

ClO₂ Generator Safety Systems

Bleaching Committee Fall 2016

Hinton, AB

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Irving Pulp & Paper

ClO₂ Plant Safety Systems Survey

Survey Questions

- ClO₂ Generator
- ClO₂ Solution Storage
- ClO₂ Heating
- Control Systems
- Redundancy
- Community
- Audits and Training

ClO₂ Generator Safety Best Practices

- Separate Building
- Access Controls
 - Lights/horns – Red/Amber (Auto and Manual triggers)
 - Operator interaction (Permit, Radio, sign in)
- Hot Work Process
 - System down and empty/Mill hot work process
 - Fire Watch/levels
- Functional Checks
 - Annually (Interlocks)
- Strength Monitoring
 - Online (redundant) with lab checks

ClO₂ Generator Safety Best Practices

- Absorber with gravity drains (rare)
 - Alternately Redundant pumps and backup power
- Relief Cap Vents
 - Outside (through a scrubber)
- Steam Ejectors
 - Interlocks/physical locks
- Organics policy
 - No organic material allowed
- Management of Change
 - Robust, including process, controls, parts and equipment

ClO₂ Storage Safety Best Practices

- Containment dyke
 - Full volume +
- Off Gas Protection
 - Passive and active systems
 - Mineral oil, bisulfate, foam
- Pressure Relief
 - Vent outside/Scrubber
- Pressure relief protection???
- Traffic Calming

ClO₂ Heating Safety Best Practices

- Physical protection
 - Vent ClO₂ when too hot, Under/over pressure
 - Flush
 - Control heating medium temperature
 - Interlocks

ClO₂ Control System Safety Best Practices

- Operator Attention
 - Dedicated/focused
- Interlocks: Manufacturer Recommended
- Supervisory controls?
- Backup systems
 - Looped controls/Multiple feeds
- Controls Access
 - Tight on operator changes
 - Limited access to systems changes
 - MoC system

ClO₂ Redundancy Safety Best Practices

- ClO₂ pumps to storage
- ClO₂ scrubber exhaust fans
- ClO₂ area sumps (if not gravity drained)
- Backup generator and air for above
- ClO₂ solution strength online
- ClO₂ solution pumps to storage
- Control systems

ClO₂ Incident Response Safety Best Practices

- Community coordination
- Community response team site tours
- Mock events

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- E2

ClO₂ Audit and Training Safety Best Practices

- Annual Audits
- Annual Training
 - Chemical Training
 - Procedure Review
 - Emergency Response
- HAZOP for Changes

Acknowledgements

Thank you to the mills that participated in the survey and to those who made additions today

Please respond to the survey if you haven't already.