



THE RESPONSE OF THE VERIFICATION SYSTEM TO THE ANNOUNCED NUCLEAR TESTS BY THE DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

Press briefing on 9 September 2016 (Vienna).

Capturing the evidence of nuclear tests and providing timely data and data analysis to States Signatories is at the core of the mission of the CTBTO.

The readiness of the Commission to fulfil this mission was tested twice in 2016, with announced nuclear tests by the Democratic People's Republic of Korea on 6 January and 9 September. Prior to 2016, the Democratic People's Republic of Korea had conducted three nuclear tests, in 2009, 2011 and 2013.

The 2016 tests were nine months apart. This was the shortest interval between two announced tests thus far. In both cases, as in the three previous announced tests, the verification regime of the Treaty performed in a holistic manner. The results demonstrate that the IMS network and IDC capabilities are reaching full maturity for routine operations and are ready for post-entry-into-force conditions.



Session of the Preparatory Commission on 7 January 2016 (Vienna).

ANNOUNCED NUCLEAR TESTS IN 2016

The announced tests were detected by the IMS facilities. The data were shared with States Signatories in near real time. States Signatories received automatic and reviewed products in accordance with the draft IDC Operational Manual. The Standard Screened Event Bulletins were issued within post-entry-into-force time lines.

All automatic standard event lists (SEL1, SEL2 and SEL3) were issued. These provided analysts with a good starting point to further refine automatic solutions.

To report on the 6 January event, the REB used data from 102 seismic stations, ranging in distance from 4 degrees (PS37 (Russian Federation) and PS31 (Republic of Korea)) to 165 degrees (PS1 (Argentina)). Data from 83 of these stations were used to compute the location. The area of the error ellipse was 193 km², well within Treaty requirements for an OSI. The body wave magnitude was determined to be 4.82.

The REB for the event on 9 September used data from 108 seismic stations, with PS37 and PS31 the closest stations and PS1 the furthest. Data from 97 stations were used to compute the location. The area of the error ellipse was 152 km², well within Treaty requirements for an OSI. The body wave magnitude was determined to be 5.09,

the largest of the five announced tests by the Democratic People's Republic of Korea.

Figure 2 shows the stations that detected the event on 9 September as reported in the REB. Figure 3 presents a waveform comparison for the two stations closest to the two test events in 2016.

The events in 2016 were large enough to be detected by a sufficient number of stations for their explosion characteristics to be clearly seen on the basis of the data from the seismic stations alone. Both were classified as having non-earthquake characteristics in the Standard Screened Event Bulletin.

In both cases, atmospheric scientists at the IDC conducted transport calculations using meteorological forecast models from the European Centre for Medium-Range Weather Forecasts to

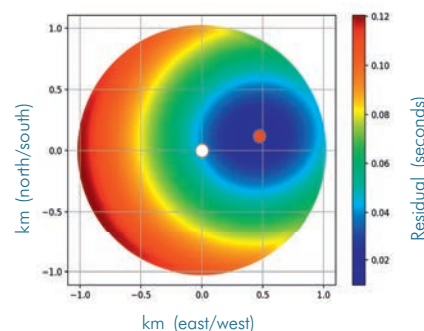


Figure 1. Estimate of the relative distance between the two events in 2016, using the January event (white dot) as a reference for the September event (red dot). The September event is 0.46 km east-north-east of the January event.

predict when particulate and noble gas emissions from the location determined by the seismic analysis would reach the IMS radionuclide stations. To this date, no correlation has been made between the seismic recording of the two tests and radionuclide observations.

The PTS is developing a set of tools for special analysis of selected events. Among these tools is a cross-correlation based technique to refine the REB location relative to a master event. This technique determined that the 9 September event was located 0.46 km to the east and slightly north of the event on 6 January (see Figure 1).

In response to the announced tests, the Commission held technical briefings for States Signatories to discuss the findings of the verification system. The Commission thanked the PTS for its timely response to the events and its technical briefings. It also expressed its satisfaction with the performance of the verification regime of the Treaty.

During the meetings, States Signatories made statements presenting their national positions. States condemned the tests, expressing grave concern over the serious negative effect of such tests on international peace and security and rejecting any and all nuclear explosive tests. They called on the Democratic People's Republic of Korea to refrain from any further nuclear tests and re-emphasized the importance and urgency of the entry into force of the Treaty.



Preparatory Commission meeting on the announced nuclear test on 6 January 2016 (Vienna).

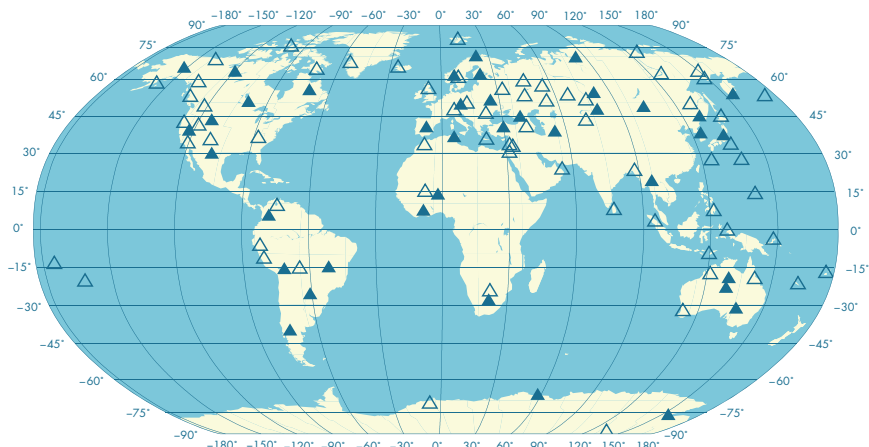


Figure 2. IMS stations that detected the 9 September 2016 event as reported in the REB. Solid triangles represent primary seismic stations; empty triangles represent auxiliary seismic stations.

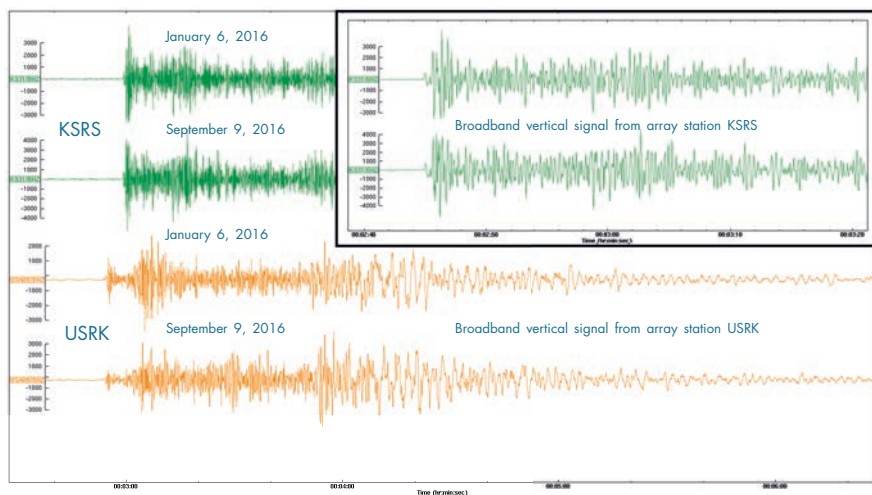


Figure 3. Waveform comparison for the two stations closest to the two test events in 2016. The inset is a detail of a broadband vertical signal.

