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China's Nuclear Weapons Modernization

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https://fas.org/issues/nuclear-weapons/

Briefing to seminar on China's Nuclear Modernization and Implications for India
Institute of Chinese Studies
New Delhi (virtual)
March 9, 2022

Brief overview

- Federation of American Scientists background
- China's evolving nuclear posture
- Land-based missile developments
- Sea-based missile developments
- Bomber developments
- Force projections

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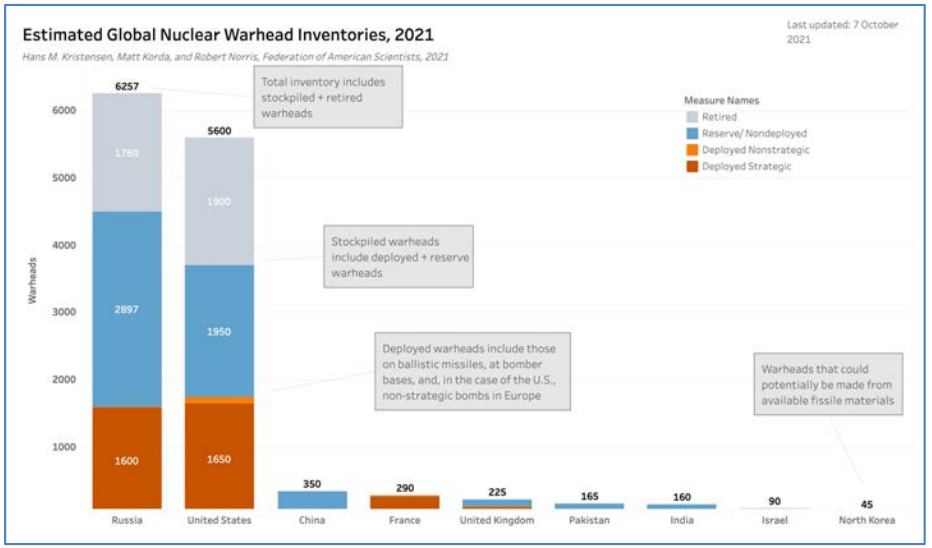
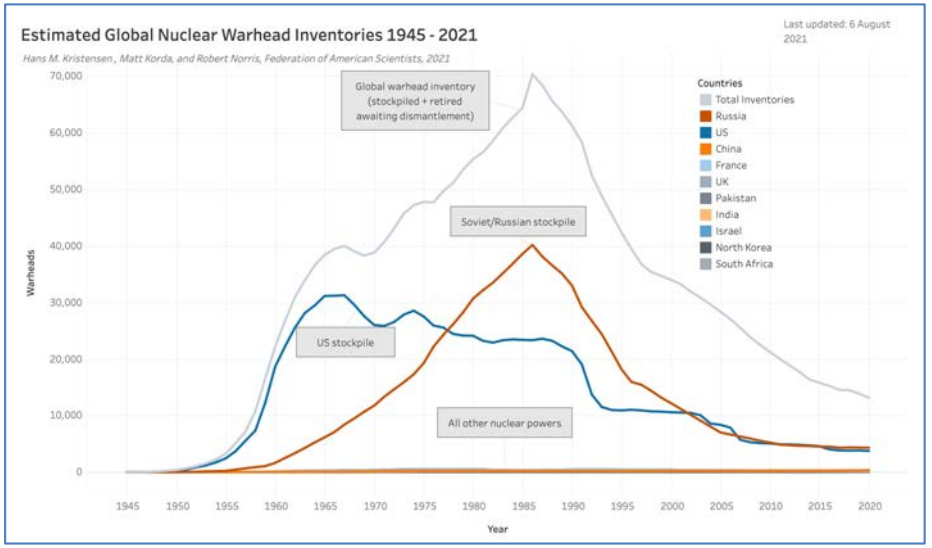
FAS Nuclear Information Project

Empower public debate about status and future of nuclear weapons by providing informative, factual, free resources:

- Track global nuclear force developments
- Status of World Nuclear Forces
- Nuclear Notebook
- SIPRI Yearbook

Nuclear Notebook
NUCLEAR ARSENALS OF THE WORLD





https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/

Evolving Chinese nuclear posture

> "Among the nuclear-weapon states, China… possesses the smallest nuclear arsenal."
> *Chinese Ministry of Foreign Affairs fact sheet 2004*

Then:

- Minimum deterrent
- Small arsenal (compared with US/Russia)
- Will not participate in nuclear arms race
- Slow and modest nuclear modernization
- MONAD of land-based missiles/bombers
- No alert, warheads in storage
- Simple retaliation strategy
- No-first-use policy
- No threat/attack against non-nuclear states/NWZ

Now/future:

- Medium deterrent (officially still minimum)
- Growing arsenal (still smaller than US/Russia)
- Active role in increasing nuclear competition
- Rapid and broad modernization
- Emerging TRIAD
- Increasing alert level, evolving launch-on-warning
- Counterattack strategy (escalation steps?)
- No-first-use policy
- No threat/attack against non-nuclear states/NWZ

Chinese nuclear discoveries

Silo discovery was not an accident but build on years of previous monitoring and reporting on Chinese nuclear sites:

Discovery of first Chinese Jin-class SSBN

Discovery of extensive missile training area in central China

Most recently of missile silo construction


Blogs > Strategic Security > New Chinese Ballistic Missile Submarine Spotted

New Chinese Ballistic Missile Submarine Spotted

By Hans Kristensen · July 5, 2007

By Hans M. Kristensen

A new satellite image appears to have captured China's new ballistic missile submarine. Coordinates: 38°49'4.40"N, 121°29'39.82"E.

https://fas.org/blogs/security/2007/07/new_chinese_ballistic_missile/


Extensive Nuclear Missile Deployment Area Discovered in Central China

By Hans Kristensen · May 15, 2008

By Hans M. Kristensen

https://fas.org/blogs/security/2008/05/extensive-nuclear-deployment-area-discovered-in-central-china/

Current arsenal

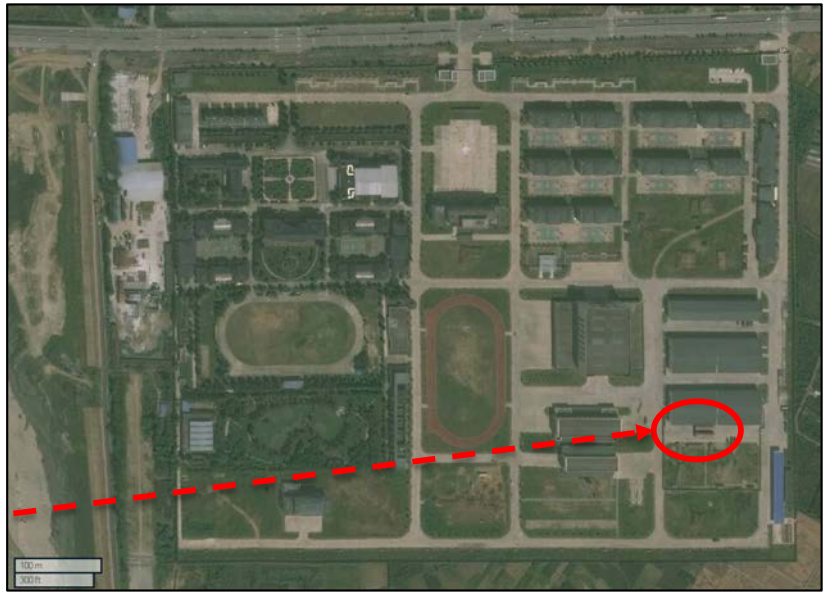
- Estimated stockpile of 350 warheads
- Growing ICBM force (mobile and silo)
- ~330 silos under construction (DF-31A, DF-41?)
- Growing MRBM/IRBM force (DF-21E, DF-26)
- Growing SSBN fleet (Type 094/096)
- Emerging bomber force (some old capability)
- Increasing MRV/MIRV (DF-3B, DF-41, JL-3)

Chinese nuclear forces, January 2022

Type/Chinese designation (US designation)	No. of launchers	Year first deployed	Range (km)[a]	Warheads x yield[b]	No. of warheads[c]
Aircraft	*20[d]*				*20*
H-6K (B-6)	10	2009	3,100	1 x bomb	10
H-6N (B-6N)	10	2021	3,100+	1 x ALBM	10
H-20 (B-20)	–	[2025+]	. .	. .	–
Land-based missiles[e]	*280*				*258*
DF-4 (CSS-3)	6[f]	1980	5,500	1 x 3,300	6
DF-5A (CSS-4 Mod 2)	10	1981	12,000	1 x 4,000-5,000	10
DF-5B (CSS-4 Mod 3)	10	2015	13,000	5 x 200-300	50
DF-5C (CSS-4 Mod 4)	. .	[2020s]	13,000	[MIRV]	. .
DF-15 (CSS-6)	. .	1990	600	1 x ?[g]	. .
DF-17 (CSS-22)	36[h]	2020	>1,800	1 x HGV[i]	. .
DF-21A/E (CSS-5 Mod 2/6)	40[j]	2000/2016	>2,100[k]	1 x 200-300	40[l]
DF-26 (CSS-18)	200	2016	4,000	1 x 200-300	20[m]
DF-31 (CSS-10 Mod 1)	6	2006	7,200	1 x 200-300	6
DF-31A/AG (CSS-10 Mod 2)[n]	72	2007/2018	11,200	1 x 200-300	72
DF-31A/AG (CSS-10 Mod 2) silo	. .	[2025+]	11,200	1 x 200-300	. .
DF-41 (mobile version) (CSS-20)	18[o]	2020	12,000	3 x 200-300	54
DF-41 (CSS-X-20A) silo	. .	[2025+][p]	12,000	[3 x 200-300]	. .
Sea-based missiles	*6/72[q]*				*72*
JL-2 (CSS-N-14)	72	2016	>7,000	1 x 200-300	72
JL-3 (CSS-N-X-?)	. .	[2020s][r]	>9,000	[MIRV]	. .
Total	**390**				**350[s]**

Land-based missile developments: mobile

- DF-41 ICBM being fielded (2+ brigades?)
- DF-31AG ICBM replacing DF-31A, more brigades
- DF-26 IRBM in significant numbers (dual-capable)
- DF-21E MRBM replacing DF-21A
- DF-4 liquid-fuel ICBM phasing out



Possible DF-41 TELs under tents at integration brigade (644) base at Hanzhong in Shaanxi (33.1321, 106.9361).

Image: September 13, 2021, © Maxar Technologies

Land-based missile developments: mobile

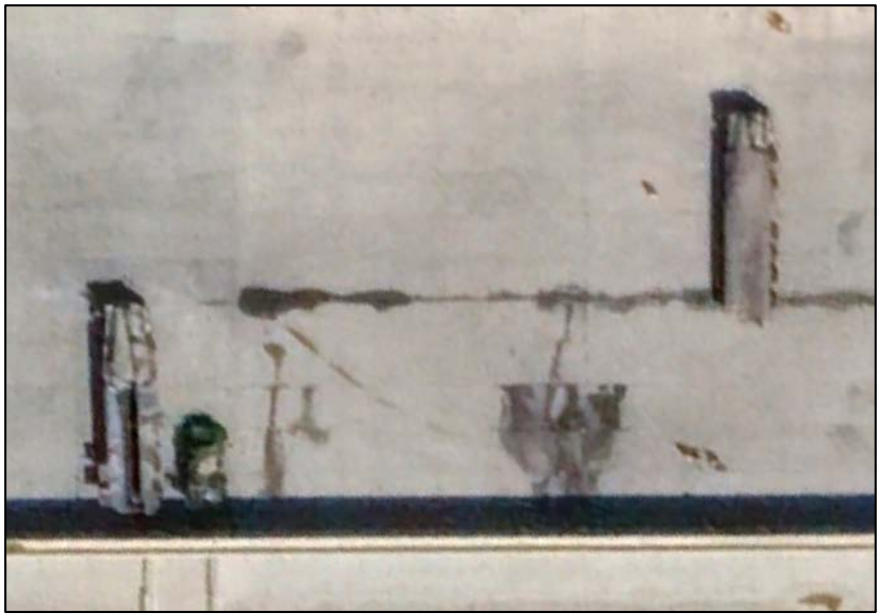
- DF-26 IRBMs fielded in large numbers

Possible DF-26 launch units at 611 Brigade near Qingyang in Anhui (30.6903, 117.9011). Upgrade from DF-21A?

Image: Airbus 2021/2022 via Google Earth

DF-26 launchers at 646 Brigade in Korla in Xinjiang (41.6946, 86.1734).

Image: October 14, 2021, © Maxar Technologies



Land-based missile developments: silos

FAS disclosed second missile silo field under construction near Hami

Across China we monitor construction of ~330 apparent silos


A Closer Look at China's Missile Silo Construction

By Matt Korda and Hans Kristensen · November 2, 2021

Suspected Missile Silo Construction at Yumen
40.02235° N, 96.61833° E
May 30, 2021

© Maxar Technologies

What's underneath the shelters over China's suspected silo construction sites? Image © 2021 Maxar Technologies

https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/


A 2nd New Nuclear Missile Base for China, and Many Questions About Strategy

Is China scrapping its "minimum deterrent" strategy and joining an arms race? Or is it looking to create a negotiating card, in case it is drawn into arms control negotiations?

The New York Times

Chinese engineers erected an inflatable dome over the construction site of an underground missile silo, left, to hide the work below. Support facilities and temporary storage for construction equipment are seen at right. Planet Labs Inc.

By William J. Broad and David E. Sanger

July 26, 2021

In the barren desert 1,200 miles west of Beijing, the Chinese government is digging a new field of what appears to be 110 silos for launching nuclear missiles. It is the second such field discovered by analysts studying commercial satellite images in recent weeks.

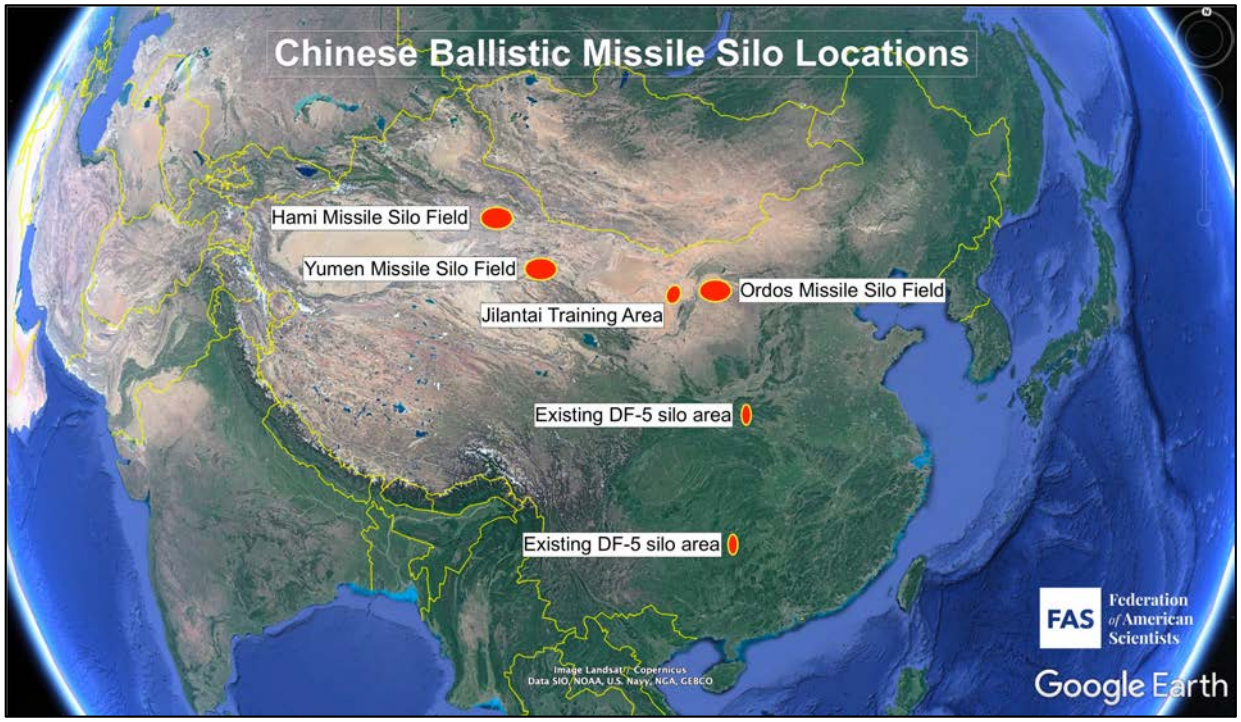
Land-based missile developments: silos

Three large new missile silo fields in northern/central China

Location and numbers very different from Chinas current missile silo force

Further inland potentially to project silos from conventional weapons

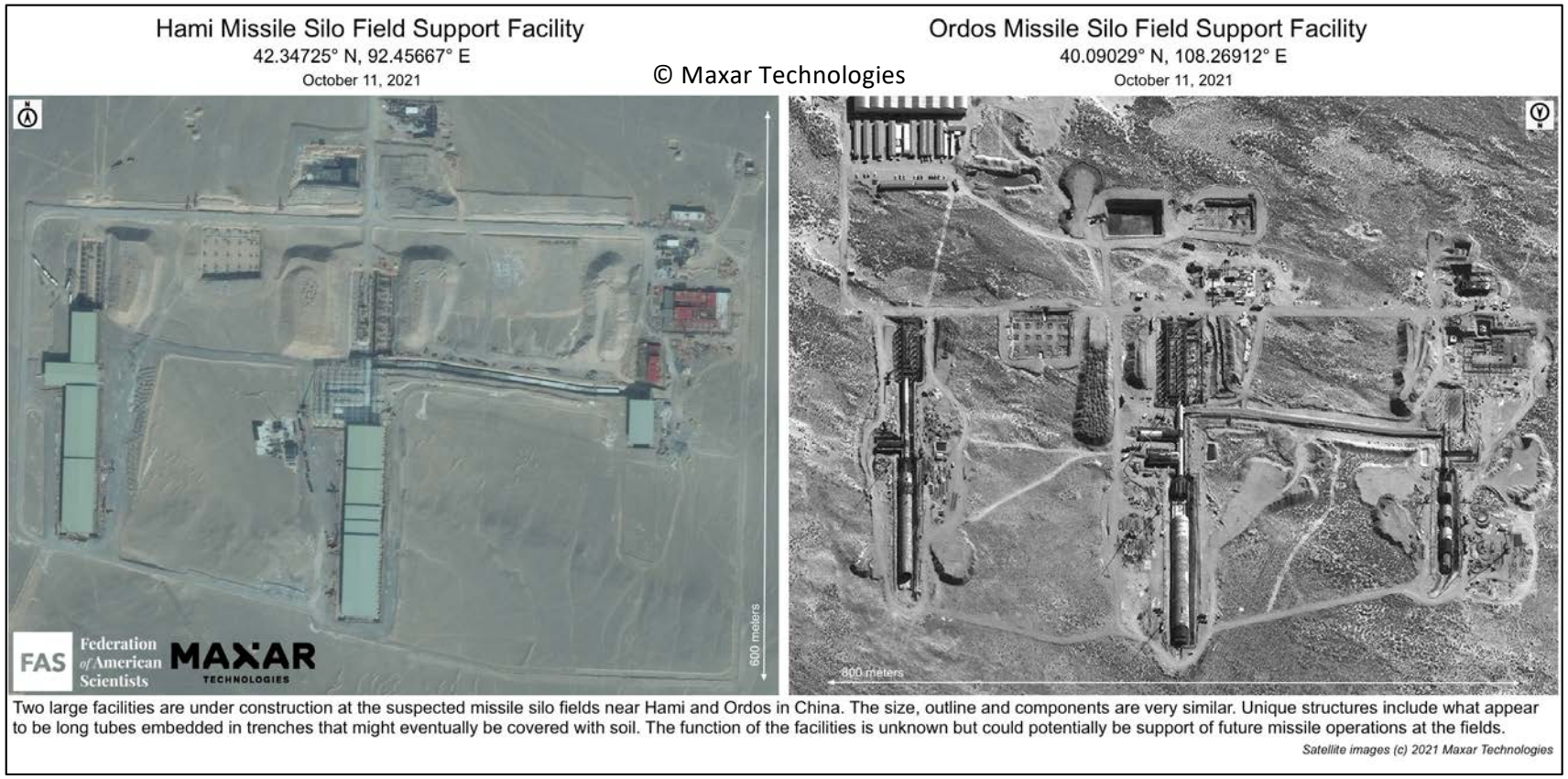
Large numbers indicate retaliatory capability is seen as being vulnerable to attack



https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/

Land-based missile developments: silos

Unique underground facility construction at Hami and Ordos missile fields



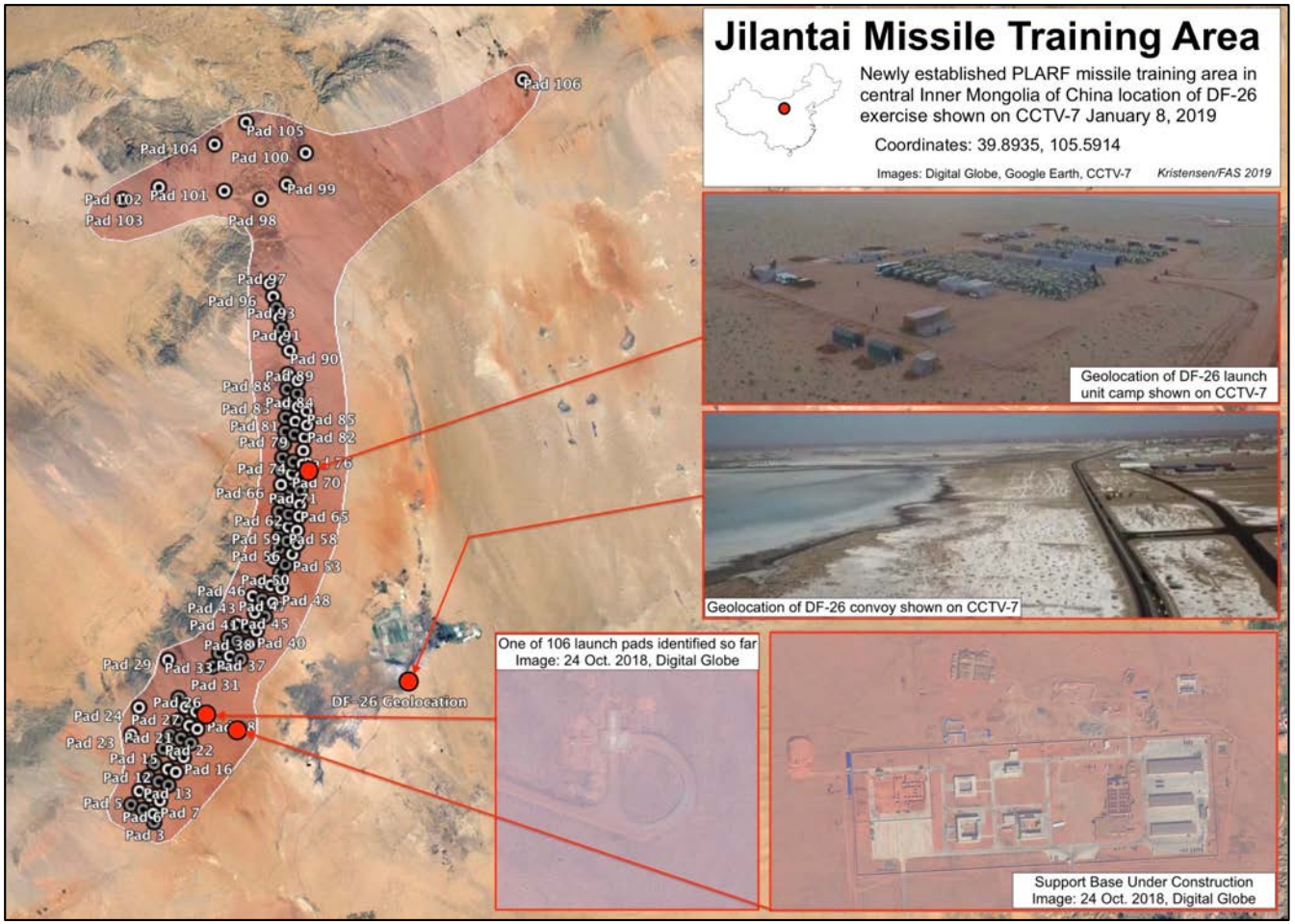
Two large facilities are under construction at the suspected missile silo fields near Hami and Ordos in China. The size, outline and components are very similar. Unique structures include what appear to be long tubes embedded in trenches that might eventually be covered with soil. The function of the facilities is unknown but could potentially be support of future missile operations at the fields.

Satellite images (c) 2021 Maxar Technologies

https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/

Land-based missile developments: training areas

In particular, the structures that made the discovery of the Chinese silos possible were first documented in the new PLARF training area near Jilantai in central China



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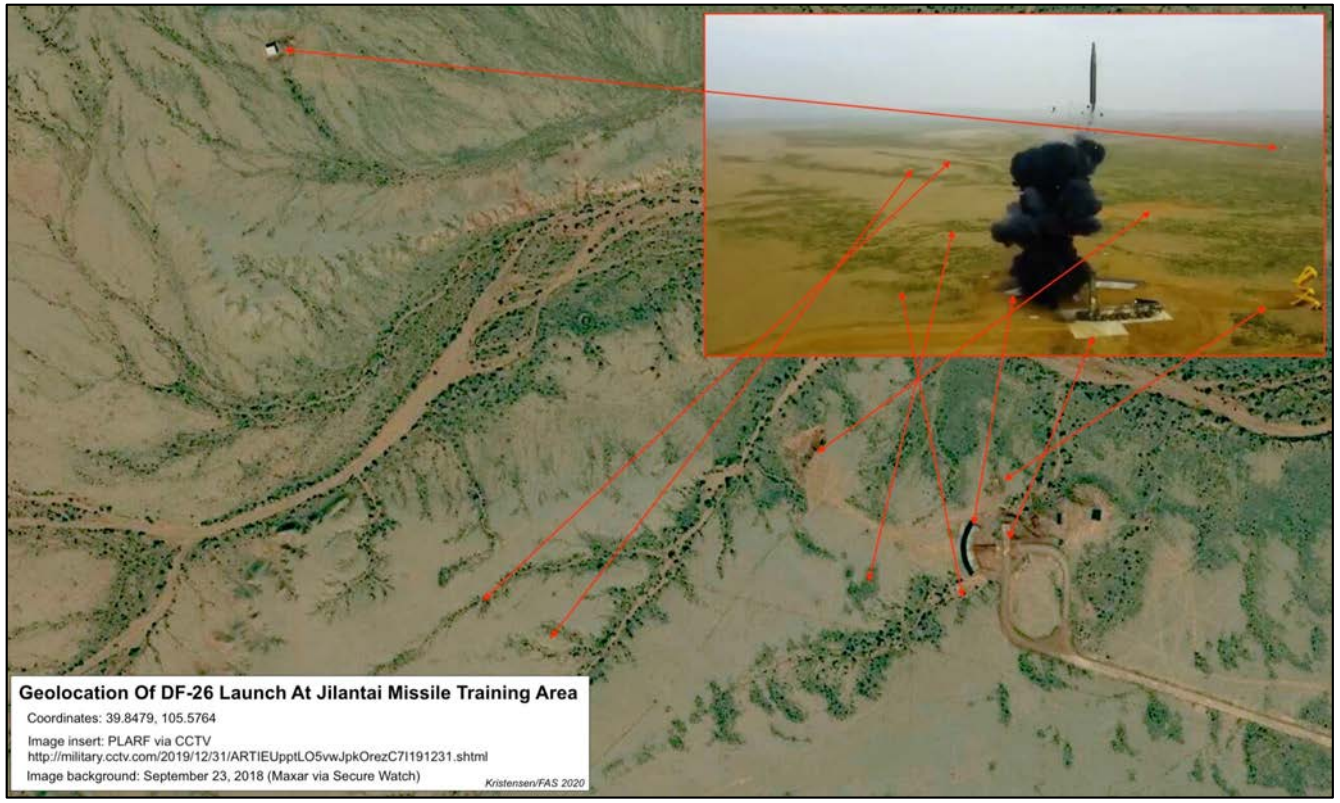
Land-based missile developments: training areas

At Jilantai we could observe new missile launchers training and compare dimensions with launchers seen on other photos. Although most focus on silos right now, these road-mobile launchers make up most of China's nuclear force today

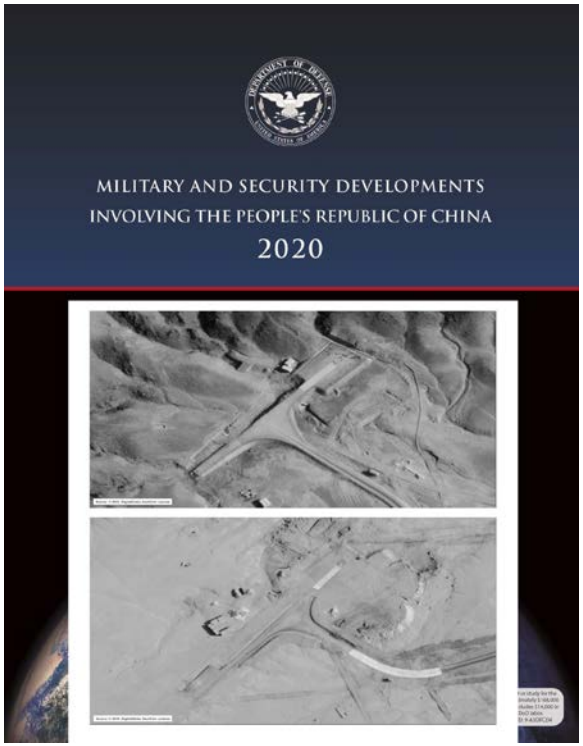
Land-based missile developments: training areas

We could also geo-locate individual missile test launches of new missiles, such as this DF-26 IRBM, by matching landscape features seen on video with those seen on satellite images



Land-based missile developments: silos

Jilantai is where we first discovered China's work on new types of missile silos. Our report from 2019 was included in the Pentagon's 2020 China report

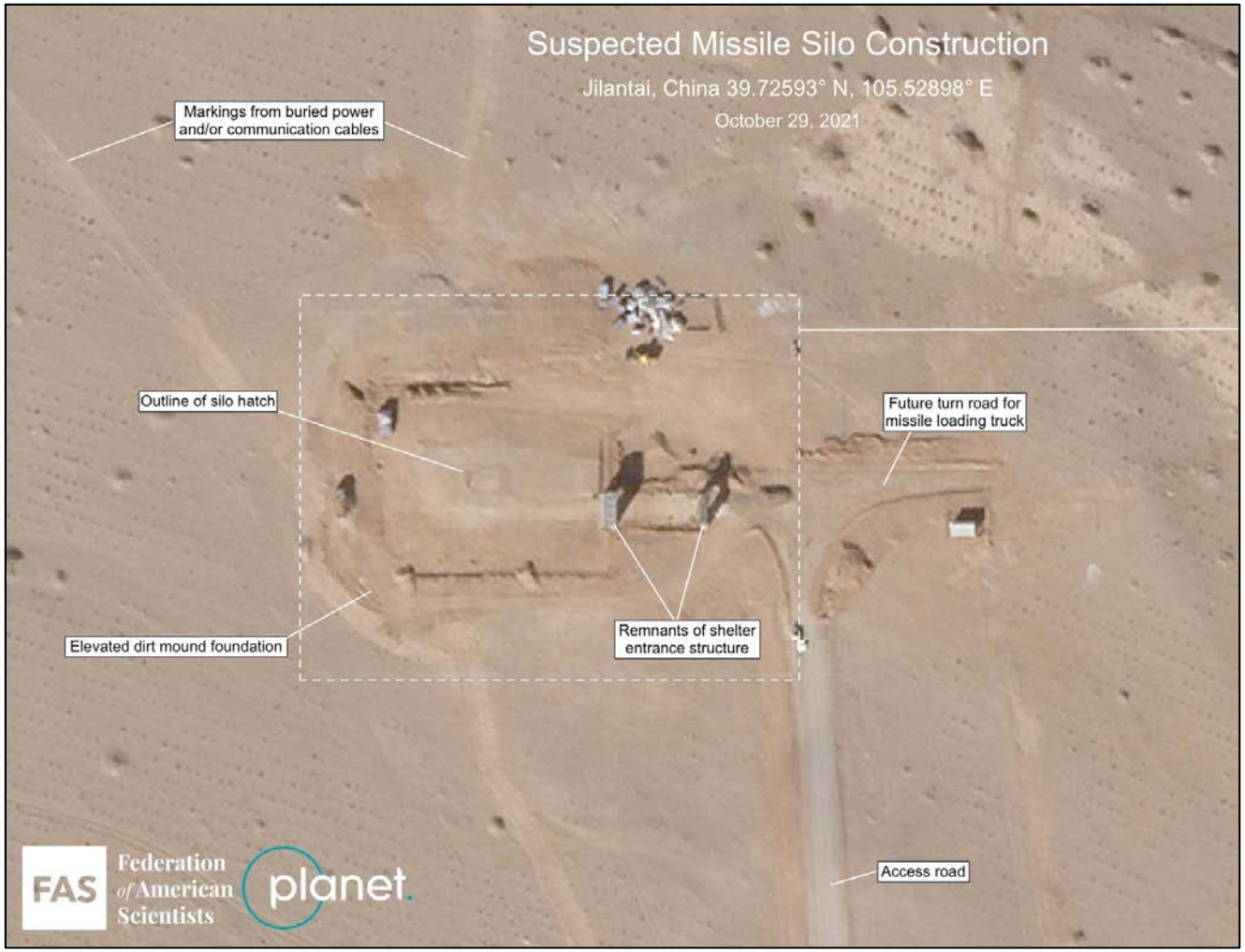


Land-based missile developments: silos

Jilantai is also where we first observed the unique bubbles or inflatable tents that China used to protect and conceal silos details. It was these bubbles that made the discoveries of the large missile silo fields possible: their grid-pattern was easy to see with 3-meter resolution satellite images

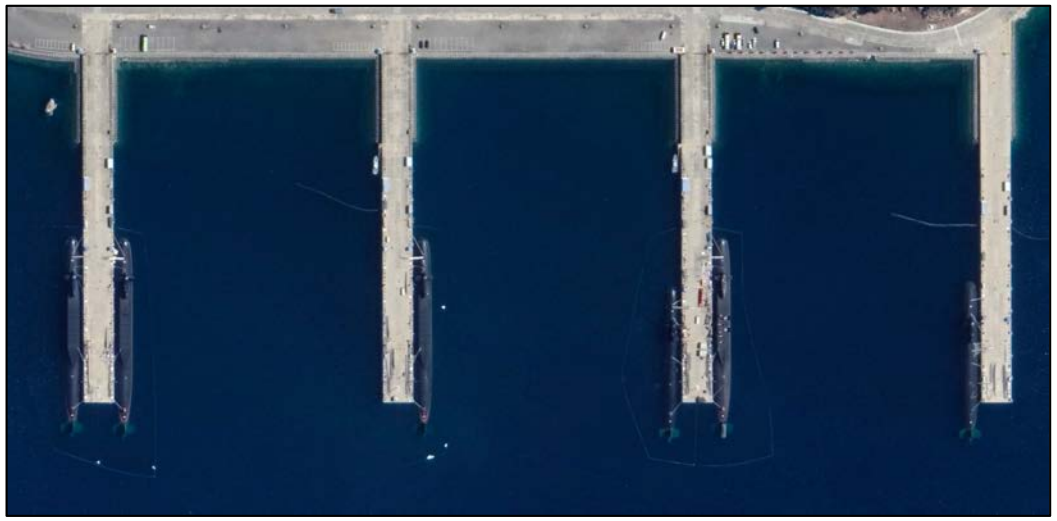
Land-based missile developments: silos

And, yes, they're silos. Not windmills. When bubble comes down, it shows silo hatch and other features



Submarine developments

- After first experimental Xin-class (Type 092) SSBN, fleet of 6 Jin-class (Type 094) SSBNs is now in service
- Each can carry up to 12 JL-2 SLBMs; possibly upgrading to JL-3 SLBM
- New class (Type 096) in development; will carry JL-3 SLBM with MRV/MIRV



4 Jin-class (Type 094) SSBNs and 2 Chang-class (Type 095) SSNs at Hainan base.

Image: February 20, 2021 (Maxar via Google Earth)

Bomber developments

- Bomber force has been reassigned nuclear role
- H-6N with ALBM operational
- Possible first base Neixiang Air Base in Henan (32.9737, 111.8850)

First reported by Roderick Lee

Force projections

We're monitoring more than 330 silos under construction

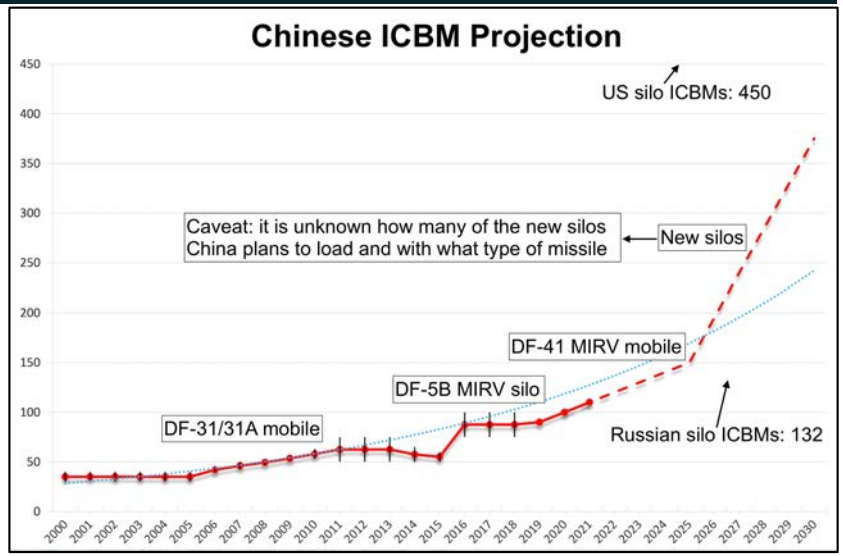
If all are loaded with ICBMs, China could exceed Russian ICBMs and approach US ICBMs by 2030s

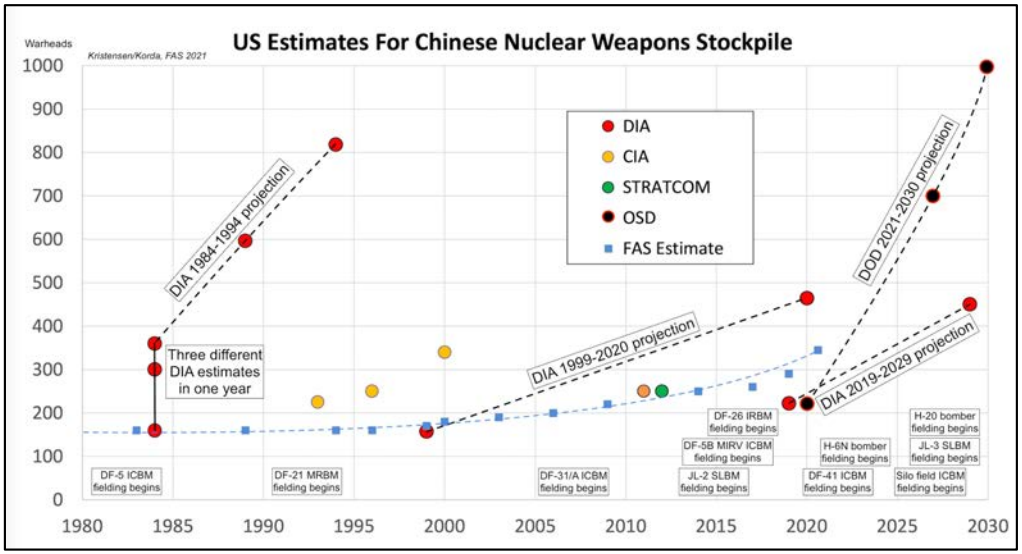
US military projects 700 warheads by 2027 and more than 1,000 by 2030

Projection depends on new plutonium and warheads production

It is unknown how China plans to arm the new silos: all, some?

What missile? DF-31A and/or DF-41?





QUESTIONS?