



## STRENGTHENING THE NUCLEAR TEST BAN IN SOUTHEAST ASIA

BY STEPHEN HERZOG

*Stephen Herzog ([stephen.herzog@yale.edu](mailto:stephen.herzog@yale.edu)) is a PhD candidate at Yale University and a nonresident WSD-Handa fellow with Pacific Forum CSIS. Previously, he managed science diplomacy projects supporting the CTBT for the US Department of Energy's National Nuclear Security Administration.*

Fears of the next North Korean nuclear test are a reminder of the importance of the test ban in neighboring regions. Southeast Asia is among the world's most committed regions to the Comprehensive Test Ban Treaty (CTBT): nine of ASEAN's 10 member states have ratified the CTBT. When [Myanmar did so](#) in September 2016, this left Thailand—a treaty signatory—as the only ASEAN state yet to deposit its instrument of ratification. The region is also slated to host 12 of the treaty's International Monitoring System (IMS) stations. ASEAN's universal adherence to the Nonproliferation Treaty and the Bangkok Treaty further showcase this strong regional dedication to the test ban.

These laudable numbers are only one side of the story, however. There are [numerous ways](#) for Southeast Asian states to upgrade their national capabilities to enhance verification, which will not just improve nuclear test detection and deterrence in the region and beyond, but will also offer opportunities to save lives from deadly natural disasters. In short, ASEAN should be all in on the test ban.

### Monitoring the CTBT

The [completed IMS](#) will contain 337 global facilities for detecting nuclear explosions underground, underwater, and in the earth's atmosphere. Right now, 292 of these stations are collecting seismic, hydroacoustic, infrasound, and radionuclide data around the clock, with all but one of the stations set to be in Southeast Asia. Certification of the final facility in Thailand would bolster global monitoring of nuclear tests, particularly with respect to data on [North Korean](#) activities.

But test ban monitoring isn't limited to finishing the IMS and getting all its stations online. Determining if a nuclear explosion has occurred, and how to react, is a political decision to be made by governments. And after the treaty enters into force, [on-site inspections](#) will be decided by

state votes in the CTBT Organization's (CTBTO) Executive Council. For this reason, many states have formed "national data centers" with a staff that assesses technical data to inform policymakers. Only six of 10 ASEAN members have established a data center thus far. Unfortunately, among some countries with a center, expertise focuses on either waveforms *or* radionuclides—not both. Coordination among all areas of the monitoring community would go a long way to support the CTBT and provide policymakers with sound analysis.

Each state may also designate 28 users from six institutions to receive the monitoring system data through a real-time web portal run by the CTBTO in Vienna, Austria. No ASEAN member state has designated the maximum number of users and some haven't nominated any users. This means that a few states are not looking at the CTBT data at all. Ensuring that scientists in each country have access to IMS data is central to the success of the test ban. Likewise, [regional data sharing](#) from national stations that aren't part of the IMS could reduce potential misperceptions by increasing the accuracy of, and confidence in, treaty monitoring.

### Saving lives from natural disasters

For some ASEAN member states, nuclear issues are not a priority. Other initiatives to promote national wellbeing are considered far more important and worthy of public spending. There are also misperceptions that nuclear arms control and nonproliferation are the domains of great powers or wealthy states. The global nature of CTBT verification efforts suggests that this cannot be the case. However, natural disasters create incentives to develop geophysical monitoring capabilities—even for states with low levels of interest in the test ban.

Southeast Asia confronts considerable risks from earthquakes, volcanoes, and tsunamis. The region has complex tectonics and high levels of [seismic hazards](#). One tragic example is the Indian Ocean tsunami of 2004: its epicenter was off the coast of Sumatra and it resulted in the loss of up to 280,000 lives. Citizens of ASEAN states must also live with regular earthquakes and dangers from the region's many active volcanos.

CTBT technologies can help mitigate the impact of these disasters in several different ways. For example, seismic

stations and data are useful for developing earthquake hazard maps and improving building codes. Along with hydroacoustic data, they can provide [early warning of tsunamis](#). Infrasound stations can detect and monitor volcanic eruptions, while radionuclide data tracked the radiation effects of the Fukushima Daiichi nuclear disaster.

The vast array of civil-scientific uses for such data led then-United Nations Secretary General Ban Ki-moon to declare in 2011: “Even before entering into force, the CTBT is saving lives.” Indonesia, Malaysia, Myanmar, the Philippines, and Thailand have all signed [tsunami warning agreements](#) with the CTBTO. These agreements grant disaster response centers access to a pipeline of rapid, streamlined IMS data for distributing real-time tsunami warning alerts. The remaining five ASEAN states would benefit from similar agreements with the CTBTO.

### **Monitoring benefits all**

Southeast Asia’s commitment to the principles of the CTBT is unquestionable. Few other regions have made such impressive progress to outlaw the testing of nuclear weapons. ASEAN can now build on its legal and political leadership by further embracing the science of verification. Efforts to strengthen the technical side of nuclear explosion monitoring are also consistent with the peaceful values enshrined in the [ASEAN Charter](#) and will yield regional and global benefits. After all, test ban science and technology is a dual-use enterprise. Nuclear treaty monitoring boosts abilities to mitigate the risk of natural disasters, and vice versa.

Many opportunities await Southeast Asia in the realm of the CTBT. Establishing national data centers throughout the region and broadening access to IMS data would be productive steps. But human capacity development is even more critical. ASEAN states that do not already do so should consider making wide use of the CTBTO’s [funded training courses](#) for monitoring specialists. And highly developed countries in the Americas, East Asia, and Europe should be aware of the considerable benefits of providing technical assistance, engaging in scientific partnership, and granting aid to the region.

The effects of nuclear tests and natural disasters do not stop at borders. With data sharing and cooperation, strides by any one Southeast Asian state to expand its monitoring capabilities will reinforce the nuclear test ban and help save lives across the region. Further actions by ASEAN will do even more.

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