ANALYSIS OF UNDERGROUND REACTOR SITING*

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SUMMARY

A technical assessment is made of potential benefits and penalties of underground reactor siting concepts as compared with current surface siting practice. Mined rock cavity and cut and cover techniques are considered with the turbine-generator system located underground and on the surface. The results of calculations in several areas of concern are presented. These include comparisons of radioactive releases and biological and property damage consequences resulting from severe reactor accidents in underground and surface plants. Transport of radioactive contaminants by groundwater following a core meltdown accident is investigated. A seismic analysis is done at three actual sites to establish what differences might exist in underground installations versus surface plants. A siting survey and map analysis are performed to estimate the availability of candidate sites for the various undergrounding concepts. Differential cost estimates are made for several underground configurations. The Decision Analysis Technique is applied to the general question of underground siting and to the choice among the various concepts as a parallel approach to the evaluation of the technical issues raised by undergrounding.

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