

# MP-IDSA *Commentary*

## India–Japan Agreement on UNICORN Masts: A Key Milestone in Defence Cooperation

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### **S***ummary*

The November 2024 India–Japan UNICORN masts deal for fitment on-board Indian Navy ships ushers in a new era of bilateral defence cooperation.

India and Japan signed a Memorandum of Implementation (MOI) on 15 November 2024 for the co-development of Unified Complex Radio Antenna (UNICORN) masts.<sup>1</sup> This innovative technology is for fitment on-board Indian Navy ships. While Japan will provide advanced design expertise, India will focus on integration and co-production. The agreement symbolises the deepening of the defence ties between India and Japan.

The agreement is particularly notable as it makes India the second Asian nation to receive Japanese defence technology, after the Philippines in November 2023.<sup>2</sup> An air surveillance radar system was delivered to the Philippine Air Force under a 2020 contract between the Department of National Defense of the Republic of the Philippines and Mitsubishi Electric Corporation. These developments are in tandem with Japan’s gradual departure from its post-Cold War pacifist stance, which is also reflected in its increasing defence budget and relaxation of restrictions on its defence technology exports.

## UNICORN’s Technological Strengths

With its stealth technology and radio frequency functioning, this antenna is one of the best-quality weapon-grade antennas in the world. These will be co-produced by Bharat Electronics Limited (BEL).<sup>3</sup> The antenna, also known as Nora-50, was developed by Japan’s NEC Corporation, Sampa Kogyo K.K. and Yokohama Rubber Co. Limited.<sup>4</sup> It is currently installed on the mast of Mogami-class frigates of the Japan Maritime Self-Defence Forces (JMSDF).

### UNICORN Mast on Mogami-Class Frigate



Source: “[New Warship Antenna Systems and Upgraded 2008 Security Pact: How India and Japan Plan to Fight Terrorism](#)”, *Indian Defence News*, August 2024.

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<sup>1</sup> “[Memorandum of Implementation Signed with the Government of Japan for Co-Development of Unicorn Masts for the Indian Navy](#)”, Press Information Bureau, Ministry of Defence, Government of India, 16 November 2024.

<sup>2</sup> “[Japan, Philippines Sign Defence Pact in the Face of Shared Alarm Over China](#)”, *The Hindu*, 8 July 2024.

<sup>3</sup> Ritu Sharma, “[India, Japan to Develop ‘Stealth Antenna System’ for Indian Navy Warships; Ink Memorandum of Intent](#)”, *Eurasian Times*, 17 November 2024.

<sup>4</sup> “[The Transfer of the Air Surveillance Radar Systems to the Philippines](#)”, Ministry of Defense of Japan, 2023.

According to Yokohama Rubber, it is a system aimed at improving stealth by consolidating various antennas previously attached to multiple masts on the deck into a single support.<sup>5</sup> This unique innovation enhances the stealth capabilities and operational efficiency of ships by consolidating multiple antennas, typically attached separately to a mast, into a single radar dome (radome).

The Indian Navy currently uses the BEL-supplied Advanced Composite Communication System (ACCS), a fourth-generation data and voice-integrated system for external communication.<sup>6</sup> Even though these are reliable, the sophisticated stealth functions in the Nora-50 antennas offer greater security, which is extremely crucial for dealing with the digitally vulnerable environment of the contemporary battlefield. The UNICORN antenna represents a state-of-the-art achievement in terms of space and maintenance efficiency through its consolidated design which incorporates multiple antennas into a single structure.<sup>7</sup>

The operational efficacy of the Indian Navy in the Indo-Pacific, meanwhile, can be significantly increased by the UNICORN system’s sophisticated capabilities. While keeping a low radar cross-section (RCS) by overcoming the mutual interference between the closely packed antennae, these composite antennas will provide better communication capabilities in a period when marine domain awareness and naval presence are very essential.<sup>8</sup> By reducing the cross-sectional visibility of the mast, UNICORN significantly minimises the electronic signatures of warships, making them harder to detect. Improved stealth features will enable the navy to be better equipped to carry surveillance missions and address maritime security threats.

Additionally, ships in open waters are at risk of lightning bolts. Therefore, an effective lightning diverter strip has been installed across the single mast surface to ward off potential harm to the ship. The Fibre Reinforced Plastic (FRP) radome in this composite antenna provides enhanced system maintainability and also helps with weather resistance. The entire Unicorn antenna can be replaced as a single item to enhance repairs. The damaged antenna is fixed on-site and kept on hand as a ‘ready-use’ spare. The TACAN (Tactical Air Navigation) antenna design, which was moved from the topmost mast position to the lower end of the UNICORN antenna and changed from the traditional disc shape to a hollow doughnut shape, is another technological accomplishment of this antenna.<sup>9</sup>

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<sup>5</sup> Dinakar Peri, [“India and Japan Signed an Agreement for UNICORN Masts for Indian Naval Warships”](#), *The Hindu*, 16 November 2024.

<sup>6</sup> Inder Singh Bisht, [“Japan to Export ‘Unicorn’ Naval Ship Stealth Antenna to India”](#), *The Defense Post*, 5 September 2024.

<sup>7</sup> Ritu Sharma, [“Japan OKs ‘Path Breaking’ Mast Tech for Indian Navy; Tokyo’s New Export Policy Makes India 2nd Beneficiary”](#), *Eurasian Times*, 13 March 2024.

<sup>8</sup> [“India-Japan Defense Partnership Takes a Leap: Unicorn Antenna Co-Development”](#), India Defence Research Wing, 26 November 2024.

<sup>9</sup> [“Enhanced Stealth for Indian Navy with Pathbreaking Japanese Communication Antenna”](#), *Financial Express*, 23 November 2024.

## **Make in India and Defence Manufacturing**

The deal between BEL and the Japanese companies to co-produce the antennas marks an important step in strengthening India’s defence capabilities. The agreement is in sync with the objective of the ‘Make in India’ initiative in the defence sector.<sup>10</sup> This will enhance the production capacity and quality and have an overall positive impact on the Indian defence industry landscape. Further, it will facilitate the advancement of skills and opportunities for networking between small retailers and suppliers.

Technology sharing and co-production initiatives bolster indigenous production. India has been heavily reliant on Russian defence equipment. This has resulted in vulnerabilities in terms of the availability of spare parts, repairs, upgrades and diplomatic leverages. The antenna agreement with Japan not only unlocks new procurement sources and avenues for defence collaborations but also strengthens the bond with a reliable democratic partner, sharing the vision of a free, stable and prosperous global order.<sup>11</sup>

Moreover, the global geopolitical scenario and sanctions on Russia following the Ukraine conflict make this diversification attempt particularly timely. In addition to the agreement with Japan, India has also taken steps to enhance defence cooperation with other nations such as US and France.<sup>12</sup> By expanding its options for defence-related procurements to include technologically advanced and like-minded nations, India is on the path to greater strategic autonomy as well as bargaining power in the international defence market.

## **Prospects**

The foundation of defence industry cooperation between India and Japan was initiated in 2015, when both nations signed the transfer of defence equipment and technology agreement.<sup>13</sup> The UNICORN masts deal ushers in a new era of defence cooperation in the India–Japan bilateral relationship and strengthens India's domestic defence capabilities. India–Japan collaboration is essential to bolster Indo-Pacific security framework and establish a more stable and equitable regional order.

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<sup>10</sup> [“New Warship Antenna Systems and Upgraded 2008 Security Pact: How India and Japan Plan to Fight Terrorism”](#), *The Economic Times*, 21 August 2024.

<sup>11</sup> [“Japan-India Partnership in a New Asian Era: Strategic Orientation of Japan-India Global Partnership”](#), Ministry of Foreign Affairs of Japan.

<sup>12</sup> Sanjeev R. Sen, [“India Looks West for Cutting-Edge Weapons to Reduce Reliance on Russia”](#), *Business Standard*, 3 December 2024.

<sup>13</sup> [“Agreement Between the Government of Japan and the Republic of India Concerning Transfer of Defence Equipment and Technology”](#), Ministry of Foreign Affairs of Japan, 2015.

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