

# PT. HEAT TRANSFER SOLUTIONS INDONESIA

**The Most Innovative In Heat Transfer Solutions**



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# Vision mission

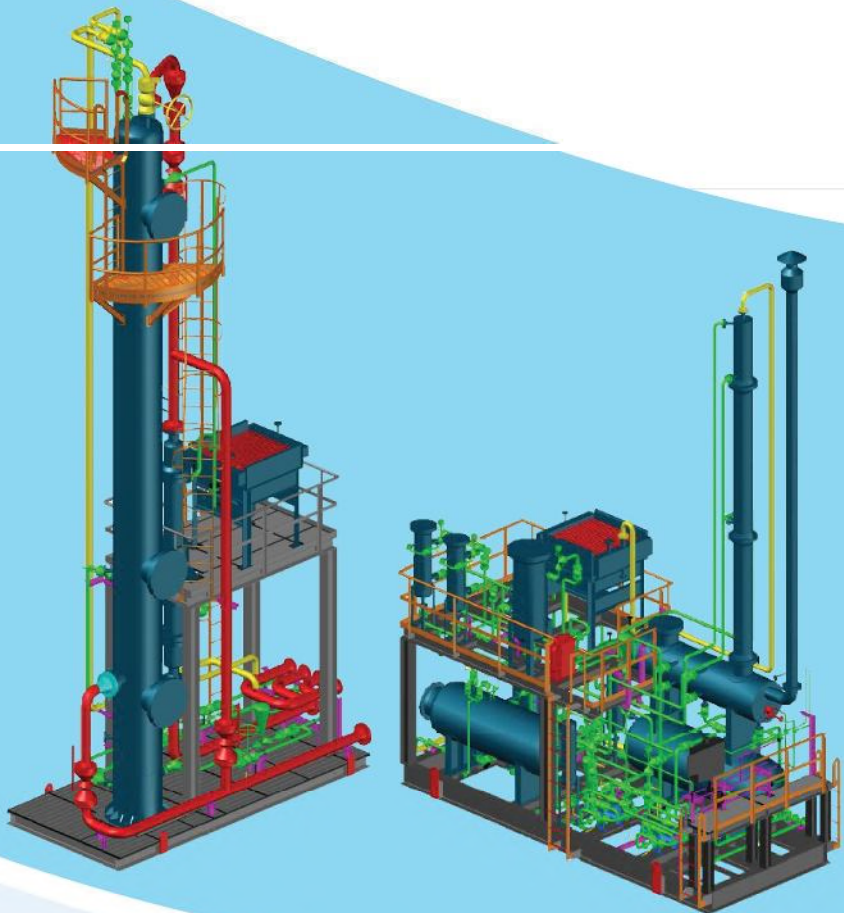
PT. Heat Transfer Solutions Indonesia strives to offer the most innovative in heat transfer solutions

# Our Objective

- Benefit customers by providing affordable and superior products.
- To offer the most innovative heat transfer solutions with a strong focus on engineering, forging new paths for design

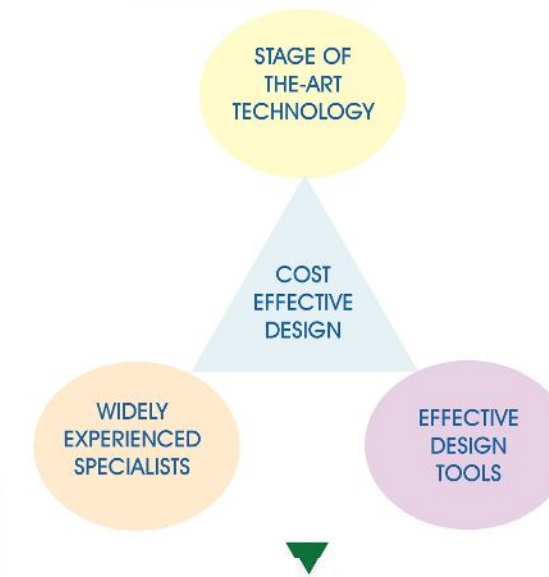
# Our Products & Services include:

- Process Skid Packages, such as: Glycol Dehydration Unit, Crude Oil Pump Skid, Oil Booster Pump Skid, etc
- Air Cooled Heat Exchanger (Forced, Induced and Natural Draft), Economizers
- Shell & Tube Heat Exchangers
- Double Pipe Heat Exchangers (Hairpin)
- Jacketed Pipe Exchangers
- Feedwater Heaters
- Pressure Vessels such-as: Gas Scrubber, KO Drum, Surge Tank, Air receiver Tank, Separator, Closed Drain Vessel, etc
- Engineering & Maintenance Services, include HE Performance Assessment and Cleaning Services
- Heat Exchanger Parts



# Quality

Inspection, NDT and performance tests are performed at every manufacturing stage for controlling the components and finished products



# We are committed to providing:

- A safe work environment
- Safe systems of work for our workers
- Suitable and safe equipment
- Information, instruction, training, and supervision to ensure workers are competent and working safely

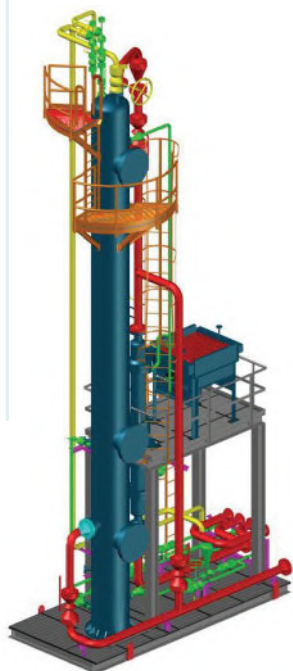
# Our Design tools:

- HTRI Xchanger Suite for thermal design
- COMPRESS for mechanical design
- BricsCAD Pro for 2D & 3D drawing works
- FEPIPE, NozzlePro, 661Pro are Paulin Research Group Finite Element Analysis Software
- SAP2000 Plus for Structural Analysis

# 30 MMSCFD TEG Dehydration Natural Gas Plant Bangladesh Petroleum Exploration & Production Co. Ltd.

Customer :

Consortium of Shengli Engineering & Consulting Co. Ltd. And Zicom Equipment Pte. Ltd.



FAT for Burner Management System

Joint Operation of PT. **Transalindo Eka Persada** and PT. **Heat Transfer Solutions Indonesia** to design and fabricate:

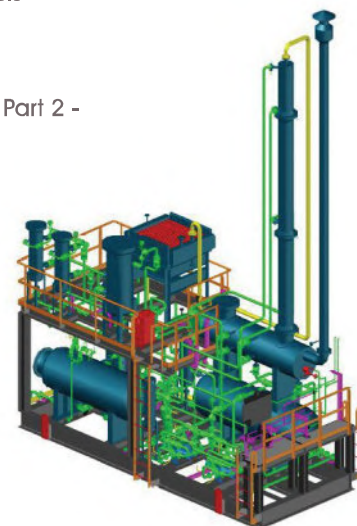
- TEG Contactor Skid Package
- Glycol Dehydration Skid Package

## Code Compliance

- ASME VIII Div. 1 – ASME BPV Code Rules for Construction of Pressure Vessels
- TEMA – Standards of the Tubular Exchanger Manufacturers Association
- API Std 660 – Shell-and-tube Heat Exchangers
- API Std 661 – Air-Cooled Heat Exchangers for General Refinery Service
- API Std 662 Part 2 - Plate Heat Exchangers for General Refinery Services Part 2 - Brazed Aluminium Plate-fin Heat Exchangers
- ASME B31.3 – Process Piping
- AWS D1.1 – Structural Welding Code Steel

## We did

- Engineering works, such-as Thermal Design, Mechanical Design, Structural Analysis, 3-D Modeling, Isometric Drawings, Construction Drawings
- Design and Drawings both skids including piping
- Supply Glycol/ Glycol Heat Exchanger (Braze PHE)
- Design and supply Gas/ Glycol Exchanger (STHE)
- Design and supply Glycol Reboiler c/w Burner Management System
- Design and supply Still Overhead Gas Cooler (ACHE)
- Design and supply Glycol Reflux Condenser (Coil Type)
- Design and supply Glycol Air Cooler (ACHE)
- FAT for Air Coolers and Burner Management System



# Overheating on EJW Coolers at LPG Plant, Jatibarang, West Java

Owner : PT. Sumber Daya Kelola



## Summary

Engine Jacket Water Coolers overheating exceeded 200F. EJW Bundle was designed for inlet temperature of 195F. Cooler unit was been spraying with water at air inlet over four years, then fin tube was damaged and brittle. Engine speed only run at maximum of 1000 rpm and flow gas maximum of 2.5 MMSCFD.

## Challenge

It was the first time HTSI had tackled modification of air cooler challenge, with a little changes on plenum sizes and fan shaft power was within the available range of engine power.

## Solutions

- Thermal re-rating
- Replace and re-selection Moore Fans
- Replace existing bundles EJW & TAW, re-arrange tube pitch, diameter & fin OD
- Modify plenum structure
- Replace and re-design fixed louvers to suit new bundles
- Install inlet bell

KEY ENGINE DATA		
1048.5 RPM Engine Speed	1048.5 RPM Desired Eng Spd	23 PSI Man Air Press
66.6 PSI Filterd Oil Press	185 °F Coolant Water	132.8 °F Man Air Temp
187 °F Inlet Temperature	30.0 °C Actual Temp	0.0 Bar Delta

15/04/2013 13:54

## HTSI Comment

- Now the inlet temperature is 175 – 195F
- Engine speed run at 1050 rpm and flow gas can be increased to 3.7 MMSCFD



## Safety Summary

Total 9664 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0



# Crude Oil Cooler HE-1551

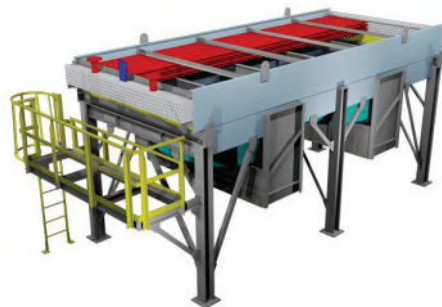
Early Production Facility EPF-3 Plant Expansion  
Banyu Urip, Cepu, Mobil Cepu Ltd

Owner : PT. Exterran Indonesia



## Specification Summary

- 5,06 MMBtu/hr for cooling of 12571 BOPD Crude Oil from 217F to 145F
- Forced draft, ASME U-Stamp & National Board
- Moore Fans Class 10000 S30 VE Manual HD EC RH diameter 8 FT 6 blades
- WEG NEMA Motor Type 0940M, 20 hp (15kW)/ 3 phase/ 380VAC/ 4 pole/ 1460 rpm/ 50 hz, NEMA Design B, Insulation Class F, Class 1 Div. 1, TEFC, SF1.15, 284T Frame V6R(D)
- The Unit Cooler is equipped with MCC F2100 series Eaton Cutler Hammer 20hp with VFD 9000X AF Drive Series Model SVX020A1-4A1B1, Vibration Switch Murphy VS2-EX



## Code Compliance

- ASME VIII Div. 1 – ASME BPV Code Rules for Construction of Pressure Vessels
- API Std 661 – Air-Cooled Heat Exchangers for General Refinery Service
- NACE MR0175 – Standard Material Requirements Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment
- AWS D1.1 – Structural Welding Code Steel

## We did

- Engineering works, such-as Thermal Design, Mechanical Design, Structural Skid Analysis, Fan Rating & Drive Selection, 3-D Modeling, Construction Drawings, Electrical & Instrument Drawing
- Fabrication, testing & inspection, coating of header box, bundle and support structural
- Installation of motors, belt drives and fans, including belt alignment
- Installation of Electrical & Instrument
- Assembly & Install MCC F2100 series Eaton Cutler Hammer 20 HP
- Performance test at shop & site



## Safety Summary

Total 11366 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 1



# Oil Export Pump Skid P-860

## Early Production Facility EPF-3 Plant Expansion

### Banyu Urip, Cepu, Mobil Cepu Ltd

Owner : PT. Exterran Indonesia



#### Specification Summary

- Triplex Plunger Pump Model 1 65T-5L with plunger size of 4 in x 5 in stroke length, volumetric rate of 326 gpm (74.1 m<sup>3</sup>/hr) at 400 rpm, maximum discharge pressure 780 psi (5377 kPa)
- TECO Westinghouse NEMA Motor Type AEEANE, 125 hp (93kW)/ 3 phase/ 380VAC/ 4 pole/ 1480 rpm/ 50 hz, NEMA Design C, Insulation Class F, Class 1 Div. 2, TEFC, SF1, 444T Frame
- Suction pipe size of 6 in NPS and discharge pipe size of 3 in NPS
- The Pump Skid is equipped with MCC F2100 series Eaton Cutler Hammer include VFD 9000X series, Vibration Switch Murphy VS2-EX, Norrisel Series 3-2700A Control Valve, Suction & Discharge Stabilizers, Rosemount 2051 Pressure Transmitter.

#### Code Compliance

- ASME B31.3 – Process Piping
- AWS D1.1 – Structural Welding Code Steel
- API Std 674 – Positive Displacement Pumps – Reciprocating
- API Std 675 – Positive Displacement Pumps – Controlled Volume, 2nd Edition
- ISO 5167-1:2003 – Measurement of fluid flow



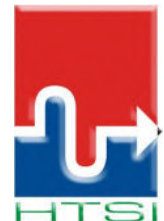
#### We did

- Engineering works, such-as Calculation of NPSH & Power required, Structural Skid Analysis, Drive Selection, 3-D Modeling, Isometric Drawings, Construction Drawings, Electrical & Instrument Drawing
- Fabrication, testing & inspection, coating of structural skid, off-skid and on-skid piping
- Installation of pump, motor and belt drive, including belt alignment
- Installation of Electrical & Instrument
- Assembly & Install MCC F2100 series Eaton Cutler Hammer 125 HP
- Performance test at site



#### Safety Summary

Total 8633 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0



# Oil Booster Pump Skid P-825

Early Production Facility EPF-3 Plant Expansion  
Banyu Urip, Cepu, Mobil Cepu Ltd

Owner : PT. Exterran Indonesia



## Specification Summary

- Centrifugal ANSI B73.1 Process Pump Model Griswold 811M-4x3-8G, flow rate of 320 gpm at 3000 rpm, total head 104 ft, maximum discharge pressure 45 psig
- Baldor NEMA Motor Type 0940M, 20 hp (15kW)/ 3 phase/ 380VAC/ 4 pole/ 2925 rpm/ 50 hz, NEMA Design B, Insulation Class F, Class 1 Div. 2, TEFC, SF1.15, 284TS Frame
- Suction pipe size of 8 in NPS and discharge pipe size of 6 in NPS
- The Pump Skid is equipped with MCC F2100 series Eaton Cuttle Hammer 20hp, John Crane Seal Pot, Pressure Indicator

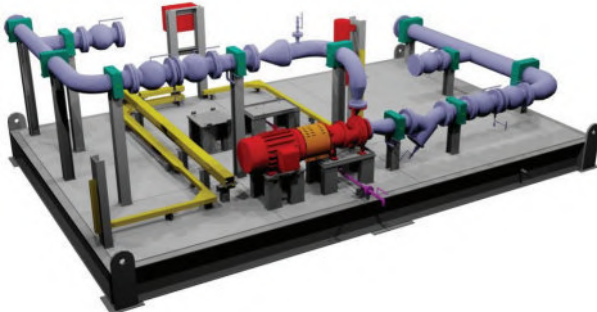


## Code Compliance

- ASME B31.3 - Process Piping
- AWS D1.1 - Structural Welding Code Steel
- API Std 610 – Centrifugal Pump for Petroleum, Petrochemical and Natural Gas Industries
- ISO 5167-1:2003 – Measurement of fluid flow

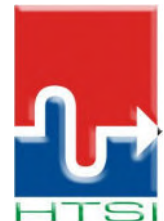
## We did

- Engineering works, such-as Calculation of NPSH & Power required, Structural Skid Analysis, Shaft Coupling Selection, 3-D Modeling, Isometric Drawings, Construction Drawings, Electrical & Instrument Drawing
- Fabrication, testing & inspection, coating of structural skid and on-skid piping
- Installation of pump, motor and flexible coupling, including shaft alignment
- Installation of Electrical & Instrument
- Assembly & Install MCC F2100 series Eaton Cutler Hammer 20 HP
- Performance test at shop



## Safety Summary

Total 1845 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0



# WFT WIRA 1 & 2 WELL TEST BARGES

Customer : PT. Weatherford Indonesia



Flare Gas Scrubber

## Specification Summary

- Two (2) units Vent Gas/ Closed Drain Vessel, V-501 & V-801, 1219 ID x 3048 T/T, Vertical
- Two (2) units Flare Gas Scrubber, V-401-W1 & V-401-W2, 1676 ID x 3048 T/T, Vertical
- One (1) unit 100 BBL Dual Compartment Surge Tank, 2438 ID x 3048 T/T, Vertical
- Material Specification Plain carbon steel SA516 Gr. 70 and NACE MR 0175



Surge Tank

## Code Compliance

- ASME VIII Div. 1 – ASME BPV Code Rules for Construction of Pressure Vessels
- ASME B31.3 – Process Piping
- AWS D1.1 – Structural Welding Code Steel

## We did

- Engineering works, such-as Mechanical Calculations, Construction Drawings, Structural Skid Drawings and Isometric Drawings
- Fabrication, testing & inspection, coating of Pressure Vessels, Structural Skids & Pippings
- Volumetric Calibration of Surge Tank
- MIGAS Certifications and Lloyd's Register
- Delivery at site



Vent Gas / Closed Drain Vessel

## Safety Summary

Total 25682 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0



# 20 MMSCFD Gas Compressor at Betung Field Pendopo PT. Pertamina EP Asset 2 Region Sumatra

Customer : PT. Karismakarya Budimandiri



Air Receiver Tank



Gas Scrubber



Fuel Gas Scrubber

## Specification Summary

- 25 MMSCFD Gas Scrubber, 1200 mm ID x 2950 mm T/T, Vertical,
- 3.2 MMSCFD Fuel Gas Scrubber, 489 mm ID x 2455 mm S/S, Vertical
- Air Receiver Tank 1.5 m<sup>3</sup>, 914 mm ID x 1962 T/T, Vertical
- Material Specification Plain carbon steel SA516 Gr. 70

## Code Compliance

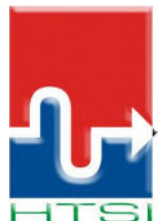
- ASME VIII Div. 1 – ASME BPV Code Rules for Construction of Pressure Vessels

## We did

- Engineering works, such-as Process Internal Designs, Mechanical Calculations & Construction Drawings
- Fabrication, testing & inspection, coating of Gas Scrubber, Fuel Gas Scrubber and Air Receiver Tank
- Delivery at site

## Safety summary

Total 5256 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0



# Propane Condenser C-757-02

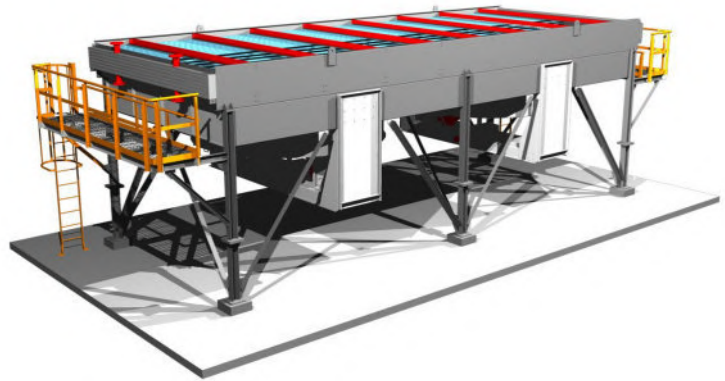
Austcold Refrigeration System, LPG Plant Babelan, Bekasi

## Summary

The existing Propane Condenser was been spraying with water above tube bundle for over five years, then fin tube was damaged, leakages and propane gas was loss during operation.

## Solutions

- Thermal rating with new sizing, duty 6.88 MM Btu/hr, Inlet/ Outlet Temperature 149F/ 113F at 46870 lb/hr
- Replace the obsolete fans and use heavy duty & extended chord Moore Fans 6 blades with lower fan shaft power and noise
- Reduce the electric power consumption from 2 x 37kW to 2 x 30 kW
- Replace completed unit with new design, better construction and easier for maintenance for rotating parts.



Existing Condenser

## Code Compliance

- ASME VIII Div. 1 – ASME BPV Code Rules for Construction of Pressure Vessels
- API Std 661 – Air-Cooled Heat Exchangers for General Refinery Service
- AWS D1.1 – Structural Welding Code Steel

## We did

- Engineering works, such-as Thermal Design, Mechanical Design, Structural Skid Analysis, Fan Rating & Drive Selection, 3-D Modeling, Construction Drawings, Civil Foundation Drawing, Piping Isometric Drawings
- Fabrication, testing & inspection, coating of header box, bundle and support structural
- Installation of motors, belt drives and fans, including belt alignment
- Civil foundation works, site installation, off-skid piping works and installation of electrical & instrument, MCC
- Performance test at shop & site



New Condenser

## Safety Summary

Total 7557 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0



# Additional Preheater in Drier Regeneration Gas Circuit Train F Bontang, East Kalimantan

## Drier Reactivation Gas Preheater, F2-E-6

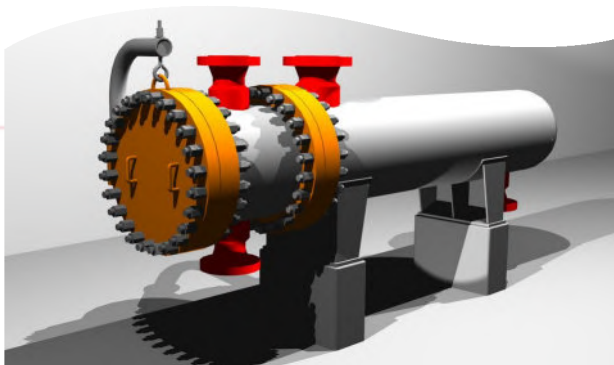
Customer : PT. Badak NGL



Tube Bundle

### Specification Summary

- Service of Unit: Drier Reactivation Gas Preheater, F2-E-6
- TEMA Type CEU, Size 700 ID x 3160 mm Length
- Heat Exchanged 2329890 kcal/hr
- Design Pressure 49.2 kgf/cm<sup>2</sup>g and Temperature 466C for Shell side and Tube side
- Material SA516 Gr. 70 (Shell), SA209 T1 (Tube), SA182 F1 (Tubesheet)



Drier Reactivation Gas Preheater

### Code Compliance

- ASME VIII Div. 1 – ASME BPV Code Rules for Construction of Pressure Vessels
- TEMA – Standards of the Tubular Exchanger Manufacturers Association
- API Std 660 – Shell-and-tube Heat Exchangers

### We did

- Engineering works, such-as Thermal Design, Mechanical Calculations and Construction Drawings
- Fabrication, testing & inspection, heat treatment, coating of heat exchanger
- MIGAS Certification and ASME U-stamp
- Delivery at site

### Safety Summary

Total 2216 working hours  
Lost time injury – 0  
Day lost incident – 0  
Near misses reported – 0

# Offtake Station PT. Kalimantan Jawa Gas (KJG) Tambak Lorok, Semarang

## STEAM HEATER SKID PACKAGE

Customer : PT. PGAS Solutions

### Specification Summary

- Shell & Tube Heat Exchanger 31X2702
- TEMA Type CEU, 429ID x 1524L, 1.27MW duty to maintain a minimum temperature of natural gas by steam heating
- Induced Draft Cooler 31X2703 for cooling of water condensate from 148C to 40C
- Hazardous Area - Explosion Proof

### Code Compliance

- ASME VIII Div. 1 - ASME BPV Code Rules for Construction of Pressure Vessels
- API Std 660 - Shell-and-tube Heat Exchanger
- TEMA - Standards of the Tubular Exchanger Manufacturer Association
- API Std 661 - Air-Cooled Heat Exchangers for General Refinery Service
- AWS D1.1 - Structural Welding Code Steel



### We did

- Engineering works, such-as Thermal Design, Mechanical Design, Structural Skid Analysis, Fan Rating, 3D Modelling, Construction Drawings, Electrical & Instrument Drawings
- Fabrication, testing & inspection, coating of steam heater, header box, structural skid and on-skid piping
- Supply & Installation of LV Motors & MCC Panel
- Supply & Installation of Electrical & Instrument, including Temperature Controller
- Performance test at shop & site



### Safety Summary

Total 7844 working hours  
Last Time injury - 0  
Day lost incident - 0  
Near misses reported - 0

PT. HEAT TRANSFER SOLUTIONS INDONESIA

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# Proyek Pembangunan Pabrik Gula Terpadu, PT Industri Gula Glenmore (IGG), Banyuwangi

## AIR HEATER

Customer : PT. Rekeyasa Industri

### Specification Summary

- Two (2) units Air Heater, Economizer Type
- Bundle Dimension : 7045 L x 3048 W x 4640 H
- Total weight : 56 tonnes per unit



### We did

- Detail shop drawings
- Fabrication & inspection of air heaters bundle & casing
- Site delivery



### Safety Summary

Total 18.258 working hours  
Last Time injury - 0  
Day lost incident - 0  
Near misses reported - 0



# Crude Oil Stripper Cooler HFF625507 / HFF625607

Air Cooled Heat Exchanger For  
Banyu Urip CPF

Owner : ExxonMobil Cepu Ltd



## Specification Summary

- 6.28 MW for cooling of 223530 Kg/hr Crude Oil from 120C to 75C
- Forced draft, ASME U-Stamp
- Moore Fans Class 10000 S42VE Manual HD EC RH diameter 13 FT 5 blades
- Siemens IEC Motor, 18.5 kW, 3 phase, 380 VD, 4 pole, 1478 rpm, 50 hz, IC411, IP56, Insulation Class F, Class 1 Zone 2 IE1 II 2G Ex db e IIC T4 Gb ATEX



## Code Compliance

- ASME VIII Div. 1 - ASME BPV Code Rules for Construction of Pressure Vessels
- API Std 661 - Air Cooled Heat Exchanger for General Refinery Service
- NACE MR0175 - Standard Material Requirement Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment
- AWS D1.1 - Structural Welding Code Steel
- Header Box Material of SA516 Gr.60N + HIC

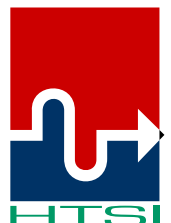
## We did

- Engineering works, such-as Thermal Design, Mechanical Design & FEA Nozzles, Fan Rating & Drive Selection, 3-D Modeling, Construction Drawings
- Hot Air Re-Circulation Evaluation (CFD analysis)
- Fabrication, testing & Inspection, coating of header box, bundle and support structural
- Installation of motors, belt drives and fans, including belt alignment
- Performance test at shop
- Delivery at Cepu Site



## Safety Summary

Total - working ours  
Lost time injury - 0  
Day lost incident - 0  
Near misses reported - 0



# Provision Of Cooler E-702 Exxon Bojonegoro

Customer : Exxon Mobile Cepu

## Specification Summary

1 Unit Air Cooler Heat Exchanger  
Dimension : 2790 L x 9800 W x 3500 H  
Total Weight : 69300kg (Empty)



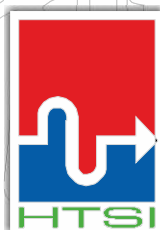
Inspection of Tube

## We did

- Install scaffolding on Header side (right & left side) in order for man way and working access in cooler E-702 in area open yard
- Open shoulder plug on header
- Preparation of tools, equipment and collect waste management : Waste management is only collecting liquid waste which contain HC and B3 waste. Treatment of liquid waste is exclude in our scope of work.
- Mechanical cleaning-water jet on inner tube with flexible lances :  
Fin Tube Qty 303 ea  
Header x L 5,000 mm x H 300 mm x W 150 mm x Qty 2 ea  
Used heavy high pressure pump Back wash nozzle or Rotary nozzle
- Closed Plug & Maintenance tube plug hole if broken
- Provide spare part of shoulder plug & gasket if plug or gasket broken
- Perform nitrogen purging for leak teast
- Uninstall scaffolding

## Safety Summary

Total 1595 working hours  
Last Time injury - 0  
Day lost incident - 0  
Near misses reported - 0



email : sales@pt-htsi.com

# WATER JET CLEANING



Mechanical Cleaning with Flexible Lance



Result Leak Test Header Box

# WATER JET CLEANING

## Service of Mechanical Cleaning-Water Jet on Air Cooled Heat Exchanger

Customer : Cakrawala Persada for Exxon Mobil Cepu Ltd

### Specification Summary

Air Cooler Heat Exchanger

Tag HFF681606

3 Bay / 6 Bundle

Dimension : 11520 L x 18850W x 4400H

Total Weight : 71802kg (Empty)



Inspection of Header Box



### We did

- Preparation work and save working area
- Perform preparation of tools, equipments, safe working area and waste management
- Perform open 50% shoulder plug & plug gasket for 6 bundle with total tube 810 ea (3 bay/6 bundle)
- Perform preparation of collect waste management
- Perform mechanical cleaning with water jet and heavy duty pump
- Perform closed shoulder plug & plug gasket
- Perform leak test using nitrogen

### We Supply

- Spare part of Shoulder Plug with quantity 81ea
- Spare part of Plug Gasket with quantity 810ea



Before Cleaning



After Cleaning



Deposit Waste



12/01/2018

Cleaning Process



### Safety Summary

Total 4698 working hours

Last Time injury - 0

Day lost incident - 0

Near misses reported - 0