



# **Boiler Chemical Cleaning- Valmet Approach**

**Presented by  
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# Valmet Expertise

- Planning
- Procurement
- On Site Preparations
- Cleaning Execution
- Inspection and Reinstatement
- Startup



# Planning

# Planning Prerequisites

- Drawings
  - P&IDs of Feedwater, Boiler Water, Steam and Blowdown/Drain Systems
  - Side Elevation
  - Steam Drum Internals' Arrangement
  - Lower Header Arrangement
- Boiler Section Water Volumes
  - Water Tubes and Headers
  - Economizer Tubes and Headers
  - Steam Drum
- Outage Schedule
- Unescorted Access to Boiler for 2 Days

# Planning Tasks

- Determine Circuitry
  - Tie Points
  - Direction of Flow
  - Simplified Flow Diagram
- Determine Chemical Method and Application Conditions
  - Chemical Quantities
- Derive Mechanical Scope
  - Temporary and Permanent Modifications
  - Piping Routing
  - Isometric Drawings
  - Quantify Piping, Valves, Fittings, Gaskets, etc
  - Identification of Nozzles to be Removed for Header Inspection and Flushing
  - Steam Drum Internal Modifications
  - Scope Document with Illustrations, Pictures, and Detailed Instructions

## Planning Tasks, cont.

- Derive Procedure with Safety and Environmental Requirements, Detailed Cleaning Steps, and Post-Chemical Cleaning Hand Flushing
- Detailed Microsoft Project Schedule
- Finalize Chemical Cleaning Company Requirements and RFQ Document
  - Chemical Quantities
  - Minimum Hose Quantities
  - Equipment Specifications
  - Time Requirements
- Water Side Valve Position Requirements
- Steam/Feedwater, Demineralized Water/Cool Condensate, Electricity, and Compressed Air Quantified and Source Points Identified
- Safety and Environmental Requirements Identified
- Possible Concurrent Nonrelated Tasks Planned
- Staging Areas Defined

# Planning – Important Aspects

- Planning should take place concurrently with overall construction planning
- Early involvement will result in reduced preparation/execution durations and lower costs.
- Collaborative efforts between Mill, Valmet, and mechanical contractor representatives are important prerequisites



# Procurement



- Chemical Cleaning Vendor
- Mechanical Contractor
- Rental Items
  - Air Compressor
  - Fork Lift
  - Boiler, If Required
- Materials
  - Piping, Valves, Bolts, Gaskets, Consumables, etc
  - Chemicals via Chemical Cleaning Vendor
  - Fuel

In Addition to our Planning, Valmet can provide this items via subcontracts, manage the subcontracted items and assume liability for performance and results.



# On Site Preparations

- Procedures Approved
- All Contract Personnel Safety Trained
- Valmet Task Manager On Site 3-4 Days Prior to Start of Cleaning
  - Review and Finalize Mechanical Preparations
  - Interface with All Involved Parties on Schedule, Safety, Environmental, and Other Preparation Subtasks
  - Assist Chemical Cleaning Vendor onto Site
- Valmet Service Engineer On Site
- Chemical Cleaning Vendor Staged
- Chemical Solution Concentrates Prepared
- Mechanical Preparations Complete
- Safety and Environmental Requirements Implemented. Personnel briefed.
- Valves Aligned
- Operators Assigned (Two on 24 hour per day basis) and Briefed
- Adjacent Nonrelated Tasks Isolated

## On Site Preparations, cont.

- 90% of Boiler Insulated
- Hydrotest Complete
- All Boiler Doors and Dampers Closed
- Utilities Connected and Charged
- Safety Barricades Installed



# Cleaning Execution

- Cleaning Procedure Executed
- A Collaborative Effort Between Valmet, Operations and the Chemical Cleaning Vendor
- Flows, Temperatures, and Levels Routinely Monitored by Operators, Valmet, and Chemical Cleaning Vendor
- Boiler Walked Routinely for Leak Detection
- Chemical Cleaning Vendor Operates Temporary Equipment, Handles Chemicals and Routinely Analyzes Solvent for Concentrations and pH.
- Valmet Interprets Results of Solvent Analyses to Determine Solvent Progress and Initiation of Next Stage



# Inspection and Reinstatement

- Water Side Lockout
- Inspection Nozzles/Handholes Cut
- Headers and Drum Inspected
- Sludge Removed from Tubes and Headers
- Inspection Nozzles/Handhole Caps Welded
- Temporary Piping Removed
- Drum Internals Reinstated
- Temporary Modifications Removed
- Boiler Valves Aligned for Final Hydrotest





# Startup

- Final Hydrotest
- Final Boiler Cleanup
  - Add Water Cleanup Chemicals
  - Fire Boiler to 550-600 psi
  - Conduct Continuous Steam Blow While Reducing Suspended Iron In Boiler to 1 ppm or Less Using Valmet Blowdown Procedure
- Concurrent Steam Blow of Superheater, If Required

# 2015 Boiler Chemical Cleaning Project List

Customer	Mill	Boiler	Valmet Provided Items			
			Plan	Execute	Subcontract	
					Chem Clean Vendor	Mechanical Services
Georgia-Pacific	Brunswick	RB6 Tampella	√	√	√	√
Georgia-Pacific	Cedar Springs	RB3 B&W	√	√	√	
Graphic Packaging	West Monroe	RB4 C-E	√	√	√	√
Graphic Packaging	West Monroe	HRSG Deltak	√	*		
WestRock	Mahrt	RB2 Tampella	√	√	√	√
WestRock	Demopolis	PB4 Valmet BFB	√	*		
WestRock	Covington	PB9 C-E	√	*	*	*
WestRock	West Point	RB4 C-E	√	*		
Green Bay Packaging	Morrilton	RB C-E	√	√	√	
Greif, Inc	Riverville	RB B&W	√	√	√	√
Catalyst Paper	Rumford	RB B&W	√	√		
Weyerhaeuser	Flint River	RB B&W	√	√	√	

