

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

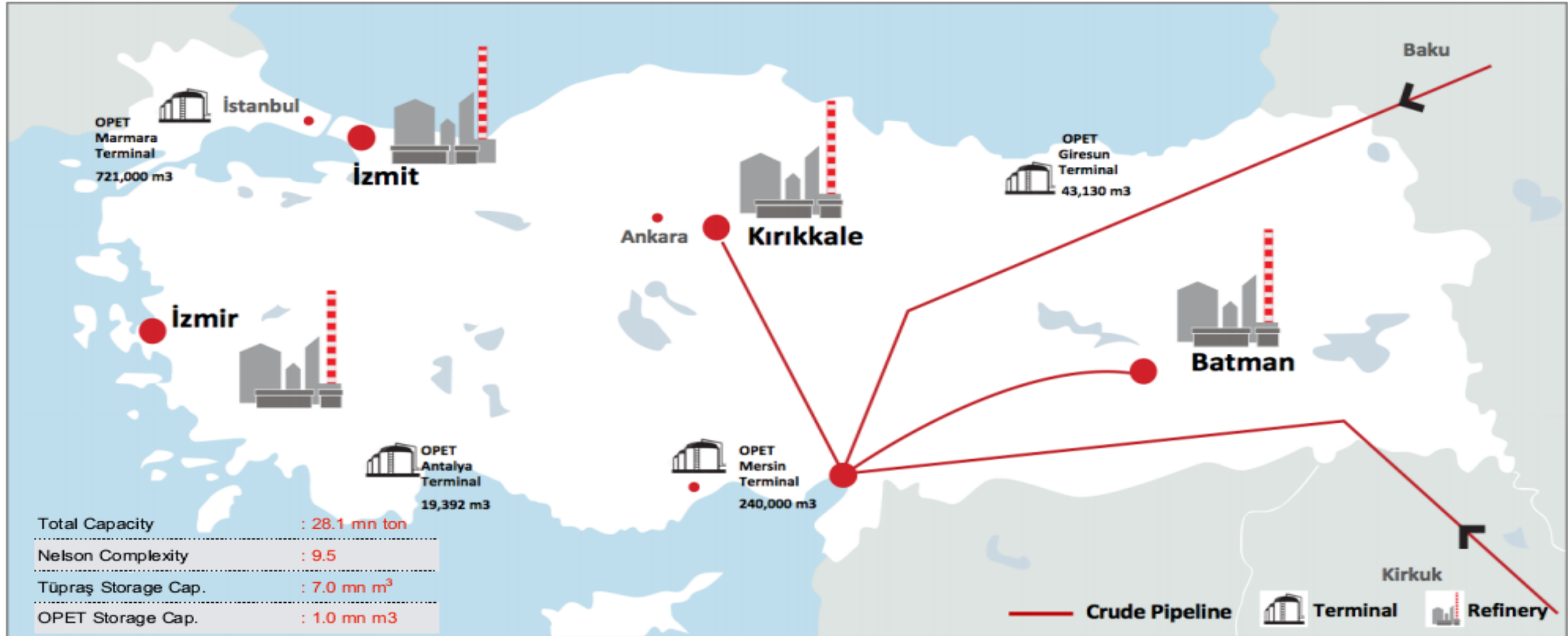
XX.05.2019

Onur Aka  
Process Superintendent

# Agenda

- TUPRAS General Information
- RUP General Information
- RUP **Delayed Coker Unit**
- Issues Encountered During Precommissioning/Commissioning/Operation
- Recommendations

# TUPRAS General Information



## İzmit

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

## İzmir

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

## Kırıkkale

- 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

# Tüpraş Residuum Upgrading Project (Scope)

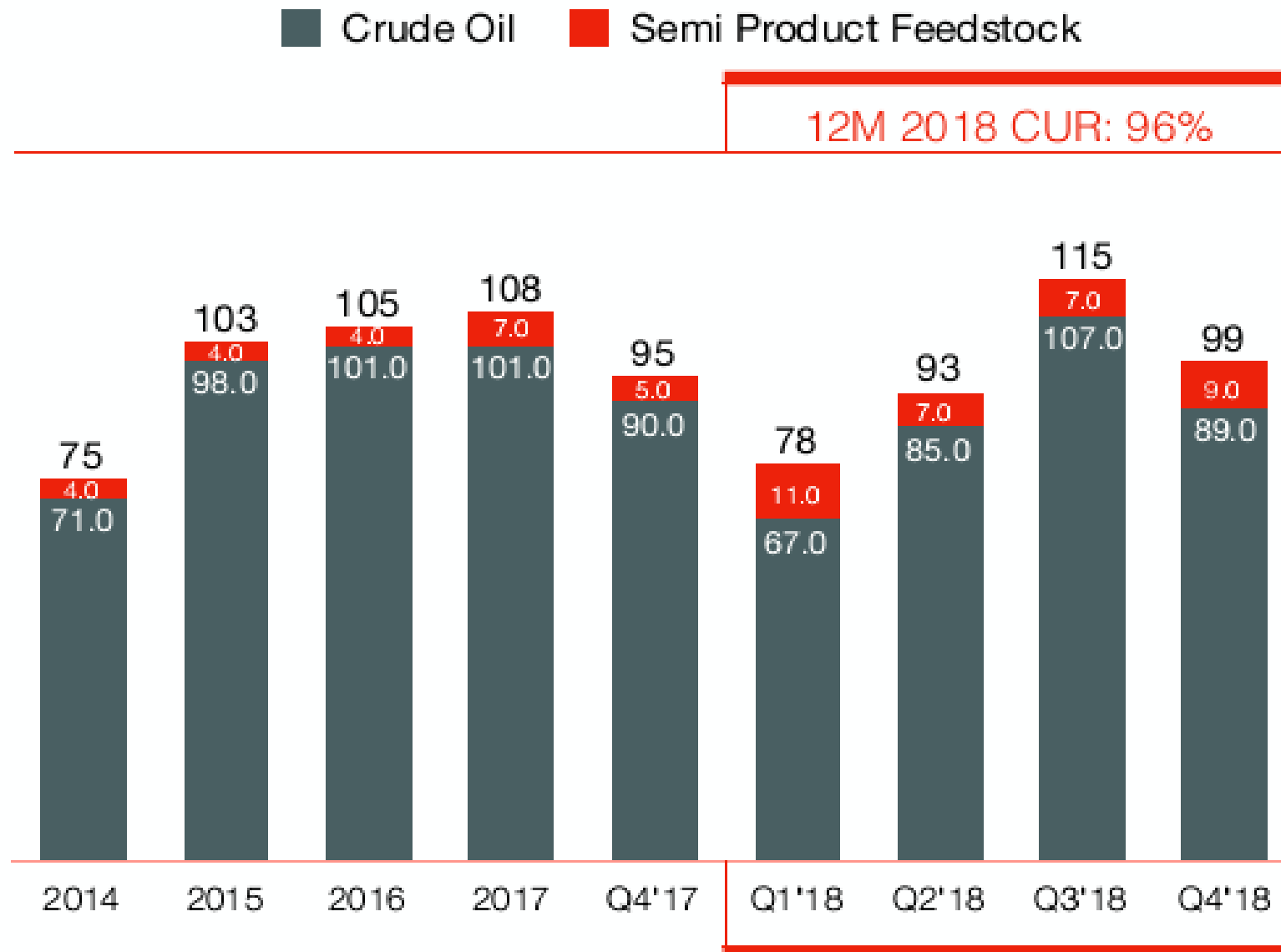
- **Delayed Coker Unit** (8,200 m<sup>3</sup>/d), Foster Wheeler USA
- **Integrated Unicracking Process Unit** (8,800/4,000/1,300 m<sup>3</sup>/d), UOP
- **Vacuum Distillation Unit** (8,500 m<sup>3</sup>/d), Shell Global Solutions
- **Hydrogen Production Unit** (160,000 Nm<sup>3</sup>/h), Technip
- **Sulphur 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 m<sup>3</sup>)
- **Waste Water Treatment Unit** (12,000 m<sup>3</sup>/d),
- **Jetty Terminal**
- **GARE Station**



# RUP Financial Figures

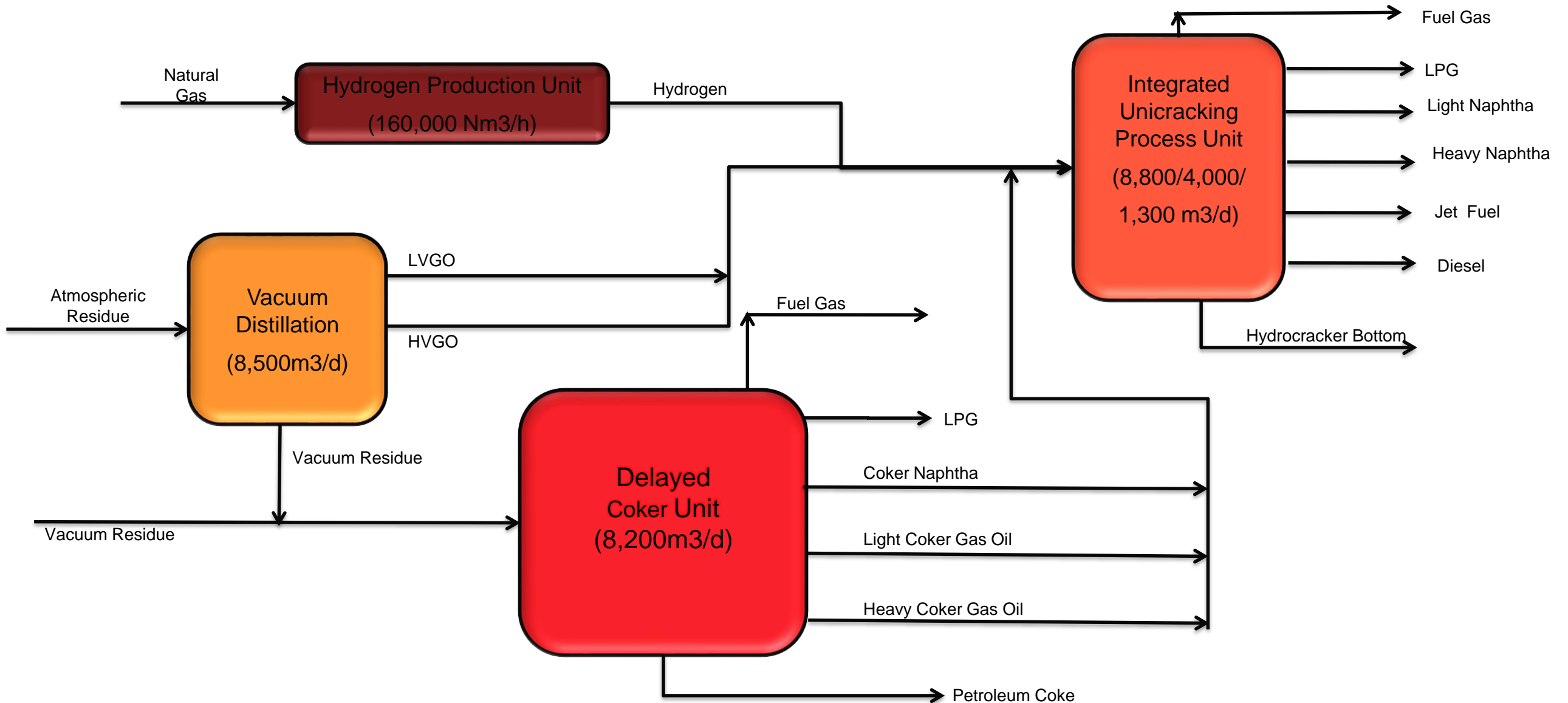
- Total Investment Cost: ~ 3 Billion\$
- Increase in TUPRAS EBIDTA: 550 Million\$/yr
- Decrease in Trade Balance Deficit of Turkey: 1 Billion\$/yr
- TUPRAS Refineries Capacity Utilisation: %75-80 → %100 (Actual ~%105)
- Nelson Complexity Index of İzmit Refinery: 7.78 → 14.5

# Capacity Utilisation





# RUP Brief Process Flow Diagram



# RUP Delayed Coker Unit

- Licensors: Foster Wheeler USA
- SYDEC Process (**S**elective **Y**ield **D**elayed **C**oking)
- 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





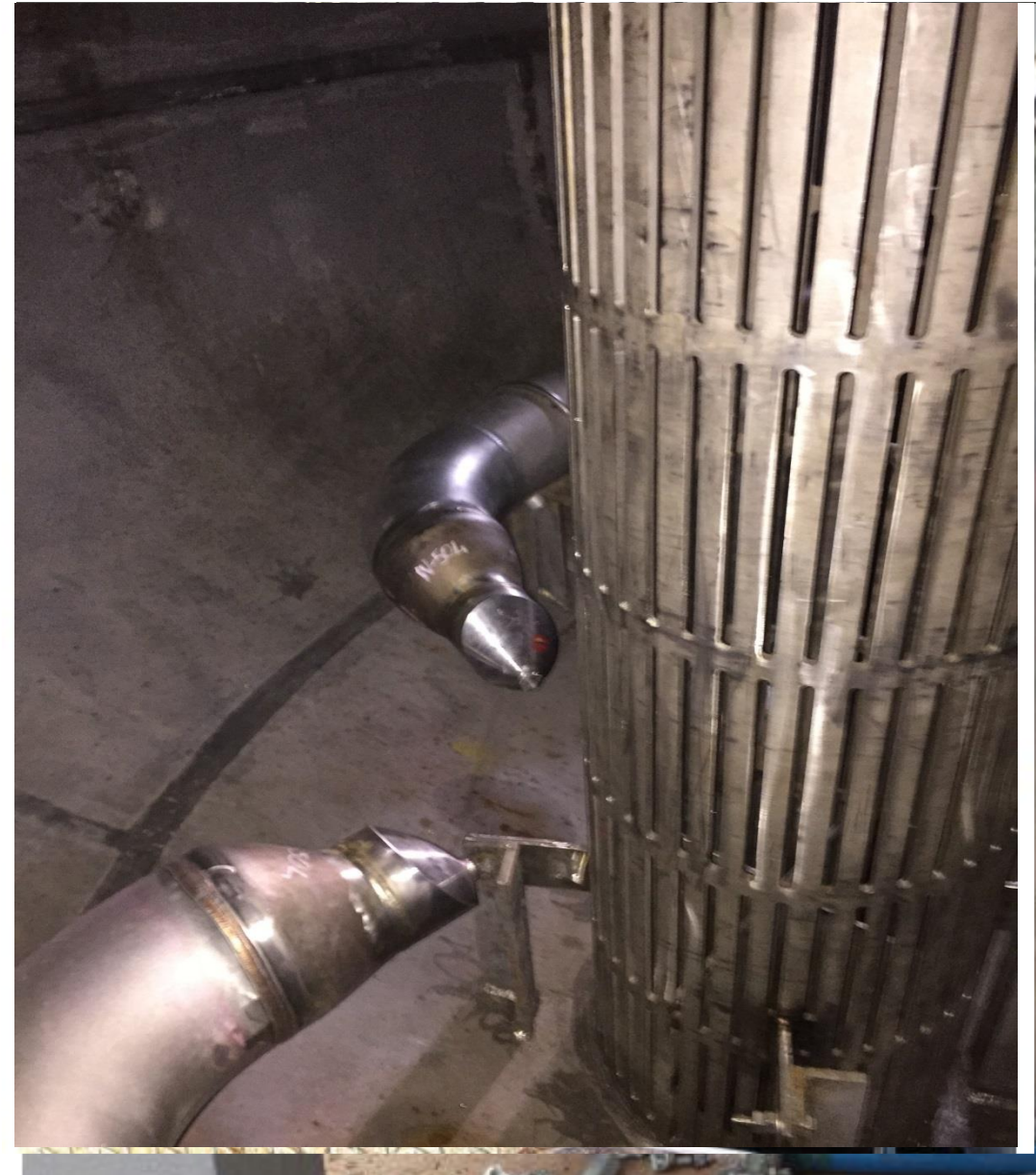
# Technology Partners (Vendors)

- Furnace: FW Fired Heater Division (FWFHD)
- Coke Drums: Sumitomo Heavy Industries
- Coke Cutting System: Flowserve
- Unheading System: DeltaValve
- Coke Handling: Taimwesser 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

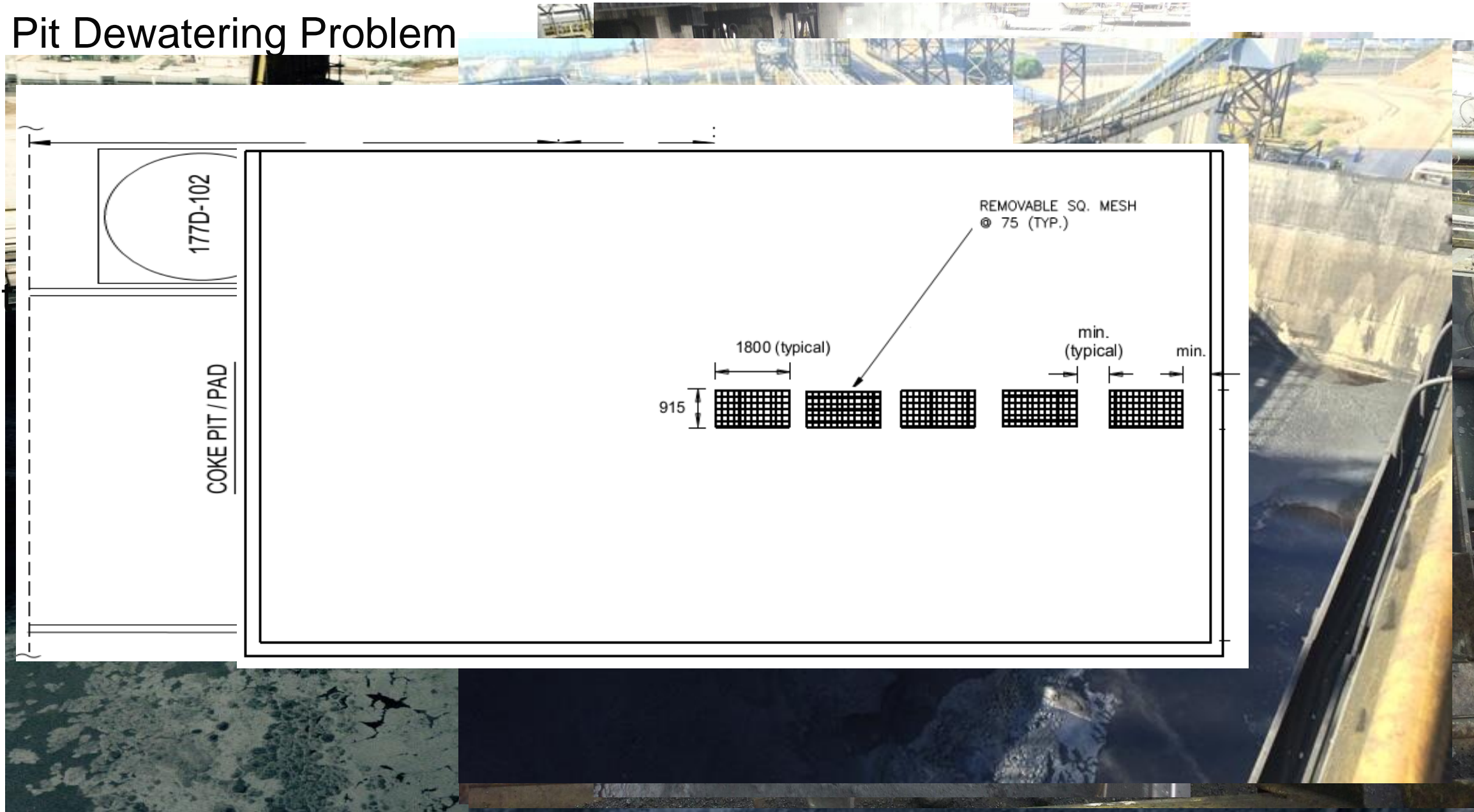
- Coke Drum Quench&Antifoam N
- Coke Drum Insulation Revision



# Issues Encountered - 3

## ➤ Coke Pit Dewatering Problem

➤ What



# Issues Encountered - 4

## ➤ Coke Chute Support Damage



SWITCH DECK  
(from drain valve)

SWITCH DECK (from Drain Valve)

TOP VIEW

FRONT  
VIEW

to COKE MAZE

to Coke MAZE



# Recommendations

- Consider all activities in the area of the coke drums and overhead piping
- Consider Lubrication



- Extensive Classroom and Onsite Training for operators is mandatory



**THANK YOU.  
ANY QUESTIONS?**