



Safety Management of Concrete Dams Using an Expert System

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Dedication

الإهداء

إلى نهر الحب الذي يجري في روحي فعلمي معاني الحب والعطاء والإيثار.. إلى من بدعائها تبددت الصعاب وتحققت الأمنيات.. إلى التي أثمرت روحي..

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Abstract

Safety of dams plays a critical role in the maintenance of dams and in their functions. For the purpose of maintaining the safety of dams, an inspection program is prepared. This program is essential for their stability and safety. The program must be developed as part of each operating plan. The inspection program aims to evaluate the structural and operational aspects of the dam in order to analyze and solve defects and verify the parts of the dams are functioning properly. These defects must be identified in concrete dams. At present, in case of detection of defects in dams, an expert is employed in this field to identify all procedures necessary to achieve the safety of the dams.

Concrete dams are one of the most dangerous types of dams, if not the most dangerous ones. This risk is reflected in several aspects. Dam projects can be considered one of the most important strategic projects in countries, if not the most important ones, as they require a high initial cost. In case of failure, the flood caused by the failure could lead to high human and economic losses. Therefore, the safety of dams requires great attention to the preservation of people's lives and their property, in addition to dams functions.

In this research, the researcher studied the concrete dams to identify possible defects that the dam may face. Then, he developed an expert system that can handle all the defects

in the database without having to resort to an expert in this field. This point was the main objective of this research.

The researcher found the most affecting defects, ranks of all defects according to priority and comprehensive assessment of the dam concerned taking into consideration internal factors including structural factors as well as external and environmental factors.

The results of this system showed that the developed system is applicable to all types of dams, concrete and others, as there are concrete structures as substructure in many other types of dams.