



Cruise Missiles in Southern Asia

Strategic Implications for China and India

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Outline

- Doctrinal Overview: Nuclear & Conventional forces
- Cruise missiles and potential capabilities for China & India
 - Contribute to deterrence stability
 - Negate the effectiveness of missile defenses
 - Facilitate preemptive conventional counterforce attacks
- CBMs and cruise missiles: Difficult to implement and verify
- Conclusion



Doctrinal Similarities: China and India

- Nuclear Doctrine:
 - Neither contours or size of the nuclear arsenal is specified
 - Posture of “assured retaliation.”
 - No-first use □ credible second strike capability
- Conventional Doctrine:
 - New emphasis on preemptive concepts



Cruise Missiles and Nuclear Deterrence

- *Do cruise missiles contribute to deterrence stability?*



Cruise Missiles and Nuclear Deterrence

- Triad:
 - Submarine: China (limited) & India (under development)
 - Limitations of the aircraft: endurance; strategic depth; & air defenses
 - Rely more on land based ballistic missiles
- Cruise missiles could fill this deterrence gap
 - Missile defenses are uncertain
 - Counter-force operations are difficult
 - Small size of the transport-erector-launchers (TELs) & faint launch signature
 - Affordability in development & flexibility in deployment

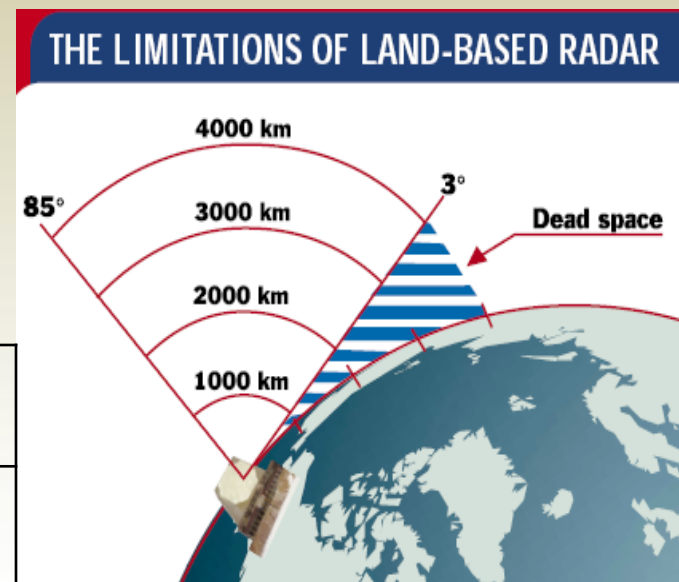


Cruise Missiles and Missile Defense (MD)

- *Do cruise missiles negate missile defenses?*

Cruise Missiles and Missile Defense (MD)

- MD in India: Pakistan's first-use & missile gap with China
- MD in China: Signaling or tech. demonstrator
- Cruise Missiles (CM): offensive counter to MD
 - low radar cross-section (RCS)
 - minimal infrared signature, and
 - earth curvature & “dead space”



Source: David Tanks, *Assessing the Cruise Missile Puzzle: How Great a Defense Challenge*, The Institute for Foreign Policy Analysis

	<i>Speed</i>	<i>RCS</i>	<i>Detection range</i>	<i>Reaction time</i>
Aircraft	800 km/hr	7 m ²	370 km	28 minutes
CM	800 km/hr	0.1m ²	130 km	10 minutes



Cruise Missiles and Conventional Operations

- *Do cruise missiles facilitate preemptive conventional counterforce attacks against the adversary's strategic forces?*
- *If attacks are only against dual-capable delivery systems, does it result in crisis escalation? and,*
- *Does precision offered by cruise missiles facilitate conventional strikes against targets of strategic importance?*



Cruise Missiles and Conventional Operations

- Counterforce ops: attacks against nuclear forces
- Strategic-strike ops: disable adversary's "center of gravity"
- Ideal weapon for these ops:

	Aircraft	BM	CM
<i>Penetrate air defenses</i>	Difficult	Probable	Yes
<i>All weather precision</i>	Difficult	Probable	Yes
<i>Extended stand-off range</i>	Difficult	Yes	Yes
<i>Minimum sensor-to-shooter to-target times</i>	Difficult	Yes	Probable

- Conventional options + MD + C4ISR □ new non-nuclear triad
- Non-nuclear triad + nuclear parity □ tilt towards ***preemption***



Conclusion

- Confidence building measures (CBMs)
 - CBM 1: Refrain deployment of cruise missiles near border
 - CBM 2: Pre-test notifications
 - Challenges:
 - Greater standoff ranges
 - Multi-platform launch
 - Low radar and infrared signals
- Efforts to base cruise missile development and deployment on security requirements, ***not*** merely driven by technology or by the respective “strategic enclaves.”



Conclusion

- Establish credible modes of communication
 - Expand nature and scope of the current military exchanges
 - Institutionalize track-1.5 and track-2 style forums
- Define what constitutes transparency
 - Difficult task given ambiguity is part of deterrence posture



Appendix

Land-attack Cruise Missiles in China & India

- China
 - ***Hong Niao*** series
 - HN-1 (600km); HN-2 (1800km); and HN-3 (3000km)
 - ***DH-10***: reportedly based on HN-2 and is nuclear-capable
- India
 - ***Brahmos***: 290km hypersonic
 - ***Sagarika and Shaurya***: submarine-launched nuclear-capable with over 1000km range
 - ***Nirbhay***: 800-1000km for conventional missions



Chinese Nuclear Forces

Chinese nuclear forces, 2010

Type	NATO designation	Number	Year deployed	Range (kilometers)	Warhead × yield (kilotons)	Number of warheads
<i>Land-based ballistic missiles</i>						
DF-3A	CSS-2	~17	1971	3,100	1 × 3,300	~17
DF-4	CSS-3	~17	1980	5,400+	1 × 3,300	~17
DF-5A	CSS-4	~20	1981	13,000+	1 × 4,000–5,000	~20
DF-21 ^a	CSS-5 Mods 1,2	~60	1991	2,150	1 × 200–300	~60
DF-31	CSS-10 Mod 1	~8	2006 ^b	7,200+	1 × 200–300?	~8
DF-31A	CSS-10 Mod 2	~13	2007	11,200+	1 × 200–300?	~13
<i>Submarine-launched ballistic missiles^c</i>						
JL-1	CSS-NX-3	(12)	1986	1,000+	1 × 200–300	(12)
JL-2	CSS-NX-4	(36)	2012?	7,200+	1 × 200–300?	(36)
<i>Aircraft^d</i>						
H-6	B-6	~20	1965	3,100	1 × bomb	~20
					DH-10	? ^e
Others (?)	?	?	1972–?	–	1 × bomb	~20
Total						~175 ^f

~135 ←
Land-based BM

^aThis table only counts nuclear-only versions DF-21 (CSS-5 Mod 1) and DF-21A (CSS-5 Mod 2). The DF-21C may be dual-capable but is normally considered conventional, and the DF-21D is under development. A total of 85–95 missiles of all types exist for 75–85 launchers.

^bAn early but limited “initial threat availability” was achieved in 2006.

^cNeither the JL-1 nor the JL-2 SLBM is fully operational, although warheads probably are available. The JL-2 is under development but failed recent tests.

^dHaving tested several nuclear bombs, China is thought to have a small stockpile of nuclear bombs with yields between 10 kilotons and 3 megatons. Figures are only for those aircraft that are estimated to have a secondary nuclear mission. Aircraft range is equivalent to combat radius.

^eThere is no clear confirmation that the DH-10 has nuclear capability, but U.S. Air Force intelligence lists the weapon as “conventional or nuclear,” the same description as the Russian nuclear-capable AS-4.

^fAbout 65 additional warheads may be in reserve or awaiting dismantlement, for a total inventory of approximately 240 warheads.



Indian Nuclear Forces

Type/designation	Range (km)	Payload (kg)	Comment
Aircraft			
Mirage 2000 H/Vajra	1,800	6,300	Squadron 1 or 7 at Gwalior Air Force Station
Jaguar IS/IB/Shamsher	1,600	4,775	At Ambala Air Force Station
Land-based missiles			
Prithvi I	150	1,000	Nuclear version entered service after 1998 with the army's 333rd and 355th Missile Groups. Will be converted from liquid-fuel to solid fuel
Agni I	700+	1,000	Possible launch in spring 2010. Deployed with the army's new 334 Missile Group in 2004
Agni II	2,000+	1,000	Under development. Fourth and fifth army launches in 2009 failures. Six launch on May 17, 2010 successful. Deployment with the 335th Missile Group in 2004
Agni III	3,000+	1,500	Under development. Fourth test-launch on February 7, 2010
Sea-based missiles			
Dhanush	350	500	Under development. Extended-range naval version of Prithvi II. Sixth test on December 13, 2009
Sagarika/K-15	300–700	500–600	Under development. K-15 test-launched February 26, 2008 from a submerged platform; possible deployment on the <i>Arihant</i> after 2010