COOEC
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Oilfield Surface Facilities

OFFSHORE OIL ENGINEERING

Summary

COOEC has formed a talent team with oilfield surface facilities engineering design, procurement, construction and project management capabilities. Successfully implemented a number of EPC projects, including K1A, upgrading project, Restart, LL Southwest, LLNW and etc. COOEC has not only undertaken a large number of Green Field projects, but also engaged multiple Brown Field projects, such as Corrective Maintenance, LLK Optimization and etc. COOEC’ s capabilities continue to improve.

Core Value

Local
Engineering

Local Expertise
Collaborated R&D
Commercialize Technology

Global
Strategy

Cost-effective Modulization

SCM Globalization
Fabrication Capacity
Logistic Efficiency

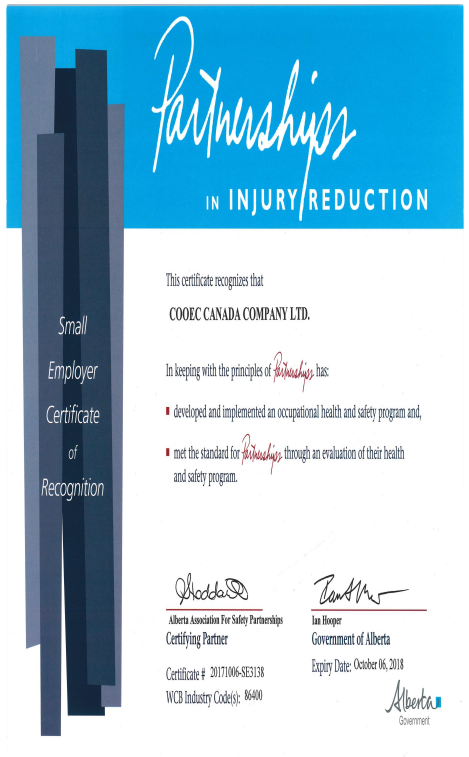
Lean
Solution

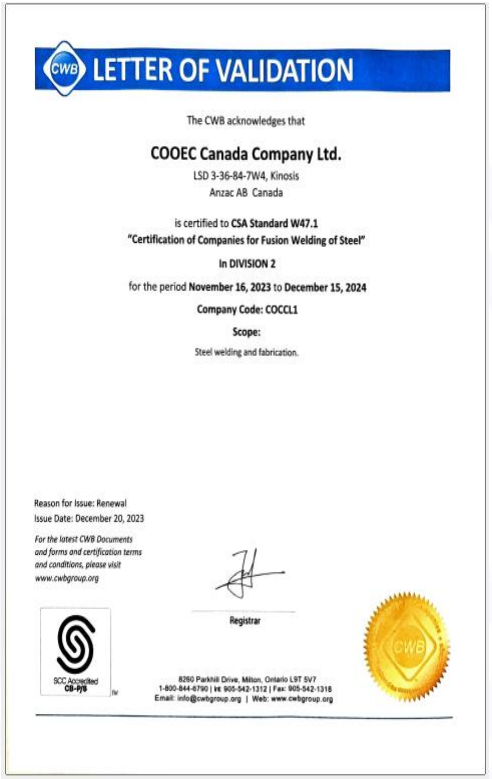
Value Add Lump Sum

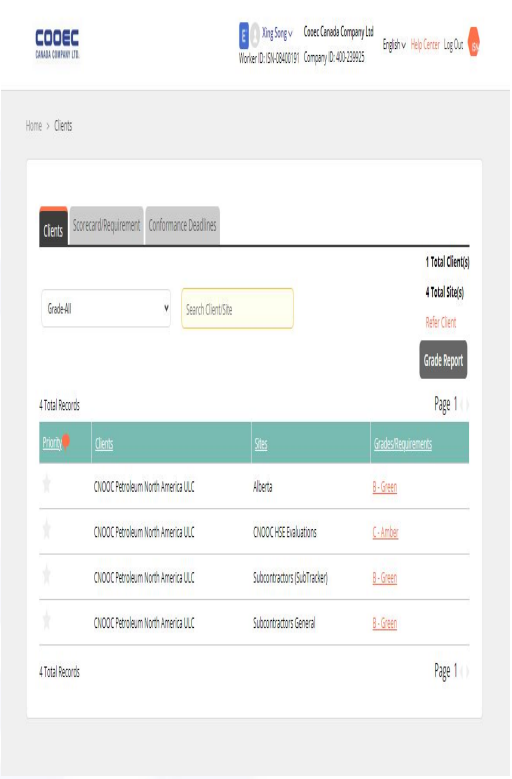
Client Derived
Multi-cultural Management
Lean Execution

Qualification Certificate

COOEC has obtained the necessary certification and qualifications which can well implement project design and subsequent maintenance and renovation work for the customer.







•Partnerships in Injury Reduction
•AB Safety System Certification

•APEGA
•AB Design Certification

•SEQual
•Certificate of Registration

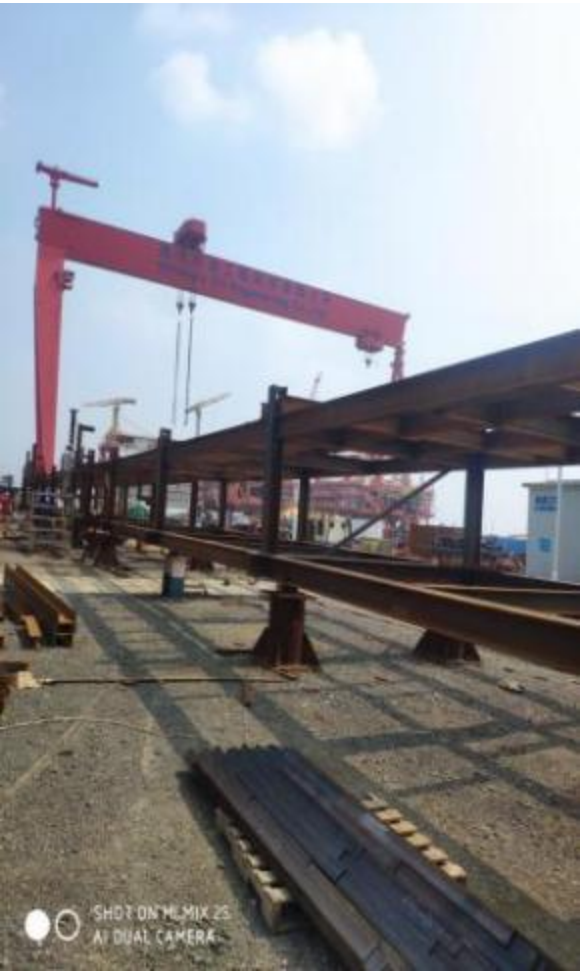
•Certification of Companies for Fusion Welding of Steel

•ISNetworld
•Quality and Safety Subcontract Management System

EPCI For Uganda Kingfisher Oil Field
EPC3 Production Facilities

Client Name	CNOOC Uganda Limited
Project Location	Albert Lake, Uganda
Contract Type	EPCI
Duration	2021.09-2025.06
Scope of work	FEED + EPCI of 5 Well Pads, Central Process Facilities(capacity of 40,000 bbls/day), Pipelines and etc

Long Lake North-West (LLNW) Project



Project Overview

- The Long Lake North West (“LLNW”) project is primarily a new green field Steam Assisted Gravity Drain (SAGD) development that is to be tied into Owner’ s existing Long Lake Central Processing Facility (CPF).

Scope Of Work:

- Construct one new SAGD well pad with 8-well pair Well Pad and 4 interconnecting Flowlines.
- The Well Pad scope includes:
- 8 SAGD well pairs (including small/large bore extended reach horizontal steam injection and production wells by Owner)
- Well Pad modules includes 12 small modules with a total weight of about 500 tons
- Four 2.345km pipelines (steam, asphalt emulsion, associated gas, natural gas)
- 25 kV OH Power Line
- Produced vapor handling facilities as be required

Project Objective:

- Project is a new development plan that will be tied-in to the existing Long Lake facility. This project will provide the solid platform for production growth stability and make great contribution for Owner’ s long term operation target.

K1A Pipeline Replacement

Project Scope of Work

- 10.4km PE and 10.4km BFW Pipeline
- 4 anchor blocks
- 2 sets of PLMS
- 6 HDD Pullback
- All tie-ins construction & pre-commissioning

Project Challenges

- Complex geological conditions result the pipeline conditions are complex and difficult to design and construct.
- The welding prefabrication process of double-layer pipe is complicated
- Extremely high design temperature difference leads to special design and construction requirements
- The impact of Canada’ s special construction environment on design and construction
  - Extremely low temperature -41℃
  - Drainage and muddy construction site environment during ice and snow melting period
  - High standards of environmental protection requirements

Active Actions

- Adopt multiple technological innovations, such as Well-point technology drainage, S-lay pipeline decentralization, one grouting on one side, install trench-box and etc.
- Optimize management
- Reasonably decompose construction work to improve work efficiency

Performance

Long Lake K1A Restart Project

Project Challenges:

- Extremely Cold Weather seriously affects site construction efficiency
- Device renovation is complicated
- Difficulty in construction with limited space
- Tight project schedule

The Kinosis 1A (K1A) Restart Project is dedicated to returning the K1A facilities to service after a lengthy outage due to a production pipeline failure that occurred in 2015. K1A is a Steam Assisted Gravity Drain (SAGD) development that is tied into CPNA existing Long Lake Central Processing Facility (CPF).

Restart activities:

- K1A Steam Generation Facility (SGF)
- K1A Well Pads (1 & 2)
- Source Water and Disposal Water Wells (surface facilities only)
- K1A Pipelines, including new Boiler Feed Water and Produced Emulsion
- Long Lake tie-ins and associated facilities

The Project’ s restart activities include engineering, procurement, construction, inspections, maintenance, pre-commissioning, commissioning, start-up and initial operation of the facility. The primary phases of execution include:

- Inspections
- Maintenance
- Pre-commissioning and Commissioning
- Initial Operations (Start-up)

Performance

Long Lake Southwest Greenfield SAGD Project

Overview:

Designing and building multiple green field Steam Assisted Gravity Drain (SAGD) Well Pads and an associated flowline connecting the well pads to the client’ s Central Processing Facility (CPF).

Engineering:

Executed by COOEC Canada’ s local engineering team, leveraging COOEC HQ’ s engineering experience in modular design while meeting Canadian industry standards.

Project Management:

COOEC Canada’ s team includes individuals with 30+ years of project management and construction management experience in the oil sands industry.
We not only provide quality service, but a solution of certainty to our clients.
We are committed to developing long lasting relationships in the industry.

Supply Chain Management:

Collaboration with local and international suppliers to purchase materials for LLSW.
Our team is working with local and Aboriginal contractors.

Pile Foundation Construction at Wellpad

Module Manufacturing in China

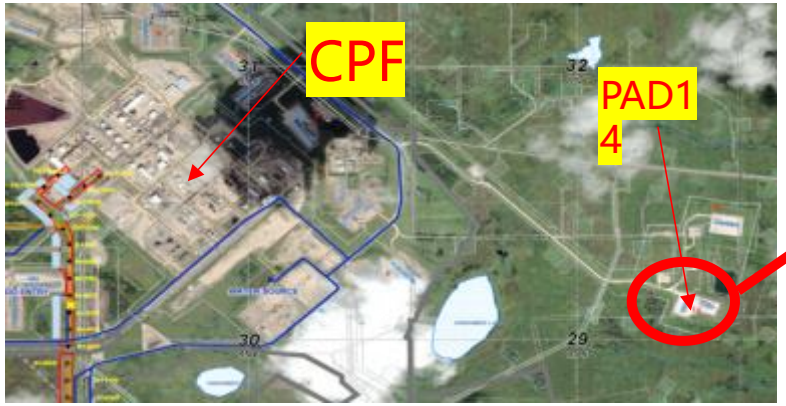
Total 57 modules were fabricated in China and re-assembled into Alberta Size Modules in Edmonton

Long Lake Upgrader Project

- The Upgrader Partial Restart project is to have necessary modification on the existing upgrader facility, to facilitate the plant to come back running and with the capability to reduce the viscosity of the bitumen and produce a portion of cracked naphtha and gas oil by mild thermal cracking process to reduce the diluent addition in the dilbit product.
- COOEC reviewed and authenticated the design products which have been completed by CPEL.
- COOEC took the responsibility to review these design products for the compliance of Canadian local codes, regulations and requirement from safety and HSE aspects.

Performance

Pad 14 Extension EPC Project



Mechanical completion time is much ahead of the expected.

Project Overview

- The Long Lake Pad 14 Well Pair Extension project is primarily a brown field Steam Assisted Gravity Drain (SAGD) development that primarily involve drilling an additional four (4) well pairs to the existing Wellpad and tieing into spare module bays within the central module on Long Lake Well pad 9114.
- It encompasses engineering, design and procurement of surface facilities, construction, Pre-Commissioning, drilling and completions (By Owner), Commissioning, start-up (By Owner), and initial operation of the well pads.

Scope Of Work:

- 4 well pair, 11 pipe rack modules including engineering, fabrication, installation, and pre-commissioning
- EHT engineering, procurement, and installation
- Piling engineering, installation, cut and capping

Performance

Corrective Maintenance Project (CM)

In 2023, COOEC undertook maintenance project package totally includes 23 projects. COOEC set up on-site CM construction team through project execution.

In 2024, we continued the "engineering + service" business layout and combined the "short and efficient" characteristics of operation maintenance, establish maintenance project package to coordinate engineering, procurement, construction and project management resources to optimize SCM process and the authority to enhance or response speed to meet Client’ s requirement.

Trim diluent injection relocation

Desalter Trial EPC

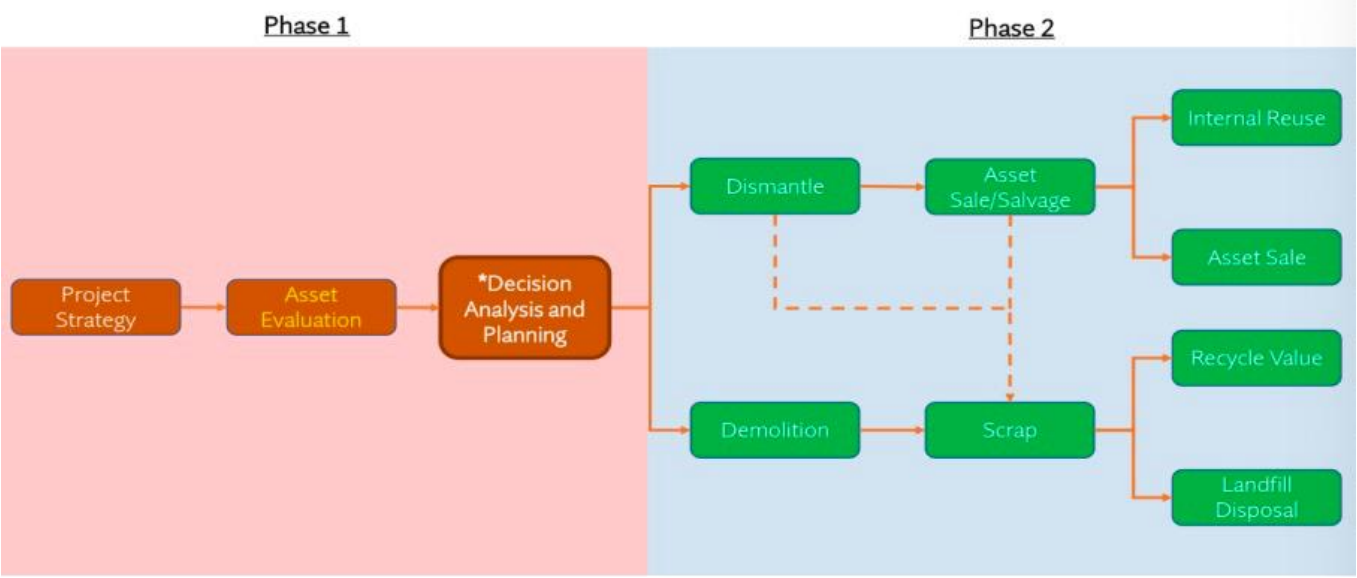
Tank Farm piping E&I Modification

E-001 Jumper Line to FWKO

Performance

HCU & Carbonyl Dismantle, Demolish and Disposal Project

Totally 90 main equipment, 59 will be removal and 31 will be retained



- Site Survey & Inspection
- Engineering Design
- Procurement & Subcontracting
- Site Construction
- Post-Construction Disposal

Long Lake Facility

HCU

Carbonyl

Performance

R&D Project: Mini SAGD

Project Overview:

• Modularized, transportable, low-cost, small-scale Well-Pad and CPF Facility for COOEC ’ s client.

Engineering:

• Engineered with the ability to be interconnected on site and disassembled.

Technology will provide the client the ability to:

• - Explore remote sweet spots
• - Pilot test potential wells
• - Expand current developments
• - Reduce developmental risk and payback time
• Technology is strongly supported by CNOOC and COOEC’ s team of 3000+ engineers.

Project Management:

• In-house capabilities for engineering and project management are dedicated to the success of this project.
• High costs associated with building permanent SAGD facilities will be significantly reduced.

Supply Chain Management:

• Supply chain management team is focused on assuring that the Mini SAGD equipment fabrication meets regulations, standards, and laws.

COOEC
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Empower the Future with Excellent Engineering

THANKS

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