Support Network Critical to Coker Crane Success

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SUPPORT IS KEY:

Successful operation needs trained operators and maintenance personnel:

• Protective features require periodic maintenance/replacement:
  – Encoders for position sensing
  – Limit switches for travel limits, brake wear sensing, wire-rope mis-reeving
  – Skew sensors

“Mostly quiet…”

• (2) Existing P&H brand cranes, Jamnagar (1987)
SUPPORT IS KEY:

Successful operation needs trained operators and maintenance personnel:

- Protective features require periodic maintenance/replacement:
- Failures of some systems cause un-trained operators to lose confidence, turn features “Off”...
  - Skew control
  - Sway control
  - Semi-automation

• Panipat delivered (supported by KC-Thailand)
SUCCESSFUL OPERATION NEEDS TRAINED OPERATORS AND MAINTENANCE PERSONNEL:

- Protective features require periodic maintenance/replacement:
- Failures of some systems cause un-trained operators to lose confidence, turn features “Off”...
- Trained, motivated Operators are the first-line of defense for Maintenance Team:
  - Performing pre-shift safety checks
  - Reporting alarms/symptoms accurately
  - Adjusting/repairing as instructed
  - Observing Operating procedures

“...safety features have been extremely helpful in avoiding any undesirable and unsafe incidents...” *

* See Article: Support Network Critical to Coker Crane Success
BUILDING A NETWORK:

When first delivering to India, an in-country service network was needed:

- Personnel trained at Konecranes facilities in Houston and Finland
  - Electrics Factory – Finland
  - Inverter & PLC courses
  - Project Management Training / Houston
  - Shop Assembly and Testing / Houston

- (2) Jamnagar cranes delivered

2008
When first delivering to India, an in-country service network was needed:

- Personnel trained at Konecranes facilities in Houston and Finland
- Tech Support was positioned near refinery sites
- Bina crane delivered
- Delhi support added
BUILDING A NETWORK:

When first delivering to India, an in-country service network was needed:

- Personnel trained at Konecranes facilities in Houston and Finland
- Tech Support was positioned near refinery sites
- Later, Service branches were opened to provide additional support

• Baroda crane delivered
• Baroda support added
• Bathinda crane delivered
BUILDING A NETWORK:

When first delivering to India, an in-country service network was needed:

- Personnel trained at Konecranes facilities in Houston and Finland
- Tech Support was positioned near refinery sites
- Later, Service branches were opened to provide additional support
- Finally, a dedicated Coker Crane Service Team...

**Coker Team India** was formed:
- Get the right resource to site
- Customer-focused response
- Trained experts with a **Team Culture**

“...all of our customers get an improved experience.”

- Mangalore crane delivered
- Guwahati crane delivered
- Kolkata Branch opened
BUILDING A NETWORK:

When first delivering to India, an in-country service network was needed:

- Personnel trained at Konecranes facilities in Houston and Finland
- Tech Support was positioned near refinery sites
- Later, Service branches were opened to provide additional support
- Finally, a dedicated Coker Crane Service Team... *Coker Team India* was formed
- Konecranes Services now partnering with bucket mfg., Anvil Attachments, Ltd.:
  - Spare Parts
  - Inspection services
  - Bucket rebuilds
  - Replacement buckets

• Vadinar cranes (2) delivered
MEASURING SUCCESS:

How can we measure success?

- **Coker Team India** is active supporting both Indian and international customers
  - Saudi Arabia
  - Philippines
  - Soon Oman, Belgium, Turkey...

- Paradeep crane delivered
- Saudi Arabia cranes (4) delivered
MEASURING SUCCESS:

How can we measure success?

- **Coker Team India** is active supporting both Indian and international customers
- (11) of the Konecranes coker sites in India operate with **only one crane**...a testament to reliability

- Kochi crane delivered
- Philippines cranes(2) delivered
MEASURING SUCCESS:

How can we measure success?

- **Coker Team India** is active supporting both Indian and international customers
- (11) of the Konecranes coker sites in India operate with **only one crane**...a testament to reliability
- Very high levels of customer satisfaction where Konecranes operates and maintains

- Chennai crane delivered
- Chennai Branch opened
MEASURING SUCCESS:

How can we measure success?

- **Coker Team India** is active supporting both Indian and international customers
- (11) of the Konecranes coker sites in India operate with **only one crane**...a testament to reliability
- Very high levels of customer satisfaction where Konecranes operates and maintains
- Continued business - Konecranes has received orders for 15 cokers for India
- Konecranes brand cokers have handled an estimated **200 million metric tons** of coke in India with **no prolonged downtime**

“**The downtime for these cranes is extremely low**...”

- Oman cranes (2) delivered
- Turkey cranes (2) delivered
- Belgium crane in process
- Jamnagar crane in process
- Haldia crane in process
### MEASURING SUCCESS:

How can we measure success?

**Konecranes branded coker cranes sold to Indian Customers:**

<table>
<thead>
<tr>
<th>Ordered</th>
<th>Qty.</th>
<th>Crane Lift Capacity (m³)</th>
<th>Bucket Size (m³)</th>
<th>Years Operating (per crane)</th>
<th>No. of Cranes</th>
<th>Op-Yrs</th>
<th>Specified Tons/Day Produced</th>
<th>Coke produced per Day per crane (tpd)</th>
<th>Handling &quot;Factor&quot; (times coke handled)</th>
<th>estimated tons/ year handled x 350 days/year (t)</th>
<th>Coke Handled to Date (t)</th>
<th>Konecranes Maintaining?</th>
<th>Konecranes Operating?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1</td>
<td>32 MT</td>
<td>15 M. Mech.</td>
<td>[ Not yet in Service ]</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>Yes</td>
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<tr>
<td>2015</td>
<td>1</td>
<td>40 MT</td>
<td>22 M. Mech.</td>
<td>[ Not yet in Service ]</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>Yes</td>
</tr>
<tr>
<td>2014</td>
<td>1</td>
<td>33 MT</td>
<td>21 M. Mech.</td>
<td>[ Not yet in Service ]</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<tr>
<td>2013</td>
<td>1</td>
<td>37 MT</td>
<td>23 M. Mech.</td>
<td>[ Not yet in Service ]</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>Yes</td>
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<td>2011</td>
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<td>55 MT</td>
<td>30 M. Mech.</td>
<td>0.5</td>
<td>1</td>
<td>0.5</td>
<td>4,172</td>
<td>4,172</td>
<td>2</td>
<td>2,920,400</td>
<td>1,460,200</td>
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<td>Yes</td>
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<td>40 MT</td>
<td>20 M. Mech.</td>
<td>4.25</td>
<td>2</td>
<td>8.5</td>
<td>7,154</td>
<td>3,577</td>
<td>2.3</td>
<td>5,758,970</td>
<td>48,951,245</td>
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<td>41 MT</td>
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<td>2</td>
<td>1</td>
<td>2</td>
<td>3,300</td>
<td>3,300</td>
<td>2</td>
<td>2,310,000</td>
<td>4,620,000</td>
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<tr>
<td>2009</td>
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<td>40 MT</td>
<td>20 M. Mech.</td>
<td>4.5</td>
<td>1</td>
<td>4.5</td>
<td>3,150</td>
<td>3,150</td>
<td>2</td>
<td>2,205,000</td>
<td>9,922,500</td>
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<td>5.25</td>
<td>3,314</td>
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<td>2,319,800</td>
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<td>2007</td>
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<td>33 MT</td>
<td>15 M. Mech.</td>
<td>5.5</td>
<td>1</td>
<td>5.5</td>
<td>1,417</td>
<td>1,417</td>
<td>2</td>
<td>991,900</td>
<td>5,455,450</td>
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<tr>
<td>2006</td>
<td>2</td>
<td>35 MT</td>
<td>20 Yd. Mech.</td>
<td>7.5</td>
<td>2</td>
<td>15</td>
<td>12,504</td>
<td>6,252</td>
<td>1.5</td>
<td>6,564,600</td>
<td>98,469,000</td>
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<td>No</td>
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<td>2003</td>
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<td>10.75</td>
<td>1</td>
<td>10.75</td>
<td>3,100</td>
<td>3,100</td>
<td>2</td>
<td>2,170,000</td>
<td>23,327,500</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>=</th>
<th>Total Cranes</th>
<th>15</th>
<th>Operating Years are Approximate, as of: 2016.75</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total CraneOp Yrs =</th>
<th>55.50</th>
</tr>
</thead>
</table>

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<tr>
<th>350 x Op Days / Year</th>
<th>13,424,250 = Total Coke Produced</th>
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<td>203.6 Million mt</td>
<td>Million mt</td>
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</table>
How can we measure success?

“Typical” Break-down has been approx. 2 days
Coker Specialists respond quickly and problems are resolved

Recently (2) significant Break-down incidents:
• Derailing (Aug-2016):
  o One crane in a 2-crane facility derailed
  o Time was spent checking wheel and rail alignment
  o But failure was found to be in Skew-Control software
  o Software was re-loaded, system recalibrated, crane running fine
  o This is longest shutdown reported to date... **19 days**

• Encoder signal failure (July-2016):
  o Problem was first mis-diagnosed (by KC) as bad encoder
  o Time was wasted obtaining/installing replacement
  o Trouble was actually damaged encoder cable, replaced/resolved
  o This is second-longest shutdown... **10 days**
MEASURING SUCCESS:

How can we measure success?

But the good news is...

• 55.5 OpYears / 200 million metric tons handled:
  o No Hoist/Close Motor failures
  o No Gantry/Trolley Motor failures
  o No Gear failures
  o No Drum failures

• Main failures, ReGen Units and Inverters
  o Several due to improper storage prior to install
  o Most failures on Commissioning or shortly after
  o Operationally:
    – 4 failed ReGen Units
    – 1 Gantry Inverter
  o Otherwise, a few encoders, sensors, bearings...
A variety of Services available:

- Crane operators
- Maintenance personnel
- Inspection services
- Technical support
- Training
FULL-SERVICE SUPPORT:

...with a variety of Service Products:

- Mainman reporting
- TRUCONNECT® remote monitoring
- RopeQ wire rope diagnostics
- RailQ runway rail alignment
- CMS diagnostic data analysis
- yourKONECRANES.com® web portal
KONECRANES INDIA TODAY:

KC Coker locations:

- Panipat (2003)
- Bina (2007)
- Baroda (2008)
- Bathinda (2009)
- Mangalore (2009)
- Guwahati (2010)
- Vadinar (2 KC 2010/2010)
- Paradeep (2011)
- Kochi (2013)
- Chennai (2014)
- Haldia (2016)

(17 cranes as of July-2016, incl P&H brand)

(Year Ordered)
CONCLUSION:

The keys to coker crane success:

Experience:
- Total combined operating time for Konecranes and P&H coker cranes is now over 1,800 Operating Years
- Over 55 Operating Years for Konecranes Indian cokers
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Experience:
- Total combined operating time for Konecranes and P&H coker cranes is now over 1,800 Operating Years
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Technology:
- Konecranes suite of software features for Safety, Reliability and Productivity

Konecranes Technology:
- DynAGrab hoist-grab control
- DynATrak skew control
- DynAPilot sway control
- Semi-Automation
- CNS crane monitoring system
- TRUCONECT® remote monitoring
- D2G Inverter control software
- Hot-Spare Inverter controls
- DynAReg regeneration control
- Mechanical moment isolation

Total combined operating time for Konecranes and P&H coker cranes is now over 1,800 Operating Years
Over 55 Operating Years for Konecranes Indian cokers

Safety, Reliability and Productivity

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• Over 55 Operating Years for Konecranes Indian cokers

Technology:
• Konecranes suite of software features for Safety, Reliability and Productivity

Service:
• Support for Konecranes products wherever buyers install it
• Team India Experts for Indian and international locations
• Operation, Maintenance, Training...

“We’ll send Team India...”
KEY TAKE-AWAYS:

The keys to coker crane success:

Operators:
• Whether operation is by Owner, Contractor or Konecranes, Operators **Must** be Trained

Maintenance:
• Whether Maintenance is by Owner, Contractor or Konecranes, Maintenance people **Must** be Trained

Partner:
• Work with a partner who is **local, dedicated, and customer focused**

Equipment:
• With the above, plus the right equipment and appropriate spares... **Success !!**
MAIN RESULT:

Satisfied Customers !!
Thank you !!

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Safety,
Reliability,
Productivity.

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