MilkTech International

UW-MRIL

Cleaning and Sanitation: Introduction to Simple Observations of Cleaning Flow Dynamics

1

Objectives

- To understand how to visually assess CIP Flow Dynamics in milking systems.

2

Steps in The NMC Cleaning Procedures

- 1a. Routine Bulk Tank Milk Quality Analysis
- 1b. Strategic Milk Sampling
- 2a. Observation of Cleaning Procedures
- ***2b. Observation of CIP Flow Dynamics***
- 3. Water Quantity and Quality
- 4. Unit Flow Measurement in Milking Parlors
- 5. Milk Line Slug Flow Dynamics

3

Importance of Flow Dynamics

- A cleaning failure can result from a failure in any one of these processes:
  - Chemical, Thermal or Physical
- If little or no cleaning solution comes into contact with certain portions of the milk contact surfaces, the chemical, thermal and physical actions cannot take place.
  - If cleaning solutions are not adequately distributed to all parts of the milking system, there will be a cleaning failure.

4

2b. Observation of CIP Flow Dynamics

- … an initial assessment of the water and airflow dynamics of a milking CIP system.
  - These observations and measurements can be performed without special testing equipment.

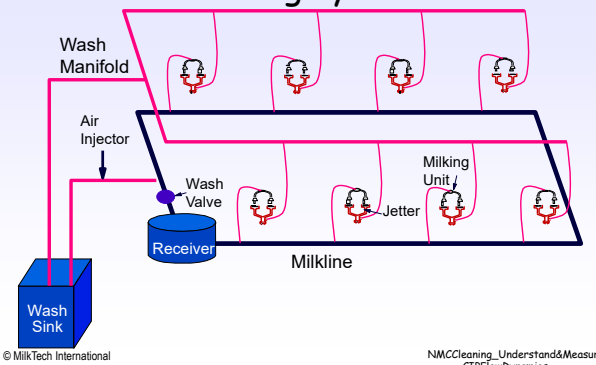
5

Assessing flow dynamics

- First step is to understand the intended flow circuit.
  - A sketch of the CIP system will
    - ✓ aid in understanding the flow circuit
    - ✓ document conditions for future reference and consultation with equipment service personnel.

6

Here is a diagram of a simple cleaning system



7

A sketch of the CIP system

- In the sketch, you should indicate:
  - Diameter and length of all lines
  - Location of critical components such as:
    - ✓ Receiver(s),
    - ✓ wash sink(s),
    - ✓ air injector(s),
    - ✓ Milk/wash valve(s) and
    - ✓ Other manual or automatic valves that may be operated before or during the wash cycle.
    - ✓ Other equipment that is cleaned or used for cleaning.

8

- Record other details about the cleaning system

Type of system: ____Parlor ____Round-the-barn

Number of units _____

Claw type _____

Shell and liner type _____

Milk meters or weigh jar type _____

Other equipment _____

Milk line diameter _____

Wash line diameter(s) _____

Automatic washer type_____

Air injector type(s)_____

Milk/wash valve type: ____paddle ____butterfly ____plug

Are there restrictors on jetters or jetter hoses? Y N Hole sizes _____

Are there restrictors on wash lines? Y N Hole sizes_____

Date of last liner change _____

How often are liners changed? _____

Date of last change of hoses and other rubber parts _____

Other CIP system characteristics _____

9

Here are some things to note when you observe the implementation of the cleaning routine

- Does the sanitary trap valve close (trap-out) during the CIP procedure
- Is air drawn into units or wash lines at the wash sink?
- Is the ball removed from the sanitary trap during washing?
- Do more than 5 gallons of water drain from the balance tank after the wash cycle?
- Does the milk pump run continuously during the wash cycle?

10

Some Symptoms of Flow Problems …

- Improper air injector location and/or timing produce these symptoms:
  - System "traps out" (ball valve in sanitary trap shuts off system vacuum during one or more wash cycles).
  - Air is drawn into system at wash sink during detergent cycle.
    - ✓ Air drawn into intake lines or milking units at wash sink means an uncontrolled point of air injection.
  - Milk pump never shuts off during cleaning.
  - Large volume of water drains from distribution tank when vacuum pump shuts off after cleaning.

11

Flow problems

- Flow problems commonly result from improper air injector location and/or timing cycles and often result in a flooded system.

12

If there are flow problems…

- If the initial tests indicate that flow problems exist, a complete flow evaluation should be performed.
  - A qualified service person with appropriate test equipment and training should be consulted for a complete flow analysis.

13

Important Notes:

- Changes to the CIP system, such as altering air injector timing or varying any hardware settings, should NOT be done without proper testing equipment so that the changes can be adequately assessed.
- The installation and commissioning of every milking system should include installation of the equipment and adjustment of the controls to circulate solutions throughout the milking system for effective cleaning.

14

A complete CIP flow analysis should be conducted whenever:

- A new system is installed,
- A change is made to an existing system, or
- The recommended CIP procedures are being followed, but milk quality tests indicate a cleaning problem exists.

15