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Application of Value Engineering in the Design and Implementation of Dam channel and Storage Pump Power Plant (Case Study of Siah Bishe Project)

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ABSTRACT

Dams and Power Plants of Siah Bisheh are the first projects of the dams and Storage Pump Power Plant in Iran. The project is located 125 kilometers north of Tehran, Mazandaran province, which due to its proximity to the Siah Bisheh village it's called the same name. The purposes of this project are to create a balance in the consumable power grid of the country at high and low consumption hours, reduce the cost of thermal power of amortization, create a recreational and tourism environment in the region, and create job creation during the implementation and operation. This project has been found of two upper and lower dam and a Power Plant which is used of two channels due to the water transformation between the upper and lower dam. according to the relatively large distance between dams from each other and the complex topography of the Siah Bishe project, the design and implementation of channel tunnels have complexity and special importance, which it's more important factors are being long route of the channel, passing the channel from the earthquake-prone and fault areas, high water pressure, the presence of tunnels and geological complexity of the area. According to the above subjects, the Siah Bishe projects had been one of the most complex and difficult parts of the project for design and implementation. In this article has been proceeded to the description of the important points of the value engineering application in the design and implementation of the channels, which its results and achievements will be very useful in designing and constructing of other country's projects.

Key words: Value engineering, Dam and Pump Storage Power Plant, Channel, Siah Bisheh project.

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1. INTRODUCTION

The main purpose of creating the Pump Storage Power Plant is electricity generation at high operating hours and its consumption at low load hours. The operation of the world's first Pump Storage Power Plant began in 1890 in Italy and Switzerland. At the moment, more than 90,000 megawatts of the pump storage power plant is in operation and about 3 percent of the world's generative electrical energy is supplied by these power plants (1). These power plants have good economic efficiency and they usually start from one to four minutes, which is a very short time compared to thermal power plants (2). In Iran, with the aim of power supply in high

load consumption hours and using it in low-load hours, as well as in order to reduce the amortization of thermal power plants, Siah Bishe studies plan began in 1979, and in order to using of the available potential in the Alborz Mountains, the site of the project location was selected in 125 kilometers north of Tehran, located in Mazandaran province. This project was constructed on the Chalus River and near the Siah Bisheh Village and is at the moment is in the final stages of installation and initiation. Another goal of the project is creating a recreational and tourist environment for tourists, providing low water demand and job creation in the area during the implementation of the plan and the operation period (3).