KORYON
engineering

Management Letter

Mustafa Kemal Atatürk ends his opening speech of the 1st Grand National Assembly of Turkey on April 24, 1920, with the sentence "Success is our eternal power that will ensure that our hopes do not fall into pessimism in our hearts even for a moment". In a period when production, industrialization and regeneration are very difficult, we are chasing our goals in the light of our achievements and experiences.

Establishing a company where qualified engineers would work together was among our dreams and goals as well as being a qualified engineer. After about 15 years of professional career in different companies, it has become easier for our dreams and goals to come to light. The support of each of our friends who joined us on the way to becoming a company, within the framework of our values, has been very effective and precious.

What enabled us to move forward in this process was nothing but our knowledge, experience and stance. Each of our friends who joined us day by day did not hesitate to show the same effort and devotion as us, did not spare their efforts and this synergy allowed our new friends to join us. We worked hard as a team, we did not spare our effort and we focused on our work to create the highest level of satisfaction for our customers. With each passing day, our power and influence increased.

Our goal is to be a company that gives pleasure, peace and trust to its employees, is known at the international level with its integrated engineering service approach, and whose outputs are trusted, and that goes further every day.

With the aim of getting stronger together...

Erinç Özkorucu
General Manager

Hakan Çalışkan
Engineering Manager

Corporate

Koryon Engineering established in 2017 and has risen with its experienced engineering staff and took its place in the sector. Since its establishment, it has signed projects not only in domestic projects, but also in important international locations such as Europe and the Middle East.

All processes are managed systematically and efficiently at Koryon Engineering. All stages are frequently evaluated during both project design and field studies, so work is done within time planning. We aim to provide a safe working environment and to be preferred by our customers, as certified by our national and international documents.

As Koryon Engineering, we know that it is our colleagues who make us who we are and provide us with a big share in our rapid and sustainable growth. Since our establishment, we get our strength from our experienced staff. We continue to grow together with our customers, gain experience and increase our competitiveness.

Ethic | Focus | Effort

Sustainability

"Koryon Engineering designs with the aim of protecting the sustainability of ecological regeneration."

Sustainability means that aims to ensure a more controlled use of resources and to reduce the damage to nature to a minimum or even to zero.

Economic Sustainability

Koryon Engineering does not stray from ethical values while making financial plans, takes precautions against the problems that threaten society and the world, and provides a serious profit in a long time.

Social Sustainability

As Koryon Engineering, we have adopted the principle of treating our working partners fairly and having an ethical supply chain process so, a man-hour with more motivation and skills has been obtained.

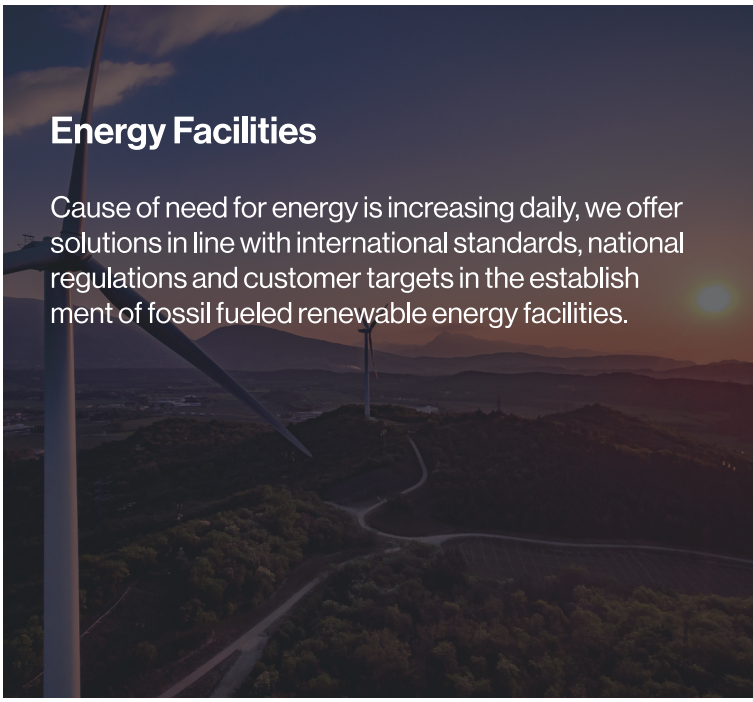
Enviromental Sustainability

Environmental sustainability is definitely the most important. We are reviewing existing processes to find better and greener alternatives; while reducing our carbon footprints and waste, reducing negative environmental impacts.

In the light of these basic components, Koryon Engineering adopts sustainability and evaluate the sustainability being of efficiency, our debt to nature and legacy of generations to come.

Refinery and Petrochemical Facilities

Koryon Engineering provides internal and external engineering services in refinery and petrochemical facilities with international standards. For capacity increase and efficiency projects we take part in, we ensure that customer targets are achieved with sustainable solutions in both legal requirements.

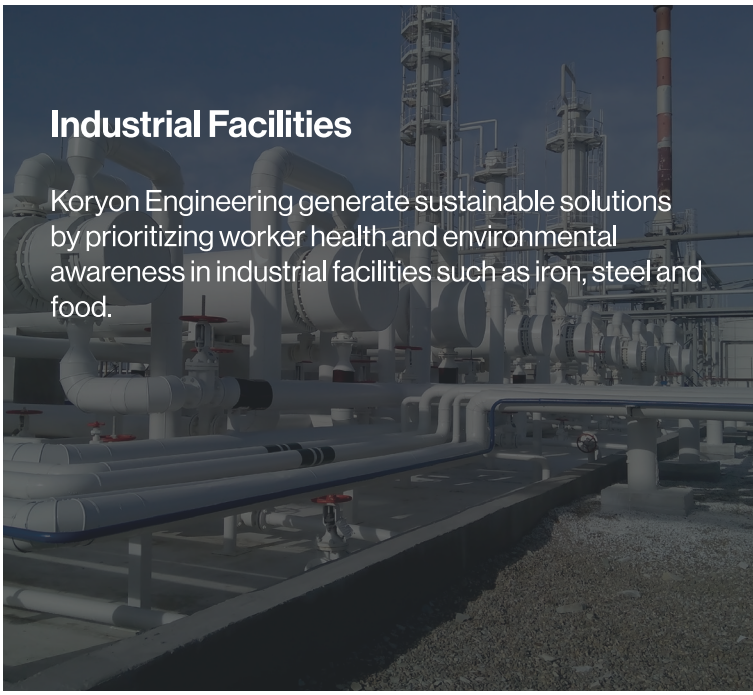


Energy Facilities

Cause of need for energy is increasing daily, we offer solutions in line with international standards, national regulations and customer targets in the establish ment of fossil fueled renewable energy facilities.

Storage Areas

We design underground, aboveground petroleum products, chemical or natural gas storage areas/fields established for security of supply or com mercial activity at national or international level, in accordance with international standards at basic engineering, FEED (Front End Engineering Design) or detail engineering levels.



Industrial Facilities

Koryon Engineering generate sustainable solutions by prioritizing worker health and environmental awareness in industrial facilities such as iron, steel and food.

Process Safety

With a rapidly growing experience in process and hazard analysis, Koryon Engineering offer both real-time and online HAZOP-LOPA studies to its customers. More than 20 projects, including whole plants or more simple debottlenecking projects, are finalized in the last 2 years. Our studies cover wide range of industry: Refining, petrochemicals, food, fertilizer, jetty, storage facility, utilities, fertilizer, aero space.

Fertilizer and Chemical Facilities

We provide solutions on the engineering side of the investments that chemical and fertilizer plants need due to process development, efficiency and local/in ternational regulations with our competent team.

Pipelines
(Underground, Aboveground, Submarine)

Pipelines are of great importance in terms of meeting the product needs between producer and consumer countries. Precisely because of that, as Koryon Engi neering, we provide our customers with route selec tion, pipeline planning, material selection and detailed engineering services in surface, underground or submarine pipeline projects.

Mining Areas

Koryon Engineering, offers solutions in the mining sector projects and construction consultancy by giving particular importance to occupational safety, living health and environmental sustainability princi ples, with international standards.

Fire Fighting Systems

We design fire fighting systems or verify existing fire fighting systems in plants or facilities according to industry standards. We design fire protection systems in accordance with the National Fire Protection Asso ciation (NFPA) and local fire regulations according to customer specific insurance requirements.

Advanced Engineering

In structural mechanical analysis, we aim to find the effects of mechanical loading and boundary condi tions on a physical structure and its components, and for this we benefit from the relevant fields of physics, mathematics, and material sciences.

We perform heat and flow analyses for engineering applications outside the limits of package programs in industrial fields with computational fluid dynamics studies.

Filling / Loading Facilities

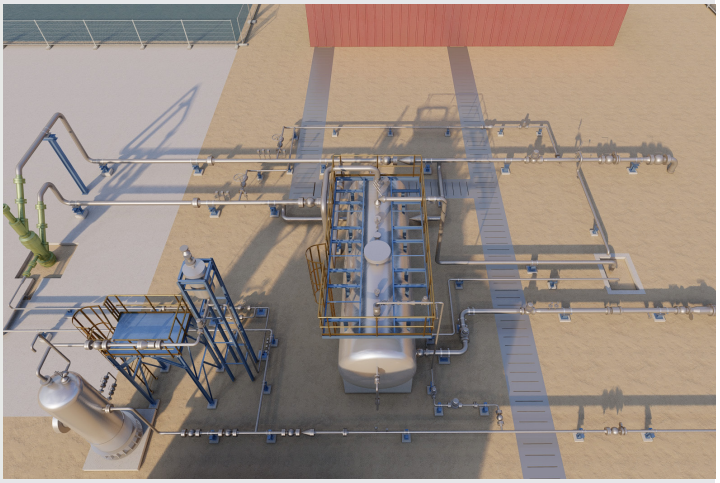
As Koryon Engineering, we cover the demands of our customers with our knowledge and experience in the design of crude oil and petroleum products, natural gas and chemicals filling facilities in accordance with international standards.

Reverse Engineering Applications

Using three-dimensional scanning technologies such as laser and optical scanners, we create CAD models of the field and equipment, and create digital twins of your facilities with our experienced team. We work on the created model for current field updates and stud ies. As Koryon Engineering, we use reverse engineer ing methods in most of our projects and provide the best service to our customers.

PROJECTS

Salt Lake Natural Gas Underground Storage Project (Phase-2)



- **Client:** Yüksel Proje
- **Owner:** Botaş
- **Business Area:** Storage Areas
- **Project Maturity Level:** Detail Engineering
- **Location:** Aksaray / Turkey
- **Completion Date:** Ongoing

The capacity of the Salt Lake Underground Natural Gas Storage Facility in Aksaray is being increased within the scope of the Phase-2. It is aimed that the total storage volume will reach 5.4 billion cubic meters by increasing the current capacity by 4 times. Detailed engineering works of this project, which has strategic importance for Turkey, are carried out meticulously.

Scope of Project:

Storage and Piping Design:
- 40 underground natural gas storage wells
- Creating piping specifications and wall thickness calculations
- 80 km piping line (68 km underground – 12 km aboveground)
- Preparation of piping layout and isometry projects
- Preparation of piping material lists and specifications

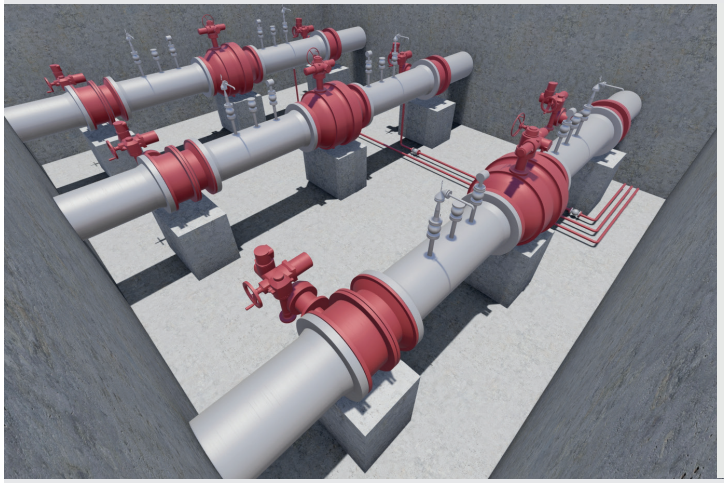
Mechanical Design:
- Design of 5200 m^3/h pump stations
- 2 pig station designs

Electrical Design:
- Short circuit and load flow analysis
- Preparation of single line diagram, specifications and information sheets for LV, MV and electrical equipment systems
- Preparation of heat tracing system specifications and information sheets

Instrument Design:
- Creation of process control systems and production of detailed documents
- Creation of specification and information sheets of equipments of process control systems
- Preparation of assembly details for field connections of process control systems

Process Safety:
- Preparation of hazardous area classification (HAC)
- Hazop study

Yanbu Madinah Water Transmission Line Project (Phase-4)



- **Client:** Temelsu
- **Business Area:** Pipelines (Underground, Aboveground, Submarine)
- **Project Maturity Level:** Detail Engineering
- **Location:** Madinah / Saudi Arabia
- **Completion Date:** Ongoing

This project includes the treatment of sea water to drinking water, underground and aboveground piping and the necessary pump station design between the cities of Yanbu and Medina, which are 200 km apart. The designed project piping planning, valves and equipment were examined, and balance stations were established against all problems that may arise due to the high volume. The entire project has been delivered with detailed layout drawings and stress analyzes and is being successfully projected. The cooling system of the main and booster pumps is designed as a closed system; auxiliary, maintenance and control equipment is being prepared.

Scope of Project:

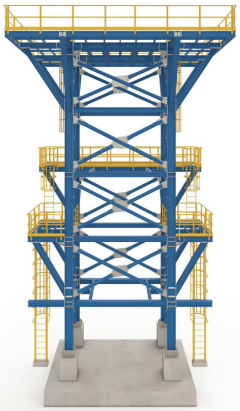
Piping Design:
- Pipe classification up to 84" in diameter
- 18 km total pipeline
- Layout and section drawings
- Piping isometric design
- Piping stations piping
- Tank farm stress analysis

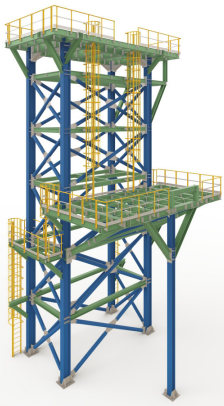
Pump Station Design:
- 2 main pump stations with a flow rate of 30,000 m^3/h
- 1 booster pump station with 30,000 m^3/h flow rate

Equipment Review:
- Surge vessels
- Buried pipe stress analysis
- Stress analysis of main and auxiliary pumping stations
- Relocation tank farm stress analysis
- Equipment layout
- SIF inspection for elbow, TEE, weldolet components

Equipment Cooling System Design:
- BoD
- HMB
- PFD
- P&ID
- O&CF
- Hydraulic systems and heat exchanger design

Erdemir No.4 Coge Battery Piping Works





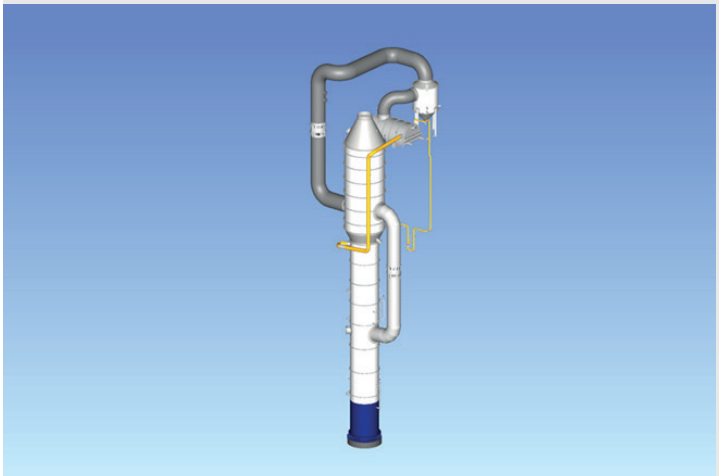
- **Client:** Erdemir Ereğli Demir ve Çelik Fabrikaları T.A.Ş.
- **Business Area:** Iron & Steel
- **Project Maturity Level:** Detail Engineering
- **Location:** Zonguldak / Turkey
- **Completion Date:** 2024

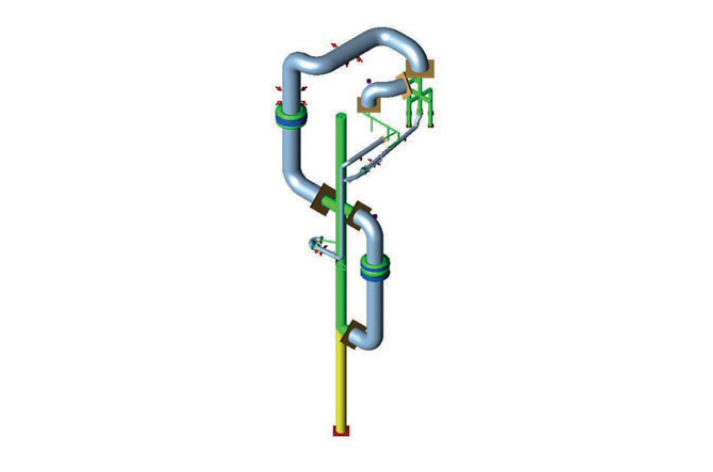
In Erdemir, "No.4 Coge Battery Piping Works", process design, hydraulic calculation of the system, creation of a 3D model with cloud data, piping design, static analyzes steel construction, foundation of rotating and static equipment, preparation of final static & rotating equipment datasheets, API 650 storage tank design & manufacturing drawings, preparation of detailed projects, automation/instrument and electrical design were made

Scope of Project:

- Hydraulic Analysis, P&ID, Line List,
- Thermal Stress Analysis,
- 3D Model, Piping Layout and Isometric Drawings,
- 60 hot & cold connections (Tie-in) details
- 13 Lines Piping Design (Utility Lines & Coge Line & Firefighting)
- MTO,
- Clashed checked with Cloud Data
- Design and Piping of Pump Stations
- Static & Rotating Equipment Datasheet and M&R
- API 650 Storage Tank Design & Detailed Design
- 250 MT Steel Structure Design
- Foundation Desing of Steel Structure
- Foundation Desing of Static & Rotating Equipment
- 2D/3D Cable Routing Designs
- Control philosophy
- Instrument Datasheets, Hook ups
- Instrument Loop and Wiring Diagrams
- Electrical Single Line Diagram

Pipe Flexibility Analysis





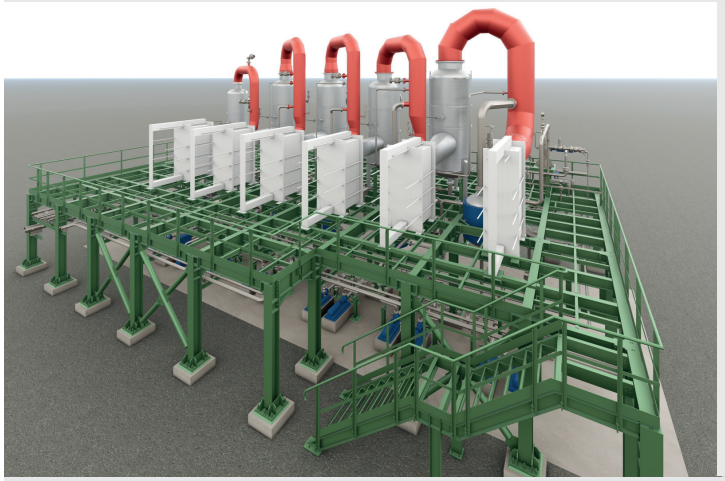
- **Client:** Alfa Laval (Copenhagen)
- **Business Area:** Edible Oil Production
- **Project Maturity Level:** Detail Engineering
- **Location:** Spain
- **Completion Date:** 2023

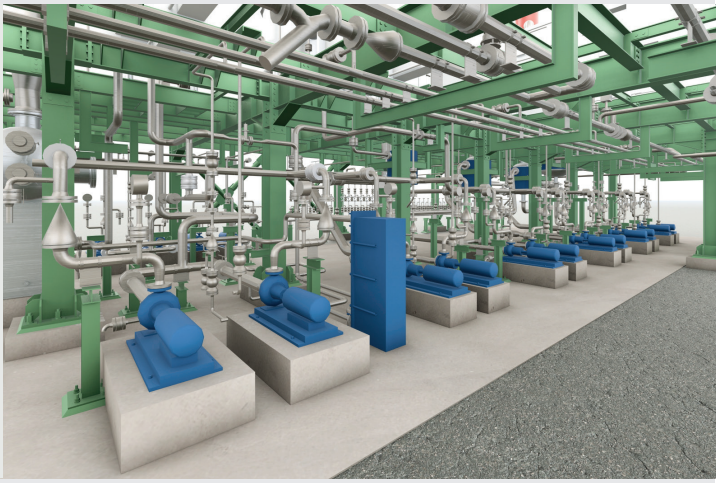
In edible oil production unit, pipe flexibility analysis for 55 out of 155 lines is performed. Moreover, all flanged connections were checked in terms of flange leakage. Besides, all loads and moments occurred on equipment nozzle are compared with allowable limits. It is verified that all loads are within the limits. In order to conform the related piping standard and customer specifications, spring hangers and expansion joint are designed.

Scope of Project:

- Stress check as per ASME B31.3
- Number of 55 lines, temperature above 150C
- Number of 20 equipment connection check,
- Flange Leakage check,
- Spring Hanger Design & Selection,
- Expansion Joint Design,

IGSAS Pressure Vessel & Piping Works





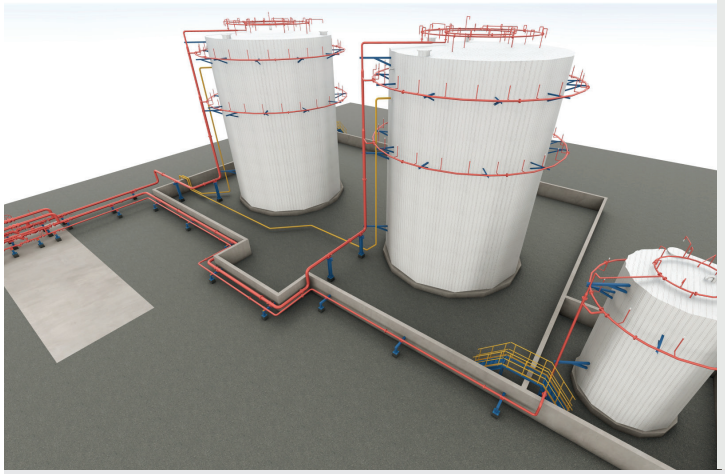
- **Client:** İGSAŞ İstanbul Gübre Sanayi A.Ş.
- **Business Area:** Fertilizer Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Kütahya / Turkey
- **Completion Date:** 2023

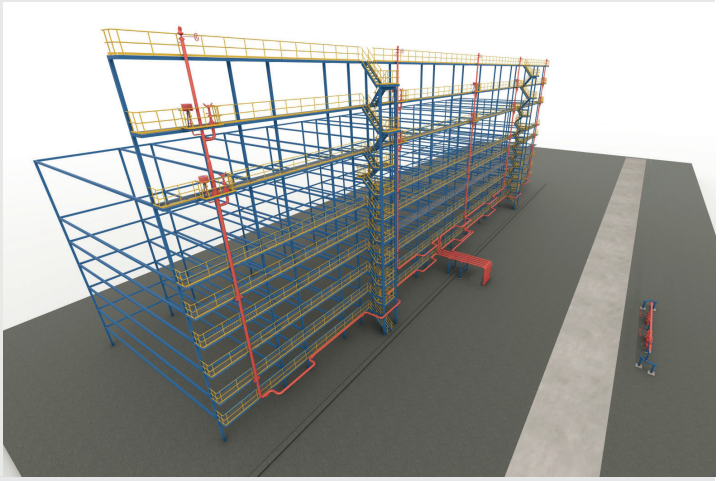
In Kütahya, "Pressure Vessels & Piping Works", creation of a 3D model piping design, AME Sev.VIII. Div.1 pressure vessel designs & manufacturing drawings were made Engineering and purchasing processes of 10 stainless steel pressure vessels have been completed and the productions have been carried out in the factory of our sister company KUARK Industry.

Scope of Project:

- 3D Model, Piping Layout and Isometric Drawings,
- Utility & Process Lines Piping Design
- MTO,
- Equipment Layout (10 Pressure Vessels & 16 pumps, 6 Heat Exchanger)
- Asme Sec. VIII Div.1 Stainless Steel Pressure Vessels Design & Manufacturing Drawings
- Foundation Desing of Steel Construction (10 m x 20 mt x 10 mt)

PETKİM Fire Fighting Projects





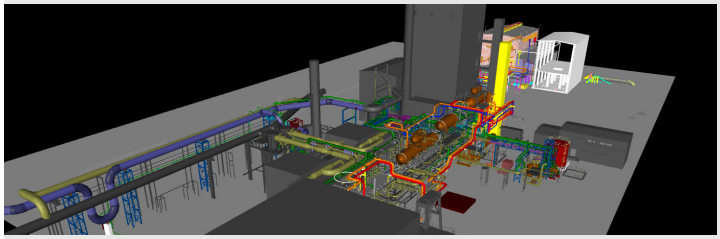
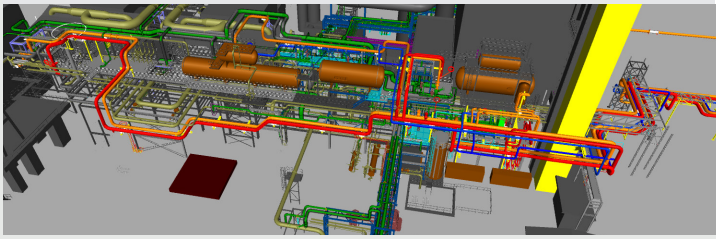
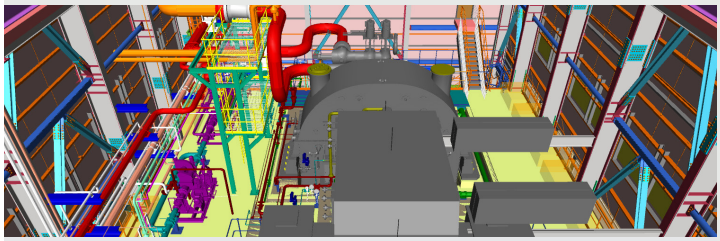
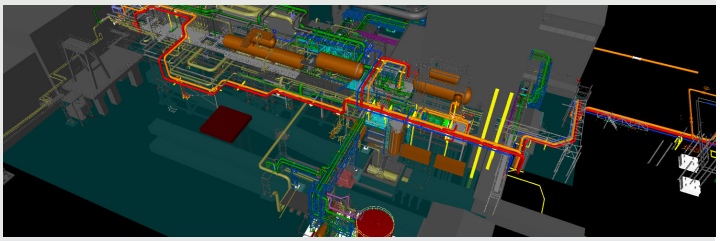
- **Client:** Petkim Petrokimya Holding A.Ş.
- **Business Area:** Oil & Gas
- **Project Maturity Level:** Detail Engineering
- **Location:** Izmir / Turkey
- **Completion Date:** 2023

In SOCAR Refinery, "Fire Fighting Projects", all detailed engineering, firefighting system design according to NFPA, creation of a 3D model, piping design, static analyzes steel construction, preparation of detailed projects, whole firefighting system automation/instrument and electrical design were made for seven different area.

Scope of Project:

- Fire Fighting Design according to NFPA
- Hydraulic Analysis, P&ID, Line List,
- Thermal Stress Analysis,
- 3D Model, Piping Layout and Isometric Drawings,
- MTO,
- Foundation and Steel Structure Design
- 2D/3D Cable Routing Designs
- Control Philosophy
- Cause Effect and Loop Diagram
- Instrument Datasheets, Hook ups
- Instrument Wiring Diagrams
- Firefighting System Equipment Datasheet and M&R
- Electrical Tracing Calculation & Design
- Electrical Single Line Diagram

Erdemir Ereğli TG10 Steam Turbine Engineering Works

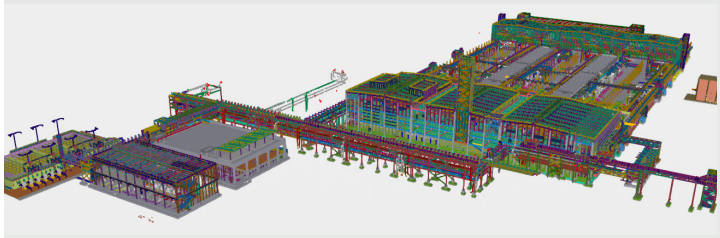
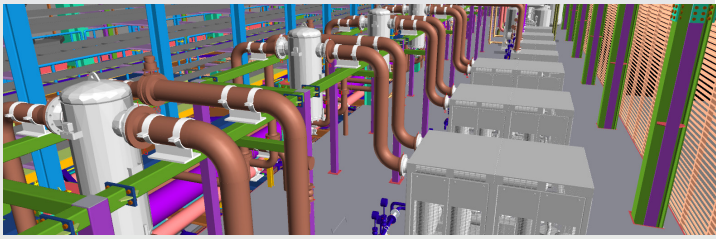
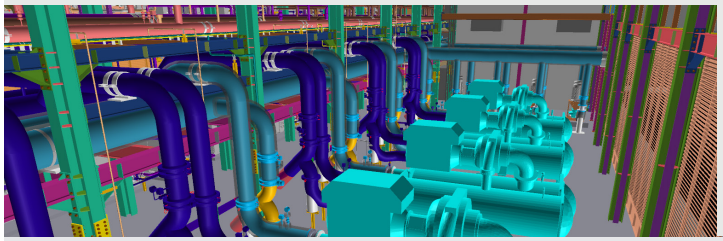
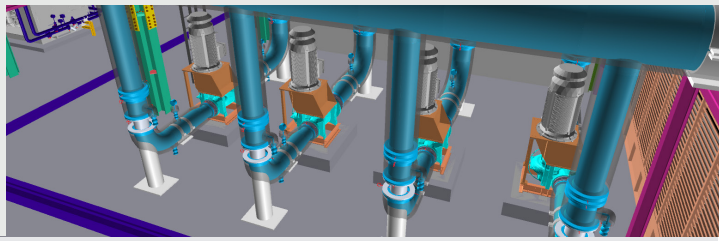
- **Client:** UET - Erdemir
- **Business Area:** Industrial Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Zonguldak / Turkey
- **Completion Date:** 2023

Koryon Engineering carries out the process, mechanical, piping, instrumentation, and fire protection projects for the BOP scope of the 60 MW capacity steam turbine engineering works decided to be added to the Power Plant in ERDEMİR. Technical evaluations of the supplier documents to be purchased within the scope of the project are also carried out to determine their suitability. In this way, it contributes to the selection of the right product.

Scope of Project:

- Conducting heat-mass balance, process flow diagram, pipe and instrument diagram, hydraulic analysis and diameter optimization
- Production of all process documents based on basic process calculations
- Retrieval of the existing power plant with laser scanning
- Route studies of the steam and auxiliary lines in the new turbine building and the existing power plant
- Stress analysis and spring support selection studies of turbine connections
- Design of underground cooling water lines (64”)
- Layout and section studies
- Pipe material classification
- Preparation of equipment/valve purchasing documents and technical evaluations
- Preparation of purchasing documents and technical evaluations of control and electric on-off valves
- Production of fire philosophy, detection and extinguishing detail projects

MTR & Fiber Production Facilities Expansion Project

- **Client:** SASA
- **Business Area:** Industrial Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Adana / Turkey
- **Completion Date:** 2023

Process, mechanical, piping, electrical and instrumentation studies were carried out within the scope of the MTR & Fiber Utility Facilities Project. 16.000 m3/h circulation capacity cooling tower pond hydraulic analysis is performed as per ANSI. Compressor and chiller building is designed. All steam and condensate distribution networks are designed. Amount of appx. 140.000 WDI utility piping (AG/UG) isometric drawings generated. Moreover, power distribution (MV/LV System Design), cathodic protection, all instruments and flow meters RFQ packages are prepared.

Scope of Project:

- Heat and mass balance of all utilities
- PFD and P&IDs
- Creation of process control systems and production of detailed documents
- Complete 3D Model, Piping Layout and Isometric Drawings
- Piping Material Lists, Procurement specifications
- M.V. / L.V. Systems Design
- 2D/3D Cable Routing Designs
- Control System Architecture and DCS
- Instrument Datasheets, Hook ups
- Instrument Loop and Wiring Diagrams

Körfez and Derince Terminal Additive System Project

- **Client:** Shell
- **Business Area:** Storage Areas
- **Project Maturity Level:** Detail Engineering
- **Location:** Kocaeli / Turkey
- **Completion Date:** 2023

This project includes the design activities of additive system in Shell's Körfez and Derince Terminals. Required process calculations for additive operations is completed in the project. In addition, new additive pumps and transfer piping systems are designed to obtain requirements.

Scope of Project:

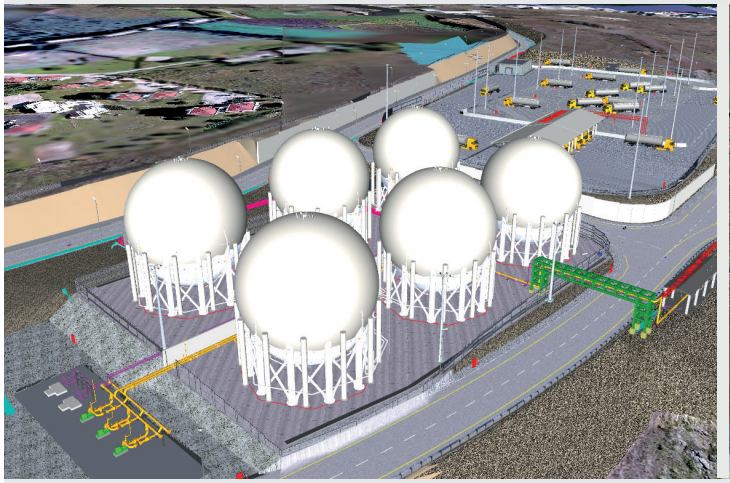
Process Design:
- Hydraulic Calculations for Truck Loading Additive System
- Piping and Instrumentation Diagram (P&ID)

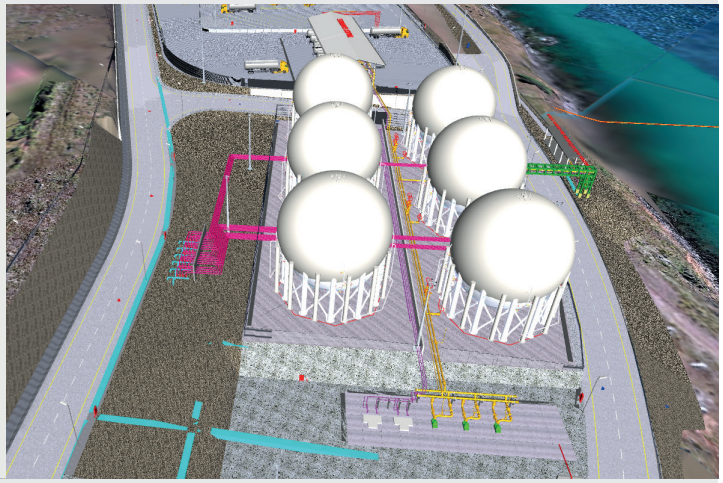
Piping Design:
- 3D Model
- Piping Isometrics
- Material Take-Off (MTO) List

Mechanical Design:
- Datasheet for Additive Pumps

Structural Design:
- Pump Foundation Detail Calculations and Drawings
- Secondary Steel Detail Design

LPG Storage Terminal and Jetty Integration Project





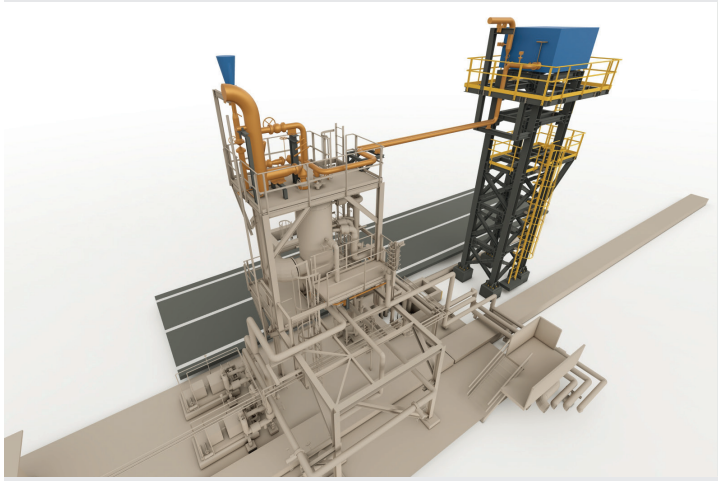
- **Client:** Yüksel Proje
- **Business Area:** Refinery and Petrochemical Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Adana / Turkey
- **Completion Date:** 2023

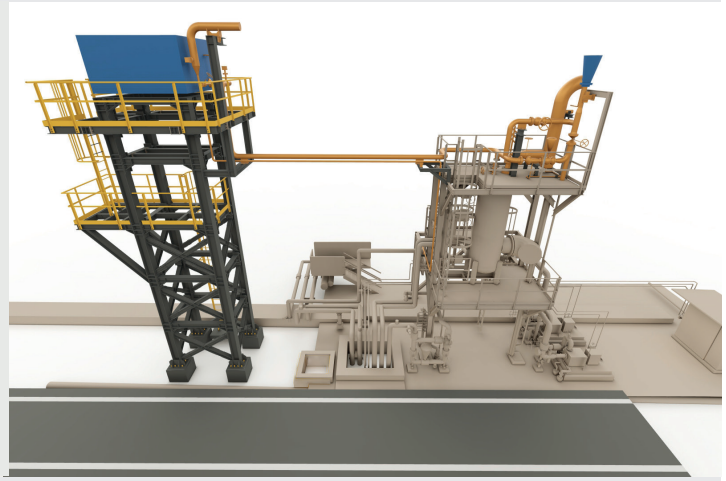
This project includes detail engineering design for LPG Storage Terminal, Truck Loading / Unloading Facility and Jetty Integration. During the project, 2 underwater (subsea) pipelines which carry LPG & Propane Liquid and Vapor were designed. Engineering works for Truck loading / unloading facility and pump & compressor station also performed during the project schedule.

Scope of Project:

- Subsea Pipeline On-Bottom Stability Analysis
- Subsea Pipeline Free Span Analysis
- Subsea Pipeline Expansion Analysis
- Process Flow Diagram (PFD)
- Piping and Instrumentation Diagram (P&ID)
- Hydraulic Calculation for Operations
- Specification and Datasheet for LPG Pumps
- Specification and Datasheet for LPG Compressors
- Specification and Datasheet for LPG Metering Station
- Specification and Datasheet for Truck Loading Arms
- 3D Model
- Isometric Drawings
- Piping Layouts
- General Specification for Instrumentation System
- Instrument Datasheets
- Instrumentation Detail Design Works

Installation of Air-Cooled Heat Exchanger





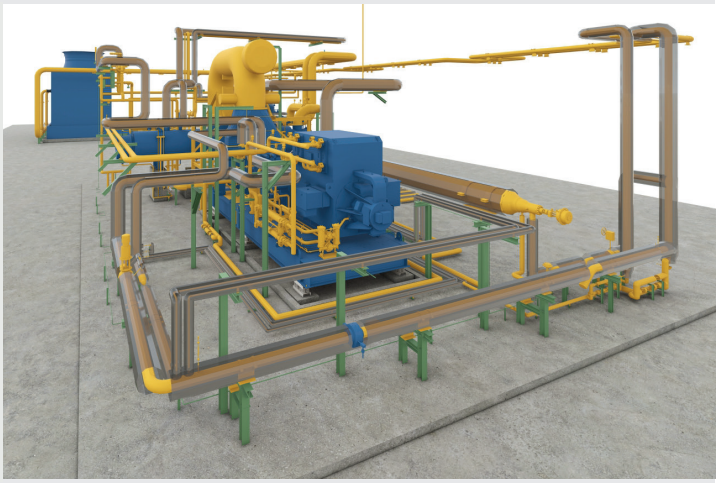
- **Client:** TÜPRAŞ İzmit Refinery
- **Business Area:** Oil&Gas
- **Project Maturity Level:** Detail Engineering
- **Location:** Izmit/Turkey
- **Completion Date:** 2023

In TÜPRAŞ Izmit Refinery, "Installation of Air-Cooled Heat Exchanger", all detailed engineering, static analyzes for pressure vessel and steel construction, preparation of detailed projects, preparation of final equipment datasheets are.

Scope of Project:

- Hydraulic Analysis, P&ID, Line List,
- Thermal Stress Analysis,
- 3D Model, Piping Layout and Isometric Drawings,
- 2D/3D Cable Routing Designs
- Instrument Datasheets, Hook ups
- Instrument Loop and Wiring Diagrams
- Air-Cooled Heat Exchanger Steel Structure & Foundation Design

2 MW Biomass Plant, Steam Turbine Power Piping Project



- **Client:** Ecogreen
- **Business Area:** Pipelines (Underground, Aboveground, Submarine)
- **Project Maturity Level:** Detail Engineering
- **Location:** Denizli / Turkey
- **Completion Date:** 2022

This project has been prepared to design all piping works of the 2MW Steam Turbine facility in Denizli. After the approval of PFDs and P&IDs prepared in accordance with customer demands, detailed model studies were started. All lines (main steam, intermediate draft, condensate, instrument air, etc.) in the turbine building have been designed. Due to the high design and operation temperature & pressure values of lines such as the Main Steam Line (HP) located in the turbine building, some of the lines are designed with alloys. Stress analysis of all lines in the turbine building has been made, and the lines have been made 'stress free', and stress analysis has been carried out in accordance with the NEMA standard, taking into account the allowable load values at the turbine nozzles. Also, information sheets of special supports on the main steam line have been prepared.

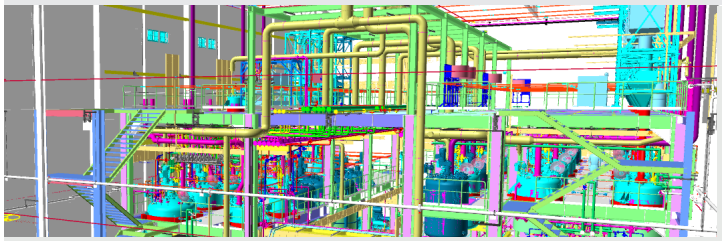
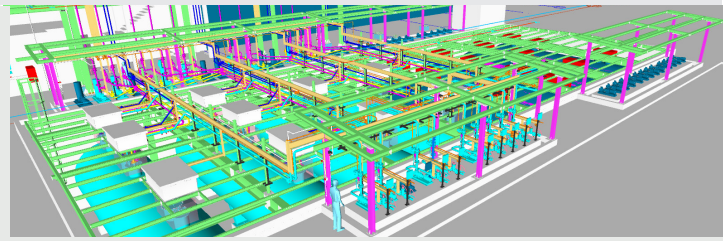
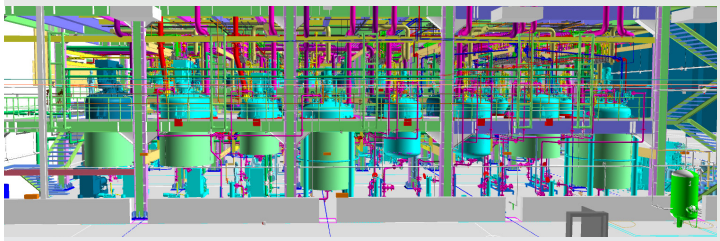
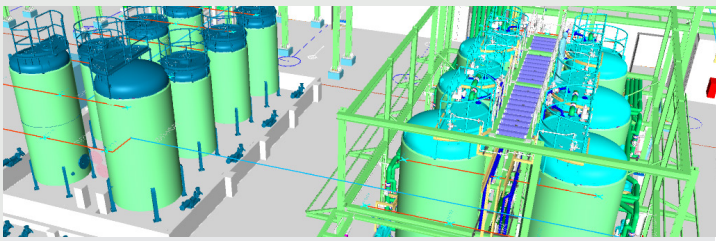
A cooling water system was designed to reduce the temperature effect at the facility, and a hydraulic analysis study was carried out considering the cooling water flow rates required by the equipment. The pipelines to be used for the cooling of the condenser, generator and oil cooler systems in the turbine building have been designed according to line speculations. Taking into account the allowable load values on the connecting flanges of the equipment, stress analysis has been made, and the cooling water system has been made 'stress-free' and information sheets have been prepared for special supports.

All projects are approved by Ecogreen. Field implementation of the project is planned to be completed in the middle of 2022.

Scope of Project:

- PFD, P&ID
- Hydraulic analysis
- Thickness and material selection report
- Pipe specifications for all facility
- Design of 3 km pipeline
- Equipment&Piping layout and section drawings
- Isometric design of pipeline
- Material list
- Stress analysis of main and circulation steam
- Filling platforms steel and reinforced concrete projects and calculation reports

Ink Plant Design Project

- **Client:** Buhler
- **Owner:** Toyo
- **Business Area:** Industrial Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Manisa / Turkey
- **Completion Date:** 2022

This project includes the design of the auxiliary systems, all the piping works of the offside and the electrical & instrumentation systems of the ink factory to be established in Manisa. After the approval of the PFDs and P&IDs prepared in accordance with the customer demands received, technical specifications and information sheets were prepared for the equipment that require the system, and bids were collected from the companies. Customer approval has been obtained for the equipment and systems to be procured by bringing the bids to the same base. Detailed model studies were initiated based on the proposals approved by the customer.

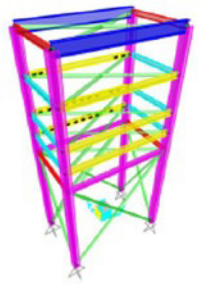
All lines (Nitrogen, air, steam, condensate, cooling water, chilled water and hot water) within the auxiliary facilities were designed. By considering the flow rates required by the systems, hydraulic analysis and stress analysis of the lines with high design and operation temperature & pressure values were made, and the lines were made 'stress free'.

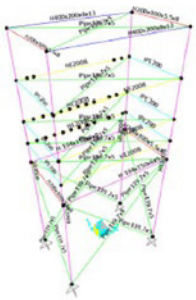
Detailed electrical and instrument projects were prepared for the control of auxiliary systems and energy supplies, and a preliminary cost calculation was made and delivered to the customer.

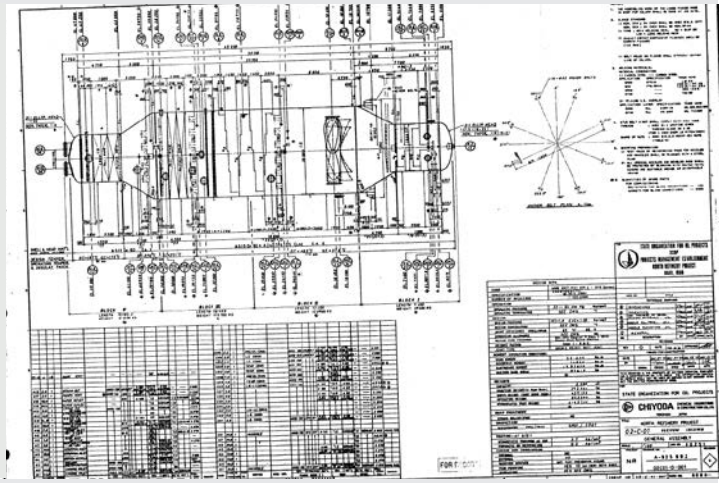
Scope of Project:

- PFD, P&ID
- Hydraulic analysis
- Thickness and material selection report
- Piping specification for all facility
- 10 km piping design
- Isometric Design of Pipeline
- Stress analysis
- Layout and section drawings of equipment and piping
- Preparation of equipment technical specifications and information sheets
- Technical evaluation process of equipment
- Cost analysis for all disciplines
- Electrical & Instrument panel layout, specification and data sheet preparation
- Instrument specifications and data sheets
- Electrical & Instrument detail manufacturing projects

Baiji North Refinery Rehabilitation Project







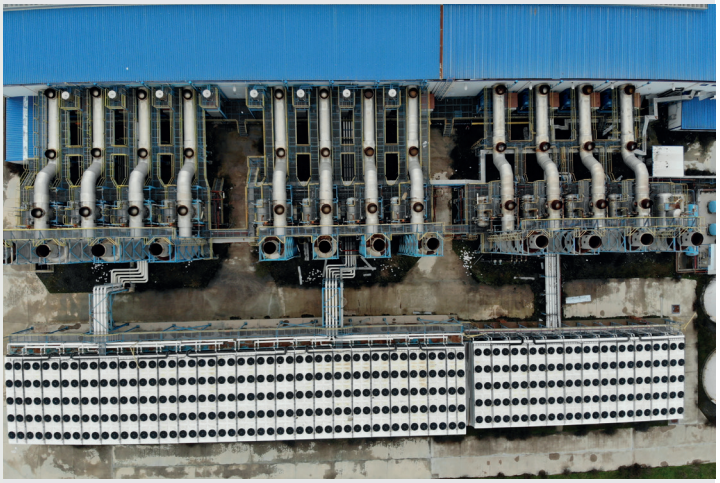
- **Client:** Çalık Enerji
- **Business Area:** Refinery and Petrochemical Facilities
- **Project Maturity Level:** Front End Engineering Design (FEED)
- **Location:** Baiji / Iraq
- **Completion Date:** 2022

This project includes detailed review of existing refinery assets which were damaged from terror attacks. During the project schedule, engineering documentation for purchasing activities were completed. Bill of quantities for re-construction activities were prepared. Re-routing of existing pipes with stress analysis and preliminary design of new piperacks were completed. Koryon's dedicated project team, all disciplines (process, piping, mechanical, civil and structural, electrical, instrumentation and control) worked with coordination of Employer's team.

Scope of Project:

- Analysis of existing structures (steel and concrete) and preparation of Bill of Quantities (BoQ)
- Detailed Review of existing static and rotating equipment packages
- Preparation of purchasing documents for static and rotating equipment packages
- Creation of I/O list of all refinery
- Detailed review of existing refinery's electrical system and preparation of purchasing documents
- Preparation of Instrument and Valve List for all Refinery

Çakmaktepe Power Plant Transport Phase-1



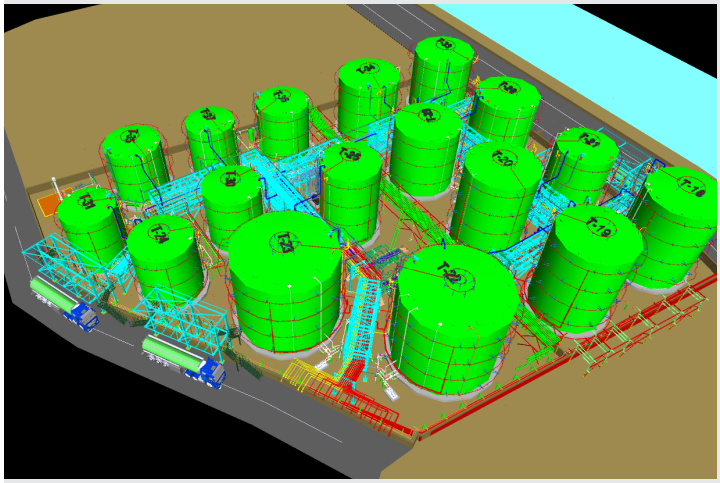
- **Client:** İltekno - AKSA
- **Business Area:** Energy Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Izmir / Turkey
- **Completion Date:** 2021

Reverse engineering service was provided for the first phase of the electricity generation facility transportation project, consisting of 27 engines with 9 MW power and 2 steam turbines with 20 MW power, in Aliağa-Izmir, and all the necessary projecting for the transportation of the facility was done by Koryon Engineering. 3D digital twin of the entire facility was created in line with cloud data, with 12 weeks of strong office work after 3 weeks of laser scanning. P&ID, electrical and instrument systems were checked in the field and related documents were as-built. The cutting plans, equipment and line tags detail information were also processed on the 3D model and delivered.

Scope of Project:

- Laser scanning
- Cloud data creation
- 3D modelling
- Creating pipe cutting plans and MTO
- Preparation of isometries
- Preparation of as-built P&IDs as red markup
- Preparation of line lists and equipment lists
- As-built modelling of primary and secondary steels
- Preparation of cutting plans of primary and secondary steels
- Creation of cable termination lists of the existing system
- Creation of electrical equipment and panel lists of the existing system
- Creation of the panel layout document of the current system

Acrilat Tank Farm Project



- **Client:** Poliport
- **Business Area:** Pipelines (Underground, Aboveground, Submarine)
- **Project Maturity Level:** Detail Engineering
- **Location:** Kocaeli / Turkey
- **Completion Date:** 2021

In this project, it was prepared for the tank area to be used as a chemical storage area at the Poliport Dilovası facility. PFD and P&ID were prepared according to customer demands, and HAZOP (Hazard and Operability Analysis) was carried out during the detailed studies. Piping projects have been prepared to store the chemical products that will come to the storage area by sea in the tanks, to use them in the factory and to fill the products on the filling platforms and tankers. Piping projects are designed in such a way that pigs can pass to clean the transport lines.

The design of the pipelines used for the cooling of the 17 tanks in the storage tank area, the steel design of the pipe bridges that enable them to be transported in the field, and the project of the foundations of the steel structures and equipment were made. Information sheets have been prepared for the instruments on the piping between the tank top and the pump tank connections and the instruments to be used on the filling platforms. CCTV and fire gas detection systems have been studied and designed specifically for the tank area.

Lighting and grounding projects, cable section calculations according to the general load list, electrical panel layouts and all other electrical and instrumentation projects have been prepared for the second tank site. All projects were approved by Poliport and implemented in the field.

Scope of Project:

- PFD, P&ID and hydraulic analysis
- Thickness and material selection report
- Scrubber, heat exchanger and pump
- 10,5 km pipeline between tank - pump - manifold - facility
- Equipment&Piping layout and section drawings
- Isometric design of pipeline
- Stress analysis of tank farm
- Tank nozzle orientations
- Hazard and operability analysis
- Control and process safety report
- Instrument data sheets
- CCTV and fire & gas detection projects
- Grounding and lighting projects
- Pipe bridges and filling platforms steel & reinforced concrete projects and reports
- Secondary steel projects

Refinery - Base Oil Transfer and Truck Loading Project

- **Client:** Teknokon
- **Business Area:** Refinery and Petrochemical Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Izmir / Turkey
- **Completion Date:** 2020

At the Refinery, the first two stages of which were completed in previous years, the black product truck sales terminal; It is designed to cover the 3rd stage extract and wax fillings to be used for black product production. In the project, integration with tie-ins to the existing field in the product tank area, creation of a 3D model, design of extract and wax pump stations, static and piping designs of filling islands, whole field automation/instrument and electrical system design were made. It has been successfully designed to ensure a smooth integration with the existing structure and to make future investments.

Scope of Project:

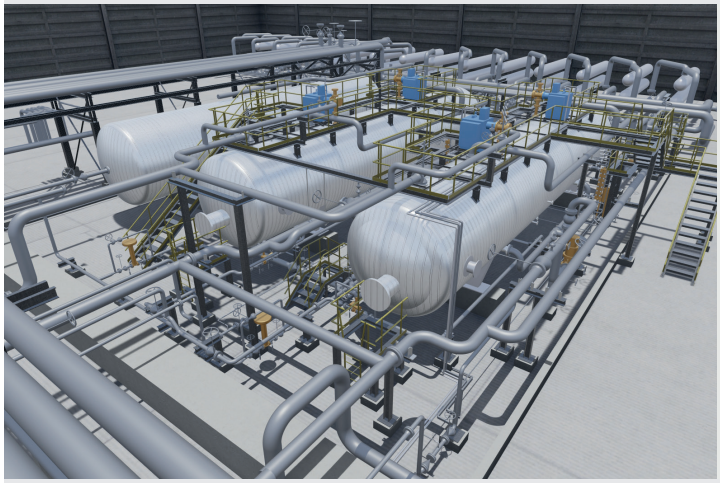
Piping and Pump Design
- Checking the suitability of 10 pumps with 60 m^3/h flow rate for each
- Hydraulic inspection of the system
- Inspection of the working envelope of 4 filling arms, determination of locations
- Design and piping of 2 pump stations
- 2 pipe bridges
- Steel platform and interconnects
- 100 hot & cold connections (Tie-in) details
- 20 km piping
- Canopy design allowing double-sided filling
- Utility piping line design (CR, CS, Steam, FW etc.)

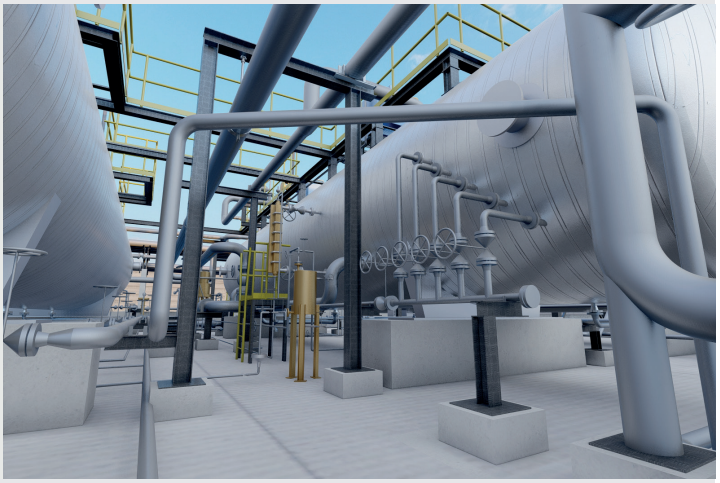
Mechanical Design:
- Hydrolic systems
- Stress analysis
- Isometric design
- 3D design
- MTO

Electric and Instrumentation Design:
- Control philosophy
- Cause & Effect and loop diagram
- Electrical equipment and instrument layout projects
- Hook-up drawings
- Cable route design
- Electrical single line diagram

Civil Design:
- Architectural design
- Section drawings and detailing
- 2 pieces of pipe bridge design, manufacturing and detail pictures
- 2 culverts design, manufacturing and detail pictures
- 10 pump with flow rate of 60 m^3 /h , basic calculation and detail pictures / slogger / secondary steel

Refinery - Desalter Revamp Project





- **Client:** Teknokon
- **Business Area:** Refinery and Petrochemical Facilities
- **Project Maturity Level:** Detail Engineering
- **Location:** Izmir / Turkey
- **Completion Date:** 2020

This project includes the revamp of the desalination system currently in use at the Refinery facility. Initially, the desalination area was scanned with laser and combined with cloud data, and a revamp project was designed with the most efficient and shortest solutions. Revisions have been made in order for the updated system to work properly with the updated system. All equipment has been selected and designed in a way that is suitable for the system and prevents corrosion.

Scope of Project:

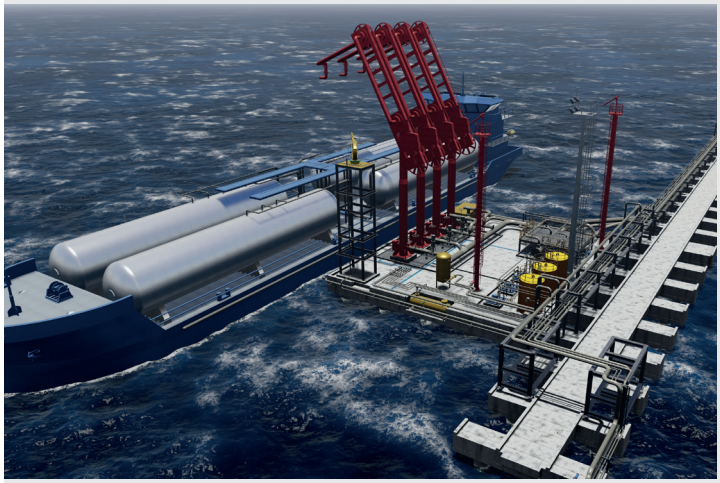
Piping-Process – Mechanical Design:
- Working with cloud data
- Laser scanning of desalter area and reverse engineering applications
- Stress analysis
- Isometric drawings
- 18 Tie-in hook-up details
- Equipment layout plan
- MTO

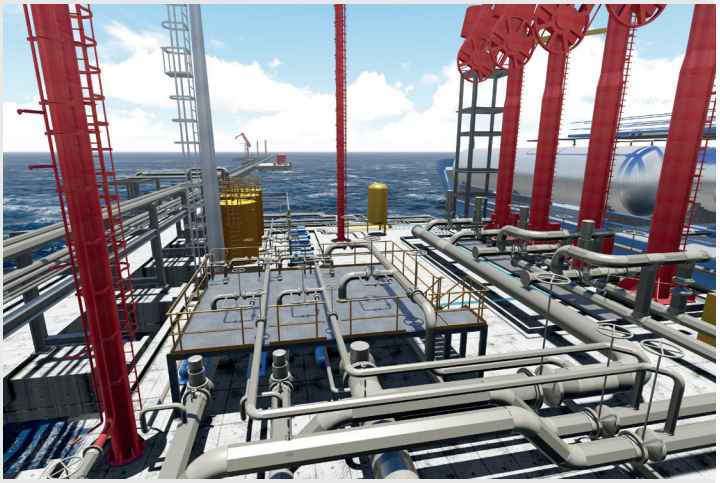
Instumentation Design:
- I/O list
- Cable list and terminal diagram
- Instrument layout
- JB layout
- MTO
- Cable layout and assembly details
- Instrument data sheets
- Hook-up drawings

Electrical Design:
- Transformer layout projects
- Electrical load list
- Electrical single line diagram
- MTO
- Cable routing design

Civil Design:
- Desalter steel platform
- Pipe bridge

Dörtyol FSRU Jetty Project





- **Client:** Botaş
- **Business Area:** Filling & Loading Stations
- **Project Maturity Level:** Detail Engineering
- **Location:** Hatay / Turkey
- **Completion Date:** 2020

This project includes the jetty designs for the "Floating LNG Storage and Gasification Ships (FSRU)", which carries out the transportation of liquefied natural gas with LNG (Liquefied Natural Gas) ships, storage and gasification with floating systems, and the pipeline, which is a kind of flow assurance for pipes and flow lines filler and oil jetty design.

Scope of Project:

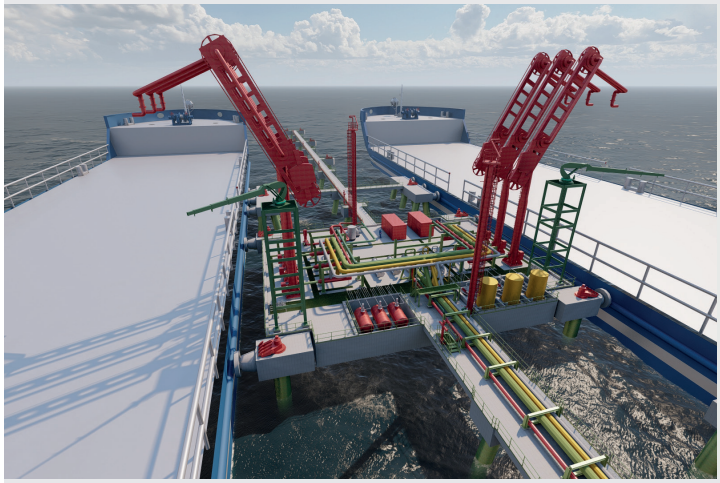
Jetty Layout & Loading platform plan:
- Loading arms
- Fire protection system
- Utility tanks
- Pipeline pigging (PIG's)
- Pier ladder

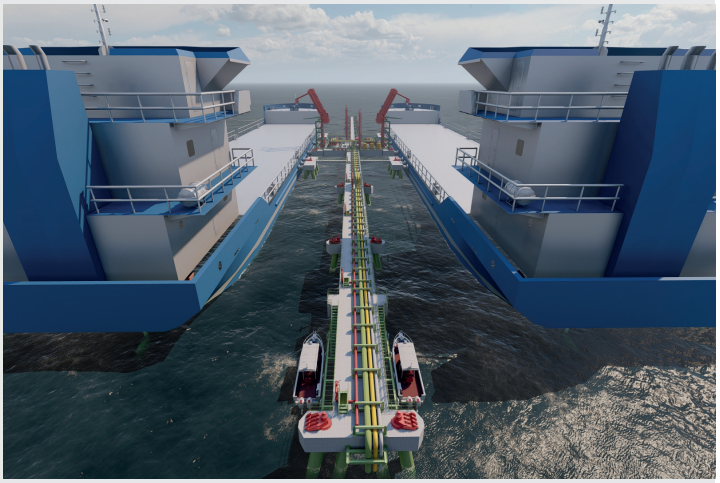
Piping design:
- Natural gas, crude oil, diesel, petrol line piping design
- System utilities line piping design
- Fire fighting system
- Steel structure and pipe supports design

E&I Design:
- MV/LV Key system design
- Single line diagram & load list
- Control philosophy, cause & effect, control system architecture, datasheets documentation
- Fire Detection System

Measurement & PIG station design:
- Measurement, P&ID
- Measuring - orifice calculations
- Layout plan (Z Form)

Off-Shore Platform & SubSea Piping Project





- **Client:** Opet
- **Business Area:** Filling / Loading Facilities
- **Project Maturity Level:** Front End Engineering Design (FEED)
- **Location:** Mersin / Turkey
- **Completion Date:** 2019

An offshore platform is a large structure used to house the workers and machinery needed to drill or produce natural resources through tunnels/wells on the seabed. Depending on the conditions, the platform may be attached to the ocean floor, may consist of an artificial island, or may be floating. This project includes pre-engineering studies of Opet's Off-shore platform to be built in Mersin. The basis of the design, P&ID studies, platform layout and underwater piping stress analyzes have been successfully completed.

Scope of Project:

Process Design:
- Basic of Design
- Process flow diagram (PFD)

Piping Design:
- 6x6 km submarine piping
- Above platform piping

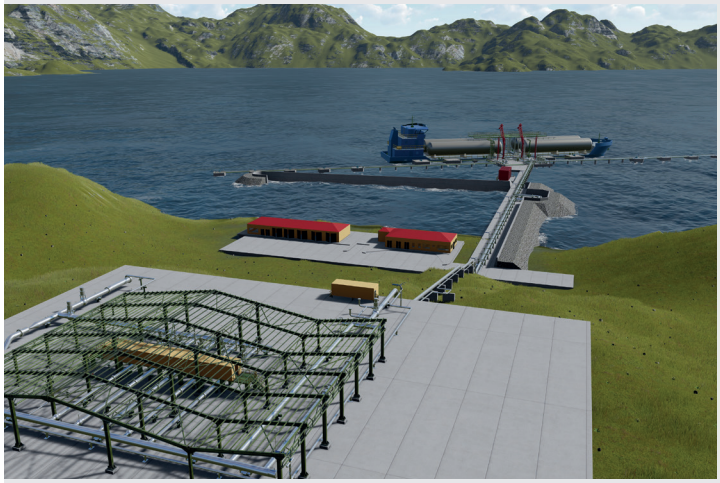
Shore Valve / Pig station design:
- Mechanical design
- Shore station design
- Electrical and instrumentation design

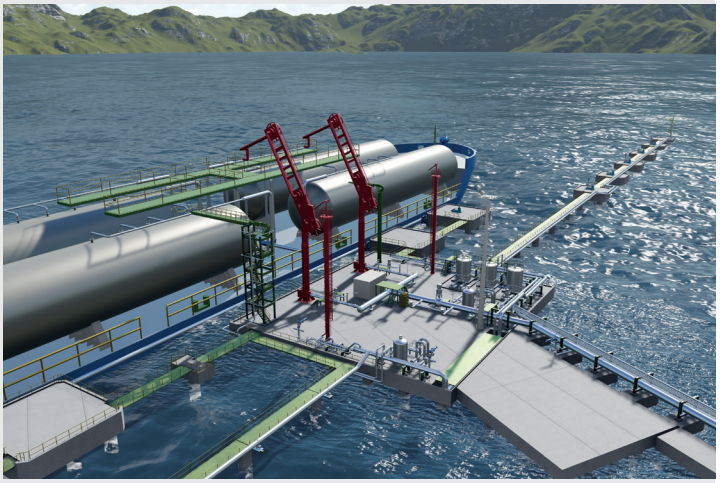
Submarine Piping Calculations:
- Buoyancy analysis
- Stability analysis
- Section drawings
- Layout drawings

Electrical and Instrument System:
- Feasibility calculations

Platform Layout Studies:
- Marine loading arm
- Fire system
- Control room

Saros FSRU Jetty Project





- **Client:** Botaş
- **Business Area:** Filling & Loading Stations
- **Project Maturity Level:** Detail Engineering
- **Location:** Edirne / Turkey
- **Completion Date:** 2018

This project includes the jetty design for the "Floating LNG Storage and ReGasification Units (FSRU)", which carries out the transportation of LNG (Liquefied Natural Gas) with LNG carrier vessels, storage and regasification with floating systems, and also the construction of connection systems to the jetty and the construction of liquid natural gas. It includes the connection of the gas to the existing BOTAŞ natural gas system through the metering station by transforming it into gas phase.

Scope of Project:

Piping Design:

The design of the piping system for natural gas and its utilities (heating/cooling fluids) on an area of 600 square meters and the design of the fire fighting system have been successfully completed.

- 600 m^2 Field area,
- 16" x 2 Marine loading arm, blowdown system,
- Over the jetty piping
- Counter station
- Pig station(PIG's),
- Fire fighting system
- Marine pump station

E&I Design:

Many documents have been prepared, including placements on the jetty, electricity taken from official institutions, the design of the entire electrical system, the design of the automation and control system, safety and HAZOP risk assessment studies.

- MV/LV Key system design
- Single line diagram & load list
- Control philosophy, cause & effect, control system architecture, datasheets documentation
- Fire detection system

Copper Mine - Slurry & Water Pipeline Design

- **Client:** Acacia Mining Operations
- **Business Area:** Pipeline (Underground, Aboveground, Submarine)
- **Project Maturity Level:** Detail Engineering
- **Location:** Kastamonu / Turkey
- **Completion Date:** 2018

In this project, the necessary piping and pumping station for the water line and mud line required for production were designed within the copper mine site. In addition, the layout plan has been prepared in detail and architectural studies have been carried out in order for the designed system to work smoothly. All steel structure, electrical, instrument control, fire detection and data sheets of the project were designed and concluded with success. In addition, PA/GA and CCTV services were provided.

Scope of Project:

Piping Design:
- 4x6 km piping line
- Pipeline construction projects

Pump station design:
- 3 pump stations with 1200 m^3/h flow rate
- Equipment layout

Construction Design:
- Static calculations
- Section drawings and detailing
- Plan and sizing of the workstation

Elecric & Instrumentation Design:
- Single line diagram & Load List
- I/O list
- Fire detection system
- PA/GA ve CCTV system
- Control philosophy, cause & effect, datasheets documentation

Process Design:
- P&ID development

References


BOTAŞ


SOCAR


Petkim


Tüpraş


aksa
ENERJİ


ÇALIK ENERJİ


roketsan


cimtas


İGSAŞ
İstanbul Gübre Sanayii A.Ş.


TOROS
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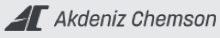
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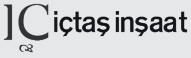
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- Caloric DX 5207 Equipment Pre-Static Design
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- BOTAŞ Tuzgölü Phase-2 Under Ground Gas Storage Design
- Yanbu Phase-3 Extension Pipeline Project Design
- Production Building Reverse Engineering - Cloud to 3D
- Ink Plant Utility Design
- Turbo Generator-10 60 MW Turbine Design
- New MTR & Fiber Plant Utility Design
- Saros FSRU E&I Design
- Turbo Generator BOP Piping Design
- Genaral Plant Fire Fighting Design
- Biological Storage Tank Design
- Crude Oil Injection Design
- Tank Farm Compatibility & Product Change
- Storage Tanks Coil Design
- Knock-Out Drum Design
- Fertilizer Plant Stainless Steel Vessel and Platform Design
- T501 Tankı E&I İşleri
- No.4 Coge Battery Piping Works
- OMAS Mining MCC E-House Design
- New PTA Stairway Design
- Shaikan Gas Management Project
- Hydrogen Piping Review
- Baiji Refinery Engineering Support Service
- Vagon 3D Modelleme
- İzmir VOC Emisyonlarının Azaltılması
- Holding Basin HAZOP
- Turyağ Bosphorus Project
- Turyağ Co-gen Mechanical & Piping Works
- Star HTF-055 ve HTF-056 Hazop
- VCU Project & Engineering
- Injection System Design
- ADR Mining Mercury Remediation Electrical Works
- Slurry Pipeline Design
- Edible Oil Plant Pipe Stress Analysis
- West Qurna 2 SCPP Project
- Shell and Tube Heat Exchanger Revamp
- LPG Storage Tank Fark & Loading Facility & Subsea Piping
- Azerbaycan Bakü- Haor Proje Hazop Çalışması
- PSV Sizing
- Renewal Of Demi T-404AB and T-407 Storage Tanks Project HAZOP
- Yatağan Thermal PP Main Steam Line Design
- TUPRAS Air Cooled Heat Exchanger Design
- CCTV System Renewal Project
- Project ERA Process Design
- ARADA Phase-2 Water Transmission System
- Malzeme Depo Yangın Hattı Su Bağlantısı Projesi
- Jetty Yangın Hattı Projesi
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- Aquakraft KM-1&KM-2 E&I Works
- DCU Revamp Project HAZOP LOPA Study
- Power Plant HAZOP
- CO2 Pipeline & Facility
- Piping Stress Analysis
- Köpük Deluge Sistemi Revizyonu
- PVC Sprinkler Sistemi Tasarımı
- WWTP Chemical Plant Project HAZOP LOPA Study
- KSA Juranah ISWR
- Cement Factory Waste Heat Recovery Design
- Jetty Loading Facility
- Turyağ Fritolay
- PLT-148 Degassing Vessel Platform Design
- Gebze Plant P&ID As-Built
- DCU Revamp Project HAZOP LOPA Study
- ALFA LAVAL N5609 Piping Analysis
- Centrica Athlone&Profile Park Reciprocating Diesel Oil Power Plant Project
- 2022-ER-632 HAZOP
- 2022-ER-362 HAZOP
- Tuz Gölü Doğalgaz Depolama projesi HAZOP
- KSA Riyadh City Southern Ring WTS
- MLA Montaj Ankraj Tasarımı
- RSM Test Fırını Ar-Ge Projesi
- Alhandra Cement Factory Waste Heat Recovery Design
- Tuz Gölü 3.Etap Projesi
- Ceketli Degazing Hattı Stres Analizi
- U-200 Beton Baca Lazer Tarama
- Yakıt Dolum Tesisi Boru Hattı Tasarımı
- PTA Buhar Hattı Dizaynı
- SG4 Kazanı Temelleri Kapasite Tahkiki ve Güçlendirme Projesi
- Derince Terminali Tank Söküm/Yapım İşleri
- Seal Gas Conditioning Unit Revamp_HAZOP
- Project-Raven
- Faz-3 Kömürlü Su Piti Kapasite Arttırımı
- Easymelt P&ID As-Built Projesi
- WQ2 Engineering Package-2 E&I Support Service
- SpoolFab Mühendislik Hizmeti
- TA OWS Rehabilitation Engineering
- 7C-511 Dramı Yağ Cebinin Sloba Gönderilmesi Dizaynı
- Karpower RMS Skid İmalatı İşleri
- Atık Kabul Tesisi - FEED Çalışmaları - Hazop ve Akış İhtiyaçları
- Chiller Sistemi FEED Çalışması
- Dolum Adası Tesis Dizaynı
- KIRIKKALE ASA Geri Kazanım Tesisi Tasarımı
- BATMAN ASA Geri Kazanım Tesisi Tasarımı
- Boiler System FEED Study
- Marmara Terminali Kapasite Artışı Avan Proje Hazırlanması
- XHS Hatları Değişim Projesi - Montaj Riskleri Değerlendirmesi
- PSV Sizing Verification
- Depolama Tankı Vent Hesabı

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