

From Missouri to Natanz: US Global Strike Capability

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Recent years have seen a substantial change in US power projection capability. For decades this capability was based on the use of aircraft carriers; now the US possesses the unique capability of executing an extensive, intercontinental attack without the need to operate from foreign territory. An American attack on Iran, if executed, could possibly be the first significant demonstration of this capability. The next stage will be the ability to carry out such an operation within a shorter response time than is currently possible.

Aircraft carriers and their escort ships have been a dominant component in almost every American military action since the end of the Second World War. To many observers, the aircraft carrier, perhaps more than anything else, has been a symbol of US military might. Even today, when voices are heard speculating over a possible US military action against Iran, the natural tendency is to check how many aircraft carriers are situated in the Persian Gulf. Modifications in the deployment and numbers of aircraft carriers are perceived as essential data with regard to US preparedness for launching a military action.

However in recent years the US has been involved in an ongoing process that will change the current state of affairs. In fact, already today aircraft carrier deployment is not necessarily a key indicator of US operational preparedness. Instead, a possible American military move against Iran is likely to rely on forces stationed in the US itself and on weapons whose locations would be disclosed only after opening fire. These capabilities have been employed in the past, but they are gradually playing an increasingly central role in US combat plans. At this stage advanced US power projection capability is still being developed; however, if all goes according to plan, within a decade – and perhaps sooner – the US is expected to undergo a revolutionary change on this level.

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The Road to Global Strike

Changes in US power projection capability are predicated on underlying reasons and rationales. For years aircraft carriers have been considered a key instrument in US power projection capability. The ability of an aircraft carrier together with its escort ships to deploy in a relatively short time in a crisis region and be ready for immediate action upon arriving has granted it a large degree of operational flexibility. The mere fact that an aircraft carrier is dispatched to a region is a demonstration of US determination. Sometimes the appearance of an aircraft carrier and its accompanying task force is sufficient to neutralize a crisis.

However, notwithstanding operational flexibility, several days are required for an aircraft carrier to arrive at the theater of action. In addition, the airborne wing of an aircraft carrier relies on attack planes with a limited effective range, and as of today, aircraft carriers do not carry stealth aircraft. This means that in most cases the airborne wing of an aircraft carrier is forced to operate as a part of "strike packages," where a considerable portion of the force is allocated to defense against air and land threats, while only a small part of it used for attacking the mission's designated targets.

In such cases it is necessary to employ aircraft taking off from land airbases. The problem is that these are not always available in a particular region, and it is often difficult to receive diplomatic authorization from neighboring countries to deploy and activate aircraft from their territory. Added to this is the difficulty in getting permission to fly in foreign airspace. As a result, aircraft are forced to fly in less than optimal flight paths, thus lengthening flight time and creating additional challenges for the mission's successful



performance. A good example was the punitive action against Libya in April 1986. US warplanes were forced to take off from Britain and make a lengthy bypass of the Iberian Peninsula given France's opposition to their passing through its airspace.¹

Advanced power projection was initially demonstrated as a limited level capability,² activated only on a small scale and in tandem with a much more extensive action employing short range capabilities. Since then, the capability has been expanded significantly and has achieved operational dominance, to the point where it is able to be activated independently and not as an accompanying factor.

The critical advances occurred in recent years. Due to the great importance accorded by the Bush administration to finding a response to non-conventional threats from countries such as Iran and North Korea, it was decided to prepare for the option of direct attack missions from US territory, without the need to rely on the assistance of foreign countries. At the beginning of 2003, US Strategic Command (STRATCOM), which until then was responsible only for the planning and execution of nuclear warfare plans,

B-2A stealth bomber during aerial refueling

was assigned an additional task called Global Strike. This task consists of, *inter alia*, the capability to attack quality enemy targets, including non-conventional weapons facilities located at any point on earth. In August 2004, STRATCOM completed an operational plan that includes preliminary readiness for Global Strike missions, *i.e.*, missions ready to be executed upon receiving the command.³

While the concept of Global Strike also comprises alternative nuclear options, this article focuses on the concept's conventional dimension and the ability to hit any point on earth directly from US territory.

Iran: The First Practical Test?

The path to implementing the idea of Global Strike can be demonstrated with its possible application against Iranian nuclear facilities. In a similar manner it is possible to examine its application in operational scenarios against other targets in other countries. This analysis *is not* an attempt to examine all military alternatives at the disposal of the US vis-à-vis Iran or their implications, but rather is an examination of the role of Global Strike as one among these alternatives.

The starting assumption is that the goal of any American military move would be first and foremost to hit nuclear targets in Iran⁴ rather than a wider scale operation also directed at hitting army concentrations, military targets, and so forth. The majority of these targets are stationary and defended, away from population centers; some of them are located underground so as to make hitting them difficult. An analysis of current US military capabilities demonstrates that a possible military move against these targets could almost entirely be executed by forces operating from US territory, together with forces secretly deployed in the Persian Gulf,

far from the eyes of the media.

Most of the attacking force at the disposal of the US for attacking defended targets is based on B-2A type stealth bombers stationed in Missouri.⁵ The ability of the B-2A to fly directly from the US,⁶ independently penetrate beyond enemy air defense systems while avoiding detection, and carry unique types of armaments grants it an advantage over any other weapon system. Each B-2A is capable of carrying eight guided penetration bombs weighing approximately two tons each.⁷ For comparison's sake, no aircraft positioned on the deck of an aircraft carrier is capable of carrying even one bomb of this type.⁸ What is more, the B-2A will constitute the sole platform capable of carrying the MOP (Massive Ordnance Penetrator) bomb, which weighs approximately 15 tons. This bomb is now under development, but based on past history it can be assumed that when needed, the bomb's introduction into operational use can be accelerated.⁹ The US Air Force currently has twenty-one B-2A bombers. If we assume that only two-thirds of them are operational at any given time, then the US has the capability to attack more than 100 well-defended targets simultaneously, along the likes of the centrifuge plant at Natanz, for example.

The bomber's long range capability has an added advantage. The fact that the US controls airspace over Iraq and Afghanistan enables the planning of penetration routes, guaranteeing that not all bombers will come from the direction of the Persian Gulf, *i.e.*, southwest to northeast as the Iranians can expect. It is possible to plan penetration routes such that a portion of the force comes from the east, a portion from the west, with some forces even coming in from the north instead of the south. This means that Iran could find



itself attacked simultaneously from several directions, and from points where its air defense system is thinner. Fighter planes with far shorter ranges would find themselves hard-pressed to execute such outflanking maneuvers.

An additional important component of US power projection capability is the Tomahawk cruise missile. The missile was first employed in 1991 and since then hundreds have been launched in operational actions. But in this area too fundamental changes have occurred in recent years. In 2004 a new version of the missile came into service; its greatest advantage stems from its two-way communication ability. The operational significance of this is that the missile transmits via satellite communication an image of the target seconds before it is hit. This capability, absent from previous models of the missile, enables an assessment of the results of an attack in real time.¹⁰ In addition it is possible to draw up a list of fifteen targets for the missile, or even transmit information on a new target while the missile is in flight.¹¹ Put another way, imagine a scenario in which several missiles are launched against the same target so as to assure its destruction; if information is received that the target has been destroyed it will be possible to deflect the remainder of the missiles, freeing them to attack alternate targets. Similarly, if an important target is not destroyed, a real time allotment of additional missiles will be possible in order to attack the target, even if these missiles originally had other targets designated for them.¹²

Along with the operational flexibility of the new generation of Tomahawk missiles, there has been another significant change in the operational capability of cruise missiles. As part of the nuclear arms reduction agreements between the US and Russia, the US



Navy was required to remove from service four of its eighteen Trident ballistic nuclear missile-carrying submarines (SSBNs). These nuclear submarines in their original configuration were able to carry 24 ballistic missiles armed with nuclear warheads. The submarines were designed with the ability to remain underwater secretly for several months while unaccompanied and unassisted by other ships. Instead of retiring these submarines from service it was decided to reconfigure them to carry cruise missiles (SSGN) and special operation forces. In place of nuclear missiles, each submarine of this type can carry 154 cruise missiles.

This seemingly does not represent any innovation or novelty; indeed cruise missiles are permanently placed in attack submarines and on surface ships. However, in practice, converting Trident submarines to launching platforms for cruise missiles constitutes a fundamental operational change. Two Trident submarines arriving secretly to the Persian Gulf could launch over 300 cruise missiles within six minutes.¹³ For comparison's sake, a typical naval task force is equipped with between 120 and 180 cruise missiles,¹⁴ scattered among a large number of ships. In oth-

Trident submarine launching cruise missiles (artist's sketch)

The advantage of Global Strike lies in the ability to carry out a wide scale operation without the need for numerous early preparations.

er words, dozens of ships are needed in order to match the fire-delivering force of two submarines. Clearly a naval task force such as this is far more vulnerable, particularly in a relatively crowded arena such as the Persian Gulf and against an opponent like Iran, which has invested heavily in long range anti-ship missiles.

The launching procedure on a Trident submarine is much faster than that of a regular marine force, such that the exposure time is cut to just a few minutes, after which the submarines leave the area. In addition, the simultaneous firing of hundreds of cruise missiles complicates the self-defense efforts of the opponent. A situation in which Iran is attacked by B-2A bombers as well as cruise missiles coming in from all directions will make it difficult for its air defenses to function successfully. Unlike bombers having to cross the airspace of several countries, the cruise missiles can be launched without any need to coordinate with other countries. Today the US Navy is in the midst of a process for gradually absorbing the Trident submarine. The first submarine entered operational service in February 2006. This process is scheduled to continue over a number of years, but the assumption is that if an operational need arises, this timeframe can be shortened.¹⁵

The combination of B-2A bombers and cruise missiles would enable the simultaneous strikes on hundred of targets in Iran as part of a broad move against its nuclear infrastructure.¹⁶ That fact that these weapon systems possess a high degree of accuracy combined with the fact that the majority of nuclear targets are not situated in the heart of population centers reduces the risk of collateral damage. Nevertheless, operational experience has shown that the B-2A is also capable of precisely hitting targets situated

in the heart of a city, for example the bomber attacks in Belgrade during Operation Allied Force in Yugoslavia in 1999.

If follow-up attacks become necessary, for example on sites not completely destroyed, it will be possible to make further use of Global Strike forces, albeit on a smaller scale. The B-2A bombers could make additional sorties, activated from the Diego Garcia naval base in the Indian Ocean, about 5,000 kilometers from Iran. If the bombers are forced to return to the US, and if in the first wave of attack all of the operational bombers are employed, the second wave could be carried out a mere two days later. Using the Diego Garcia base could enable additional waves in less than a day. On the other hand, in the case of submarines, it would be difficult to execute a repeat attack within a short time since the vessel would have to be rearmed.¹⁷

It is important to remember that the advantage of Global Strike lies in the ability to carry out a wide scale operation without the need for numerous early preparations. If additional waves of attack are required, or if it is decided to expand the target base to include additional targets (so as to enable a response to possible Iranian counter operations and retaliation), it is reasonable to posit that forces stationed in the Gulf region will be used as well.¹⁸

Prompt Global Strike – From Days to Minutes

Despite the qualitative, fundamental change in US power projection capability currently underway, the capability itself is not revolutionary. If we examine, for example, the use of B-2A bombers, they require several hours to get from the US to Iran, and they must cross the airspace of several countries. The time variable shortens in the case of launch-



ing cruise missiles, but this necessitates the early deployment of submarines in the area of action, which is liable to take several days. In fact, current power projection capabilities would likely become irrelevant should the need arise to respond within a shorter time, for example, a scenario in which information is received that North Korea is preparing for a missile attack on South Korea; or an attempt by China to hit the US spy satellite apparatus; or a plan by Iran to attack Israel with non-conventional weapons. True, these scenarios are extreme, but they are possible. In such cases, all the US can do today is to employ forces already situated in the region, but these too are liable to be unsuitable from an operational aspect. Or, the US could try to relay a threatening message to the enemy when its intentions are uncovered, in the hope that this will deter it from carrying out the action.

Scenarios of this sort have prompted the US to work on a new warfare concept called Prompt Global Strike, or PGS. The goal is to develop weapons enabling a direct attack from US territory on any target at any point on earth, without needing to coordinate with other countries and within approximately one hour of receiving the order, to a degree of accuracy measuring several meters. If using B-2A bombers shortens response time from several days to about one and a half days, now the goal is to shorten this to less than one hour. If the emphasis in Global Strike is on the distance dimension, then PGS, as its name implies, adds the importance of the time dimension.

Setting aside the question of how to supply the required intelligence for the moment, it is possible with today's technology to carry out PGS missions. Intercontinental ballistic missiles (ICBM), for example those posi-



tioned on US bases or in submarines (SLBM), can hit any point on earth within the required fixed period of time. However, these missiles suffer from two key disadvantages. First, all intercontinental ballistic missiles currently in the possession of the US are equipped with nuclear warheads; and second, since these missiles were intended for delivering nuclear payloads, their rate of accuracy is lower than conventional armaments. Official data is classified, but the precision of the most accurate intercontinental ballistic missiles can be measured in tens of meters. For the sake of comparison, the precision of a smart bomb is to within a few meters or even less. Accordingly the idea arose to equip intercontinental missiles with new conventional warheads that include guidance systems aimed at improving accuracy to the required level. This capability has already been proven in test launches.¹⁹

But while most of the technology is already available, the use of PGS capability based on converting intercontinental ballistic missiles presents quite a few problems that concern distinguishing between conventional and nuclear weapon attacks. If we imagine a situation where a decision is

Test launch of a Tomahawk missile (January 2003) as part of evaluation of the concept of launching cruise missiles from Trident submarines

The goal is to develop weapons enabling a direct attack from US territory on any target at any point on earth, without needing to coordinate with other countries and within approximately one hour of receiving the order.

made to activate PGS facilities against Iran, then the US could launch intercontinental ballistic missiles from its own territory. The fear is that the early warning systems of countries like Russia or China would detect the launch without knowing whether it is a conventional or nuclear missile. Today this problem is of relatively less importance because any non-experimental launch of an intercontinental ballistic missile would be automatically defined as an operational nuclear launch, with all that this entails. The fear is that a conventional attack would be interpreted as nuclear. In order to prevent this situation, several solutions have been proposed. The simplest solution would be to give advance notification to Russia, for example, of a missile launch; however this solution is likely to disclose the attack and harm its chances of success. Other possible solutions include positioning conventional intercontinental ballistic missiles at separate sites from nuclear missiles; or launching them using different flight paths.²⁰ Today the voices of those opposed to the idea of reassigning intercontinental ballistic missiles for use in conventional missions are stronger than those supporting the idea. Congress is emphatically opposed to funding a research and development program in this area and is blocking any attempt to allocate funds for this purpose, even for projects defined as feasibility studies. Thus, for example, a fierce struggle is underway concerning the Navy's request to equip a specific number of Trident II submarine-launched ballistic missiles with conventional warheads.

Conclusion

Even if it is decided to continue developing PGS capabilities based on existing intercontinental ballistic missiles or other alternatives,

it will take another decade until these become operational. However, the US already has the unique operational ability to carry out within a day or so a comprehensive attack operation aimed at hundreds of targets, including well defended ones, without relying on forces stationed in the territory of foreign nations or a broad operation to hit the enemy's air defense systems. This capability is expected to expand when submarines carrying cruise missiles are brought into service and the development of new penetration bombs is completed.

This capability has operational and geo-strategic importance. First, reliance on countries in a region of action to allow the activation of force from their territories has decreased. Second, a considerable portion of the need to coordinate the timing of an action with other countries (endangering the chances of surprising the opponent) has been saved.²¹ Activating forces from US territory and from underwater launch positions would enable the element of surprise, since the enemy would have very few signs, if any, that an attack is imminent. In the case of Iran it would be possible to exploit this long range capability in order to attack from different directions simultaneously, thus damaging the targeted country's ability for self-defense.

This does not mean that a possible attack on Iran's nuclear facilities via Global Strike would be simple or assured of success. This article has not at all dealt with many key questions, including: how is the required intelligence for defining hundreds of designated target points for the attack force obtained? How should Iranian retaliatory attempts be thwarted? Is it enough to attack nuclear targets, or is a wider action called for, i.e., directed against government facilities, surface-to-surface ballistic bases, and the like? And

still unexamined has been the question, perhaps the most important of all, of whether a military operation alone, as described here or by other means, can halt Iran's efforts to achieve military nuclear capability.

Global Strike does not pretend to be a magical solution or a substitute for other military capabilities – air or land – nor for all possible operation scenarios; it is rather an additional and important stage in the development of US fighting capability. However, Global Strike can assist the US in overcoming no small portion of the operational obstacles on the path to a broad scale attack on nuclear targets in Iran. This type of capability is not at the disposal of other countries.

Notes

1. "Operation El Dorado Canyon," April 2005, http://www.globalsecurity.org/military/ops/el_dorado_canyon.htm.
2. On the first day of the 1991 Gulf War, B-52 bombers took off from a US airbase, flew directly to the Gulf, launched cruise missiles, and returned to US territory. This mission, which lasted close to forty hours, was at the time thought to be the longest in history. Since then similar missions have been flown during operations in the Gulf, the Balkans, and Afghanistan. John Tirpak, "The Secret Squirrels," *Air Force Magazine* 77, no. 4, April 1994, http://www.afa.org/magazine/perspectives/desert_storm/0494squirrels.asp.
3. Hans M. Kristensen, "Global Strike: A Chronology of the Pentagon's New Offensive Strike Plan," *Federation of American Scientists*, March 2006, pp. 4–5, <http://www.fas.org/ssp/docs/GlobalStrikeReport.pdf>.
4. For a map of key Iranian nuclear sites see Ephraim Kam, "A Nuclear Iran: What Does it Mean, and What Can be Done," *INSS Memorandum* No 88, February 2007, p. 14, <http://www.tau.ac.il/jcss/memoranda/memo88.pdf>.
5. Added to this is the ability to launch long-range cruise missiles from B-52 bombers that will not penetrate Iranian airspace. These bombers could also take off directly from US territory.
6. The range of the B-2A without aerial refueling is approximately 9,600 km. With a single refueling the range increases to 16,000 km. The flight distance to the Natanz region on a flight path from the US to the Middle East crossing over Egyptian and Saudi Arabian airspace is approximately 14,000 km. In 2001, as part of the war in Afghanistan, bombing sorties of similar distances were carried out. The profile of a typical sortie includes: a direct flight from the US to the region, six refuelings in the air, an attack on the target, and finally landing at the Diego Garcia base in the Indian Ocean. Flight time: 40 hours. Upon landing the bomber was refueled with its engines still running; the crew was replaced by a new crew, and then the plane took off for a direct flight to the US lasting 30 hours.
7. For a discussion of the question whether existing arms, including those activated by the B-2A, can successfully confront the level of defense of Iranian nuclear targets, see Whitney Raas and Austin Long, "Osirak Redux? Assessing Israeli Capabilities to Destroy Iranian Nuclear Facilities," SSP Working Paper, April 2006, http://web.mit.edu/ssp/Publications/working_papers/wp_06-1.pdf.
8. The only aircraft capable of carrying bombs of this type is the US Air Force's F-15E. However, activating this aircraft necessitates using bases in the Persian Gulf as well as escort planes. In addition, the F-15E is capable of carrying only two bombs of this type, as opposed to the eight carried by the B-2A.
9. "Massive Ordnance Penetrator – DTRA Fact Sheet," April 2007, http://www.dtra.mil/newservices/fact_sheets/display.cfm?fs=mop.
10. In other words there is no need to wait to gather visual intelligence of targets after an attack in order to evaluate the strike; it is possible to make an evaluation based on the missile's transmission of a replay picture indicating whether or not it hit its designated target.
11. "Tomahawk Cruise Missile," *Raytheon*, 2006.
12. It is not known if the US has the ability to alter

- the allocation of targets for a large number of missiles simultaneously and in real time.
13. CDR Robert Aronson, "SSGN: A 'Second Career' for the Boomer Force," http://www.navy.mil/navydata/cno/n87/usw/issue_6/ssgn.html.
 14. Ibid.
 15. "Guided Missile Submarines – SSGN," *United States Navy Fact File*, January 9, 2005.
 16. An additional advantage for the combined activation of bombers and submarine-launched missiles is that the operation would be multi-branched, i.e., not the exclusive domain of a single branch of the US armed forces. Experience has shown that inter-branch conflicts have influence on operational planning and on decisions over which forces are to participate in operations.
 17. In addition to Trident submarines it will be possible to execute follow-up attacks via cruise missiles positioned on ships permanently stationed in the Persian Gulf.
 18. Aircraft carriers are important from two key aspects vis-à-vis long range attack operations, first, as a deterrent measure, where precisely due to their high profile they are likely to send a message to the enemy. Second, although most scenarios do not call for the participation of aerial forces positioned on the decks of aircraft carriers in attacking nuclear targets, these forces could assist in thwarting a portion of possible retaliatory attempts by the enemy (Iran), mainly directed against Persian Gulf countries.
 19. For example, in March 2005 there was a test of a conventional warhead for a submarine-launched ballistic missile equipped with a terminal guidance system, making it accurate to less than ten meters.
 20. Amy F. Woolf, "Conventional Warheads for Long-Range Ballistic Missiles: Background and Issues for Congress," *Congressional Research Service*, February 9, 2007, <http://www.fas.org/sgp/crs/nuke/RL33067.pdf>.
 21. At the same time, almost all flight paths from the US to the Gulf necessitate approval for crossing Egyptian and Saudi airspace. Moreover, it can be assumed that in any case there would be a certain degree of pre-attack coordination, at least so that these countries could prepare for the eventuality of being attacked in retaliation for a US attack.