TÜPRAŞ Residuum Upgrading Project (RUP)
Delayed Coker Unit (DCU)

XX.05.2019

Onur Aka
Process Superintendent
➢ TUPRAS General Information
➢ RUP General Information
➢ RUP Delayed Coker Unit
➢ Issues Encountered During Precommissioning/Commissioning/Operation
➢ Recommendations
TUPRAS General Information

**Izmit**
- 11.0 MT Capacity
- NC: 14.5
- Storage Capacity: 2.99 mn m³

**Izmir**
- 11.0 MT Capacity
- NC: 7.66
- Storage Capacity: 2.51 mn m³
- Base oil 400 k tons

**Kirikkale**
- 5.0 MT Capacity
- NC: 6.32
- Storage Capacity: 1.27 mn m³

**Batman**
- 1.1 MT Capacity
- NC: 1.83
- Storage Capacity: 0.27 mn m³

**Total Capacity**: 28.1 mn ton
**Nelson Complexity**: 9.5
**Tüpraş Storage Cap.**: 7.0 mn m³
**OPET Storage Cap.**: 1.0 mn m³
Tüpraş Residuum Upgrading Project (Scope)

- **Delayed Coker Unit** (8,200 m³/d), Foster Wheeler USA
- **Integrated Unicracking Process Unit** (8,800/4,000/1,300 m³/d), UOP
- **Vacuum Distillation Unit** (8,500 m³/d), Shell Global Solutions
- **Hydrogen Production Unit** (160,000 Nm³/h), Technip
- **Sulphur Recovery Units** (420 ton/d, 2 trains), Jacobs
- **Amine Regeneration Unit** (2 trains),
- **Sour Water Stripping Unit** (2 trains),
- **Cooling Water Systems**,
- **Flare**,
- **Co-generation System** (120 MW ISO), GE+Aalborg
- **Tank Farm** (23 tanks, 665,000 m³)
- **Waste Water Treatment Unit** (12,000 m³/d),
- **Jetty Terminal**
- **GARE Station**
➢ Total Investment Cost: ~ 3 Billion$

➢ Increase in TUPRAS EBITDA: 550 Million$/yr

➢ Decrease in Trade Balance Deficit of Turkey: 1 Billion$/yr

➢ TUPRAS Refineries Capacity Utilisation: %75-80 → %100 (Actual ~%105)

➢ Nelson Complexity Index of İzmit Refinery: 7.78 → 14.5
➢ Licensor: Foster Wheeler USA
➢ SYDEC Process (Selective Yield Delayed Coking)
➢ Capacity: 51.578 BPSD
➢ Furnace Outlet Temperature: 925-940°F
➢ Coke Drum Pressure: 15 Psig
➢ Coke Drum Vapor Temperature: 810-825°F
➢ Throughput Ratio: 1.07
➢ Furnace: FW Fired Heater Division (FWFHD)
➢ Coke Drums: Sumitomo Heavy Industries
➢ Coke Cutting System: Flowserve
➢ Unheading System: DeltaValve
➢ Coke Handling: Taimweser and McLanahan
➢ DCS/ESD/Fire&Gas Systems: Yokogawa
➢ Main Contactor: Tecnicas Reunidas
➢ Subcontractor: Tekfen İnşaat
Issues Encountered - 1

➢ Fractionator Bottoms Revisions

➢ Coke Drum & Critical Piping Const. Review
Issues Encountered-2

➢ Coke Drum Quench & Antifoam Nozzles Installation
➢ Coke Drum Insulation Revision
Coke Pit Dewatering Problem

What was wrong?
➢ Coke Chute Support Damage

TOP VIEW

FRONT VIEW

to COKE MAZE

Issues Encountered - 4
➢ Consider all activities related with Coke Structure maintenance.

➢ All construction teams should be aware of expected movement of coke drums and overhead piping.

➢ Consider Lube Oil and Hydraulic Oil flushing as long lead items.

➢ Extensive Classroom and Onsite Training for operators is mandatory.
THANK YOU. ANY QUESTIONS?