Challenges in Dairy Processing Applications: CIP

Reduce Waste and Increase Efficiency During Clean-In-Place Processes
**Dairy Processing Applications: CIP**

Minimizing waste and reducing the cost of utilities while ensuring highest product quality is a challenge in the dairy processing industry. The ability to maximize efficiency during cleaning and sanitization processes while ensuring the health and safety of consumers is key. Clean-in-Place (CIP) procedures ensure that process equipment and pipework is clean/sterile, ready for the next process to be run.

Some of the key problems are highlighted here, along with the Emerson solution.

**Problem**

- **Product leftover within the pipes becomes waste during the CIP process**
- **Utility steam heating adds costs when not managed properly**
- **Steam trap failure adds costs of extra steam to keep plant running**
- **CIP processes running too long increases material and energy costs**

**Solution**

- **Rosemount X-Well provides accurate non-intrusive process temperature measurements without thermowells or process penetrations that would impede pigging. Easy to install with quick response time, and suitable for rapid flow rates.**
- **Rosemount 3051HT Pressure Transmitter offers high accuracy at low pressure ranges for repeatable, continuous level measurement readings. It provides best-in-class performance over changing temperatures with rapid return to true zero after the completion of a CIP process.**
- **Rosemount 708 Wireless Acoustic Transmitter provides reliable communication of real time data, wirelessly. Effective monitoring of steam trap health ensures energy is not being wasted, saving energy costs and maintenance hours.**
- **The line powered Rosemount 56 Dual Channel Transmitter can be connected to both the Rosemount 225 Toroidal Conductivity and 403 Contacting Conductivity Sensors. Toroidal sensors are ideal for the high conductivity, and potentially harsh conditions, in CIP chemical addition.**
- **The Rosemount 5408 Level Transmitter features high accuracy at low pressure ranges for repeatable, continuous level measurement readings. It provides best-in-class performance over changing temperatures with rapid return to true zero after the completion of a CIP process.**
- **The hygienically approved Rosemount 2120 Level Switch Vibrating Fork with robust housing and fast drip fork design, provides precise, repeatable, and reliable point level control and overfill prevention. An adjustable switch delay prevents false trips from spray balls and turbulence.**
- **The Rosemount 3051S MultiVariable Flow Transmitter reduces measurement readings. It provides best-in-class performance over changing temperatures with rapid return to true zero after the completion of a CIP process.**
- **The line powered Rosemount 56 Dual Channel Transmitter can be connected to both the Rosemount 225 Toroidal Conductivity and 403 Contacting Conductivity Sensors. Toroidal sensors are ideal for the high conductivity, and potentially harsh conditions, in CIP chemical addition.**
- **The Rosemount 708 Wireless Acoustic Transmitter provides reliable communication of real time data, wirelessly. Effective monitoring of steam trap health ensures energy is not being wasted, saving energy costs and maintenance hours.**
- **The Plantweb™ Steam Trap Insight Application provides real-time information about steam trap conditions, energy usage, emissions and leak detection. The web-based platform allows you to securely access your data anywhere, and the solution seamlessly integrates with your current system.**

**A typical CIP station design: the system is usually highly automated.**

In small dairies the CIP station is commonly centralized. In larger plants, the CIP station is replaced by smaller units located close to each group of processing equipment. Use of the correct sensing technology at each stage is important since there are a number of challenges with the procedures. Some of the key problems are highlighted here, along with the Emerson solution.
Problem: During the CIP program, it is important to be able to detect whether there is milk, water, or caustic chemicals in the system. Access to this information helps ensure as little as possible wastage during changeover from CIP back to production.

Solution: The Micro Motion® H-Series Hygienic Coriolis Flow and Density Meter Sensor allows dairies to identify different fluid densities. This allows operators to rapidly detect the difference between product, rinse water, and cleaning solution, ensuring an efficient changeover to the next process.

Inability to differentiate between milk and water hampers efficient process changeover. CIP processes require a certain turbulence to maintain cleanliness.

Problem: Liquid moving through pipes during the CIP process must maintain a certain velocity for optimal cleanliness. Liquids moving too slowly can leave behind undesirable chemicals and spoiled product.

Solution: The Micro Motion H-Series Hygienic Coriolis Flow and Density Meter provides the most accurate measurement of velocity to help maintain the highest degree of sanitation. It calculates volume flow rate, flow totals, and concentration measurement for process control and provides reliable performance even under extreme process conditions.

Troubleshooting downtime requires an experienced maintenance crew.

Problem: CIP systems need to run throughout multiple shifts. Facilities are not necessarily equipped with maintenance experts during second or third shifts. Processes could be down much longer than anticipated due to troubleshooting inefficiencies.

Solution: The Asco Numatics™ G3 or 580 Series electronic platform communications module provides localized diagnostics to pinpoint sensor or valve failure.

Centralized expensive stainless-steel boxes create long air lines.

Problem: Equipment wash down requirements in the food and beverage industry require CIP systems to protect electronics. Replacing damaged equipment is costly and increases downtime.

Solution: The Aventics CL solenoid pilot valve series enables customers to adhere to equipment wash down requirements. This series is IP69K rated to meet global washdown regulations for the food and beverage industry. Machine builders can increase performance and decrease expensive enclosures.

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Global Headquarters
Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379 USA
+1 800 999 9307 or +1 952 905 8888
+1 952 949 7001
RFQ.RMD-RCC@Emerson.com

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