Aeromagnetic surveys constitute a quick and straightforward method to obtain a geological picture of the area under study, and at the same time it can be applied to identify the possible presence of anthropogenic magnetic signatures. This technique is regularly applied in the minerals and oil and gas exploration industries, geological studies, and detection of unexploded ordnance (UXO), among many other fields. The use of magnetic field mapping is allowed during the continuation period of an on-site inspection (OSI) in the framework of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). When properly applied, it contributes to the search logic of the inspection team by offering a comprehensive coverage of the inspection area in a short period of time, providing basic information about the geology as well as identifying potential targets that can be inspected later from the ground. This paper provides an overview of the aeromagnetic surveys conducted during the Integrated Field Exercise (IFE08), held in September 2008 in the former Soviet nuclear test site at Semipalatinsk, Kazakhstan. Most of the magnetic signatures identified after analysis of the data can be attributed to geological units. However, other magnetic anomalies would require further investigation from the ground in order for their origin to be clarified, demonstrating the utility of this technique in the framework of an OSI.

Conclusions. Most of the visible magnetic signatures on the final analytic signal map were attributed to geological and/or topographic units, as could be expected from the survey planning oriented to an initial reconnaissance of the area. However, discrete short wavelength magnetic anomalies were identified, one of them for example in the middle of the RAS, which warranted further investigation from the ground by the inspection team to determine their origin. Therefore, even though the particular aerogeophysical platform and survey were conceived for exploration purposes, aeromagnetism shows its value in the framework of OSI. Further effort should be focused on the development and implementation of this technique within the search logic of an on-site inspection.