

# ARCHIVED REPORT

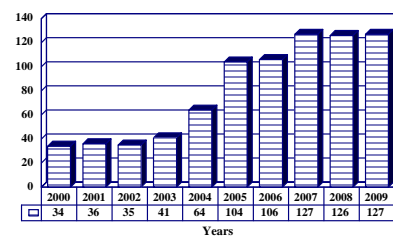
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## SP-152 (2S19) Msta-S 152 mm Self-Propelled Howitzer - Archived 4/2000

### Outlook

- SP-152 (2S19) is one of the new standard systems in the Russian Army
- Msta-S production forecast to run through the coming ten years
- System heavily promoted on the export market
- There is some modernization and retrofit potential for the Msta-S

10 Year Unit Production Forecast  
2000 - 2009



### Orientation

**Description.** A tracked 152 millimeter self-propelled artillery system

**Sponsor.** The development and initial production of this artillery system was sponsored by the Ministry of Defense of the Soviet Union through the Soviet Army. Continued support is through the Ministry of Defense of the Russian Federation.

**Contractors.** The SP-152 (2S19) was developed by the Uraltransmash design bureau and originally manufactured by the Russian Federation State Arsenal at Yekaterinburg. The present production effort is headed by the Uraltransmash Works at Yekaterinburg with the serial production also being undertaken by the Sterlitamak organization in Bashkiriya, Yekaterinburg in the Russian Federation.

**Licensees.** None

**Status.** SP-152 (2S19) production is ongoing in the Russian Federation; the system is in service with the Russian Federation and two other nations. This system is being actively promoted on the open market at a very competitive price.

**Total Produced.** As of January 1, 2000, a total of 663 SP-152 (2S19) artillery systems had been manufactured.

**Application.** Mobile fire support for the field army at the battalion and division levels.

**Price Range.** In equivalent 2000 United States dollars, the SP-152 (2S19) unit price as offered on the export market is \$1.719 million.

### Technical Data

**Design Features.** A modern, fully enclosed self-propelled artillery system featuring an automatic loading system and a gas turbine-powered auxiliary power unit.

**Crew.** Five: commander, gunner, two loaders and driver; Russian sources note that two additional men can be carried if needed.

**Muzzle Brake.** Double-baffle

**Recoil System.** Hydropneumatic

**Breech Mechanism.** Semi-automatic vertical sliding wedge

**Ammunition.** The 2A64 cannon of this artillery system fires the new range of 152 millimeter ammunition the former Soviet Union developed beginning in 1966. The types include High Explosive-Fragmentation (OF-45), High Explosive/Base Bleed (OF-61), Smoke, unspecified chemical, Cargo - submunition dispensing (3023), electronic jamming (3NS30) and the 3VDTs8 nuclear projectile. The SP-152 (2S19) is also compatible with the 30F39/9K25 Krasnopol laser guided projectile.

**Armor.** The SP-152 (2S19) is fabricated from conventional steel alloy armor offering protection from 7.62 millimeter armor piercing projectiles, mines and ballistic fragments.

**Dimensions.** The following dimensional data are for the latest production standard of the SP-152 (2S19).

	<u>SI units</u>	<u>US units</u>
Length overall	11.92 meters	35.79 feet
Width	3.58 meters	11.75 feet
Height	2.99 meters	9.81 feet
Combat weight	41.96 tonnes	46.25 tons
Fuel capacity	865 liters	230.05 gallons
Ordnance caliber	152 millimeters	5.98 inches

**Performance.** The maximum 2A64 ordnance range figure is with the standard OF-61 High Explosive/Base Bleed projectile. The maximum speed and vehicle range data are for use on a metalled road. With preparation, the 2S19 can ford five m (16.4 ft) of water.

Maximum speed	60 kilometers per hour	37.3 miles per hour
Maximum range	500 kilometers	372.6 statute miles
Step	52 centimeters	1.71 feet
Trench	2.8 meters	9.19 feet
Slope	36%	36%
Gradient	47%	47%
Fording	1.5 meters	4.92 feet
Elevation	+68°	+68°
Depression	-4°	-4°
Traverse (total)	360°	360°
Maximum ordnance range	28.5 kilometers	31,167.6 yards
Maximum rate of fire	8 rounds per minute	8 rounds per minute
Sustained rate of fire	4 rounds per minute	4 rounds per minute

**Engine.** Although based on the chassis of the gas turbine powered T-80 tank, the SP-152 (2S19) uses a diesel engine-based powerpack, specifically the V-84A diesel engine of V-12 configuration. This liquid cooled multifuel engine is rated at 626.39 kilowatts (840 horsepower); the Russian State Factories provide this engine. The power-to-weight ratio is 14.93 kilowatts per tonne (18.16 horsepower per ton). Alternatively, the 2S19 can be fitted with the V-46 diesel engine which is rated at 581.65 kilowatts (780 horsepower). Both engines are equipped with a smoke generating system. The AP-18D gas turbine powered auxiliary power unit, rated at 16 kilowatts, is used to operate the fire control and other operations when the main engine is shut

down; this unit is located in the turret. A 27 volt electrical system with four batteries is the standard electrical fit.

**Gearbox.** The SP-152 (2S19) uses an unidentified manually operated constant mesh type gearbox with seven forward and one reverse gear ratios. The Russian State Factories provide this unit.

**Suspension and Running Gear.** The SP-152 (2S19) suspension system is largely based on that of the T-80 tank. The SP-152 (2S19) uses a torsion bar type suspension with six dual-tired road wheels on each side; the drive sprocket is at the front while the rear road wheel acts as the idler. The first, second and sixth road

wheel stations on each side are fitted with regulated shock dampers. Five track return rollers are mounted on each side. The RMSH track is 58 centimeters wide.

**Fire Control.** The SP-152 (2S19) is normally used for indirect fire missions with the targeting data provided by a forward controller through a fire direction center or other command post. The SP-152 (2S19) crew receives this data via the onboard radio and lays the cannon

accordingly. The SP-152 (2S19) is fitted with the 1V122 data transmission and receiving system for coordination with the fire control vehicle. The gunner is provided with the 1P22 3.7 power panoramic sight which is mounted in a rotating armored cover on the turret roof; this sight is stabilized in the horizontal plane. The gunner also has the 1P23 5.5 power telescopic sight for direct fires.

## Variants/Upgrades

**Variants.** The SP-152 (2S19) is based on the modified T-80 tank chassis. As of early 2000, no known variants have been directly derived from the SP-152 (2S19) self-propelled artillery system.

A product improved version of the SP-152 (2S19) was first heard of in mid-1996. This system is designated the 2S30 Iset. One source states that this newer system mounts a 155 millimeter cannon and was developed for the Indian competition. However, this does not coincide with several other sources; as of early 2000, nothing factual is known about the 2S30.

155 millimeter/52 caliber version? In the early nineties, India formulated a requirement for 600 new self-propelled howitzers. Specific to the requirement is a complete turret mounting a 155 millimeter cannon 52 calibers in length; the turret is to be mounted on an existing tank chassis. India has been manufacturing the Russian T-72 tank under license for years; this is the

designated platform. However, more recently, mention has been made of using the chassis of the new (and still troubled) Arjun tank as the platform. In any event, the Russian Federation has responded to the requirement, offering a version of the SP-152 (2S19) fitted with the required cannon. Some sources consider this proposal to be a serious contender.

One source has mentioned that the new 155 millimeter/45 caliber cannon of the Slovak Zuzana system is the basis of a new cannon. But the initial evaluation of the competing systems was apparently not acceptable to the Indians, and further evaluations are required. However it appears that the SP-152 (2S19) is one of the favored systems to meet the Indian requirement.

**Modernization and Retrofit Overview.** As of early 2000, there has been no known activity in this area.

## Program Review

**Background.** The SP-152 (2S19), also known as the Msta-S and by NATO as the M-1990, is the latest example of several new self-propelled artillery systems that the former Soviet Union has introduced since the early seventies. The development of the new self-propelled artillery system, headed by designer Yu.V. Tomashev, was prompted by lessons learned in the Ramadan War as well as the general perception that the then Soviet Army was due for a new generation of more sophisticated self-propelled artillery systems.

Concurrent to that effort was one to develop a new range of 152 millimeter ammunition. In order to speed the development as well as to reduce overall costs, it was decided to base the new self-propelled artillery system on the ordnance used on the 2A65 152 millimeter towed gun/howitzer. The basic chassis and some portions of the powertrain are also derived from the T-80 tank while the diesel engine and associated components are from the T-72 tank. The development of the SP-152 (2S19) began in 1984, and the first

systems were fielded in 1989. Msta is named after a river; the "S" stands for samokhodny, or self-propelled.

**Description.** The SP-152 (2S19) Msta-S is built on a fully tracked chassis that is used for the T-80 tank. The SP-152 (2S19) is a turreted artillery system that bears a good deal of resemblance to the French AU-F1 (see separate report in this section). The hull is fabricated of all welded steel alloy armor affording protection from small arms projectiles and ballistic fragments. The driver's compartment is to the front of the vehicle, the fighting compartment with the turret is in the center, and the engine compartment is to the rear. The driver, who is seated at the front of the vehicle in the center, is provided with a single piece hatch cover and three periscopes, the center of which can be removed and replaced with a night driving device as required.

In the turret, which is fabricated in the same manner as the hull, the commander is seated to the right and is provided with a cupola incorporating all around periscopic vision devices. The commander also has

access to the PZU-5 secondary armament suite, which is based on the 12.7 millimeter NVST machine gun, which is provided with 300 rounds of ammunition. The machine gun can be operated by remote control from within the turret. The gunner is seated to the left with the two loaders to the rear; all positions are provided with single piece hatch covers.

The AP-18D auxiliary power unit, rated at 16 kilowatts and powered by a gas turbine, is used to operate the fire control and other operations when the main engine is shut down. The SP-152 (2S19) is very stable and does not require a spade for stabilization of the vehicle when firing.

The 2A64 152 millimeter cannon has a semi-automatic vertical sliding wedge breech block assembly. An automatic projectile loading system and power assisted ramming device are fitted in order to increase the rate of fire. This system selects the projectile, sets the fuze and places the projectile in the breech assembly via the power assisted ramming device. The charges are selected by use of the 6EhTs19 selector component and then semi-automatically loaded with the assistance of the loaders. After firing, the charge cases are automatically ejected.

All turret and cannon operations are powered by the 2Eh46 howitzer drive mechanism with manual backup; the laying of the cannon in elevation is automatic while the laying in traverse is semi-automatic in operation.

The maximum elevation of the 2A64 152 millimeter cannon is +68°; depression is -4°; and turret traverse is 360°. After firing, the cannon automatically returns to the index position. There are fifty 152 millimeter projectiles and cartridge cases carried in the hull and turret. If desired, new projectiles and charges can be loaded into the SP-152 (2S19) while the system is in action; this loading is accomplished through two hatches at the rear of the turret.

A 1V116 intercommunications system is provided, and a R-173 frequency modulated radio is used for external communications. An automatic fire detection and suppression system is fitted. A dual air filtration and ventilation system is fitted in conjunction to the nuclear, biological and chemical defense system. The SP-152 (2S19) is also equipped with a self-entrenching system which is mounted on the lower glacis. This equipment enables the vehicle to dig a firing pit in less than an hour. Three Type 902 electrically operated smoke grenade launchers are mounted on each side of the turret. The 2Kh51 training system has been developed for the SP-152 (2S19).

Operational Analysis. While the SP-152 (2S19) is a modern self-propelled artillery system, one of its probable primary mission areas was to provide tactical nuclear fires. This mission was negated by former President Gorbachev's announcement regarding reductions and elimination of the former Soviet Union's tactical nuclear weapons.

## Funding

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The Soviet Union Ministry of Defense provided the funding for the development and initial procurement of the SP-152 (2S19). The Russian Federation is continuing this.

## Recent Contracts

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Not available as contractual information is not released.

## Timetable

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This timetable relates to the SP-152 (2S19) only.

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1984	Development begins
	1987	Serial production begins
	1989	SP-152 initial operating capability
	1990	Program publicly revealed
May	1996	2S30 Iset program revealed
Early	2000	Production ongoing

## Worldwide Distribution

**Export Potential.** The SP-152 (2S19) has not been exported to any other country outside the former Soviet Union. However, this system is presently being promoted on the open market for at least two potential procurement programs. Adding to the system's worldwide exposure were its excellent firepower and mobility demonstrations at the IDEX-93 weapons fair. As a result of the nation's protracted efforts to field a new 155 millimeter/52 caliber self-propelled artillery system, India will reportedly lease or possibly purchase the SP-152 (2S19) to fill the need on an interim basis.

**Countries.** As of early 2000, the SP-152 (2S19) is in service with the following nations: **Belarus** (13), **Russian Federation** (610) and **Ukraine** (40).

## Forecast Rationale

As of early 2000, the serial production of this self-propelled artillery system is ongoing, although at a fairly low rate. The poor state of the nation's economy is reflected in the comparison between current production rates and the higher levels of only a decade or so ago. Still, the level of production is significant; in fact, it is even higher than that of the Russian tanks, possibly because of the high level of importance that Russian military doctrine places on artillery.

So far, the production of the 2S19 system has been directed mainly to the requirements of the Russian Federation. Belarus and Ukraine also have the system in service but these two nations' inventories were received while still part of the old Soviet Union.

Since the early nineties, the Msta-S has been heavily promoted on the international export market. As of early 2000, however, no sales had taken place. Because this self-propelled artillery system is being offered on the export market at a highly competitive unit price and is essentially on par with anything but the newest systems from Western Europe or the US, we still support a probable export order sometime in the coming five years or so. This, plus the high level of interest

generated by the system at recent weapons fairs, is expected to lead to at least a minimal level of export sales. Most of these sales are likely to be to the Middle East, although an increasing sales efforts have been taking place in southeast Asia since 1996.

In our research on Russian artillery overall, we find that the SP-152 (2S19) Msta-S is the primary system of its type that is being standardized in the modernized Russian artillery park. For this reason alone, the SP-152 (2S19) is expected to remain in production through the entire forecast period. The jump in production shown in the chart below reflects the probability that the Russian economic situation will, in a few years, improve to the point that the serial production of the 2S19 can be increased to a more efficient level in order to speed the modernization process.

Of course, we will continue to monitor this system and related developments for events that could change our forecast, and update this report on an interim basis if warranted.

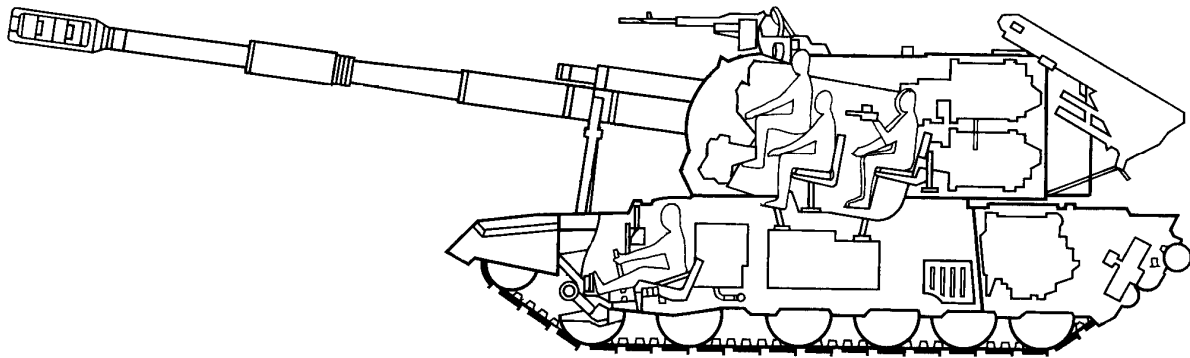
Our forecast is for complete 2S19 Msta-S systems, and not for the turret.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Ordnance	(Engine)	through 99	High Confidence Level				Good Confidence Level				Speculative			Total 00-09
			00	01	02	03	04	05	06	07	08	09		
URALTRANSNASH STATE ASSOCIATION SP-152 (2S19) (a)	V-84A	663	34	36	35	41	64	104	106	127	126	127	800	
Total Production		663	34	36	35	41	64	104	106	127	126	127	800	

(a) Production shown is for service deliveries only.



SP-152 (2S19) Msta-S 152 mm Self-Propelled Howitzer

Source: Russian Federation