ID: Type: **Poster**

SEMIPALATINSK TEST SITE USAGE FOR EFFECTIVENESS CHECK OF NEW DETECTION METHODS OF UNDERGROUND NUCLEAR EXPLOSIONS

At site “Balapan” of Semipalatinsk test site (STS), 105 underground nuclear explosions (UNE) were carried out in vertical wells with power up to 150 kt and depths up to 500 m, at the site “Degelen” - more than 200 UNEs were carried out in horizontal tunnels at depths up to 200 m. Actual locations determination of UNEs on STS by existing methods is complicated by depth of UNEs at “Balapan”, and by mountainous terrain conditions at the site “Degelen”. Diversity of geological conditions of UNEs locations determines different effectiveness of regulated technologies and determines the need to improve it and study of additional methods possibilities. It is proposed to conduct research for effectiveness assessment of new detection methods of UNEs. The feasibility of the proposed methods allow using them to conduct the first phase (tritium content in the atmospheric air for localization of inspection area) and the second phase (concentration of gases in soil air and heat measurement to detect underground-loosened zones). These methods have shown its high efficiency in studies on STS, they are not officially part of the in-situ methods now, but it can be quite successfully used to detect “fresh” UNEs and explosions conducted several decades ago.

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Track Classification: Theme 2. Events and Nuclear Test Sites