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# The SS-20: A Range of Choices

by

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**W**inston Churchill's often quoted observation that the Soviet Union "is a riddle wrapped in a mystery inside an enigma" would appear to have some validity even today. In any case the confrontational nature of relations between the United States and the Soviet Union make it prudent to follow the good advice of an even older strategist, Sun Tzu, that it is necessary to "... know one's enemy" if success is to be assured.

The Soviet SS-20 missile system has in the words of Helmut Schmidt, "upset the military balance in Europe and created for itself an instrument of political pressure on the countries within the range of the SS-20, for which the West so far has no counterbalance."<sup>1</sup> The continued deployment of these missiles was the stimulus for Nato's decision to introduce cruise and Pershing 2 missiles on the European continent. If we are to confront this threat rationally and effectively, a thorough understanding of its potency is essential. It is equally indispensable if we are to negotiate any type of an arms control agreement which is consistent with US and Nato security requirements. My ambition here is to analyze the Soviet deployment of the SS-20 in terms of its capabilities and possible military application so as to ensure such an understanding.

## SS-20 Capabilities

The Soviet SS-20 missile was first deployed in 1977. Its basic dimensions and characteristics are listed in the following chart:<sup>2</sup>

<b>RANGE:</b>	2700 nm/5000 km <sup>a</sup>
<b>WARHEADS:</b>	3
<b>SOLID FUEL:</b>	2 stages
<b>CIRCULAR ERROR PROBABLE:</b>	.26 nm
<b>CURRENT INVENTORY:</b>	350 <sup>b</sup>
<b>YIELD:</b>	Varies to 1.5 megaton

<sup>a</sup> A study produced by General Dynamics has disputed this claim for the range of the SS-20. It states that the missile has a range of 3500 nm or 6500 km with 3 RVs or with a 1.5 mt warhead. It also described the missile as having a range of 4600 nm or 8500 km with a light 50 KT warhead.<sup>3</sup>

FIGURE 1

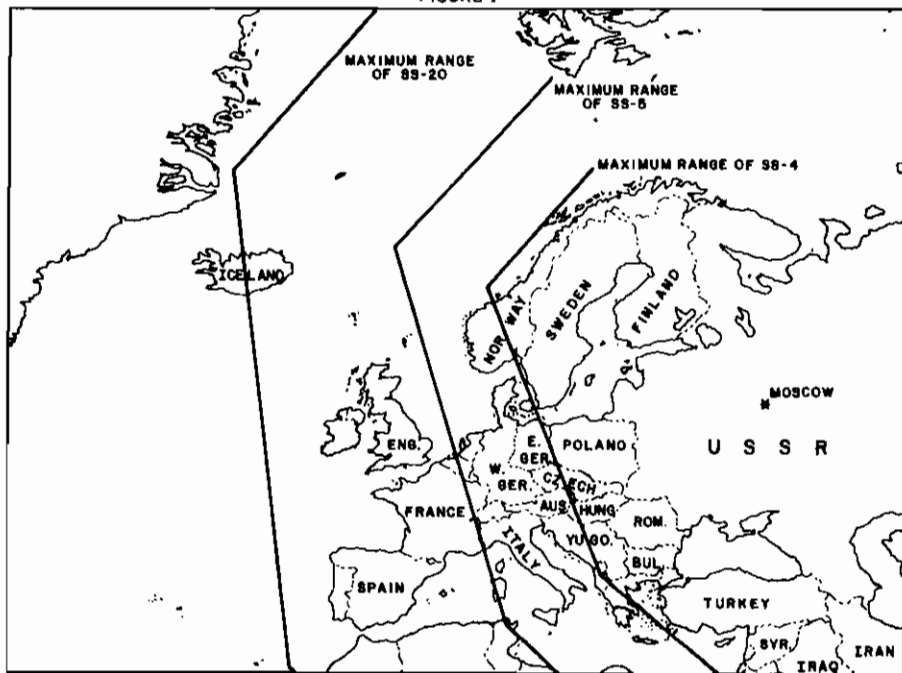
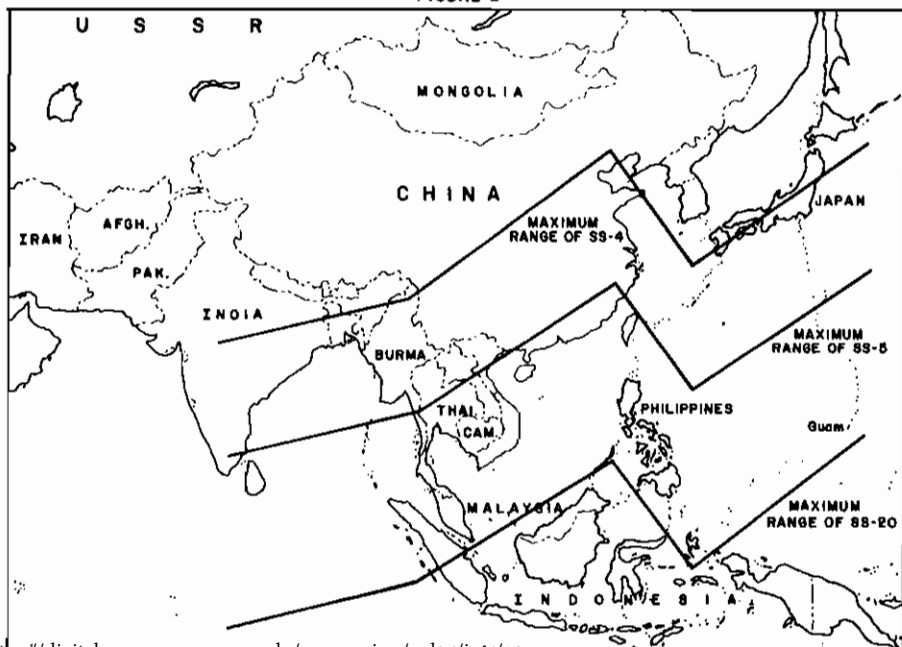


FIGURE 2



<sup>b</sup>Recent reports have placed the number of SS-20 missiles at 350 (1,050 warheads). This coupled with the remaining SS-4 and SS-5 weapons yields a total of roughly 1,280 warheads deployed on these systems. Soviet production of the SS-20 has been accelerated to a level of one launcher per week which, if this rate is maintained, would give the Soviet Union approximately 400 SS-20 launchers by the fall of 1983 (the initial deployment period for new Nato systems.<sup>4</sup>)

In evaluations done by the International Institute for Strategic Studies, the SS-20 was rated 0.9 for survivability—the highest given any Soviet system—largely because the missile is mobile. It was rated 0.8 for reliability on the estimated likelihood that the system would function as designed. The SS-5 was rated 0.6 for survivability and 0.5 for reliability in the same report.<sup>5</sup>

The weapon is being deployed in areas general to the SS-4 and SS-5, and will replace those liquid-fueled systems first deployed in 1961 and 1964 respectively.<sup>6</sup> The Far Eastern region of the Soviet Union was accorded priority in the early deployment of the SS-20.<sup>7</sup> The planned deployment of the proposed missiles will apparently consist of one-third being placed in the Western Soviet Union, one-third on the Sino-Soviet border, and the remaining third to be deployed as a “swing force” which could be quickly moved to either area and used to strike targets in either Asia or Europe, depending on the situation.

The system's reported range varies from source to source, from a low of 4500 km to a high of 5500 km. Some analysts note that this variation may be largely a function of the size of the particular delivery package and thus the range could vary from weapon to weapon. In any case the improvement it gives Soviet forces in range over the older systems is graphically portrayed in the maps of Europe and Asia (see Figures 1 and 2). These maps were constructed by using the range of 5000 km and known SS-20 basing.

The weapon is designed with a refire capability; consequently in ascertaining the actual number of weapons deployed, the number of launchers will not necessarily give the accurate figure of total missiles. The MIRV and refire capability of the weapon will give the Warsaw Pact a distinct advantage over Nato in delivery systems with ranges beyond 600 km in the period up to 1988, and that is taking into consideration the completion of theater nuclear force modernization by Nato.<sup>8</sup> As previously noted, the Soviet Union's current production rate will ensure approximately 400 SS-20s deployed by the fall of 1983 (the start date for Nato's deployment of GLCMs and Pershing 2). This will provide the Soviets with 1,200 additional warheads (considering 3 RVs per missile), or roughly twice the number they had with the SS-4 and SS-5. Its solid fuel system makes it much less cumbersome to prepare for launch than its SS-4 and SS-5 forbears and will also allow it to be positioned and launched much more quickly and surreptitiously.

With a CEP of only .26 nm, the SS-20 is a significant improvement over the SS-4 and SS-5 which have CEPs that, in some cases, exceed 1.0 nm. Given this

improvement certain SS-11 weapons can now be retargeted. The SS-11 inventory consists of 580 missiles with a range of 5,700 nautical miles.<sup>9</sup> By releasing this weapon from its theater role, the Soviets have been able to redirect them to a strategic mission. The added SS-20 accuracy also contributes to Soviet strategic security by effectively countering the French Force de Frappe and any burgeoning Chinese capability. This is of particular importance to the Soviets because of the ability of the French and Chinese to strike the Soviet homeland and the deployment in the last year of new, more accurate French and Chinese weapons systems.

One should be reminded that CEP values are the results obtained through the observation of Soviet tests. Testing of such weapons is normally done in a very precise fashion in which the location of the launcher is scrupulously calculated to the most minute measurement. All procedures are carried out in a systematic fashion in order to obtain the best possible result. The weapon when used in combat, however, will undergo Clausewitz's "friction of war." In this setting the weapons may be launched from areas that have not been precisely surveyed or may be subject to the normal errors common to humans when subjected to the rigors of exhaustion and terror common to the battlefield. In addition, the location and configuration of the target could be altered greatly if the attack is to take place after warning has been given and the opponent can take action to reduce damage. By this, the precise location of targets such as principal troop locations, command centers, and weapon sites (to name but a few) are known during peacetime, but once hostilities commence this information is subject to the errors of target acquisition. Thus the Soviet's choice of whether to begin the war with the use of these weapons is of critical importance, as use at the onset of hostilities will insure that crews are in the best possible condition, accurate information of launch and target locations is available, and the data will have been previously calculated and recalculated. Although, additional weapons could be used to compensate for mistakes that may occur and assure the same probability of success.

Besides the impressive capabilities already mentioned, the SS-20 provides the Soviets the opportunity to achieve a technological "breakout" through conversion to a SS-16 model by the addition of a third stage. This would increase the range of the system to over 9,000 km or about 5,700 miles,<sup>10</sup> and could give the Soviets a deployable "MX" far in advance of any target date that the United States might now have for its system. However, analysts are skeptical of such upgrading because testing of the SS-16 has not been successful.<sup>11</sup> Nevertheless, the United States remains concerned as it has been reported that some SS-16s may be already intermixed with SS-20s at a silo complex near Novosibirsk where a weapon with greater range than the SS-20 makes sense.<sup>12</sup> Recent reports have alleged that the Soviets had deployed up to 200 SS-16 missiles in the northern region of the Soviet Union.

With a range of some 6,000 nautical miles, this system could threaten targets

as far south as Omaha, Nebraska in the United States.<sup>13</sup> Deploying the SS-16 at the same location with the SS-20 may be a ploy to avoid accusations of SALT II violations (the deployment of the SS-16 as a mobile ICBM is precluded by SALT II).

This could have profound consequences for Soviet capabilities and for an arms control agreement because it would be virtually impossible to verify a SS-16 ICBM inventory. The erector-launcher vehicle used for the SS-20 is compatible with the SS-16 which would facilitate the Soviet conversion from one missile to the other.<sup>14</sup> In addition the canisters in which the missiles (SS-20 and SS-16) are transported can be made to look exactly alike.<sup>15</sup> Most analysts discount reports that the SS-16 is currently deployed in a mobile mode though some think that it may be deployed in a few silos. If the Soviets could deploy the SS-20 while stockpiling enough third stages, they could increase the number of ICBM launchers available in a relatively short period of time.

The emphasis that the Soviets have placed on the SS-20 is further demonstrated by its development costs, which for over the last ten years has been one of the largest expenditures in the Soviet defense budget.<sup>16</sup> The weapons' characteristics are in keeping with the principal tasks outlined for the strengthening of the Soviet Strategic Rocket Forces; which are to keep or increase the lead maintained over the United States in: payload, number of launchers, and land mobility of the system.<sup>17</sup> Decisions on weapons procurement are made at the highest levels of the Soviet government, and the SS-20 is consistent with a developing strategy of producing weapons which are designed to fight and win a nuclear war and also ensure the seizure of European industrial technological assets intact, if possible, through reduced collateral damage.

Soviet officials have continued to downplay the significance of the SS-20 arguing that its deployment does not represent a quantum leap in Soviet capabilities but is only a long overdue modernization of obsolescent systems, namely the SS-4 and SS-5. This argument is substantiated by Lieutenant General Nikolai F. Chervov, Chief of the Directorate of the Soviet General Staff, who seems to fill a role as a spokesman on military affairs and coordination for arms control issues: "Obsolescent types of missiles have come to the end of their serviceable life and are being replaced by the SS-20 missiles, which are designed to carry out the same tasks. Of course, it would be strange if the new missiles were worse than the old ones, but their tasks and combat potential have remained basically the same."<sup>18</sup> This point was further reiterated in the Soviet publication *The Threat to Europe*.<sup>19</sup> However, the Soviet "logic" is fallacious for two reasons. First, the older SS-4 and SS-5 systems are fixed, vulnerable and inaccurate, with CEPs in excess of a mile. The mobile SS-20 system is obviously less vulnerable and with its improved CEP and range could be used for counterforce targeting for which older

systems were inadequate. Second, the Soviets do not seem to be retiring the older systems. Former Secretary of Defense Harold Brown in his last report to Congress noted that though some SS-4 and SS-5 missiles have been retired, ". . . a substantial number remain in service creating the impression that the SS-20 is augmenting and not replacing them."<sup>20</sup> Currently, 230 SS-4s and SS-5s are still operational.

As regards the future, two points are important in the evaluation of this weapon system's capabilities. First, any advances in technology that would provide for a SS-16-type conversion that would be compatible with the mobile SS-20 erector launcher must be closely monitored. Second, the simple fact that this is a *mobile* system cannot be overemphasized. The earlier charts are reminders of vast coverage this system can provide by movement of the launcher. It is worth noting that the deployment of Soviet missiles to Cuba in 1962 was discovered when US flights returned with photos of the construction of missile launching sites. This gave the United States time to react before the missiles became operational. In the case of the SS-20, such a luxury no longer exists.

**Targeting and the SS-20.** Soviet nuclear targeting doctrine is very straightforward. Once nuclear combat begins, atomic weapons are to be used with whatever intensity necessary to defeat the enemy.<sup>21</sup> Their analysis is completely mission-oriented, and target categories are examined in the context of their contribution to a particular mission. Of first priority in the strategic mission is the defeat of the opposing military forces, in particular, the nuclear forces. Two factors weigh heavily here: first, the magnitude and likelihood of the target damaging Soviet vital interests; and second, the ease with which the target can be engaged and destroyed.<sup>22</sup> The SS-20 with its increased range, payload, and accuracy can be expected to play a vital role in meeting these targeting objectives. Most Soviet analysts would agree with the summary of target analysis as stated by Major General Vasily I. Zemskov, former member of the Military Science Administration of the General Staff and current editor of *Military Thought*, in an article in *Voyenna mysl*: "The power of nuclear weapons will be concentrated above all toward destruction of the military-economic potential, defeat of the groupings of armed forces, and undermining of the morale of the population. Very important strategic missions of the armed forces can be the destruction of the largest industrial and administrative-political centers, power systems, and stocks of strategic raw materials; disorganization of the system of state and military control; destruction of the main groupings of troops, especially of the means of nuclear attack."<sup>23</sup>

The targeting doctrine may have been altered to some degree to incorporate three concepts: efficiency in the use of weapons, limiting the targeting of cities to use political targeting or terror without having to

destroy the *prize* in the process, and the emergence, to some degree, of a Soviet "limited nuclear war" concept. The idea of efficiency in the use of nuclear warheads is consistent with the Soviet belief in the real possibility of using such weapons in combat. While many Western writers would argue that the weapons are self deterring—because of the wholesale destruction wrought by them—the Soviets have shown an interest in reducing the size of warheads used while decreasing the CEP to secure the same results. As one Soviet general officer put it: "Initial attention is given to the selection of those enemy targets against which strategic nuclear means could be best used. Depending on the features of the strike targets, a selection is made of the nuclear weapons carriers (strategic missile, missile-armed aircraft, submarines or surface craft) which could best and most rapidly execute the assigned mission with minimum expenditure of explosive power."<sup>24</sup>

Some believe the development of such systems as the SS-20, Backfire bomber, and possible expansion to nuclear-capable field artillery is evidence that the Soviets are developing a concept of "limited nuclear operations." Recent evidence of how the Soviets have conducted major training exercise would also sustain this view.

The following table may be used as a guide to possible combat tasks, priorities, and related objectives. It reflects official military doctrine concerning operations enunciated in 1971 by Marshal Grechko and simulated in the global tactical exercise *Okean-75*. It has been condensed to include only those targets readily strikeable by the SS-20.

### SOVIET OBJECTIVES AGAINST NATO FORCES IN A NUCLEAR WAR<sup>25</sup>

Targeting Priority	Objectives	Combat Tasks
1	Destruction of enemy nuclear attack capability	US forward-based air carriers, US-West Pershing rocket bases, United States Air Force Europe, West German and British strike command nuclear-capable aircraft bases, Tanker bases in France. British and French ballistic rockets and submarines, nuclear storage sites in West Germany
2	Destruction or disruption of enemy control of state and military activities	All Command and Control facilities in Western Europe
3	Destruction or disruption of enemy troop basing system	US Seventh Army bases in West Germany Major ports of entry and supply, for example: Antwerp, Belgium, Hamburg, West Germany, Rota, Spain; Holy Loch, Scotland; Rhein Main, West Ger-



Targeting Priority	Objectives	Combat Tasks
4	Destruction of enemy military-industrial support facilities	Tank farms in United Kingdom. Nuclear power reactors in UK, Belgium, and West Germany
5	Destruction and disruption of enemy rear services and transport	Nato highway, rail, barge "choke points," etc.

The table is consistent with the view of Sokolovskiy and others when he observed: "The main task of the attacking troops will be the annihilation of atomic artillery, missiles and tactical aviation throughout the enemy territory. The bases for these weapons are within range of operational tactical missiles and frontal aviation, and they can be readily eliminated by nuclear attacks."<sup>26</sup>

Much available evidence seems to indicate that the Soviets would utilize nuclear weapons if hostilities began with the United States. While this point may be debatable, the fact that the Soviets have the capability to do so with some degree of precision is not. The critical question still remains as to when these weapons would be used. Would such strikes occur immediately or after Nato had had an opportunity to deploy and reinforce? As noted by the International Institute for Strategic Studies, warning time is critical to secure necessary reinforcements. If an attack should commence before they are in place, those coming by sea become much more uncertain and air reinforcements and their transit facilities will likely come under attack.<sup>27</sup>

It is generally accepted that the Soviets will make every effort to allow Nato little notice. Their doctrine calls for striking first with a massive, in-depth nuclear strike which would attempt to isolate the battlefield and disrupt command control and communications; breach the main defenses, and destroy Nato's nuclear means of attack.<sup>28</sup> The need to strike first, especially against an enemy's nuclear weapons, is underscored in the following excerpt by a Soviet strategist: "A delay in the destruction of means of nuclear attack will permit the enemy to launch the nuclear strikes first and may lead to heavy losses and even to the defeat of the offensive. The 'accumulation' of such targets as nuclear weapons and waiting with the intention of destroying them subsequently is now absolutely inadmissible."<sup>29</sup>

Should the Soviet Union decide to initiate hostilities in Europe with a nuclear strike, the SS-20 gives them the capability to make such an attack devastating. General Pierre Gallois, noted French strategist, has calculated that the Soviets could strike a crippling blow against Nato without using all the SS-20s they have available.<sup>30</sup> It is apparent that an attack upon the principal headquarters, airfields, and nuclear assets could be accomplished without using the entire SS-20 force. Such a "surgical" blow could nearly eliminate any capability that Nato might have to respond in kind, and thus

force the United States to respond with its central strategic forces or risk the loss of Nato.

This discussion has centered on the threat the SS-20 presents to Nato; however, it also threatens vital US interests in the Far East. The Soviets treat the China problem as unpredictable and do not discount irrational behavior by Beijing. Rather than depending upon deterrence based solely on an assured second-strike capability, the Soviets are prepared for a "pre-war" fighting posture which will confront a threatening aggressor with a high probability for annihilation and defeat.<sup>31</sup>

The Soviet Union has made it clear that in a war involving the USSR and China: they would make first use of nuclear weapons, they would make all necessary use of such weapons, and they would not fall victim to the trap of being drawn into the interior of China to wage a long and bloody "people's war."<sup>32</sup> This "long-range" warfighting strategy is further supported by the deployment of the majority of the Chinese army, supply centers, etc. over 100 km from the border which places them effectively out of the range of short-ranged missiles. The ratio of Soviet theater nuclear forces to divisions of troops is also much larger than one finds in the Western USSR<sup>33</sup> which suggests that the majority of the offensive "punch" will be provided by longer range missiles.

The Chinese have deployed two small IRBM systems which have the capability of striking targets in the Western USSR. Additionally, in May of 1980 they tested the new CSSX-4, ICBM which has a range of 6,400 miles.<sup>34</sup> The Chinese have also made efforts to harden their silos, increase accuracy, and quicken reaction time.<sup>35</sup> In assessing the impact of this weapon's deployment upon the Eastern theater one fact must remain obvious: the balance of strategic power between the Soviets and the Chinese remains decisively in the Soviet's favor, so much that it is hard to imagine how the Chinese strategic vulnerability could be further degraded by the SS-20 deployment. Nevertheless, the SS-20 gives the Soviets a highly accurate and survivable system for future targeting against the Chinese. Furthermore, it allows them the ability to retarget some of their larger systems, such as the SS-11, to other targets in the Pacific should they become involved in a conflict with the United States. It may also serve to further political goals by encouraging China and other Asian states to seek accommodation with the USSR.

In the Far East it would seem likely that a Soviet surprise assault against the United States and China would include the following targets: Subic Bay and Clark Field in the Philippines, the fleet repair facilities in Japan, 8th Army HQ in Seoul, principal US bases on Guam and Okinawa, principal targets in China especially the Chinese nuclear facility at Lop Nor and local military assets in the Korea and Tsushima Straits which would hinder the exit of the Soviet fleet to the Pacific.

In attacking the targets listed the Soviets would be consistent with their

doctrine in isolating the battlefield strategically, wiping out those enemy nuclear forces capable of striking the USSR or its strategic lines of communication, using the SS-20 to exact gains through threats, such as, giving the Chinese reason to pause before entering a war between Nato and the Warsaw Pact, and paving the way for rapid advances by its conventional forces.

**Conclusion.** The SS-20 gives the Soviet Union an effective counterforce weapon for use in the European and Asian theaters. Developments in Soviet military doctrine seem to emphasize theater operations which further demonstrates the importance of this system.

The Soviet claim that the SS-20 is merely a modernization of existing intermediate range nuclear forces is wholly false. This is clearly demonstrated by their retention of large numbers of SS-4s and SS-5s and the improved range and accuracy of the SS-20. In addition, Soviet progress on this weapon may portend future threats to US security because of possible SS-16 conversion.

In an era of strategic parity, Soviet INF superiority is a potential political wedge between the United States and its allies. It can reduce allied certainty in US commitment while allowing the USSR an effective instrument to tacitly or actively encourage accommodation. It may increase the importance of conventional forces in view of Soviet dominance at theater levels. It is a system that threatens US national security both in Nato and the Far East and, as such, it must be closely monitored and its politico-military potential countered if we are to reduce our own vulnerability to its obvious potency.

### Notes

1. Richard Burt, "NATO and Nuclear Deterrence," Arms Control Association Conference, Brussels, Belgium, 23 September 1981.
2. "The Balance of Theatre Nuclear Forces in Europe," *Air Force Magazine*, December 1980, p. 125.
3. William C. Ruchert, ed., *The World's Missile Systems* (Pomona, Calif.: General Dynamics, 1980), p. 280.
4. "NATO and the Warsaw Pact Force Comparison" published by NATO, May 1982, p. 49.
5. International Institute for Strategic Studies, *The Military Balance 1981-1982* (London: 1981), p. 218.
6. Office of the Secretary of Defense, *Soviet Military Power*, 1981.
7. "Soviet Nuclear Arsenal Continues to Proliferate," *Aviation Week and Space Technology*, 13 June 1980, p. 75.
8. National Defense University, *Proceedings of the National Security Affairs Conference 23-25 July 1979* (Washington: Ft. McNair, 1978), p. 38.
9. Phillip A. Peterson, "Flexibility: A Driving Force in Soviet Strategy," *Air Force Magazine*, March 1980, p. 97.
10. Gregory R. Copley, ed. *Defense Foreign Affairs Handbook* (Washington: Copley and Associates, S.A., 1980), p. 548.
11. Interview with Col. John Kelliher, Department of Strategy, National Defense University, Washington, D.C.
12. "SS16 Deployment Raises Senate Questions," *Aviation Week and Space Technology* 24 September 1979, p. 24.
13. Niles Lathem, "Soviet Secret Weapon Threatened U.S.," *New York Post*, 3 April 1982, p. 2; David E. Froman and Robert D. Clark, "Soviet Frezes Weapons," *Washington Post*, 5 April 1982, p. 5.

14. David Jones, ed. *Soviet Armed Forces Review Annual 1980* (Gulf Breeze, Fla.: Academic International Press, 1980), p. 5.
15. Edgar Ulsamer, "Moscow's Goal is Military Superiority," *Air Force Magazine*, March 1980, p. 48.
16. William T. Lee, *Soviet Defense Expenditures in an Era of SALT* (Washington: U.S. Strategic Institute, 1979), p. 18.
17. Lewis Allen Frank, *Soviet Nuclear Planning* (Washington: Enterprise Institute, 1977), p. 10.
18. Foreign Affairs and National Defense Division, Congressional Research Service, Library of Congress, *The Modernization of NATO's Long-Range Theater Nuclear Forces*, a report prepared for the Committee of Foreign Affairs, U.S. Congress, House (Washington: U.S. Govt. Print. Off., 1981) p. 42.
19. A. Solkinov, *The Threat to Europe* (Moscow: Progress Publishers, 1981), p. 19.
20. Secretary of Defense Harold Brown, *Report of the Secretary of Defense to the Congress on the FY 82 Budget* (Washington: U.S. Govt. Print. Off., 1981) p. 3.
21. Benjamin Lambeth, *Selective Nuclear Options in American and Soviet Strategic Policy* (Santa Monica, Calif.: Rand, 1976), p. 35.
22. Joseph Douglass and Amoretta Hoerber, *Soviet Strategy for Nuclear War* (Stanford University: Hoover Institute Press, 1979), p. 75.
23. *Ibid.*, p. 16.
24. Joseph Douglass, *Soviet Military Strategy in Europe* (New York: Pergamon Press, 1980), p. 57.
25. Frank, p. 12.
26. Marshall, V.D. Sokolovskiy, *Soviet Military Strategy*, translated by Harriet F. Scott (New York: Crane-Russak, 1975), p. 292.
27. National Defense University, p. 109.
28. James Quinlan, *Validity of a Tactical Nuclear Defense for NATO* (Carlisle, Pa.: US Army War College, 1977), p. 20.
29. Douglass, p. 168.
30. Interview with General d'Armee Aerienne (ret.) Pierre Gallois, Paris, France, 24 June 1982.
31. Leon Goure, *The Role of Nuclear Forces in Current Soviet Strategy* (Miami: Center for Advanced International Studies, 1974), p. 5.
32. *Ibid.*, p. 20.
33. S.T. Cohen and W.C. Lyons, "A Comparison of U.S.-Allied and Soviet Tactical Nuclear Force Capabilities and Politics," *Orbis*, Spring 1975, p. 80.
34. Robert L. Pfaltzgraff, Jr., "China-Soviet Strategy and American Policy," *International Security*, Fall 1980, p. 33.
35. Paul H. Godwin, *The Chinese Tactical Air Force and Strategic Weapons Program: Development, Doctrine, and Strategy* (Maxwell AFB: Air University, 1978), p. 44.

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