L3HARRIS®
FAST. FORWARD.

HIGH REALISM SIMULATION & TRAINING

Complete Power Plant Simulations and Training Services for Better Personnel Development and Plant Engineering Support

For five decades, L3Harris has worked with leading utilities, plant designers and research organizations to create superior operator training simulators and simulators to assist in and de-risk plant builds. We have established ourselves as the world's pre-eminent manufacturer of high-realism power plant simulators, powered by the second-to-none Orchid® simulation environment. In addition, L3Harris' 2D and 3D interactive Learning Technologies are sure to increase your students' understanding and retention of power plant fundamentals and systems. Orchid® IX with unmatched 3D visualization will dramatically change field personnel training.

L3Harris has deployed the world's highest fidelity operator training simulators for HWR, GCR, BWR and PWR nuclear plants. Our simulators are also used to support operator training at coal, oil & gas, GT and CCGT plants.

We have vast experience supporting New Build projects with our simulation solutions—resulting in significant error reduction in plant designs.

With our Learning Technologies (Learning Modules, System Knowledge Modules and Learning Simulators), we capitalize on the use of interactive visualization to further the objectives of power plant training programs by improving or augmenting the learning experience with a higher degree of efficiency, retention and accessibility.

Orchid® IX is the classroom of the future. Using Reflected Reality technology, Orchid® IX is the most realistic, fully immersive display technology available today. With a large field of view and unmatched richness and depth of detail, users can experience virtual worlds as they would in real life.

L3Harrrs' superior learning and training environments provide clear advantages for obtaining operator licenses/ certification, optimizing plant operating procedures, accelerating learning and reducing costs. Personnel trained with our technology acquire the skills necessary to increase plant performance, minimize downtime, and provide confident emergency response.

L3HARRIS' SIMULATORS PROVIDE SUPERIOR REAL WORLD POWER PLANT TRAINING

L3Harris offers various products and services, including full scope operator training simulators, part-task trainers, simulator retrofits and upgrades and full-scale 3D immersion solutions. We provide conception to completion turnkey systems, specific components, and simulator design tools as required by the customer. With worldwide presence, a solid leadership position and the ability to provide any level of customer support, L3Harris ensures the success of your simulator projects. Our simulators offer the highest quality in simulation fidelity and training, equipping trainees and instructors with user-friendly tools for learning, controlling and exploring complex power plant systems.

USES AND ADVANTAGES

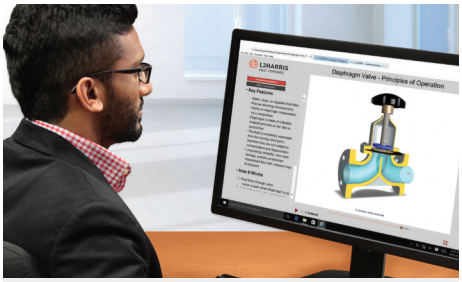
Cost-effective training for:

- Experienced operators and new recruits
- Overall plant and individual system operation and control
- Improved team interaction and performance
- Increased field worker know-how
- Emergency plan implementation and incident management
- Command of malfunction and transient situations
- I&C familiarization

MORE BENEFITS

- Operations optimization, including start-up and shutdown
- Fewer unplanned outages
- Improved plant safety
- Analysis of plant response to equipment and/or instrument failure
- Efficient plant design planning and upgrading
- DCS and plant process computer verification and validation
- Ease of simulator upgrade and ability to keep current with plant
- Multiple configurations on one simulator
- Portability of simulation for classroom training
- 3D immersion for accurate whole-plant knowledge and diagnosis

SUPERIOR TRAINING SYSTEMS FROM THE WORLD'S LEADING SIMULATION COMPANY



LEARNING MODULES

Getting the fundamentals right

SYSTEM KNOWLEDGE MODULES

Making plant drawings come alive

LEARNING SIMULATORS

Enhancing plant learning

CLASSROOM SIMULATORS & PART-TASK TRAINERS

Extending the benefits of classroom training

ENGINEERING SIMULATORS

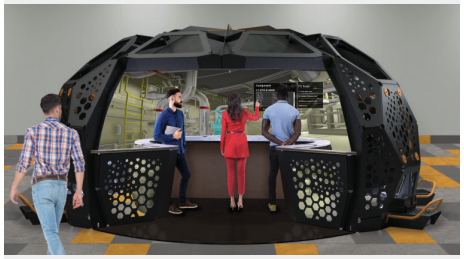
High-fidelity models and robust tools for plant engineering and analysis

FULL SCOPE OPERATOR TRAINING SIMULATORS

Realistic environments for operator authorization and optimizing procedures

SIMULATOR UPGRADES & MODIFICATIONS

Extending the life of your simulator



IMMERSIVE & INTERACTIVE 3D VISUALIZATION

Reflected Reality for incredibly accurate 3D immersion

INNOVATIVE SOLUTIONS

The team at L3Harris comprises the world's largest, most experienced group of simulation engineers, all dedicated to designing, developing and building simulators focused on quality and fidelity. The creative synergy and collaborative spirit between our engineers generates new ideas and bold concepts that put our simulators way ahead of the competition. The company's superior products and responsive service reflect the company's maturity and commitment to power plant simulation – now and in the future.

QUALITY AS A GUIDING PRINCIPLE

National Quality Assurance has confirmed that L3Harris maintains a quality management system that conforms to the ISO 9001:2015 international standard for all of our business lines. There are no exclusions to the scope of the registration, which includes hardware and software design and development, product realization, sales and service.

Our quality policy is to ensure that our products meet or exceed customer requirements and that we enhance customer satisfaction by continuously improving our system. This focus on quality has proven itself repeatedly. The quality processes and know-how that go into developing our power plant simulators are key contributors to the success that is enjoyed by our worldwide simulator customers.

PROUD CANADIAN TECHNOLOGY

L3Harris entered the power plant simulation business five decades ago, when we were awarded our first order for a full scope CANDU nuclear power plant simulator for the Pickering A plant. Since then, we have established ourselves as the world's pre-eminent manufacturer of high-realism power plant simulators, powered by the second-to-none Orchid® simulation environment.

FIVE DECADES OF EXPERIENCE

L3Harris entered the power plant simulation business in 1973. Today, L3Harris is the world's foremost supplier of high-end, full scope operator training simulators for nuclear power plants of most manufacturers, as well as simulation solutions for coal, oil and gas-fired power plants. Our Power Systems and Simulation business is known for it's customer-centric approach, technological superiority and value-added service in delivering best-in-class simulators. A sample of our customers globally:

ARGENTINA
Embalse

BELGIUM
Tihange 1

BRAZIL
Angra 1
Angra 2

CANADA
Bruce A
Bruce B
Canadian Nuclear Laboratories
Darlington
Gentilly-2
IMSR Advanced Reactor
Pickering A
Pickering B
Point Lepreau
SNC-Lavalin

CHINA
CAP1400 Engineering Design
Analyzer Support
Daya Bay
Hongyanhe Phase I Units 1, 2
Hongyanhe Phase I Units 3, 4
Ling Ao
Ling Ao Phase II
Qinshan Phase III

FINLAND
Olkiluoto 3

FRANCE
Framatome
Institut de Radioprotection et de Sûreté Nucléaire
Institut National des Sciences & Techniques Nucléaires

GERMANY
Brunsbüttel
Framatome
Isar
Leipzig
Philippsburg
Stade

GREAT BRITAIN
Dungeness B
EDF Energy Campus
EDF Energy Nuclear Power Academy
Hartlepool
Heysham 1
Hinkley Point B
RWE npower
Sizewell B

IRELAND
Moneypoint
Poolbeg

JAPAN
Nuclear Regulation Authority

KOREA
Pyeongtaek
Wolsong 1
Wolsong 2
Wolsong 3

MEXICO
Laguna Verde

QATAR
Ras Abu Fontas B

ROMANIA
Cernavodă

SAUDI ARABIA
Qurayyah

SLOVENIA
Brestanica
Krško

SOUTH AFRICA
Koeberg

SWEDEN
Forsmark 1
Forsmark 3
Oskarshamn 1
Oskarshamn 2
Oskarshamn 3
Ringhals 2

SWITZERLAND
ALSTOM (Switzerland) Ltd.
Beznau
Leibstadt

UNITED ARAB EMIRATES
Barakah

USA
ANO-1
Brunswick
Callaway
Center for Advanced Engineering and Research
Clinton
Crystal River 3
Davis-Besse
Diablo Canyon
Enrico Fermi 2
Fort Calhoun
Framatome
Idaho National Laboratory
McGuire
Oconee
Pilgrim
Prairie Island
Rancho Seco
San Onofre 1
San Onofre 2/3
St. Lucie 1
St. Lucie 2
South Texas Project
Susquehanna 1
Three Mile Island 1
Turkey Point
Waterford 3
Westinghouse
Wolf Creek

The company's know-how and innovative technologies have had a positive impact on the world of power plant simulation. We have perfected systems to design, develop and execute the world's most sophisticated simulators in various operating environments. Here are just a few of our remarkable achievements.

First CANDU power plant simulator project starts (Pickering A, Canada)	1973	
	1979	Introduced the concept of "global malfunctions"
First BWR power plant simulator project starts (Pilgrim, USA)	1984	
	1984	First PWR power plant simulator projects start (St. Lucie and Turkey Point, USA)
First fossil power plant simulator project starts (Qurayyah, Saudi Arabia)	1988	
	1989	Began developing simulators on open computing platforms
Launched graphical, component-based modeling (ROSE®)	1991	
	1991	First graphical, component-based LNG terminal simulator project starts (Pyeongtaek, Korea)
First power plant simulator upgrade project starts (San Onofre, USA)	1991	
	1991	First graphical, component-based fossil plant simulators start (Moneypoint and Poolbeg, Ireland)
First graphical, component-based nuclear plant simulator project starts (South Texas Project, USA)	1992	
	1992	First European nuclear power plant simulator project starts (Cernavodă, Romania)
First Asian nuclear power plant simulator project starts (Wolsong, Korea)	1994	
	1999	Natively developed first full scope nuclear plant simulator on PC/Windows (Ling Ao, China)
First severe accident simulation model integrated with full scope simulator in service (Krško, Slovenia)	2000	
	2002	First African simulator project starts (Koeberg, South Africa)
First Latin American simulator project starts (Angra, Brazil)	2004	
	2005	First Generation III nuclear power plant simulator project starts (Olkiluoto 3 [EPR], Finland)
First GCR power plant simulator project starts (Hartlepool, Great Britain)	2005	
	2007	Introduced our signature Orchid® simulation environment
Instructor Station equipped with scenario-based testing and scenario manager	2010	
	2011	Introduced Learning Simulators, combining 3D visualization with high-fidelity simulation
Launched touch-capable Instructor Station for tablets and desktops	2018	
	2019	Launched Orchid® IX: immersive and interactive 3D visualization
First full-scale 3D plant visualization project starts (Barakah, UAE)	2019	
	2020	First SMR power plant simulator project gets underway (IMSR, Terrestrial Energy)

LEGEND: | Projects 'firsts' | Technological 'firsts'

LEADING THE WAY

From our first project in 1973 to our current status as a global power plant simulation leader, our success has been made possible by our esteemed customers and end-users who have always challenged us to be the best. With this support and inspiration, L3Harris has been empowered to push technological boundaries and to seek state-of-the-art solutions to meet our customers' challenges and evolving needs.

Our power plant simulators have received industry-wide recognition for superior training and plant operational applications. With five decades of experience in power plant simulation development, we have pioneered many of the principal advances in simulator design and functionality. Even our first simulator had sophisticated features such as "record," "playback," "controls not in agreement" (commonly referred to as "switch-check" nowadays) and full simulation of the plant computer system.

LEARN MORE

For more information on L3Harris' high realism simulation & training solutions, visit L3Harris.com or send us a request at power.mapps@L3Harris.com

High Realism Simulation & Training

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8565 Côte-de-Liesse
Montréal, Québec, Canada H4T 1G5
t +1 514 787 4999 | f +1 514 788 1442
power.mapps@L3Harris.com