

Impact of Turkey's Space Program on the Security Environment in CENTCOM's AOR

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Key Points

- Turkey announced its National Space program for the next 10 years including sending Turkish citizens into space.
- The Turkish space program is the largest and most ambitious project in modern Turkish history.
- There is some possibility that the Turkish space program links to the ballistic missile program which seeks to increase the range of current missiles.
- Any Turkish activities in building long range ballistic missiles could lead to an arms race in the Middle East.

Definitions / Introduction

Over the last decade, Turkey has invested in its space ambitions, resulting in the strengthening of its space-related know-how and strengthening its position within the global arena. In 2011, RASAT, and 2012, Gokturk 2, were launched into orbit. The two Earth Observation (EO) satellites were designed and developed in Turkey. With the capacity to deliver far more in terms of the global satellite market, Turkey went on to establish its state-of-the-art space systems Assembly, Integration, and Testing (AIT) center in the capital city of Ankara. The center has been operational since 2015 and supported Turkey's mid-size satellite projects.

To add to its arsenal of space capabilities, Turkey has also built its own communications satellite, Turksat 6A, which was the culmination of local technology powerhouses Tubitak Space, Turkish Aerospace, Aselsan, and CTECH, as well as state-owned satellite operator Turksat. Turksat 6A is scheduled to be launched in 2022. The Turksat 6A marks the biggest space-related milestone in the country's history, and was the bright backdrop for the establishment of the Turkish Space Agency in December of 2018. The Turkish Space Agency is tasked with the preparation and implementation of the National Space Program.¹

The state-owned rocket and missile manufacturer Roketsan announced it had successfully test-launched a sounding rocket into space in November 2019.² On February 28, 2021, Turkey's Industry and Technology Minister, Mustafa Varank, announced Delta V Space Technologies, is expected to develop authentic hybrid engine

¹ Adrienne Harebottle, "Space Ambitions: Turkey Prepares to Compete and Capture," *Via Satellite*, June 14, 2020, <https://www.satellitetoday.com/innovation/2020/06/18/space-ambitions-turkey-prepares-to-compete-and-capture/> (accessed March 1, 2021).



² Metin Gurcan, "Turkey's space program not yet ready for takeoff," *Al-Monitor*, November 16, 2020, <https://www.almonitor.com/originals/2020/11/turkey-space-program-roketsan-successfully-launched-rocket.html#ixzz6q00fAca>, (accessed February 20, 2021).

technology for the country's space mission to the moon. Rocket engines, engine sub-technologies and launch sub-structures are being developed in Turkey. For this to be achieved, the company is aiming at developing and converting competitive launch systems, stage propellant engines, and engines that can operate in space.

Mustafa Varank spoke on future development by said the company is planning to fire its rocket this summer. "We expect Delta V to develop engines that will launch our moon mission," the minister said.³ Overall, it seems that establishing the Turkish Space Agency was a necessary step toward the future development of a ballistic missile program.

'We will go to Moon in 2023': Turkish President Erdogan

Introductory meeting of Turkey's national space program was held at Bestepe National Congress and Culture Center in the capital Ankara with the attendance of President Recep Tayyip Erdogan

Turkish President
RECEP TAYYIP ERDOGAN



TUA Turkish Space Agency

10 TARGETS OF TURKEY'S NATIONAL SPACE PROGRAM FOR NEXT 10 YEARS

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|---|---|---|---|--|
| <p>TARGET 1</p> <p>Making the first contact with the Moon in Republic of Turkey's centennial year</p> | <p>TARGET 2</p> <p>Creation of a trademark on new-generation satellite development capable of competing with the world</p> | <p>TARGET 3</p> <p>Developing a regional positioning and timing system</p> | <p>TARGET 4</p> <p>Accessing to space and establishment of a space port</p> | <p>TARGET 5</p> <p>Increasing competitiveness in space by investing in space weather, meteorology</p> |
| <p>TARGET 6</p> <p>Carrying Turkey a step forward in astronomical observations and follow-up of space objects from the Earth</p> | <p>TARGET 7</p> <p>Further development of space industry economy system</p> | <p>TARGET 8</p> <p>Forming a Space Technology Development</p> | <p>TARGET 9</p> <p>Improving effective and competent human resources in the field of space</p> | <p>TARGET 10</p> <p>Sending a Turkish citizen to space with a scientific mission</p> |

Figure 1. Targets of Turkey's National Space program for next 10 years.

³ "Turkish company set to develop hybrid rocket tech for Turkey's moon mission," *TRT World*, March 1, 2021, <https://www.trtworld.com/magazine/turkish-company-set-to-develop-hybrid-rocket-tech-for-turkey-s-moon-mission-44627> (accessed March 1, 2021).

Space ambitions

Unveiling Turkey's 10-year space program in February 9, 2021, President Erdogan announced that the first goal of the program was to reach with the moon in 2023, the 100th anniversary of the foundation of the Turkish republic.⁴ The space program outlines Turkey's 10-year vision, strategies, objectives, and projects on space policies. It consists of 10 targets and two stages (figure 1). The first stage, a rough landing would be made on the Moon with a national and authentic hybrid rocket that will be launched into orbit at the end of 2023 through international cooperation. At the second stage in 2028, the initial launching, which carried our probe to orbit, will be made through Turkey's own rockets.⁵

Despite Turkey's successes in creating its own high-tech products and its political disagreements with the United States, to a certain extent, Ankara understands the need for cooperation with American companies. In particular, in cooperation with SpaceX, Ankara launched on January 8, 2021 the next-generation Turksat 5A communications satellite, which is used for both civilian and military purposes.

To broaden relations, Tesla Inc. and Space Exploration Technologies Corp. founder Elon Musk held a phone call with Turkish President on January 27, 2021 to discuss cooperation in space technology.⁶ Recently, Turkey expressed its comprehensive plans to cooperate with Pakistan and Azerbaijan in the field of space technology. Three countries recently entered into a new phase of a strategic partnership with the visits of Turkey's Foreign Minister Mevlut Cavusoglu and Azerbaijan's Foreign Minister Jeyhun Bayramov to Islamabad in February, 2021.

Turkish Minister of Industry and Technology Mustafa Varank was quoted as saying that Turkey is at the signing stage of agreements with space agencies of Pakistan and Azerbaijan to improve collaboration in the use of space for civilian purposes which requires international cooperation. It hopes that extended space collaboration with Turkey will pay its dividends to Pakistan for meeting the goals of Pakistan's Space Program 2047 and the country's future scientific requirements.⁷

Along with the construction of the Istanbul Shipping Canal, the space program is the largest and most ambitious project in modern Turkish history. There is some evidence that Turkish space program links to ballistic missile program which needs to increase a range of current missiles.

Ballistic missile program

Consequently, Turkey's ambitious new space program could presumably be a cover to circumvent international regulations and acquire the potential to develop long-range ballistic missiles. From the late-1980s, and in response to the rapid spread of ballistic missiles in her neighborhood, Turkey has opted to add a symmetrical ingredient to her traditional policy of asymmetrical response, and began developing and deploying her own ballistic missiles.

⁴ Tuba Sahin and Ali Murat Alhas, "Turkey unveils national space program," *Anadolu Agency*, February 9, 2021, <https://www.aa.com.tr/en/science-technology/turkey-unveils-national-space-program/2139378> (accessed March 1, 2021).

⁵ Ibid.

⁶ Koc Cagan, "Elon Musk and Erdogan Discuss Space Technology Cooperation," *Bloomberg*, January 27, 2021, <https://www.bloomberg.com/news/articles/2021-01-27/elon-musk-and-erdogan-discuss-space-technology-cooperation> (accessed March 1, 2021).

⁷ Sabir Shahtakhti, "Minister: Turkey intends to cooperate with Azerbaijan in the field of space," *Azertag*, February 11, 2021, https://azertag.az/en/xeber/Pakistan_Azerbaijan_Turkey_space_cooperation (accessed March 3, 2021).

Erdogan's desire to develop long-range missiles dates back to early 2012, when the president of Turkey's Scientific and Technological Research Council (TÜBİTAK) announced that then-Prime Minister Erdogan had asked them to start developing missiles with a range of 2,500 kilometers.⁸ According to military classification, this meant that Turkey was interested in developing medium-range ballistic missiles (ICBMs) with a range of 1,000 to 3,000 kilometers.

The deputy head of the Defense Industry Directorate, the highest planning and procurement body for the defense industry, confirmed the start of such developments in September 2012.⁹ In November 2015, Erdogan himself, in a television interview, announced his desire to develop longer-range missiles. Nowadays, Turkey has Bora-1 a tactical ballistic missile based on a Chinese design (the export version is called Khan) which entered the military's inventory in 2017 and has a range of 280 kilometers. A work on the Bora-2 program has already begun and still is not finished.

The range of the planned Bora-2 remains a political and military secret. Turkey is a signatory to the Missile Technology Control Regime, which prohibits missiles with a range longer than 300 kilometers. The MTCR is an informal, non-treaty association of governments sharing common interests in the nonproliferation of missiles, UAVS and related technologies.¹⁰ Technically, unless Ankara opts for adding another stage to Bora, which would mark a burdensome difficulty in terms of know-how and defense economics, it would be safe to assume that the Bora family will remain a short-range system (meaning an operational range of less than 1,000 km).

By comparison, Iran's Sejil 2 solid-fuel ballistic missile has a two-stage design (independent rocket stages with engine and propellant), setting its operational range at around 2,000 km which places it in the medium-range ballistic missile category (operational range between 1,000 km and 3,000 km).

An educated guess suggests that Turkey would focus on minimizing the launch-cycle and boosting precision and maneuverability (new generation ballistic missiles, such as the Russian SS-26 Iskander, can follow unpredictable trajectories and homing maneuvers to strengthen missile defenses).

Another area of improvement might be to reduce the radar cross-section of Bora by altering its design to prevent it being easily detected by early warning systems. Although such modernization packages might furnish the Turkish Armed Forces with an even more lethal battlefield asset, it would not hint at a program to produce delivery means for nuclear payloads, as there is no visible work on nuclear warhead design. There are no indications that the Bora line will be adjusted for WMD delivery and, so far, no effort to develop an airburst mode warhead detonation during the tests (airburst above ground level is preferred in ballistic missiles used in WMD dissemination).¹¹

⁸ "Erdogan's space program may be cover to hide Turkey's ambition to develop missile technology," *Nordic Monitor*, February 26, 2021, <https://nordicmonitor.com/2021/02/moon-travel-or-missile-trouble-what-is-behind-erdogans-ambitious-space-program/> (accessed March 1 2021).

⁹ "BMC'ye 'Kirpi' uyarısı," *Milliyet*, September 27, 2012, <https://www.milliyet.com.tr/ekonomi/bmcy-e-kirpi-uyarisi-1603169?kisa-haber> (accessed February 25, 2021).

¹⁰ Burak Ege Bekdil, "Turkey seeks to expand range of locally built missile," *Defensenews*, May 2, 2018, <https://www.defensenews.com/land/2018/05/02/turkey-seeks-to-expand-range-of-locally-built-missile/> (accessed March 2, 2021). ¹¹ Can Kasapoğlu, "Military Policy, Techno-Nationalism Trends and Defence Industrial Capabilities," *SWP*, October 2019, <https://www.swpberlin.org/10.18449/2019C38/> (accessed March 2, 2021).

Analysis

The Turkish government has so far avoided questions regarding the cost of the program and how it will proceed. According to Middle East Eye, the Turkish space program will cost upwards of \$1 Bn and would require building a rocket launch site in Somalia. Somalia was reportedly chosen for scientific reasons, such as its proximity to the equator, as well as for security reasons.¹¹ *Historical note: France also considered using Somalia to host a spaceport in the 1960s due to its close proximity to the equator, which makes it more suitable for rocket launches.*

Turkey has been beset by economic stress for several years, and Erdogan's popularity ratings in the country are seen as low and falling. The astronomical costs of a space program such as that announced will not be easily borne by the state budget. But supporters say the project will deliver technical and highly specialized jobs, reducing the brain drain abroad of scientists and researchers.¹²

According to Sitki Egeli, assistant professor of the Department of Political Science and International Relations, İzmir University of Economics, a nuclear non-weapon state and a long-time NATO ally like Turkey developing an interest in MRBM capability constitutes enough of an anomaly, for which a good strategic explanation has so far been lagging. In this respect, strict adherence to all regional and global nonproliferation initiatives and arrangements continues to be a mainstay of Turkey's foreign and security policies.

For over six decades, Turkey has distanced itself from weapons of mass destruction (WMD) and their delivery means out of her conviction that such capabilities resulted in more competition and insecurity than being conducive to peace and stability. Without a doubt, the US and NATO's extended deterrence guarantees – to include nuclear warheads deployed on Turkish soil– encouraged and greatly facilitated Turkey's spotless commitment to such a noble cause. Among the full set of nonproliferation and export control arrangements of which Ankara is a party are the Missile Technology Control Regime (MTCR) and the Hague Code of Conduct (HCOG), both of which aim specifically at restraining the spread and/or use of ballistic missiles.^{13,14}

The Turkish expert of the Carnegie Endowment for International Peace, Sinan Ülgen, said that though most states that want a nuclear weapon can get one through determined effort, the fact remains that most choose not to proliferate. Turkey is no exception. Not even the prospect of a nuclear-armed Iran is likely to push Ankara to develop its own nuclear weapons. The only circumstance where such a scenario would acquire a degree of likelihood is a breakdown in Turkey's security relationship with the United States.¹⁵

In September 2019, Turkish President Tayyip Erdogan said it was unacceptable for nuclear-armed states to forbid Ankara from obtaining its own nuclear weapons, but did not say whether Turkey had plans to obtain them. In fact, Turkey signed the Nuclear Nonproliferation Treaty in 1980, and has also signed the 1996 Comprehensive Nuclear Test-Ban Treaty, which bans all nuclear detonations for any purpose. Nevertheless, Erdogan hinted that he wanted the same protection for Turkey as Israel.¹⁶

¹¹ Ragıp Soylu, "Revealed: Turkey plans spaceport in Somalia for \$1bn moon mission," *Middle East Eye*, February 18, 2021, <https://www.middleeasteye.net/news/turkey-space-programme-somalia-base-cost-revealed> (accessed March 2, 2021).

¹² "Erdogan's announcement of Turkish space programme short on budget details," *BNE IntelliNews*, February 10, 2021, <https://www.intellinews.com/erdogan-s-announcement-of-turkish-space-programme-short-on-budget-details-202624/> (accessed March 1, 2021).

¹³ Sitki Egeli, "Turkey Embarks Upon Ballistic Missiles: Why and How?" *Uluslararası İlişkiler*, Volume 14, No. 14, 2017, pp. 3-22.

¹⁵ Sinan Ülgen, "Turkey and the bomb," *The Carnegie*, February 2012, https://carnegieendowment.org/files/turkey_bomb.pdf (accessed March 1, 2021).

¹⁶ Ece Toksabay, "Erdogan says it's unacceptable that Turkey can't have nuclear weapons," *Reuters*, September 4, 2019, <https://www.reuters.com/article/us-turkey-nuclear-erdogan-idUSKCN1VP2QN> (accessed March 1, 2021).

In his address to the UN General Assembly in September 2019, President Erdogan said that nuclear weapons should be completely banned or available to all states. Today, there is a noticeable amount of disagreement between the United States and Turkey. Perhaps the most consistent is Turkey's acquisition of the Russian S-400 air defense system, which has led to the country's exclusion from the F-35 joint strike fighter program and the imposition of sanctions under the Countering America's Adversaries Through Sanctions Act (CAATSA).

While many analysts dismissed Erdogan's declaration as more rhetorical posturing designed to advance Turkey's status in the regional security architecture, the president's remarks reveal Turkey's perception of its own deepening strategic vulnerability vis-a-vis its regional rivals. Lacking the strategic weapons system to deter Iran, Saudi Arabia, or Israel, Erdogan's tough talk signals a shift in its nuclear policy that will likely be revealed in the advancement of its ballistic missile program.¹⁷

With Turkey now in open confrontation with its NATO allies, and having gambled and won a bet that it could conduct a military incursion into Syria and get away with it, Erdogan's threat takes on new meaning. If the United States could not prevent the Turkish leader from routing its Kurdish allies, how can it stop him from building a nuclear weapon or following Iran in gathering the technology to do so?¹⁸

According to a former deputy secretary of defense John J. Hamre, Erdogan like the Iranian authorities needs to show that he is on the two-yard line, that he could get a weapon at any moment. Turkey has the makings of a bomb program: uranium deposits and research reactors. It is also building its first big power reactor to generate electricity with Russia's help. That could pose a concern because Mr. Erdogan has not said how he would handle its nuclear waste, which could provide the fuel for a weapon.¹⁸

Conclusion

In the short term, the Turkish defense technological and industrial base lacks the capacity to produce a two-stage, medium-range ballistic missile, which would be a meaningful asset for building a nuclear deterrent with real regional impact, and arm it with an advanced, miniaturized nuclear warhead.

Besides, any serious violations of the non-proliferation regimes, to which Turkey has committed itself, might lead to devastating economic repercussions and possibly the collapse of Turkey's peaceful nuclear energy plans.¹⁹ It is doubtful that Erdogan could put a weapon together in secret. Any public move to reach for one would provoke a new crisis. His country would become the first NATO member to break out of the treaty and independently arm itself with the ultimate weapon.

¹⁷ Michaël Tanchum, "Erdogan talks tough on nuclear weapons as Turkey goes ballistic," *Turkish Policy Quarterly*, November 18, 2019, <http://Turkishpolicy.Com/Blog/40/Erdogan-Talks-Tough-On-Nuclear-Weapons-As-Turkey-Goes-Ballistic> (accessed March 1, 2021). ¹⁸ David E. Sanger and William J. Broad, "Erdogan's Ambitions Go Beyond Syria. He Says He Wants Nuclear Weapons," *The New York Times*, October 20, 2019, <https://www.nytimes.com/2019/10/20/world/middleeast/erdogan-turkey-nuclear-weapons-trump.html> (accessed March 1, 2021).

¹⁸ Ibid.

¹⁹ Can Kasapoğlu, "Military Policy, Techno-Nationalism Trends and Defence Industrial Capabilities," *SWP*, October 2019, <https://www.swp-berlin.org/10.18449/2019C38/> (accessed March 2, 2021).

Recommendations for US / USCENTCOM

- Closely monitor the expansion of Turkish space program regarding possible development of long-range ballistic missiles.
- Provide appropriate assistance for Turkish government to avoid possible cooperation between Ankara and Moscow as well as Iran and China in space field.