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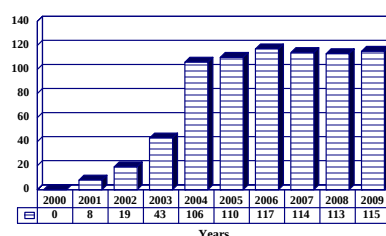
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SP-120 (2S31) Vena 120 mm Self-Propelled Gun - Archived 4/2000

Outlook

- Production now forecast to begin in a year or so and run through the rest of the forecast period
- System being operationally tested
- Some modernization and retrofit potential may develop in the outyears

10 Year Unit Production Forecast
2000 - 2009



Orientation

Description. A tracked 120 millimeter self-propelled artillery system

Sponsor. The development and forecast procurement of this self-propelled artillery system is being sponsored by the Ministry of Defense of the Russian Federation through the Russian Army.

Contractors. The SP-120 is being developed and will be manufactured by the Motovilikha Zavod located at Perm in the Russian Federation. The P. O. Kurganskiy Mashinostroitel organization is the main subcontractor.

Licensees. None

Status. The development and operational testing of the SP-120 is ongoing. Several reports indicate that preparations for serial production are ongoing.

Total Produced. As of January 1, 2000, a total of five SP-120 (2S31) self-propelled artillery systems had been manufactured.

Application. Mobile fire support for airborne, naval infantry and light armored forces. The SP-120 (2S31) was probably designed to replace the SO-120 (2S9) system in the Russian Army.

Price Range. The unit price of the SP-120 is \$803,000 in equivalent 2000 United States dollars.

Technical Data

As only a minimal amount of technical data has been released on the SP-120 (2S31), all following data are provisional. The available evidence now indicates that the first several examples of this equipment were mounted on an as yet unknown developmental chassis; the serially produced systems are expected to be based on the chassis of the BMP-3 armored vehicle.

Crew. Four: commander, gunner, loader and driver

Muzzle Brake. None

Recoil System. Hydropneumatic

Breech Mechanism. Unknown

Ammunition. This system is stated by Russian export officials as being compatible with types of domestic (Russian pattern) and international 120 millimeter (mortar) projectiles.

Armor. Research indicates that the SP-120 (2S31) is fabricated from aluminum armor. It is possible that explosive reactive appliqué armor can be fitted to the hull and turret.

Dimensions. The SP-120 is probably based on a modified chassis of the Boevaya Mashina Pekhota (BMP)-3 tracked mechanized infantry combat vehicle. This amphibious vehicle is covered in detail in the military vehicles book that is a companion to this. No specific dimensional or performance data are presently available although one source states that the combat weight is 19 tonnes (20.94 tons); the basic hull dimensions and performance of the BMP-3 are found in that report. The manufacturer has stated that the SP-120 (2S31) is amphibious, being propelled by waterjets. The 120 millimeter ordnance can be used as a direct/indirect fire gun (and possibly howitzer) or as an indirect fire mortar although it is not yet clear whether the SP-120 (2S31) Vena can achieve the angles of elevation that are normally associated with a mortar. One source states that the maximum range of the as yet unknown designation ordnance is 13 kilometers (14,216.8 yards) firing a High Explosive round. A maximum ten round per minute rate of fire can be attained. A total of seventy 120 millimeter projectiles is carried with 22 in two ready use magazines. Most sources indicate that ten rounds of the Kitolov-2M laser-guided projectile are

carried; this round has a range of 14 kilometers (15,310 yards).

Engine. The SP-120 (2S31) uses the UTD-29M ten cylinder liquid cooled four-cycle diesel engine rated at 372.85 kilowatts (500 horsepower) at an unspecified engine speed. The power-to-weight ratio is 19.62 kilowatts per tonne (23.88 horsepower per ton). A 27 volt electrical system is fitted.

Gearbox. The SP-120 (2S31) uses an unidentified gearbox, with four forward and two reverse gear ratios.

Suspension and Running Gear. A hydropneumatic suspension system is used on this vehicle. Other than the fact that six road wheels and three return rollers on each side are used with the drive sprocket to the rear, no other information on the suspension and running gear of the SP-120 (2S31) is available.

Fire Control. While details are not yet known, Russian officials are on record as stating that the SP-120 (2S31) Vena is an autonomous system. The fire control suite includes a computer, an automated positioning and survey system, laser rangefinder and a laser target designation system. Some sources state that one SP-120 (2S31) can act as a fire direction center, controlling up to six other systems. Day and night vision and sighting equipment are fitted.

Variants/Upgrades

Variants. None at this time although since the SP-120 (2S31) Vena is based on the BMP-3 chassis, it can be considered a variant of that armored vehicle.

Modernization and Retrofit Overview. Not applicable at this time.

Program Review

Background. The SO-120, which has the Russian industrial designation 2S9 and is called the Nona-S, was developed from the late 1970s. This 120 millimeter howitzer/mortar type system has been more recently complemented by the SM-120 (2S23), called the Nona-SVK, a wheeled system that is fully described in this section. Even though these two systems apparently have a good deal of service life left in them, the Russians began the development of a new tracked 120 millimeter artillery system in 1990. But the new system is, by most accounts, superior because of its higher level of tactical flexibility. The new system, which has the industrial designation 2S31 and is called Vena, was first revealed to the world in early 1993 at a weapons fair in the Middle East. However, it now appears that the system displayed was based on an as yet unknown developmental tracked chassis. The latest example of the system, first shown in mid-1997, is based on the

chassis of the BMP-3 tracked mechanized infantry combat vehicle.

Description. As of early 2000, and despite the mid-1997 public display of the system, only a minimal amount of information has been released regarding the SP-120 (2S31) Vena. The general appearance and other data indicate that the system is most likely based on the modified chassis of the Boevaya Mashina Pekhota (BMP)-3, one of the newer mechanized infantry combat vehicles to come out of the former Soviet Union/Russian Federation. The Boevaya Mashina Pekhota-3 design represents an evolutionary improvement of earlier designs. The SP-120 retains the amphibious capability of the BMP-3.

The hull is of all welded aluminum alloy construction. The vehicle is probably of the conventional configuration with the interior divided into three

compartments. In this configuration, the driver is seated forward, the fighting compartment with the turret is in the center, and the engine/gearbox are located to the rear. In addition to the 120 millimeter armament, six smoke grenade launchers are mounted on each side of the turret. A total of seventy 120 millimeter projectiles are carried with two ready use magazines each holding 11 rounds. A laser detection device and obscurant screening system are fitted to the vehicle and a nuclear, biological and chemical defense system is fitted.

The following details were revealed about the SP-120 (2S31) Vena at the aforementioned weapons fairs. The system is autonomous and automatic in operation. The positioning data and site survey are automated; this equipment, plus day/night optical/electronic equipment, allow for rapid and accurate engagements. The long barreled 120 millimeter main armament is much longer than that used in the SO-120 (2S9) and the SM-120 (2S23). A fume extractor is located in about the mid-portion of the barrel. The traverse (360°) and elevation (+80°) and depression (-4°) functions are powered and fully automated and operate in conjunction with the vehicle's fire control system; a manual backup is provided.

Ammunition and Performance. The SP-120 (2S31) is stated by the Russians to be compatible with all 120 millimeter mortar ammunition. It is further claimed that the latest pattern Russian 120 millimeter High Explosive mortar ammunition is as effective as 122 and 152 millimeter High Explosive artillery projectiles. Finally, the Russians claim that the SP-120 (2S31) is up to four times more effective than similar systems. The

SP-120 (2S31) can also fire the Kitolov-2M laser guided projectile; a total of ten are usually carried.

While details are still not available, it is probable that the 120 millimeter ordnance can function as a direct or indirect fire gun and possibly as a howitzer.

Tactical Employment. Like the SO-120 (2S9) and the SM-120 (2S23), the amphibious SP-120 appears to be optimized for airborne and other light forces. And like the SM-120 (2S23), the vehicle is built from largely proven components. The SP-120 (2S31) Vena is clear evidence that the Russians are not about to give up their love of artillery of all types. The system is highly flexible with considerable firepower that will allow light units to have an effective organic artillery support system to accompany them into combat. The probable direct and indirect fire gun (and probably howitzer) capability with the new High Explosive and laser guided ammunition gives a useful and tactically interesting capability.

Moreover, like the SO-120 (2S9) and SM-120 (2S23), the SP-120 (2S31) has a significant advantage over other self-propelled mortar systems. Self-propelled mortars have been around for decades; however, most of these systems mount the mortar on a turntable in an open topped vehicle. The SP-120 (2S31) design, on the other hand, allows the ordnance (it is not yet certain if the ordnance used on the SP-120 (2S23) Vena can be elevated to the angles normally associated with mortars) to be operated from an enclosed space that not only protects the crew from small arms fire and ballistic fragments but from nuclear, biological and chemical contaminants as well.

Funding

The Ministry of Defense of the Russian Federation is providing the funding for the development and forecast procurement of the SP-120 (2S31) Vena.

Recent Contracts

Not available as contractual information is not released.

Timetable

This timetable relates to the SP-120 (2S31) only and not to the SO-120 (2S9) or SM-120 (2S23), which are covered in a separate reports.

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1990	Development begins
Early	1993	System publicly revealed
April	1997	Definitive prototype system revealed

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Early	2000	Final development and extended operational testing ongoing

Worldwide Distribution

Export Potential. Given the need for export sales of all types by the Russian Federation, it is only a matter of time before this interesting and effective weapon system makes its appearance outside the Russian Federation.

Countries. **Russian Federation** (five developmental/operational test systems).

Forecast Rationale

As of early 2000, the serial production of the SP-120 (2S31) had yet to get under way. The delay is most likely due to the Russian Federation's economic conditions which have limited military spending of all types, including that needed to operationally test new equipment.

Our research into the SP-120 (2S31) program has been significantly hampered by a lack of available data. Aside from the mid-1997 public display of what was most likely the definitive prototype of the SP-120 (2S31) Vena, little additional information has been released on the system. Furthermore, the system has yet to be described in detail in the arms catalogs coming out of the Russian Federation; something we consider odd given the Russians' need for revenue generated from weapons export.

The information we were able to gather indicates that it is indeed a new standard artillery system earmarked for the new Russian military, particularly the light forces. The self-propelled system is said to be a cost-effective

amalgamation of the new and slightly modified BMP-3 tracked vehicle with a new turret and somewhat unique armament.

The SP-120 (2S31) Vena should eventually have an important role in the rationalized artillery park of the Russian Federation. This new self-propelled artillery system will most likely augment, then replace the SO-120 (2S9), especially in the naval infantry, airborne and similar light units. Barring any unforeseen events, manufacture of the SP-120 (2S31) seems assured through the entire forecast period; however, the facts of life in the new Russian Federation mean that the production rate of this system will ramp up only slowly, to a rate that is nowhere near what it would have been a decade ago.

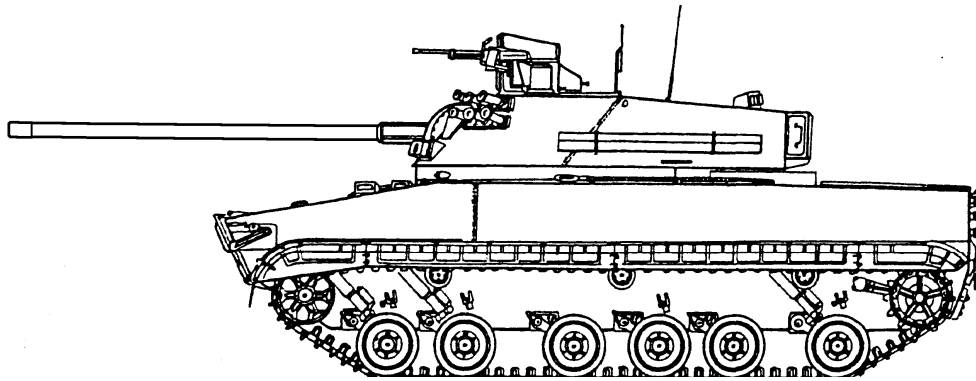
Due to the strong marketing effort for this system on the international market, we will continue to monitor this system and related developments and will update this report on an interim basis if warranted.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Ordnance	(Engine)	High Confidence Level					Good Confidence Level			Speculative			Total 00-09
		through 99	00	01	02	03	04	05	06	07	08	09	
MOTOVILIKHA ZAVOD/KURGANSKIYI SP.120 (2S31) ^(a)	UTD-29M	5	0	8	19	43	106	110	117	114	113	115	745
Total Production		5	0	8	19	43	106	110	117	114	113	115	745

(a) Production through 2000 is for the prototype and developmental systems mounted on the experimental chassis well as a few based on the BMP-3 chassis.



Source: Forecast International