

Iraq



Country Name:	Republic of Iraq
Population:	30.4 million
Land Area:	437.072 km ²
Language:	Arabic (official), Kurdish (official in Kurdish regions) and others
Currency:	1 Iraqi Dinar (ID) = 1.000 fils
Capital:	Baghdad



Derbandikhan Dam and the hydro power plant

The Renewal of the Derbandikhan Hydropower Plant in the Kurdistan Region of Iraq

Luthardt GmbH

Iraq is a country that has been afflicted by wars and sanctions from the beginning of the 1980s until very recently. In order for human life and civil society to flourish again, a key element of modern societies – the energy infrastructure – now has to be reconstructed.

Background of the project

While new power plants are in the process of being built and planned, the rehabilitation repair of existing ones assures the most direct and quickest impact on the renewal of the country's energy infrastructure.

After already having successfully completed rehabilitation works at the Dokan dam in the Kurdish Region of Iraq in the recent past, Luthardt GmbH has conducted another crucial renovation in the region, this time at the Derbandikhan hydro-power plant.

Today, the Derbandikhan power station once again produces electrical power on a reliable basis, while simultaneously providing agricultural irrigation for the region.

With a capacity of 249 MW, the Derbandikhan power station – today and after a long and tumultuous history – is among the largest hydropower plants in Iraq. Located on the Diyala Sirwan River in the Kurdish Region of Iraq, 65 km southeast of the city of Sulaimaniyah and 420 km north of Baghdad, it plays a vital role in a multipurpose scheme for power production and agriculture irrigation in the region.

The main structure of the hydro complex is an earth embankment gravity dam, 128 m high and 445 m long at its crest. Constructed in 1956–1961, the dam was initially equipped with small hydro-turbine generators for the facility itself, which were replaced after the completion of the power



New switchgear in refurbished rooms

station at the base of the dam in 1985. However, only one of the three planned 83 MW hydro-turbine generators was commissioned, as the personnel had to leave the site during the Iran-Iraq war in the 1980s. In these years, the switchyard was damaged by the advancing Iranian forces. The substation was dismantled by decree from Baghdad.

After the war, in 1990, the Ministry of Electricity commissioned the remaining two hydro-turbine generators and commenced part production in 1990. However, due to the first Gulf war in 1991, the following 10 years of sanctions, and the second Gulf war in 2003, the dismantled substation could not be repaired and brought back to its original state until very recently, when the government of Iraq received a loan from the World Bank for its repairs.

Project description

Building on the successful rehabilitation of the Gas Insulated Switchgear (GIS) substation at the nearby Dokan hydropower plant, Luthardt GmbH was also contracted to overhaul the GIS substation at the Derbandikhan power station.

The work involved the design, manufacture, installation, and commissioning of most of the GIS substation. The existing medium voltage switchgear was replaced, as well as the AC low voltage and DC distribution panels including redundant batteries and chargers. Furthermore, a new smoke detection system was installed in the complete substation, replacing the existing one.

In order to maximize the power transformer safety, a complete new deluge system was installed on all three transformers. Moreover, civil works for the rehabilitation of the substation building were required. It included the replacement of the ceiling, covering the walls properly, and air conditioning repair.



The Derbandikhan substation in good shape again

Rehabilitation compatible with original equipment

Since the whole substation construct of the Derbandikhan power station, over time, suffered from considerable wear under poor maintenance conditions, the project was constantly confronted by the essential question: replacement or rehabilitation?

Decisions had to be made as to whether it was still possible to repair certain parts or whether their replacement was inevitable. Complying with latest IEC-standard, the equipment or components had to be compatible with the equipment that wasn't replaced.

Since the original Mitsubishi 145 kV GIS needed many spare parts that are no longer manufactured by the original equipment manufacturer, Luthardt successfully launched an intense market sourcing campaign to find the necessary compatible spare parts.

Outlook

Today, Iraq unfortunately still suffers from short power supplies and unstable power grid conditions.

In order to address this problem, many new plants are planned or already under construction. However, since this measure is very time consuming, an overhaul is often the best option. Therefore, renovation of power stations and substations in many cases not only proves technically feasible, but also economically profitable.

Rehabilitation of existing plants is the only short-term measure to provide Iraq with the necessary power supply and a stable power grid; it is also a measure that can be effective in the mid-term.

As Luthardt GmbH has repeatedly proven in the past, it can offer these services by relying on its first-class know-how, its proximity to German manufacturers, parts suppliers and service providers as well as its longstanding business experience in the Iraqi market itself.



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