6 Rules for Optimizing Process Design to Improve Cleanability and Sanitization

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What you'll learn:

There are five fundamental rules to optimize your process cleaning and sanitization.

Following these rules will help you:

- Minimize Cost
- Minimize Complexity
- Minimize Downtime
- Minimize Risk

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Rule #1: *Minimize volume and surface area to be cleaned*

More surface area =

More Downtime
More Water/Chemicals
More Cost
More Complex CIP
More Risk

Solution: Continuous process systems with minimal surge volume

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Rule #2: *Drainability is not an option*

Equipment Design –

No flat surfaces – top or bottom
Avoid baffles if at all possible
Properly size and protect vents

Piping Design –

Slope to tanks/drains
Reduce couplings/ledges
No dead legs

Solution: Keep it simple

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Rule #3: *Separate process into cleaning zones*

Minimize impact of downtime by cleaning part of the process while still running others

Surge tanks: Create volume

Parallel piping paths: Create complexity

Solution: Design modular processes to run independently in series

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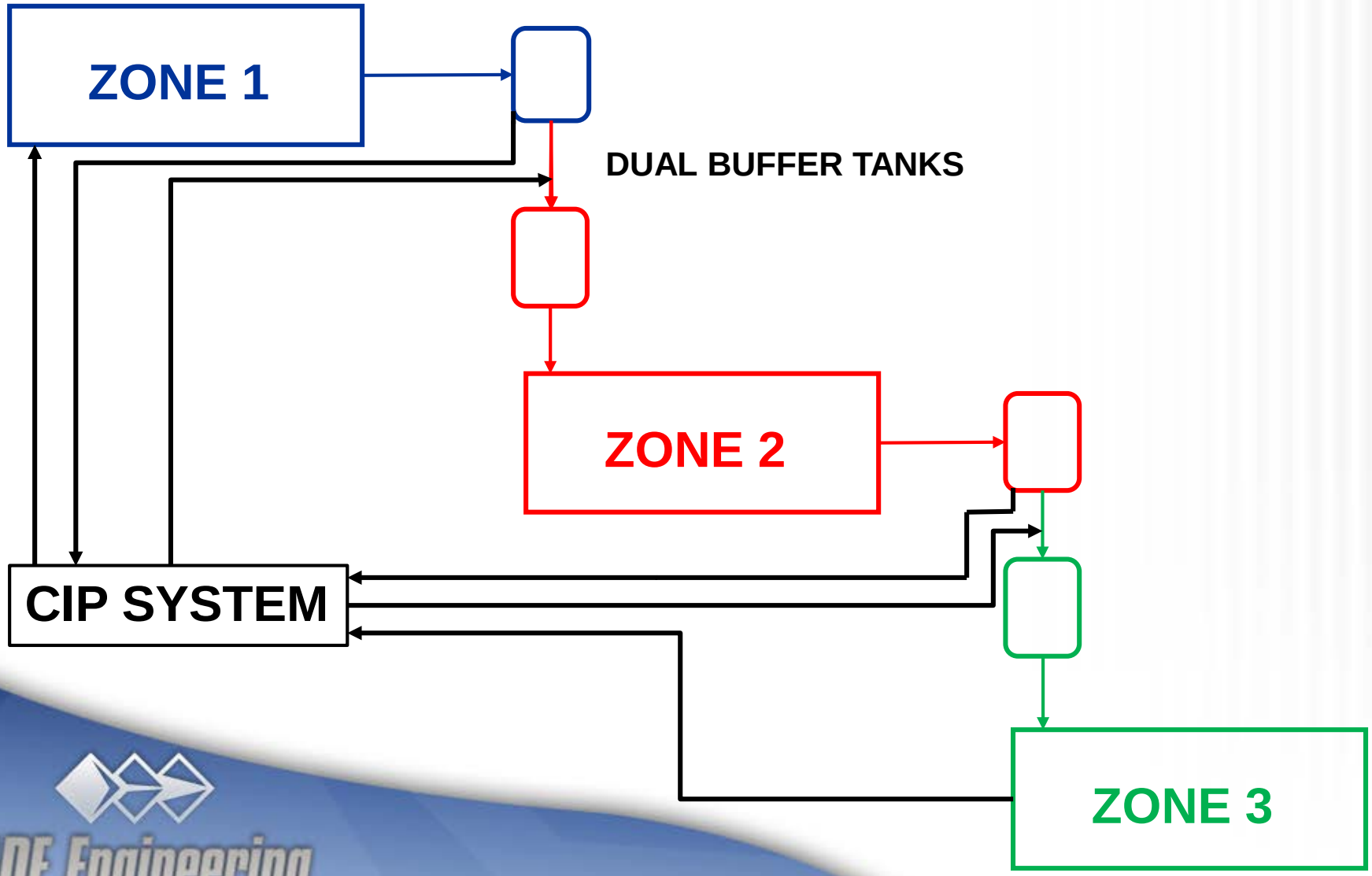
MODULAR ZONES



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Rule #4: ***More frequent sanitization is more effective***

FSMA Food Defense Plan –

Cleaning & Sanitization help resist adulteration

Sanitization is not Sterilization –

Spores will survive

Edible oils are carriers for bacterial & fungal spores

Solution: Allow spores to germinate, then sterilize again

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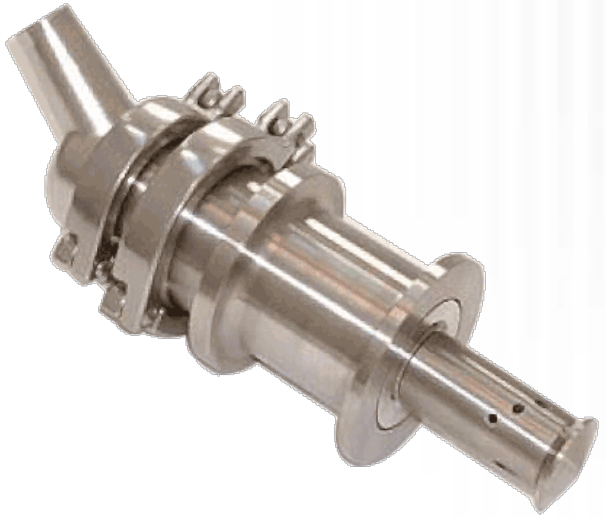
Rule #5: *Avoid Offline Cleaning*

Clean offline only where unavoidable. Offline cleaning is thorough, but creates major downtime!

Offline cleaning creates an open system, which creates more opportunity for contamination or intentional adulteration (FSMA).

Solution:

- Closed process systems
- Clean-in-Place



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Rule #6: *Design for CIP from the start*

If existing system is not GMP compliant, it is typically cheaper to build new than to retrofit old.

Retrofitting for CIP is complex. It requires excellent documentation and impacts every facet of the process and facility design.

Solution: Design processes for cleanability up-front. CIP must not be an afterthought.

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Questions?

Contact mwilliamson@adfengineering.com

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