A Yokogawa Commitment to Industry

vigilance

APPLICATION NOTE

Flexible Flow Path Management in Process Automation

Industry: All **Product Category: Systems**

Managing flexible plant production routes has never been easier.

Introduction

Most multi-product plants have a variety of ways to connect major process units. When using hose connections or complicated manifold systems, the combinations of paths between tanks may be difficult to manage. The challenge in these situations is to balance the need for flexible production with that of transfer path integrity. When it comes to ensuring that the right connections are made between tanks, a flexible flow path solution is very useful.

Benefits

- Increase productivity
- Avoid costly or hazardous cross contaminations
- Avoid costly spills
- Enforce operating procedures
- Maintain flexible production configurations

Process description

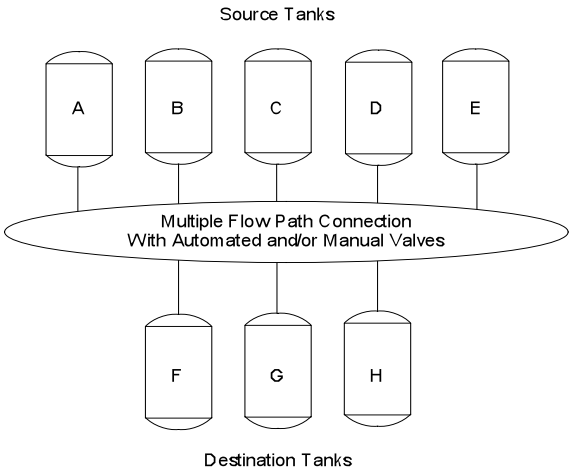
In many multi-product facilities, there is a large combination of source and destination tanks and a myriad of ways to interconnect them. Automation may be sporadically applied, requiring operators to manually open many valves to complete a flow path connection. Due to previous application code limitations, operators may even need to "manually" open automated valves via the Distributed Control System (DCS) interface.

A common limitation is the inability to program and/or maintain all of the combinations, especially considering the frequency of product requirement changes. In these dynamic situations, traditional interlock programming is also difficult to effectively achieve, which results in interlocks configured for relatively few paths. Consequently, many flow path management issues are addressed simply by trusting an operator to properly setup and monitor the transfer. This is a time-consuming and error prone process with the potential for cross contamination, spills, and lost production.

Application solutions

Yokogawa's CENTUM Distributed Control System (DCS) provides the powerful and flexible Sequence and Batch Oriented Language (SEBOL) as well as ISA-88 compliant unit management facilities such as the Yokogawa Unit Instrument. Additionally, CENTUM DCS allows connections to external systems via OPC. For flexibly managing flow paths, SEBOL can dynamically assign and use valve names utilizing lists maintained on the DCS within function block parameters or in external databases such as Microsoft Excel or Microsoft Access. The choice of where the information is maintained is flexible and is enabled by the "openness" of CENTUM via OPC, ISA-95 compliance, and available data access connections. Users can easily maintain flow path configurations, enabling them to change configurations based on product requirements, not DCS programming constraints.

The application determines source and destination tanks and looks up all the valves and pumps needed for the path between them. Using dynamic name assignment, the CENTUM DCS system can build the path "on the fly". The flow paths can be aligned automatically where automation exists or can be aligned manually by sending ordered and detailed prompting to operators. During a transfer, the path is automatically monitored, and the transfer is stopped for improper valve alignments. Operators are given detailed information to resolve flow path problems.



Conclusion

With the open standards compliant Yokogawa CENTUM DCS, a flexible design for Flow Path Management allows the focus on production, not on the difficulties of maintaining the control system. Using the flexibility of SEBOL, flow paths can be automatically aligned, saving time and enforcing operating procedures. Even when transfers are not fully automated, a flow path management solution can provide for sequential and guided prompting to properly enforce safe and standard operating procedures. Contact your Yokogawa representative for your flexible flow path solution.

Revision 0