

Ten-year retrospective of DPRK nuclear program

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10-year comparison of DPRK nuclear program

Nuclear Capability	January 2003	January 2014
Nuclear reactors	5 MWe – standby 50 MWe – standby 200 MWe - abandoned	
Fuel fabrication	Standby – corroding U conversion - operating	
Uranium enrichment	DPRK – denied US – 2002 accusation	
Nuclear export	UF6 to Libya Reactor to Syria	
Political	Kim Jong-il No mention of nukes	

Plutonium production halted. Uranium enrichment – building capacity.
No nuclear weapons, no long-range rockets.

10-year comparison of DPRK nuclear program

Nuclear Capability	January 2003	January 2014
Nuclear reactors	5 MWe – standby 50 MWe – standby 200 MWe - abandoned	5 MWe restarted ELWR under construction
Fuel fabrication	Standby – corroding U conversion - operating	Reactivated Fuel for ELWR
Uranium enrichment	DPRK – denied US – 2002 accusation	Centrifuge facility Covert facilities ?
Nuclear export	UF6 to Libya Reactor to Syria	Cooperation with Iran?
Political	Kim Jong-il No mention of nukes	Kim Jong-un New constitution declares DPRK nuclear state

10-year comparison of DPRK nuclear program

Nuclear Capability	January 2003	January 2014
Plutonium	0 to 10 kg	24 to 42 kg
HEU (Highly enriched U)	Likely zero	Possibly 100 kg
Nuclear tests	Zero	3
Nuclear weapons	Likely zero Pu Zero HEU	4 to 8 Pu Possibly 4 HEU
Long-range rockets	One failed Taepodong-1 launch (1998)	Successful Unha-3 launch (Dec. 2012)

26 SEP 2010

Overhead imagery

Source: DigitalGlobe

4 NOV 2010

Source: DigitalGlobe

28 MAY 2011

Source: GeoEye

4 NOV 2011

Source: DigitalGlobe, 38 North

26 JAN 2012

Source: DigitalGlobe

20 MAR 2012

Source: DigitalGlobe

24 JUN 2012

Source: GeoEye

6 AUG 2012

Source: GeoEye

DigitalGlobe - 38 North
March 27, 2013

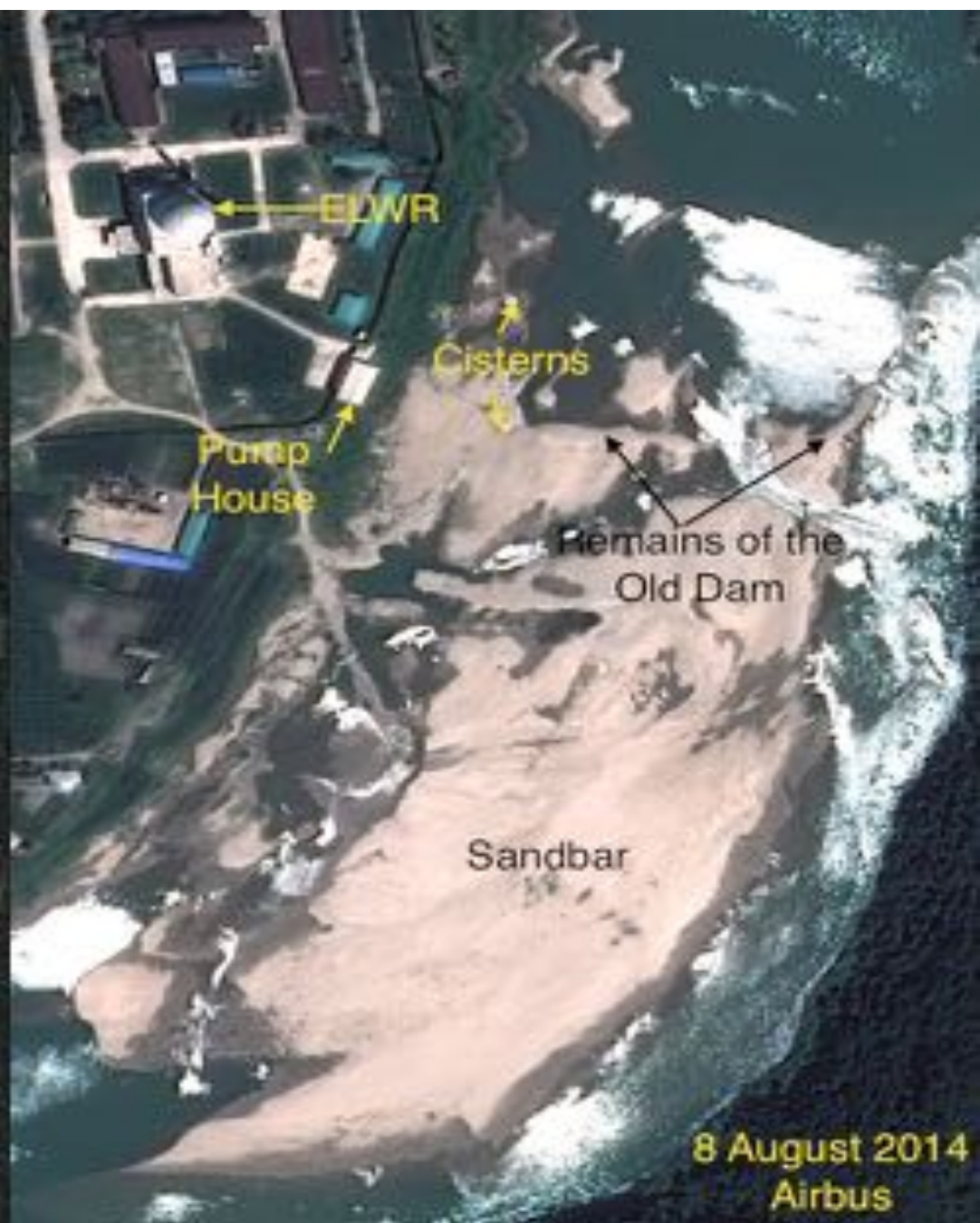
Yongbyon Fuel Fabrication Plant, North Korea



Source: DigitalGlobe; A.Puccioni, IHS Jane'



South tunnel is prepared for another nuclear test.
More activity around the West tunnel.





Steam

**Expanded
Centrifuge
Roof**

Image Credit: Digital Globe - ISIS
Image Date: December 2, 2013

13 September 2014 DigitalGlobe

Note: The Swing Arms Are All in the Retracted Position

Sohae rocket launch pad



Keeping up with North Korean developments

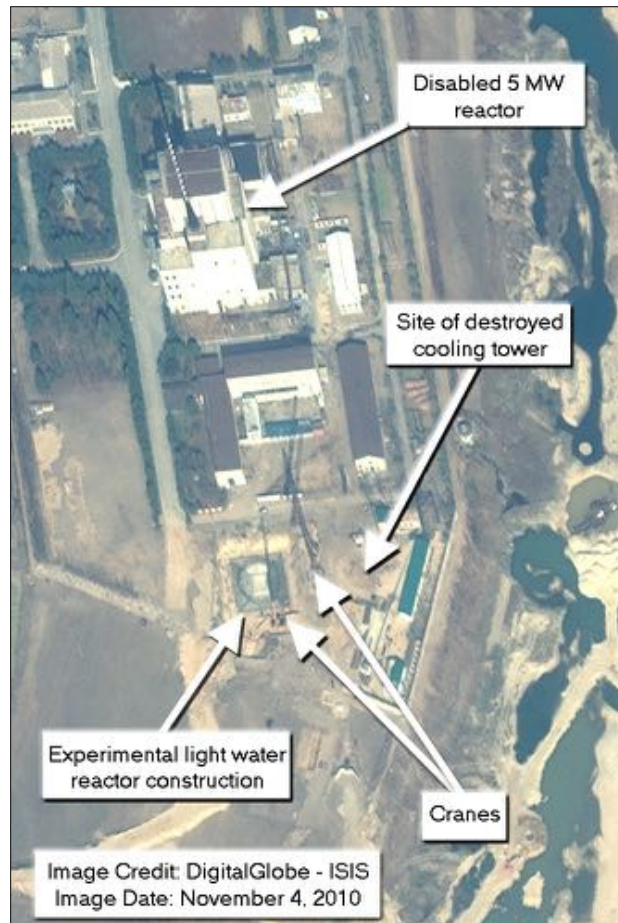
Access to Yongbyon until 2010



November 2010 visit to Yongbyon presented us with a new reality

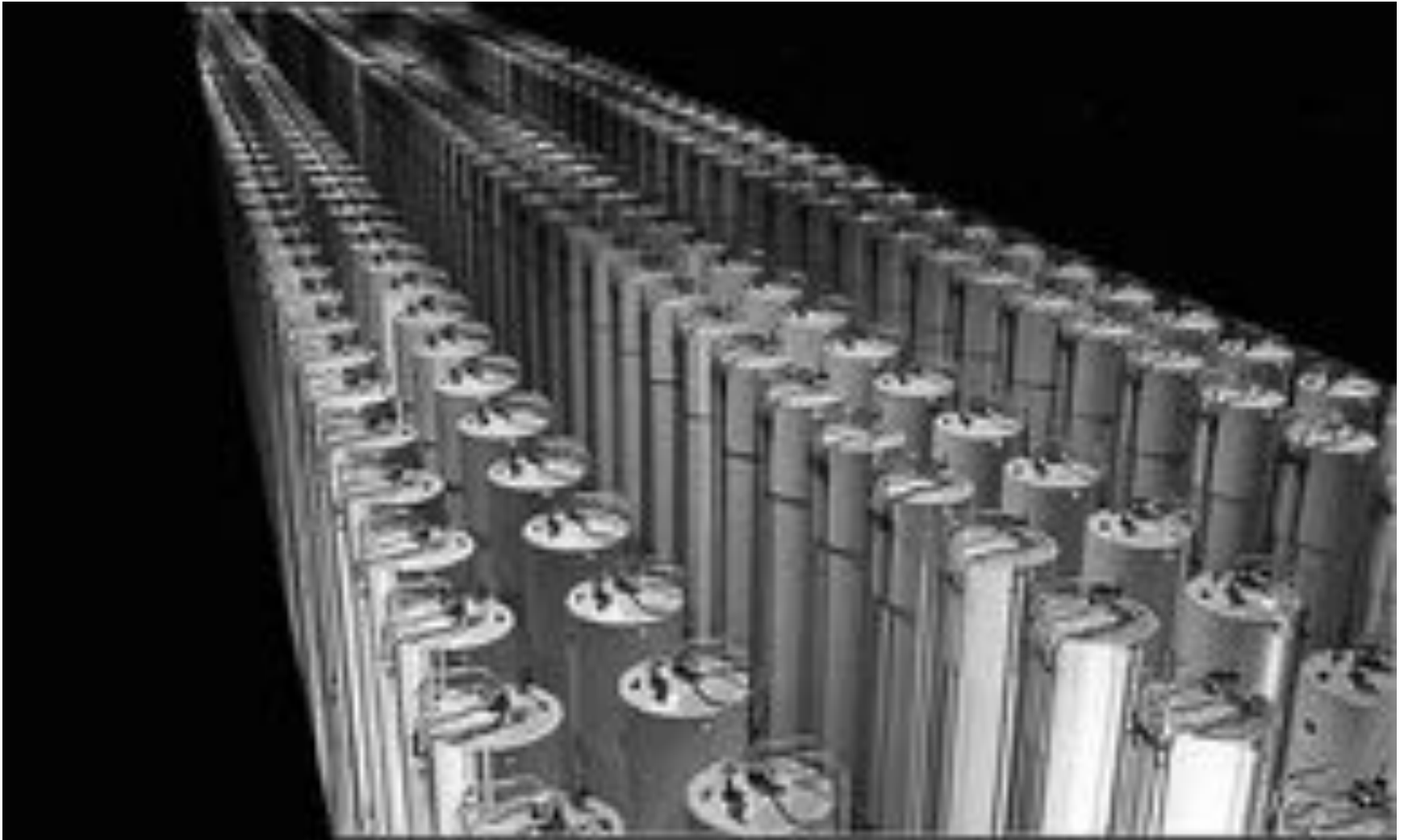
“We will convert our center to an LWR and pilot enrichment facility.”

DPRK Official, Nov. 2010



No foreigners have been at Yongbyon since Nov. 2010

Purely illustrative - this is not Yongbyon, but close to what we saw (Nov. 12, 2010).



Piketon, Ohio Centrifuge plant, 1984 (Department of Energy)

Several additional centrifuge lines were removed graphically to try to get this as close as possible to the centrifuge cascades we saw in Bldg. 4 at Yongbyon

Potential DPRK nuclear program by 2016

Nuclear Capability	January 2003	December 2016 (Estimates)
Plutonium	0 to 10 kg	34 to 52 kg
HEU (Highly enriched U)	Likely zero	Possibly 500 kg
Nuclear tests	Zero	Possibly 4
Nuclear weapons	Likely zero Pu Zero HEU	6 to 10 Pu Possibly 12 HEU
Long-range rockets	One failed Taepodong-1 launch (1998)	Musudan or KN-08 tests

Recent activities

Nuclear Capability	January 2014	Current activities
Plutonium	24 to 42 kg	No additional Pu now, but in 3 years, 6 kg per year possible
HEU (Highly enriched U)	Possibly 100 kg	No information
Nuclear tests	3	Lots of activity at test site
Nuclear weapons	4 to 8 Pu Possibly 4 HEU	No information
Long-range rockets	Successful Unha-3 launch (Dec. 2012)	Lots of activity at launch site. Many shorter-range launches.

Recent activities

Nuclear Capability	January 2014	Current activities
Nuclear reactors	5 MWe restarted ELWR under construction	Apparent cooling issues Exterior appears ready
Fuel fabrication	Reactivated Fuel for ELWR	Lots of activity at FFP Other potential site
Uranium enrichment	Centrifuge facility Covert facilities ?	Doubled centrifuge roof Speculation of covert
Nuclear export	Cooperation with Iran?	Iran cooperation more difficult for now
Political	Kim Jong-un New constitution declares DPRK nuclear state	Threats off and on

So, what to do now?

- Deal with DPRK as it is, not the way we'd like it to be
- Stay the course on denuclearization, but limit threat
 - Long term defined by Sept. 19, 2005 Joint Statement
- For now - three no's and three yes's
 - No more bombs (no Pu or HEU)
 - No better bombs (no nuclear or missile tests)
 - No export
- Yes - address fundamentals of North Korea's insecurity to create conditions favorable to disarmament.
And, provide energy and economic assistance

For now – halt, then roll back.