

Cybertech Automation helps industry engineer, build, configure, and commission instrumentation, electrical, and control system technologies.

# ONLINE SWINGOVERS/CUTOVERS AND LEGACY CONTROL SYSTEMS

*An online swingover/cutover has significant advantages as long as your plant is prepared for additional planning and the risk of a nuisance trip.*

There are innumerable legacy control systems still in use today. These systems continue to operate even though they are obsolete, not supported by the vendor/manufacturer, hard to maintain/support (i.e. no spares, no documentation and no qualified personnel) and hard to change/expand. These legacy systems include:

- Electrical relays and devices
- Pneumatic transmitters, selectors, switches and panels
- Non-certified PLCs used as SIS systems
- Obsolete SIS systems
- Obsolete DCSs (e.g. Bailey, Fisher PROVOX, Moore APACS, Honeywell TDC and Westinghouse)
- Obsolete PLCs (e.g. Modicon and Allen-Bradley)

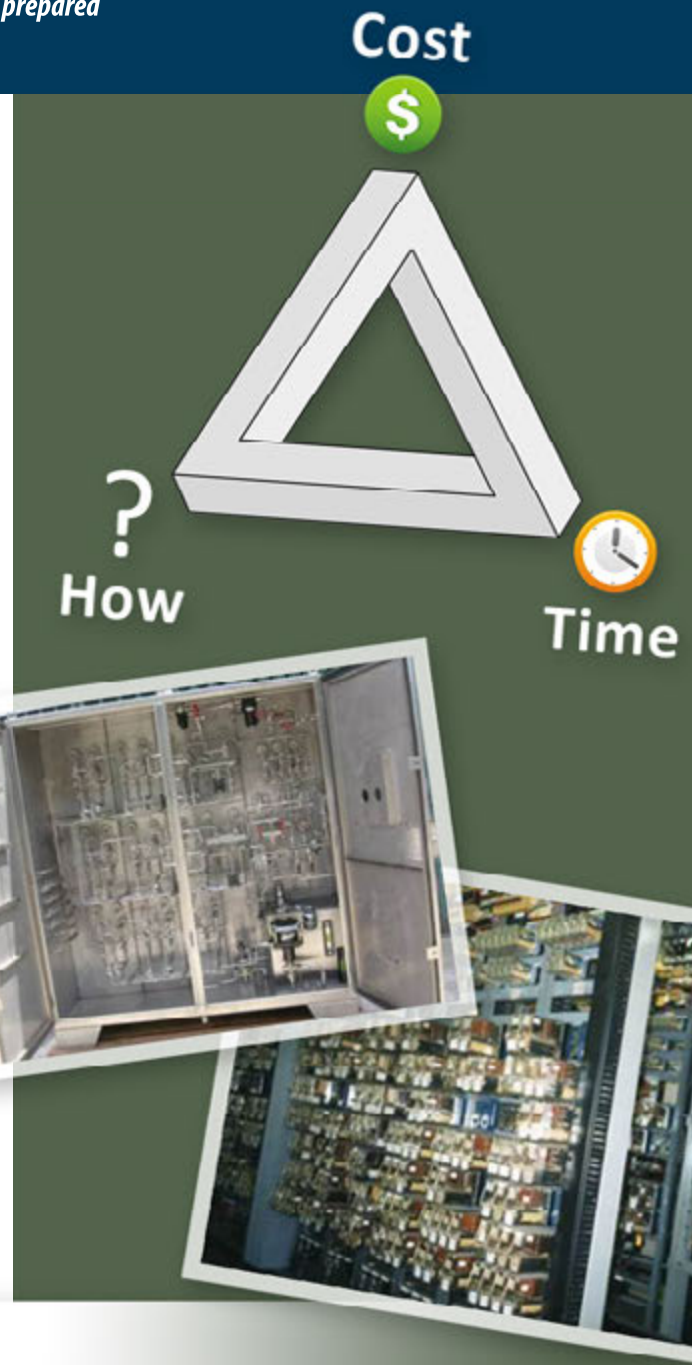
## WHY MIGRATE A LEGACY CONTROL SYSTEM?

Migrating a legacy system means that you can comply with new standards, regulatory requirements and insurance requirements. This is especially true for process heaters and boilers. Other compelling reasons for upgrading include:

- Realization via a re-HAZOP/SIL LOPA process that your current shutdown system does not meet required SIL
- Obsolescence/maintainability issues
- Capacity/expansion
- Improved functionality (alarming, historian, sequence of events, first ins, reliability and availability)
- Improved service life

## WHY HAVEN'T PLANTS MIGRATED?

Many plants have delayed migration because certain obsolete shutdown systems have proved more reliable than control systems. They run in the background (unlike DCS/PLC systems that actively control) and are relatively easy to fix and support (spares are usually available). Perhaps most significantly, the logistics for migration can be daunting.



## Contact

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## YOU CAN MIGRATE YOUR LEGACY CONTROL SYSTEM IN THREE WAYS:

- Online – Unit running and hot swigover/cutover
- Turnaround – Unit shutdown and offline migration
- Combination – Turnaround portions may be required to facilitate an online cutover

## CHOOSING THE BEST METHOD REQUIRES CONSIDERATION OF:

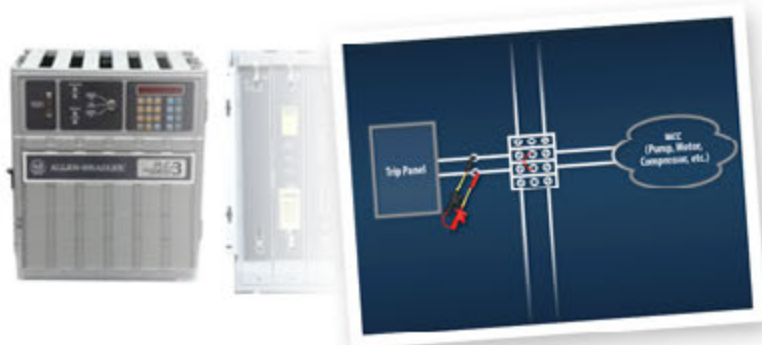
- Turnaround windows
- Turnaround critical path and the risk of turnaround extension
- Risk to the plant and impact of a nuisance trip
- Cost (comparison of increased online cutover project costs versus turnaround production outage costs)
- Is it even possible to do an online migration?

Turnaround Migrations	Online Migrations
<b>Disadvantages</b> <ul style="list-style-type: none"> <li>• Potentially many start-up issues all at once</li> <li>• Inability to go back</li> <li>• Operations start up on a new system during a critical period</li> <li>• Incorrect migration control/shutdown philosophy may impair start-up</li> </ul>	<b>Disadvantages</b> <ul style="list-style-type: none"> <li>• Hybrid system exists during migration</li> <li>• Potential inability of operations to restart without project team</li> <li>• Plant overrides/impairments required</li> <li>• Risk of nuisance trips</li> <li>• May still require turnaround work (instrument preparation, post for demolition work, testing of outputs and sequences)</li> </ul>
<b>Advantages</b> <ul style="list-style-type: none"> <li>• Can't trip the plant</li> <li>• All work can be completed</li> <li>• Can prove outputs and shutdowns (values, pumps, etc.)</li> <li>• Can prove start-up sequence logic for compressors, heaters and pumps</li> </ul>	<b>Advantages</b> <ul style="list-style-type: none"> <li>• Problems handled one at a time</li> <li>• Operations has time to adjust to new system and can revert back</li> <li>• Ability to truly as-build the existing system and expose undocumented functionality</li> <li>• Can validate the SIS process reading immediately</li> <li>• Not a schedule-driven activity</li> </ul>

## HOW TO PERFORM AN ONLINE MIGRATION

For each process system, interlock, etc.:

- Migrate outputs to the new system first
- Migrate inputs one-by-one
- Hybrid the old/new system if planned migration takes longer than expected



## ADDITIONAL MIGRATION CONSIDERATIONS/QUESTIONS

- Replacement in-kind or new control/shutdown philosophy?
- Converting code (automated tools) versus a rewrite, and testing the implications
- New alarms, smart alarming and suppression strategies
- New standards applied to an old plant
- Demand on HVAC/UPS with old and new systems in parallel for a period of time
- Weather/process impacts to online swigover
- Leaving some systems un-migrated adds complexity/risk to the plant operations and maintenance
- The migration project needs to coordinate and be in sync with other onsite projects
- A phased unit-by-unit online cutover may take years, and this requires a consistent design philosophy and awareness of system revision issues and new vendor hardware/software offerings
- Most importantly, your team needs to focus on maintaining process safety integrity during cutover while avoiding nuisance trips.

### Impact of a New Control/Shutdown System

Operations	Maintenance	Engineering
<ul style="list-style-type: none"> <li>• Essentially a new plant in an old plant</li> <li>• More information/graphics</li> <li>• Potential new trips and new setpoints</li> <li>• New compressor, heater, pump and equipment start-up sequences</li> <li>• New alarms</li> <li>• New impairments, bypasses and procedures</li> </ul>	<ul style="list-style-type: none"> <li>• New testing and preventative maintenance requirements</li> <li>• Training requirements</li> <li>• New diagnostics (HART, sequence of events and system monitors)</li> <li>• New control system hardware</li> <li>• NAMUR and write-protected instrumentation</li> <li>• New spares</li> </ul>	<ul style="list-style-type: none"> <li>• IEC61511 IPF Lifecycle to support new shutdown/trip systems</li> <li>• New programming tools</li> <li>• Training requirements</li> <li>• Enhanced flexibility, expansion and optimization capacity</li> </ul>

## CONCLUSIONS

In summary, an online cutover has significant advantages as long as your plant is prepared for additional planning and the risk of a nuisance trip. Remember that most online cutovers require both pre and post turnaround work to prepare and then finally complete the work.