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# Toward the End of Force Projection?

## I. The Anti-Access Threat

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**Corentin Brustlein**

*July 2011*



Laboratoire  
de Recherche  
sur la Défense

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# Abstract

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Force projection has become a general posture and a fundamental dimension of the influence Western powers intend to exert over the world by means of their armed forces. However, for the last fifteen years, Western states' adoption of expeditionary postures has encouraged the proliferation of certain technologies. The latter favor strategies based on naval and air interdiction, and threaten to render foreign interventions too costly. This article thus seeks to provide some clues for understanding and assessing the threat anti-access strategies pose to Western, and especially European, force projection capabilities. In order to illustrate in a concrete way the potential problems regional adversaries can pose, this article will focus on assessing the Iranian anti-access threat.



# Introduction

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Force projection capacity has historically been a criterion distinguishing great powers from other states. Most countries are able to use force to maintain internal order or defend their borders, but very few have the possibility to impose their will on their adversary by resorting to force several thousand kilometers away from their national territory. Therefore, the “command of the commons” – oceans, air, and space – by certain states used to be a unique feature in the confrontations between great powers.<sup>1</sup> As was proved by the two World Wars, securing and exploiting the command of seas and air was likely to have a decisive impact on the outcomes of land campaigns and wars in general.

Once the long parenthesis of the two World Wars was closed, the West became, again, the main beneficiary of the command of the commons, and took advantage of this asset to carry out a number of armed interventions. Due to the protection offered by nuclear deterrence since 1945 and the absence of territorial threats after 1990, Western countries have moved from a logic of total war to one of limited war. As a consequence, they have developed power-projection capabilities and their armed forces have focused on quality rather than quantity. Some operations that occurred during and after the Cold War, such as the Suez crisis, the takeover of the Falklands or the Gulf War, exemplify this development. More than a specific type of military operation, force projection has become a general posture and a fundamental dimension of the influence that great powers, in this instance the West, intend to exert over the world by means of their armed forces.

Yet, this situation could experience a historical reversal. For the past 15 years, a growing number of experts have observed that Western states’ adoption of expeditionary postures has encouraged the proliferation of certain technologies. The latter favor strategies based on naval and air interdiction, and threaten to render foreign interventions too costly.<sup>2</sup> Thus, systems such as submarines, naval mines, cruise and ballistic missiles, and surface-to-air missiles (SAM) are at the heart of a complex problem posed to most Western military operations. The anti-access threat became an issue in the United States following Operation *Desert Storm* and in the midst of a debate on the future of the US armed forces. However, this issue

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<sup>1</sup> Barry R. Posen, “Command of the Commons: The Military Foundation of U.S. Hegemony”, *International Security*, Vol. 28, No. 1, Summer 2003, pp. 5-46.

<sup>2</sup> Anti-access strategies do not include piracy, which is less a strategy aimed at weakening the enemy’s forces than a criminal practice targeted against trade and tourist activities.

has seldom been studied in France, with a few exceptions.<sup>3</sup> Unsurprisingly, the most far-reaching studies on this topic do not look at the threat facing France and Europe, nor do they assess those countries' ability to counter this threat. One of the aims of this study is thus to provide the first elements of an assessment of the anti-access threat to Western forces as a whole.

In the United States, the issue of anti-access emerged in the 1990s, but only after the 2001 Quadrennial Defense Review (QDR) and Donald Rumsfeld's military transformation plans did it get a tangible impact on US defense policy. The topic was subsequently put on the back burner by the US administration while it was grappling with insurgencies in Iraq and Afghanistan, but reappeared in American debates over the last few years. Obviously, this renewal is not fortuitous. It is rather a side effect of the strategic debate initiated around two questions: defining the future orientations of the American defense apparatus, and striking the right balance between preparing for future conflicts and supporting current operations. The United States, as the dominating military player today and as an insular power, is the first to be concerned by the severe military and political challenges facing force projection.<sup>4</sup>

Such an evolution looming over the world's first military power is necessarily problematic for France. Although it does not claim to be an enforcer of the international order, France has set ambitious targets for itself through its White Paper on Defense and National Security (*Livre blanc sur la défense et la sécurité nationale*, LBDSN), namely:

"France will possess the skills inherent in the critical phases of a major operation, whether at the launch phase, i.e. for its forces to have "force entry" capability, or during the transition from a coercive operation to a stabilization operation, then to one of peace consolidation".<sup>5</sup>

French military power is thus directly concerned by the emergence of anti-access capabilities. This is all the more true as the constrained defense budgets of middle-sized powers require an even more careful balance between their capacity for build-up and the capabilities needed for

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<sup>3</sup> See for instance Etienne de Durand, *L'Amérique et l'Alliance*, Paris, Notes de l'Ifri, No. 23, 2001, pp. 43-44; Bruno Gruselle, *Missiles de croisière et stratégies d'anti-accès*, Paris, Fondation pour la recherche stratégique, 2006; Laurent Murawiec, *La guerre au XXI<sup>e</sup> siècle*, Paris, Odile Jacob, 2000, pp. 11-12. For a history of the concept, see Roger Cliff *et al.*, *Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States*, Santa Monica, RAND Corporation, 2007, pp. 3-11.

<sup>4</sup> Among most recent documents illustrating this American concern, see the *Quadrennial Defense Review Report*, 2010, pp. 31-34; John T. Bennett, "Pentagon Crafting Anti-Access Concept", *Defense News*, 25 January 2010, p. 3; Andrew F. Krepinevich, *Why AirSea Battle?*, Washington, Center for Strategic and Budgetary Assessments, 2010; Abraham M. Denmark and James Mulvenon (eds.), *Contested Commons: The Future of American Power in a Multipolar World*, Washington, Center for a New American Security, 2010.

<sup>5</sup> *The French White Paper on Defense and National Security*, Paris, Odile Jacob – La documentation française, 2008, p. 202.

irregular warfare. For this reason, it becomes particularly difficult to maintain some specific know-how, for instance in the field of mine countermeasures.

This article thus seeks to provide some clues for understanding and assessing the threat anti-access strategies pose to Western, and especially European, force projection capabilities. To that end, two weaknesses of the US debate must be underlined and rectified: the first one is the recurring tendency to evaluate the threat only on the basis of the adversary's anti-access capabilities, without taking into account forcible entry capabilities; the second is the fact that although it plays an essential part, the political dimension of this issue has more often than not been overlooked.

This study is comprised of two parts, published separately: the first one – which is the focus of the present article – intends to present the relationships between anti-access and force projection postures, and looks at the various existing anti-access capabilities and strategies. The second part, published in another issue of the *Focus stratégique* series, seeks to set the issue of anti-access back in its strategic dimension, by taking into account potential responses to this threat (“forcible entry capabilities”), and by reasserting the paramount nature of the political dimension of the problem.

Understanding and assessing the threat posed by anti-access assets and postures first requires looking at *force projection as a central but fragile element of Western states' strategic postures*. This fragility is compounded by modus operandi and capabilities pertaining to anti-access that seek to prevent or disrupt force projection operations through harassment and interdiction. Even though anti-access is a fundamentally strategic issue, understanding it requires being cognizant of its *operational and technical dimensions*, as this type of posture often relies on the diffusion of certain key technologies.

In order to illustrate in a concrete way the potential problems that regional adversaries can pose to Western states, and especially to Europe, and whereas most analyses on this theme have been devoted to Chinese capabilities and approaches, this article will focus on assessing the Iranian anti-access threat.



# Force Projection and the Anti-Access Threat

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An anti-access strategy is first and foremost a defensive strategy. Using military and political means, it aims to disrupt or prevent – or even discourage, when it entails a deterrent dimension – a force projection operation. As such, anti-access capabilities would not be, in themselves, a threat to Western countries, were their strategic postures not depending on foreign interventions justified by overseas security interests. Such postures are, by their very nature, complex and vulnerable. It would thus be wrong to think that the issue of anti-access emerged as a result of post-Cold War trends. The issue burst into the strategic debate during this period, but the concept conveys older operational and strategic realities.

## ***Inherent Weaknesses***

Force projection is the capacity of a state to employ land, air and naval units in a distant theater of operations. To do this requires a range of specific equipment and know-how in order to gather, move over several thousand kilometers and reorganize units representing hundreds of thousands of tons of materiel and thousands of individuals – sometimes in emergency situations. The expeditionary posture adopted by present Western armies implies extremely complex missions of projection and, as a consequence, suffers from a number of significant inherent weaknesses and vulnerabilities.

These weaknesses are twofold: on the one hand, there are physical vulnerabilities within the logistical system of force projection missions and, on the other hand, the strategic vulnerabilities that characterize these operations and foreign interventions in general.

The physical characteristics of force projection operations tend to create a significant number of vulnerabilities. The required naval and air maneuvers follow a course whose predictability, clumsiness and slowness have been observed and criticized in the past.<sup>6</sup> Sea shipping is the only way to transport the volume of materiel necessary to carry out large operations, but it is vulnerable – to varying degrees – all along the journey toward a distant area. Depending on the territory where the assembly

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<sup>6</sup> For an overview of the logistical complexity of force projection operations, see Michael E. O'Hanlon, *The Science of War. Defense Budgeting, Military Technology, Logistics, and Combat Outcomes*, Princeton, Princeton University Press, 2009, pp. 141-168.

points are located, they can be subjected to terrorist attacks,<sup>7</sup> or mere demonstrations which could hamper planning and embarkation. Cyber attacks can also target logistical information management systems essential to reduce the equipment's deployment and employment time .

As far as the journey is concerned, there is a risk of harassment by small boats (potentially loaded with explosives and maneuvered by terrorists), submarines, aircraft and anti-ship cruise missiles (ASCM), as well as naval minefields. The convoy is even more vulnerable when it crosses chokepoints (such as the Suez and Panama canals, or the straits of Hormuz, Malacca, Gibraltar and Bab-el-Mandeb), the surroundings of which cannot be perfectly controlled. The narrower the waterway, the shorter the range needed to strike the convoy, thus providing a wider choice of possible hostile actions.

Finally, the debarkation and landing points and gathering areas, whence the forces are brought together into the theater of operations, are often located in less controllable and more exposed environments, be it only due to the adversary's increased proximity. Facilities located in these zones can be the target of acts of sabotage or terrorism, ballistic missile strikes or long-range artillery firing, all kinds of means paving the way for blackmail attempts toward the host state.<sup>8</sup> Strategic airlift is, as a whole, less vulnerable to attacks perpetrated during the transfer, but the departure and arrival runways remain exposed to bomb attacks, special operations forces, cyber attacks, MANPADS, etc.

A ground intervention intended to defend or liberate an allied country requires constituting a deployment base. To do so requires that adequate seaports, airfields and land facilities are made available.<sup>9</sup> These facilities should enable the unloading of equipment, the debarkation of combatant and noncombatant personnel, and the settling and organization of the forces in one or several locations called gathering and waiting areas. The sea and aerial ports of debarkation (SPOD or APOD) should be suitable for the volume of materiel transported, which means that they must be big enough to contain the largest strategic airlift aircraft (C-5 type) or the cargoes and roll-on/roll-off ships transporting the heaviest equipment.

More generally, many of the difficulties facing force projection postures result directly from the offensive nature of this type of operation. Preparing or engaging in a distant conflict implies waging offensive warfare at the operational or strategic level. Offensive is the only way for the belligerent to impose its will on an adversary, but it is, by nature, a vulnerable posture. Defensive postures, on the contrary, enjoy a number of significant advantages. The superiority of defense over offense, as

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<sup>7</sup> One can think, for instance, of the attack against the American destroyer *USS Cole* in 2000, while it was anchored in the port of Aden.

<sup>8</sup> Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Abingdon, Routledge, 2009, pp. 237-238.

<sup>9</sup> In the US as well as in NATO, the terms Aerial Port of Debarkation (APOD) and Sea Port of Debarkation (SEAPOD or SPOD) are used.

underlined by Clausewitz and later by Mao, can be attributed to various factors. First, the defender has a better knowledge of the terrain, and usually has had time to prepare it so as to ward off enemy attacks. Second, it can rely on stronger support from the local population. Finally, it is closer to its supply bases and hence enjoys shorter communication and supply lines.

Conversely, the attacker progresses within an area it knows poorly and moves away from its bases as it pulls ahead, thereby making its logistics more complex and vulnerable.<sup>10</sup> This disadvantage has an impact at the tactical and technological levels: the attacker is the one coming to the fore to strike the defenders, thus becoming more vulnerable to defensive assets taking full benefit of concealment techniques and dispersion. These very systems are all the more dangerous due to their low costs: when protecting the surroundings of a territory, very long range weapons are not indispensable, and cheaper capabilities with a shorter range can be acquired in higher numbers.<sup>11</sup>

The unbalance between offense and defense shows clearly through force projection operations: Western armies suffer from their position of attackers, while their adversaries take advantage of their defensive postures. Such difficulties, inherent to these kinds of operations, exemplify the “loss-of-strength gradient”, according to which a state’s military power declines as its forces move away from the national territory.<sup>12</sup> The sheer volume of vehicles, systems, and equipment to be deployed, along with ammunition needs, constitute an increasing logistical burden.

One major political and strategic datum adds to the weaknesses of the offensive at the operational level: what is at stake in a conflict is more likely to be given greater importance by the defender, who is by definition local, than by the distant attacker. As its interests are greater, the defender can sustain a more intense and enduring effort, while at the same time tolerating heavier human and financial costs than its adversary.<sup>13</sup> It should be noted that armies do not adopt defensive postures to protect only a state’s vital interests, and have not always managed to benefit from such a moral advantage. Nonetheless, the asymmetry of stakes in a conflict tends to favor the defender, especially in the case of force projection operations because they take place very close to its territory, if not *within* it.

Force projection, in that it consists in sending combat units into distant theaters so as to influence an adversary’s policy or subdue it, is an inherently vulnerable and difficult posture. Despite its weaknesses, force

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<sup>10</sup> “Every attack loses impetus as it progresses”, Carl von Clausewitz, *On War*, Princeton, Princeton University Press, 1976, p. 71. See also pp. 363-366, 527, 566-573. For Mao’s writings, see for example Mao Tse-Toung, *Ecrits militaires de Mao Tse-Toung*, Pékin, Editions en langues étrangères, 1964, pp. 115-116 and 265-269.

<sup>11</sup> Posen, “Command of the Commons”, *op. cit.*, pp. 22-24.

<sup>12</sup> Kenneth Boulding, *Conflict and Defense: A General Theory*, New York, Harper & Brothers, 1962, pp. 78-79.

<sup>13</sup> Clausewitz, *On War*, *op. cit.*, pp. 90-99.

projection has always been closely linked to great power status and remains today one of the means by which great powers protect their strategic interests overseas and, more generally, help to maintain a certain form of international order.

### ***Access and Anti-Access: From Past to Present***

Force projection as a means to defend interests by the use of force in distant theaters of operations has always been a privilege of great powers. Athens' naval domination during the Peloponnesian War, that of Great Britain until the early twentieth century and America's since the end of the Cold War, enabled each of them to project their forces freely and to sustain enduring military interventions relying on their sea power<sup>14</sup>

European states' colonial conquests and rivalries during the 16<sup>th</sup> and 17<sup>th</sup> centuries drove them to build ships whose growing number and quality offered an ever-greater reach.<sup>15</sup> Jeremy Black thus recalls that in the 17<sup>th</sup> century:

“Greater competition between European powers in oceanic trade, maritime control and colonial acquisition outweighed any transoceanic struggle with non-European powers [...]. A shift in military capability heralded the decline of some non-European forces and the start of a new European-dominated power balance, remaining in part to the present day.”<sup>16</sup>

Supported by the technological and organizational progress driving the “military revolution”, in particular by the increase in lethality resulting from the improvement of firearms of all calibers, great powers were able to conquer new continents with almost complete impunity – with consequences still perceptible today.

Force projection has come back to the forefront of Western powers' strategic concerns since the end of the Cold War. Along with this tendency, the structures, doctrines and equipment of European and American armed forces have evolved, driving some of them to transition from conscription to professional armies. Although European and American armed forces now both consider force projection a key mission, the reasons why they do so, their capabilities and their field experience in this domain, clearly differ.

Europe's transition toward armies that gave greater prominence to overseas interventions is above all a consequence of the reorientation that followed the disappearance of the Soviet threat. While Europe's territory

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<sup>14</sup> Williamson Murray, “Operational Issues of Sea Basing In the Twenty First Century”, in *Defense Science Board Task Force on Sea Basing*, Washington, U.S. Department of Defense, 2003, pp. 138-140.

<sup>15</sup> Geoffrey Parker, *The Military Revolution: Military innovation and the rise of the West, 1500-1800*, Cambridge, Cambridge University Press, 1996, p. 103 and following.

<sup>16</sup> Jeremy Black, *War and the World: Military Power and the Fate of Continents, 1450-2000*, New Haven, Yale University Press, 2000, p. 60.

and vital interests no longer seemed to be at risk, the Persian Gulf War served as a reminder of the existence of security interests in distant theaters. Hence, Operation *Desert Storm* illustrated the persistence of regional threats, but also revealed to all coalition members the costs and difficulties associated with force projection operations. European armies are, however, far from equal in this regard: France and the UK gave foreign interventions a specific importance even before the end of the Cold War. The 1990s only enshrined this position by decreasing the relative importance of border defense missions and putting the stress on the armed forces' qualitative developments required for foreign interventions.<sup>17</sup>

Unlike many of its allies, the United States has always been an expeditionary military power and will remain one so long as it chooses not to revert to an isolationist posture. The insular position the US enjoys and the absence of territorial threats on the American continent have always offered Washington the privilege to opt either for isolation or for involvement in global affairs – a freedom simply inaccessible to most states. The US major and continuous involvement in foreign affairs started when it entered the war in 1941 and has lasted up to the present day.<sup>18</sup> As a consequence, the US has early on needed the ability to reach other continents, especially Eurasia. Although America has, since then, maintained an expeditionary posture, the constraints inherent to this orientation and under which it has had to operate have evolved since the time of East-West confrontation.<sup>19</sup> During the Cold War, US armed forces benefited from a constant and massive physical presence on their European and Asian allies' territories aimed at countering a clearly identified threat from the East. The current period is characterized by a diminution of military deployments and, above all, a shifting of threat toward other regions, especially the “arc of crisis” extending from Maghreb to Central Asia.<sup>20</sup>

### ***Lifecycle of the 'Anti-Access' Concept***

Western armies' shows of force in the past twenty to thirty years, from the Falklands to *Iraqi Freedom*, enshrined the reorientation of military apparatuses toward actions far from home territories. States seeking global power, regional powers and other states challenging the world order took note of the successes – sometimes more tactical and operational than strategic – of these interventions. They came to the realization that they had to find ways of responding to practices they could face in the future. Hence, acquiring certain technologies seemed expedient to those states willing to keep interventionist powers at a distance.

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<sup>17</sup> Tom Dyson, “Convergence and Divergence in Post-Cold War British, French, and German Military Reforms: Between International Structure and Executive Autonomy”, *Security Studies*, Vol. 17, No. 4, 2008, pp. 725-774.

<sup>18</sup> For an analysis of the US grand strategy since 1940, see Christopher Layne, *The Peace of Illusions: American Grand Strategy from 1940 to the Present*, Ithaca, Cornell University Press, 2006.

<sup>19</sup> See Nicole Vilboux, *Les stratégies de puissance américaine*, Paris, FRS - Ellipses, 2002, pp. 11-41.

<sup>20</sup> Williamson Murray, “Thoughts on Sea Basing in the Twenty First Century”, in *Defense Science Board Task Force on Sea Basing*, *op. cit.*, pp. 121-122.

So, anti-access capabilities emerged in the 1990s as a mainly American concern, sometimes supported by analyses underlining the necessity of certain armament programs above others.<sup>21</sup> Still, several factors compel us to go beyond the superficial idea that the anti-access threat could be no more than a fantasy of the American military-industrial complex: the vulnerabilities of force projection postures observed on many occasions throughout the past two decades of interventions, along with the diffusion of certain technologies, require taking into account the diversity and complexity of the anti-access threat.

The course of the Gulf War and the passivity of the Iraqi adversary contributed to the birth of a predominantly American debate on the methods of force projection and the growing constraints facing this type of operation. Thus, the crossing influences of changing threats and new opportunities were to bring about the evolution of the “force projection” function. In terms of threats, a retrospective analysis of the coalition’s achievements in the Gulf reminded Western armies of – or even revealed – the vulnerabilities of their posture and practices, and of the operational choices that a less inactive, more imaginative, or luckier adversary could have made. As adversaries drew lessons from Saddam Hussein’s fate, it seemed unlikely that Western armies would ever again be as fortunate as they retrospectively seem to have been on that occasion.<sup>22</sup> The future looked dark for force projection as it faced potential adversaries such as Iraq (before 2003), North Korea, Iran and the People’s Republic of China. More broadly, this type of operation could be a disadvantage for any state having a correct knowledge of its own plans’ strengths and weaknesses, as well as those of Western military practices, which were unveiled so many times in the past years, provided they possessed relevant weaponry (SAM, anti-ship and ballistic missiles, naval mines, etc.).

Parallel to these growing vulnerabilities, more and more military analysts – sometimes the same who underlined the weaknesses of force projection – identified, in the course of operations, evidence that Western powers’ military advantage could be maintained thanks to technological progress. They could thus continue to intervene in distant theaters with impunity. Indeed, the achievements of F-117 stealth bombers that contributed to neutralizing Iraqi air defenses during the night from 16<sup>th</sup> to 17<sup>th</sup> of January 1991, along with AWACS, JSTARS, *Tomahawk* missiles and electronic warfare aircraft, gave a glimpse of what was then coined a

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<sup>21</sup> The experts of the analysis center of Northrop Grumman, an American company in charge of the construction of the B-2 bomber, were very active in this debate: <http://www.northropgrumman.com/analysis-center/>.

<sup>22</sup> Among the most glaring illustrations of the coalition’s good fortune, there is the example the Iraqi *Al-Hussein* missile (an extended-range SCUD-B) that sunk only a few hundred meters from the coalition’s ships and ammunition stored in the open air on a pier of Al Jubayl port. See Adam B. Siegel, “Missile Defense at the Waterfront: Implications of the SCUD Missile Attack on Al Jubayl Port, 15-16 February 1991”, *Defense & Security Analysis*, Vol. 19, No. 1, 2003, pp. 15-33. For examples of this type of analyses of the Gulf War, see Thomas G. Mahnken, “America’s Next War”, *The Washington Quarterly*, summer 1993, pp. 171-184.

Revolution in Military Affairs (RMA).<sup>23</sup> Based on information technologies, the RMA was supposed to offer a clear advantage to those armed forces that took the full benefit from them.

The arrival of Donald Rumsfeld as head of the Pentagon turned the issue of access into a high potential threat, as illustrated in the Quadrennial Defense Review (QDR) of 2001.<sup>24</sup> The anti-access threat is, by definition, a fundamentally “naval” and “aerial” topic. Its occurrence in the QDR notably illustrates how influential the US Navy and Air Force had been in proving their “usefulness” to the political power and justifying the budget necessary to the development and procurement of “transformational” capabilities. Transformation and anti-access then strongly influenced American capacity choices during the first mandate of the Bush administration. Although the wars in Afghanistan and Iraq somewhat put this issue on the back burner, the anti-access threat continues to affect the way the American defense apparatus prepares for the future. Its recent reappearance in strategic debates illustrates inter-services rivalries when it comes to funding priorities. In that context, this topic has again become the intellectual – and thus budgetary – “war-horse” of the Navy and Air Force, against the COIN-dominated defense and political decision-making circles.

When Western strategic postures are considered, anti-access appears as an important challenge which cannot be seen as the sole product of a US inter-services bureaucratic rivalry. However, taking into account this very specific organizational factor sheds light on an essential characteristic of the debate on the anti-access threat: why it focused on the military dimension of the problem.

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<sup>23</sup> On the first hours of Operation *Desert Storm*, see Williamson Murray *et al.*, *Gulf War Air Power Survey: Volume 2, Part. I: Operations*, Washington, U.S. Government Printing Office, 1993, pp. 120-124.

<sup>24</sup> Some analyses differentiate anti-access from area denial: “If [anti-access] strategies aim to prevent US forces entry into a theater of operations, then [area-denial] operations aim to prevent their freedom of action in the more narrow confines of the area under an enemy’s direct control” i.e. its own territory. We shall not use this distinction in the present article where the whole of the capabilities concerned are gathered around the generic term “anti-access”. Andrew Krepinevich, Barry Watts et Robert Work, *Meeting the Anti-Access and Area-Denial Challenge*, Washington, Center for Strategic and Budgetary Assessments, 2003, p. 5.



# Countering Force Projection Operations

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Defense experts' analyses present the anti-access threat primarily as a consequence of the diffusion of advanced technologies. Diffusion benefits many actors – allies, neutral states, as well as potential adversaries of Western countries. It goes without saying that anti-access capabilities vary greatly depending on the states concerned: they range from rudimentary capabilities, unable to cause harm unless used against unprotected facilities or units, to conventional ballistic missiles with terminal guidance, like those currently being developed by the Chinese People's Liberation Army.

In order to provide a concrete illustration of this tendency by looking at a particular case, this study will analyze recent developments in Iranian defense posture, especially in regards to its capacity to block the Strait of Hormuz and to strike neighboring countries in the Persian Gulf. Iran is currently trying to assert its power on the regional scale, in areas located near present and future Western interests. Therefore it probably is the most serious case of anti-access threat that the European and French armies could someday confront.

## ***A Growing Diffusion of Advanced Technologies***

An anti-access posture can rely on various types of increasingly diffused yet constantly improving technologies. In this regard, three categories of weaponry stand out: strike capabilities (anti-ship and land-attack cruise and ballistic missiles), air defense systems and purely naval means (submarines and naval mines).

### **Strike Capabilities: from Harassment to Interdiction?**

On most occasions, Western defense communities saw war from a distance – typified by the aerial phase of *Desert Storm* – as a revelation of the decisive advantage that a modern “informational” army could mobilize against an “industrial” adversary.<sup>25</sup> Precision-guided munitions (PGMs),

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<sup>25</sup> Alvin and Heidi Toffler, *War and Antiwar. Survival at the Dawn of the 21st Century*, New York, Little, Brown and Co., 1993.

employed in limited numbers in 1991, progressively came to make up an ever-bigger share of the projectiles employed in air campaigns.<sup>26</sup>

However, although they still hold a clear advantage in this domain, Western forces are not the only beneficiaries of the progress made in terms of precision of strikes, in particular in regards to land-attack (LACMs) or anti-ship cruise missiles (ASCMs). The slowness of the fleets renders them particularly vulnerable to ASCM strikes, as was proved by the cases of the Israeli destroyer *Eilat* sunk by Egyptian *Styx* missiles in 1967, the *Sheffield* sunk by an Argentinean *Exocet* in 1982 or the Israeli corvette *Hanit* hit by a C-802 ASCM fired by Hezbollah during the war of summer 2006. The number of states possessing anti-ship or LACMs of any ranges does not seem to have increased exponentially between 1992 and 2006.<sup>27</sup> Nonetheless, this number remains significant and is increasing, which seems all the more worrying considering the substantial improvement of these means of delivery (range, precision, speed, and even stealthiness) as well as the growing share of force projection missions for Western armed forces.

Furthermore, the relative stability of the number of states possessing cruise missiles of any kind should not overshadow the fact that new states – such as China, Taiwan, South Korea and India – started LACM programs in the 1990s.<sup>28</sup> Certain potential theaters of intervention, like the Persian Gulf (for Europe and the US) or the China and Japan Seas (for the US) face an intensification of the threat posed by potential adversaries such as Iran, North Korea or the PRC, who acquire increasingly varied means of delivery.

The diffusion of strike capabilities provides its beneficiaries with the opportunity to aim for effects superior by far to the relatively limited damage that Iraq inflicted upon the coalition by this means in 2003. On the one hand, the extended range of missiles means that one can threaten targets that were, until then, out of reach. On the other hand, the enhanced precision of weapons now makes it possible to hit with the desired physical effect facilities such as command and communication centers, radars,

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<sup>26</sup> PGMs accounted for 9% of projectiles fired during *Desert Storm*, 29% during *Allied Force*, 60% during *Enduring Freedom* and 68% during *Iraqi Freedom*. See Benjamin Lambeth, *Air Power Against Terror. America's Conduct of Operation Enduring Freedom*, Santa Monica, RAND Corporation, 2006, p. 252; T. Michael Moseley, "Operation Iraqi Freedom - By the Numbers", USCENTAF, 30 April 2003, p. 11.

<sup>27</sup> Seth Carus listed around 60 states possessing cruise missiles in 1992 and David Tanks 81 in 2000, a figure that was used in 2008 by the Congressional Research Service. W. Seth Carus, *Cruise Missile Proliferation in the 1990s*, Westport, Praeger, 1992, pp. 126-140; Paul Kerr, *Nuclear, Biological and Chemical Weapons and Missiles: Status and Trends*, Congressional Research Service, RL30699, February 2008, p. 19; David Tanks, *Assessing the Cruise Missile Puzzle: How Great a Defense Challenge?*, Washington, Institute for Foreign Policy Analysis, 2000, p. 3.

<sup>28</sup> Dennis M. Gormley, *Missile Contagion. Cruise Missile Proliferation and the Threat to International Security*, Westport, Praeger Security International, 2009, p. 196.

points of debarkation or ammunition dumps. The increasing precision of certain ballistic missiles and, above all, the deployment of supersonic cruise missiles, also render the fleets more vulnerable.<sup>29</sup> The defense capabilities of fleets and land facilities against ballistic and, to a lesser extent, cruise missiles may be growing steadily, as was proved by the 2003 Iraq War, but the capacity to inflict saturation strikes, the diversity of the threat and the combination of cruise and ballistic means of delivery render the task of interception infinitely more complex and expensive.<sup>30</sup>

### Hampering the Fleets' Freedom of Action

Cruise and ballistic missiles are not the only means a state can employ in an attempt at regional blackmailing, or when defending the naval surroundings of a theater of operations: submarines, naval mines or fast patrol boats can slow, disrupt, or even impede force projection operations from the sea. States like China can even adopt a posture of layered in-depth naval defense.

The fact that they remain submerged for very long periods gives nuclear attack- and ballistic missile submarines formidable stealthiness. However, for now they remain the privilege of a very small number of countries. The same does not hold true for diesel submarines – such as the *Kilo*-class ships built in Russia – which have been sold to the PRC, Iran, India and Algeria.<sup>31</sup> In addition, the armament of these conventionally powered submarines has substantially improved in the past years: more and more often, they carry ASCMs whose range can reach 250 kilometers (SS-N-27 *Clubs* equipping certain *Kilo*-class ships).

The development of submarine-launched strike capabilities is coupled with perceptible progress in terms of quietness: in this field, the characteristics of the *Kilo*-class submarines are nothing new but confirm an existing trend, also illustrated by the improvement of Chinese *Song*-class submarines. One of them recently managed to surface in the midst of an American carrier battle group without having been noticed beforehand.<sup>32</sup>

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<sup>29</sup> Theodore Gaillard, "Cruise Missile Sector Facing Supersonic Challenge", SpaceWar, 11 October 2007, available at: [http://www.spacewar.com/reports/Cruise\\_Missile\\_Sector\\_Facing\\_Supersonic\\_Challenge\\_999.html](http://www.spacewar.com/reports/Cruise_Missile_Sector_Facing_Supersonic_Challenge_999.html).

<sup>30</sup> "Ballistic and cruise missiles are liable to be the long-range weapons of choice, given their capabilities to threaten land and sea targets from afar. The accuracy and lethality of such systems will increase significantly between now and 2025, even for the delivery of conventional ordnance. The competition between missile developments and defensive systems will be a key operational challenge over the next several decades. Large-scale missile attacks will be able to overwhelm defensive systems, despite considerable improvements to them. American bases abroad will become vulnerable to these weapons", The United States Commission on National Security/21st Century, *New World Coming: American Security in the 21<sup>st</sup> Century – Supporting Research and Analysis*, 15<sup>th</sup> September 1999, p. 52.

<sup>31</sup> James Clay Moltz, "Global Submarine Proliferation: Emerging Trends and Problems", *Nuclear Threat Initiative*, March 2006, available at: [http://www.nti.org/e\\_research/e3\\_74.html](http://www.nti.org/e_research/e3_74.html).

<sup>32</sup> On this incident, see for instance Bill Gertz, "China sub stalked U.S. fleet", *The Washington Times*, 13<sup>th</sup> November 2006, available at: <http://www.washingtontimes.com/news/2006/nov/13/20061113-121539-3317/>.

These evolutions are all the more worrying because in littoral combats the properties of the environment (surrounding noises, water temperature and salinity, etc.) make it even harder to carry out littoral anti-submarine warfare (ASW) missions.<sup>33</sup> Besides, maintaining the know-how related to these missions has tended to become a lesser priority for Western fleets since the end of the Cold War.<sup>34</sup>

In addition, submarines also strengthen another disrupting factor for force projection operations: mining. Naval mines have several advantages for those belligerents who pursue anti-access strategies: the most basic versions are cheap, and there is a great variety of models (moored or drifting) and triggering systems (contact or influence mines – magnetic, acoustic, etc.).<sup>35</sup> Existing procedures and equipment for mine warfare are constantly improved, but as of today there is no quick way to clear minefields.<sup>36</sup> Minefields combining several types of devices in a single zone – among which certain complex models possess several types of detonators – compel mine clearance units to be prudent and in turn slow the pace of the operations. Another element can further increase the time and cost of such operations: because the defender has a good knowledge of the seabed, it can maximize the mines' effects or the difficulty of minesweeping. Coastal defense units (ships, submarines, ASCMs, aircraft, artillery, etc.) can also protect the minefield and disrupt minesweeping operations.<sup>37</sup> This whole posture can take the shape of a defense in successive and complementary layers, in which the efficiency of each element is reinforced by the others.

### **Increasingly Sophisticated Surface-to-Air Threats**

One last factor must be added that further complicates naval projection operations: enemy air defenses. Western armed forces have gotten used to enjoying air superiority above theaters of operations and taking full advantage of this asset by constantly observing the battlefield and the adversary's defense posture. They could also take benefit of air superiority to use airspace freely for tactical or strategic mobility or, of course, in order

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On improvements in submarines' stealth, see Office of Naval Intelligence, *The People's Liberation Army Navy: A Modern Navy with Chinese Characteristics*, August 2009, pp. 20-23.

<sup>33</sup> Till, *Seapower*, *op. cit.*, p. 239.

<sup>34</sup> On the United States see, for instance, Owen R. Cote and Harvey Sapolsky, *Antisubmarine Warfare After the Cold War*, MIT Security Studies Conference Series, June 1997, available at: [http://web.mit.edu/ssp/Publications/confseries/ASW/ASW\\_Report.html](http://web.mit.edu/ssp/Publications/confseries/ASW/ASW_Report.html); Keith W. Edmunds, "ASW – Current and Future Trends", *Defense & Security Analysis*, Vol. 16, No.1, April 2000, pp. 73-87; see also Martin Sieff, "ASW Dangers – Part I", UPI.com, 12<sup>th</sup> June 2008, available at: [http://www.upi.com/Business\\_News/Security-Industry/2008/06/12/Defense-Focus-ASW-dangers-Part-1/UPI-74581213308031/](http://www.upi.com/Business_News/Security-Industry/2008/06/12/Defense-Focus-ASW-dangers-Part-1/UPI-74581213308031/).

<sup>35</sup> According to Hoyt, the price of some basic mines is approximately \$1,000. Timothy Hoyt, "The Next Strategic Threat: Advanced Conventional Weapons Proliferation", in Henry Sokolski and James M. Ludes (eds.), *Twenty-First Century Weapons Proliferation: Are We Ready?*, London, Routledge, 2001, p. 40.

<sup>36</sup> James Dunnigan, *How to Make War? A Comprehensive Guide to Modern Warfare in the Twenty-first Century*, New York, Harper, 2003, pp. 229-236.

<sup>37</sup> Till, *Seapower*, *op. cit.*, p. 239.

to strike the adversary quickly and with increased precision. Today, opposing forces remain unable to contest Western air superiority. However, they do attempt to procure assets that would enable them to exploit the third dimension for offensive purposes – using cruise or ballistic missiles, or unmanned air vehicles (UAVs) – and also for defensive purposes, by building integrated and multi-layered air defense systems. Indeed, after the Gulf War, American intelligence services observed a growing demand in SAM systems capable of intercepting stealth aircraft or cruise missiles.<sup>38</sup>

Whereas the coalition had achieved impressive successes against Iraqi defenses during Operation *Desert Storm*, NATO discovered eight years later that neutralizing Serb SA-3/SA-6 systems' missile batteries and radars was extremely difficult if these were employed using so-called “non-cooperative” tactics, and concealed by terrain and vegetation.<sup>39</sup> This incapacity of NATO's air forces did weigh on the conduct of the operations as it dissuaded their aircraft to fly below 15,000 feet, thus reducing their tactical effectiveness and increasing the risk of collateral damage.<sup>40</sup> But this significant capacity to cause harm – especially because the first versions of some of these SAM systems were deployed in the 1960s – was nothing compared to the threat posed by the most recent models of long-range SAMs exported by Russia, in particular S-300 variants. Modern systems have progressed in terms of the number of targets that the radars can follow and engage simultaneously and also in terms of the interception range and the nature of the targets that can be intercepted – among them cruise missiles, anti-radiation missiles, or even apparently stealth aircraft.<sup>41</sup> Today, a dozen European and Asian states, among them China and India, own variants of the S-300, and many other countries possess systems that are as recent but with a shorter range. Syria and Iran repeatedly displayed their willingness to buy S-300s, but no acquisition was ever confirmed, and contradictory information is regularly issued about the Iranian attempts.<sup>42</sup>

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<sup>38</sup> Patrick J. Garrity, *Why the Gulf War Still Matters: Foreign Perspectives on the War and the Future of International Security*, Los Alamos National Laboratory – Center for National Security Studies, July 1993, p. 76.

<sup>39</sup> This surprising phrase – are tactics ever cooperative? – refers to certain practices consisting in using search radars so as to provoke the launch of an anti-radiation missile that would be unable to reach its target. Operators turn the radar on so as to be targeted by the coalition's HARM missiles and turn it off as soon as the missile is launched. Once it lost its signal, the missile could no longer maintain its trajectory and went astray.

<sup>40</sup> Posen, “Command of the Commons”, *op. cit.*, pp. 24-30.

<sup>41</sup> See “Operations in Kosovo: Problems Encountered, Lessons Learned and Reconstitution”, Hearing before the Military Readiness Subcommittee of the Committee on Armed Services, House of Representatives, 26 October 1999, pp. 4 2-43, available at: [http://www.fas.org/man/congress/1999/has299030\\_0.htm](http://www.fas.org/man/congress/1999/has299030_0.htm); Owen R. Cote, Jr., *Assuring Access and Projecting Power: The Navy in the New Security Environment*, MIT Security Studies Conference Series, April 2002, Chapter 3, available at: [http://web.mit.edu/ssp/Publications/navy\\_report/demands.pdf](http://web.mit.edu/ssp/Publications/navy_report/demands.pdf).

<sup>42</sup> Christopher Bolkcom, “Military Suppression of Enemy Air Defenses (SEAD): Assessing Future Needs”, Congressional Research Service, RS21141, 5 June 2006, p. 2; “S-300P (SA-10 Grumble)”, *Missile Threat*, available at: [http://www.missilethreat.com/missiledefensesystems/id.50/system\\_detail.asp](http://www.missilethreat.com/missiledefensesystems/id.50/system_detail.asp).

## Unconventional Options

One final conceivable option for anti-access strategies is to resort to antisatellite (ASAT) weapons, WMDs, and offensive cyber warfare.

To complicate or even deter force projection operations, ASAT and cybernetic weapons could be used to target contemporary armies' information systems and flows – extending the anti-access threat to the immaterial domain. Because modern armies rely increasingly on their C4ISR systems (for positioning, observation, target acquisition, data transfer, strike precision, etc.), unconventional assets tend to become the options of choice for states willing to oppose Western projection forces. However, acquiring an ASAT capacity requires mature ballistic capabilities and advanced guidance systems. As a result, for now, only the most militarily advanced potential adversaries can access these systems, such as China, Russia, or potentially adversaries supported by these two countries.<sup>43</sup>

In the field of WMDs, psychological, disrupting or destructive effects could be sought by using chemical, biological, radiological or even nuclear weapons (depending on the political and military contexts considered). The number of courses of action available is, in theory, infinite; but the most destructive options, such as nuclear strikes, could not be opted for without incurring the risk of a devastating retaliation from interventionist powers, of which the main three (United States, United Kingdom, France) possess modern nuclear weapons and means of delivery. Nonetheless, should the threat be indirect and targeted against a host-state protected by an extended deterrence posture, the situation would be more complex and delicate. This raises the question of which options are available to interventionist powers when it comes to limiting wars and avoiding escalation against an enemy proliferator.<sup>44</sup>

Conversely, with the revival of the nuclear industry throughout the world, the related risks of radioactive material being stolen, and the relative availability of chemical and biological agents, we can imagine various scenarios of resorting to WMDs that would remain under the Western deterrence threshold.<sup>45</sup> For instance, one could think of strikes or, above all, terrorist attacks, involving radioactive materials or persistent – but not highly lethal – chemical or biological agents that could contaminate

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<sup>43</sup> Armies and societies' reliance on satellites contributes to encourage the development of boost- and ascent-phase missile defenses and offers possibilities to fight against ASAT.

<sup>44</sup> For an analysis looking at this type of hypotheses, see for example Barry R. Posen, "U.S. Security Policy in a Nuclear-Armed World, or What If Iraq Had Had Nuclear Weapons?", in Victor A. Utgoff (ed.), *The Coming Crisis: Nuclear Proliferation, U.S. Interests, and World Order*, Cambridge, MIT Press, 2000, pp. 157-190.

<sup>45</sup> Michael Moodie, "Dangerous Weapons in Dangerous Hands: Responding to the Challenges of Chemical and Biological Terrorism", *Proliferation Papers*, No. 28, Summer 2009, available at: [http://www.ifri.org/downloads/PP28\\_Moodie\\_Summer2009.pdf](http://www.ifri.org/downloads/PP28_Moodie_Summer2009.pdf).

potentially large areas (APOD and SEAPOD in particular) and durably paralyze a significant part of the operation.<sup>46</sup>

Far from favoring only Western and interventionist powers, technological progress also benefits potential or actual regional powers against which military interventions could have to be planned in the future. Iran holds, in this regard, a particular place, as it currently tries to assert itself as a regional power and attempts to build up military forces matching this status. The combination of its ambitions, capabilities and geographical location – close to current and future Western allies and interests – make Iran a particularly interesting case study of anti-access strategies for France and Europe.

### ***Iranian Anti-Access Strategy and Capabilities***

The threat that Iranian armed forces would pose in the event of a foreign intervention in the Persian Gulf illustrates perfectly the diverse forms an anti-access strategy can take. The effectiveness of Iranian armed forces' anti-access capabilities would depend on the various elements considered.

Analysts studying Iranian defense usually consider that the strategy Tehran would adopt in the face of a Western intervention in the Gulf comprises of four main elements: (1) laying a minefield in the Gulf of Oman, and especially the Strait of Hormuz; (2) harassing the projection fleet or transport ships (such as supertankers) that try to reach or leave the Persian Gulf, using submarines, missile boats, and ASCM batteries on Iranian shores; (3) employing air defense means to protect Iranian naval bases, ASCM batteries, and, more generally, Iranian military installations; and finally (4) resorting to irregular, LACM and ballistic missile attacks in order to strike seaport and airfield facilities, assembly areas, command and control centers, supply bases, etc.

After the Gulf War, Iran identified several priorities for its military development. Among these were: the reinforcement of ballistic capabilities employed as a deterrent, and compensating for its inability to acquire air superiority; the possession of forces that control, or at least prevent, access to the Strait of Hormuz; and finally, the improvement of its air defenses.<sup>47</sup>

Hence, Iran's naval strategy against a Western intervention could take the shape of a multi-layered defense and anti-access system capitalizing on its knowledge of the area, on the proximity of its bases, as

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<sup>46</sup> Cliff *et al.*, *Entering the Dragon's Lair*, *op. cit.*, p. 8; for a detailed study of the threat posed by chemical and biological agents to the US Air Force, see Brian G. Chow *et al.*, *Air Force Operations in a Chemical and Biological Environment*, Santa Monica, RAND Corporation, DB189-1, 1998, pp. 10-54. It is worth noting that, in a scenario where a logistical node would get paralyzed, the importance of other nodes would be increased. As a result, the whole system would be weaker and the incentive to disorganize or neutralize logistical nodes would be greater. Each bottleneck would thus create a new vulnerability.

<sup>47</sup> Garrity, *Why the Gulf War Still Matters*, *op. cit.*, p. 99.

well as on the assumed casualty aversion of Western forces.<sup>48</sup> This naval strategy forms part of a general posture aimed at providing the country with the capacity to absorb the first adversary conventional strike. Indeed, this capacity appeared as a top priority following the Gulf War, and can only remain one so long as an attack scenario against Iranian nuclear facilities cannot easily be ruled out. When applied to Tehran's naval capabilities, resilience should be made possible by dispersing assets; avoiding direct confrontation with the adversary's fleet; reinforcing coastal defenses; and exploiting opportunities offered by littoral zones to conceal them.<sup>49</sup> In order to prevent its defenses from being neutralized too quickly, Iran also seems to have engaged in the decentralization of its command structure, so that each element can keep fighting despite coordination and command centers having been neutralized by adversary air strikes.<sup>50</sup>

Mine warfare is also developing in the country. In 2010, the Iranian naval forces supposedly possessed three to four thousand naval mines of different kinds, ranging from moored contact mines to drifting influence mines.<sup>51</sup> Naval mines can be laid by specialized ships, civil ships and boats, midget submarines and *Kilo*-class submarines, which Iran bought from Russia at the beginning of the 1990s.<sup>52</sup> These submarines, famous for being among the quietest diesel vessels in the world and able to carry 24 mines in place of their torpedoes, could easily constitute a minefield unnoticed.<sup>53</sup> According to a recent estimate, Iranian naval forces could, without much trouble, manage to lay a minefield of 700 units in the Strait of Hormuz before their mining assets were neutralized.<sup>54</sup> In view of the slowness of recent mine clearance operations, as well as the possibility that Iranian mines could mix several types of triggers, the minesweeping operation that should allow the clearing of a relatively secure corridor along the strait would take some time.<sup>55</sup> This is all the more likely as the minefield would probably be protected by harassing anti-ship missiles and commandos.

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<sup>48</sup> Office of Naval Intelligence, *Iran's Naval Forces: From Guerilla Warfare to a Modern Naval Strategy*, Autumn 2009, p. 11.

<sup>49</sup> Office of Naval Intelligence, *Iran's Naval Forces*, *op. cit.*, p. 9, pp. 21-22; Steven R. Ward, *Immortal: A Military History of Iran and its Armed Forces*, Washington, Georgetown University Press, 2009, pp. 314-316.

<sup>50</sup> Office of Naval Intelligence, *Iran's Naval Forces*, *op. cit.*, pp. 7-9.

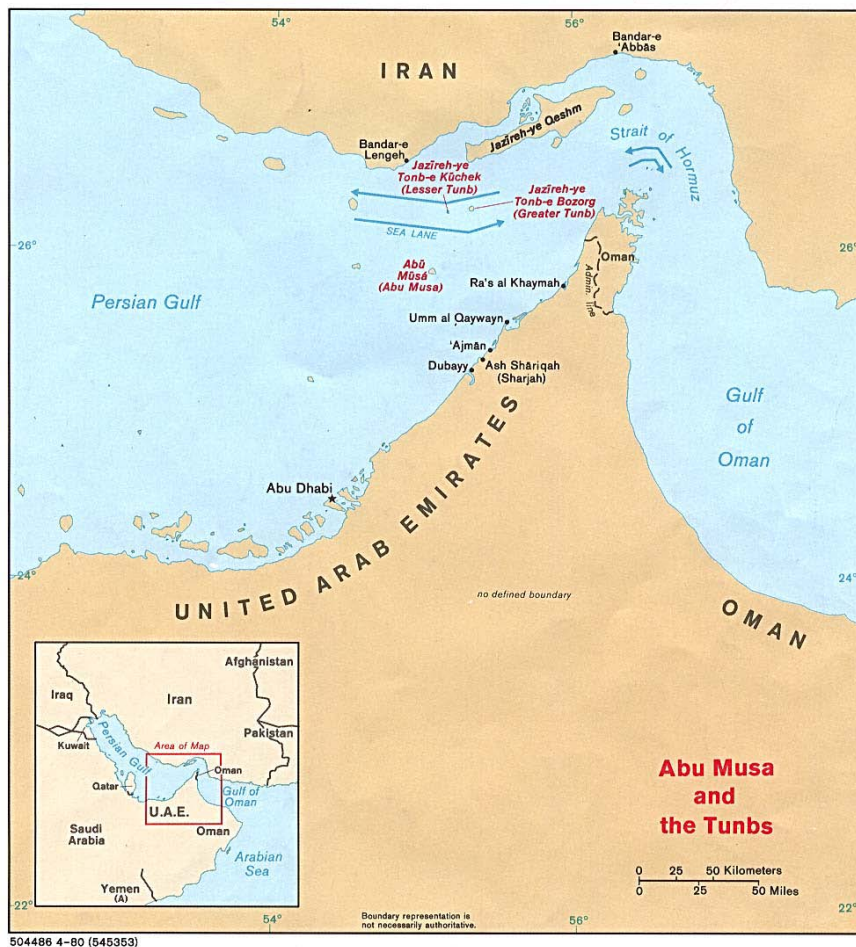
<sup>51</sup> Frank Hoffman, "The Maritime Commons In a Neo-Mahanian Era", in Denmark *et al.*, *Contested Commons*, *op. cit.*, p. 59. A recent Pentagon memo estimated the number of Iran's naval mines at 3,500: *Unclassified Report on the Military Power of Iran*, April 2010, p. 5, available at: [http://www.fas.org/man/eprint/dod\\_iran\\_2010.pdf](http://www.fas.org/man/eprint/dod_iran_2010.pdf).

<sup>52</sup> Fariborz Haghshenass, *Iran's Asymmetric Naval Warfare*, Washington Institute for Near-East Policy, Policy Focus, No. 87, September 2008, pp. 13 and 16.

<sup>53</sup> Anthony Cordesman and Martin Kleiber, *Iran's Military Forces and Warfighting Capabilities: The Threat in The Northern Gulf*, Westport, Praeger Security International, 2007, p. 114; Hoyt, "The Next Strategic Threat", *op. cit.*, pp. 39-40; Office of Naval Intelligence, *Iran's Naval Forces*, *op. cit.*, p. 16; Caitlin Talmadge, "Closing Time. Assessing the Iranian Threat to the Strait of Hormuz", *International Security*, Vol. 33, No. 1, Summer 2008, p. 89.

<sup>54</sup> Talmadge, "Closing Time", *op. cit.*, p. 93.

<sup>55</sup> Caitlin Talmadge considers that such operations would take approximately one month. *Ibid.*, p. 97.



Map 1. The Strait of Hormuz <sup>56</sup>

The Iranian Revolutionary Guards Corps Navy (IRGCN), in particular, adopted this indirect style based on “naval guerilla”. The Iranian fleet is split between the IRGCN and the Islamic Republic of Iran Navy (IRIN), the former being responsible for the Persian Gulf and the Strait of Hormuz, and the latter being in charge of the Gulf of Oman.<sup>57</sup> Iran seems to be preparing itself for a naval asymmetric war with the help of fast patrol boats equipped with torpedoes or anti-ship missiles, and aimed to harass civil or military traffic near the Strait of Hormuz.<sup>58</sup> Harassment can also be undertaken from the islands of Abu Musa and the Greater Tunb, where Iran recently reinforced its military installations. The islands are respectively located on the southern flank of the channels used by supertankers, and between those two channels (see map 1).<sup>59</sup>

<sup>56</sup> Credit: University of Texas Libraries: [http://www.lib.utexas.edu/maps/middle\\_east\\_and\\_asia/hormuz\\_80.jpg](http://www.lib.utexas.edu/maps/middle_east_and_asia/hormuz_80.jpg).

<sup>57</sup> Office of Naval Intelligence, *Iran's Naval Forces*, *op. cit.*, p. 11.

<sup>58</sup> *Ibid.*, pp. 13-14; Ward, *Immortal*, *op. cit.*, pp. 314-6.

<sup>59</sup> David Hartwell and Allison Puccioni, “Island Fortresses: Abu Musa and the Greater Tunb”, *Jane's Intelligence Review*, Vol. 21, No. 9, 14 August 2009, pp. 33-35.

To back up these tactics, anti-ship missiles can be launched from the batteries positioned on the northern bank of the strait. As of today, there must be around thirty ASCM batteries capable of striking across the whole breadth of the strait, deployed over a part of Iranian territory equivalent to three times the size of Kosovo.<sup>60</sup> The missiles likely to be used for such attacks are increasingly sophisticated and make interception ever more difficult. Indeed, HY-2/C-201 *Silkworm* missiles are progressively replaced by more recent systems of Chinese conception – C-801s and C-802s – which, although they cruise at subsonic speeds, are characterized by shorter delays of employment, extended range, enhanced precision, and lower flight paths, making interception more difficult.<sup>61</sup> Consistently with its need for cover and concealment, Iran seems to favor small and mobile launch platforms. Allegedly, it has also planned to deploy fake ASCM fire units along the shore.<sup>62</sup> Iran also seems to have managed to acquire a small number (a dozen at most) of KH-55s – Russian missiles illegally sold by Ukraine in the early 2000s. With its 2,500-kilometer range, this cruise missile could potentially be a major qualitative leap for Iran, compared to the systems currently deployed in its arsenal. However, the missile is unlikely to have been integrated into Iranian units, but might rather be analyzed for the purpose of reverse engineering.<sup>63</sup> Finally, Iran could, within a few years, possess *Kilo*-class submarines capable of launching ASCMs with a 200-kilometer range: the first of its three vessels is currently being modernized to that aim.<sup>64</sup>

An Iranian strategy aimed at impeding access to the Persian Gulf or increasing sharply its cost should then logically be supported by defenses against its adversaries' air superiority (especially the US and Israel). As of today, Iranian capabilities in this field still appear to be relatively weak; it can defend specific points, or maybe zones, against air strikes but lacks a complete cover of its territory.<sup>65</sup> Iran is supposed to possess a great diversity of surface-to-air assets to defend against Western forces' air strikes, but they remain overall rather inefficient. The only long-range SAMs deployed in Iran are SA-2s and SA-5s, both old and fixed systems of limited potential. These systems currently seem to concentrate around Tehran, seaports and nuclear facilities.<sup>66</sup> Besides, Iran also possesses a great number of short- and medium-range SAM systems of Western origin (such as *Hawks* procured under the Shah) or built by the Soviet Union or Russia,

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<sup>60</sup> Talmadge, "Closing Time", *op. cit.*, p. 104.

<sup>61</sup> Office of Naval Intelligence, *Iran's Naval Forces*, *op. cit.*, p. 17.

<sup>62</sup> Talmadge, "Closing Time", *op. cit.*, p. 101; Ward, *Immortal*, *op. cit.*, p. 315.

<sup>63</sup> Cordesman and Kleiber, *Iran's Military Forces and Warfighting Capabilities*, *op. cit.*, pp. 154-155; Gormley, *Missile Contagion*, *op. cit.*, p. 100.

<sup>64</sup> Modernization should enable *Kilo* submarines to launch YJ-1 or *Novator Alfa* ASCMs. However, it seems that Iran is experiencing difficulties to pursue this, as it is reluctant to send its submarines to Russia. Cordesman and Kleiber, *Iran's Military Forces and Warfighting Capabilities*, *op. cit.*, p. 114; Office of Naval Intelligence, *Iran's Naval Forces*, *op. cit.*, p. 18; "Submarine Proliferation. Iran Import Behavior", *Nuclear Threat Initiative*, available at: <http://www.nti.org/db/submarines/iran/import.html>.

<sup>65</sup> Cf. *Unclassified Report on the Military Power of Iran*, *op. cit.*, p. 6.

<sup>66</sup> Cordesman and Kleiber, *Iran's Military Forces and Warfighting Capabilities*, *op. cit.*, p. 97.

but they do not currently appear to pose a real threat to modern aircraft supported by electronic warfare and Suppression of Enemy Air Defense (SEAD) assets.

Iran is conscious of its weaknesses. As a result, it has, over the past years, favored a decentralized approach of its surface-to-air defense. Hence, Iran relies on a greater autonomy of command, on mobile assets (SA-15s and SA-22s), and takes advantage of the mountainous terrain.<sup>67</sup> This current situation could evolve depending on Iran's future equipment. Numerous sources have underlined the existence of a Russo-Iranian agreement for the supply of S-300 SAMs (V/PMU2) whose capacities are far superior to the defenses Western armies have been facing until today. For now, the sale has been suspended, apparently due to pressures from the US and Israel, but the possibility that Iran will end up acquiring such capabilities in the long run – either as a retaliatory measure from Russia, or through other channels such as Belarus – cannot be ruled out.<sup>68</sup> Syria bought Russia around fifty SA-22 / *Pantsir* S-1, of which a dozen will probably be transferred to Iran. The latter already owns around thirty SA-15 / *Tor*-M1. Their short ranges (20 and 15 kilometers, respectively) do not make SA-22s and SA-15s highly threatening to modern air forces that can fire their missiles from a safe distance, beyond these ranges. However, their mobility and the modernity of their components may protect them from many anti-radiation capabilities, except for the most recent ones.<sup>69</sup>

Lastly, Iran possesses a large spectrum of assets to strike APODs, SPODs and theater bases. Such attacks could be carried out as part of an interdiction strategy, were previous actions to fail to prevent enemy fleets from entering the Persian Gulf. Iran could use threats to blackmail a neighboring country and discourage it from allowing Western forces on its territory, or even try to alter its behavior by a limited use of force. The sole existence of these anti-access and strike capabilities may suffice to favorably alter neighboring countries' behaviors.<sup>70</sup> The Iranian ballistic arsenal comprises of means of varied ranges, from rockets firing at several dozen kilometers to *Shahab*-3 and *Sejjil*-2 medium-range ballistic missiles. The extension of the missiles' reach and the transition to solid-fuel propellants (*Sejjil*-2), more stable and faster to prepare for launch than the liquid-propelled *Shahab*, typify the fact that Iranian ballistic mediums globally tend to improve. For now, according to available estimates of their precision, Iranian ballistic missiles do not appear as a credible threat for targets such as runways, which would be vital for the success of any operation against Iranian forces.<sup>71</sup> On the contrary, the greater surface of seaport facilities and, especially, assembly and storage areas, make them more exposed to such strikes. It should be noted that, to be politically

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<sup>67</sup> "Iranian air defences", *Jane's Intelligence Digest*, March 2007.

<sup>68</sup> *Ibid.*

<sup>69</sup> About the transfer of the *Pantsir* system, see *Military Balance 2009*, London, IISS, 2009, p. 275; Abdullah Toukan and Anthony H. Cordesman, *GCC - Iran: Operational Analysis of Air, SAM and TBM Forces*, Center for Strategic and International Studies, 20 August 2009, p. 57.

<sup>70</sup> Ward, *Immortal*, *op. cit.*, p. 316.

<sup>71</sup> Toukan and Cordesman, *GCC - Iran*, *op. cit.*, pp. 123-124.

effective, an attempt to convince the Gulf regimes not to allow a Western military presence on their territory would not necessarily need to be supported by a highly credible military threat.

Theoretically, Iran could also try to disorganize the process of force projection on the ground by using proxies to disperse appropriate chemical and biological agents. As of today, however, we do not know with certainty what Iran's capabilities in this field are. There is little doubt that Iran possesses the know-how and facilities necessary to run offensive chemical and biological programs, but there seems to be no tangible evidence that Iran did initiate such programs.<sup>72</sup> Moreover, even if successful limited strikes against facilities hosting Western forces could momentarily, or even continuously, hamper their action, the political consequences of such an attack could be devastating for Iran.

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The study of Iran's capabilities that could potentially be used as part of an anti-access strategy illustrates the multidimensional character of the threats that Western projection forces could be confronted with. Nonetheless, analyzing the Iranian anti-access threat in the Persian Gulf should not be limited to the study of the assets developed and deployed by Tehran – and which it may be putting forward as a deterrent.

Beyond the diffusion of advanced technologies, which the Islamic republic of Iran typifies in a concrete way, one can assess the scope of the challenge posed to Western projection forces only by setting these capabilities in a strategic perspective. This requires first to take into account the capabilities that interventionist powers could mobilize in order to defeat anti-access strategies. Secondly, it appears necessary to understand the political and strategic context of these operations, as it would be fundamental in determining the belligerents' respective capabilities.<sup>73</sup> This will be the focus of a future issue of the *Focus stratégique* series that will be published in Fall 2011, taking forward the analyses developed in the present article.

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<sup>72</sup> Cordesman and Kleiber, *Iran's Military Forces and Warfighting Capabilities*, *op. cit.*, pp. 157-168.

<sup>73</sup> The bibliography gathering the references mentioned in this article appears in the issue No. 21 *bis* of the *Focus stratégique* series.

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