

Next Generation

Drilling & Subsea Systems





Drilling Systems

Superior Performance

Offshore operations have many challenges and 20,000 psi only increases the complexity. Harsh conditions, ultra deep water, speed of operations, environmental impact, weight of equipment and safety of your people are just some of the things to consider. We understand. You need the best topside equipment to make it happen from a partner that is capable of designing, executing and integrating the complete system.

HOISTING SYSTEMS

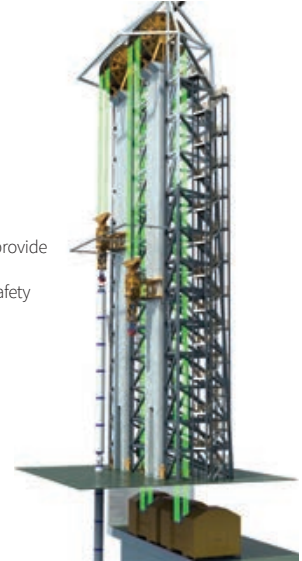
Cylinder Hoisting

- Delivered in 750, 1000, and 1250 sT
- Capable of 1500, 1750, 2000 sT and beyond
- Push button speed change across all load ranges
- Faster acceleration/deceleration and response
- Accumulator and pressure vessels for energy recovery and passive compensation
- Multiple cylinders provide operational redundancy
- Multiple parallel wires share load – increased safety
- No slip/cut, 5 year wireline life
- Floor mounted active/passive compensation
- Completely open drillfloor layouts
- Lowered center of gravity



Single Layer Winch

- Delivered in 350 and 750 sT
- Capable of 1000, 1250, 1500, 1750, 2000 sT and beyond
- Improved speeds across all load ranges
- Faster acceleration/deceleration and response
- Kinetic Energy Recovery System (KERS)
- Multiple motors, brakes, drives, and flywheels provide operational redundancy
- Multiple parallel wires share load – increased safety
- No slip/cut, 5 year wireline life
- Winch and crown mounted active/passive compensation
- Completely open drillfloor layouts
- System operates at less than 10 rpm



*Dual Active Heave Drawworks configurations available in 1250 and 1500 sT ratings

Top Drive Systems



TDX 1500

- Max Torque: 105,000 ft-lbs
- Hoisting: 1,500 sT at elevator
- Rotating load capacity: 1,500 sT

Other Products

- BX 7 Elevator - 1,250 sT
- BX 9 Elevator - 1,500 sT
- Links - Weldless, forged from single piece
- Pipe handler

Floor Operations



ARN 270

- Triple grip design
- 200,000 ft-lbs make/break torque

Other Products

- PS495 hydraulic power slip: 1,250 - 1,500 sT capacity
- Manipulating arms
- Service access baskets
- Utility winches: 5 - 30 sT

Solid Control / Pumping System



DORS™ Routing System

- Automated mapping and remote control transfer system
- Maximize uptime
- Reduce risk of contamination
- Reduce chemical/mud losses
- Efficient plant usage/capacity

Other Products

- Mud pumping
- Mud mixing
- Storage/tanks
- Valves and piping
- Engineering support team for mud package

Motion Compensation



Riser Tensioning

- NRT-4800 N-Line riser tensioner
- 4,800 kips max tension capacity
- Riser anti-recoil system
- Redundancy - capable of operating on four of six cylinders

Drill String Compensation

- Active and passive compensation
- Floor mounted compensators
- Crown mounted compensators

Configure the perfect package for your ultra deepwater requirements with a wide range of dependable NOV topside options



Proven Innovation

Committed to Your Success

- Rigorously-tested designs - robust, reliable, redundant
- Configured packages
- Evolution of proven concepts
- Invested in world-class R&D facilities

Seamless Execution

- Industry-leading project management
- Close collaboration with our partners
- Worldwide quick response manufacturing facilities

Priority on Safety

- Safety is integral to our design
 - Drops compliance
 - Ergonomic considerations
 - Regulatory partnerships
- Condition based monitoring and maintenance features
- Remote monitoring and advisory capabilities
- Multi-machine control system
- Hands-off operations
- Our standards meet or exceed industry regulations

Control System



Cyberbase™

- Integrated drilling control system for advanced drilling rigs
- Application interfaces for web driller and kick monitoring
- Complies with highest safety standards

Other Products

- Multi Machine Control (MMC)
- VFD power distribution
- Maestro™ drilling power allocation
- SoftSpeed II™

Tubular & Riser Handling



CRX

- Height: 148 ft
- Maximum stand height: 142 ft
- Reach: 5 m
- 2 7/8" – 22" tubular OD range (Excludes fingerboard limits)

Other Products

- Hydraracker IV (Hydraulic)
- PRS 5 (Electric)

Lifting and Handling



Trident Crane

- Purpose built for fiber rope but can also handle hybrid rope or steel wire
- AC PM electric drive on winch enables reduced power consumption
- Substantial weight savings
- Lower CoG of crane system compared with winch above deck
- Lifting Operator Station

*Offshore lattice and knuckle boom cranes also available

Other Considerations



- BOP handling system
- Xmas tree handling
- 20ksi choke & kill manifold
- Gantry cranes and trolley systems
- Onsite inspection and repair

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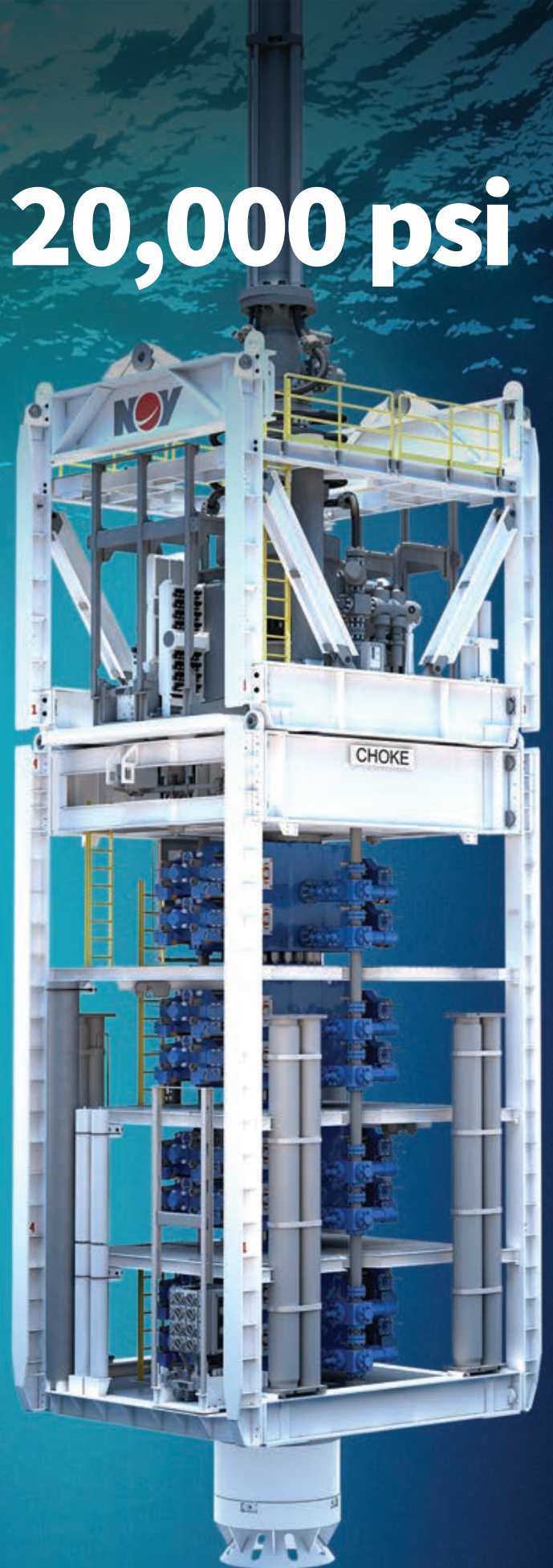
Higher Hookloads

**Configurable
Rigfloor**

20,000 psi

As offshore drilling moves into deeper water and more complex reservoirs executing a project on time and under budget has never been more critical.

Our commitment to helping our customers overcome these challenges has never been greater.



Complete System OEM Greatest Shearing Capacity Global Support Network

Rigorously Tested

- Above API standards
- BOP shell test to 1.5x
- Detailed results available on request

Proven Concepts

- Evolution of principles used in industry-leading 15,000 psi stacks
- Maintains NOV standard 5,000 psi working pressure
- 12,000 ft. water depth rating
- Low Force Shear System

Advanced & Simplified

- Modular stack configurations (6, 7, or 8 cavity)
- Low shock SPM valves
- Boltless doors and replaceable seal seats for enhanced serviceability



Robust & Reliable Controls

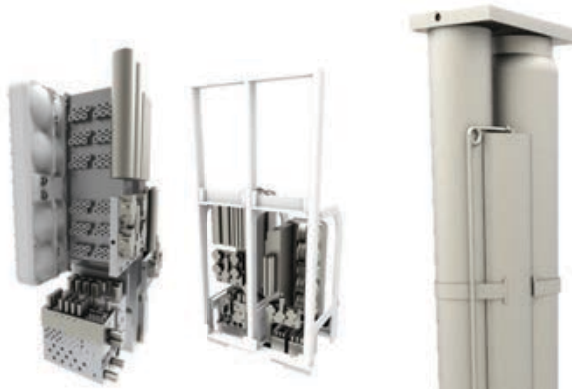
- Reduced number of seals by 67% in control pod
- Retrievable RCX™ Control Pod with 140 function capability
- Retrievable EHBS with integrated acoustics

Weight Conscious

- Depth Compensated Bottles
- Multi-ram capability potentially eliminates a cavity
- Shearing capability potentially eliminates a cavity
- Lightweight riser flange design

Safety Priority

- Ram position indicators
- High angle release riser connector
- Comprehensive fault logging – BOP health monitoring
- Configurable stack frame with space to work
- Ladders and platforms at each level



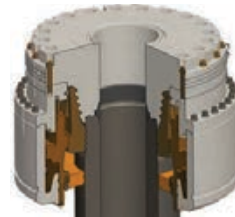
Retrievable RCX Control Pod

- Dual Retrievable Modules
 - LMRP
 - BOP
- 174" H X 102" W X 54" D
- 40,000 lbs
- 140 Functions
- Operating Pressure: 5,000 psi
- Regulated Pressures
 - 5,000 psi
 - 3,000 psi
- Common Retrieval Tool with EHBS
- -20° C to 50° C (-4° F to 122° F)

Depth Compensated Bottles

- Most efficient subsea accumulator
- Maintains performance regardless of depth
- Significantly reduce number of bottles needed

Usable Vol. (Max)	H	W	D	Weight
19.95 Gal	150"	34"	19.5"	7,208 lb
24.2 Gal	175"	34"	19.5"	7,984 lb
30.3 Gal	210"	34"	19.5"	9,077 lb
32.8 Gal	225"	34"	19.5"	9,545 lb



Wellhead Connector

- Model: CDX-2030
- 20,000 psi Rated Wellbore Pressure
- Industry leading bending and tension capacity
- Unlock force 30% greater than locking force
- Load path directly through self-locking segments
- 92% surface coverage on locking profile allows for higher pre-load without damaging wellhead/mandrel
- Use of common parts across other models for increased availability
- Locking piston visual indicators with wear based maintenance grooves
- Utilize H4 locking profile



I Class Flange Type Riser

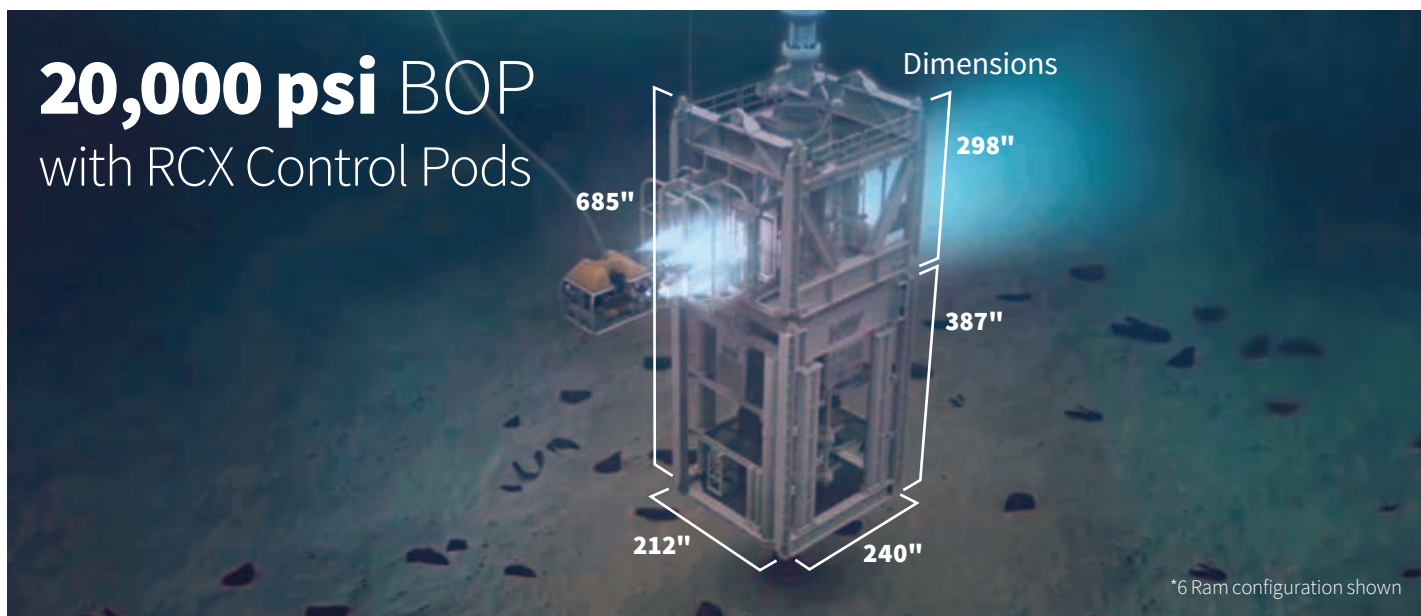
- Length: 75 ft Joints
- OD x Wall Thickness: 22" x 0.875"
- Tapered String: 22" x 1.0625"
- Mud Weight: 16 ppg @ 10,000 ft
- Tension Capacity: 4.0M lbs - I Class
- Riser Tools, Spider, Gimbal: 1500 sT
- Telescopic joint rating: 4000 kips
- Inner/outer barrel lock rating: 3000 kips
- Rotary Table: 75.5"
- Diverter: 75.5" / 500 psi
- N-Line or Wireline tensioner options
- Buoyancy: 62" Ultralight
- Choke & Kill Lines: 7.25" OD x 4.5" ID
- Mud Boost: 5"OD x 4"ID – 7.500 psi
- Rigid Conduit Lines: 2.875" OD x 2.32" ID

LMRP HAR Connector

- Model: CHX-1030
- HAR – High Angle Release
- 10,000 psi Rated Wellbore Pressure
- 1,500 psi Rated Operator Pressure

Robust, Reliable, Retrieveable

NOV's 20,000 psi BOP will be controlled by the new RCX control pods. With new regulations, stack pulls have become more frequent, raising costs and inefficiency. NOV has identified root causes of failure and eliminated them through innovative design, increasing robustness and reliability. In the unlikely event of a failure, the RCX control pod can be retrieved and replaced without pulling the stack.



18-3/4" 20K Stack Configuration	Dimensions (H x W x D)	Dimension LMRP (H x W x D)	Dimension Lower Stack (H x W x D)	Est. Weight (lbs)
6 Ram (3 Double)	685" x 240" x 212"	298" x 240" x 212"	387" x 240" x 212"	980,000
7 Ram (3 Double, 1 Single)	749" x 240" x 212"	299" x 240" x 212"	451" x 240" x 212"	1,250,000
8 Ram (4 Double)	775" x 240" x 212"	298" x 240" x 212"	477" x 240" x 212"	1,350,000

BOP Specifications	MULTI RAMS PIPE RAMS	DESIGN	FLANGE CONFIGURATION	HEIGHT (in)	WEIGHT (lbs) 23" Operator	WEIGHT (lbs) 15-1/4" Operator	SHEAR RAMS
		<ul style="list-style-type: none"> Single Single Single Double Double Double 	<ul style="list-style-type: none"> Stud X Stud Stud X Flange Flange X Flange Stud X Stud Stud X Flange Flange X Flange 	<ul style="list-style-type: none"> 45.00 63.00 83.00 73.50 91.50 111.50 	<ul style="list-style-type: none"> 58,980 66,010 73,040 78,470 85,500 92,530 	<ul style="list-style-type: none"> 53,480 60,510 67,540 72,970 94,900 102,700 	
<ul style="list-style-type: none"> • Model: 18-3/4" 20,000 psi • Boltless Doors • Replaceable Seal Seats • Automatic Locking System • Ram Position Indicators • 15-1/4" Operator: 18.8/20.3 Gallons (Open/Close) – 3,000 psi max • 23" Operator: 52.9/52.0 Gallons (Open/Close) – 5,000 psi max • Centralizing Shear Rams • Pipe Rams (Multiple Sizes) • Multi Rams (4-1/2" - 6-5/8") 							

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Corporate Headquarters

7909 Parkwood Circle Drive
Houston, Texas 77036
USA

Rig Systems Headquarters

10000 Richmond Avenue
Houston, Texas 77042
USA