China, India, and Cruise Missiles

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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
- Conclusion
  - CBMs and cruise missiles: Difficult to implement and verify
  - Policy Initiatives

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

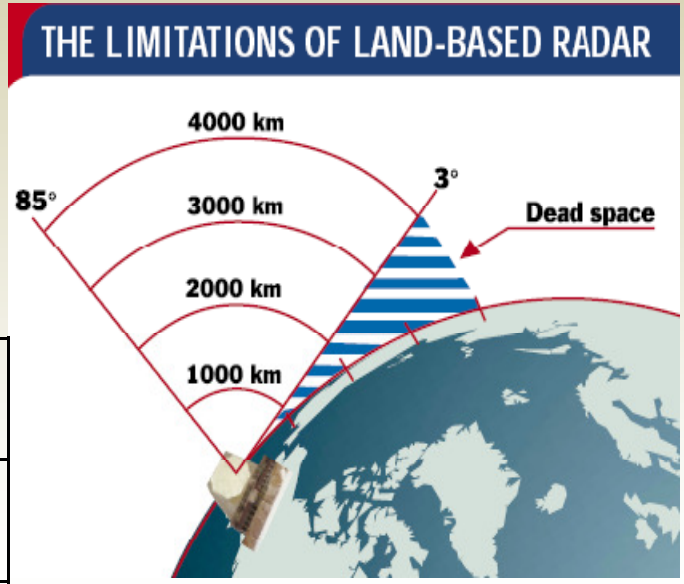
Cruise Missiles and Missile Defense (MD)

- ***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"



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

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

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**
Penetrate air defenses	Difficult	Probable	**Yes**
All weather precision	Difficult	Probable	**Yes**
Extended stand-off range	Difficult	**Yes**	**Yes**
Minimum sensor-to-shooter to-target times	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

Sources: Jane's and Aviation Week

Chinese Nuclear Forces

Chinese nuclear forces, 2010

Type	NATO designation	Number	Year deployed	Range (kilometers)	Warhead × yield (kilotons)	Number of warheads
Land-based ballistic missiles						
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
Submarine-launched ballistic missiles[c]						
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)
Aircraft[d]						
H-6	B-6	~20	1965	3,100	1 × bomb	~20
					DH-10	?[e]
Others (?)	?	?	1972–?	–	1 × bomb	~20
Total						~***175***[f]

[a]This 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.

[b]An early but limited "initial threat availability" was achieved in 2006.

[c]Neither 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.

[d]Having 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.

[e]There 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.

[f]About 65 additional warheads may be in reserve or awaiting dismantlement, for a total inventory of approximately 240 warheads.

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Land-based BM

Norris R S , Kristensen H M Bulletin of the Atomic Scientists 2010;66:134-141

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 *Arihant* after 2010

Norris R S , Kristensen H M Bulletin of the Atomic Scientists 2010;66:134-141