Potential applicability of Russia Cooperative Threat Reduction in North Korea

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The Threat

Nunn and Lugar "…helped Russia and other former Soviet republics cope with an inheritance from hell."
David E. Hoffman – *The Dead Hand*

- **Loose nukes**
- **Loose nuclear materials**
- **Loose nuclear people**
- **Loose nuclear exports**

Threat: Nukes out of the hands of Soviet government

Nuclear threat from North Korea

Threat: Nukes in the hands of North Korean government

- Misunderstanding, miscalculation, mistake
- Act of last resort facing perceived existential threat
- Regime change – external, internal, health
- Adventuresome military

- Export of nuclear technologies in desperation

End goal must be the elimination of nuclear weapons and program.
Halt, roll back and eliminate.

U.S. view of 1992 threat from Soviet breakup

- Loose nukes
  - Tens of thousands nuclear weapons
- Loose nuclear materials
  - ~ 1,400,000 kg fissile materials
- Loose nuclear people
  - Several hundred thousand in nuke complex
- Loose nuclear exports
  - Huge complex, with economy in chaos

The making of a perfect nuclear storm

Russia – North Korea comparison

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  - Libya (end 2003), Syria (end 2007)

DPRK estimated current nuclear capabilities (S.S. Hecker)

Nuclear Capability	December 2020 (Rough estimates)
Plutonium	25 – 48 kg
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Nuclear devices (sufficient material)	~45 (20 to 60)* (Very few hydrogen bombs)
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* Numbers based on amount of bomb fuel available – may not all be weaponized

Looking from the inside

Oct. 11, 2021 Defense Expo
KN-23 and Hwasong 8, 12,15,16

From the Soviet Union to four states with nuclear weapons

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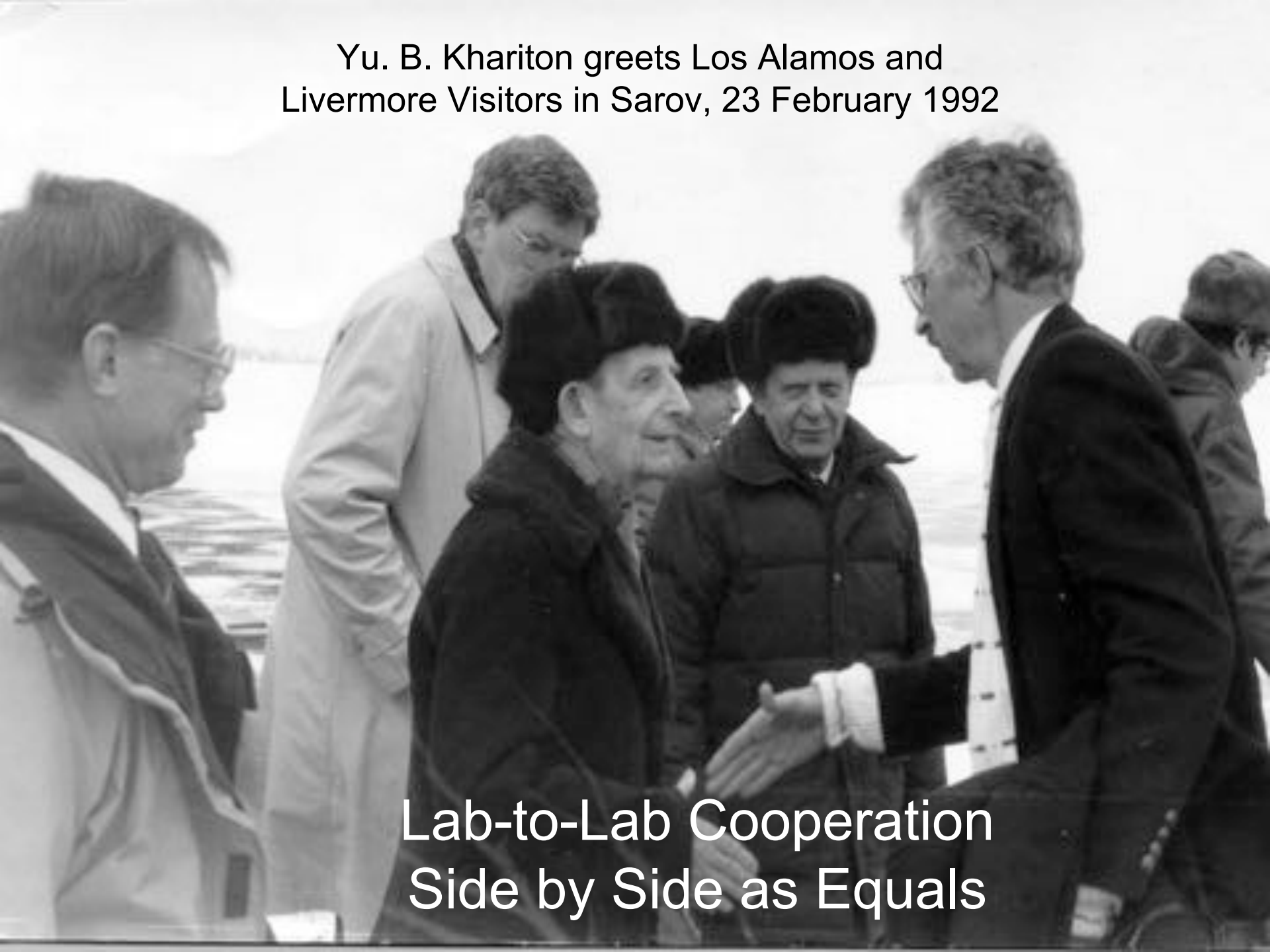
Yu. B. Khariton greets Los Alamos and Livermore Visitors in Sarov, 23 February 1992



Lab-to-Lab Cooperation
Side by Side as Equals

Was it worth it?

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Comparison of Soviet/Russia to DPRK

- Threat
- Size
  - Nuclear weapons
  - Delivery systems – missiles and airplanes
  - Facilities
  - People
- Sophistication
  - Scientific and technical community
- Connectivity
  - With external scientific and military community

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  - Scientific community
  - Nobel laureate scientists vs. competent engineers
  - Nuclear tests – 715 vs. 6

- Connectivity
  - Limited connection to outside scientific and technical world
  - No contact between strategic rocket force militaries

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Lessons from Soviet/Russia CTR

- Requires bold political initiative – new thinking
- Needs strong, sustained U.S. political support
- Keep the focus on" CTR" – Cooperative, Threat and Reduction
  - Must be designed and implemented together (cooperative)
- Involvement of technical professionals, role of Track II
- Nuclear worker reorientation – important, but difficult
- Focus on bilateral programs, but welcome international participation

Thoughts about a bold DPRK initiative

- Cooperative military to civilian conversion

- Elimination of North Korea's chemical weapons as a confidence-building step for nuclear disarmament

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Nunn-Lugar Cooperative Threat Reduction

U.S. view of 1992 clear and present danger in Russia

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Threat changed from nukes in hands of Soviet government to nuclear assets getting out of the hands of government

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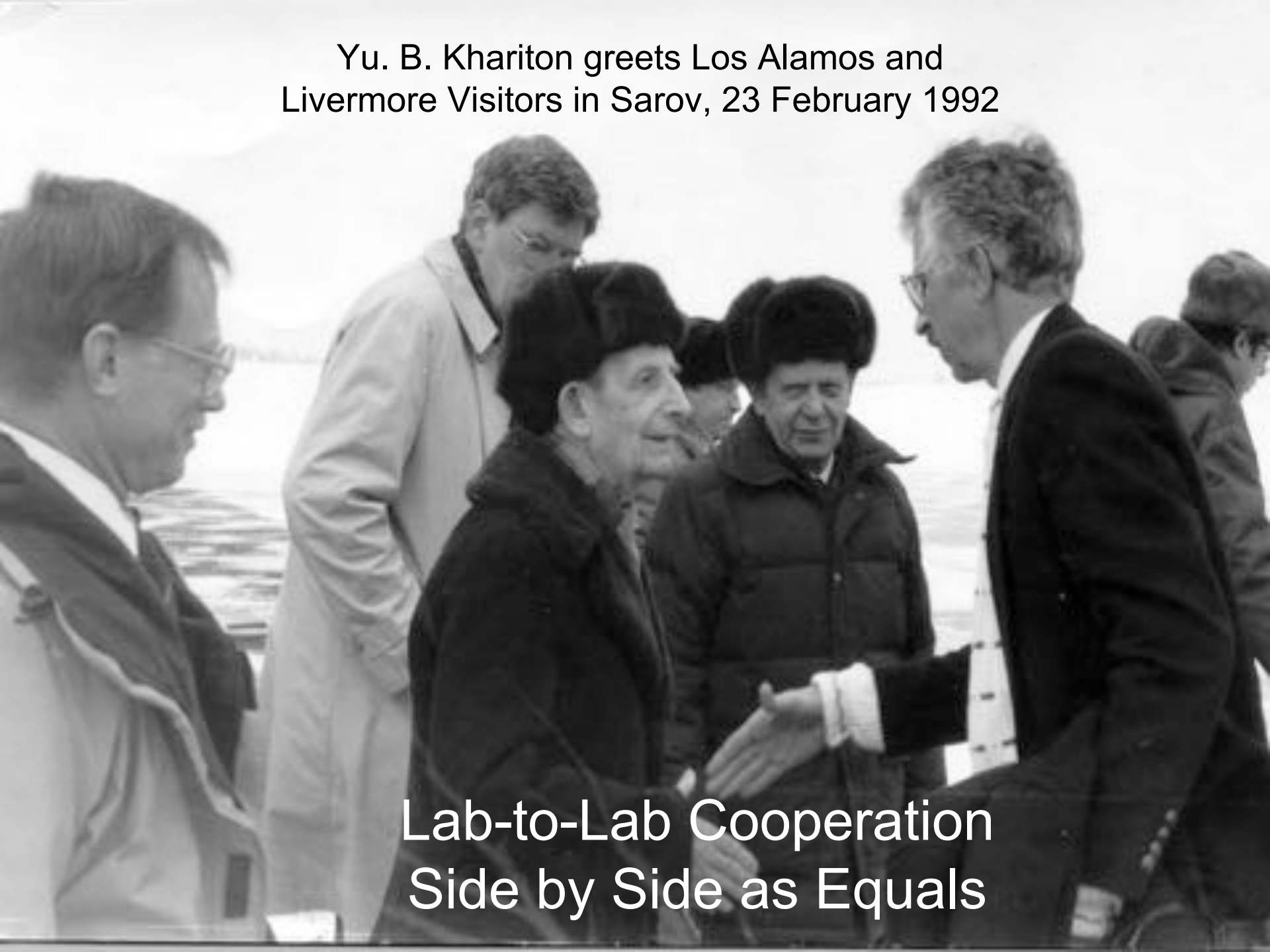


Lab-to-Lab Cooperation
Side by Side as Equals

Lab-to-lab drivers

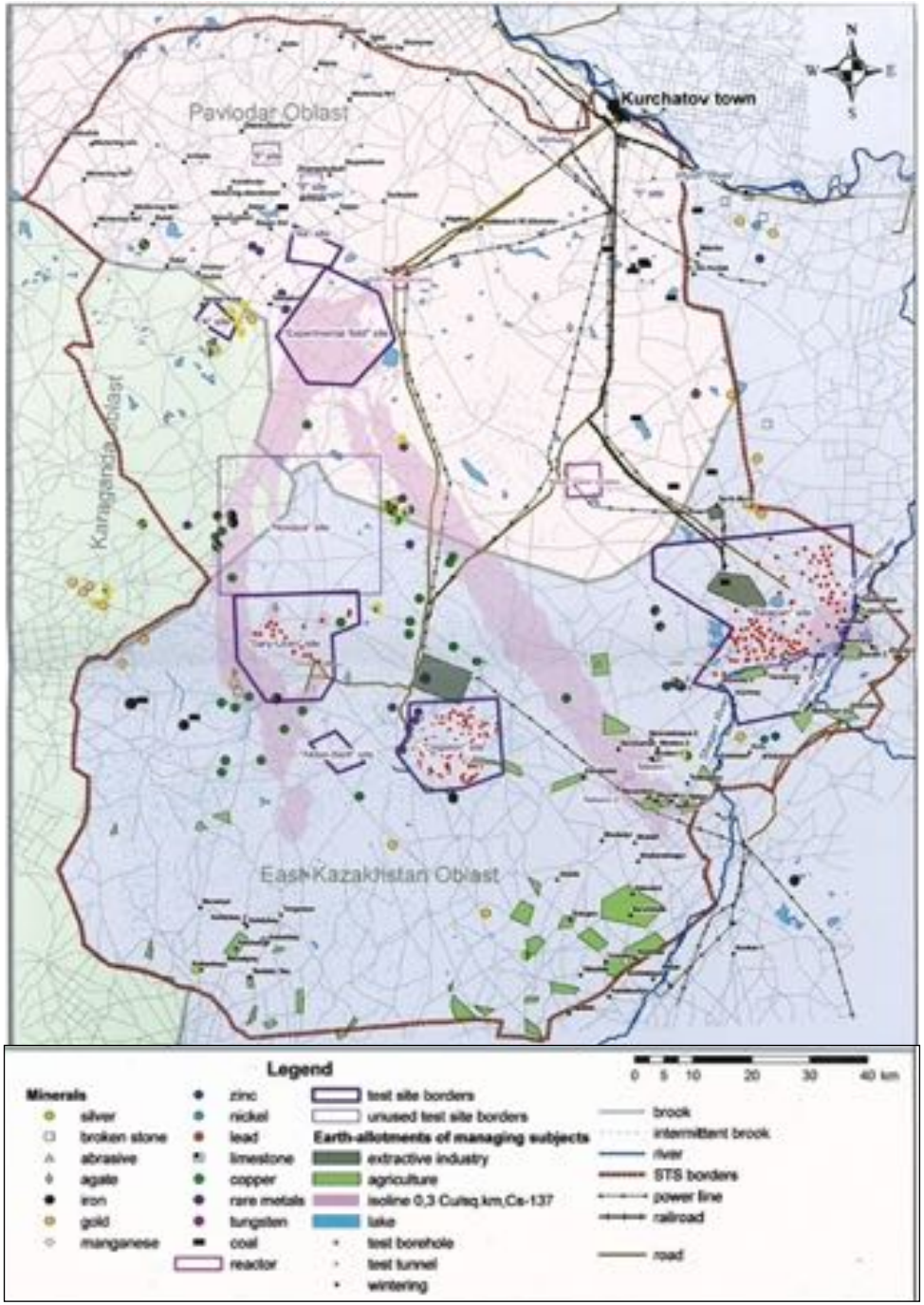
United States

- Loose nukes
- Loose materials
- Loose people
- Loose exports
- Curiosity

Russia

- End isolation
- Pay their people
- Mitigate nuclear dangers
  - Weapon safety & storage
- Hope
- Global responsibility

To discover, to create, to build something new together



Semipalatinsk Nuclear Test Site

- Total tests (1949-1989)
  - 456 nuclear tests (616 nuclear explosions)
  - 340 underground
  - 116 atmospheric tests
  - 175 non-nuclear chemical explosions
- Underground nuclear testing: 1961-1989
- High altitude and near surface testing: Experimental Field (Opytnoye Pole)
- Tests in tunnels: Degelen Mountain
- Tests in boreholes: Balapan and Sary-Uzen
- Commercial explosions: Telkem
- Incomplete chain reaction tests: Aktan-Berli

Semipalatinsk Test Site – April 19 - 20, 1998

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What are North Korea's capabilities?

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Let's look at the details

Governs size of arsenal	Governs sophistication of arsenal	Governs threat arsenal poses
Bomb-grade Pu or HEU →	**Weaponization** →	**Delivery system**

- Most difficult part
- Reactors **(Pu)** or enrichment **(HEU)**

Hydrogen bombs
- **Tritium**
- **Deuterium**
- **Li-6D**

- Physics, computers
- High explosives
- Detonators
- Initiators
- Machining
- Assembly
- Explosives tests
- Arming, fuzing, firing
- Nuclear testing

- Plane
- Boat
- Van
- Missile

Yongbyon Nuclear Research Center

One of the most watched places on Earth


26 SEP 2010
Commercial 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


12 DEC 2013
Source: DigitalGlobe/ Google Earth

Looking from the inside

Nuclear tests critical to sophistication

- Oct. 9, 2006: Close to1 kiloton
  - Likely Pu
- May 25, 2009: ~ 2 to 7 kilotons
  - Likely Pu
- Feb. 12, 2013: ~ 7 to 14 kilotons
  - Either Pu or HEU
- Jan. 6, 2016 – deeper than others, ~ 7 to 14 kilotons
  - Claim of H bomb not likely. Possible proof of principle H-bomb?
- Sept. 9, 2016 – ~ 15 to 25 kilotons
  - Likely made progress in miniaturization
- Sept. 3, 2017 > 100 kilotons, possibly 250 kilotons
  - Two-stage thermonuclear possible

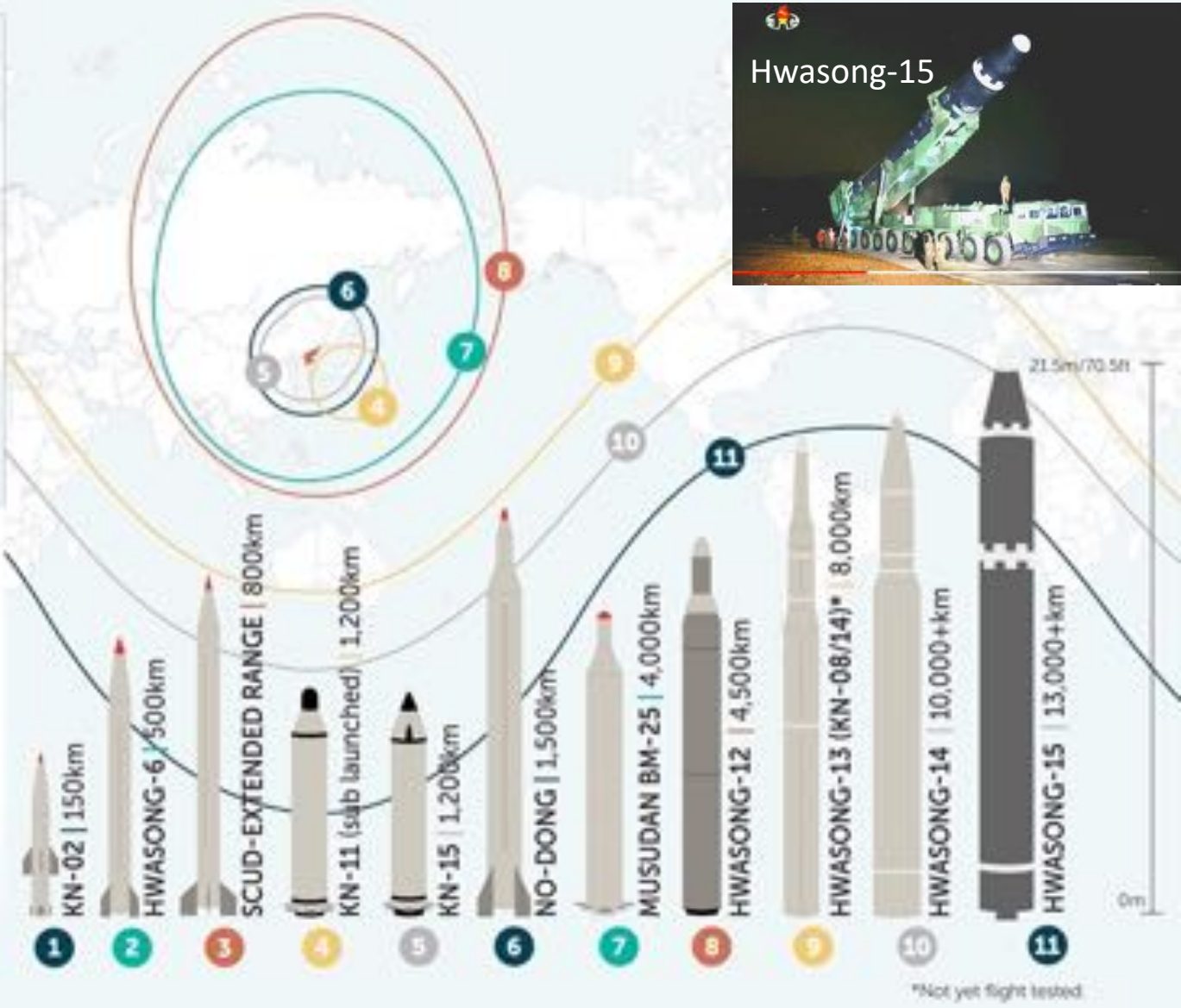
KCNA claim of hydrogen bomb a few hours before test

September 3, 2017 nuclear test

NORTH KOREA'S BALLISTIC MISSILES

North Korea's ballistic missile program is one of the most rapidly developing threats to global security. In recent years, an unprecedented pace of missile testing has included new and longer range missiles, sea-launches, and the orbiting of satellites. The most notable of these advances has been North Korea's development of two new intercontinental ballistic missiles, the Hwasong-14 and -15, which can likely reach the continental United States.

CSIS | CENTER FOR STRATEGIC & INTERNATIONAL STUDIES | MISSILE DEFENSE PROJECT



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The North Korea Challenge for U.S. Presidents

Don't build the bomb
Succeeded – but NK built a hedge

Don't build the bomb
Failed. ~ 6 nukes by end of term.
No successful missile tests

Don't build a nuclear arsenal.
Denuclearize
Failed. ~ 20 – 25 bombs by end of term
Successful missile tests

Prevent use of nuclear weapon
Denuclearize – max pressure
Summit diplomacy and letters
Failed. ~45 bombs by end of term

Dealing with the Covid-19 pandemic

JUNG YEON-JE/AFP VIA GETTY IMAGES


Daily Star

The National Interest, Sept. 20, 2021

North Korea Continues to Claim Zero Cases of COVID-19

Nearly total lock-down has protected citizenry but caused economic hardship