A Heritage of Firsts
A History of Innovations

Glenn Curtiss
Wilbur Wright
Orville Wright

First Flight
December 17, 1903

Aviation’s Pioneers
Employees: 6500
Sales: $1Billion +
## DeltaGuard Bottom Units Sold

<table>
<thead>
<tr>
<th>Customer</th>
<th>Orders</th>
<th>Installations</th>
<th>Mfg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChevronTexaco-Salt Lake</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>ChevronTexaco-Pascagoula</td>
<td>6</td>
<td>6</td>
<td>0</td>
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<tr>
<td>ChevronTexaco-El Segundo</td>
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<tr>
<td>Citgo-Lake Charles (1 Spare)</td>
<td>5</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Citgo-Lemont</td>
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<td>6</td>
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<tr>
<td>BP-Texas City</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Premcor-Pt Arthur</td>
<td>6</td>
<td>6</td>
<td>0</td>
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<tr>
<td>Suncor-Ft McMurray</td>
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<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Petrobras-Brasil</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Petrozuata-Venezuela</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Lyondell-Citgo (1 Spare)</td>
<td>5</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Valero-Corp Christi Valero-Aruba</td>
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<td>2</td>
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<tr>
<td>Shell-Wilmington (1 Spare)</td>
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<tr>
<td>Marathon</td>
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<tr>
<td>Coffeyville Resources</td>
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<tr>
<td>Flint Hills Resources</td>
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<td>2</td>
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<td><strong>TOTAL</strong></td>
<td><strong>71</strong></td>
<td><strong>34</strong></td>
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</tr>
</tbody>
</table>
Chevron Salt Lake Installation

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

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

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

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

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

• Effects of feed-entry method on life cycles
  – Feed line
  – Cone area
  – Drum wall
  – Skirt
Together we can make a difference…