Coking in India

Keynotes

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Delayed Coking

coking / decoking of heavy residue in the refining process
what to do with this low price?
how can we survive with our business?
Oilprice, Brent, 15 years
Oilprice, Brent, 15 years

- 2012
- 2016
- 2002

January - December

usd/barrel

0 - 100
Oil production and trading

Oil Trading nations, (Wikipedia)
Delayed Coker Units

**Coker in India**
- Numarligarh
- Bongaigaon
- Guwahati
- Dig Boi
- Reliance I / II
- Gujarat
- Digboi
- Panipat
- Binar
- Essar
- HMEL
- MRPL
- Paradip
- CPCL
- BPCL
- Barauni
- Haldia
Delayed Coker Units (DCUs) in India are built in extreme ambient. All equipment including the Coke Cutting Systems have to meet these requirements.

The requirements are summarized as

a) Ambient and Design conditions in warm areas
   - temperature ranges from -3°C to +50°C, wetted parts 3°C to 120°C
   - sun, wind, rain, dust, humidity
   - Humidity above 90%, often 100%

b) Refinery conditions
   - hazardous, corrosive atmosphere, sea side
   - operation mode manual / remote / automated

c) Company specification
   - specification of final user, contractor, licensor

d) Local codes and standards
   - other local codes

In the project and design phase items c) and d) are most important and should be met later. a) and b) are most important.
Development of coke production per drum

view point from decoking aspects

not process

What amount of coke do I have to cut in which time?
Development of coke production per drum viewpoint from decoking aspects

What amount of coke do I have to cut in which time?

Delayed Coker Units in India
Delayed Coker Units

DCU in 1990’s

**Delayed Coking Equipment**
- Heater, Process equipment
- Switch valves, manual

**Decoking Equipment**
- Deheading devices
  - manual operated

Jet Pump
- flow, pressure 250/200

Coke Cutting
- pneumatic hoists + DSDs

Control System
- manual operation
- Relays / 1 PLC cabinet,
  - DR (AB), 1600mm

DCU in 2016

**Delayed Coking Equipment**
- Heater, Process equipment
- Switch valves, autom, / remote

**Decoking Equipment**
- Deheading Systems
  - Slide valves, remote/automatic

Jet Pump
- flow, pressure 310/345

Coke Cutting
- electrical hoists + DSDs

Control System
- manual /remote /auto-operation
- PLC cabinet,
  - TMR/QMR, 9000mm
Delayed Coker Units

DCU in 1990’s
**Delayed Coking Equipment**
Process equipment

**Specification for Coke Cutting**
Send by mail in paper format
Send by mail floppy discs
start of sending too much data

Spec for mechanical equipment
mainly pump / motor / gear
Spec for instrumentation
for standardisation in the ref.
No spec for the Control System

DCU in 2016
**Delayed Coking Equipment**
Process equipment

**Specification for Coke Cutting**
Download from server
MB’s of data
from autarc departments

Concentration on instrumentation
and control systems

**Do we believe that a coker becomes safer with larger control systems ?**
TMR/QMR instead of DR ?
Coke Cutting Systems 2016

**Mechanical Design**

Jet Pump unit
- Basic design related to coke drum diameter, coke type
- Flow and Head defined very precise, but without relation to detailed piping
  - Tested, checked acc. API610

**Instrumentation, PLC design**

Control System
- Very detailed specified
- Dual-Redundant, TMR/QMR
- SIL rated
- Redundant I/O’s for all data

**Cutting System**

- Basic design without detailed requirements
- Industrial standard is not available or not used for CCS

**Instrumentation**

- SIL rated instruments
- Safety signals hardwired
**Tendency worldwide**

In the project and design phase items c) and d) are most important and should be met

c) project specification
d) local codes and standards

During operation

a) and b) are most important.

a) Ambient and Design conditions
b) Refinery conditions
Installations in India

- HMEL
- Jet Pump
- 1st coke
- MRPL
- IOCL Paradip
THANKS FOR YOUR ATTENTION