



**DELTA GUARD™**



**DeltaValve™**

DELTAVALVE IS A DIVISION OF CURTISS-WRIGHT FLOW CONTROL CORPORATION



**DeltaValve™**

RAISING THE STANDARD IN PLANT PERFORMANCE



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**CURTISS  
WRIGHT**

**A Heritage of Firsts  
A History of Innovations**



**Glenn Curtiss**



**Wilbur Wright**



**Orville Wright**



**First Flight**

**December 17, 1903**

**Aviation's Pioneers**



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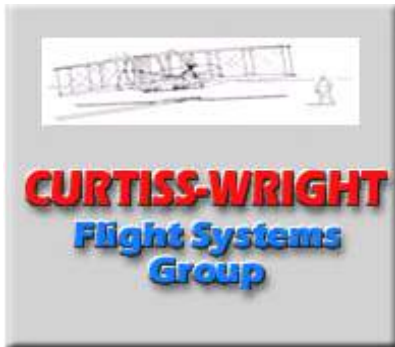


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**CURTISS  
WRIGHT**

**Business Segments**



1929



1961



1968

**Employees: 6500**







**Sales: \$1Billion +**



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# DeltaGuard Bottom Units Sold







	Customer	Orders	Installations	Mfg
	ChevronTexaco-Salt Lake	2	2	0
	ChevronTexaco-Pascagoula	6	6	0
	ChevronTexaco-El Segundo	6	6	0
	Citgo-Lake Charles (1 Spare)	5	4	0
	Citgo-Lemont	6	0	6
	BP-Texas City	6	2	4
	Premcor-Pt Arthur	6	6	0
	Suncor-Ft McMurray	2	0	2
	Petrobras-Brasil	4	0	4



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# DeltaGuard Bottom Units Sold

Customer	Orders	Installations	Mfg
 Petrozuata-Venezuela	4	0	4
 Lyondell-Citgo (1 Spare)	5	4	0
 Valero-Corpus Christi	2	0	2
Valero-Aruba	4	0	4
 Shell-Wilmington (1 Spare)	5	4	0
 Marathon	2	0	2
Coffeyville Resources	4	0	4
 Flint Hills Resources	2	0	2
<b>TOTAL</b>	<b>71</b>	<b>34</b>	<b>34</b>



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# Chevron Salt Lake Installation



- First installation
- 2-unit installation
- Anode Coke
- Fully fabricated design
- Bolted transition spool
- Standard side feed entry
- 24 hour cycles





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# Chevron Pascagoula Installation



- 6-unit installation
- Shot coke
- Fully fabricated design
- Bolted transition spool
- Complete site inspection of valve Feb 2005
- First to drain water through valve
- 12 hour cycles

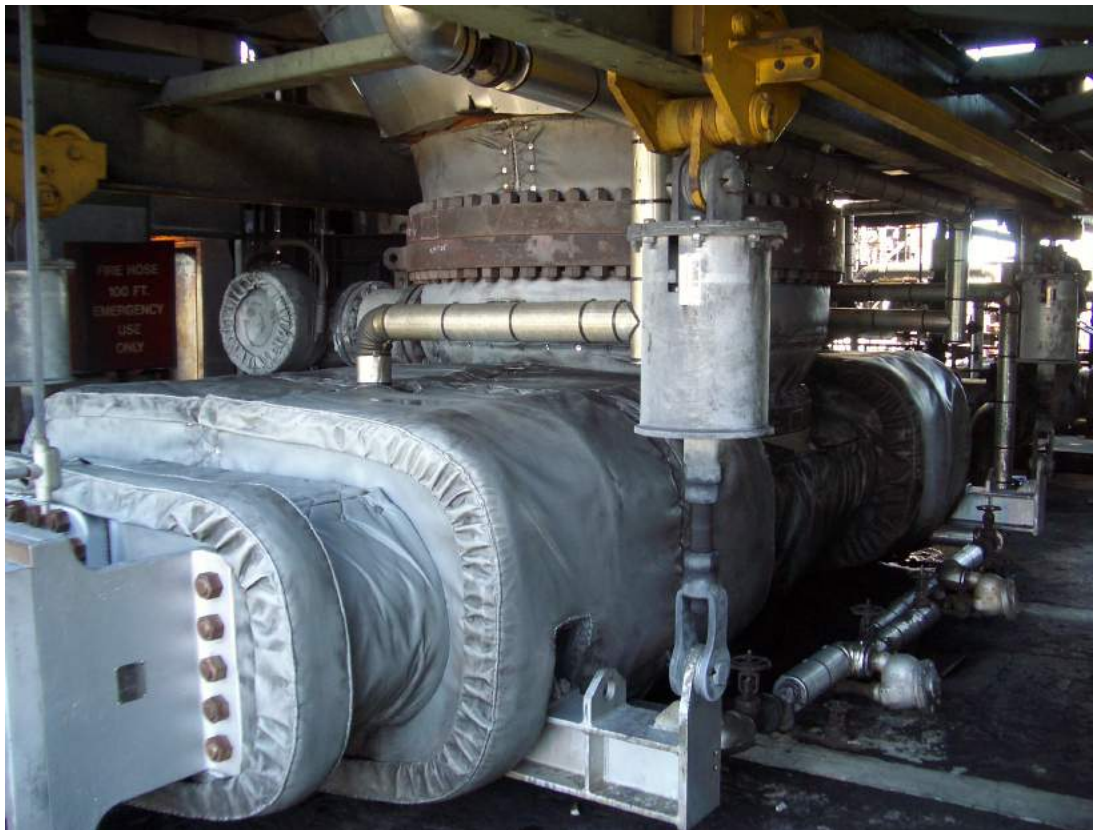


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# Chevron El Segundo Installation



- 6-unit installation
- Shot coke
- First cast design installation
- Bolted transition spool
- Chevron type insulated spool
- 15 hour cycles





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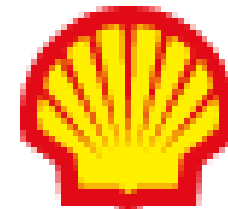
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# Shell Wilmington Installation



- 4-unit installation
- Sponge coke
- Cast design
- Welded transition spool
- Higher feed entry point
- Steeper upturn on feed-line
- Added steam to cooling box
- 24 hour cycles





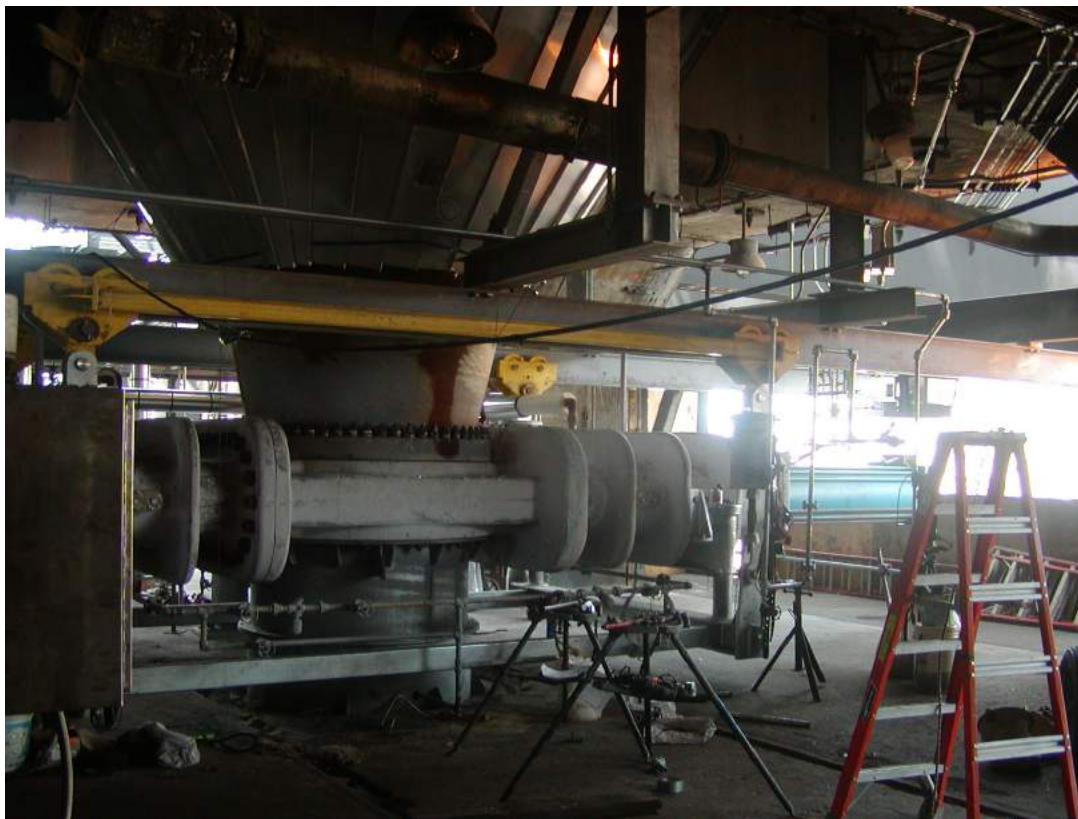
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# Citgo Lake Charles Installation



- 4-unit installation
- Shot coke
- Cast design
- Welded transition spool
- Site inspection Feb 2005
- 18 hour cycles





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# Premcor Port Arthur Installation



- 6-unit installation
- Shot coke
- Cast design
- Welded transition spool
- Draining drum water and coke through valve
- 11 hour cycles



**Premcor**





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# BP Texas City Installation



- 2-unit installation
- Shot coke
- 4 additional units in production
- Cast design
- Welded transition spool
- Inlet horizontally into straight section
- 14 hour cycles





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# Lyondell-Citgo Houston Installation



- 4 of 8 units
- Shot coke
- Welded transition spool
- Cast design



**LYONDELL-CITGO**  
Refining LP



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# DeltaGuard Overview

## Safe Unheading

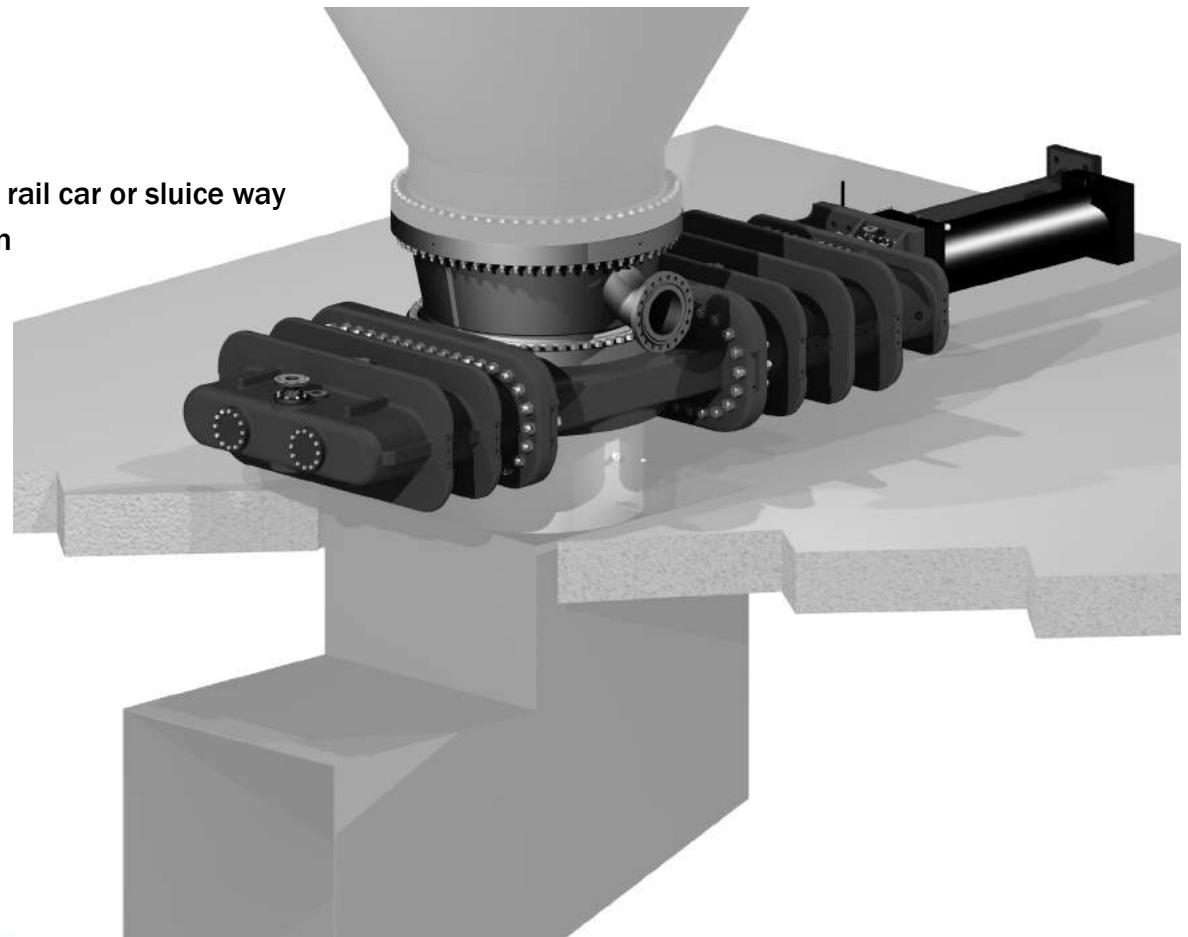
- Eliminate exposure risk to personnel
- Remotely operated from control room
- Totally enclosed drain discharge into pit, rail car or sluice way
- Safe secondary backup actuation system

## Easy Operation

- Push button controls
- No feedline to disengage
- Discharge chute permanently attached to device
- No intermediate chute to raise

## Low Maintenance

- Device has one major moving part
- No gaskets to replace
- No drum flange surfaces, tools or deck to clean between cycles



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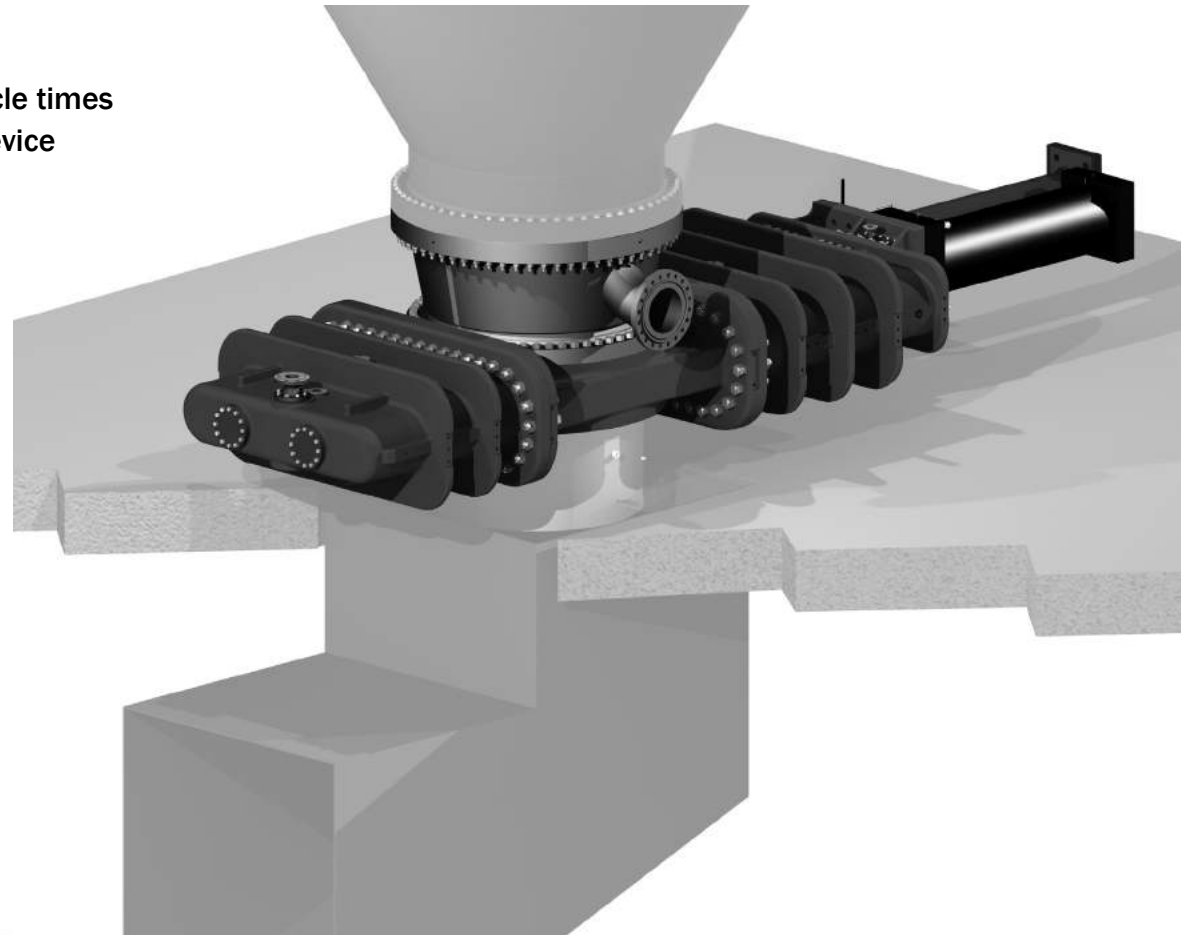
# DeltaGuard Overview

## Increased Throughput

- Increased production due to reduced cycle times
- Drum can be drained directly through device
- Compatible with shot coke production

## ROI (return on investment)

- Significant reduction of operating and maintenance costs
- Ability to safely process alternative crudes namely shot coke





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## News

- Full life cycle study completed on DeltaGuard using site measured thermal responses DeltaValve, SES, Chevron, Citgo, ConocoPhillips, CD Adapco
- ConocoPhillips thorough review and approval of DeltaGuard March 2005
- First DeltaGlide completed
- Solutions for meeting market demands







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# Technology Updates

- DeltaGuard upper/lower bonnets fabricated
- New DeltaGuard throttling design completed
- Top-entry, in-line repairable, modulating isolation valve: 2005 release
- Event Recorder for extended warranties
- More delayed coking technology to come





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# Web Based User's Forum

- **Public Information Exchange**
  - Entry method, spool type
  - Cycles in Service
  - Draining technique
  - Interlocks
  - Maintenance history
  - Bugs / Fixes
  - Complaints / Praises
  - Accident avoidance events
  - Questions to DeltaValve
  - Technology Releases





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## Further Study

- **Best method for drum entry**
  - Bolted / Welded
  - Straight in / Up turned
  - Into cone / Straight section
  - Close to gate / High above gate
  - Single entry / Double entry





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## Further Study

- Effects of feed-entry method on life cycles
  - Feed line
  - Cone area
  - Drum wall
  - Skirt





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**Together we can make a difference...**

