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## THE GROWL OF THE ‘GROWLER’: ‘TRIUMF’ FOR THE IAF

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Image 1: S-400 Triumph (SA-21 Growler) Long Range Surface to Air Missile loaded on the Almaz TEL (Transporter Erector Launcher) towed by a 6x6 BAZ vehicle.

Source: Air Power Australia <http://www.ausairpower.net/APA-S-400-Triumf.html>

Russian President Vladimir Putin’s recent visit to India (October 15-16, 2016) led to India signing some major defence deals which included the supply of five battalions of Russian S-400 long range surface to air missiles (LR-SAM) at a cost of \$5.5 billion (Rupees 39,000 crores)<sup>1</sup>. The Russian President was in India to attend the BRICS Summit at Goa and India-Russia

agreements were finalised in bilateral meetings on the sidelines of the BRICS Summit. S-400 – also known as ‘Triumf’ in Russia and SA-21 ‘Growler’ by NATO – is amongst the most lethal long range surface to air missile systems in the world. S-400 has a tracking range of 600 km and can engage targets up to a range of 400 km at a scorching speed of 13.8 Mach (17000km/h)<sup>2</sup>. Deliveries of the S-400 to India are not likely to

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start before 2019-2020 as Russian manufacturing plants are busy meeting their own requirements and the demand from China<sup>3</sup>. At a time when Indian Air Force (IAF) fighter aircraft strength is down to 33 squadrons<sup>4</sup> due to retiring of old aircraft and delays in new inductions, the acquisition of S-400 missiles will be a major shot in the arm for the IAF. Its long range and advanced capabilities will be a nightmare for both the Pakistan Air Force (PAF) and Chinese Air Force (also known as People's Liberation Army Air Force – PLAAF).

The S-400 system is designed to intercept all types of airborne targets – aircraft, UAVs, cruise missiles and ballistic missiles. Its long range makes it a theatre area air defence weapon with anti ballistic missile capabilities. Ballistic missiles can be engaged up to a distance of 60 km and travelling at speeds of approximately 4800 m/s (14.1 mach)<sup>5</sup>. It is claimed that the system is also capable of destroying stealth aircraft<sup>6</sup>. The anti ballistic missile capabilities of the S-400 will provide India a ballistic missile defence (BMD) shield to counter any threats from Pakistan's or China's short range and medium range ballistic missiles. The system can fire three types of missiles - the first one is the very long range missile for targets at distances of 400 km; the second one has a maximum range of 250 km; and the third one is for targets at a maximum distance of 120 km<sup>7</sup>. S-400 is an upgraded variant of the 200 km range S-300 PMU2 SAM system and was initially labelled as S-300 PMU3.

China has also signed a deal with Russia in 2014 for supply of six battalions for S-400 missiles and these will be delivered from 2017 onwards<sup>8</sup>. Russia has also deployed S-400 missiles in Syria to protect its air base there in the ongoing civil war.

S-400 missile system has a modular design which basically comprises of the central control station; fire control units with their acquisition and fire control/engagement radars; missile launchers on Transporter Erector Launcher (TEL) vehicles with each TEL carrying four missiles; and the support vehicles for missile storage, testing and maintenance equipment. The central command station has the Big Bird 91N6E surveillance radar. This radar is an improvement on the earlier 64N6E Big Bird series radar for the S-300 missile system. It is a fully digital system with more peak power than the earlier versions to cater for the longer range missiles<sup>9</sup> and is designed to pick up aircraft, cruise missiles and ballistic missiles. It has a large 2GHz band reflective phased array antenna with boom mounted feeds, in a dual sector back to back arrangement. The large antenna gives it good antenna gain with low side lobes. The maximum detection range is about 600 km.<sup>10</sup> The 'Growler' is a powerful weapon system with multiple capabilities which can be used for area defence against multiple airborne threats. The phased array radars in the system are difficult to jam due to their agile beam steering, high antenna aperture, very low side lobes, high power,

monopulse angle tracking and other ECCM features. Normal standoff jammers and self-protection jamming suites are not likely to be effective against the S-400.

Out of the five S-400 battalions being acquired by IAF, one can be deployed for defence of the capital Delhi, three on the Pakistan border and one in the East against China. These deployments can, of course, be altered to meet changing threat perceptions. S-400 is a highly mobile system with a deployment time of just 5 minutes and can be swiftly moved from one theatre to another by road, rail or air. While the S-400 is a defensive missile its long range can be used in an offensive role by deploying it along the Pakistan border and threatening Pakistani aircraft inside their territory.

S-400 will be a serious threat to Pakistan Air Force (PAF) AWACS, Tankers, fighter aircraft and other ISR aircraft operating close to the border within the S-400 missile envelope. PAF AWACS will be forced to operate from deeper inside Pakistan thereby negating their radar cover in Indian airspace.

The induction of S-400 will greatly enhance IAF operational capabilities and will cushion the impact of reduction in fighter aircraft strength. PAF and PLAAF will have to factor in the S-400 “growler’s growl” in any future conflict against India.

*(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily*

*reflect the position of the Centre for Air Power Studies [CAPS])*

#### Notes

<sup>1</sup> Rajat Pandit, “\$10.5bn defence pacts inked with Russia,” *Sunday Times of India*, October 16, 2016, p. 14.

<sup>2</sup> Rakesh Krishnan Simha, “How Russia’s S-400 makes the F-35 obsolete,” [http://in.rbth.com/blogs/2015/03/11/how\\_russias\\_s-400\\_makes\\_the\\_f-35\\_obsolete\\_41895](http://in.rbth.com/blogs/2015/03/11/how_russias_s-400_makes_the_f-35_obsolete_41895), accessed on October 18, 2016.

<sup>3</sup> Manu Pubby, “India in process of inducting a range of systems to defend the skies,” *The Economic Times*, October 14, 2016, <http://economictimes.indiatimes.com/news/defence/india-in-process-of-inducting-a-range-of-systems-to-defend-the-skies/articleshow/51366173.cms>, accessed on October 18, 2016.

<sup>4</sup> Express News Service, “IAF: Don’t have the numbers to fully fight two-front war,” *Indian Express*, March 11, 2016, <http://indianexpress.com/article/india/india-news-india/do-not-have-the-numbers-to-fully-fight-two-front-war-iaf/>, accessed on October 18, 2016.

<sup>5</sup> “Jane’s Land Based Air Defence Systems 2013-2014”.

<sup>6</sup> “Jane’s Land Based Air Defence Systems 2013-2014”.

<sup>7</sup> “Factbox: Russia’s S-400 Air Defense Missile System,” *Moscow Times*, November 26, 2014, <https://themoscowtimes.com/articles/factbox-russias-s-400-air-defense-missile-system-41765>, accessed on October 18, 2016.

<sup>8</sup> Rakesh Krishnan Simha, “How Russia’s S-400 makes the F-35 obsolete,” [http://in.rbth.com/blogs/2015/03/11/how\\_russias\\_s-400\\_makes\\_the\\_f-35\\_obsolete\\_41895](http://in.rbth.com/blogs/2015/03/11/how_russias_s-400_makes_the_f-35_obsolete_41895), accessed on October 18, 2016.

<sup>9</sup> Dr Carlo Kopp, “S-400/SA-21 Triumpf Self Propelled Air Defense System,” *Air Power Australia*, January 27, 2014, <http://www.ausairpower.net/APA-S-400-Triumpf.html#mozTocId952598>, accessed on October 18, 2016. This article gives a very good description of the S-400 missile system.

<sup>10</sup> Dr Carlo Kopp, “Search and Acquisition Radars,” *Air Power Australia*, <http://www.ausairpower.net/APA-Acquisition-GCI.html#mozTocId420074> accessed on October 18, 2016.

