

CONTROL AND CENTRAL MONITORING OF A LARGE SCALE MULTIPURPOSE WATER DELIVERY SYSTEM — A CASE STUDY

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ABSTRACT

This paper presents the first approach to the centralized SCADA system and automation of the Multipurpose Alqueva Project (MAP). MAP is located in the South of Portugal, mainly in the Guadiana River Basin. It will transfer water to the Sado River Basin. The MAP water delivery control system will guarantee on-line water demands and minimizes water operational losses and energy costs due to pumping. A general modular and hierarchical configuration for the control system is presented. Each component is described and automatic/manual control loops at higher levels are discussed. In the MAP central monitoring, one of the main issues is the communication system that links the remote sites to the central room. According to the specific characteristics, an economic and technical analysis is conducted for several possible architectures. The necessary equipment at the remote sites to link them to the central room is described. The architecture for the central monitoring room is also presented.

INTRODUCTION

There is an increasing awareness that water resources are limited and have to be managed more carefully. Water issues are becoming a major source of conflicts in many countries and regions.

In the near future, the European Union's Water Directive Law will establish the principle of user – payer. All users must compete for this limited natural resource and pay the same price per unit of volume used. In Portugal, agriculture uses about 85% of the water and therefore must increase water use efficiencies drastically. For the moment, most farmers pay a tax per area irrigated. Consequently, water use efficiency can be very poor.

Usually, an open-channel water conveyance and delivery system is very difficult to manage, especially if there is a demand-oriented operation (Clemmens 1987).

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