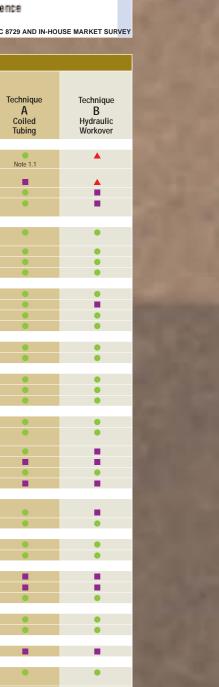








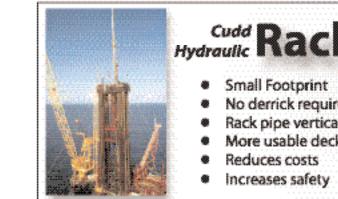






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