



Enriching Lives

## ALQUEVA IRRIGATION SYSTEM, PORTUGAL



### Introduction

Kirloskar Brothers Limited (KBL) has been a preferred supplier of pumps and equipments for the secondary as well as primary irrigation schemes to the Ministry of Irrigation, Portugal for last few years. One of the biggest irrigation schemes i.e Alqueva irrigation system for primary circuit was commissioned recently by KBL. This project runs on three very large size split casing Kirloskar pumps. This project is located in the southern region of Portugal called Alentejo.

#### Highlights and Design of the Alqueva Water System:

- 15 dams and 314 km of open channels
- 9 major pumping stations and 6 micro-hydro plants
- 56 secondary pumping stations
- Irrigated land: 115,000 hectares through sub-systems Alqueva, Pedrógão and Ardila

### Challenge

The Alentejo province is infamous for arid/ dry atmosphere and the irregular rainfall generally concentrated for a short period (November to February) and hence controlling the "water resource" is always one of the main objectives of the inhabitants of this region. The Pumping Station Pedrógão is part of the primary network of Alqueva and is located in the rocky banks of the river Pedrógão. Space available was thus a critical constraint for the pumping station. Suitable pumping solution which would overcome the topographical constraint and while doing so meets the necessary duty parameters was the key.

## **Solution**

The Pumping Station Pedrógão is part of the primary network and designed for a flow of 19.8 m3/s and total head of 60 m. Pumps are capable of operating between 63 m and 50 m and are driven by 2,900 kW/ 10 Pole, 11 KV Electric motors. KBL designed these very large size pumps in vertical execution to overcome the space constraints and the robust design ensured low vibration levels. Two floor arrangement was applied for the pump and motor assembly which separated the wet and dry area and also contributed to desired space saving. Special metallurgy was used to ensure the efficiency of more than 92%. Vertical execution option reduced the civil cost considerably for the contractor.

## **Learning**

The Primary Network of Alqueva constitutes the “Spine” of the water transport from reservoirs of Alqueva and Pedrógão for the entire area for irrigation infrastructure. The integration of engineering was a significant learning as it ensured smooth erection and commissioning of the pumpsets at site. KBL’s practice of proper study of the site during design phase again proved its importance. Considerable amount of time was spent with the Pedrógão Pumping Station site plan. This hard work resulted into a perfect delivery of the project.

## **Conclusion**

This engineering solution provided by KBL for the 1<sup>st</sup> phase of the project was compared with other leading suppliers from Europe. KBL offered energy saving, effective space utilization and flexibility of design due to rich global experience. The result of the onsite inspection of the pumps for mechanical parameters like bearing temperatures, vibrations etc. were evidently on the superior side.

The project was successfully handed-over to the customer with total satisfaction.