

Modular Rig



Archer's modular drilling rig (MDR) solution is a breakthrough in its field; utilizing an innovative, modular state-of-the-art design. It offers operational flexibility and cost efficiency unrivalled by any other modular offshore drilling units (MODU) on the market.

The MDR package can be tailored to meet well-specific requirements and provide operators with a cost efficient alternative to both mobile offshore drilling units (MODU) and traditional platform drilling rigs on both existing and future installations.

As a super-single rack and pinion rig, the MDR combines the very latest in drilling technologies in a lightweight, compact, modular package. It can be rigged up rapidly on the majority of offshore installations to provide complete life-cycle drilling and workover services, from initial well delivery right through to decommissioning.

The MDR package has been designed by operations and engineering personnel who have a deep practical knowledge and experience of offshore drilling.

It can perform most drilling operations i.e. top-hole to cased hole drilling, including complex completions, plug and abandonment and can operate in harsh offshore environments.

Operations



Through its innovative multi-purpose design, our MDR solution is capable of drilling, workover and plug and abandonment operations.

It has the ability to run complex (multi-cable) completion strings to all conventional well depths. Through the installed Unitong, both the casing and tubing are run in a safe and efficient way. There is no need for a separate rig-up for casing or tubing running, and the integrated torque/turn computer readings can be transferred in real-time via the web.

To maximize flexibility, Archer's MDR packages are designed with the capability for the following services:

- Drilling services
- Snubbing services
- Floor mounted rig assist
- Through tubing rotary drilling (TTRD)
- Workover services
- Complex completions
- Casing drilling technologies
- Managed pressure drilling (MPD)
- Plug & abandonment activities (P&A) and through rig intervention support platform for coiled tubing, slickline and e-line

The MDR can be rigged up on most offshore installations and perform most drilling services from the top hole to cased hole, side-tracks. This includes complex completions and plug & abandonment services.

Benefits & key features

Archer's modular drilling rig package is an attractive alternative to expensive, fixed drilling facilities, particularly as costs involved in reactivation or new-builds continue to rise.

The modular rig package is lighter and more compact than alternatives, reducing the platform size required. The high degree of mechanization and automation has significantly reduced size of the drilling crew and the construction costs. In addition, it can be tailored to meet well-specific requirements.

Utilization of an MDR, in both greenfield and brownfield environments, negates expensive CAPEX investments and/or costly re-activation projects. Rental of an MDR also negates operating, maintenance and re-certification costs on existing drilling facilities, therefore the following benefits can be realized:

- Low investment, rental alternative (CAPEX vs OPEX)
- Greatly reduced time from project start until start operation
- Low POB, minimum of (8+8) based on 24 hour operation
- No maintenance responsibilities unlike fixed drilling packages
- Compact, lightweight concept - reduced platform/jacket size and/or steel weight loading
- Capable of a wide range of operations; from top-hole to P&A

In comparison to high MODU rental rates, and/or lengthy and costly drilling topside upgrade projects, or as an alternative to fixed drilling topsides on greenfield projects, all of these benefits mean our MDR presents a good business case with operational and financial benefits to the operator.

Configuration & capabilities

In developing the MDR we assessed both bespoke MDR and generic Archer MDR solutions to tailor-make configurations to suit most platforms, based on our experience of drilling and intervention requirements.





Archer Emerald located on Maui A
- Tasman Sea, New Zealand, 2013

*Picture courtesy of
Shell Todd Oil Services Limited.*

Safety



Archer Topaz located on Statoil Heimdal platform. Norwegian sector of North Sea. 2014

While we focus on our customer's business needs and operational success we never forget that safety is our first priority, as a result it was a critical factor in the development of the MDR package.

It is specifically designed to ensure the highest HSE standards and practices are met. This includes:

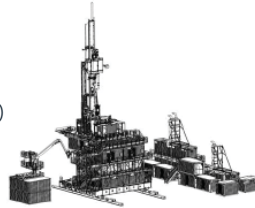
- Area classification in accordance with EI 15
- Zero discharge philosophy - drillfloor drip pans and module bunding
- No personnel on drillfloor "red zone" during normal drilling operations
- Remote / hands free pipehandling operations
- CCTV system utilized on pipe-handling equipment, at BOP deck, mud pumps and shale shakers
- Built in compliance with NORSOK D-001, EU and UK legislation including ATEX, API, PUWER, LOLER and other industry codes and standards
- Certified in accordance with DNV-OS-E-101
- Independent F&G, ESD systems capable of being integrated easily with existing platform systems
- Anti-collision prevention systems incorporated in drilling control systems, reducing human error factor

Archer is a global oilfield service company with more than 40 years' experience, over 8,000 employees, and operations in more than 100 locations worldwide. From drilling services, production optimization, well integrity and intervention, to decommissioning, Archer is focused on safely delivering the highest quality services and products to the drilling and well service markets. **We are Archer.**

Emerald 400sT SUPER SINGLES RIG

Rig capability

- Drilling services
- Snubbing services
- Through tubing rotary drilling (TTRD)
- Work-over services
- Complex completions
- Managed-pressure drilling (MPD)
- Plug-and-abandon activities (P&A)
Through Rig Intervention support (Coiled Tubing, Sickline and E-Line)



Key Features

- DNV-OS-E-101 Class rig
- Fully Mechanised & part Automated Rig Package “Hands Free”
- Cyber based Remote / Automated Drilling operation
- Compact Footprint
- Efficient Rig-up / down - 14 days
- Light Modules - Max. Lift 12 Tonnes
- Patented Self Erect Mast System
- Low POB - 16 per 24 hr Operations
- 400 short ton pull capability
- 100 short ton push “Snub” capability

Specifications

Classification	Dry Weight	Max. Wet Weight 2.2 SG Fluid	Max. Wet + Max. Hookload
Basic Rig Packages	444 MTe	466 MTe	828 MTe
Active Mud System	379 MTe	610 MTe	
Power Generation	238 MTe	244 MTe	
Combined Package	1,061 MTe	1,320 MTe	1,664 MTe

General	
Model	Rack & Pinion Super Singles Modular Drilling Unit
Substructure / Skid Beam Footprint	6m x 6m x 10m / 16m x 6m x 1.2m
Dry Weight (Complete)	1,302 MTe

Mast	
Maximum Working Load	400 sT
Mast Height	28 metres
Free Working Height	19 metres
Operating Singles	Range III (45 ft)
Utility Winch	4Te SWL

Top-Drive System	
Maximum Hoisting Speed	45 metres/min
Maximum Pull Capacity	400sT (800,000 lbs / 362 mT)
Maximum Push Capacity	100sT (200,000 lbs / 90 mT)
Maximum Torque	85,000 Nm (62,692 ft/lbs)
Maximum rpm.	190
Maximum Circulating Pressure	5,000 psi (345 Bar G)

Rotary Table	
Maximum Load	370 Tonnes
Maximum Opening	37.5 inches
Maximum Torque	45,000 Nm (33,190 ft/lbs)
Maximum rpm.	10

UniTong	
Torque Capacity	150,000 ft/lbs
Tubular Range	2-3/8" to 20"

Powerslips	
Model	PS 21
Tubular Range	2-7/8" to 14"
Maximum vertical load	350 Ton
Reactive Torque	45,000 ft/lbs @ 14" Diameter Tubing

Cathead	
Model	BX 24
Maximum Line Pull	25,000 lbs
Maximum Breakout Torque	100,000 ft/lbs on 4ft Tong
Samson Post	2.5m high complete with adjustable rollers and SWL of 120,000 ft/lbs

Driller's Cabin	
Controls	2 x Fully Redundant Drilling Operating chairs
	1 x Drilling Monitor Display Desk CCTV Station, Data Acquisition System, BOP & C&K Panel, F&G Display Panels

Cherry Picker Crane	
Maximum Reach	12.4 metres
Personnel Basket	Yes
Certified Lifting Hook	Yes
Maximum Lift Capacity	1.2 Tonnes @ 12.4 metre Radius
Maximum Lift Capacity	8 Tonnes Minimum Radius

Pipe Deck Crane	
Maximum Reach	14 metres
Tubular Range	2-1/2" to 20"
Maximum Lift Capacity	1.42 Tonnes @ 14 metre Radius

Pipefeeder	
Maximum Operational Weight	9 Tonnes

Horizontal to Vertical Pipe Gripper	
Maximum Tubular Length Handling	17 metres
Tubular Range	2-1/2" to 20"
Maximum Lift Capacity	3 Tonnes

Generator #1 to #3 (each)	
Output	Diesel Driven - 1.2 MW at 690 Volt 50 Hertz

Powerhouse #1 to #4 (each)	
Electrical Supply	690 V 50 Hz
Electrical Distribution	690V 50 Hz / 400V 50 Hz / 230V 50 Hz

SAS Module	
Systems	Tyco Fire & Gas System - Main Panel
	Emergency Shut-down - Main Panel
	Telecoms Main Panel - Phone, PA, Talkback
	Closed Circuit Television System - Main Panel

HVAC Module	
Systems	Air Handling
	Air Conditioning

HPU Module #1 & #2 (each)	
HPU Capacity	1140 HP (850kW) Electric Driven

Shale Shaker Module #1	
Shale Shaker #1	NOV Brandt VSM 300
Model	Model 1500 Burgess Magna-Vac Degasser
Capacity	1,000 GPM @ 15" of Mercury Vacuum
Ditch Magnet Model	Perm.-magn

Shale Shaker Module #2	
Shale Shaker #2	NOV Brandt VSM 300
Ditch Magnet Model	Perm.-magn

Sand Trap #1 & #2 Module (each)	
Dry Weight	11.5 Tonnes
Wet Weight	64.3 Tonnes
Sand Trap #1 Capacity	150 bbls 24 m3
System Maximum Working Pressure	150 psi 10 BAR
Charge Pump #1	NOV Mission Magnum 6x5x14 (12" Impeller)
2 x Agitators	Turbo Mixer - Type KAF 15/66 ex
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL

Screw Conveyor	
Model	Spirator Screw Conveyors - SD300 (bi-directional)
Conveyed Material	Drill cuttings 0-10mm Granulation >2.0 mT/m3
Performance	5m3/hr

Active Tank #1 Module	
Dry Weight	118 Tonnes
Wet Weight	65.3 Tonnes
Active Tank #1 Useable Capacity	109 bbls 17.4 m3
System Maximum Working Pressure	150 psi 10 BAR
Charge Pump #3	NOV Mission Magnum 6x5x14 (12" Impeller)
1 x Agitator	Turbo Mixer - Type KAF 15/66 ex
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL
Pill Tank #1 Useable Capacity	43.5 bbls 6.9 m3
Agitator	Turbo Mixer - Type KAF 14/68 ex
Charge Pump (Shared)	Utilises Active Tank #2 Charge pump #3
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL

Active Tank #2 Module	
Dry Weight	110 Tonnes
Wet Weight	67.5 Tonnes
Active Tank #1 Capacity	159 bbls 25.3 m3
System Maximum Working Pressure	150 psi 10 BAR
Charge Pump #4	NOV Mission Magnum 6x5x14 (12" Impeller)
2 x Agitators	Turbo Mixer - Type KAF 15/66 ex
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL

Mud Pump Module #1 to #4 (each)	
Mud Pump Model	NOV D-750L Triplex Piston Pump
Pulsation Dampner W.P.	5,000 psi 345 BAR
Pump Saver Model	3-1/16 5,000 psi Magnum Pump Saver
Pump Saver W.P.	5,000 psi 345 BAR
Strainer Block Diameter	4-1/16"
Strainer Block Working Pressure	5,000 psi 345 BAR

Choke and Kill Manifold	
Maximum Operating Pressure	10,000 psi
Choke Line	3"

Standpipe Manifold	
Maximum Operating Pressure	5,000 psi
Standpipe OD	5"

Trip Tank	
Tank #1 Capacity	30 bbl 5m3
Tank #2 Capacity	30 bbl 5m3
2 x Charge Pump	NOV Mission Magnum 3x2x13 (10" Impeller)

Poorboy Degasser	
Capacity	9 MMscf gas/day
Design Pressure	10 BAR
Vent Line	10" Diameter. Terminating 4 m above top of mast

BOP Stack/Accumulator Unit	
BOP Size	13-5/8"
BOP Pressure Rating	10,000 psi W.P.
Accumulator Design Code	NORSOK D-001
Design / Ops / Shear Ops Pressures	3,000 psi / 1,500 psi / 2,800 psi
Accumulator Bottle Capacity	24 x 15 US Gallons - (360 US Gallons)
Remote Panels (Zone 1 compliant)	2

Archer is a global oilfield service company with more than 40 years' experience, over 8,000 employees, and operations in more than 100 locations worldwide. From drilling services, production optimization, well integrity and intervention, to decommissioning, Archer is focused on safely delivering the highest quality services and products to the drilling and well service markets. **We are Archer.**

Topaz 400sT SUPER SINGLES RIG

Rig capability

- Drilling services
- Rig assist snubbing services
- Through tubing rotary drilling (TTRD)
- Work-over services
- Complex completions
- Managed-pressure drilling (MPD)
- Plug-and-abandon activities (P&A)
Through Rig Intervention support (Coiled Tubing, Sickline and E-Line)



Key Features

- Fully Mechanised & part Automated Rig Package
- Cyber based Remote / Automated Drilling operation
- Built in accordance with NORSOK & UK legislation
- Compact Footprint
- Efficient Rig-up / down - 14 days
- Light Modules - 12 Tonnes
- Patented Self Erect Mast System
- Low POB
- 400 sT pull capability
- 100 sT push "Snub" capability

Specifications

Classification	Dry Weight	Max. Wet Weight 2.2 SG Fluid	Max. Wet + Max. Hookload
Basic Rig Packages	541 MTe	563 MTe	925 MTe
Active Mud System	545 MTe	776 MTe	
Power Generation	185 MTe	185 MTe	
Modular Pipedeck	182 MTe	332 MTe	
Combined Weight	1,453 MTe	1,856 MTe	2,218 MTe

General	Streicher
Model	Rack & Pinion Super Singles Modular Drilling Unit
Substructure / Skid Beam Footprint	6m x 6m x 10m / 16m x 6m x 12m
Dry Weight (Complete)	1,420 MTe

Mast	Streicher
Maximum Working Load	400 sT
Mast Height	28 metres
Free Working Height	19 metres
Operating Singles	Range III (45 ft)
Utility Winch	4.5 mT SWL

Top-Drive System	Streicher
Maximum Hoisting Speed	45 metres/min
Maximum Pull Capacity	400sT (800,000 lbs / 362 mT)
Maximum Push Capacity	100sT (200,000 lbs / 90 mT)
Maximum Torque	85,000 Nm (62,692 ft/lbs)
Maximum rpm.	190
Maximum Circulating Pressure	5,000 psi (345 Bar G)

Rotary Table	Streicher
Maximum Load	370 Tonnes
Maximum Opening	375 inches
Maximum Torque	45,000 Nm (33,190 ft/lbs)
Maximum rpm.	10

UniTong	Weatherford
Torque Capacity	150,000 ft/lbs
Tubular Range	2-3/8" to 20"

Powerslips	NOV
Model	PS 21
Tubular Range	2-7/8" to 14"
Maximum vertical load	350 Ton
Reactive Torque	45,000 ft/lbs @ 14" Diameter Tubing

Cathead	Bentec
Model	HC-31
Maximum Line Pull	25,000 lbs
Maximum Breakout Torque	100,000 ft/lbs on 4ft Tong
Samson Post	2.5m high complete with adjustable rollers and SWL. of 120,000 ft/lbs

Driller's Cabin	Labtech/Streicher
Controls	2 x Fully Redundant Drilling Operating chairs
	1 x Drilling Monitor Display Desk CCTV Station, Data Acquisition System, BOP & C&K Panel, F&G Display Panels

Cherry Picker Crane	Palfinger/Streicher
Maximum Reach	12.4 metres
Personnel Basket	Yes
Certified Lifting Hook	Yes
Maximum Lift Capacity	1.2 Tonnes @ 12.4 metre Radius
Maximum Lift Capacity	8 Tonnes Minimum Radius

Pipe Deck Crane	Palfinger/KL Millar/Streicher
Maximum Reach	21 metres
Tubular Range	2-3/8" to 20"
SWL	2.5 mT

Pipefeeder	Streicher
Maximum Operational Weight	9 Tonnes

Horizontal to Vertical Pipe Gripper	Streicher/Kinshofer
Maximum Tubular Length Handling	17 metres
Tubular Range	2-3/8" to 20"
Maximum Lift Capacity	3 Tonnes

Transformer #1 and #2	
Capacity - each	1750kVA, 5.5 KV/690V

Powerhouse #1 to #4	(each)
Electrical Supply	690V 50 Hz
Electrical Distribution	690V 50 Hz / 400V 50 Hz / 230V 50 Hz

SAS Module	
Systems	Tyco Fire & Gas System - Main Panel
	Emergency Shut-down - Main Panel
	Telecoms Main Panel - Phone, PA, Talkback
	Closed Circuit Television System - Main Panel

HVAC Module	
Systems	Air Handling - Air Conditioning
Max Capacity (Fan A + B)	2 x 5000 m3/hr
Module Weight	9 mT

HPU Module #1 & #2	(each)
HPU Capacity	1140 HP (850kW) Electric Driven

Shale Shaker Module #1	
Shale Shaker #1	NOV Brandt VSM 300
Model	Model 1500 Burgess Magna-Vac Degasser
Capacity	1,000 GPM @ 15" of Mercury Vacuum
Ditch Magnet Model	Perm.-magn

Shale Shaker Module #2	
Shale Shaker #2	NOV Brandt VSM 300
Ditch Magnet Model	Perm.-magn

Sand Trap #1 & #2 Module	(each)
Dry Weight	11.5 Tonnes
Wet Weight	64.3 Tonnes
Sand Trap #1 Capacity	150 bbls 24 m3
System Maximum Working Pressure	150 psi 10 BAR
Charge Pump #1	NOV Mission Magnum 6x5x14 (12" Impeller)
2 x Agitators	Turbo Mixer - Type KAF 15/66 ex
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL

Screw Conveyor	
Model	Spirator Screw Conveyors - SD300 (bi-directional)
Conveyed Material	Drill cuttings 0-10mm Granulation >20 mT/m3
Performance	5m3/hr

Active Tank #1 Module	
Dry Weight	118 Tonnes
Wet Weight	65.3 Tonnes
Active Tank #1 Useable Capacity	109 bbls 174 m3
System Maximum Working Pressure	150 psi 10 BAR
Charge Pump #3	NOV Mission Magnum 6x5x14 (12" Impeller)
1 x Agitator	Turbo Mixer - Type KAF 15/66 ex
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL
Pill Tank #1 Useable Capacity	43.5 bbls 6.9 m3
Agitator	Turbo Mixer - Type KAF 14/68 ex
Charge Pump (Shared)	Utilises Active Tank #2 Charge pump #3
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL

Active Tank #2 Module	
Dry Weight	110 Tonnes
Wet Weight	67.5 Tonnes
Active Tank #1 Capacity	159 bbls 25.3 m3
System Maximum Working Pressure	150 psi 10 BAR
Charge Pump #4	NOV Mission Magnum 6x5x14 (12" Impeller)
2 x Agitators	Turbo Mixer - Type KAF 15/66 ex
1 x Self Cleaning Tank Nozzle	Scanjet - SC 15 TW-SS-GL

Mud Pump Module #1 to #4	(each)
Mud Pump Model	NOV D-750L Triplex Piston Pump
Pulsation Dampner W.P.	5,000 psi 345 BAR
Pump Saver Model	3-1/16 5,000 psi Magnum Pump Saver
Pump Saver W.P.	5,000 psi 345 BAR
Strainer Block Diameter	4-1/16"
Strainer Block Working Pressure	5,000 psi 345 BAR

Choke and Kill Manifold	
Maximum Operating Pressure	10,000 psi
Choke Line	3"

Standpipe Manifold	
Maximum Operating Pressure	5,000 psi
Standpipe OD	5"

Trip Tank	
Tank #1 Capacity	30 bbl
Tank #2 Capacity	30 bbl
2 x Charge Pump	NOV Mission Magnum 3x2x13 (10" Impeller)

Poorboy Degasser	
Capacity	9 MMscf gas/day
Design Pressure	10 BAR
Vent Line	10" Diameter. Terminating 4 m above top of mast

BOP Stack/Accumulator Unit	
BOP Size	13-5/8"
BOP Pressure Rating	10,000 psi W.P.
Accumulator Design Code	NORSOK D-001
Design / Ops / Shear Ops Pressures	3,000 psi / 1,500 psi / 2,800 psi
Accumulator Bottle Capacity	24 x 15 US Gallons - (360 US Gallons)
Remote Panels (Zone 1 compliant)	2

Archer is a global oilfield service company with more than 40 years' experience, over 8,000 employees, and operations in more than 100 locations worldwide. From drilling services, production optimization, well integrity and intervention, to decommissioning, Archer is focused on safely delivering the highest quality services and products to the drilling and well service markets. **We are Archer.**