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U.S. AND RATIFICATION OF THE COMPREHENSIVE TEST BAN TREATY FOR NUCLEAR TESTING (CTBT)

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### U.S. AND RATIFICATION OF THE COMPREHENSIVE TEST BAN TREATY FOR NUCLEAR TESTING (CTBT)

Abstract:

A scientific report published by the National Academy of Sciences has revived the debate in America on whether or not to ratify the Comprehensive Test Ban Treaty for Nuclear Testing. According to the report, the technological advances that have occurred since 1999 when Congress decided not to ratify it and the proper functioning of monitoring systems such as IMS (International Monitoring System) could provide sufficient guarantees for the United States to ratify the Treaty without implying any threat to their safety.

Keywords:

CTBT, nuclear test, IMS, nuclear weapon, proliferation



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#### THE COMPREHENSIVE TEST BAN TREATY FOR NUCLEAR TESTING (CTBT)

The Comprehensive Nuclear Test Ban Treaty (CTBT) was adopted by the UN General Assembly on September 10th, 1996 being opened for signature 14 days later. Since then, 183 states have signed it, and 157 have ratified it. In order to enter into force, the Treaty must be ratified by 44 states that are listed in the Annex II<sup>1</sup>. Among the countries that still have not ratified it, we can find the United States<sup>2</sup>, China, Iran, Israel and Egypt, besides India, North Korea and Pakistan, which haven't even signed it.



Source: U.S. Department of Energy. Nevada Operation Office

The treaty requires states to meet two main objectives:

-Each State Party undertakes not to carry out any test involving the explosion of nuclear weapons or any other nuclear explosion, and to prohibit and prevent any such nuclear explosion in all territory placed under its jurisdiction or control.

-Furthermore, each State Party undertakes to refrain from causing, encouraging, or participating in any way in the realization of a nuclear weapon test or any other nuclear explosion.



<sup>&</sup>lt;sup>1</sup> The text of the Treaty can looked up at: www.ctbto.org

<sup>&</sup>lt;sup>2</sup> The United States signed it on September 24th, 1996



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In 1999, the U.S. Congress decided not to ratify the CTBT by citing the difficulty in verifying whether or not participant States meet the rules of the Treaty, so as the failure to ensure the reliability of stockpiled nuclear weapons without conducting the appropriate verification tests.



However, President Obama is in favour of ratification as already stated in his speech in Prague on April 2009, and to achieve this he must convince the opposition that to ratify the treaty does not compromise the security of the United States, as it will continue its commitment to maintain the nuclear arsenal and to increase support for nuclear weapons programs, though, making it clear that such programs are not aimed at developing new types of nuclear weapons or new capabilities from the existing ones. This is almost the same argument with which he managed the New START ratification in December 2010.

The truth is that with the moratorium on preventing nuclear tests<sup>3</sup> and the signing of CTBT, the United States fulfils its commitments under the Treaty. However, partisans of U.S. ratification argue that if it does, China will probably follow. For its part, India and Pakistan could feel more pressured to finally sign and ratify it. In addition, U.S. ratification would help to achieve a Middle East free of weapons of mass destruction.



<sup>&</sup>lt;sup>3</sup> On October 31st, 1958, President Eisenhower agreed to a unilateral moratorium on nuclear testing to avoid the condition that the former Soviet Union also refrained from carrying out this type of tests. However, the Soviet Union resumed testing in 1961 with the largest number of tests ever conducted. On September 15th, 1961, the United States also resumed tests in the Nevada Desert. On October 2nd, 1992, President George W. Bush announced another unilateral moratorium on nuclear weapons testing that was later expanded in successive years until the U.S. finally signed the CTBT in 1996.



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#### THE NAS REPORT (NATIONAL ACADEMY OF SCIENCES)

The ratification of the CTBT has become an unresolved issue for Obama and one of his priorities if elected president again.

Achieving this goal has been boosted by the publication of a report by the NAS (National Academy of Sciences) in which all the technical arguments put forward by the opposition for not ratifying it are refuted. The report, conducted at the request of the Vice President's Office and the Office of Science and Technology of the White House, made a comprehensive study on the current capabilities for monitoring and detecting activities related to nuclear testing, so as the possibility to check that the arsenals are in excellent condition with no need for nuclear explosions.

In order to carry out the verification of CTBT compliance, it is essential to ensure the detection and monitoring in the four environments where may be carried out a nuclear test (underground, water in the atmosphere or in space). As for the current technical means to carry out its duties, the report indicates the following conclusions<sup>4</sup>:

#### Verification: detection and monitoring

The current International Monitoring System (IMS), consisting of 337 facilities located in 89 countries, is almost ready<sup>5</sup>. This system consists of a network of seismic equipment, stations to monitor radioactive particles in the atmosphere and hydro-acoustic and infrared stations. This network collects data in real time and transmits them to the International Data Centre located in Vienna, to be disseminated to the participant States to the Treaty.

The detection capability has remarkably improved in recent years due to technological advances. There have been improvements in seismic data processing and a higher bandwidth allowing a minimum threshold of detection to be set, in general terms in 1 kt. That is, with current technology, explosions of more than 1 kiloton (kt) underground could be detected. In water, the threshold is 0.01 k although in most oceans the threshold would be 0001 kt. As for the detection of nuclear explosions in the atmosphere or in space, they



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<sup>&</sup>lt;sup>4</sup> Conclusions are available at http://www.nap.edu/openbook.php?record\_id=12849&page=120

<sup>&</sup>lt;sup>5</sup> The system detected testing by North Korea in 2006 and 2009 and the tsunami in Japan in 2011



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would be easily detectable by satellite. In addition to IMS there are other national stations<sup>6</sup> that can provide information if they would produce a nuclear test.

Given the current detection capacity, inspectors<sup>7</sup> would detect fairly precise information about the place the explosion has taken place, by restricting it to an area of 1000 km2.

Furthermore, the report notes that, regardless of whether the treaty enters into force or not, national capacities for detection should be improved. It would be desirable, for example, to establish a radionuclide fund in the atmosphere so that any alteration of this fund will serve to detect any radioactive incident.

On the other hand, the report highlights the need of a greater transparency in the use of land that has served for testing nuclear weapons —such as the Nevada desert in the U.S.— and currently have not been closed.

#### Maintenance of stockpiles:

The report states that current technology allows diagnosing the stockpile situation without needing to conduct trials involving an explosion. The only condition is to have adequate facilities and qualified personnel.

It also notes that the Stockpiles Stewardship Program of the National Nuclear Security Administration (NNSA) has proven effective to verify the good condition of the weapons stored without the need for explosions.

#### **Detection of covert tests:**

The report points out several scenarios that could be used to mask nuclear tests. Among the various options for doing this we can find: altering the seismic signal by performing the test in a cavity or dome, or masking it with the detonation of conventional explosives. In all cases, the explosions would have to be made very few kilotons to not be detected by the monitoring system.

<sup>&</sup>lt;sup>6</sup> "National Technical Means" (NTM)

<sup>&</sup>lt;sup>7</sup> On-site Inspection System is one of the pillars of the CTBT, with the Verification and the IMS



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#### POLICY QUESTION OF RATIFICATION

The report prepared by the NAS seems to solve the technical question for verification and detection of nuclear tests. It also clarifies the current techniques for determining the conservation status of nuclear weapons stored without carrying out any explosion. However, oppositions to the U.S. ratification of the Treaty have also political arguments to make it clear that this issue is not part of the national interest. First, note that the ratification did not prevent nuclear proliferation as seen in the case of Iran and North Korea. In addition, U.S. security could be compromised, as in the present situation there are countries that are modernizing their arsenals and ratification of the treaty would prevent U.S. doing the same by failing to conduct the necessary tests. They further point out that nuclear testing is essential for the formation of its scientists and engineers in order to face new technological challenges.

But perhaps the stronger argument is that they consider CTBT will never enter into force, because it requires to be ratified not only by the U.S., but also by North Korea, Iran, Pakistan, India, Israel, Egypt and China. The U.S. ratification can serve to make others ratify too, but not all of them. This would mean that the U.S. would have to bear associated commitments to ratification at great cost to national security and without clear benefits.

For now, ratification is up for debate, and decisions will not be made until 2013, depending on who wins the next election.

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