



RUSSIA CLEARS S-400 LONG RANGE SAM SALE TO CHINA

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Image: S-400 Triumph (SA-21) Surface to Air Missile in vertical launch position with its TEL vehicle (Transporter Erector Launcher). Photo Source : Army Recognition

Source: http://www.armyrecognition.com/russia_russian_missile_system_vehicle_uk/s-400_triumph_triumf_sa-21_growler_5p85te2_long_range_surface_air_missile_system_defense_data_sheet.html

According to reports in the media President Vladimir Putin of Russia has agreed to the sale of Russia's lethal long range surface to air missile S-400 Triumfⁱ (NATO code name SA-21 Growler). The Chinese have been trying to purchase S-400 missiles since last three years but the Russians were reluctant because their priority was to first to meet their own domestic requirements and secondly they were wary of Chinese tendency to reverse engineer and make illegal copies. The S-400 missile system was inducted into domestic service in 2007 and deliveries for the Russian military are still in progress. China is not likely to get deliveries of S-400 units at least till 2016 due to production delays in Russian defence industry and the requirement of meeting domestic demand first. The fact that Putin has now agreed to the sale of these missiles indicates that Russia is looking for China's support in the Ukraine crisis. Russia is having problems with USA and European Union on its annexation of Crimea from Ukraine. Any tension between the Russians and the West raises the importance of China as it gives China a chance to play big brother. While China's pro Russia leanings are known they did a fine balancing act and abstained from the voting, against Russia, on Crimea in the UN Security Council. It is in this context that Putin seems to have acquiesced to the sale. The Russians may also have made the Chinese agree to some of their intellectual property concerns.

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Procurement of S-400 units will further strengthen China's robust air defence system. According to US DOD "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2013", PLA Air Force has one of the "largest" inventory of advanced long range SAMs in the world. China already has in its inventory the Russian S-300 series long range SAM with a range of 200 km and in addition has its own indigenous 120 km range HQ-9.

The S-400 has an engagement range of 400 km and is designed to intercept all types of airborne targets – aircrafts, UAVs, cruise missiles, 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 5000 m/s (14.7 mach)ⁱⁱ. It is claimed that the system is also capable of destroying stealth aircraftⁱⁱⁱ. Anti stealth capability of S-400 in fact is possible only if it is integrated with a passive detection system like the Ukrainian Kolchuga. According to one report the S-400 system has been integrated with the Vega/Orion passive emitter locating system^{iv}. This further enhances the operational capabilities of this very capable air defence missile.

The claim of 400 km engagement range is possible only against large RCS (radar cross section) targets or targets emitting RF (radio frequency) energy like AWACS, tankers, ISR aircraft (intelligence, surveillance, reconnaissance) and Electronic warfare aircraft. These aircraft operate at high altitudes and will be picked up at long range by the S-400 radars or the passive detection system. The engagement range for a manoeuvring low RCS fighter class of aircraft operating at lower altitudes will be much less.

The details of exact number of systems to be given to China are not clear but one report has cited a Chinese requirement of about two to four battalions^v. S-400 poses a serious threat to Taiwan as it extends Chinese capability for air dominance over Taiwan air space. Japan and India will also be affected by this sale. The implications for India of the S-400 sale are:-

- a) The anti ballistic missile capabilities of the S-400 will provide China a ballistic missile defence (BMD) shield to counter Indian second strike dependence on land based ballistic missiles. Whether this would require a review of India's no first use policy of employing nuclear weapons, is something which needs consideration and a larger debate in the country^{vi}. The Indian government also needs to sanction plans for Agni-6 with MIRV (Multiple Independently Targetable Re-entry Vehicle) and MaRV (Manoeuvrable Re-entry Vehicle). Multiple warhead missiles will increase the chances of penetrating BMD defended targets and will enhance credibility of India's strategic deterrence.
- b) Mobile SAM systems like the S-400 need to be eliminated in a small time frame. To do this IAF needs to have deeper ISR capability for accurate real time geo location of S-400 missile sites.

- c) IAF needs to consider the use of passive detection systems like the Kolchuga to enhance its early warning capabilities.
- d) The long range of S-400 class of missiles is for targets at medium/high level, at low level the missile range will reduce. Therefore, the best and universal tactic against these SAMs is to fly low, use undulations in the terrain to stay out of missile radar envelope and launch stand-off precision weapons from long range. The Indo-Russian jointly developed Brahmos supersonic cruise missile which has a range of 290km can be launched against these targets. The air launched version of Brahmos is under development and will soon be inducted in the IAF. There are plans to extend the range of Brahmos and to develop the Brahmos-2 hypersonic missile. This will increase Brahmos capability to penetrate and destroy S-400 missile sites. IAF must have these types of missiles in sufficient quantity and include stealth features in it to increase its survivability.
- e) Stealth aircraft is a very effective technology with which a strike aircraft can penetrate and carry out DEAD against a highly effective S-400 based air defence system. The USAF F-22 stealth fighter is the only aircraft currently in service which has the capability to penetrate a S-400 defended site. The planned induction of the Indo-Russian stealth FGFA (Fifth Generation Fighter Aircraft) in the coming years will give us the required capability to attack S-400 type of missile sites.
- f) S-400 has phased array radars which 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 may not be very effective against the S-400. Therefore, a DEAD (Destruction of Enemy Air Defences) mission against these types of missile sites is preferable with SEAD providing the necessary back up. Looking ahead in the future the IAF needs to consider unmanned combat air vehicles (UCAVs) like the X-47 and the X-45 for the DEAD/SEAD mission. The stealth features in the UCAVs will enable them to get close and either jam or destroy the missile radars. In the same vein it seems likely that Active Electronically Steered Antenna (AESA) planned for the Indo-Russian stealth capable fifth generation fighter aircraft (FGFA) will include electronic attack (EA) modes, which, when combined with its stealth, will enable them to seek out and blind hostile radars in support of their own

operations as well as those of other aircraft in the battle zone. EA capability must be added as a standard in the FGFA^{vii}.

Russia is pursuing its sale of advanced weapons to China for geopolitical reasons and for the lucre. S-400 SAMs will strengthen China's air defence capabilities. Anti ballistic missile capabilities of S-400 will impact on the credibility of India's strategic land based deterrence. To increase the credibility of its nuclear deterrence India may need to review its no first use policy. India also needs to develop MIRV and MaRV capability.

It will be an uphill task for the IAF to achieve air superiority against PLAAFs robust air defence missiles. IAF needs to invest in advanced DEAD systems like hypersonic cruise missiles and UCAVs to destroy PLAAF SAM sites.

(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)

Endnotes

ⁱ "PLA may finally receive Russian S-400 SAMs" , <http://www.janes.com/article/36581/pla-may-finally-receive-russian-s-400-sams> April 09,2014, accessed on April 17, 2014.

ⁱⁱ "Jane's Land Based Air Defence Systems 2013-2014".

ⁱⁱⁱ Ibid. N2.

^{iv} "S-400 Triumph 5P85E2 SA-21 Growler Surface-to-Air defense missile", http://www.armyrecognition.com/russia_russian_missile_system_vehicle_uk/s-400_triumph_triumf_sa-21_growler_5p85te2_long_range_surface_air_missile_system_defense_data_sheet.html , accessed on April 10,2014.

^v "Putin gives green light to sale of S-400 missile system to China", <http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20140329000166&cid=1101> , 29 March 2014, accessed on 22 April 2014.

^{vi} "Putin Approves Sale of S-400 to China" , <http://thediomat.com/2014/04/putin-approves-sale-of-s-400-to-china/> , accessed on April 10,2014.

^{vii} Ravinder Chhatwal, "Analysis of PLAAF Capabilities Against India" *Air Power Journal*, vol. 8, no. 4, Winter 2013, p. 80 -83 .