> Representative ILF Design, Major Water Pipeline, Middle East

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CSSP

COMMON SEAWATER SUPPLY PROJECT

Enabling one of the world's top oil producing regions

As the second largest oil producer of OPEC nations, Iraq's economy fully depends on the stability and growth of the national oil industry. It is therefore of paramount importance to keep the oil production at target level. To achieve this goal it is necessary to apply secondary oil recovery methods.

The method selected for the oil fields in Southern Iraq is to inject water into the reservoir in order to maintain the reservoir pressure and to increase the percentage of oil extraction

Water Source for Oil Field Pressure Maintenance

The amount of water required in Southern Iraqi oil fields for this purpose is in the range of 12.5 million barrels of water per day, which is equal to 24 m3/second.

Such quantities of water are not available in the project provinces of Al-Basrah and Missan, where temperatures regularly exceed 40 degrees Celsius and where the annual precipitation rate is less than 155 mm. Sourcing water from the famous Euphrates and Tigris rivers would only amount to 10% of the quantities required in the oil fields. Furthermore, use of these local water sources would significantly detract from the life sustaining water for the local population and community needs.

The only source available in sufficient quantity for the needs of the Project is seawater. In consequence it is logical to take this seawater from a single point, treat it and supply it via a common system to the various oil fields. The evolving Project is called the Common Seawater Supply Project CSSP.

ORGANISATIONAL SET UP OF THE OWNER

The South Oil Company (SOC) received a mandate from the Iraq Ministry of Oil and International Oil Companies (IOCs) to develop and operate the CSSP.

SOC's key stakeholders in development of the project include major global operators in the oil and gas industry such as BP, CNOOC, ENI, ExxonMobil, Lukoil, PetroChina, Petronas, and Shell.

In order to support SOC, the consultant CH2M Hill has been contracted as PMC (Project Management Consultant) to manage and coordinate the execution of this project.

ILF's CHALLENGING TASK

ILF identified this project as early as 2010 and presented preliminary technical concepts to ExxonMobil, who developed this project in the initial phase. Subsequently, as SOC took over the mandate for implementation of the project from ExxonMobil, ILF kept a strong focus on the developments. In 2013, ILF was pre-qualified as the only engineering company for both FEED packages (Front End Engineering Design) - i.e. for the STF (Seawater Treating Facilities) and the pipelines. Both proposals were submitted in January 2014. During the following five months, technical and commercial details were negotiated and at the end of June 2014, ILF received a Letter of Award to perform the FEED package for the CSSP pipelines. The contract between SOC and ILF was signed in Abu Dhabi on 20 August 2014.

ILF has since developed an execution plan to deliver the Tender Documents within one year, which is extremely challenging. It will require taking full advantage of ILF's broad know-how and experience in designing and managing the construction of large water transmission pipelines in the Middle East.

To provide the best value for SOC, ILF is leveraging the expertise of multiple offices. The project management team resides in Abu Dhabi, engineering is executed from the ILF Center of Excellence in Munich and the Basrah office handles all local project requirements.

FEED execution is split into two distinct phases: Optimization and Design Development, each within a 6 month schedule.

The project is currently in the optimization phase, which is a specialty of ILF. As a result of these studies a diameter of 56" has been selected for the multiple pipelines running from the Seawater Treatment Facility to the various delivery stations in the oilfields.

The route verification is nearly complete and has identified six major water course crossings including the Euphrates, the Tigris and the Shatt Al-Arab.

System design is well on its way including the simulation of transient flow conditions (another specialty of ILF) and the design of the pressure control and surge protection facilities at the delivery stations.

> Iraq Area Map showing CSSP location within Basrah province

> CSSP Pipeline Routing Overlay onto the Iraq Satellite Image

PROJECT SUMMARY

The Common Seawater Supply Project (CSSP) will supply seawater to the oil fields Zubair, Tuba, Rumaila, West Qurna, Majnoon, Gharraf, Halfaya and Missan in the south of Iraq.

The intake and the Seawater Treatment Facility (STF) will be approximately 40 km south of Basrah at the west bank of the Khor Al Zubair river.

Phase one of the project shall have a capacity of 7.5 million barrels of water per day allocated to the various oil fields in South Iraq. After completion, the full built out design capacity of the CSSP amounts to 12.5 million barrels of water per day which is equal to 24 m3/sec.

From the Shipping Pump Station (SPS), the water will be pumped via two pipeline corridors through multiple 56" steel pipelines to the oil fields over distances of up to 270 km.

The discharge pressure of the shipping pump station will be in the range of 45 bar.

At the delivery stations the water will flow into the tanks of the oilfield facilities, thereby providing hydraulic separation between these facilities and the CSSP.

The estimated cost of the project is in the order of magnitude of 12 billion U$ and it is envisioned that this megaproject will require 3 years for completion.

With an ultimate capacity of 12.5 million barrels of water per day, the CSSP will be one of the biggest plants of its kind in the world.

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