



Cylinder Replacement



OVERVIEW

Red Iron Labs' virtual reality simulations enhance real-world training, providing the ability to reset and repeat expensive, difficult to produce, or life-threatening scenarios in safe and controlled environments.

The Cylinder Replacement simulation was a project for ExxonMobil to provide a safe environment for high-risk TEAL training.

TEAL is an extremely flammable substance igniting immediately upon exposure to air that requires extreme precision in cylinder replacement at Oil and Gas refineries. This VR simulation trains technicians how to replace a cylinder properly and safely.

The modules were based on real-world critical human performance errors, near-misses, and injuries.

OBJECTIVES

- Design a 300-step replacement process that enables technicians to physically practice the replacement process in virtual safe environment.
- Recreate the the job site to maximize user familiarity with the TEAL cylinders, locations, and process. Create environment based on photographs, CAD models and plant diagrams.
- Allow technicians to switch between various roles throughout the plant, and experience events such as random cylinder failures during the replacement process.

OUTCOMES

- Increased retention of training material by 87% compared to traditional training.
- Helped ExxonMobil establish a VR training pipeline.
- The Cylinder Replacement simulation is used as a training tool for both Process and Mechanical Maintenance technicians.
- The training module is used to mitigate future incidences and to share lessons learned.

KEY STATISTICS



1 in 35 employees in the US experienced an occupational injury or illness in 2018.



The three leading causes of work-related injuries treated in an emergency department were contact with objects and equipment, overexertion and bodily reactions, and falls, slips and trips without a fall.



An estimated 2.4 million workers sustained work-related injuries and were treated in emergency departments in 2019. Further, in the US 229,410 injuries reported were so severe that they resulted in time away from work.