

# UOP LOCK HOPPER CONTROL SYSTEM (LHCS) RETROFIT

## Equipment and Systems

Honeywell UOP provides tailored aftermarket solutions that allow customers to focus on proactive maintenance strategies, operational optimizations and improvements, and reduction in total cost of ownership. UOP is committed to providing customers with proven control system technology to help ensure the long-term performance and reliability of UOP equipment. UOP proudly offers LHCS retrofits that provide customers with control systems designed to improve existing operations to most efficiently meet business goals.

### BACKGROUND

In 1985, UOP commercialized the Lock Hopper Control System (LHCS) to provide the highest quality CCR™ regenerator control system available for a CCR Platforming™ unit. Since then, the LHCS has been installed in more than 120 locations worldwide with more than 2000 years of cumulative operating experience.

### WHY SHOULD YOU RETROFIT?

With the fast pace of technological advancement in recent years, the components in older systems are becoming obsolete. The UOP LHCS retrofit has been developed to offer the following benefits:

- Overcome obsolete spare part availability issues
- Utilize the most current technology
- Enhance process availability by reducing hardware downtime
- Additional catalyst handling features

### LHCS DESIGN BENEFITS

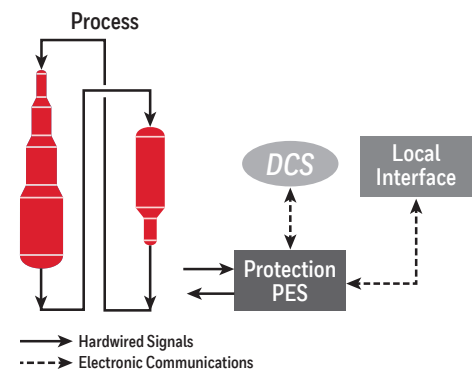
The UOP LHCS retrofit design employs the latest technology in critical control. The system captures the most beneficial enhancements from current CCR regenerator control system technology.

Features such as hot shutdown state, white burn inhibit mode, and regeneration burn zone temperature protection have been incorporated into the LHCS retrofit. These new features provide both operational benefits and enhanced troubleshooting tools.



Typical UOP LHCS Retrofit Cabinet Layout

FIGURE 1 - UOP LHCS Retrofit Configuration



At the heart of the system is a programmable electronic system (PES) specifically designed for protective applications. It uses a fault-tolerant architecture and incorporates a high level of diagnostics that result in a high degree of availability and reliability. A dedicated local display with the latest human-machine interface software is employed in the LHCS retrofit to provide process graphic, alarm, and timer set-up displays. It also provides online dynamic help screens and "first out" alarming that allows a user to quickly identify specific problems. The system configuration is shown figure 1.

## SYSTEM FEATURES

The LHCS retrofit controls all the valve sequences, heaters, chemicals, protection-related interlocks, and shutdowns in the CCR regenerator. It also includes a distributed control system (DCS) interface that allows operator control from the DCS. A variety of interfaces are available, depending on the specific DCS model. Additional operating data is provided that is used in diagnostics to calculate actual circulation rates, lift times, and gas velocities. The LHCS retrofit can receive analog 4-20 mA signals directly from field transmitters with set points for alarms and trips implemented in the LHCS retrofit, allowing replacement of the existing external trip switches. The system is mounted into a single two bay enclosure that greatly reduces overall footprint and can also be remotely located to conserve control room space.

## QUALITY ASSURANCE

All UOP control systems are built with the highest quality standards per ISO 9001-2015. Prior to shipment, each LHCS retrofit is configured and given a complete series of logic inspections and operational tests using a specially designed process simulator at our manufacturing facilities. Before the system is shipped, the customer's representatives are invited to conduct an extensive checkout of their LHCS retrofit and:

- Perform a detailed physical and operational inspection
- Receive in-depth, hands-on familiarization, troubleshooting, and maintenance training on the equipment
- And assure that when the LHCS retrofit is installed, it will function correctly upon power up for a smooth, on-time start-up

## ECONOMICS

The design philosophy of the LHCS retrofit incorporates UOP's most advanced understanding and accrued knowledge of the CCR Platforming process. It integrates process control and process safeguarding with the goal to reduce the lifecycle cost of ownership and provide the customer with process, operating, and equipment protection benefits. The economic benefits are seen with increased availability allowing the CCR Platforming unit to achieve the highest processing capacity and severity possible. Due to the extensive testing performed before shipment, the system can be installed while allowing the Platforming unit to continue operating.

## JUSTIFICATION

At UOP we pride ourselves on delivering retrofits that meet customer needs and expectations while delivering on schedule and on budget. UOP has successfully delivered and commissioned more than 140 LHCS retrofits.

### For more information

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