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Health Assessment and Performance Analysis of Dams through Design flood review, Dam Break Analysis using HEC RAS and A case study on Sri Rama Sagar Project (SRSP)

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ABSTRACT:

Dams are very important civil engineering structures built across the rivers to store the water and release it as and when required. Dams serve numerous functions like irrigation, water supply, drinking water supply, flood control, hydropower generation, navigation and recreation. Health Assessment in dams predicts the behaviors rotations, stress and strains on and in the structure, horizontal and vertical displacements, seepage and so forth. Advanced hydrometeorological data observation techniques, meteorological and hydrological forecasts and rapid data analytics are critical in reservoir management and Health Assessment and performance analysis of dams.

This paper will describe about Health Assessment and Performance Analysis of Dams though the Design flood review and Dam break analysis as it is an integral part of the dam safety programme of a country because the causalities and destruction caused as a result of the large, sudden, unexpected and uncontrollable dam break flood waves are immeasurable.

This paper comprises a case study about Sri Rama Sagar Project (SRSP), located in Telangana State. In this case study, the Probable Maximum Flood worked out from the data is 47,202cumec with a hydrograph of 288 hours duration. The time to peak is 92 hours. The project has been provided with a 45,307cumec. From the results, it is concluded that, the increased PMF value can be accommodated with small change in the Maximum Water Level and the panel of experts are suggested to carry out the reservoir routing study for revised design flood and the revised FRL and corresponding fetch to check the adequacy of spillways/sluices and freeboard as per BIS criteria.

Keywords: Health Assessment, Performance Analysis reservoir management, hydrometeorological data meteorological and hydrological forecasts, Probable Maximum Flood, hydrograph and reservoir routing

Category: Hydraulic and Water Resources Engineering/Ocean Engineering