

Contribution to the thermomechanical behavior of a concrete dam: application to Tichi-Haf arch dam

Constantly worrying about building safe structures and preventing potential disasters, makes us concerned with the dams' thermodynamic behavior.

Our work discusses the broad outlines and key concepts of the study for the thermomechanical behavior of a concrete dam through a theoretical study, and the study for a practical application on TICHY HAF dam. A thermal calculation, followed by a static mechanical calculation in linear thermoelasticity with the finite elements computer code " ANSYS ", was carried out using a suitable three-dimensional gridding, to show the importance of emergent thermal stresses within the building, and which are often neglected during the design stages of dams in Algeria. These results prove that importance.

The approach to be followed consists in the determination of the temperatures field prevailing within the building. Knowing this field at a given time, one calculates strains and then the relevant stresses. The tensile stresses; resultants of this analysis, particularly the horizontal stresses in the bank to bank direction, are compared to the tensile strength of the concrete, to prevent the risk of cracking.