Welcome to ARI

ARI Simulation is a global leader in the production of sophisticated simulation and virtual reality training solutions for the marine, energy, construction, airport and defense industries.

Our simulators have been designed and built to meet all applicable standards recommended by relevant international statutory and industry bodies including IMO, STCW 2010, The Nautical Institute, OPITO, AMERC, IMCA and others. Our marine, offshore and crane products have been audited and certified to the highest Class A Standard by DNV-GL.

We sold our first simulator 20 years ago and in the years since then we have successfully delivered and commissioned more than 1000 large scale simulation systems for clients all over the world.

Developing customised solutions has always been one of our key strengths and we have created some of the most exacting simulator recreations of our clients’ own equipment, machinery, ships and geographies in the large number of customised simulator solutions we have delivered.

Our customer focus and attention to detail is reflected in our commitment to quality in everything we do.

Training people is your priority; Making it possible is ours.
Drilling and Well Control Simulation

The ARI Drilling Simulator offers a powerful array of simulation training capabilities to those involved in the oil and gas drilling industry.

Using the latest technologies in high-fidelity graphics and engineering simulation, the Drilling Simulator provides a complete and detailed immersive simulation experience of the start-to-finish drilling operations on a virtual rig including pipe-handling, tripping in, tripping out, drilling, mud system operation, cementing operations and well control training.

Combined with the ARI Downhole Simulator, the drilling simulator provides a complete experience from surface tools operations to complex well control scenarios providing a compelling well-control and contingency training environment. Downhole geological parameters can be modified ‘on-the-fly’, enabling instructors to introduce extremely challenging training scenarios.

The ARI Drilling and Well Control Simulator is available in a range of modular configurations, from small scale, portable solutions suitable for remote and on-rig training, to containerized portable solutions to full mission multi trainee solutions suitable for deployment in training centers and academic institutions.

Depending on customer requirements, systems can be configured based on generic rigs and generic tools, or may be completely customized to recreate every detail of a customer’s own rigs, tools and work processes.

The system supports multiple rig types including land rigs, offshore jack-up rigs, offshore semisubmersible rigs, drill-ships, drill barges, modular rigs and platform rigs - all within the same software and hardware environment.

It can be installed to use actual rig control equipment if required to add a layer of complete realism to the operation of the systems. The ARI Drilling and Well Control Simulator is today being used by some of the leading manufacturers of rig equipment, colleges, drilling contractors and some of the world’s leading universities specializing in oil and gas exploration.
The (Virtual) Drill Floor

The ARI Drilling and Well Control Simulator puts trainees where they need to be - on the actual drill floor of a working rig, with precise and extremely realistic modeling of control, visuals and sounds.

Suitable for use in procedural, operations and well control training, the ARI Drilling and Well Control Simulator provides a completely immersive environment based around the driller and assistant driller workstations in the drillers cabin on the drill floor. With control and monitoring systems that replicate those found on a real rig, including the display and SCADA systems and with virtual CCTV monitoring, training and assessments are conducted in an entirely realistic environment.

The ARI Drilling and Well Control Simulator simulates a large range of rig tools, accurately modeling control systems, sensors and the mechanics and forces of such tools in operation including active heave compensation.

Simulated rig tools include:

- Catwalk
- Pipe Arm
- Top Drive
- Automated Wrench (Iron Roughneck)
- Automated Slips
- Drill Floor Environment
- Cementing Unit
- Pipe Racking System
- ...and more
The simulator allows trainees to carry out all major operations on the rig including drilling (vertical and directional); tripping in; tripping out; pipe-handling; stand-building, casing and riser running and gives complete control of the mud systems on the rig.

A full range of drilling parameters are provided to trainees including ROP, WOB and Torque on Bit. Supported well control features include Wait and Weight Method; Driller’s Method and Volumetric Method.

The ARI Drilling and Well Control Simulator is also designed to fully support the use of actual rig control hardware.

### Mud System

The mud system simulates the entire mud path and can realistically simulate each of the following (in isolation or in combination):

- Pressure drop in the whole mud path
- Pressure at specific positions including stand-pipe, bottom hole, choke line etc.
- Multiphase flow
- Drill cutting transport
- Mud velocity information
- Drill string washout
- Bit washout
- Mud return
- Lost circulation
- Surge/Swab effects

Trainees are provided with controls which allow them to configure and manage the mud systems, including manifolds, mud pumps, tank line ups etc.

Trainee parameters for mud systems include:

- Mud Pump Speed
- Mud Type
- Mud Efficiency
- Mud Capacity
- Mud Pit Volumes
Well Control Training Applications

The ARI Drilling and Well Control Simulator is capable of training personnel on a wide range of well control training applications and has been built to conform to the IWCF and IADC standards for well control training.

The ARI Drilling and Well Control Simulator includes ARI’s Standard Edition Downhole Model which models pressure, temperature and other conditions in the well into the surface feedback and monitoring systems. Most well control training scenarios can be created using this configuration. For more sophisticated well control applications, ARI offers the Advanced Downhole Module, which supports rheology models, pressure calculations, drill cutting transportation and filter cake formations.

Downhole data can be returned to the surface using LWD or MWD techniques.

Complete well profiles can be defined to provide multi-dimensional training features. Special consideration has been given to the modeling of drill string dynamics with full support for effects like drill string whirling, vibration, twist, torsional stick slip, bit bouncing and more.

Instructors are also able to dynamically configure the geological profile of the well including adjustments for rock hardness, rock porosity, rock permeability, formation pressure profiles and other factors which accurately then affect drilling parameters such as rate of penetration, lost mud circulation and other relevant parameters.

ARI’s advanced downhole simulator module is unique in providing instructors with the ability to make ‘on-the-fly’ adjustments to the downhole situations, in realtime, providing an extremely powerful and dynamic training and contingency management environment for trainees. The ARI Drilling and Well Control Simulator can also simulate the use of instrumented drill pipe transmitting well information up the chain of sensors along the entire length of the drill string.
Virtual Well Plan

VirtualWellPlan is a module which allows complete well plans to be entered into the system and stored as VirtualWell scenarios.

A complete range of geological, pressure and temperature information can be entered and stored into the well plan library in the simulator mission control application. VirtualWellPlan has an easy to use graphical interface and supports vertical, directional and multi-lateral wells and sections.

Individual training exercises can then be created from the entered well plan. This enables the trainees to practice on the high risk sections of the well such as predicted transitions from low temperature - low pressure conditions, to HPHT type conditions.

ARI VirtualWellPlan is also useful for rig team management training exercises where larger teams can be actively engaged in the process of drilling a well, in some cases over multiple sessions. VirtualWellPlan can also provide useful coordination for well-on-paper type exercises, planning and working through the entire drilling operation before the project commences, often with the complete team of contractors involved in the drilling and project process.

VirtualWellPlan is also suitable for deployment in the ARI Drilling and Well Control Simulator installations on board rigs, where data from the active well can be updated into the simulator giving the opportunity for Drillers to orientate themselves to the changing parameters of a well and practice drilling objectives prior to actually carrying them out.
The ARI Drilling and Well Control Simulator Mission Controller System provides instructors with a powerful toolkit for designing, building, managing and executing training exercises.

Instructor Features

The Drilling Simulator Mission Controller System is an integrated software suite providing instructors with the ability to fully control, supervise and monitor the Drilling Simulator. Within this system the instructors can design, build and save their own training exercises, coordinate and manage training sessions, access and modify a large range of operating parameters during a mission, manage the recording of training missions, assessment of trainees and the post session debriefing and analysis process inject faults and failures into an active training session, alter and change downhole parameters to create challenging and relevant well control situations like introducing a kick.

During a training mission, the instructor can introduce a broad range of faults and failures into the surface tools and equipment including:

- Sensor Failures
- Hydraulic Pressure Failures
- Drive Failures
- Intermittent Equipment Failures
- Feedback and Monitoring Partial or Complete Failures

The entire downhole model* is available for on-the-fly editing during a session. Some of the downhole parameters include:

- Rock Hardness
- Rock Porosity
- Formation Pressure Profile
- Temperature & Pressure
- ROP
- WOB
- Torque on Bit
- Differential Pressure Across Bit
- Stand Pipe Pressure
- Bit RPM
- LWD & MWD support

All instructor controlled parameters are accurately modeled to correctly impact the entire system. Geological and rheological inputs made by the instructor are processed by the core physics and geophysics simulation engine and produce entirely realistic effects across all aspects of the system. The instructor is thus free to ‘tweak’ the well geology and create dynamic challenges for trainees in the confidence that the system will respond exactly as it would in real life.

* Parameters will vary depending on whether the standard or advanced downhole model is installed.
Trainee sessions are logged into the instructor database and assessment (both instructor and system auto-assessments) are stored against trainee records. Each time a trainee runs a mission, the results are added to that trainee’s record and the instructor system builds a profile of the capabilities, progress and weaknesses of that trainee. This information can be used effectively to manage skills development across the drilling workforce, as well as to assess and screen new personnel. Instructors can build and create their own assessment frameworks, imposing their own company standards into the system and assessing for compliance with such standards.

After any mission, the entire recording of that mission is available for replay in a debriefing mode, enabling instructors to lead trainees back through their performance during the exercise. At any point in a debriefing, the mission can be re-started from that point and trainees can be asked to refine their responses and actions in an intuitive and powerful fashion - maximizing the learning capabilities of the platform.

The instructor system includes a comprehensive reporting system which can produce detailed reports on trainee sessions as well as tracking reports showing trainee progress and trends over multiple sessions. Additionally groups of trainees can be analysed to assist in identification of group trended strengths and weaknesses, assisting in the development of relevant training objectives.

Customization

**ARI can provide custom built models of specific rigs and their equipment to order.**

“Your Rig, Your Tools, Your Processes”

The ARI Drilling and Well Control Simulator can be supplied with generic rig models covering most major types of land and offshore rig as well as tools typically found on such rigs. ARI can also design, build and deliver completely custom models of rigs, based around customer’s own rigs and tools.

These high fidelity, fully functional models support the complete package of well control and drilling training modules and can also be provided with ARI’s unique VirtualRig Immersion Station feature, allowing users to navigate around the entire rig, inside and out - even whilst a drilling or tripping operation is underway in the main simulator.
This can be useful in leading induction training sessions—orienting personnel to the rig, familiarisation with the location of muster stations and emergency equipment; operations around the helideck, etc. It can also be used to prepare personnel for contingencies and emergencies including H2S, fires and rig evacuations. For Offshore Rigs, it is also capable of traveling down to the seabed, providing high resolution visualizations of rig anchors, risers and subsea BOPs.

ARI’s high definition modeling and fully interactive ImmersionStation technologies provide a unique training and orientation environment with almost unlimited applications.

A Dynamic Platform

From small scale mobile solutions up to complete training centers, the Drilling Simulator’s dynamic architecture supports a broad range of installation options, to meet both budgetary and functional requirements.

All versions of the Drilling Simulator can be competitively upgraded to grow with customer requirements. Architectured from the outset to support hardware-in-the-loop (HIL) functionality, the system can also be employed to work with pre-commissioning of actual rig hardware.
With operations, partners and representatives around the world, an ARI representative is only a mouse click away.

Drop us a mail at info@arisimulation.com and an ARI representative will get back to you promptly.

USA, NORTH & SOUTH AMERICAS
ariusa@arisimulation.com

INDIA
ariindia@arisimulation.com

UK & EUROPE
ariuk@arisimulation.com

PHILIPPINES
arimanila@arisimulation.com

www.arisimulation.com