The Bulava Missile

What Propels Its Unsteady Flight?

PONARS Eurasia Policy Memo No. 88

Alla Kassianova

September 2009

Bulava, a solid-propellant submarine-launched ballistic missile (SLBM), has been developed as part of a new-generation system for the naval component of Russia's strategic nuclear triad. The Bulava's deployment onboard the *Yuri Dolgoruki*, a Borei-class strategic submarine newly designed to carry the missile, has been anticipated for over two years. However, an uneven record of test launches, including its most recent failures in December 2008 and July 2009, has continued to delay the Bulava's deployment.

Meanwhile, the Bulava missile has generated an unusually high level of publicity for a strategic weapon development program. Its persistent problems continue to stimulate new rounds of expert discussion. The controversy surrounding Bulava, however, is older than the relatively recent publicity might suggest. It originates nearly a decade ago, at the project's inception.

This memo takes a historic and actor-centered look at Bulava. It argues that, as important as the project is for Russia's security and nuclear power status, its development has depended more on the will and energy of industry actors than on the ability of the state to utilize these resources through competent direction and coordination.

History

Bulava's is a story of two design firms and three missiles. One designer, the Moscow Institute for Thermal Engineering (MIT), is the Bulava's developer and the lead designer for the successful silo- and mobile-based Topol-M intercontinental ballistic missile (ICBM). The other design firm, the Makeyev State Rocket Center (GRTs, referred to here as Makeyev), developed all earlier generations of SLBMs and is located in the Southern Urals town of Miass.

The main decisions that have precipitated the current situation were made in the late 1990s when, following many years of miserly funding, the military chose to terminate the Makeyev development program for a prospective solid-propellant naval missile. Makeyev had long specialized in building liquid-propellant SLBMs, and a solid-propellant project proved challenging on many levels. The missile that came to be known as "Bark" was abandoned at a fairly advanced development stage. Six then operational Typhoon-class submarines were waiting to be retrofitted with the new missile, and the construction of the first Borei-class submarine designed for Bark was already in its second year in the Sevmash shipyard. Three failed launch tests, uncertain prospects for future development, and the certainty of continuing financial hardship reportedly forced the termination of the Bark project. Also of concern were the pure size of the 90-ton missile and the complexity of its support infrastructure, which stretched an already shrinking budget.

However, the Navy still faced the challenge of replacing the older-generation SLBM arsenal. MIT seized this opportunity, offering a proposal that addressed the military's central concern – restricted funds. Lighter and more compact, the solid-propellant Bulava-30 was to meet the performance requirements set forth by the Navy and achieve an economy of scale by incorporating parts and technologies shared with other MIT missile designs across different deployment types. Standardization could lead to savings in developing, testing, manufacturing, and servicing the prospective strategic force containing the increasingly standardized weapon systems. Though it had never built naval missiles, MIT was successfully completing a complex Topol-M program with silo- and ground-mobile launch versions. Most accounts say that the Defense Ministry held a formal tender for which both MIT and Makeyev submitted competing bids, with the contract ultimately awarded to the Bulava. The Borei-class submarines were to be redesigned for smaller missiles, while the fate of the Typhoon-class submarines, carrying soon-to-be-retired and no longer manufactured solid-propellant heavy R-39 (SS-N-20) SLBMs, was uncertain.

With Bark exiting and Bulava just preparing to enter the scene, a third missile, Sineva, emerged. While Typhoon-based solid-propellant R-39s were gradually withdrawn from service with nothing to replace them until Bulava was finished, the only viable option of sustaining the naval leg of the nuclear triad was retaining the liquid propellant R29R (SS-N-18) missiles deployed on Delta III and IV submarines. Having lost its flagship program, Makeyev resorted to a contingency plan of modernizing this missile. In 1999, Makeyev had secured an order to resume manufacture of the modernized R29, which came to be designated as Sineva (SS-N-23). The modernization program for Sineva was completed in 2004, serial manufacturing started in 2005, and the missile complex was officially commissioned to enter service by presidential decree in 2007.

In retrospect, 2004 was a symbolic turning point for the respective trajectories of Bulava and Sineva. Early in the year, Sineva failed to launch during a high-profile naval exercise under the eyes of President Vladimir Putin, and then failed another test launch the next day. That same year, a Bulava dummy successfully completed its underwater test launch, hailed by general designer Yuri Solomonov as a "huge achievement" of its fast-moving development. Despite the embarrassments of early 2004, however, Sineva

took off and developed into a success story, now serving as the backbone of Russia's strategic naval missile arsenal. Bulava's ups and downs in the last five years, on the other hand, have increased, rather than diminished, the uncertainty surrounding the future of Russia's strategic nuclear potential.

The Actors

In most contexts, juxtaposing the two missiles would make little sense: one is a new development encompassing a relatively innovative direction for Soviet/Russian rocket science, while the other is a successful and thorough modernization, building on decades of experience in liquid-propellant naval designs; each is assigned a separate role in the maintenance of the Russian nuclear deterrent force. In reality, though, much of the public discussion on the subject adopts this binary approach. It is clear that developing a comparable weapons system would be challenging even under ideal conditions. Developed in far from ideal conditions, Bulava was subject to a "regular" set of structural constraints in Russia over the last decade: dissolving supply chains, aging production assets, loss of technological discipline, unsteady financing, and dysfunctional coordination (shared, of course, with the rest of the industry). Moreover, Bulava was facing non-structural resistance. Makeyev, whose institutional identity was predicated on decades of SLBM-building expertise, squarely opposed the program due to the perceived unfairness of MIT appropriating a field in which it had no experience. It generated "resistance of the environment" on top of the already unfavorable structural conditions.

The opposition to Bulava found its voice in an information war waged through Russia's principal military-political periodical *Nezavisimoe Voennoe Obozrenie* (*NVO*). For nearly a decade, the expert community was involved in the MIT-Makeyev tug-of-war. The first praise for the modernized Sineva appeared in *NVO* at the end of 1999, and, since then, the *NVO* has published at least two dozen pieces on the subject. Often introduced as "independent experts," authors almost invariably laud the Makeyev design while offering skeptical and/or disparaging views on the Bulava program. A small sampling of recent *NVO* headlines speaks for itself: "The working Bulava is as distant as the moon" (2008), "With Sineva, why do we need Bulava?" (March 2009), and the most recent, "Yet another Bulava plunged into the sea" (July 2009). *Voenno-Promyshlennyi Kurier* (*VPK*), a periodical established in 2003, began striking back with extended interviews of Bulava's general designer Yuri Solomonov. Since its inception, *VPK* has published only one article mentioning the existence of Sineva: "SLBM 'Sineva": failed launches, self-liquidation, missed targets" (May 2009).

On a personal level, MIT director and general designer Yuri Solomonov commanded much higher public visibility than did his Makeyev counterpart. Numerous interviews in *VPK* elaborated on his perspective on Bulava and related subjects, such as the future of the strategic nuclear forces, the threat (or lack thereof) from the U.S. missile defense system, and the state of the defense industry administration. The last printed interview on the Bulava program (April 2007) stated Solomonov's "absolute confidence" in completing the flight tests on time and with positive results. Makeyev director and general designer Vladimir Degtyar, on the other hand, rarely adopted a media platform aside from a Southern Urals regional daily or his company's in-house periodical. With

Degtyar less visible than Solomonov, the right message about Makeyev was conveyed via a strong regional and local media base, web presence (makeyev.ru), and allies in *NVO*.

Even more activity occurred behind the scenes, with both parties devoting great effort to obtaining bureaucratic access. In the Russian centralized system, location in the Southern Urals put Makeyev at a disadvantage relative to the Moscow-based MIT. Vladimir Degtyar's public account of the 1998 Bark-Bulava collision always cited "lost connections" with the appropriate bureaucracies in the Navy and Ministry of Defense. Makeyev appears to have had its greatest success in utilizing horizontal professional networks, such as Navy-sponsored conferences of general designers or annual scientific readings dedicated to the memory of V.P. Makeyev. A newspaper report mentions Degtyar hiring a luxury train car to persuade important Moscow invitees to make a trip to the Urals. Makeyv has appeared successful in keeping open the issue of the liquid-propellant solution's viability for future strategic missiles. At the end of 2004, Yuri Solomonov spoke of "absurd" activities undertaken by "some general designers" who were trying to "destabilize the situation" and push programs for development of liquid-propellant carriers. Yet high-positioned officials, like then-Commander of the Russian Strategic Nuclear Forces Nikolai Solovtsov and then-Defense Minister Sergei Ivanov, have confirmed more recently that the liquid-propellant option is not yet off the table.

The efforts of Makeyev to defend its legacy and status proved beneficial in that it provided a contingency option for maintaining a necessary level of operation for Russia's sea-based strategic nuclear component during the development of a new missile. The presence of two major design firms with functioning missile designs – either credible modernization or new development – and viable networks of suppliers provided planning options.

However, it is not clear whether the bad blood between the two organizations actually diminished the resources available to Bulava's developers. Makeyev takes pride in possessing one-of-a-kind, highly specialized testing equipment, as well as unique expertise accrued from decades of building naval strategic missiles. Makeyev representatives have not volunteered much information about their part in the Bulava program. On several occasions, Solomonov emphatically stated that, in working on Bulava, MIT "was using the entire pool of experience accumulated in our country in this area, all available experimental bases, and cooperation of co-developers." Commentators noted that, despite MIT's land specialization, Bulava has performed underwater launches smoothly, and the failures that occurred have happened at later stages.

Vladimir Dvorkin, a well-known expert with personal experience in strategic nuclear matters (including participation in decisions on Bulava as chief of the 4th Central Scientific Research Institute of the Ministry of Defense), confirms that Makeyev contributed a "significant share" of the submarine launch support systems for Bulava. However, he added: "I have always believed that the extent of GRTs participation in this project could have been greater." Early in 2009, First Deputy Prime Minister Sergei Ivanov remarked on the "insufficient attention" of Bulava developers to land test runs. This prompted interpretations in the media and online forums, with some maintaining

that MIT overconfidently chose to forgo using the Makeyev-based testing equipment and others blaming Makeyev for not making its equipment available to MIT. Largely speculative and partisan, this discussion has added little to gauging Makeyev's involvement in the Bulava program. However, it did underscore, once again, that the passions surrounding the decade old Bark-Bulava decisions remain very much alive today, and MIT and Makeyev are, in fact, perceived as warring parties.

Conclusion: The Missing Part

Bulava's second consecutive launch test failure in July 2009 resulted in the resignation of its general designer and produced contradictory official comments. Despite controversy surrounding him, Solomonov appears to have been a driving force behind the Bulava project, in the same way he had been for Topol-M. That means that, in addition to being the general designer of a top-priority post-Soviet weapon development program, he was also its public face and spokesman, government lobbyist, interagency coordinator, military liaison, and organizer of a disparate patchwork of co-developers and supplier-chains. With some stylistic differences and less intense personal presence, Makeyev, too, was the ultimate driving force through bureaucracies and other systemic traps of their successful (though less complex) Sineva modernization project.

The problem is that strong industrial actors have not been matched by similar will and organization within state structures. Institutional legacies and director idiosyncrasies have not been leveraged and directed by an authority with a consistent strategy or a capable administrative mechanism. The principal driver has been the missile builders, not the National Security Council, Military-Industrial Commission, or any other government entity responsible for decisions or implementation. The impact of Yuri Solomonov has somehow been much more palpable than that of Sergey Ivanov. In the end, the story of the development of Russia's naval strategic missiles has been one of two houses competing for the attention of a largely ineffective "power vertical" that has been unable to mobilize the resources necessary for maintaining its nuclear strategic capacity, something declared to be one of its highest priorities.

PONARS Eurasia publications are funded through the International Program of the Carnegie Corporation of New York.