A study of Water Curtain system – Underground crude oil storage rock cavern Padur, Karnataka, India

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ABSTRACT

The Underground storage of crude oil Project is constructing at Padur (near Udupi) in Karnataka having storage capacity 2.50MMT. The caverns are constructing for the crude oil storage purpose, based on an artificial water curtain system to prevent the escaping crude oil through leakage paths in the rock mass. Hydrocarbon storage may take place underground in a number of different ways and the most typical might be such as: aquifer storage, salt dome storage, abandoned mines storage, depleted oil and gas fields and finally in mined rock caverns. The water curtain system is composed of an artificial set of connections of underground galleries and horizontal boreholes drilled from these galleries. This system is deployed over an artificial or natural underground cavern used for the storage of crude oil and other petroleum products to prevent the escaping through leakage paths in the rock mass. The concept of under- ground storage in rock caverns has proved superior to surface storage and the method is recognized as "Proven Technology". The principle for the oil storing in rock caverns is based on the simple physical law that for oil products lighter than water surrounded by ground water with higher pressure than the operating pressure inside the cavern, there will always be water seeping into the rock cavern. The oil cannot leak out into to rock mass due to the higher external hydrostatic pressure of the ground. This study will focuses on development and methodology of water curtain galleries and hydro confinement system.