

Developments in China's Conventional Precision Strike Capabilities

BY AKIRA MARUSAKI

According to the *Report on the Work of the Government* delivered by Chinese Premier Li Keqiang at the Third Session of the 12th National People's Congress on March 5, 2015, the People's Republic of China (PRC) maintains the position that the construction of a strong national defense capability and powerful armed forces is necessary to safeguard its national interests.¹ Coupled with the rapid increase of its defense budgets,² the PRC is likely to continue to advance the modernization of the People's Liberation Army (PLA).

Among the range of PLA capabilities undergoing modernization, this study will focus on conventional precision strike capability. In order to address the questions of how and why the PRC has been striving to improve this capability, this study will first illustrate the development of three weapon systems: the conventional ballistic missile, the anti-ship ballistic missile (ASBM), and the land attack cruise missile (LACM). It will then analyze the reason why the PRC has developed these capabilities, casting a spotlight on historical and strategic backgrounds, in particular the end of Cold War, the 1990 Gulf War, and the Third Taiwan Strait Crisis in 1995 to 1996. This study will conclude by pointing to future developments in China's conventional precision strike capabilities, drawing attention to reconnaissance capabilities.

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A) Conventional Ballistic Missile

The PLA Second Artillery Force (PLASAF) possesses a variety of ballistic missiles, such as the intercontinental ballistic missile (ICBM), the intermediate-range ballistic missile (IRBM), the medium-range ballistic missile (MRBM), and the

short-range ballistic missile (SRBM); in addition, the PLA Navy (PLAN) has the submarine-launched ballistic missile (SLBM).³ Among these ballistic missiles, the IRBM, MRBM and SRBM could carry not only nuclear warheads, but also conventional warheads.⁴

The possibility of their use as conventional ballistic missiles can be inferred from their improvement of the circular error probability (CEP).⁵ According to *IHS Jane's Strategic Weapon Systems*⁶ (hereinafter, if not otherwise specified, this study will use its data), the PRC has created more and more ballistic missiles with improved CEPs since the beginning of their development (see Figure 1). All types of ballistic missiles designed before the 1990s had a CEP of over 300 meters, such as the IRBM DF-3 with a 2,000 meter CEP, which entered service in 1970, and the ICBM DF-5 with an 800 meter CEP, which became operational in 1981. These relatively large CEPs seem to suggest that these missiles were primarily intended to deliver nuclear warheads. While accuracy requirements for nuclear ballistic missiles may vary depending on the selected targets, generally speaking, sheer destructive power of nuclear weapons can offset relative inaccuracy of the means of delivery.

However, the IRBMs, MRBMs and SRBMs developed after the mid-90s have much improved CEPs. For instance, the MRBM DF-21A, which entered service in 1996, has a CEP of 50 meters; the SRBM DF-15A, having become operational in 1996, has a CEP ranging from 30 to 45 meters; and the IRBM DF-25, which entered operational service in 2008, has a 10 meter CEP. Unless these shorter range missiles are intended for nuclear attack against counter-force targets—such as hardened missile silos—which is unlikely, their smaller CEPs seem to suggest that these missiles are designed for conventional strike with considerable accuracy. Meanwhile, the fact that the relatively new

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ICBMs and SLBMs, such as the ICBM DF-31A with a 300 meter CEP, which entered service in 2007, and the SLBM JL-2 with a 300 m CEP, having become operational in 2008,⁷ still have a large CEP means they are expected to deliver nuclear weapons. In short, the Chinese quest for precision strike capabilities can be seen in the improvement of the CEP of its ballistic missiles.

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B. Anti-Ship Ballistic Missile (ASBM)

According to *IHS Jane’s Strategic Weapon Systems*, some of the PRC’s ballistic missiles (e.g., the MRBM DF-21C and D, the SRBM DF-15B and C, and the IRBM DF-25) are believed to be equipped with maneuverable re-entry vehicles

(MaRV) with terminal guidance capabilities. Among them, the MRBM DF-21D is specifically dubbed ASBM, or “carrier killer”, presumably to be used against large ship targets—namely aircraft carriers—with conventional warheads (see Figure 2).⁸ It is essential for an ASBM to not only have initial targeting accuracy but also the capability to modify its trajectory in flight. Thus, the ASBM is a good example of development in China’s conventional precision strike capabilities.

C) Land Attack Cruise Missile (LACM)

Other than ballistic missiles, the PLA is also developing air- and ground- launched LACMs with precision strike capabilities.⁹ In the paper, “China’s Evolving Reconnaissance-Strike Capabilities: Implications for the U.S.-Japan Alliance,” author Ian Easton illustrates examples of the PLA’s cutting-edge LACMs, such as the DH-10 (or the CJ-10).¹⁰ According to *IHS Jane’s Strategic Weapon Systems*, the CEP of the HN-2, a

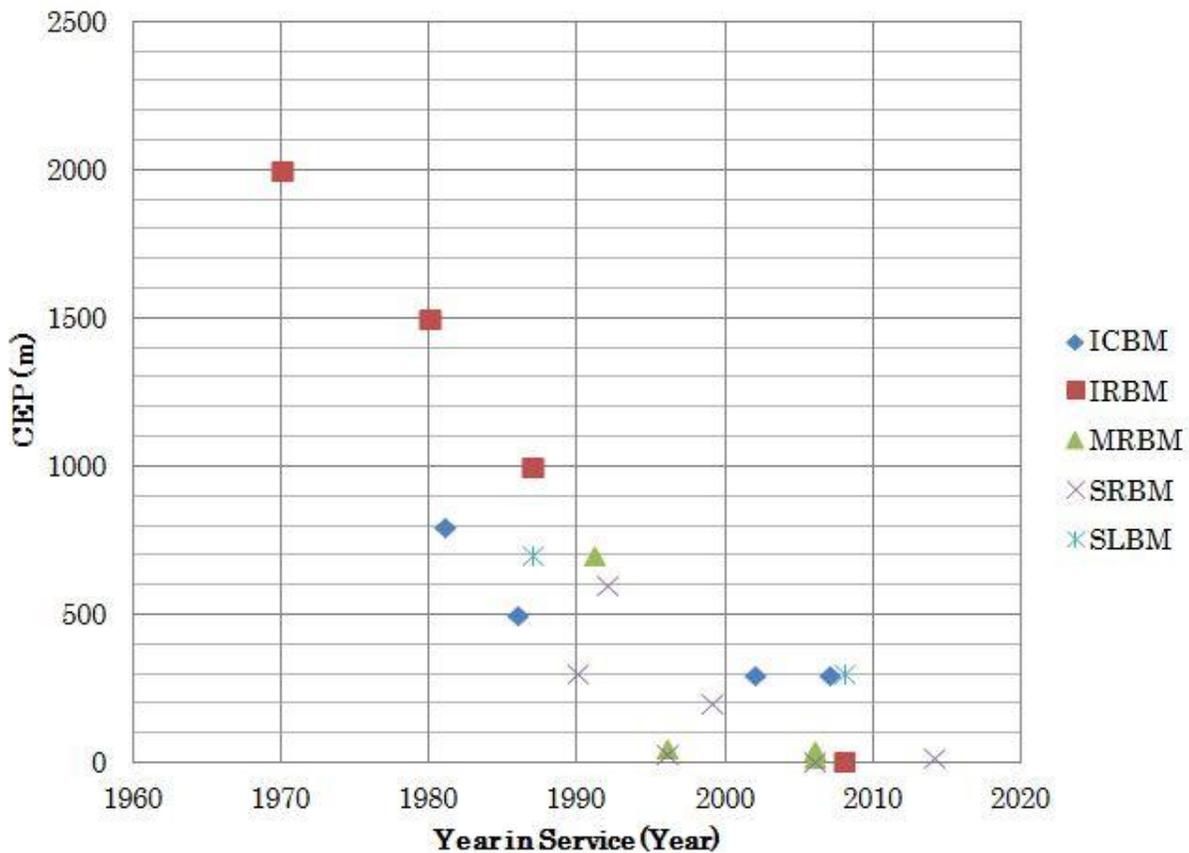


Figure 1: CEP of the PRC’s ballistic missiles (Source: IHS Jane’s 2015)

similar type of LACM to the DH-10, is only 5 meters. This means that the LACM DH-10 provides the PRC with advanced conventional precision strike capabilities.

Reasons for Development – Historical and Strategic Backgrounds

A) The End of the Cold War and Gulf War

Before the 1990s, during the Cold War, the PRC under the administration of Deng Xiaoping believed that it was possible to deter a world war.¹¹ This perspective, probably based on the nuclear deterrence strategy, seems to suggest that the PRC did not have an urgent need to develop ballistic missiles with small CEPs for use in a conventional strike.

However, in 1989, when U.S. President George H. W. Bush and the Soviet President Mikhail Gorbachev declared the demise of the Cold War at Malta, the Gulf War broke out soon after. During this war, the U.S. utilized the LACM for the first time in actual warfare.¹² Various Chinese writings on modern warfare suggest that this event had a great impact on the PRC’s strategic views on war. In January 1993, the

Chairman of the Central Military Commission (CMC) of the Communist Party of China (CPC), Jiang Zemin, concluded that local war became increasingly likely, while a world war would not break out in the immediate future.¹³ According to this shift in the assessment of the situational environment, the PRC apparently formed the opinion that the utility of nuclear weapons was relatively diminished in terms of deterring and winning local war, because local war can no longer be deterred by the nuclear deterrence, as was the case during the Cold War. Comparatively, the need to develop conventional strike capabilities, which were actually used during the Gulf War, had increased.

Consequently, the PRC began to create conventional ballistic missiles with small CEPs in the mid-1990s. Moreover, considering that conventional cruise missiles were actually utilized during the 1990 Gulf War, the PRC now had an incentive to advance its conventional strike capabilities to prevent them from being used against the PRC during a local war in the future.

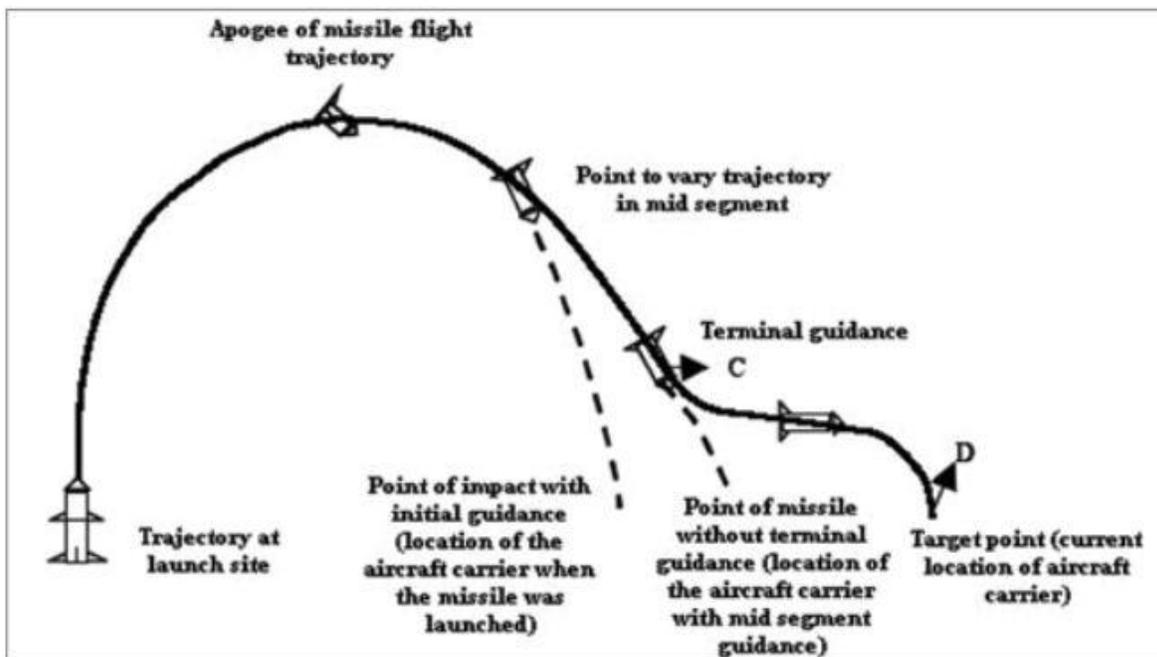


Figure 2: Schematic Diagram of ASBM (Source: U.S. Department of Defense, 2009)

B) Third Taiwan Strait Crisis and Anti-Access/Area-Denial (A2/AD) Capabilities

Another historical reason for the development of China’s conventional precision strike capability can be found in the Third Taiwan Strait Crisis, triggered by Lee Teng-hui’s visit to Cornell University in the United States in 1995. The PRC deployed its troops near Taiwan and conducted large-scale maneuvers, including live-ammunition exercises and amphibious landing training.¹⁴ In response, the U.S. dispatched two aircraft carrier strike groups, namely Carrier Strike Group Five and Carrier Strike Group Seven, to the area near Taiwan in order to monitor the PRC’s military actions.¹⁵ It is presumed that this experience increased the PRC’s motivation to possess the ASBM, in order to prevent U.S. aircraft carriers from approaching this area again during wartime.

U.S. Department of Defense annual report on the PLA reports that the goals of the PLA’s modernization is in preparation for a potential third-party intervention, probably with an eye on conflict in the Taiwan Strait.¹⁶ Therefore, the PRC prioritizes developing its anti-access/area-denial (A2/AD) capabilities.¹⁷ The SRBM can cover the East China Sea and the northern part of the South China Sea. Moreover, the MRBM and the ASBM are able to target not only the East China Sea and the South China Sea, but also the Western Pacific Ocean. The range of the LACM carried by H-6 bomber is larger than that of conventional ballistic missiles, with an attack range including Guam as well. In sum, the developments in precision strike capabilities with conventional ballistic missiles, the ASBM, and the LACM provide the PRC with A2/AD capabilities in the East China Sea, the South China Sea and the Western Pacific Ocean—all of which surround Taiwan (see Figure 3).

Future Developments – Reconnaissance Capabilities

As Amy Woolf points out, a conventional global prompt strike capability requires intelligence gathering, intelligence, reconnaissance and surveillance (ISR) capabilities to develop

conventional precision strike capabilities.¹⁸ In his report, Easton examines seven different types of reconnaissance capabilities needed to improve the accuracy of the ballistic missile and the cruise missile.¹⁹ This section will briefly look at these assets.

First, manned airborne platforms, such as the Y-8 airborne early warning plane (AEW), conduct operations for detecting and monitoring enemy military assets. The number of ISR aircraft in the PLA is reported to be inadequate to carry out sufficient surveillance. The PLA will seek to reinforce this capability.

Second, the PLA has invested and will continue to invest in various satellite platforms for maritime surveillance and reconnaissance, such as electro-optical satellites, synthetic aperture radar satellites, electronic intelligence satellites,

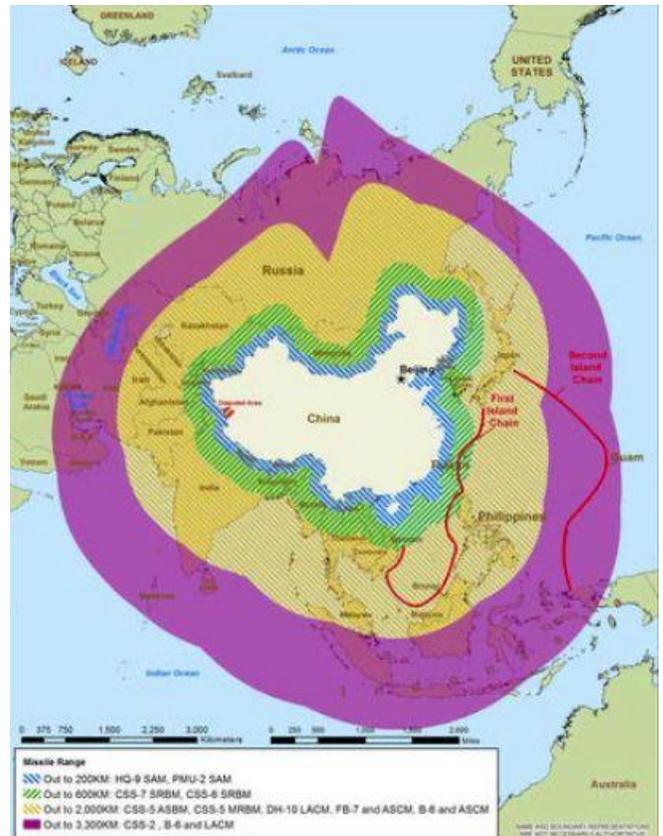


Figure 3: Conventional A2/AD Capabilities (Source: Department of Defense, 2014)

and naval ocean surveillance system satellites.²⁰

Third, submarines potentially provide an underwater reconnaissance capability. It is argued that the PRC's submarines are vulnerable to the anti-submarine warfare operations of neighboring countries, so the PLA will try to overcome this weakness by, for example, focusing on noise reduction.

Fourth, maritime surveillance ships, or "tattle-tale" ships, gather intelligence under the Chinese Coast Guard, the PLA Navy, and the PLA General Armament Department. For example, during the Rim of the Pacific Exercise 2014, it was reported that the *Dongdiao*-class auxiliary general intelligence ship operated in the Pacific Ocean. This kind of intelligence-collecting activity is expected to continue.

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Fifth, over the horizon backscatter (OTH-B) radars are a significant asset for extending the range of air and maritime surveillance, but OTH-B radars themselves are not able to provide precise data; hence, the PLA will complement these radars with other reconnaissance capabilities.

Sixth, unmanned aerial vehicles (UAV) are helpful for maritime reconnaissance activities. The PRC will seek to develop the capabilities of their UAVs by increasing both their operational altitude and flight endurance, which are capabilities the PRC does not yet possess.

Last, near-space vehicles, which operate between 20 and 100 km above the ground, may potentially be developed for future ISR capabilities. As Mark Stokes states in his report, "China's Evolving Conventional Strategic Strike Capability: The anti-ship ballistic missile challenge to U.S. maritime operations in the Western Pacific and beyond," civil programs

focused on the near-space will potentially be developed under civil and military cooperation.²¹

Conclusion

The PRC's conventional precision strike capabilities have been improved since the 1990s. This study traced the development of conventional ballistic missiles with the improved CEP, the ASBM and the LACM. Behind these shifts, there are two historical and strategic factors. First, the end of the Cold War and the use of conventional cruise missiles in the Gulf War had a great influence on the PRC by encouraging it to improve its conventional strike capabilities. Second, lessons from the Third Taiwan Strait Crisis, especially regarding the importance of A2/AD capabilities, encouraged the PRC to acquire more accurate conventional strike capabilities. In order to further develop these capabilities, the PRC will have to improve its reconnaissance capabilities to achieve greater precision through enhanced ISR. In conclusion, the PRC will continue to develop its conventional precision strike capabilities, which constitute an integral part of its A2/AD capabilities, and will continue to advance ISR capabilities in the near future.

List of Acronyms Used

A2/AD	Anti-Access / Area-Denial
AEW	Airborne Early Warning
ASBM	Anti-Ship Ballistic Missile
CEP	Circular Error Probability
DoD	U.S. Department of Defense
GPS	Global Positioning System
ICBM	Intercontinental Ballistic Missile
IRBM	Intermediate-Range Ballistic Missile
ISR	Intelligence, Reconnaissance and Surveillance
LACM	Land Attack Cruise Missile
MaRV	Maneuverable Re-entry Vehicle
MOD	Ministry of Defense (Japan)
MRBM	Medium-Range Ballistic Missile
OTH-B	Over the Horizon Backscatter
PLA	People's Liberation Army
PLAN	People's Liberation Army Navy
PLASAF	People's Liberation Army Second Artillery Force
PRC	People's Republic of China
SLBM	Submarine-Launched Ballistic Missile
SRBM	Short-Range Ballistic Missile
UAV	Unmanned Aerial Vehicles
U.S.	United States

Notes

¹ “Full Text: Report on the Work of the Government (2015),” delivered by Li Keqiang at the Third Session of the 12th National People’s Congress, March 5, 2015, http://english.gov.cn/archive/publications/2015/03/05/content_281475066179954.htm.

² The PRC’s announced defense budget for FY2014 was approximately 40 times larger than that of FY1988 (MOD 2014). Moreover, according to the *Budget Report*, the Ministry of Finance of the PRC announced that its defense budget within central budgetary expenditures for FY2015 was approximately 886.9 billion yuan with a growth of about 10.1% compared to the FY2014.

³ “Defense of Japan 2014: Annual White Paper” Ministry of Defense of Japan, 2014, at http://www.mod.go.jp/e/publ/w_paper/2014.html.

⁴ “Jane’s Weapons: Strategic,” IHS Jane’s, 2015.

⁵ The CEP is a statistical parameter utilized for describing the accuracy of ballistic missiles, defined as the radius of a circle focusing around the target, “such that the probability of an impact landing inside the circle is 50%” See Charles E. Williams, “A Comparison of Circular Error Probability Estimators for Small Samples,” Air Force Institution of Technology Air Education and Training Command, March 1997, p.2, at <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA324337>.

⁶ “Jane’s Weapons: Strategic,” 2015.

⁷ According to *Annual Report to Congress 2014- Military and Security Developments Involving the People’s Republic of China 2014* of the United States Department of Defense, the SLBM JL-2 is likely to be operational with the *Jin*-class nuclear-powered ballistic missile submarines in 2014 (and the nuclear deterrence patrols are still unconfirmed).

⁸ The SRBM DF-15C and the IRBM DF-25 might also be ASBMs because of their small CEPs and their terminal radar guidance systems; Ian Easton, “China’s Evolving Reconnaissance-Strike Capabilities: Implications for the U.S.-Japan Alliance,” Project 2049 Institute, February 2014, p. 7, at http://www.project2049.net/documents/Chinas_Evolving_Reconnaissance_Strike_Capabilities_Easton.pdf.

⁹ Lee Fuell, “Broad Trends in Chinese Air Force and Missile Modernization,” Testimony Before the U.S.-China Economic & Security Review Commission, January 30, 2014, at http://www.uscc.gov/sites/default/files/Lee%20Fuell_Testimony1.30.14.pdf.

¹⁰ Easton, “China’s Evolving Reconnaissance Strike Capabilities.”

¹¹ “The International Situation and Military Strategic Guidelines (在战争与和平问题上作出新的科学论断),” Ministry of Foreign Affairs of the People’s Republic of China, November 7, 2000, at <http://www.mfa.gov.cn/chn//pds/ziliao/wjs/2159/t8982.htm>.

¹² Eliot A. Cohen et al., “Gulf War Air Power Survey: A Statistical Compendium and Chronology,” Volume V, Office of the Secretary of the Air Force, 1993, at <http://www.afhso.af.mil/shared/media/document/AFD-100927-065.pdf>.

¹³ Jiang Zemin, “The Global Situation and Military Strategy (国际形势和军事战略方针),” *Selected Works of Jiang Zemin*, Vol. 1, 1993.

¹⁴ Qimao Chen, “The Taiwan Strait Crisis: Its Crux and Solutions,” *Asian Survey*, vol., 36, no. 11, November 1996, 1055-1066, at <http://as.ucpress.edu/content/36/11/1055.full-text.pdf+html>.

¹⁵ *Ibid.*

¹⁶ *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2014*, U.S. Department of Defense, at http://www.defense.gov/Portals/1/Documents/pubs/2014_DoD_China_Report.pdf.

¹⁷ A2 capability, on the one hand, is typically long-range and designed to prevent hostile forces from entering an operational area. On the other hand, AD capability is normally short-range and designed to limit an enemy force’s freedom of action within an operational area.

¹⁸ Amy F. Woolf, “Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues,” Congressional Research Service, October 2, 2015, at <https://www.fas.org/sgp/crs/nuke/R41464.pdf>.

¹⁹ Easton, “China’s Evolving Reconnaissance Strike Capabilities.”

²⁰ In addition to intelligence satellites, the PRC is developing the *BeiDou* navigation satellite system, the so-called Chinese version of the global positioning system (GPS). The *BeiDou* system will be useful in directing ballistic missiles and cruise missiles to the target without the use of GPS.

²¹ Mark Stokes, “China’s Evolving Conventional Strategic Strike Capability: The anti-ship ballistic missile challenge to U.S. maritime operations in the Western Pacific and beyond,” Project 2049 Institute, September 14, 2009, at https://project2049.net/documents/chinese_anti_ship_ballistic_missile_asbm.pdf.