PREFACE: SPECIAL SESSION ON NUCLEAR EXCAVATION

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The following six papers are the Proceedings of the Special Session on Nuclear Excavation sponsored by the Technical Group for Nuclear Explosives Engineering at the American Nuclear Society International Meeting in Washington, DC, November 10-15, 1968.

The Technical Group was formed during the fall of 1967 to provide a forum for open discussion, dissemination, and publication of information concerning the scientific and technical aspects of the civil, industrial, and scientific applications of nuclear explosions. Included are consideration of the processes leading to crater and cavity formation history, criteria for experimental design, evaluation of safety factors such as structures response to ground motion and air blast, and radioactivity contamination of products and environment, and the engineering aspects of specific applications. To achieve these objectives, the Technical Group has embarked upon a program to hold professional meetings on engineering with nuclear explosives, publish proceedings, and develop cooperative associations with other scientific and professional groups having similar objectives.

The Special Session on Nuclear Excavation was the first major professional meeting sponsored by the Technical Group. The subject of nuclear excavation is a timely one. Progress in the attainment of experimental data on nuclear cratering was slowed considerably during periods when the political aspects with respect to international nuclear treaties were evaluated. The detonation of the Cabriolet experiment on January 26, 1968 re-established the experimental program in regard to nuclear excavation for large-scale civil construction works such as canals and harbors. This development was accelerated with the detonation of the first nuclear row-charge excavation, the Buggy experiment, on March 8, 1968.

The Special Session on Nuclear Excavation was organized in part to bring the results of these two recent nuclear cratering experiments to the attention of the technical community. In addition, the Session included reviews on the current status of nuclear excavation theory and practice, a description of current research in corollary chemical high explosives studies, the research program for potential nuclear civil construction works, and a status report on the studies on the design for a Transisthmian sea-level canal.

This series of six papers summarizes the significant advances in nuclear excavation knowledge, acquired by theoretical and field studies since the 3rd Plowshare Symposium held in 1964.