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# Investigation Result on the Sinking of ROKS "Cheonan"

THU. 20 MAY, 2010

## The Joint Civilian-Military Investigation Group

Open Statement

The Joint Civilian-Military Investigation Group(JIG) conducted its investigation with 25 experts from 10 top Korean expert agencies, 22 military experts, 3 experts recommended by the National Assembly, and 24 foreign experts constituting 4 support teams from the United States, Australia, the United Kingdom and the Kingdom of Sweden. The JIG is composed of four teams--Scientific Investigation Team, Explosive Analysis Team, Ship Structure Management Team, and Intelligence Analysis Team.

In our statement today, we will provide the results attained by Korean and



foreign experts through an investigation and validation process undertaken with a scientific and objective approach.

□ The results obtained through an investigation and analysis of the deformation of the hull recovered from the seabed and evidence collected from the site of the incident are as follows:

The JIG assesses that a strong underwater explosion generated by the detonation of a homing torpedo below and to the left of the gas turbine room caused Republic of Korea Ship (ROKS) "Cheonan" to split apart and sink.

□ The basis of our assessment that the sinking was caused by a torpedo attack is as follows:

○ Precise measurement and analysis of the damaged part of the hull indicates that  
└ a shockwave and bubble effect caused significant upward bending of the CVK (Center Vertical Keel), compared to its original state, and shell plate was steeply bent, with some parts of the ship fragmented.

└ On the main deck, fracture occurred around the large openings used for maintenance of equipment in the gas turbine room and significant upward deformation is present on the port side. Also, the bulkhead of the gas turbine room was significantly damaged and deformed.

└ The bottoms of the stern and bow sections at the failure point were bent upward. This also proves that an underwater explosion took place.

○ Through a thorough investigation of the inside and outside of the ship, we have found evidence of extreme pressure on the fin stabilizer, a mechanism to reduce significant rolling of the ship; water pressure and bubble effects on the bottom of the hull; and wires cut with no traces of heat. All these point to a strong shockwave and bubble effect causing the splitting and the sinking of the ship.

○ We have analyzed statements by survivors from the incident and a sentry on Baekryong-do.

└ The survivors made a statement that they heard a near-simultaneous explosion once or twice, and that water splashed on the face of a port-side lookout who fell from the impact; furthermore,

┆ a sentry on the shore of Baekryong-do stated that he witnessed an approximately 100-meter-high "pillar of white flash" for 2~3 seconds. The forementioned phenomenon is consistent with damage resulting from a shockwave and bubble effect.

○ Regarding the medical examination on the deceased service members,  
┆ no trace of fragmentation or burn injury were found, but fractures and lacerations were observed. All of these are consistent with damage resulting from a shockwave and bubble effect.

○ The seismic and infrasound wave analysis result conducted by the Korea Institute of Geoscience and Mineral Resources (KIGAM) is as follows:

- ┆ Seismic wave intensity of 1.5 degrees was detected by 4 stations.
- ┆ 2 infrasound waves with a 1.1-second interval were detected by 11 stations.
- ┆ The seismic and infrasound waves originated from an identical site of explosion.
- ┆ This phenomenon corresponds to a shock wave and bubble effect generated by an underwater explosion.

○ Numerous simulations of an underwater explosion show that a detonation with a net explosive weight of 200~300kg occurred at a depth of about 6~9m, approximately 3m left of the center of the gas turbine room.

○ Based on the analysis of tidal currents off Baekryong-do, the JIG determined that the currents would not prohibit a torpedo attack.

○ As for conclusive evidence that can corroborate the use of a torpedo, we have collected propulsion parts, including propulsion motor with propellers and a steering section from the site of the sinking.

The evidence matched in size and shape with the specifications on the drawing presented in introductory materials provided to foreign countries by North Korea for export purposes. The marking in Hangeul, which reads "1번(or No. 1 in English)", found inside the end of the propulsion section, is consistent with the marking of a previously obtained North Korean torpedo. The above evidence allowed the JIG to confirm that the recovered parts were made in North Korea.

○ Also, the aforementioned result confirmed that other possible causes for sinking raised, including grounding, fatigue failure, mines, collision and internal explosion, played no part in the incident.

□ In conclusion,

○ The following sums up the opinions of Korean and foreign experts on the conclusive evidence collected from the incident site; hull deformation; statements of relevant personnel; medical examination of the deceased service members; analysis on seismic and infrasound waves; simulation of underwater explosion; and analysis on currents off Baekryong-do and collected torpedo parts.

○ ROKS "Cheonan" was split apart and sunk due to a shockwave and bubble effect produced by an underwater torpedo explosion.

○ The explosion occurred approximately 3m left of the center of the gas turbine room, at a depth of about 6~9m.

○ The weapon system used is confirmed to be a high explosive torpedo with a net explosive weight of about 250kg, manufactured by North Korea.

□ In addition, the findings of the Multinational Combined Intelligence Task Force, comprised of 5 states including the US, Australia, Canada and the UK and operating since May 4th, are as follows:

○ The North Korean military is in possession of a fleet of about 70 submarines, comprised of approximately 20 Romeo class submarines(1,800 tons), 40 Sango class submarines(300 tons) and 10 midget submarines including the Yeono class(130 tons).

It also possesses torpedoes of various capabilities including straight running, acoustic and wake homing torpedoes with a net explosive weight of about 200 to 300kg, which can deliver the same level of damage that was delivered to the ROKS "Cheonan."

○ Given the aforementioned findings combined with the operational environment in the vicinity of the site of the incident, we assess that a small submarine is an underwater weapon system that operates in these operational environment

conditions. We confirmed that a few small submarines and a mother ship supporting them left a North Korean naval base in the West Sea 2-3 days prior to the attack and returned to port 2-3 days after the attack.

○ Furthermore, we confirmed that all submarines from neighboring countries were either in or near their respective home bases at the time of the incident.

○ The torpedo parts recovered at the site of the explosion by a dredging ship on May 15th, which include the 5x5 bladed contra-rotating propellers, propulsion motor and a steering section, perfectly match the schematics of the CHT-02D torpedo included in introductory brochures provided to foreign countries by North Korea for export purposes. The markings in Hangeul, which reads "1번(or No. 1 in English)", found inside the end of the propulsion section, is consistent with the marking of a previously obtained North Korean torpedo. Russian and Chinese torpedoes are marked in their respective languages.

The CHT-02D torpedo manufactured by North Korea utilizes acoustic/wake homing and passive acoustic tracking methods. It is a heavyweight torpedo with a diameter of 21 inches, a weight of 1.7 tons and a net explosive weight of up to 250kg.

○ Based on all such relevant facts and classified analysis, we have reached the clear conclusion that ROKS "Cheonan" was sunk as the result of an external underwater explosion caused by a torpedo made in North Korea. The evidence points overwhelmingly to the conclusion that the torpedo was fired by a North Korean submarine. There is no other plausible explanation.