



IMPROVING COKER STRUCTURE AUTOMATION



Jerry N Waggoner
Process Operations Advisor

Coking.com
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Overview

- Automation history
- Foster Wheeler in automation
- Where is the industry headed
- Design for total automation




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Automation History

- Coker # 1 – 1929 Standard Oil of Indiana
- Coker of the 1990's
- Today's typical automation (16 valves per drum)




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Coker # 1 – 1929 Standard Oil of Indiana

- All Manual Operation
- Switch valve – manual
- Wedge plugs used for isolation
- Total manual deheading
- Blowdown vent stack
- Relief to atmosphere
- Coke drum pressure 60 PSIG
- NO SHOT COKE




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FW 1990's Coker

- Some Motorized Valves
- Switch Valve Motorized Ball Valve
- Some Valves Interlocked
- Blowdown to Flare – Some Recovery
- Relief System to Flare
- Coke Drum Pressure 15 PSIG
- Shot Coke becoming A Normal Operation
- Automatic Deheading Appearing on Some Units
- First Automated Crane




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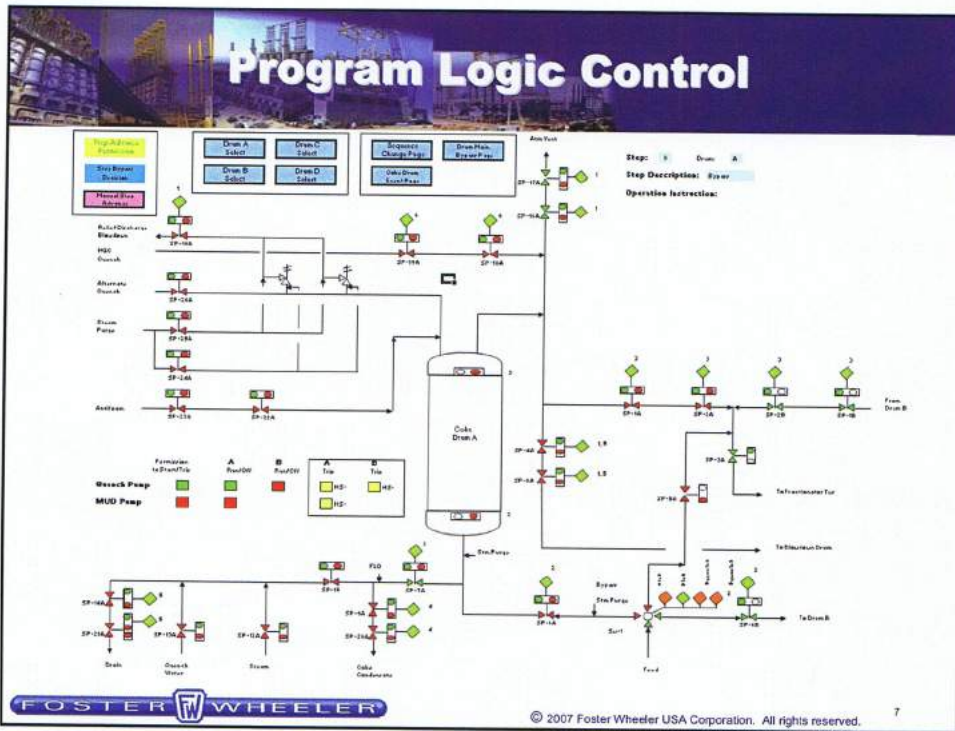
2005 Typical FW Coker Design

- More motorized valves
- Switch valve motorized
- More valves interlocked
- More double block valves
- Slide valve deheading
- Blowdown recovered to compressor
- Pressure in drum 15 PSIG or less
- Shot coke normal




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FW Current Design

- All motorized valves interlocked
- Switch valve motorized
- Batch controller monitors system
- Interlocked process permissives for safe operation
- Operator permissive to move valves
- Slide valve deheading
- Blowdown recovered to fuel gas
- Coke drum pressure 15 PSIG
- Shot coke normal
- Cut coke remotely



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Foster Wheeler in Automation

- All valves used in normal operation motorized
- Batch controller controlling batch operation
- Valves sequenced by batch controller
- Knowledge-based advisory on out-of-synchronization steps
- Remote cutting – can be automated
- Fully automated top and bottom deheading devices



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Where is the industry headed?

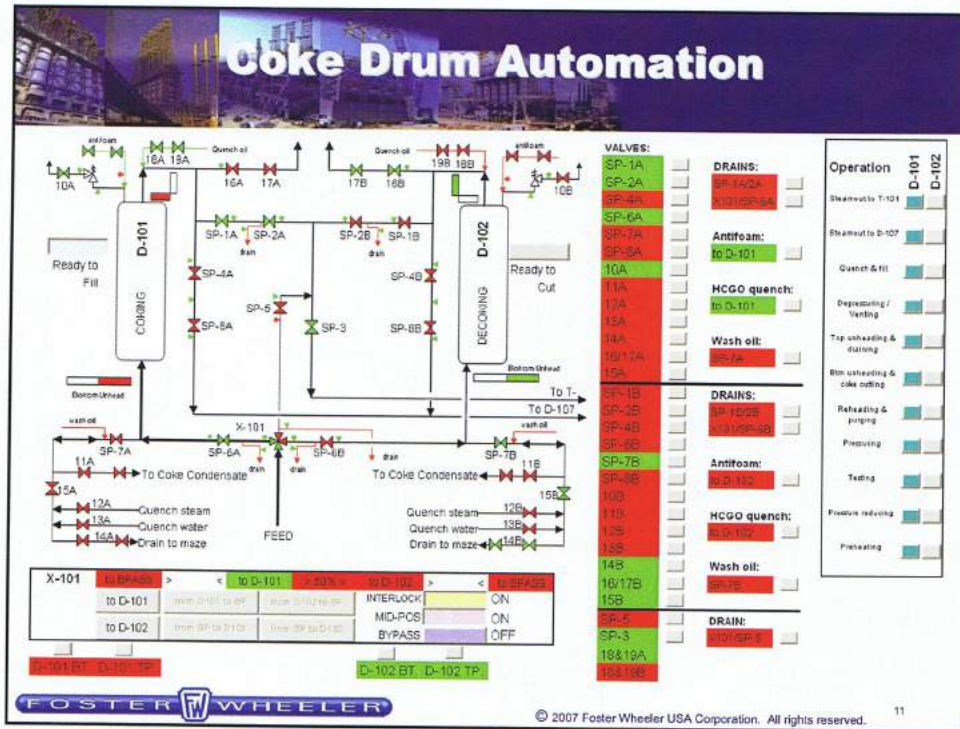
- Automation of Cutting
- Automated batch operation.
 - Switch
 - Blowdown
 - Quench
 - Drain & dehead
 - Rehead and test
 - Preheat



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Coke Drum Automation



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Design for Total Automation

Current technology will allow Cokers to operate from the control room just as other refinery units do today.



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