



# THAAD on the Korean Peninsula

BACKGROUND - October 2017



## Summary

- The decision to deploy the anti-missile defense system THAAD was made in July 2016. The first launchers became operational in May 2017.
- President Moon Jae-in initially opposed THAAD but has now accelerated its deployment in response to North Korea's nuclear test on September 3.
- Both the U.S. and South Korea see THAAD as necessary to defend against North Korea's missile threat as well as a crucial part of their security strategy in Northeast Asia.
- THAAD strongly affects South Korea's relationships with its neighbors, especially China which has objected to its deployment, viewing it as an extension of U.S. strategic interests.
- North Korea sees the deployment of THAAD as an act of aggression and has accelerated its missile and nuclear programs with further tests.

## The Development of THAAD

The Terminal High Altitude Area Defense, better known by its abbreviation THAAD, is an anti-ballistic missile defense system developed by American company Lockheed Martin. Production began in 1992 and the first contract with the U.S. government was signed in January 2007.<sup>1</sup> The stated purpose of THAAD is to defend U.S. troops, allied forces, population centers, and critical infrastructure from short- and medium-range missiles.<sup>2</sup> The first foreign sale of the system was to the United Arab Emirates (UAE) with the deal signed at the end of 2011.<sup>3</sup>

### Technical Specifications

The THAAD system consists of five components:

1. launchers,
2. missiles,
3. fire control,
4. the THAAD radar,
5. support equipment.

THAAD missiles are 6.17 meters in length and have a single stage solid fuel rocket motor with thrust. They have a range of 200 kilometers and can reach up to 150 kilometers in altitude; this is higher than any other missile

defense system. The radar, on the other hand, can identify missile threats up to 1,000 kilometers in range.<sup>4</sup>

THAAD missiles use kinetic energy, destroying an incoming missile through collision (hit-to-kill). A typical THAAD battery consists of 6-9 launch vehicles, two fire control centers, and a ground-based radar. The launch vehicles are 12 meters in length and 3.25 meters wide and are equipped 8 missiles or interceptors.<sup>5,6</sup>

There are two possible modes for the radar. The first is the *forward-based mode*, in which the system is aimed at target detection and tracking of missiles during the boost phase of their trajectory. The second is *terminal mode*, with the aim of target acquisition and tracking in the terminal phase of a missile's trajectory as it descends towards its target.<sup>7</sup>

### Interception Sequence

The sequence of a THAAD interception would

start with an enemy launching a missile. The missile would be detected by the THAAD radar system when falling into range and the information would be relayed to the fire control center. The fire control center would then instruct the launch of an interceptor missile. The target object data and predicted intercept point would be downloaded to the missile, and the missile would be fired from the launcher at the enemy projectile.<sup>8</sup> The information on the target and interception would be continuously transmitted to the missile while in flight and the enemy projectile destroyed when it re-entered the atmosphere (terminal phase). Each individual launcher takes 30 minutes to reload.<sup>9</sup>

According to official Lockheed Martin data, THAAD has maintained a 100 percent mission success rate over its last 14 development and operational tests, which included 13-for-13 successful intercepts. The U.S. Missile Defense Agency's tests reflect the same rate of success.<sup>10</sup>

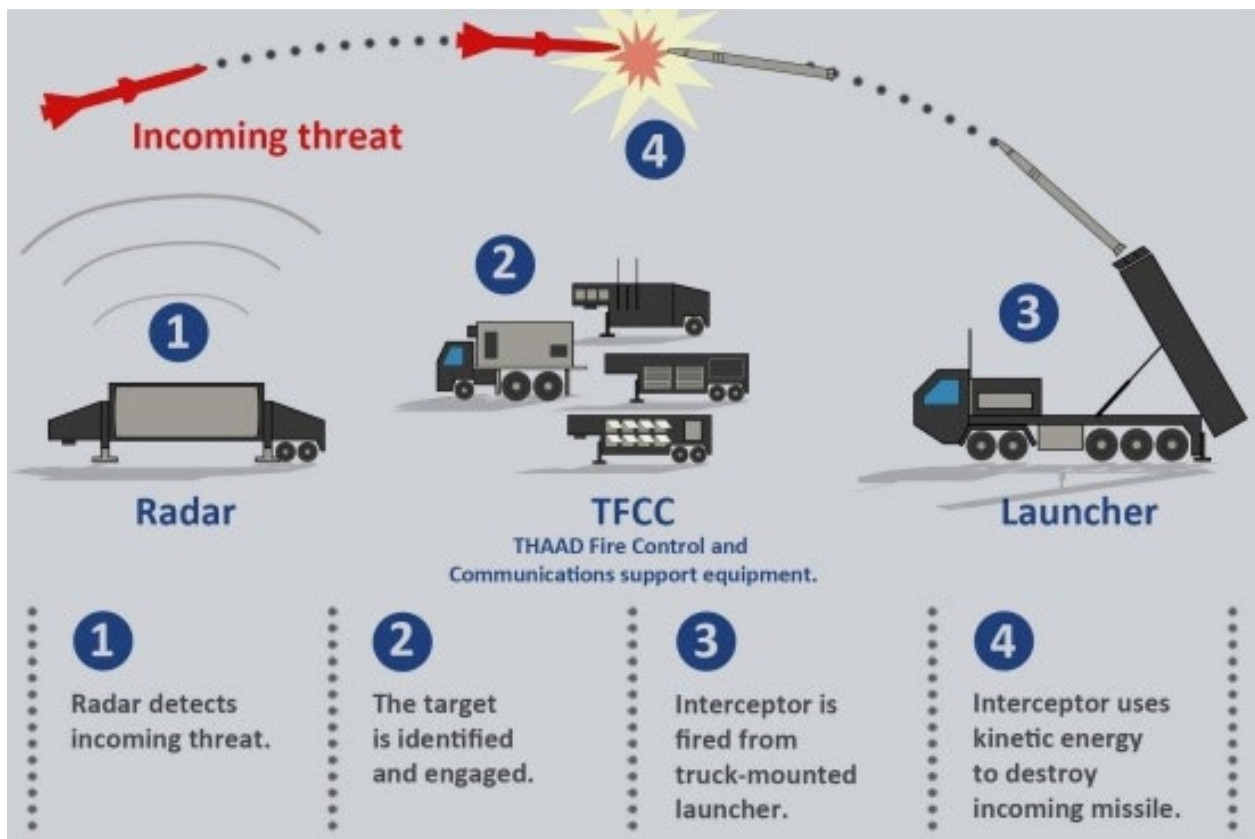


Figure 1: THAAD launch sequence



## Strengths and Weaknesses

One of the main characteristics of THAAD is the ease of transportation which makes it possible to quickly reposition the system. This gives THAAD greater flexibility to respond to changing threats. While alternative Ballistic Missile Defense Systems (BMDS), such as the Aegis BMD and Patriot/PAC-3, are also transportable, they have a more limited range. THAAD can also intercept a wider range of threats. It can intercept both exo- and endo-atmospheric threats, while the Aegis BMD can only intercept exo-atmospheric threats, and the Patriot-PAC-3 only endo-atmospheric threats.<sup>11</sup>

South Korea currently has the Patriot Advanced Capability (PAC) system, a defense system with an operational range of 20 to 35 kilometers, and is developing its own independent Korean Air and Missile Defense system (KAMD) by 2022 which will serve as lower-altitude interceptors. As THAAD is inter-operable with other BMDS, South Korea would have a multi-layered defensive shield against attacks from North Korea.<sup>12</sup> THAAD can also be used against weapons of mass destruction, i.e., chemical, nuclear, and biological warheads.<sup>13</sup>

There are, however, certain limitations to the THAAD system. It is not designed to be used against Intercontinental Ballistic Missiles (ICBMs) but rather short and medium-range missiles. It may also not be efficient against missiles with an irregular and unstable trajectory (for example, North Korea's medium-range Rodong missiles) as the interceptor missile has to precisely hit and destroy the front side of an incoming missile.<sup>14</sup> Another challenge is for THAAD's radar to differentiate between real warheads and decoys. The radar bases its data on the exterior properties of the missile, such as its shape and brightness.<sup>15</sup> When a real warhead is launched among decoys, it could be difficult for the THAAD radar to accurately identify it. Therefore, the potential exists for a THAAD missile to hit a decoy missile so allowing a real war-

head to continue towards its target.

Advances in North Korea's Submarine-launched Ballistic Missiles (SLBMs) could also pose a threat. Based on analysis of North Korea's test in August 2016, it is estimated that it has an SLBM able to travel over 1,000 kilometers on a minimum trajectory, thus can be fired outside of THAAD's radar range. Furthermore, as only a single THAAD battery has been installed in South Korea, with the radar having a 120-degree field of view, it could be theoretically possible for a North Korean submarine to travel beyond and fire outside of this field of view. More batteries would be needed for more complete coverage.<sup>16</sup>

## Deployment in South Korea

The U.S. has proposed the deployment of THAAD in South Korea since 2014. Official discussions started in early February 2016, largely as a result of North Korea's fourth nuclear test conducted a month earlier. After a series of consultations, the decision to deploy THAAD was made public by the Park Geun-hye administration on July 7, 2016. According to a joint statement between the U.S.



Figure 2: 2015 North Korean SLBM Test



and South Korea made the following day, the purpose of THAAD is to act as a “defensive measure to ensure the security of ROK and its people, and to protect Alliance military forces from North Korea’s weapons of mass destruction and ballistic missile threats.”<sup>17</sup>

It was announced on July 22, 2016, that THAAD would be installed on a South Korean Air Force base in Seongju County, which is located some 200 kilometers southeast of Seoul.<sup>18</sup> The south-central region was strategically chosen in order to protect the cities of Busan, Ulsan, and Pohang from North Korean missile attacks; this is also where U.S. reinforcements and supplies would enter South Korea in the event of an attack, and where the country’s major nuclear plants, oil facilities, and storages are located.<sup>19</sup> However, positioning THAAD in Seongju would not protect Seoul. To better defend Seoul, the current PAC defense system of the South Korean army is being upgraded.<sup>20</sup>

The site of the Air Force base was subsequently changed to a former golf and country club in Seongju after protests by local residents (see Domestic Reaction to THAAD). The deployment of THAAD was initiated ahead of schedule in April 2017, with two out of six THAAD launchers operational by May 2.<sup>21</sup> According to the South Korean defense ministry, the reason for the accelerated deployment was to meet the need for immediate operational capability of the THAAD system, in response to an increased North Korea nuclear and ballistic missile threat.<sup>22</sup> On September 7, 2017, the deployment of the remaining four launchers began.<sup>23</sup>

Based on the Status of Forces Agreement (SOFA), the responsibility to provide the land and relevant facilities to host THAAD is held by South Korea.<sup>24</sup> The U.S., on the other hand, will provide funding for the deployment and operation of a single THAAD battery system costing around US\$1.3 billion or 1.49 trillion won. Tensions briefly arose in April 2017, after President Trump claimed that it was appropriate if South Korea shouldered the

costs. This was later retracted with the U.S. agreeing to cover the costs of deployment.<sup>25</sup>

### Domestic Reaction to THAAD

The sudden deployment of THAAD announced by the Park Geun-hye administration divided public opinion in South Korea. According to a Gallup Korea poll in July 2016, 50 percent of respondents were in favor of the decision while 32 percent were opposed.<sup>26</sup>

Those in favor mentioned national security and safety as their main considerations, while those who are against were worried that the decision would negatively impact the country’s relationship with China and Russia. Some respondents also expressed a reluctance to be increasingly dependent upon the U.S. military. As the decision was not subject to a ratification process in South Korea’s National Assembly, some critics charged that the decision went beyond the framework of the Mutual Defense Treaty between South Korea and the U.S.<sup>27</sup>

Following President Park’s impeachment in a corruption scandal, THAAD became a central issue in presidential elections held in May 2017. The subsequent winner, Moon Jae-in



Figure 3: Seongju residents protest against THAAD



of the Democratic Party, campaigned to halt THAAD deployment contingent on the further evaluation of its drawbacks and benefits. President Moon had furthermore pledged to improve inter-Korean relations through an engagement-oriented policy. However, he also claimed that THAAD would be "inevitable" if North Korea conducted a sixth nuclear test.<sup>28</sup> North Korea's subsequent missile and nuclear tests resulted in Moon backtracking from his campaign pledge and instead declaring THAAD a national necessity. The week following North Korea's sixth and most powerful nuclear test on September 3, 2017, the remaining four THAAD missile launchers arrived in Seongju.<sup>29</sup> In a Gallup poll the previous month, 72 percent of respondents showed support for Moon's order to temporarily deploy the additional launchers, with only 14 percent disagreeing.<sup>30</sup>

Nevertheless, some of the strongest criticism of THAAD has been in Seongju, North Gyeongsang, where the system is deployed. While a traditionally conservative stronghold, the lack of consultation over the decision to deploy the system has been considered undemocratic.<sup>31</sup> The county governor also stated that he had only learned of the decision through media reports.<sup>32</sup> Second, residents have continually expressed their discontent citing health concerns due to radiation and the loss of land for the THAAD installation.<sup>33</sup> Third, there are concerns that there would be an increase in anti-social behavior that have occurred around other U.S. military bases in South Korea.<sup>34</sup> Finally, there is the fear that the presence of THAAD will make Seongju a military target.<sup>35</sup>

On September 30, 2016, the U.S. and South Korea announced the relocation of THAAD to Lotte Skyhill Seongju Country Club, farther from the town's main residential areas and higher in elevation, to alleviate concerns.<sup>36</sup> Protests continued, however, with hundreds setting up encampments near the site supported by various left-wing parties, including the Labor Party and Green Party. On May 8, 2017, hundreds of residents near

the Country Club filed a petition with the Constitutional Court to obtain an injunction against its construction and operation.<sup>37</sup> On September 6, 2017, as the final components of the THAAD battery arrived in Seongju for deployment, hundreds of protesters attempted to block the road to the base where they were to be installed.<sup>38</sup>

## Regional Repercussions

### North Korea's Response

North Korea has viewed the decision to deploy THAAD as both a provocation and an act of aggression.<sup>39</sup> Correspondingly, one day after the announcement of THAAD's deployment, North Korea tested a Pukuk-song-1 (KN-11) SLBM.<sup>40</sup> This was followed by three short-range missiles that were fired six days after the announcement and another two intermediate-range missiles in early August 2016.<sup>41</sup> Continuing in this fashion, the DPRK has test-fired several ballistic missiles during 2017, including its first ICBM in July 2017.<sup>42</sup> On August 9, 2017, North Korea said it was considering firing missiles at the American military base on the island of Guam in the Pacific. In late August 2017, it launched a missile over Japan, and most recently, on September 3, 2017, North Korea conducted its sixth nuclear test, which it claims was a hydrogen bomb intended to be carried on an ICBM.<sup>43</sup> Despite seeing THAAD as a hostile move, some analysts have speculated that it also serves North Korea's interest in securing a closer alliance with China.<sup>44</sup>

### China's Objections

Even before official THAAD discussions started, Beijing expressed its opposition to the system. Although China is also opposed to North Korea's nuclear development, THAAD is seen as an attempt to undermine China's strategic interests in the region.<sup>45</sup> There are several reasons for this position.

First is China's fear that THAAD could be used to intercept Chinese missiles and spy on its territory. Both the U.S. and South Ko-

---

rea have denied this by stating that THAAD will only be used against North Korea.<sup>46</sup> The THAAD battery will be placed in terminal mode, thus making it unable to detect Chinese ICBMs. Furthermore, THAAD would be poorly positioned against Chinese intermediate-range missiles if launched at South Korea or Japan. The location of THAAD would allow it to theoretically intercept missiles from Tonghua, which would follow the same trajectory as those from North Korea, but not missiles from Dengshahe, Laiwu, and Hanchang.

However, a Pentagon report has shown that it is possible to change the system into forward-based mode in just eight hours.<sup>47</sup> Once in this mode, the radar's range would increase to 3,000 kilometers, making it possible to detect Chinese ICBMs heading towards the U.S. Although THAAD missiles would not be able to intercept Chinese ICBMs in their boost and mid-range phases, the information could be transferred to the early warning radar at the Clear Air Force Station in Alaska. This would make it possible for a warhead to be tracked from a greater distance than what is currently possible.<sup>48</sup> The fact that two THAAD radars have already been stationed in Japan is already reason for concern for China, but an additional system in South Korea enables more precise detection, as the radar is 1,000 kilometers closer to its borders.

A second worry for China is the fact that, through the deployment of THAAD, South Korea will have a long-term commitment with the U.S., thus strengthening its presence in Northeast Asia. In this context, China is also concerned about a stronger security alliance between South Korea, the U.S., and Japan, which raises fears of China's containment.

In response, China has used its economic leverage and banned tour groups from visiting South Korea, as well as targeted its entertainment and car industries through unofficial sanctions. The South Korean conglomerate Lotte, which supplied the land for THAAD installations, has been deeply affected. In March

2017, Chinese regulators temporarily closed 75 Lotte stores throughout China, citing inspection failures.<sup>49</sup> Although exchanges between Beijing and Seoul somewhat improved from late spring 2017, the subsequent acceleration of its deployment has seen relations again deteriorate. On August 21, 2017, Chinese Ambassador to South Korea Qiu Guohong reiterated that "THAAD is the greatest obstacle to developing China-South Korea relations and the most difficult problem since the establishment of diplomatic relations."<sup>50</sup>

### **Russia's Stance**

Russia has also denounced the deployment of THAAD in South Korea. As with China, it fears an increasingly U.S.-dependent South Korea and a stronger U.S. presence in the region that could undermine its security interests. Following the initial deployment of THAAD in May, Chinese and Russian foreign ministers Wang Yi and Sergey Lavrov met and agreed on their opposition both to THAAD deployment in South Korea, as well as North Korea's nuclear program.<sup>51</sup>





## Endnotes

- <sup>1</sup> "THAAD Terminal High-Altitude Area Defence, United States of America," army-technology, accessed September 15, 2016, <http://www.army-technology.com/projects/thaad/>.
- <sup>2</sup> "THAAD," Lockheed Martin, accessed September 16, 2016, <http://www.lockheedmartin.com/content/dam/lockheed/data/mfc/pc/thaad/mfc-thaad-pc.pdf>
- <sup>3</sup> "U.S. in \$3.5 billion arms sale to UAE amid Iran tensions," *Reuters*, December 31, 2001, <https://www.reuters.com/article/us-usa-uae-iran/u-s-in-3-5-billion-arms-sale-to-uae-amid-iran-tensions-idUSTRE7BU0BF20111231>
- <sup>4</sup> "THAAD Terminal High-Altitude Area Defence, United States of America," army-technology.
- <sup>5</sup> Ibid.
- <sup>6</sup> Julian Ryall, "What is THAAD? South Korea's best defence against a missile attack," *The Telegraph*, September 5, 2017, <http://www.telegraph.co.uk/news/0/thaad-south-koreas-best-defence-against-missile-attack>
- <sup>7</sup> Park Hyun, "Pentagon document confirms THAAD's eight-hour conversion ability," *The Hankyoreh*, June 3, 2015, [http://english.hani.co.kr/arti/english\\_edition/e\\_international/694082.html](http://english.hani.co.kr/arti/english_edition/e_international/694082.html)
- <sup>8</sup> "North Korea 'fires three ballistic missiles into sea,'" *BBC*, July 19, 2016, <http://www.bbc.com/news/world-asia-36831308>; "THAAD Terminal High-Altitude Area Defence, United States of America," army-technology.
- <sup>9</sup> "THAAD Terminal High-Altitude Area," army-technology.
- <sup>10</sup> "Lockheed Martin-built system successfully destroy multiple targets in test of ballistic missile defence system," *Lockheed Martin*, November 2, 2015, <http://lockheedmartin.com/us/news/press-releases/2015/november/mfc-lockheed-martin-built-systems-destroy-multiple-targets-test-ballistic-missile-defense-system.html>
- <sup>11</sup> Dan Sauter, "THAAD: America's Super Shield against Ballistic Missiles?" *The National Interest*, November 19, 2014, <http://nationalinterest.org/feature/thaad-america-super-shield-against-ballistic-missiles-11701>
- <sup>12</sup> Ibid; Bruce Klingner, "The Importance of THAAD Missile Defense," *The Journal of East Asian Affairs* 29, no. 2, October (2015): 21–41.
- <sup>13</sup> Klingner, "The Importance of THAAD."
- <sup>14</sup> Park Hyun, "[Analysis] US experts question THAAD's ability to intercept North Korean missiles," *The Hankyoreh*, June 25, 2015, [http://english.hani.co.kr/arti/english\\_edition/e\\_international/697543.html](http://english.hani.co.kr/arti/english_edition/e_international/697543.html)
- <sup>15</sup> Park Hyun, "[Analysis] US experts question THAAD's ability to intercept North Korean missiles."
- <sup>16</sup> Chang Jae-soon, "Two THAAD batteries necessary for S. Korea to better defend against N.K. SLBMs: U.S. expert," *Yonhap News Agency*, August 30, 2016, <http://english.yonhapnews.co.kr/news/2016/08/30/0200000000AEN20160830000200315.html>
- <sup>17</sup> Hyun Lee, "The South Korea Protest Movement against the THAAD Missile System. 'Seongju is Korea and Korea is Seongju,'" *Global Research*, August 20, 2016, <http://www.globalresearch.ca/the-south-korea-protest-movement-against-the-thaad-missile-system-seongju-is-korea-and-korea-is-seongju/5541743>
- <sup>18</sup> Kang Seoung-woo, "Seongju picked as site for THAAD battery," *The Korea Times*, July 13, 2016, [http://www.koreatimes.co.kr/www/news/nation/2016/07/205\\_209205.html](http://www.koreatimes.co.kr/www/news/nation/2016/07/205_209205.html)
- <sup>19</sup> Ser Myo-ja and Jeong Yong-soo, "Rural town Seongju chosen as Thaad site," *Korea JoongAng Daily*, July 14, 2016, <http://koreajoongangdaily.joins.com/news/article/Article.aspx?aid=3021272>
- <sup>20</sup> Sarah Kim and Jeong Yong-soo, "Thaad won't protect Seoul area," *Korea JoongAng Daily*, July 13, 2016, <http://koreajoongangdaily.joins.com/news/article/Article.aspx?aid=3021200>
- <sup>21</sup> "US anti-missile system operational in South Korea," *BBC*, May 2, 2017, <http://www.bbc.com/news/world-asia-39775854>
- <sup>22</sup> Youmi Kim, "Accelerated THAAD deployment dividing South Korean presidential candidates," *VOA News*, April 27, 2017, <https://www.voanews.com/a/accelerated-thaad-deployment-south-korea-presidential-candidates/3827673.html>
- <sup>23</sup> Kim Tong-Hyung, "U.S. adds launchers to THAAD as dozens hurt in SKorea protests," *AP News*, September 07, 2017, <https://www.apnews.com/90956f1bd2804b0f8d6c4979851191e4/US-adds-launchers-to-THAAD-as-dozens-hurt-in-SKorea-protests>
- <sup>24</sup> Seoung-woo, "Seongju picked as site."
- <sup>25</sup> Choe Sang-Hun, "U.S. confirms it will pay for antimissile system, South Korea says," *The New York Times*, April 30, 2017, <https://www.nytimes.com/2017/04/30/world/asia/donald-trump-south-korea-missile-system-thaad.html?mcubz=1>
- <sup>26</sup> "Half of S. Koreans support THAAD deployment: poll," *Yonhap News Agency*, July 15, 2016, <http://english.yonhapnews.co.kr/national/2016/07/15/030100000AEN20160715004800315.html>
- <sup>27</sup> Kim Nam-il, "Poll: 56% of South Koreans support THAAD deployment, 31% opposed," *The Hankyoreh*, August 13, 2016, [http://english.hani.co.kr/arti/english\\_edition/e\\_national/756532.html](http://english.hani.co.kr/arti/english_edition/e_national/756532.html)
- <sup>28</sup> Adriana Diaz, Shuai Zhang, "Angered by U.S. anti-missile system, China takes economic revenge," *CBS News*, April 7, 2017, <https://www.cbsnews.com/news/china-retaliates-south-korea-us-thaad-missile-defense-lotte-and-k-pop/>
- <sup>29</sup> Taehoon Lee, "South Korea expects North to launch ICBM on Saturday, prime minister says," *CNN*, September 7, 2017, <http://edition.cnn.com/2017/09/07/asia/south-korea-thaad-north-korea/index.html>
- <sup>30</sup> Kim Nam-il, "72% of South Koreans in favour of decision to temporarily deploy THAAD launchers," *The Hankyoreh*, August 6, 2017, [http://english.hani.co.kr/arti/english\\_edition/e\\_national/805679.html](http://english.hani.co.kr/arti/english_edition/e_national/805679.html)
- <sup>31</sup> Liu Zhen, "No time to relax for South Korean opponents of controversial US anti-missile system," *South China Morning Post*, May 6, 2017, <http://www.scmp.com/news/china/diplomacy-defence/article/2093270/no-time-relax-south-korean-opponents-controversial-us>
- <sup>32</sup> Katherina H.S. Moon and Andrew I. Yeo, "Democratic Deficit and Missile Defense in South Korea," *The Diplomat*, August 4, 2016, <http://thediplomat.com/2016/08/democratic-deficit-and-missile-defense-in-south-korea/>
- <sup>33</sup> Ibid.
- <sup>34</sup> Ibid.
- <sup>35</sup> Choe Sang-hun, "South Korean Villagers Protest Plans for U.S. Missile Defense System," *The New York Times*, July 13, 2016, [http://www.nytimes.com/2016/07/14/world/asia/south-korea-thaad-us.html?\\_r=0The%20Importance%20of%20THAAD%20Missile%20Defense](http://www.nytimes.com/2016/07/14/world/asia/south-korea-thaad-us.html?_r=0The%20Importance%20of%20THAAD%20Missile%20Defense)
- <sup>36</sup> S. Korea selects golf course as new site for THAAD," *Yonhap News Agency*, September 30, 2016, <http://english.yonhapnews.co.kr/national/2016/09/30/37/030>

---

[1000000AEN20160930004900315F.html](http://1000000AEN20160930004900315F.html)

<sup>37</sup>Seongju residents seek injunction against THAAD deployment," *Yonhap News Agency*, May 8, 2017, <http://english.yonhapnews.co.kr/national/2017/05/08/0301000000AEN20170508008700315.html>

<sup>38</sup>Taehoon Lee, "South Korea expects North."

<sup>39</sup>"They're digging their own graves' North Korea's warning over US anti-missile THAAD system," *Daily Express*, September 13, 2017, <http://www.express.co.uk/news/world/853865/WW3-North-Korea-warning-US-anti-missile-THAAD-system-Kim-Jong-Un>

<sup>40</sup>K.J. Kwon and Joseph Netto, "North Korea fires submarine-based ballistic missile: South Korea," *CNN*, July 9, 2016, <http://edition.cnn.com/2016/07/09/asia/north-korea-submarine-missile/>

<sup>41</sup>K.J. Kwon and Ben Westcott, "North Korea fires 3 ballistic missiles, South Korea says," *CNN*, July 19, 2016, <http://edition.cnn.com/2016/07/18/asia/north-korea-missiles/index.html>; James Griffiths, "Timeline: How North Korea went nuclear," *CNN*, June 28, 2016, <http://edition.cnn.com/2016/01/05/asia/north-korea-nuclear-timeline/>

<sup>42</sup>"North Korea May Be Preparing Its 6th Nuclear Test," *The New York Times*, April 24, 2017, <https://www.nytimes.com/interactive/2017/04/12/world/asia/north-korea-nuclear-test.html>; "North Korea's missile tests," *CNN*, September 18, 2017, <http://edition.cnn.com/2017/05/29/asia/north-korea-missile-tests/index.html>

<sup>43</sup>Enrico D'Ambrogio " [Analysis] Possible scenarios," European Parliamentary Research Service Blog, September 12, 2017, <https://epthinktank.eu/2017/09/12/north-korea-possible-scenarios/>; "In latest test, North Korea detonates its most powerful nuclear device yet," *The Washington Post*, September 3, 2017, [https://www.washingtonpost.com/world/north-korea-apparently-conducts-another-nuclear-test-south-korea-says/2017/09/03/7bce3ff6-905b-11e7-8df5-c2e-5cf46c1e2\\_story.html?utm\\_term=.e343727e300d](https://www.washingtonpost.com/world/north-korea-apparently-conducts-another-nuclear-test-south-korea-says/2017/09/03/7bce3ff6-905b-11e7-8df5-c2e-5cf46c1e2_story.html?utm_term=.e343727e300d); "North Korea claims successful missile test," *CNBC*, September 3, 2017, <https://www.cnbc.com/2017/09/03/north-korea-claims-successful-hydrogen-bomb-test.html>

<sup>44</sup>Hongseo Park and Jae Jeok Park, "How Not To Be Abandoned by China: North Korea's Nuclear Brinkmanship Revisited," *The Korean Journal of Defense Analysis*, Vol. 29, No. 3, September 2017, 371-387.

<sup>45</sup>Yi Yong-in and Seong Yeon-cheol, "China adds security interests to its three principles for N. Korean denuclearization," *The Hankyoreh*, February 16, 2016, [http://english.hani.co.kr/arti/english\\_edition/e\\_international/730595.html](http://english.hani.co.kr/arti/english_edition/e_international/730595.html)

<sup>46</sup>Bruce Klingner, "Why South Korea Needs THAAD Missile Defense (Policy brief no. 175)," *Institute for Security & Development Policy*, April 21, 2015, <http://isd.eu/content/uploads/publications/2015-klingner-why-south-korea-needs-thaad-missile-defense.pdf>

<sup>47</sup>Hyun, "Pentagon document confirms THAAD's eight."

<sup>48</sup>Park Hyun and Park Byong-su, "THAAD missile defense system could be used to defend against Chinese attack on US," *The Hankyoreh*, June 2, 2015, [http://english.hani.co.kr/arti/english\\_edition/e\\_international/693913.html](http://english.hani.co.kr/arti/english_edition/e_international/693913.html)

<sup>49</sup>"Angered by U.S. anti-missile system, China takes economic revenge," *CBS News*, April 7, 2017, <http://www.cbsnews.com/news/china-retaliates-south-korea-us-thaad-missile-defense-lotte-and-k-pop/>

<sup>50</sup>"THAAD issues pushes South Korea-China reactions to new lows", *The Hankyoreh*, August 23, 2017, <http://>

[english.hani.co.kr/arti/english\\_edition/e\\_international/807986.html](http://english.hani.co.kr/arti/english_edition/e_international/807986.html)

<sup>51</sup>"Russia, China: THAAD was deployed in South Korea under pretext," *UPI*, May 26, 2017, <https://www.upi.com/Russia-China-THAAD-was-deployed-in-South-Korea-under-pretext/3681495854230/>

## Image credits

Cover: "2013 THAAD FTO-01 1" by U.S. Missile Defense Agency is licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)

Figure 1: "Terminal High Altitude Area Defense," *Lockheed Martin*

Figure 2: "North Korea tests submarine ballistic missile," *KCNA via European Pressphoto Agency*

Figure 3: "South Korea chooses site of THAAD U.S. missile system amid protests," *News1/Lee Jong-hyun via Reuters*