Nuclear Security and Safety Challenges:
The Challenge of Non-State Actors

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CATALYTIC NUCLEAR ATTACK

Metaphor: *catalyst increases rate of chemical reaction without catalyst Being destroyed; tiny amounts often suffice*

In 1950s, concern about n-country, that small nuclear weapons states ("China" could start nuclear war between US and FSU on theory that a catalytic state would be least damaged at end, and could increase its relative power by starting a war between other nuclear armed states.

Classic essay: Kobe derived suspicion, retaliation, destruction, catalytic war utility, and casualty matrices for each country that defined outcomes for each state in a "catalytic nuclear war"

However, the ability of US and FSU to overwhelmingly retaliate and damage the catalytic state soon allayed this concern, but it motivated superpowers to strive for nuclear non-proliferation

Main concern was state-sponsored nuclear terrorism

Donald Kobe, "A Theory of Catalytic War," *The Journal of Conflict Resolution, 6:2, June 1962, pp. 125-142, at:* http://www.jstor.org/stable/172987
J. Digby et al, *How Nuclear War Might Start, Scenarios from the 21st Century*, RAND Note N-2614-NA, Santa Monica, October 1988, at: https://www.rand.org/content/dam/rand/pubs/notes/2009/N2614.pdf

ARGUMENT: CATALYTIC NUCLEAR TERRORISM IS A SERIOUS POLICY CONCERN?

THREE NESTED ARGUMENTS:

1. **Inadvertent nuclear war is possible, probability > 0**
2. **Nuclear terrorism: valid: one or more of three threshold events are conceivable, and probability >0**
3. **Threshold nuclear terrorism can trigger inadvertent nuclear war**

Least Damage

- **Credible Threats**
- **Hostage Taking**
- **Steal, Smuggle, Acquire Footloose Fissile Material**
- **Dirty Bomb**
- **Attack Reactors**
- **Attack Spent Fuel**
- **Simultaneous Cyber Attacks Disable Critical Infrastructure**
- **Acquire Nuclear Weapon; Detonate Nuclear Weapon**

Most Damage

COMPLEXITY 21ST CENTURY STATE-BASED NUCLEAR THREAT SYSTEM

Tier 1: United States

Tier 2: Russia, China

Global triangle

Tier 3: UK, France, NATO allies + nuclear umbrella allies

Tier 4: India, Pakistan, Israel, DPRK

no shared rules of the road, more unpredictable and unstable (truel effect)

Tier 5: Non-State Nuclear Actors

Interstate Nuclear War Linkage with Nuclear Terrorism

But these two nuclear worlds—a non-state actor nuclear attack and a catastrophic interstate nuclear exchange—are not necessarily separable. It is just possible that some sort of terrorist attack, and especially an act of nuclear terrorism, could precipitate a chain of events leading to a massive exchange of nuclear weapons between two or more of the states that possess them.

Robert Ayson, "After a Terrorist Nuclear Attack: Envisaging Catalytic Effects," *Studies in conflict and terrorism,* 33:7, 2010, p. 584, at: http://www.tandfonline.com/doi/abs/10.1080/1057610X.2010.483756

How might this link happen?

NUCLEAR TERRORISM POST-COLD WAR: TRIGGER FOR INADVERTENT NUCLEAR WAR?

Multiple Pathways

- **EW failure** "trips" launch-on-warning
- **Accidental detonation**
- **Strategic miscalculation** in crisis, show of force
- **Decision making failure** (irrational, misperception, bias, degraded, group, compressed decision making)
- **Allied or enemy choices** (revenge, exploit nuclear risk, desperation)
- **Organizational cybernetics**, NC3 system itself, including meta-NC3 system
- **Synchronous and coincident combinations** of above

H. Wiberg, I.D. Peterson, P. Smoker, *ed, Inadvertent Nuclear War: The Implications of the Changing Global Order*, Pergamon, 1993

6. Current NC3 Stresses:

- Russia
- China
- SSBNs
- North Korea
- False alarms-social media triggering of EW systems
- Non-State Catalytic attack
- Disruptive AI, Q-Tech, Autonomous Vehicles

Emerging Interaction 2: North Korea NC3I

- In April 2012, North Korea reportedly upgraded its Missile Guidance Bureau to become a Strategic Rocket Force, apparently separate from the KPA's Army, Navy and Air Force. Its Commander, Lt. Gen. Kim Rak Gyom was elected to the Korean Worker's Party Central Military Committee, underscoring the commitment to developing a deliverable strategic nuclear weapon
- For such a centralized and personalized command structure as North Korea, this question of control is critically important. KJU is in command.
- Moreover, the peculiarly North Korean pyramid of power presents the possibility of instant propagation of error and possible inadvertent escalation for a military command structure prone to constant probing by and interaction with devolved US and ROK military forces at the "hard edges" of the DMZ and the Northern Limit Line.
- Cybernetic errors may creep into the DPRK nuclear command and control system
- Kim's nuclear command-and-control system may be susceptible to the Byzantine (traitorous) General subversion problem should war come at a time of disorder and near collapse in the DPRK itself.
- DPRK NC3I simple but very tightly coupled with DPRK conventional and nuclear forces
- Preplanned STRATCOM target sets likely obsolete by time war breaks out. Improvised targeting combined with delayed delivery time by strategic bombers generates real risk of useless nuclear attack.
- DPRK communications are fiber optic underground, and opaque to SIGINT, making EW difficult
- US-ROK inclination is to strike early and possibly first in revised OPLAN 2015, but attacking CPs and leadership, not just weapons and missiles, may lead to DPRK nuclear first-use.
- North Korean strategic retreat may lead to KJU-KPA taking Pyongyang hostage with nuclear weapons.
- What then?
- Coincident risks? Taiwan Sts crisis? Terrorist attack? ROK irrational move?

Emerging Interaction 3: Nuclear Terrorism as Trigger Event: Key Questions Non-State Actor NC3I

- Would nuclear-armed non-state actor eg terrorist group, have centralized single commander or adopt decentralized and delegative contingent authority? How do non-statea NC3I systems differ from state-based NC3I systems?
- Would decapitation attack on network leader prompt non-state actor nuclear use?
- What precedents exist eg Aum Shinrikyo, Al Qaeda, what formal, informal, or tacit rules and behaviors of non-state actor C3I
- Mumbai attack is archetype for self-organizing attack with centralized C2 with prior reconn, real-time situational awareness via social media, trans-border
- Does time compression of decision-making drive delegation for non-state actors as with states?
- Would non-state actors mimic launch-under-attack or launch-under-warning of attack state policies?
- What geographic depth, ability to preposition nuclear weapons, and other factors affect non-state actors propensity and ability to use nuclear weapons, and related NC3I systems?
- How does organizational structure (eg star, daisy-chain, all-channel network) affect possible nuclear threat-attack strategies?
- How do motivational goals, eg political-ideological orientation and aspiration to proto-statehood versus religious-apocalyptic orientation, affect resources, partnerships, stamina, operational procedures and strategies, targeting for nuclear threat or attack?
- How would non-state actor implement transnational C3I demands; use of non-state NCI leads to sigint, targeting, strikes, even if use encrypted communications? (including non-state cyber-attacks eg Anonymous against Islamic State
- How would non-state acquisition, threat, or use of nuclear weapons interact with n-state NC3I systems in various combinations and scenarios?

Sources:

Daniel Byman, "Why ISIS might regret the decision to go global," Brookings blog, November 16, 2015

David Killcullen *Out of the Mountains: The Coming Age of the Urban Guerrilla*. New York: Oxford University Press. 2013

C. Blair, Non-State Actor Nuclear Command and Control, FAS Public Interest Report, Fall 2010 at: http://fas.org/programs/tap/_docs/Non-State%20Actor%20Nuclear%20Command%20and%20Control.pdf

Robert Ayson, "After a Terrorist Nuclear Attack: Envisaging Catalytic Effects," *Studies in Conflict and Terrorism*, 33, 2010, pp. 571-593.

NUCLEAR TERRORIST STRATEGIC MOTIVATION

Opportunist:

- Tactical
- Short-term
- Bargaining
- Nuclear Terror for Status and Leverage

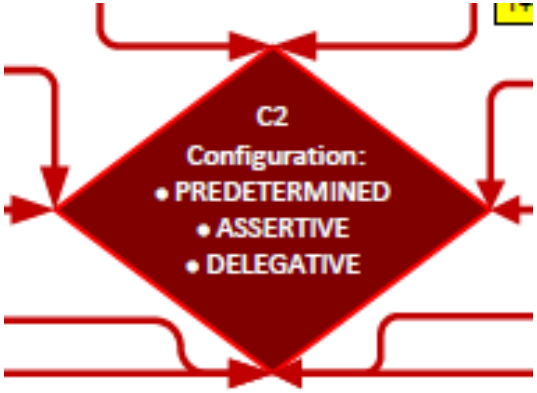
Pre-Determined NC3 (use or lose)

Patient:

- Strategic
- Nuclear Terror to Evoke Response
- Deal Body Blow
- Genocidal
- Apocalyptic

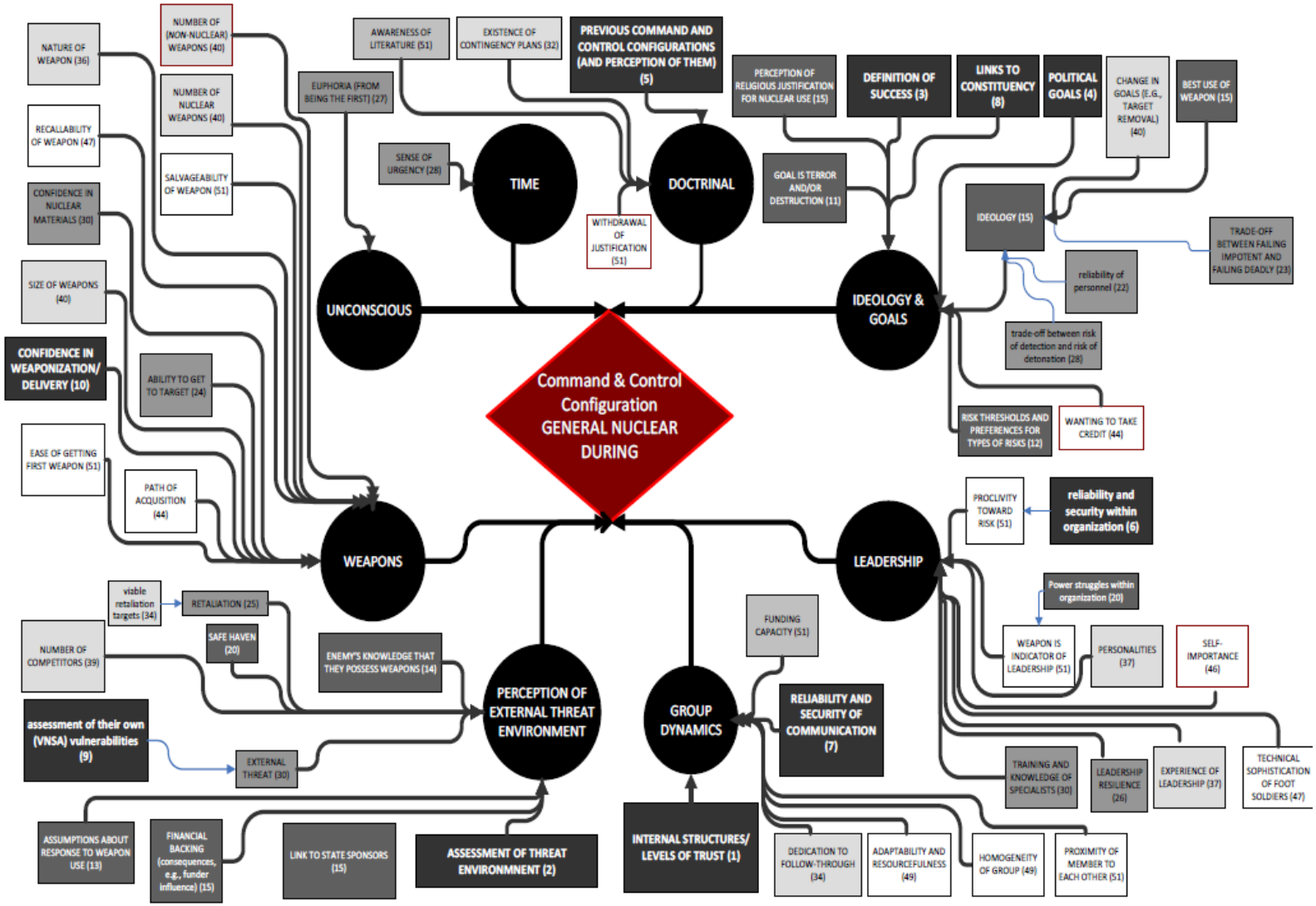
Assertive NC3 (leader controls)

Non-State Terrorist NC3 Options



S. Ellingsen, "Deliberations of a Nuclear Terrorist: Patience of Opportunism?" *Defense & Security Analysis*, 26:4, pp. 353-369 at: http://dx.doi.org/10.1080/14751798.2010.534545

Factors Affecting Terrorist Nuclear Command-and-Control



C. Blair, Two Open Source Nuclear Terrorism Projects," IGCC Nuclear Security D.C. Policy Series, December 15, 2011, at: http://fas.org/wp-content/uploads/2011/12/Blair_FAS_IGCC_Presentation_Dec_2012.pdf

STATE NUCLEAR COMMAND, CONTROL AND COMMUNICATIONS NC3
Procedural and Technical Measures to Control Nuclear Weapons Positively (ensure authorized use) Negatively (ensure never used without authority)

Controls

Procedural Measures

Technical Measures

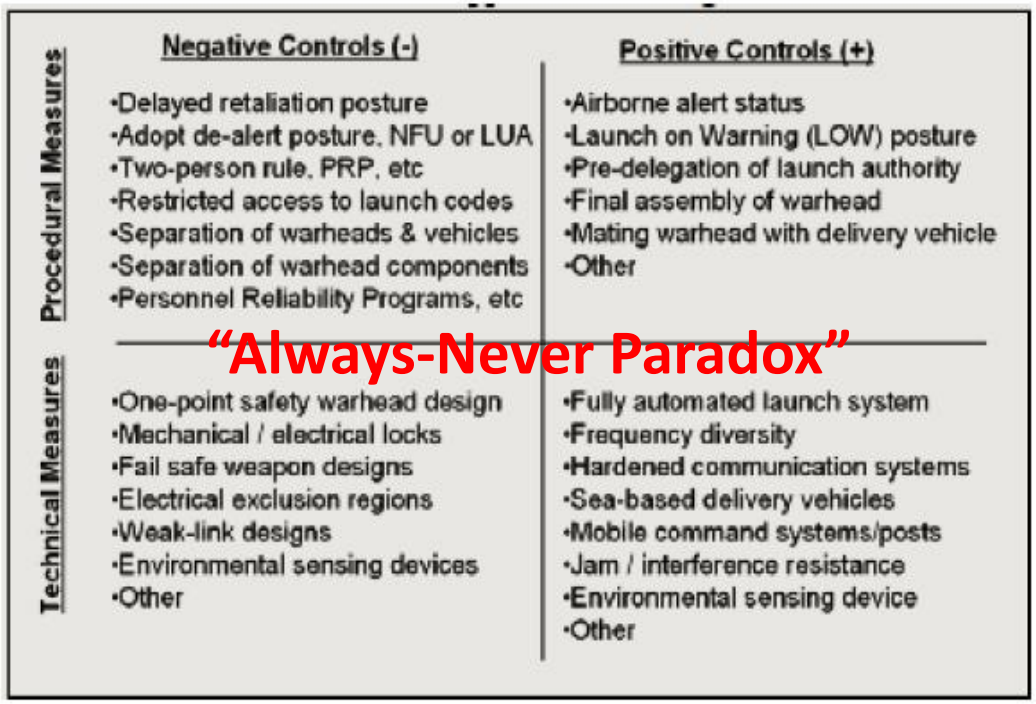


Figure 1. Example Technical and Procedural Negative and Positive Controls

J. Conley, "Nuclear Command and Control in the Twenty-first Century: Trends, Disparities, and the Impact on Stability," in O. Price, J. Mackby, *Debating 21st Century Nuclear Issues*, CSIS, 2007, pp. 226-250, at: https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/media/csis/pubs/07-09-14_priceponi.pdf
Virginia Tech Applied Research Corporation, Nuclear Command, Control, and Stability Framework, December 29, 2016, https://calhoun.nps.edu/bitstream/handle/10945/48707/Nuclear%20Command%20Control%20and%20Stability%20Assessment_Final%20report_29Dec15%20rev2.pdf?sequence=1&isAllowed=y

RISK OF NUCLEAR TERRORISM
Northeast Asia Regional Experience

- Low-level individual terroristic violence with nuclear materials, against nuclear facilities, is real
- Nuclear material diversion risk is real
- Insider "sleeper" threat is real
- Insider corruption is real
- Extortion threat over insider is real
- Cult threat and attempt to build, buy nuclear weapons is real
- Cyber-terrorism against nuclear reactors is real (although ambiguous as to attribution)
- Stand-off ballistic and drone threat is real
- Non-state actors adopt new technology very fast, eg drones
- Risk of loss of control of nuclear weapons only in North Korea, China, Russia, and on US deployed submarines. None in South Korea or Japan to worry about.
- Extreme ethno-and xenophobic nationalism emerging in China, Korea, Japan

STUDY COMPLEX ENGINEERING PROJECTS BY FIVE VIOLENT NON-STATE ACTORS CONDITIONS FOR SUCCESS

- **Substantial resources**
- **Safe Haven**
- **Technical Expertise, Own, Procured**
- **Culture of Learning from Failure**

Requires strategic commitment due to goal or change in environment, not tactical Long-term planning, rational choice (up to 10 years)

Table 1: Summary of Case Study Features

	PIRA	Aum Shinrikyo	FARC	Zetas	HAMAS	*AQ Khan Network*[2]
Complex Engineering Effort	Sophisticated mortar systems	Chemical weapons; Nuclear Weapons	"Narco-subs"	Encrypted countrywide radio network	Operational tunnel network into Israel	*Illicit transfer of nuclear equipment and designs*
Overall Outcome	Successful	Chemical: Limited success; Nuclear: Unsuccessful	Successful	Successful	Successful	*Successful*
Type of Organization	Terrorist	Terrorist / Cult	Terrorist / TCO	TCO	Terrorist	*Smuggling network*
General Motive	Ethnonationalist	Apocalyptic-Millenarian	Marxist; Financial gain	Financial gain	Ethnonationalist; Islamist	*Financial gain*
Regional Context	Western Europe	Asia	South America	North America	Middle East	*International*

Source: G. Ackerman, "Comparative Analysis of VNSA Complex Engineering Efforts," Journal of Strategic Security, 9:1, 2016, at: http://scholarshipcommons.usf.edu/jss/vol9/iss1/10

PAST IS NOT PROLOGUE

Past and Present Supply Non-State Terrorist Actors

- Politico-ideological
- Apocalyptic-millenarian
- Politico-Religious
- Nationalist-separatist
- Ecological
- Insurgency

- Criminal-military (profit based)
- Criminal-scientists (profit based)
- Pyscho-pathological mass killers
- Lone Wolf
- Copy Cats

Future Supply:

- Independent cities (theocratic, corporate, green)
- Non-states (Taiwan, micro-states, failed state, ungoverned territory, province in dissociating, failing state)
- Convergent global terrorist-criminal networks gatekeepers of flow through coastal megacities, supplanting highlands

NUCLEAR WEAPONS -CAPABLE NON-STATE TERRORIST ORGANIZATIONS

Practical constraints

- Expense, hard to steal, risk of discovery
- Hard to make
- Hard to conceal

Strategic constraints (CB ratio)

- Delegitimate NSA if genocidal
- Political-ideological objectives
- Lead to elimination, own
- Opportunity cost, easier alternatives
- Failure, discovery

Figure 2: A combination of factors influence a group's decision-making, and places most terrorist groups in the High Strategic Constraints/High Practical Constraints category

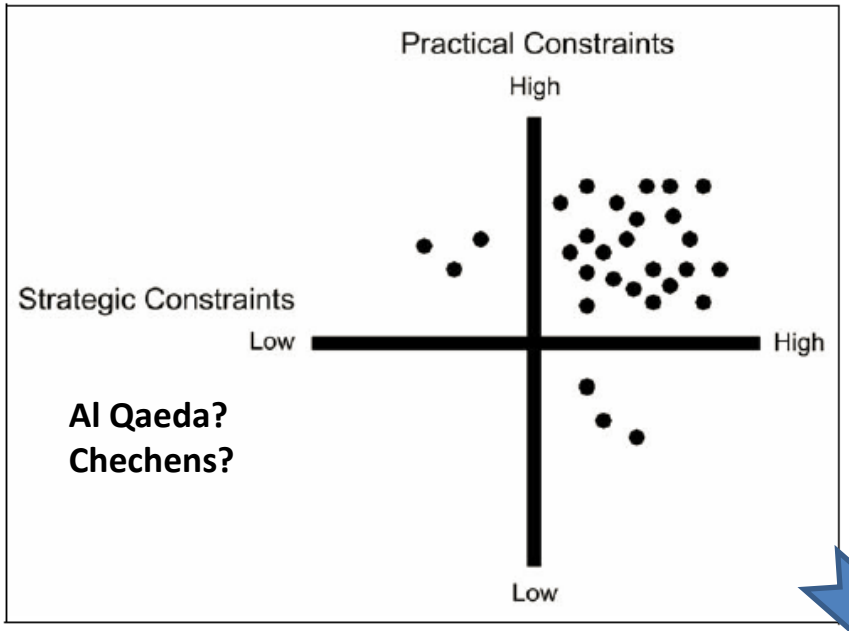
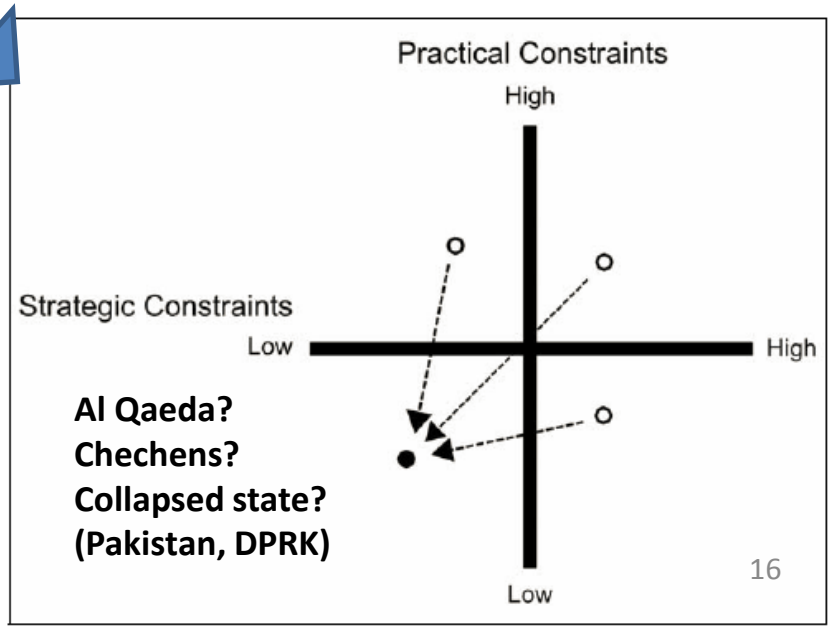


Figure 3: Hypothetically, diminished Practical and/or Strategic Constraints could lead to an increased WMD threat from a particular terrorist group



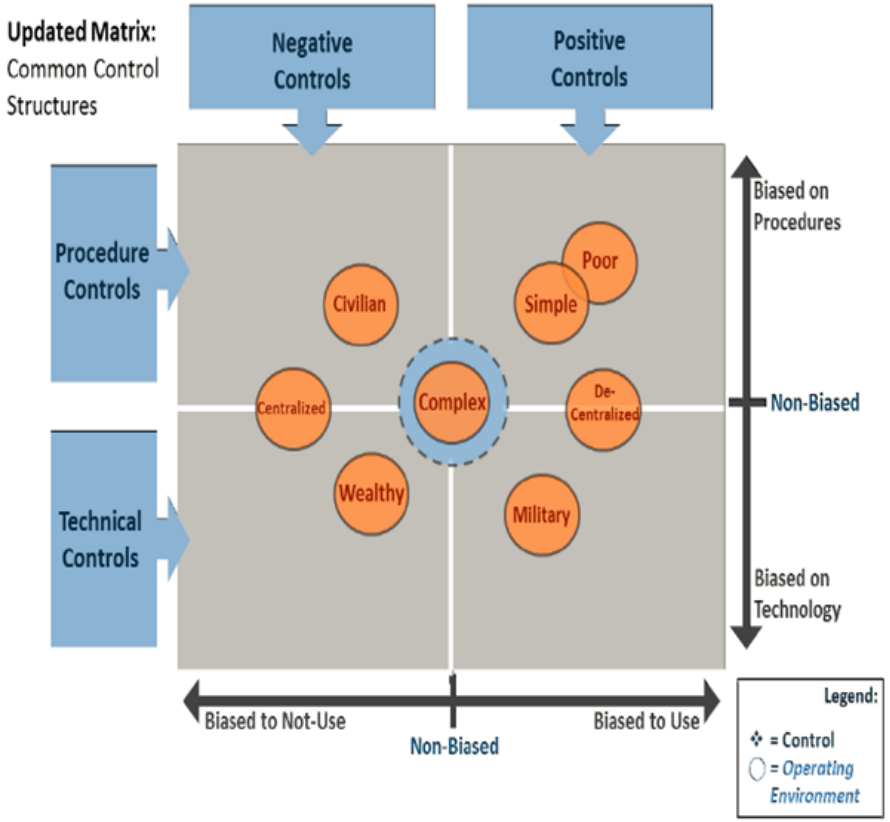
J. Forest, "Framework for Analyzing the Future Threat of WMD Terrorism," Journal of Strategic Security, 5:4, 2012, pp. 61-62, at: http://scholarcommons.usf.edu/jss/vol5/iss4/9

REGIONAL PATHWAYS TO NUCLEAR WAR

1. **US-DPRK conflict** (including with it, US allies in the region Japan, South Korea and Australia; and all sixteen [check] UNC command allies in Korea. Many permutations possible ranging from non-violent collapse to implosion and civil war, inter-Korean war, slow humanitarian crisis. Of these implosion-civil war likely most dangerous.
2. **China-Taiwan conflict,** whereby China may use nuclear weapons to overcome US forces operating in the West Pacific, either at sea, or based on US (Guam, Alaska) or US allied territory in the ROK, Japan, the Philippines, or Australia); or US uses nuclear weapons in response to Chinese attack on Taiwan.
3. **China-Japan conflict** escalates via attacks on early warning systems, eg SOSUS (Ayson-Ball, 2011).
4. **China-Russia conflict**, possibly in context of loss-of-control of Chinese nuclear forces in a regional conflict involving Taiwan or North Korea.
5. **Russia-US conflict,** involving horizontal escalation from a head-on collision with Russian nuclear forces in Europe or the Middle East; or somehow starts at sea (mostly likely seems ASW)
6. **Simultaneous conflict combinations across 1-5, or other** unanticipated nuclear-prone conflict axes erupt (such as Russia-Japan)

R. Ayson, D. Ball, "Can a Sino-Japanese War Be Controlled?" *Survival,* 56:6, December 2014/January 2015, pp. 135-166, at: http://www.tandfonline.com/doi/abs/10.1080/00396338.2014.985441?journalCode=tsur20&&

Figure Seven: **State nuclear weapons control biases by NC3 type**



Note: according to dominant characteristic shown in orange circle; also, real states may exhibit more than one characteristic

Source: Virginia Tech Applied Research Corporation, Nuclear Command, Control, and Stability Framework, December 29, 2016, at: https://calhoun.nps.edu/bitstream/handle/10945/48707/Nuclear%20Command%20Control%20and%20Stability%20Assessment_Final%20report_29Dec15%20rev2.pdf?sequence=1&isAllowed=y

THRESHOLD TERRORIST NUCLEAR ATTACKS

Three types terrorist nuclear attacks may affect nuclear weapons decisions of states due to scale, perpetrator ambiguity, precursor signal

1. **Credible threat of either nuclear detonation or radiological attack with possible massive damages**
2. **Actual or sub-critical nuclear detonation**
3. **Actual spent fuel or reactor attack with substantial radiological release**

VULNERABILITY TO TERRORISM OF NUCLEAR SPENT FUEL: THE SOUTH KOREAN CASE

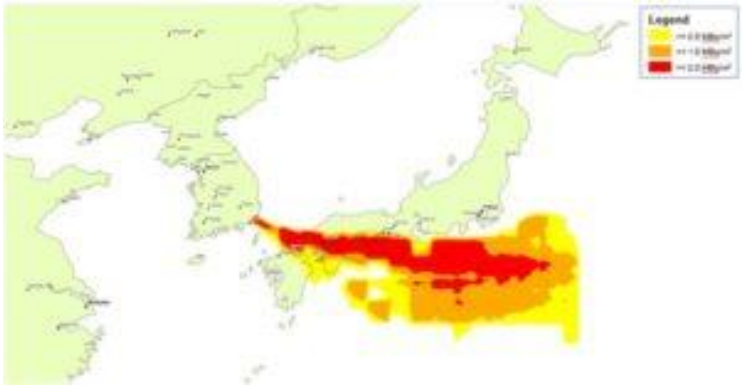


Figure 6. Contamination levels after the hypothetical fire of Kori-3 pool using weather data on Jan 1, 2015

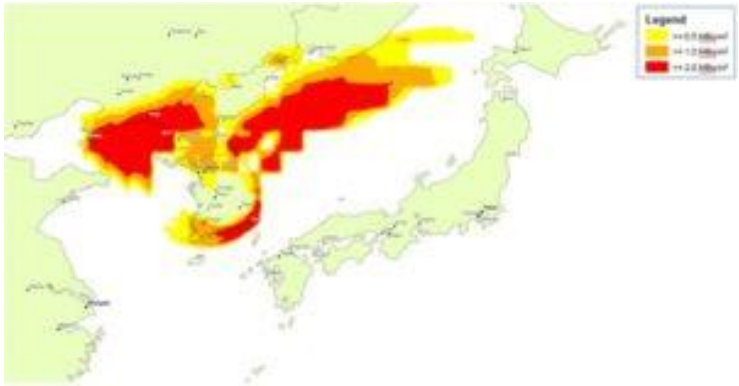


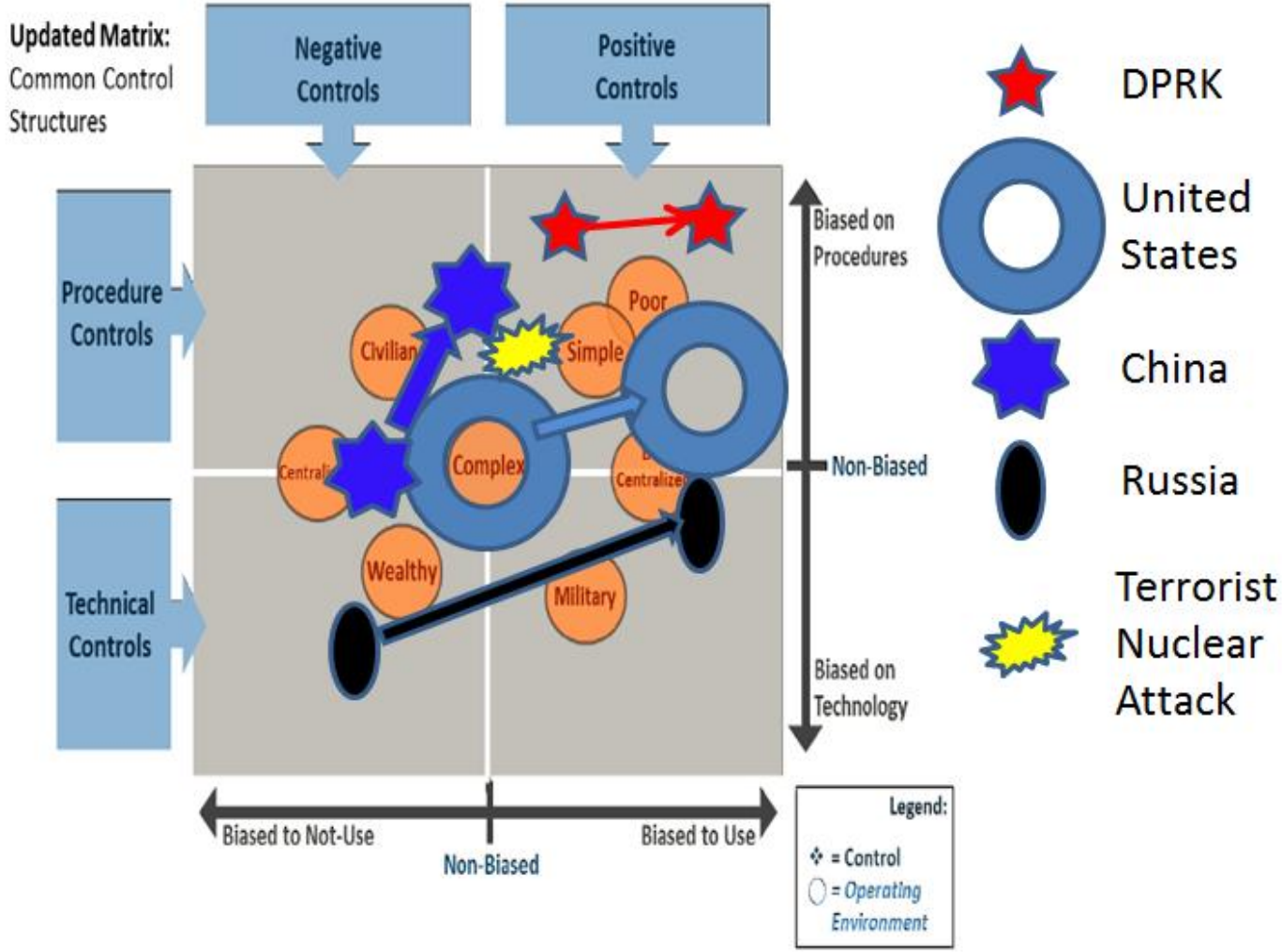
Figure 7. Contamination levels after the hypothetical fire of Kori-3 pool using weather data on Apr. 1, 2015

Country	Contaminated area (km^2)		Evacuated people	
	Average	Max	Average	Max
ROK				
Evacuated area	9,000	54,000	5,400,000	24,300,000
Evacuated area for more than 30 years	6,000	45,000	3,300,000	19,000,000
DPRK				
Evacuated area	5,000	64,000	1,100,000	13,400,000
Evacuated area for more than 30 years	2,000	30,000	620,000	7,400,000
Japan				
Evacuated area	27,000	67,000	7,900,000	28,300,000
Evacuated area for more than 30 years	14,000	40,000	4,300,000	18,400,000
China				
Evacuated area	2,000	28,000	700,000	8,700,000
Evacuated area for more than 30 years	1,000	9,000	400,000	4,900,000

Table 5. Summarized results of the Kori-3 SFPF accident

Jungmin Kang, "VULNERABILITY TO TERRORISM OF NUCLEAR SPENT FUEL: THE SOUTH KOREAN CASE", NAPSNet Special Reports, November 30, 2017, https://nautilus.org/napsnet/napsnet-special-reports/vulnerability-to-terrorism-of-nuclear-spent-fuel-the-south-korean-case/

Figure 8: **Impact of a Terrorist Nuclear Threat or Attack on Interstate Nuclear Use Control**



CREDIBLE THREAT OF ACTUAL OR SUB-CRITICAL NUCLEAR DETONATION 1

Event In: Nuclear Weapons States

- **Two possibilities for conflict linkage:**
  Insider sourced perpetrator, none if determined
- **Outsider sourced perpetrator—suspicion matrix activated [x country], connects to potential escalation pathways to interstate nuclear war.**

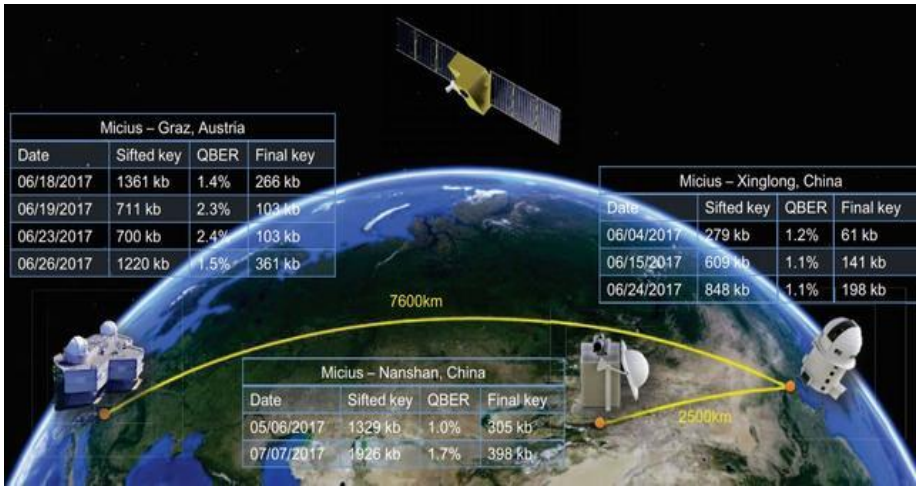
Possible NUDET sites and [suspected perpetrator]:

China NC3 Bias Impact [US, North Korea, Russia]

Russian Far East NC3 Bias Impact [US, China]

North Korea NC3 Bias Impact [US]

NUCLEAR COMMAND-AND-CONTROL IN THE QUANTUM ERA



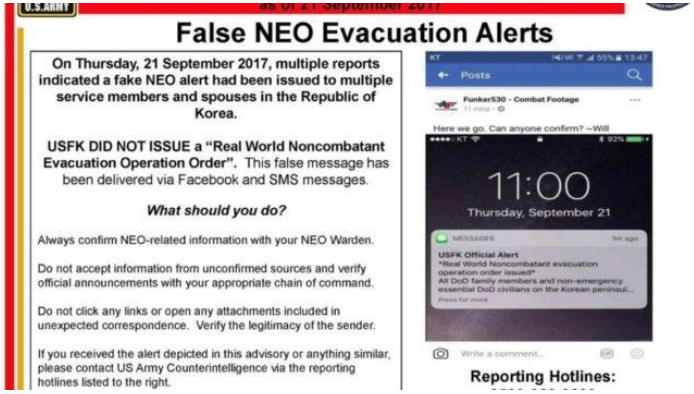
China's Micius satellite long distance Q communication test from here

Q-NC3 communications
Q-NC3 encryption: secrecy and past data files, eg PRP, procedures
Q-NCE Solving Computationally Massive Problems
Q- Rendering Visible Nuclear Weapons and Delivery Systems—and Command Centers
Q- Quantum Monitoring and Verification

Peter Hayes, "NUCLEAR COMMAND-AND-CONTROL IN THE QUANTUM ERA",
Blue Peter NAPSNet, March 29, 2018,
https://nautilus.org/napsnet/nuclear-command-and-control-in-the-quantum-era/

FALSE ALARMS, FALSE NEGATIVES AND POSITIVES, FAKE PEACE, FAKE WAR

- **Seoul Facebook non combatant evacuation Feb 2017**
- **Guam false alarm July 2017**
- **Hawaii false alarm September 2017**
- **Tokyo false alarm September 2017**
- **Minuteman/Trident missile launch, Dec 6 2017**



False NEO Evacuation Alerts

On Thursday, 21 September 2017, multiple reports indicated a fake NEO alert had been issued to multiple service members and spouses in the Republic of Korea.

USFK DID NOT ISSUE a "Real World Noncombatant Evacuation Operation Order". This false message has been delivered via Facebook and SMS messages.

What should you do?

Always confirm NEO-related information with your NEO Warden.

Do not accept information from unconfirmed sources and verify official announcements with your appropriate chain of command.

Do not click any links or open any attachments included in unexpected correspondence. Verify the legitimacy of the sender.

If you received the alert depicted in this advisory or anything similar, please contact US Army Counterintelligence via the reporting hotlines listed to the right.

Reporting Hotlines:

Table 2: Combinations of Truth Content and Report

	TRUTH CONTENT		
REPORT	**F: FALSE**	**M: MIXED**	**T: True**
P: POSITIVE attack is under way	FP	MP	TP
C: CONTESTED attack is, is not underay	FC	MC	TC
N: NEGATIVE no attack	FN	MN	TN

Peter Hayes, "REDUCING THE RISK THAT SOCIAL MEDIA STORMS TRIGGER NUCLEAR WAR: ISSUES AND ANTIDOTES", Blue Peter NAPSNet, February 01, 2018, https://nautilus.org/napsnet/reducing-the-risk-that-social-media-storms-trigger-nuclear-war-issues-and-antidotes/

See also:

Stanley Foundation, *Three Tweets to Midnight: Nuclear Crisis Stability and the Information Ecosystem,* Policy Dialogue Brief, February 2018 at: https://www.stanleyfoundation.org/resources.cfm?id=1646&title=Three-Tweets-to-Midnight:-Nuclear-Crisis-Stability-and-the-Information-Ecosystem

M. Chessen, *THE MADCOM FUTURE: HOW ARTIFICIAL INTELLIGENCE WILL ENHANCE COMPUTATIONAL PROPAGANDA, REPROGRAM HUMAN CULTURE, AND THREATEN DEMOCRACY... AND WHAT CAN BE DONE ABOUT IT,* Atlantic Council, 2017, at: http://www.atlanticcouncil.org/publications/reports/the-madcom-future

L. Saalman, "Fear of false negatives: AI and China's nuclear posture, *Bulletin of the Atomic Scientists*, April 24, 2018, at: https://thebulletin.org/military-applications-artificial-intelligence/fear-false-negatives-ai-and-china%E2%80%99s-nuclear-posture

Possible Antidotes

- Resolve nuclear prone conficts
- Multilateral Data Exchange & Independent Early Warning Networks
- Global NC3 Code of Conduct
- Command Discipline, military tradition and honor
- Laws of War, humanitarian international law—NWPT assert jurisdiction to hold nuclear weapons personnel accountable and create tribunals for trials for nuclear aggression and starting nuclear wars
- Support nuclear refuseniks, provide sanctuary in NWPT states
- Trade warheads for NC3 upgrade
- Reduce warheads, fissile material, vulnerable fuel cycle sites!
- NWPT: supply sanctuary for nuclear refuseniks, make nuclear weapons targeting transparent, accountability tribunals

韓星趙敏基自殺亡 C4 《娛樂》版

蘋果日報

福利熊每日一菜

Trump: Deal or create Adam

狂人高峰會 核危機大轉折

川普將見金正恩

Antidotes for Relative EW Deficit-Remedies 1

Joint Data Exchange Center (JDEC)

Provisions
The Memorandum Of Agreement Between The Government Of The United States and Government Of The Russian Federation On The Establishment Of A Joint Center For The Exchange Of Data From Early Warning Systems And Notifications Of Missile Launches established a Joint Data Exchange Center (JDEC) in Moscow for the exchange of information derived from each side's missile launch warning systems on the launches of ballistic missiles and space launch vehicles. The JDEC is also intended to serve as the repository for the notifications to be provided as part of an agreed system for exchanging pre-launch notifications on the launches of ballistic missiles and space launch vehicles.

Background: President Clinton and President Yeltsin issued a joint statement 02 September 1998 announcing that they had reached agreement on a cooperative initiative between the United States and Russia regarding the exchange of information on missile launches and early warning, and the potential establishment of a multilateral notification system for the launch of ballistic missiles. President Clinton and President Putin signed the Memorandum Of Agreement in Moscow on 04 June 2000. The JDEC will builds upon the successful establishment and operation during the millennium rollover of the temporary joint center for Y2K Strategic Stability in Colorado Springs. The system is to be set up in phases, and by the end of the third phase, it will include information on ballistic missile and space launches of third parties.

2015…DOA…moribund?

New Concept: Replace JDEC with Mulilateral Data Exchange Network

- **Revive as multilateral mechanism based on multiple levels of reciprocal, bilateral data exchange between nuclear weapons states, and including data from non-nuclear states?**
- **Devolved, self-implementing networked data exchange on bilateral basis (NOTAMs-ICAO system)**
- **Include nuclear and non-nuclear weapons states**
- **Parallel civil society based early warning-surveillance system, especially cities**

GLOBAL NC3 CODE OF CONDUCT

// to 2002 *Hague Code of Conduct against Ballistic Missile Proliferation*

CODIFICATION OF NORMS AND STATES PRACTICES, EG

"DO NOT TARGET THE NATIONAL HIGH COMMAND OF A NUCLEAR WEAPONS OR NUCLEAR ARMED STATE;"

"DO NOT CO-LOCATE NUCLEAR WEAPONS WITH ONE'S OWN HIGH COMMAND POST OR EARLY WARNING INTERPRETATION SITES OR SENSORS;"

"DO NOT MIX/FUSE/SHARE NUCLEAR AND CONVENTIONAL COMMUNICATIONS SYSTEMS;"

"WHEREVER POSSIBLE, USE DEDICATED NUCLEAR COMMUNICATIONS SYSTEMS;"

"DO NOT ATTACK OR INTERFERE WITH A NUCLEAR WEAPONS STATE'S NATIONAL TECHNICAL MEANS," INCLUDING BY IMPLICATION,

"DO NOT ATTACK THE UNDERLYING COMMUNICATIONS AND COMPUTER SYSTEMS ON WHICH NTM RELY FOR NC3 OPERATION;"

"DO NOT TAKE NC3 COUNTER-MEASURES THAT REDUCE DECISION TIME AND INCREASE IMMEDIACY OF NUCLEAR DECISIONS UNDER INTERNATIONAL LAW."

"DESIGNATE A LEGITIMATE AND ACCOUNTABLE NATIONAL COMMAND AUTHORITY FOR ALL NUCLEAR FORCES."

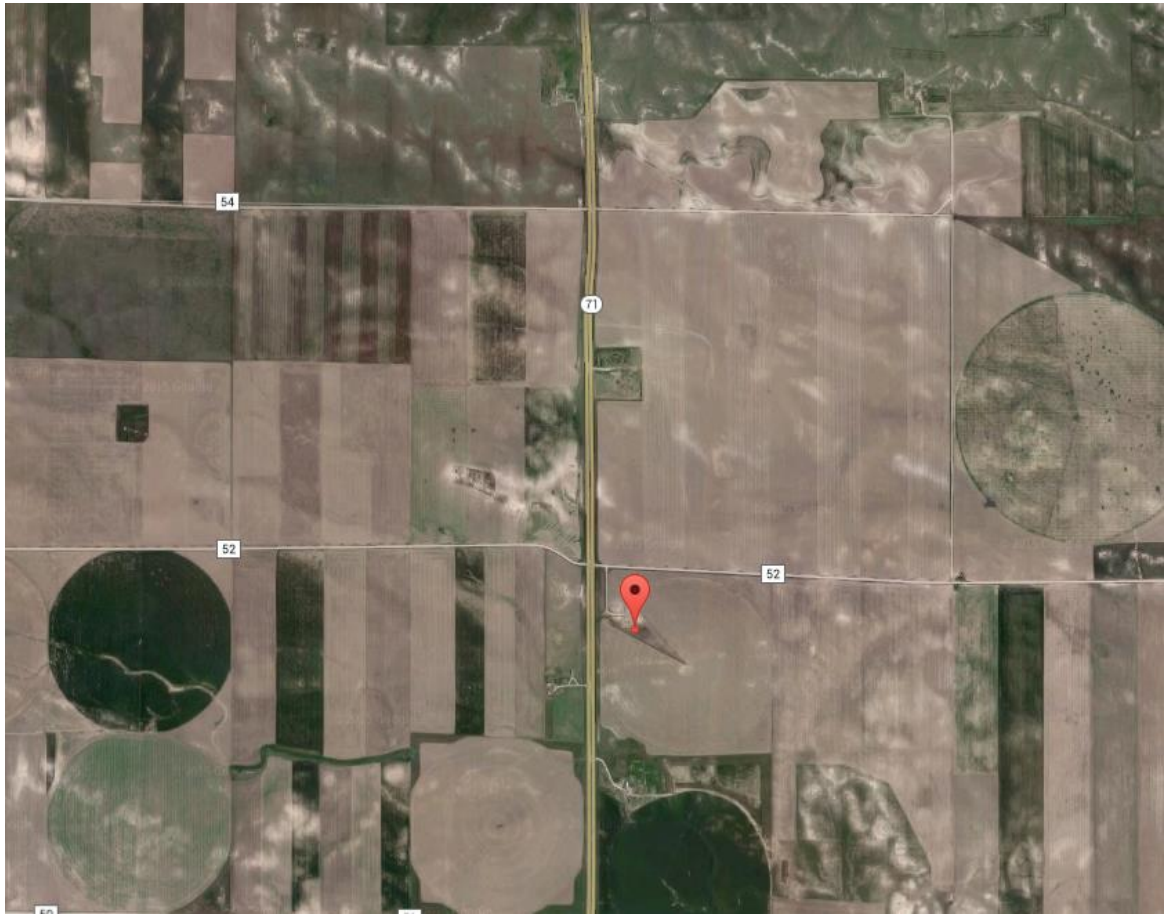
"INSTITUTE A TWO-PERSON RULE FOR ALL LAUNCH DECISIONS AND IMPLEMENTATION STEPS IN NC3 OPERATIONS."

Trident submarine-launched ballistic missile fired on November 7 from offshore Los Angeles
Social Media Storm
Aliens?
Armageddon?
Nuclear attack?
Early warning for CH, RF, DPRK?
Already in play

SF image above from:
https://vimeo.com/145029572?utm_source=AM+Nukes+Roundup&utm_campaign=2dab571683-AM_Nukes_Roundup&utm_medium=email&utm_term=0_547ee518ec-2dab571683-391728633&mc_cid=2dab571683&mc_eid=1d0f44d114

Briefing image in submarine from:
https://www.flickr.com/photos/usstratcom/sets/72157658690516614

Antidotes-Remedies 2



Kimball Nebraska missile silo at: 41°21’46.0”N 103°39’38.0”W

Antidotes-Remedies 2

Kimball Nebraska missile silo at: 41°21’46.0”N 103°39’38.0”W

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Kimball Nebraska missile silo at: 41°21’46.0”N 103°39’38.0”W

Antidotes for NC3 system failure 3: Duty to Disobey and NC3 Refuseniks?

October 28, 1962: ~ 12.30 am Air Force Capt. William Bassett unit in Okinawa received authenticated launch order to fire Mace missiles *at China* and Russia in spite of Defcon2 not 1 status. He challenged the order, even after it was resent, and took measures to ensure no missiles would be fired, until stand-down order received.
~ 6 hours later in real time
October 27, 1962, ~ 5pm Vasili Arkhipov, political officer on Russian sub B-59 and in command of Russian sub flotilla, voted against firing nuclear torpedo at US aircraft carrier, 1 of 3 votes, after an argument.

September 26, 1983: Stanislav Petrov, lieutenant colonel in the Soviet Air Defense Forces, was the officer on duty at the Serpukhov-15 bunker near Moscow which housed the command center of the Soviet early warning system. Dismissed multiple warnings of incoming US missile attack as errors. Later alarm determined due to rare alignment of sunlight on high-altitude clouds and satellite orbits.

1968 Michael Roach, ADM officer, Korea
1975, Major Harold Hering

What norms, standards, principles, if any, justify refusal by military personnel at receiving end of NC3 system to refuse to fire nuclear weapons?
Humanitarian law: "manifestly illegal"

- **Necessary**
- **Proportional**
- **Civilian-military principle**

Anthony J. Colangelo, "THE DUTY TO DISOBEY ILLEGAL NUCLEAR STRIKE ORDERS", NAPSNet Policy Forum, October 09, 2017, https://nautilus.org/napsnet/napsnet-policy-forum/the-duty-to-disobey-illegal-nuclear-strike-orders/

Antidote 4

Trade smaller arsenals for upgraded NC3 force multiplier (reducer)