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Sorting Out the Nuclear and Missile Threats From North Korea

North Korea's satellite launch last December and its detonation in February of a third nuclear device occurred in blatant defiance of multiple UN Security Council resolutions prohibiting such activities. Condemnation of these actions by the international community nonetheless precipitated a flurry of particularly strident North Korean threats against the United States and South Korea. These threats were actually hollow, but they provoked a billion-dollar strategic missile defense deployment decision and spawned calls by U.S. pundits and politicians for preventive attacks on North Korea. Although the intensity of the crisis is now waning, North Korea's pursuit of nuclear and missile capabilities continues, and its political isolation from the international community deepens. It is high time to sort out the nature of the threat and reconsider what can be done about it.

HIGHLIGHTS

- North Korea is believed to have enough plutonium for four to eight nuclear weapons and may have some highly enriched uranium as well.
- But it is years away from being able to pose a nuclear threat against the U.S. mainland.
 - o Although it has hundreds of operational short- and medium-range ballistic missiles, there is no evidence it has achieved the miniaturization of a nuclear device necessary for arming these missiles.
 - o Moreover, it has never flight-tested a long-range ballistic missile or demonstrated the guidance and re-entry capabilities required for such a system.
- In the face of unanimous resolutions of the UN Security Council demanding a stop to North Korean nuclear and missile activities, Pyongyang responded with defiance in March and April of this year, threatening "pre-emptive nuclear attacks" against the United States and an end to the 1953 armistice.
 - o Unlike previous crises, the latest episode involved no fighting and cost no lives.
- o Although North Korea has no nuclear-tipped, long-range missiles, the United States responded to its bombast by deploying additional forces to the region and promising to deploy additional strategic missile defense interceptors in Alaska.
- Given North Korea's continuing nuclear weapons buildup and technology transfers, Pyongyang's deepening isolation, and the inherent risk that a military provocation on the Korean peninsula could spin out of control, a new policy approach is urgently needed.
 - o The new approach will require:
 - aggressive diplomatic engagement, which refrains from making threats of preventive attack and "regime change;"
 - a willingness to take incremental steps and adopt confidence-building measures that enhance stability, short of the ultimate goal of nuclear disarmament; and
 - an awareness that North Korean aggression is deterred primarily by maintaining U.S. and South Korean conventional military superiority, not by maintaining a huge U.S. nuclear arsenal and deploying strategic missile defenses.

Background

The Democratic People's Republic of Korea (DPRK) was established inside the Soviet zone of occupation that had been established in the northern half of the Korean peninsula at the end of World War II, just as the Republic of Korea (ROK) was established inside the U.S. zone in the southern half of the peninsula. Both halves of the country claimed to represent all of Korea. With assistance from the Soviet Union, North Korean military forces crossed the demilitarized zone separating the two jurisdictions in 1950 in an unsuccessful attempt to unify the country by force under the rule of North Korea's founder, Kim Il Sung. UN forces intervened to oppose the invasion, and three years of intense combat ended in an armistice in July 1953, an uneasy truce still in effect 60 years later.

The North/South military balance, meanwhile, has been shifting steadily in favor of South Korea. The U.S. Office of the Secretary of Defense assesses that this "widening military disparity" helps fuel North Korea's "commitment to improving asymmetric and strategic deterrent capabilities as the primary guarantor of regime survival."¹ The foremost strategic deterrent capability comes from nuclear weapons.

With the United States as its nuclear superpower ally, South Korea signed the nuclear Non-Proliferation Treaty (NPT) in 1968, ratifying it in 1975. North Korea acceded to the NPT in 1985, but did not complete a safeguards agreement with the International Atomic Energy Agency (IAEA) within the 18 months allotted for the task, demanding throughout that all U.S. nuclear weapons from South Korea first be withdrawn. Following the U.S. withdrawal of these weapons as part of the Presidential Nuclear Initiatives of President George H.W. Bush, North Korea completed its safeguards agreement with the IAEA in 1992.

When IAEA inspectors subsequently conducted surveys, they discovered discrepancies in North Korea's initial report, in particular with regard to the amount of plutonium that had been reprocessed in North Korea. Amid IAEA demands for special inspections, North Korea announced its intention to withdraw from the NPT, leading to a serious crisis. In fall 1994, however, the United States and North Korea concluded the Agreed Framework, for an overall resolution of the nuclear issue on the Korean peninsula. Under this agreement, Pyongyang first committed to freeze its illicit plutonium weapons program



The U.S. Army

A ground-based missile interceptor (GBI) is lowered into its silo at Fort Greely, Alaska. In response to recent North Korean provocations, the Defense Department announced that 14 more GBIs would be added to the 30 already operational. They would be armed with CE2 kill vehicles that have not yet achieved a successful intercept in GBI flight tests.

in exchange for aid, including the provision of heavy oil to North Korea and help with construction of two light-water nuclear reactors.

Prior to and after signing the Agreed Framework, North Korea has continued to transfer ballistic missile technology to a number of states of proliferation concern. U.S. efforts to negotiate an end to North Korea's nuclear and missile developments and its export of sensitive technologies have met with only partial and intermittent success. Both sides failed to meet in full the commitments contained in the Agreed Framework. Amid mutual recriminations, the agreement collapsed in 2002; and in January 2003, North Korea announced its withdrawal from the NPT, resuming the operation of its nuclear facilities.

A second major diplomatic effort was initiated in August 2003 with the six-party talks, involving China, Japan, North Korea, Russia, South Korea, and the United States. In between periods of stalemate and crisis, those talks achieved a critical breakthrough in September 2005 with a joint statement of principles to guide future negotiations. North Korea pledged to abandon "all nuclear weapons and existing nuclear programs" and return to the NPT. The United States affirmed that it had no intention to attack or invade North Korea, and the parties agreed to discuss, at an appropriate time, the subject of the provision of a light-water nuclear reactor to Pyongyang.

Prospects for implementation of the 2005 Joint Statement commitments were soon heavily buffeted by North Korea's nuclear proliferation activities, in particular by its first nuclear test, in October 2006. Although the parties were still able to agree in 2007 on an action plan for carrying out the steps specified in the 2005 agreement, information emerged following Israel's attack that same year on an undeclared Syrian nuclear reactor indicating that the North Koreans were extensively involved in that reactor's construction.

The six-party talks broke down completely in 2009, following disagreements over verification and an internationally condemned North Korean rocket launch. Subsequently, a round of U.S.-North Korean talks led to the February 2012 Leap Day agreement, according to which North Korea would suspend operations at its Yongbyon uranium-enrichment plant, invite IAEA inspectors to monitor the suspension, and implement moratoriums on nuclear and long-range missile tests and the United States would provide food aid. This agreement soon foundered following North Korea's April 2012 satellite launch attempt.

Pyongyang subsequently stated that it would never

return to the six-party talks and is no longer bound by their agreements. The five other parties state that they remain committed to the talks and have called for Pyongyang to recommit to its 2005 denuclearization pledge.²

The Hot-Air War of 2013

In spite of UN Security Council resolutions requiring a long-range missile flight moratorium and an end to additional nuclear testing, North Korea launched a satellite into orbit on December 12, 2012, and conducted an underground nuclear test on February 12, 2013, its third overall. These actions prompted additional condemnations by the international community along with additional sanctions in UN Security Council Resolution 2094.

Rather than bringing Pyongyang to heel, the unanimous demands of the UN Security Council provoked an unprecedented barrage of bombastic threats throughout March and April directed at the United States and South Korea.

In early March, North Korea announced its intention to launch a pre-emptive nuclear strike against the United States. It then declared an end to the 1953 armistice and announced it was withdrawing from all nonaggression pacts with South Korea, closing its joint border crossing, and disconnecting the hotline between the two Koreas.

On March 30, Pyongyang declared that the North was in a state of war with the South. North Korean leader Kim Jong Un declared that missiles were ready to be fired at U.S. bases in the Pacific in response to the flights of two U.S. nuclear-capable bombers over South Korea. On April 4, the North Korean state-run Korean Central News Agency announced, "The moment of explosion is approaching fast. No one can say a war will break out in Korea or not and whether it will break out today or tomorrow."³ Reports began circulating that North Korea had moved two Musudan ballistic missiles on road-mobile launchers to a test site on the eastern coast.

Time to Reassess

By May, the weeks-long annual U.S.-South Korean military exercises had been concluded, and North Korea's feverish threats of pre-emptive nuclear attack had been ratcheted back to Pyongyang's more customary level of rhetorical excess. Unlike the other periodic crises involving North Korea over the years (Figure 1) neither military clashes nor any deaths occurred this time. Contrary to the predictions of many observers, no additional nuclear or long-range missile tests were conducted.

Yet, diplomatic engagement with North Korea is still

stalled, the near-term potential for inadvertent escalation is high, and the further development of North Korea's nuclear and missile capabilities now appears more likely than ever. Moreover, anxieties in South Korea and Japan about provocative North Korean behavior have intensified.

It became evident that North Korea was proceeding on a uranium track as well, having constructed a modern, industrial-scale uranium-enrichment facility with 2,000 centrifuges.

North Korea has now conducted three underground

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Concerns deepened that the NPT would be weakened by North Korea's flaunting of the treaty's norms and the demands of the UN Security Council.

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A prerequisite of any policy shift is getting a better fix on the objective realities concerning the North Korean nuclear and missile threats. North Korea is, in the jargon of the intelligence community, "a hard target." It is very difficult to obtain the depth and breadth of information about the country's capabilities and leadership needed for constructing effective foreign and defense policies. Reviewing what is known is a good place to start.

Nuclear Capabilities

In spite of North Korea's 1985 accession to the NPT, the IAEA was never able to certify that all of Pyongyang's nuclear activities were peaceful. By the time the 1994 Agreed Framework was negotiated, North Korea had reprocessed enough plutonium from its five-megawatt Yongbyon research reactor to supply sufficient fissile material for several nuclear weapons. Yet, implementation of the Agreed Framework and introduction of IAEA safeguards brought an abrupt halt to North Korea's access to the plutonium. For eight years, plutonium stockpiles were kept under constant surveillance by agency inspectors. When the Agreed Framework collapsed in 2002, North Korea expelled the IAEA personnel and regained access to the plutonium for use in constructing weapons. During an unofficial November 2010 visit from a U.S. delegation led by nuclear scientist Sigfried Hecker,

nuclear explosive tests, in 2006, 2009, and 2013. The first two tests are assumed to have used plutonium, leaving sufficient stockpiles for building four to eight nuclear weapons, depending on the design and desired yield. It is not known whether North Korea has produced and stockpiled the highly enriched uranium (HEU), which can be used in nuclear weapons. Pyongyang announced in March 2013 that it would be reconstructing the Yongbyon

Figure 1: Crises involving North Korea

YEAR	EVENT	DESCRIPTION
1968	<i>The Blue House Raid</i>	North Korean Army commandos sought to assassinate South Korean President Park Chung-hee at his Blue House residence. The incident resulted in 26 deaths.
1968	<i>USS Pueblo Capture</i>	North Koreans captured the US intelligence collection ship USS Pueblo outside North Korean territorial waters. The ship's 82 crew members were tortured and starved during their 11-month captivity.
1969	<i>EC-121 Shootdown</i>	A North Korean fighter plane shot down a US Navy reconnaissance aircraft over the Sea of Japan. The shootdown resulted in 31 deaths.
1976	<i>DMZ Axe Murders</i>	North Korean soldiers killed two US Army officers with axes in the Korean Demilitarized Zone for pruning a tree that had been personally planted by DPRK Founder Kim Il Sung.
1983	<i>Rangoon Bombing</i>	North Korea was implicated in a bombing of the Martyrs' Mausoleum in Burma during the visit of South Korean President Chun Doo-hwan, which killed 21 people, including three members of Chun's cabinet.
2010	<i>ROKS Cheonan Sinking</i>	A North Korean submarine torpedoed and sank a South Korean navy ship in disputed waters off Korea's west coast. The sinking resulted in 46 deaths.

Multiple Sources



Yeong-Wook/Dong A Daily/Getty Images)

The first stage of North Korea's Unha-3 space launch vehicle is displayed at a South Korean Navy base on December 14, 2012 after being fished out of the Yellow Sea. Examining the debris from North Korea's successful satellite launch has helped foreign experts refine their analyses of North Korea's ballistic missile capabilities.

reactor, which had been shut down in 2007 and partially dismantled. It also continues to construct a light-water nuclear reactor it says will be used for civilian power generation starting in 2014.

The speed with which North Korea could further expand its fissile material holdings is scenario dependent, and estimates vary, even if there is agreement on the ratio between uranium and plutonium sources and the reactors used. A comprehensive 2012 study examined six different scenarios for North Korean fissile material production, measured in terms of nuclear weapons equivalents, over the next five years. The range of totals projected across all scenarios was enough fissile material for 14 to 48 nuclear warheads.⁴

Missile Capabilities

Ballistic missiles would be the preferred delivery system for a North Korean nuclear weapon. Yet, little is known about whether the regime has been able to design and test a warhead that would be small enough and sufficiently reliable for placement on the tip of a missile.

As soon as U.S. congressional hearings in early April revealed a heavily qualified Defense Intelligence Agency

assessment that North Korea had nuclear weapons capable of ballistic missile delivery, the Defense Department and the director of national intelligence hastened to add that this was not a consensus view of the U.S. government.⁵ On May 15, a "senior U.S. official" said, "I don't believe [the North Koreans] have the capability to miniaturize the nuclear warhead, put it on the top of the missile, work the launch and reentry problem, and target.... I don't think they have been able to put the whole piece together."⁶

For many years, North Korea has had a ballistic missile infrastructure based on the production and modification of Soviet-era, liquid-fueled Scud ballistic missiles with maximum ranges of 300 and 500 kilometers (the Hwasong 5 and Hwasong 6). Medium-range systems, such as the 1,300 kilometer-range Nodong missile, were developed by stretching the Scud design. The Unha space launch vehicle or its presumed military derivative, the Taepo Dong-2 intercontinental ballistic missile (ICBM), utilizes a modified Scud missile stacked on top of a cluster of Nodong missiles. There is a consensus that North Korea has deployed several hundred Scud short-range ballistic missiles and Nodong medium-range ballistic missiles on some 150 launchers. It is not known whether any of them

have been fitted with nuclear warheads. Without nuclear warheads, these low-accuracy missiles are essentially weapons of terror against civilians in urban areas, of limited utility against point targets or mobile military formations.

There is less of a consensus over North Korea's longer-range ballistic missiles, which could be used at some point in the future to deliver nuclear warheads to strategic U.S. bases in the Pacific or even to the U.S. mainland. The Unha-3, the rocket North Korea used to place its first satellite in orbit, has been the principal focus of public attention for potential weapons adaptation in this category since it has much in common technologically with a long-range ballistic missile. The presumed military variant of the Unha has been designated in the West as the Taepo Dong-2. Both systems would use the same first and second stages. The U.S. intelligence community first assessed that a Taepo Dong-2 flight test was likely by the end of 1999, but it did not occur until 2006. That launch and two subsequent launches of Unha space launch vehicles failed before a successful satellite launch was achieved in late 2012 (Figure 2). According to nongovernmental experts, evidence collected from these launches suggest that using the three existing stages of the Unha in a military variant would not provide sufficient range to deliver a nuclear warhead to the U.S. mainland.⁷

Two additional types of North Korean longer-range ballistic missiles have been frequently mentioned in the Western press and by U.S. defense officials, most recently in the annual report to Congress from the Office of the Secretary of Defense. The report referred to one as "an intermediate-range ballistic missile...showcased" in an October 2010 military parade.⁸ Other reporting makes clear that this language refers to a missile or missile mock-up observed in the 2010 parade and again in a 2012 parade. The same airframe has apparently been seen by satellites, for instance in April, when two such missiles were reportedly located on their road-mobile launchers at a launch site on the eastern coast. The system, designated the Musudan, or BM-25, bears a strong resemblance to an older Soviet, liquid-fueled submarine-launched ballistic missile (the SS-N-6, or R-27) having the same diameter but two additional meters in length. Since the most advanced variant of the R-27 had an estimated range of 3,000 kilometers,⁹ the U.S. range estimate for the Musudan of 3,200 or more kilometers presumably comes from calculating the additional fuel capability a stretched variant would have. Without an actual flight test of the system, however, high confidence in this estimate and in its implied deployment status is lacking. Indeed,

nongovernmental missile expert Markus Schiller has concluded that the parade version was a mock-up and that "no fact-based and reliable statements can be made about the missile—only statements about the configuration of the presented mock-up are possible."¹⁰

A similar situation exists with regard to six road-mobile ICBM missiles or mock-ups displayed in an April 2012 parade and designated the KN-08 ICBM. Differences between the missiles presented and the absence of structural features required for actual missiles convince nongovernmental experts that the systems presented were clearly mock-ups, again making any performance estimates dubious. The Office of the Secretary of Defense nonetheless provides an estimated range of 5,440 or more kilometers for the untested system it categorizes as "not yet deployed."¹¹ In early 2011, Defense Secretary Robert Gates warned that North Korea was developing a road-mobile ICBM.¹² In March 2013, Director of National Intelligence

Figure 2: North Korea's Long-Range Ballistic Missile/Space-Launch Vehicle Launches

TAEPO DONG-1 SLV

- **Date of Launch:** August 1998
- **Stages:** *Nodong 1st stage*; unknown 2nd stage; solid-fuel 3rd stage
- **Performance:** 3rd stage failed to place satellite in orbit

TAEPO DONG-2 ICBM

- **Date of Launch:** July 2006
- **Stages:** *Clustered Nodong 1st stage*; unknown 2nd stage; unknown 3rd stage
- **Performance:** 1st stage failed after 42 seconds

UNHA-2 SLV

- **Date of Launch:** April 2009
- **Stages:** *Clustered Nodong 1st stage*; probable modified *Nodong 2nd stage*; unknown 3rd stage
- **Performance:** 3rd stage failed

UNHA-3 SLV

- **Date of Launch:** April 2012
- **Stages:** *Clustered Nodong 1st stage*; modified *Nodong 2nd stage*; unknown 3rd stage
- **Performance:** 1st stage failed after 90-100 seconds

UNHA-3 SLV

- **Date of Launch:** December 2012
- **Stages:** *Clustered Nodong 1st stage*; modified *Nodong 2nd stage*; 3rd stage similar to Iran's *Safir SLV 2nd stage*
- **Performance:** Successfully placed satellite in orbit

ENDNOTES

Michael Elleman, "Prelude To an ICBM? Putting North Korea's Unha-3 Launch Into Context," *Arms Control Today*, March 2013; correspondence with author

James Clapper testified that the U.S. government believed North Korea “has already taken initial steps” toward fielding the KN-08. The same month, Joint Chiefs of Staff Vice Chairman Adm. James Winnefeld said that “we believe the KN-08 probably does have the range to reach the United States.”

Yeonpyeong Island. One thing that has changed is South Korea’s tolerance for such actions. It now appears that a future military provocation would be more likely to elicit a robust military retaliation.

North Korea could also employ its hundreds of short- and medium-range ballistic missiles in launching

If North Korea ever develops a credible capability to launch nuclear-tipped ballistic missile warheads against the United States, the certain prospect of retaliation and regime change rather than the uncertain prospect of interception by missile defenses will stay the hands of the leadership in Pyongyang.

Psywar Mission Accomplished?

Until more evidence is forthcoming, it will be impossible to rule out a North Korean hoax or deception about current or imminent ICBM capabilities. Despite any gap between the threatening rhetoric and the reality on the ground, Pyongyang appears to have succeeded in getting a U.S. response commensurate with North Korea actually having a formidable current or imminent nuclear-tipped, long-range ballistic missile capability. In response to North Korea’s over-the-top rhetoric and U.S. application of extreme worst-case analysis, the United States rushed deployment of two Aegis missile defense cruisers to South Korea and a Terminal High Altitude Area Defense unit to Guam and pledged to acquire 14 additional ground-based interceptor missiles in Alaska at a cost of nearly \$1 billion. Although no doubt intended to assure U.S. allies and the American people of Washington’s ability to defend, the rattled response implied instead that Washington lacked confidence in its ability to deter attack.

The Real Threats

The certain threats from North Korea have changed little in recent years: its ability to launch a devastating, short-warning artillery attack on the 10 million inhabitants of the South Korean capital Seoul and its ability to initiate a no-warning military provocation against isolated units or populations. The former is unlikely because North Korea would have to anticipate a devastating response that would seal its fate. Events in the latter category are, unfortunately, far from theoretical. 2010 brought two examples: North Korea’s sinking of the South Korean naval ship Cheonan and the shelling of South Korea’s

conventional attacks on the cities of South Korea and Japan. It could perhaps construct nuclear warheads for a few of these missiles in coming months, but a reliable nuclear delivery capability is probably years away. Nuclear-tipped missiles capable of threatening the U.S. mainland are an even more distant prospect.

The use of nuclear weapons by North Korea would obviously be a high-impact, if low probability, event. It is therefore important to recognize the critical factor preventing any such event. If North Korea ever develops a credible capability to launch nuclear-tipped ballistic missile warheads against the United States, the certain prospect of retaliation and regime change rather than the uncertain prospect of interception by missile defenses will stay the hands of the leadership in Pyongyang.

Talk, Do Not Threaten

Basing policies on the more realistic appraisal of North Korea’s current capabilities provided above and acting accordingly will help avoid making things worse by overreacting to provocative rhetoric and militaristic gestures.

Three additional considerations should guide policy.

- The U.S. government should take care to avoid implicit or explicit threats to overthrow the North Korean regime. The United States can denounce a regime’s behavior and policies without denouncing its very existence. Labeling Pyongyang a charter member of the “axis of evil” in 2002 may have gratified the domestic political base of President George W. Bush, but it did not enhance the prospects for achieving



North Korean leader Kim Jong Un is shown on television overseeing a live fire military exercise on March 20, 2013. As the third generational head of a political dynasty started by North Korea's founder, Kim Il Sung, the younger Kim is believed to have rapidly consolidated his control over the regime since the death of his father. But the policy direction he will set is not yet clear.

U.S. nonproliferation goals. It is likewise unnecessary and counterproductive to make explicit threats of preventive military attack. That *The New York Times* in April could provide a platform for an op-ed urging a preventive strike against North Korea for moving two missiles or mock-ups to the coast for a probable test flight shows how readily U.S. political discussion entertains proposals to use force outside the constraints of international law. That such calls for military attacks reciprocate the tone adopted by North Korea's own verbal barrage is hardly a recommendation.

- The U.S. government should engage diplomatically with North Korea and with its neighbors whenever possible, if for no other reason than to acquire information. As veteran U.S. diplomat James Dobbins points out, negotiations do not always resolve the issues being negotiated, but they always yield information about the negotiating partner. The dearth of information on the government of Kim Jong Un is breathtaking. Outsiders have so little information about what is going on in Pyongyang that North Korean experts are divided on whether the latest crisis was motivated more by domestic political maneuvering or by perceptions of security threats. The only American who has spent significant time with North Korea's leader is a former basketball player. Yet, the United States treats diplomatic engagement as a reward for good behavior. It lists prerequisites for

the resumption of talks and implies that establishing formal diplomatic relations and negotiating an end to the Korean War would be the last step taken in seeking to resolve differences over nuclear and missile issues.

- The United States should drop denuclearization as a prerequisite to resuming talks with North Korea, focusing instead on confidence-building measures, such as freezes and inspections, which may be attainable in the midterm. The 1994 Agreed Framework, which yielded an eight-year freeze on North Korea's plutonium production at little cost, was a significant nonproliferation achievement even if it was ultimately unsuccessful at ending North Korea's nuclear program. Likewise, North Korea's seven-year moratorium on long-range missile testing delivered real security benefits to the United States and its allies. Incremental steps toward nuclear and missile constraints do not imply an abandonment of the ultimate goal, but may actually open a path to reaching it that is not yet visible.

Conclusion

Dealing with North Korea is surreal and dangerous. The first step in dealing with this most difficult of interlocutors is to objectively assess the nature of the threat it poses and the political-military balance existing in Northeast Asia. This assessment begins with a recognition that North Korea is a failed state under most criteria. It is nonetheless a centralized, martial society that has succeeded in controlling its population. Moreover, it has succeeded in acquiring rudimentary nuclear and ballistic missile capabilities and has proliferated some of these technologies to other states. Although it is unlikely at present to be able to credibly threaten nuclear-tipped ballistic missile attacks against its neighbors, it could eventually do so and may even pose a future nuclear missile threat to the United States. Curbing North Korea's nuclear and missile programs and deterring their use and proliferation should be of the highest priority, meriting active diplomatic engagement with North Korea and its neighbors.

ENDNOTES

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