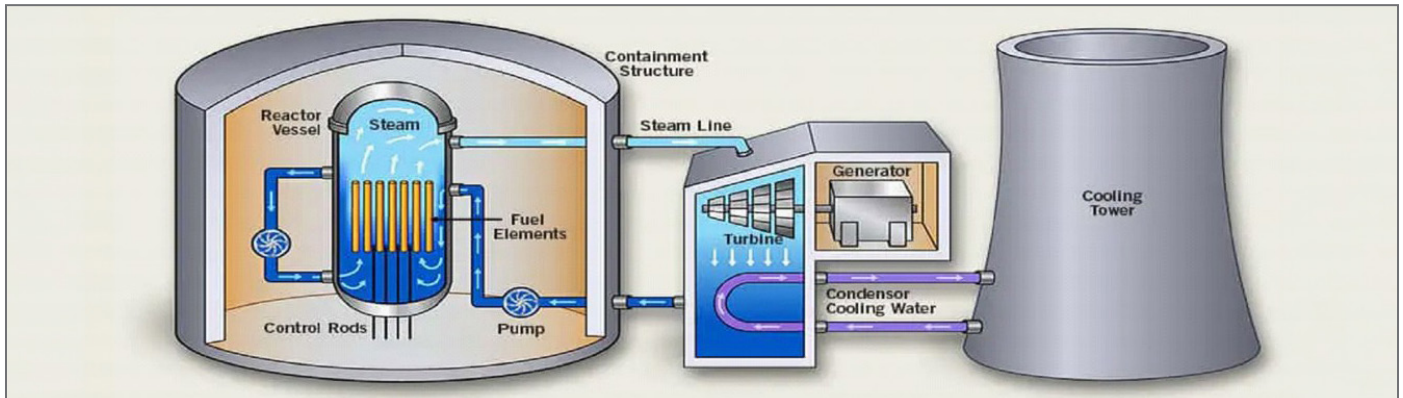# 3KEYMASTER™ Generic Boiling Water Reactor

GBWR Simulation Modeling

CURTISS-WRIGHT

Nuclear Power Products and Services

GBWR Overview

As nuclear power is expanding around the globe, so is the need for a trained nuclear workforce. In this regard, Curtiss-Wright's Simulation Group* has expanded their capabilities of nuclear power plant training offerings by developing a Generic Boiling Water Reactor (GBWR) real-time, full scope, high-fidelity simulator. The GBWR allows students to perform complete plant startups, shutdowns, and load maneuvers, as well as realistically simulating normal and abnormal plant transients, including malfunction scenarios. This simulator can be provided for installation at a customer site using standard local area network technologies in a client/server mode or in standalone mode.

Additionally, we offer the ability to access the simulator through a web-based simulator interface; thereby allowing use of the simulator over the Internet from anywhere in the world. The GBWR simulator is geared toward newly formed nuclear agencies, universities, and institutes, and can be integrated with a Learning Management System (LMS) to track each student's progress through the lessons.

Our customers are using the GBWR simulator to provide training on nuclear power plant fundamentals, concepts and operations, and exposure to the various BWR systems. Enhancing workforce development, targeted demographics include students, engineers, and plant operators that will staff existing, newly built, or designed nuclear power plants.
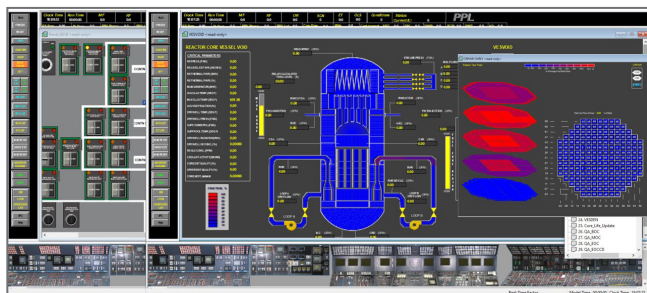
Key Features

- Full Instructor Station capabilities
- Access to system P&ID graphics that may be used to supervise the plant
- Full emulation of a traditional analog control room
- Full trending capability allowing the user to trend any process parameter for transient analysis
- Complete alarming system with multiple sounds based on priority and type of alarm
- Over 10,000 Input/Output points represented through the panel graphic displays
- Runs on local computers or protected servers with access to a graphical user interface through the World Wide Web
- Multi-screen capability to allow visualization through multiple screens and Web browsers
- Web-based security and company firewalls
- LMS connectivity capability maintaining the student's records

Learning Objectives

- Basic understanding of nuclear engineering fundamentals
- How nuclear plant works; the systems' function and purpose
- Major plant components, system operations, controls and safety
- Perform transient and control analysis
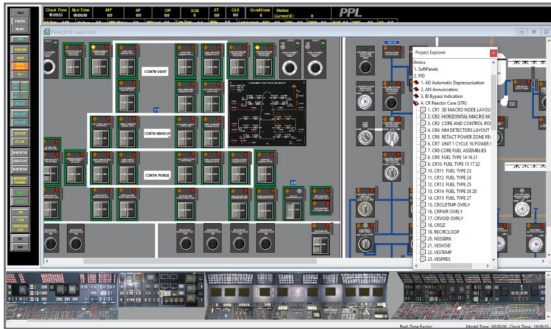- Skills and knowledge foundation required to operate a BWR plant

*: WSC, a legacy brand of Curtiss-Wright's Simulation Group, headquartered in Frederick, MD, is a global simulation and services company. Acquired by Curtiss-Wright in 2024, WSC is recognized for the quality and efficiency of their products and flexible team-oriented approach to serving its customers.

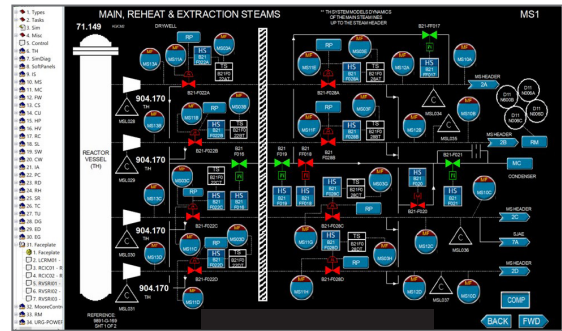# 3KEYMASTER™ Generic Boiling Water Reactor

GBWR Simulation Modeling

Plant Operations

- Normal Operations
- Reactor Startup and Shutdown
- Turbine Startup and Shutdown
- Generator Synchronization
- Loading and Unloading
- Transients
- Emergency Operations
- Conduct Operations/Team Training/Command and Control
- Safety System Surveillances

Integrated with the Simulation Group's 3KEYSTUDENT™ Environment, the GBWR training tool is a powerful training system.

Key Features of 3KEYSTUDENT

- Integrated with a full featured Intelligent Tutoring System to provide instructions and procedures visually and verbally
- Multiple modes of operation based on "show," "mentor," and "test" mode
- Capable of downloading 1 to 100s of graphical interface screens for plant controls
- Web based Student and Instructor, single, or shared access from anywhere in the World
- Provides hints with graphical highlights to aid the student in understanding the lessons
- Provides time and score functionality compliant with SCORM LMS Systems
- Can be centrally controlled by one instructor with students anywhere in the world

Advantages of 3KEYSTUDENT

- Capable of delivering simple to full-scope high-fidelity simulation lessons over the Intranet or Web
- Lessons may range from simple component or system lessons to full startup/shutdown
- Expandable to deliver lessons from 1 to 100s of students concurrently
- Lessons can be interrupted for any reason and resumed at a later time
- Safe and protected environment with the simulation software running on remote/local Servers.

Main Steam Supply & Shut Off System

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