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Application of Electrical and Active Seismic Methods to Detect Evidence of an Underground Nuclear Explosion

There is little experience with application of electrical and active seismic methods that can be applied during the continuation period of an on-site inspection (OSI), one of the verification methods of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). Controlled source audiomagnetotelluric (CSAMT), dipole-dipole resistivity, and induced polarization electrical measurements were carried out along three survey lines over and near to ground zero of an historic underground nuclear explosion. An active seismic survey was carried out over a series of lines over surface ground zero using a compressional and shear wave vibrator source and three-component receiver geophones. Seismic data were processed for reflection, refraction, and ReMi (refraction microtremor) methods. The presentation will provide details and results of the surveys, an assessment of application of the method toward the purposes of an OSI, and an assessment of the manpower and time requirements for data collection and processing that will impact OSI inspection team operations.

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