

**INSTRUMENTATION DEVELOPMENT FOR FIELD TRIAL AND SIMULATOR USE**

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The testing of nuclear devices, of structures loaded by the forces associated with such devices, and the simulation of such loadings by high explosive (HE) detonations presents the engineer and scientist with highly complex and unique measurement and instrumentation problems. In response to these problems, the U.S. Defense Nuclear Agency (DNA) has a continuing program designed to further the state-of-the-art with respect to this type of instrumentation. Problems such as the measurement of stresses at the kilo- or mega-bar level, kilo-g accelerations, and 100 kHz frequencies are typical of recent problems addressed. This paper describes the general scope and achievements of the DNA instrumentation development effort over the past few years and focuses on the significant results of this program and possible future developments. Many of the techniques described are unique and involve complex analytical efforts as well as hardware development. Frequently, there has been and is a transfer of earthquake engineering and full-scale dynamic testing of civil construction.