

Open Nuclear Network's

FACTORS RELATED TO PAST DPRK NUCLEAR TESTS

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I. Executive Summary

In light of recent analyses about a possible next nuclear weapon test by the DPRKⁱ, ONN has compiled data related to each of the six previous nuclear weapon tests of the DPRK, specifically the timing of the previous tests, nuclear test site preparations, launch vehicle development, environmental factors and the political context. These factors may assist in assessing when a next test might take place. It should be noted, however, that there may be other relevant factors that cannot be fully understood from open sources (e.g. the intentions of Kim Jong Un).

II. Past Nuclear Tests

A. Timing - Times, Days, Dates

All six previous nuclear tests took place between 9:30 and 12:30 (KST). On the other hand, there appears to be no strong correlation between the timing of the tests and the day of the week. Five out of the six nuclear tests were conducted on or in the lead-up to major anniversaries in the DPRK. Two tests took place on or very near a significant date on the U.S. calendar: the second test (2009), which took place on US Memorial Day; and the sixth test (2017), which took place one day before US Labor Day. Three nuclear tests took place during US or ROK presidential election campaigns or inaugurations: the third test (2013) took place on the day of the 2013 US State of the Union Address and nearly two weeks before the inauguration of former-ROK President Park Geun-hye; the fifth test (2016) took place in the month before the 2016 US presidential election; the sixth test (2017) took place just less than four months after former-ROK President Moon Jae-in's inauguration.

B. Nuclear Test Site

No clear signatures of test preparations at the Punggye-ri nuclear test site were identified using commercially available satellite imagery. For the first (2006) and second (2009) nuclear tests, no sufficiently high-resolution satellite imagery has been identified that could be utilized to make such assessments. Several signs of activity starting at approximately three months before the third (2013) nuclear test were identified, including an increase in the number of personnel and vehicles near the test tunnel, concealment of the tunnel entrance, a probable cable line stretching from the tunnel entrance and a probable satellite dish near the tunnel entrance.ⁱⁱ In the run up to the fourth (2016), fifth (2016) and sixth (2017) nuclear tests, no clear signs were visible in available satellite images.ⁱⁱⁱ

C. Launch Vehicle Development

The DPRK's timing of nuclear tests seems to be correlated with its launch vehicle development programme schedule – five of the previous six nuclear tests were undertaken within three months of a long-range rocket or satellite launch. Conversely, the longest span of time separating a launch from a nuclear test was a failed test in April 2012, which was just over ten months before the third nuclear test (2013).

D. DPRK Statements

In two of the six previous nuclear tests, the first test (2006) and the third test (2013), explicit comments were made by the DPRK leadership in the weeks prior to the tests clearly indicating

its intention to perform a nuclear test. No similarly explicit statements were identified as having been made in the leadup to the other nuclear tests.

E. Environmental Factors

None of the DPRK's previous nuclear tests, or intercontinental ballistic missile (ICBM) or satellite launches, were conducted in June or August.^{iv} The inactivity in June is assessed as likely related to state-wide manpower-intensive agricultural projects, which may require the mobilization of the military during the rice transplantation season between mid-May and mid-June.^v With respect to August, heavy rainfall could potentially damage the nuclear test site and impact test operations.

F. Political Context

The second nuclear test (2009) took place while then-DPRK leader Kim Jong Il's health was deteriorating and the DPRK was in a transition period.

APPENDIX: PAST DPRK NUCLEAR TESTS

Nuclear Test	Date	Time (KST)	Day of Week	Significant DPRK Date	Significant International Date	ICBM / Satellite launch ^{vi}	Explicit Official Statement	Outside of Agricultural Season?	Outside of Rainy Season?	Political Context
1st	9 Oct 2006	10:35	Mon	10 Oct - 61st founding anniversary of the WPK	None	5 Jul 2006 Long-range rocket launch [failed] within ~3 months	Yes ^{vii} 6 days prior	Yes	Yes	15 Jul 2006: UNSC resolution 1695 adopted condemning DPRK missile launches
2nd	25 May 2009	9:54	Mon	None	25 May - US Memorial Day	24 Feb 2009 Satellite launch [failed] within ~3 months	No	No	Yes	DPRK in a transition phase: Kim Jong Il's health deteriorating 24 Apr 2009: UNSC imposed financial sanctions on three DPRK firms related to WMD proliferation
3rd	12 Feb 2013	11:57	Tue	10 Feb - Korean New Year in 2013 12 Feb - US President Obama's State of the Union Address 16 Feb - Kim Jong Il's 71st birth anniversary 25 Feb - Inauguration of ROK President Park Geun-hye	None	5 Apr 2012 Satellite launch [failed] within ~10 months 12 Dec 2012 Satellite launch within ~2 months	Yes ^{viii} 19 days prior	Yes	Yes	22 Jan 2013: UNSC resolution 2087 adopted
4th	6 Jan 2016	10:30	Wed	8 Jan - Kim Jong Un's 33rd birthday [note: not an official DPRK holiday]	None	7 Feb 2016 Satellite launch within ~1 month	No	Yes	Yes	No action taken by the UNSC between January 2013 and March 2016
5th	9 Sept 2016	9:30	Fri	9 Sept - 68th founding anniversary of the Republic	5 Sep - US Labor Day 8 Nov 2016: US Presidential election 9 Dec 2016: impeachment of ROK President	7 Feb 2016 Satellite launch within ~7 months 4 Jul 2017 & 28 Jul 2017 ICBM test within ~10 months	No	Yes	Yes	2 Mar 2016: UNSC resolution 2270 adopted
6th	3 Sept 2017	12:30	Sun	25 Aug - 57th anniversary of the Day of Songun 9 Sept - 69th founding anniversary of the DPRK	4 Sep - US Labor Day	4 Jul 2017 & 28 Jul 2017 ICBM test within ~2 months 28 Nov 2017 ICBM test within ~3 months	No	Yes	Yes	20 Jan 2017: US President Donald Trump inaugurated 11 May 2017: ROK President Moon Jae-in inaugurated 5 Aug 2017: UNSC resolution 2371 adopted

This table includes information that was identified as most relevant to a past nuclear test; this list is not exhaustive of all potentially relevant factors.

Endnotes

- ⁱ “Annual Threat Assessment of the U.S. Intelligence Community”, Office of the Director of National Intelligence, February 2022, available at: <https://www.armed-services.senate.gov/hearings/to-receive-testimony-on-worldwide-threats>. “Minister of Defense Extraordinary Press Conference”, Japanese Ministry of Defense, 7 May 2022, available at: https://www.mod.go.jp/j/press/kisha/2022/0507a_r.html. “[단독] ‘北 ‘핵탄두 소형화’ 완성...20일 바이든 방한 직전, 풍계리서 7차 핵실험 할듯” (“Exclusive: North Korea Completes 'Nuclear Warhead Miniaturization'... Likely to Conduct Seventh Nuclear Test in Punggye-ri Right Before Biden's South Korea Visit on [May] 20”), Dong-A Ilbo, 6 May 2022, available at <https://www.donga.com/news/Politics/article/all/20220506/113254261/1>.
- ⁱⁱ Jack Liu, “The Challenge of Predicting Future North Korean Nuclear Tests”, 38 North, 1 February 2016, available at: <https://www.38north.org/2016/02/punggye020116/>.
- ⁱⁱⁱ David Albright and Robert Avagyan, “Monitoring Activity at Punggye-ri Nuclear Test Site”, 3 February 2013, available at: <https://isis-online.org/isis-reports/detail/monitoring-activity-at-punggye-ri-nuclear-test-site/10#images>. Also, see Planet Labs images for the periods between 1 December 2015 through 6 January 2016, 1 August through 9 September 2016, and 1 August through 3 September 2017 at the following locations: Punggye-ri, Tunnel 2 (41° 16' 51" N 129° 05' 08" E), the main administrative area (41° 16' 41" N 129° 05' 15" E) and the southern support areas (41° 13' 39" N 129° 06' 37" E and 41° 13' 13" N 129° 06' 28" E), available at: <https://www.planet.com/explorer/>.
- ^{iv} “北朝鮮による核・弾道ミサイル開発について (The DPRK's nuclear and ballistic missile developments),” Japanese Ministry of Defense, pp. 16-19, available at: https://www.mod.go.jp/j/approach/surround/pdf/dprk_bm.pdf. On 29 June 2014, two SCUD missiles were launched, see: “Kim Jong Un Guides Tactical Rocket Firing Drill of KPA Strategic Force,” KCNA, 30 June 2014.
- ^v In the past, the Japanese Ministry of Defense has noted in its Annual White Papers that the DPRK soldiers were mobilized for agricultural works. For example, see, Japanese Ministry of Defense, Defense of Japan (Annual White Paper) 2014, Section I-1-2-1, available at: http://www.clearing.mod.go.jp/hakusho_data/2014/html/n1121000.html#a9
- ^{vi} This list includes all known DPRK ICBM/satellite launches through December 2021. The list does not include the DPRK's 1998 attempted launch of its first satellite using a small carrier rocket, as the vehicle had little potential for use as a long-range rocket.
- ^{vii} The Foreign Ministry issued a statement asserting that Pyongyang “will in the future conduct a nuclear test.” “DPRK Confirms to Conduct Nuclear Test in the Future,” China.org.cn, 4 October 2006, available at: http://www.china.org.cn/international/2006-10/04/content_1182923.htm
- ^{viii} The DPRK National Defence Commission stated: “We do not hide that a variety of satellites and long-range rockets which will be launched by the DPRK one after another and a nuclear test of higher level which will be carried out by it in the upcoming all-out action, a new phase of the anti-U.S. struggle that has lasted century after century, will target against the U.S., the sworn enemy of the Korean people... .” Ju-min Park, Choonsik Yoo, “North Korea to target U.S. with nuclear, rocket tests,” Reuters, 24 January 2013, available at: <https://www.reuters.com/article/uk-korea-north-nuclear-idUKBRE90N0Z020130124>

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One Earth Future Foundation (OEF) is an incubator of innovative peacebuilding programs that designs, tests, and partners to scale programs that work hand-in-hand with those most affected by conflict to eliminate the root causes of war. We believe in a world beyond war, where sustainable peace is truly possible.

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One Earth Future's Open Nuclear Network programme is a non-aligned, non-governmental entity that seeks to increase security for all States by ensuring that nuclear decision makers have access to high quality, shareable open source information which enables them to make the best decisions in the face of escalating conflict.

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