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James A. Blackwell

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**For More Information:**

Dr. James A. Blackwell, Project Leader

[jblackwe@ida.org](mailto:jblackwe@ida.org), 703-845-6904

ADM John C. Harvey, Jr., USN (ret) Director, SFRD

[jharvey@ida.org](mailto:jharvey@ida.org), 703-575-4530

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# **Cognitive Hyper-Dissonance: Nuclear Signaling Through Military Exercises**

James A. Blackwell

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## Executive Summary

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Military exercises provide the opportunity to communicate strategic intent, develop operational concepts, and train in tactics, techniques and procedures (TTPs). Yet, we do not fully understand how military exercises communicate nuclear messages because the international relations community has largely ignored nuclear operations in the cognitive domain of war—how humans perceive and decide and how we distinguish signal from noise. The empirical evidence indicates that communicating nuclear intent through military exercises was fraught with uncertainty, ambiguity, deception, and bluff. The intended message was rarely received. Unintended messages abounded.

The United States and the Union of Soviet Socialist Republics (USSR) conducted over 200 land-based nuclear exercises between 1950 and 1990, taking differing approaches to operationalizing nuclear missions. The United States and the North Atlantic Treaty Organization (NATO) preferred the two-sided, free-play Field Training Exercises (FTXs) to explore operational concepts, while the Soviets and the Warsaw Pact emphasized one-sided, scripted Command Post Exercises (CPXs) as problem-solving drills. The USSR's logistics exercises often included movement of actual nuclear weapons across the simulated battlespace, while the United States executed more live-fire atomic maneuvers, especially in the early years of learning how atomic weapons could be integrated into military operations.

Exercise plans often referred to broadly stated intentions of communicating a deterrent message to the other side, sometimes citing what adversaries had done in their exercises in support of specific training goals and objectives. The evidence enabled meta-analysis of signals and noise sent and received: Each side watched the other's nuclear exercises but misapprehended capabilities and intentions. The Cold War nuclear exercise experience should induce prudence as nuclear-armed states attempt to send nuclear messages in a time of Great Power Competition.

The United States conducted only nine nuclear exercises between 1961 and 1970, as the Vietnam War disrupted the pace of operationalizing nuclear missions. In the same period, U.S. intelligence had observed in every case that the Warsaw Pact crossed the nuclear threshold at the same point in exercise time that NATO did. Most often, this crossover was within the first two days of hostilities. Nevertheless, despite clear and consistent evidence from Soviet exercises that indicated their intent to go first and go big with nuclear strikes, some U.S. analysts persuaded themselves that the Soviets would not do so in the real event. Soviet exercise planners wrote articles indicating that they had examined Return

of Forces to Germany (REFORGER) to derive correlation of forces data and formulas for use in Warsaw Pact exercises. Their conviction that a war in Europe would rapidly escalate to the use of tactical nuclear weapons was based on their analysis that this is what happened regularly in NATO exercises

SH'CHIT-76 and REFORGER-75 epitomized the expression of Soviet and U.S. nuclear capabilities and intentions during the Cold War era. However, by 1982, nuclear signaling through military exercises shifted to less visible types of maneuvers. On both sides, large-scale exercises almost exclusively demonstrated conventional operations. Nuclear missions were conducted in more latent events.

The U.S. Army in Europe fielded two tactical-level atomic weapons that had been developed in the 1950s especially for the European theater: the Atomic Demolition Munition (ADM) and the Davy Crockett recoilless rifle. In practical U.S. exercise experience, these weapons were determined to be almost useless, but the Soviets became convinced that these weapons were highly effective. The long procession of U.S. FTXs and CPXs had demonstrated to the Soviets that the advantages that had accrued to the United States of greater numbers of tactical nuclear weapons, a faster decision cycle, and a capacity to slow the Soviet rate of advance, particularly with ADMs, meant that the Soviets could not advance their empire beyond the German border. The record reveals three types of cognitive dissonances in nuclear messaging through military exercises: distorted perceptions of nuclear capabilities, discerning true intentions, and which side had nuclear decision superiority.

U.S. nuclear exercises convinced Soviet military planners that they would be hard pressed to sustain the rates of advance prescribed in Soviet operational norms. Nevertheless, senior Soviet officials continued to insist on unreasonably high rates of advance.

While the Soviets said they would not be the first to go nuclear, they went first in just about every nuclear exercise that they conducted. The fact that Soviet scenarios invariably began with a NATO conventional attack never served to persuade the West that their ambition was anything other than to conquer Western Europe. Although there was a range of uncertainty as to whether it would happen on Day 1, Day 4, or sometime between, the United States and its NATO allies interpreted adversary exercise behavior to indicate that the Soviets would go nuclear first, early, and often.

While the Soviet script always said that NATO had decided to go nuclear first and was in the process of executing a strike, for Soviet exercises, the scenarios almost always had the Soviets conducting a preemptive nuclear strike starting the moment their intelligence analysis concluded that a NATO nuclear strike decision was imminent. The Soviet's message was aimed as much at the Warsaw Pact as at NATO. As one analyst reported, "In effect, the Warsaw Pact High Command kept two sets of briefing books, one for those at

the very top and another for their armed forces, propaganda purposes, and public consumption.”<sup>1</sup> The motivation behind the invariable Warsaw Pact exercise road-to-war scenario was an attempt to conceal their true intent to strike first.

Although the Soviets professed to be able to make and execute operational nuclear employment decisions faster than NATO, they constantly second-guessed themselves based on their interpretations of U.S. nuclear exercises. The Soviets believed that the United States had decision superiority in tactical nuclear weapons employment. They believed that the speed with which U.S. nuclear forces could employ tactical nuclear weapons accurately on key targets was measured in minutes, not hours. Nevertheless, in their exercises, they communicated a message to the United States that they would be able to execute a preemptive strike. The United States, from its own exercise experience, concluded that NATO would not be able to execute a tactical nuclear strike before the Soviets could launch their first strike. Yet, U.S. exercise behavior continued to practice the execution of a tactical nuclear first strike to halt a Warsaw Pact conventional attack.

Despite the absence today of much of the explicit nuclear exercising by the United States and its allies approaching the scale and scope of the Cold War, nuclear messages are being transmitted and received. The Cold War exercise experience should give us caution about how exercises send nuclear messages and the content of the messages that others are receiving. Understanding human heuristic perception and decision-making approaches can contribute to more effective message sending and understanding and aid in making responsible nuclear escalation decisions. Two initiatives would address these concerns:

- **Á Every nuclear-armed state must critically review its exercise program with a view to rehabilitating its nuclear messaging through exercises.** Nuclear-armed states rehabilitating their nuclear exercise programs should also work to acquire a better understanding of how their exercises communicate nuclear messages. Likewise, they should improve their understanding of their adversaries’ nuclear intentions. Military professionals did not do this well during the Cold War. While intelligence sources and methods have improved the collection of raw data on capabilities, discerning intentions remains largely intuitive—indeed heuristic. Advances in behavioral science research can provide improvements in this aspect of operationalizing nuclear missions.
- **Á Deterrence theory must change from the Cold War paradigm.** We need to expand empirical behavioral science research and development to understand human heuristic decision making as it applies to nuclear signaling. Promising approaches have been pioneered by Joshua Kerzer at Harvard University and by

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<sup>1</sup> Benjamin B. Fischer, “CANOPY WING: The U.S. War Plan That Gave the East Germans Goose Bumps,” *International Journal of Intelligence and CounterIntelligence* 27, no. 3 (2014): 437, <https://doi.org/10.1080/08850607.2014.900290>.

Gerd Gigerenzer and colleagues at the Max Planck Institute for Human Development. Building on Gigerenzer's field research on how much human decision making is fast, frugal heuristics, Kerzer shows empirically that military measures perceived to be "costly" have greater influence on perceptions of national security interests. Nuclear military exercises on land are similarly "costly."

Collaborative research into the behavioral science of nuclear decision making could explore paths toward new forms of confidence-building measures that would make nuclear messaging more effective while producing mutual confidence about nuclear intent. A potentially productive start would be to convene a trilateral (the United States, Russia, and China or the United States and Asia-Pacific Allies) Track 1.5 dialogue toward that end.



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# Cognitive Hyper-Dissonance: Nuclear Signaling Through Military Exercises

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## A. Overview

Military exercises provide the opportunity to communicate strategic intent, develop operational concepts, and train in tactics, techniques and procedures (TTPs). The 2018 United States Nuclear Posture Review (NPR) declares that Russia and China are pursuing nuclear employment strategies that include limited use of nuclear weapons. To deal with this emerging threat the NPR directs that "... Combatant Commands will plan, organize, train, and exercise for this mission."<sup>1</sup> The NPR asserts that such exercises will demonstrate preparedness to respond to nuclear and non-nuclear aggression.

Yet, we do not fully understand how military exercises communicate nuclear messages because the international relations community has largely ignored nuclear operations in the cognitive domain of war—how humans perceive and decide and how we distinguish signal from noise. Much of the literature on nuclear exercise messaging is anecdotal and subjective. This article analyzes new empirical evidence and offers implications for understanding military exercises.

The United States and the Union of Soviet Socialist Republics (USSR) conducted over 200 land-based nuclear exercises between 1950 and 1990 (see Figure 1). The United States conducted over sixty atomic exercises during the first nuclear decade, while the Soviets conducted only three. The USSR got on the board in 1961 and began sending its own messages through a burst of exercises. It accelerated its nuclear exercises in the following decade, surpassing the United States in scale and scope. The Soviets had gotten the message that the future of warfare was going to be nuclear, and, as the Vietnam War diverted America's attention to non-nuclear forms of war, the Warsaw Pact communicated its nuclear intent through the scenarios that drove their nuclear exercises. The United States and its North Atlantic Treaty Organization (NATO) Allies reinvigorated their signaling of nuclear intent in the 1970s, spearheaded by their highly visible Return of Forces to Germany (REFORGER) exercises. Then, in the 1980s, nuclear messaging through military exercises by both sides took a different path. Nuclear exercises essentially levelled off as the Cold War drew to a close and abruptly ended when the Soviet Union collapsed.

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<sup>1</sup> Department of Defense, *Nuclear Posture Review 2018* (Washington, DC: OSD, February 2018), 58, <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

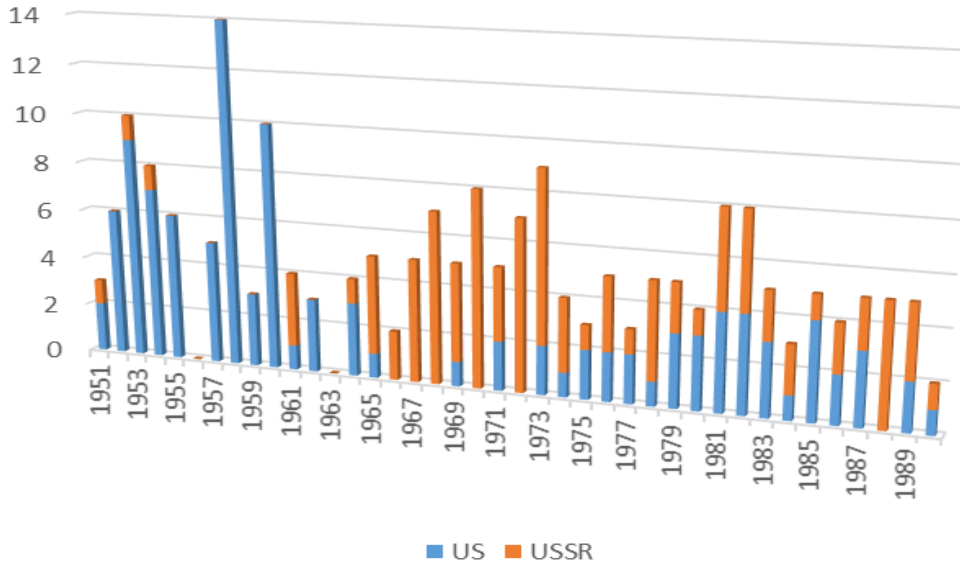


Figure 1: Nuclear Exercises by Country, 1951-1989

As the data in Table 1 show, the two sides took differing approaches to operationalizing nuclear missions. The United States and NATO preferred the two-sided, free-play Field Training Exercise (FTX) to explore operational concepts, while the Soviets emphasized one-sided, scripted Command Post Exercises (CPX) as problem-solving drills. The USSR's logistics exercises often included movement of actual nuclear weapons across the simulated battlespace, while the United States executed more live-fire atomic maneuvers, especially in the early years of learning how atomic weapons could be integrated into military operations.

Table 1: Nuclear Exercises by Type, 1951-1990

	1951	1952	1953	1954	1955	1957	1958	1959	1960	1961	1962	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	TOTAL					
BEWT																																										3		
CPX																																												36
FTX	1	3	2	4	3	3	4	1	6	1	2	1	1				1		1		2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	51			
ALF	1	3	6		2																																						13	
LOGEX				1	1	1	4																																			10		
TOTAL USA	2	6	9	7	6	5	14	3	10	1	3	3	1				1		2		2	1	2	2	2	1	3	3	4	4	3	1	4	2	3		2	1	113					
YEAR	1951	1952	1953	1954	1955	1957	1958	1959	1960	1961	1962	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	TOTAL					
BEWT																																											0	
CPX	1									2			2	1	1	2	3	6	3	6	6	3	1	1		3	1	1	1	3	1	1	1	1	1	1	4	2	1	59				
FTX			1													2	2		2		1	1			1	1	1	1		3	1	1	1	1	1	1	1	1	1	1	23			
ALF				1								1	1																													3		
LOGEX												1		1	1	2	3	1								1																10		
TOTAL USSR	1		1	1						3	1	4	2	5	7	4	8	3	7	7	3	1	3	1	4	2	1	4	4	2	2	1	2	2	5	3	1		95					
GRAND TOTAL	3	6	10	8	6	5	14	3	10	4	3	4	5	2	5	7	5	8	5	7	9	4	3	5	3	5	5	4	8	8	5	3	5	4	5	5	5	2	208					

Note: BEWT = Battle War Table Exercise; CPX = Command Post Exercise; FTX = Field Training Exercise; ALF = Atomic Live-Fire Exercise; LOGEX = Logistics Exercise.

Exercise plans often referred to broadly stated intentions of communicating a deterrent message to the other side, sometimes citing what adversaries had done in their exercises in support of specific training goals and objectives. However, no records are available that allow side-by-side, exercise-by-exercise comparisons of what each side tried to communicate and what the other side perceived. Nevertheless, the evidence does reveal intentions and perceptions of exercises that enable rudimentary meta-analysis of signals and

noise sent and received. After Action Reports (AARs), intelligence reports, general staff assessments, lesson plans, and doctrinal materials are particularly illuminating. A growing body of material is emerging from declassification efforts and provides sufficient evidence to reach a summary judgment: *Each side watched the other's nuclear exercises but misapprehended capabilities and intentions.*

The Cold War nuclear exercise experience should induce prudence as nuclear-armed states attempt to send nuclear messages in a time of Great Power Competition.

## **B. Soviet Enlargement, U.S. Containment: 1945–1960**

When the Soviets dropped an Iron Curtain across Europe in 1945, they did not have any atomic weapons. Stalin held steadfast to the dogma that “permanently operating factors” governed Soviet military doctrine in the struggle between irreconcilable social and economic forces.<sup>2</sup> In the Soviet correlation of forces, atomic weapons would not be the absolute weapon asserted by Western theorists.<sup>3</sup>

In 1946, President Truman embarked on a course of containing Soviet expansion, and Stalin recognized that the United States was not going to leave Europe. From the Soviet geopolitical perspective, the Americans were surrounding the Soviet Union with air bases from which they could launch bombers to reach any point in the Soviet Union<sup>4</sup> and drop the thousand atomic bombs that comprised the U.S. arsenal in 1953.<sup>5</sup> Their fears were not unwarranted. David Rosenberg<sup>6</sup> reports that a 1948 U.S. emergency war plan called for the delivery of fifty atomic bombs against twenty Soviet cities to destroy 50 percent of Soviet industry, reflecting the central strategic idea of the period—that the Soviet Union could be defeated if its war-supporting industrial base could be shattered.<sup>7</sup> Soviet paranoia swelled. General Fedor Rybalchenko remarked, “Before ten years have gone, they will whip our ass.”<sup>8</sup> When Stalin died in March 1953, during the Korean War, Soviet leaders feared the

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<sup>2</sup> Jonathan Samuel Lockwood, *The Soviet View of U.S. Strategic Doctrine: Implications for Decision Making* (New York: National Strategy Information Center, Inc., 1983), 28–29.

<sup>3</sup> Bernard Brodie, ed., *The Absolute Weapon: Atomic Power and World Order*, 1<sup>st</sup> ed. (New York: Harcourt, Brace and Co., 1946).

<sup>4</sup> Vladislav M. Zubok, *A Failed Empire: The Soviet Union in the Cold War from Stalin to Gorbachev* (Chapel Hill, NC: UNC Press, 2007), 66.

<sup>5</sup> Hans M. Kristensen and Robert S. Norris, “Global Nuclear Weapons Inventories, 1945–2013,” *Bulletin of the Atomic Scientists* 69, issue 5 (2013): 78, <https://doi.org/10.1177/0096340213501363>.

<sup>6</sup> David Alan Rosenberg, “American Nuclear Strategy and the Hydrogen Bomb Decision,” *The Journal of American History* 66, no.11 (June 1979): 62–87, <https://www.jstor.org/stable/1894674>.

<sup>7</sup> Aaron L. Friedberg, “A History of U.S. Strategic ‘Doctrine’—1945 to 1980,” *The Journal of Strategic Studies* 3, issue 3 (December 1980): 46, <https://doi.org/10.1080/01402398008437055>.

<sup>8</sup> Victor Sebestyen, *1946: The Making of the Modern World* (London: Macmillan, 2014), 143.

United States would seize the moment to invade the Soviet Union, starting with a massive nuclear strike.<sup>9</sup>

Stalin left the Red Army in place long after the end of World War II to thwart a revanchist Germany.<sup>10</sup> It was also the vanguard for the expansion of Soviet influence around the periphery of the USSR. Yet, Stalin seemed acutely aware of the inherent ambiguity of military exercises as signals of political intent and retained a firm hand on his generals as the sole decider of risks to take or avoid.<sup>11</sup> The Warsaw Pact served as an instrument of Soviet suppression over restive members but was, in fact, a “Cardboard Castle”—its military large in numbers but lacking in combat capability.<sup>12</sup>

### 1. U.S. Atomic Live-Fire Maneuver Exercises

The United States embarked on an ambitious military exercise program to advance its technical expertise and develop operational concepts for nuclear weapons employment. The first U.S. nuclear exercises were attempts to maneuver battalion-sized task forces in conjunction with the detonation of a live atomic weapon. These exercises were the Desert Rock series: ten Atomic Energy Commission test detonations that were integrated into maneuvers at the Nevada Test Site from 1951–1955.<sup>13</sup>

These live-fire nuclear exercises progressed in tactical complexity to include bombers, helicopters, and a production-model 280mm artillery cannon. They grew in size to brigade level, culminating with Shot Apple 2 on May 5, 1955, involving a combined arms task force of 1,000 soldiers and over 200 tanks.<sup>14</sup> The 29-kiloton atomic device, fired off a 500-foot tower, had minimal physical effect on the armored vehicles; however, when radiation monitoring devices inside the vehicles indicated dangerous dose levels, the Task Force Commander executed an extemporaneous maneuver to the objective area.<sup>15</sup>

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<sup>9</sup> Zubok, *A Failed Empire*, 86.

<sup>10</sup> *Ibid.*, 8, 20–24.

<sup>11</sup> *Ibid.*, 40.

<sup>12</sup> Vojtech Mastny, “The Warsaw Pact as History,” in *A Cardboard Castle? An Inside History of the Warsaw Pact, 1955–1991*, ed. Vojtech Mastny and Malcom Byrne (New York: CEU Press, 2005), 1–74.

<sup>13</sup> Headquarters, Camp Desert Rock, *Exercise Desert Rock V: January–June 1953*, vol. 1, *Operations*, Final Report (Las Vegas, NV: Headquarters, Camp Desert Rock, 16 July 1953), [https://archive.org/details/DTIC\\_ADA078559/page/n23](https://archive.org/details/DTIC_ADA078559/page/n23).

<sup>14</sup> Jean Ponton, Martha Wilkinson, and Stephen Rohrer, *Shot Apple 2: A Test of the TEAPOT Series, 5 May 1955*, DNA 6012F (McLean, VA: JRB Associates, 25 November 1981), 22, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a113538.pdf>; Anthony Leviero, “Task Force Razor Shaves Big Apple 2,” *Army Combat Forces Journal* 5, no. 11 (June 1955): 38–43.

<sup>15</sup> Defense Threat Reduction Agency, “Operation TEAPOT,” Fact Sheet (Fort Belvoir, VA: DTRA, May 2015), 6, [https://www.dtra.mil/Portals/61/Documents/NTPR/1-Fact\\_Sheets/16\\_TEAPOT.pdf](https://www.dtra.mil/Portals/61/Documents/NTPR/1-Fact_Sheets/16_TEAPOT.pdf).

While secrecy shrouded most of these exercises, outsiders were occasionally allowed to observe from a controlled observation point at News Nob. Sometimes, this collection of observers included foreigners and press.<sup>16</sup> For Apple-2, the news media observed the detonation, the maneuver, and the Civil Defense demonstrations known as Operation CUE<sup>17</sup> from a vantage point on a peak located 4,480 meters away.<sup>18</sup> Apple-2 was the second atomic test televised live across the United States, with military advisors providing expertise.<sup>19</sup>

## 2. The First Soviet Exercises

The Soviets did not detonate their first atomic device until 1949 and had only fifty nuclear weapons in 1952.<sup>20</sup> They turned their efforts toward nuclear warheads delivered by tactical and theater rockets while working to develop intercontinental ballistic missiles (ICBMs). In the meantime, during the 1950s, the rocket-launched nuclear warhead displaced the tank as the Soviets' central strategic weapon.<sup>21</sup> Nuclear fires to enable a tank-led offensive became the focus of Soviet military exercises. Soviet military theorists challenged the Stalinist doctrine of the dominance of “permanently operating factors” and asserted that in the atomic age, only a surprise preemptive attack would secure victory if war broke out.<sup>22</sup>

Soviet military leaders and atomic scientists were dogged by their perception of the U.S. lead in developing and fielding atomic weapons. Their first attempt to operationalize nuclear missions was a CPX in 1951<sup>23</sup> followed by an FTX in 1953.<sup>24</sup> The Soviet Union conducted a live-fire exercise in 1954. In this “Totskoye” event, the Soviets detonated a 40-kiloton device and maneuvered a division-sized army force through ground zero while flying a number of aircraft through the radioactive debris cloud. Defense Minister Nikolai

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<sup>16</sup> U.S. Department of Energy, “News Nob,” DOE/NV - - 774, (Las Vegas: National Nuclear Security Administration, Nevada Field Office, Office of Public Affairs, August 2013), [https://www.nnss.gov/docs/fact\\_sheets/DOENV\\_774.pdf](https://www.nnss.gov/docs/fact_sheets/DOENV_774.pdf).

<sup>17</sup> Ponton, Wilkinson, and Rohrer, *Shot Apple 2*, 52.

<sup>18</sup> *Ibid.*, 25.

<sup>19</sup> *Ibid.*, 52.

<sup>20</sup> Kristensen and Norris, “Global Nuclear Weapons,” 78.

<sup>21</sup> John G. Hines, *Soviet Strategic Intentions 1965–1985: An Analytical Comparison of U.S. Cold War Interpretations with Soviet Post-Cold War Testimonial Evidence* (Edinburgh: University of Edinburgh, 1995), 314–315, [https://era.ed.ac.uk/bitstream/handle/1842/20570/HinesJG\\_1996redux.pdf?sequence=1&isAllowed=y](https://era.ed.ac.uk/bitstream/handle/1842/20570/HinesJG_1996redux.pdf?sequence=1&isAllowed=y).

<sup>22</sup> David Holloway, *Stalin and the Bomb: The Soviet Union and Atomic Energy 1939–1956* (New Haven, CT: Yale University Press, 1994), 331.

<sup>23</sup> *Ibid.*, 242.

<sup>24</sup> *Ibid.*, 325.

Bulganin, along with a number of Marshals and Generals, observed this exercise and declared afterwards that the Red Army was ready to wage atomic warfare.<sup>25</sup>

### 3. Initial U.S. Operational Level Field Exercises

Although the Korean War had depleted the ranks of the forces in the United States, in 1952, the Army decided it was time to start improvising its use of atomic weapons. The first large U.S. field exercise to include simulated tactical use of atomic weapons was SNOWFALL, involving 33,561 troops in February 1952 at Camp Drum, New York. There was no training on these weapons and no manuals for the troops. SNOWFALL was a two-sided exercise involving an Airborne Division and Armored Cavalry Regiment, with a Regimental Combat Team as the aggressor. The use of atomic weapons was reserved for the final phase of the exercise, with the aggressor going first to halt an attack, followed by the friendly force firing its atomic weapon on the aggressor's reserves. The exercise director, in his final report, cautioned the Army not to believe that atomic weapons were the ultimate weapon in battle. Their use was just like all other forms of fire support—to be integrated with the scheme of maneuver.<sup>26</sup>

The Army conducted additional nuclear exercises in the Continental United States, but Korean War demobilization made it difficult. SAGEBRUSH, held in the Louisiana Maneuver Area in 1955, was prominent.<sup>27</sup> Given the size of the maneuver area and notoriety among locals,<sup>28</sup> these exercises would have been well covered by Soviet human and open-source intelligence collection.

### 4. NATO's First Operational Level Nuclear Exercises

In Europe, the United States and its NATO Allies concluded that the defense of Europe required early use of atomic weapons to stop the onslaught of overwhelming Soviet armored firepower. NATO's Military Committee asserted that the alliance needed "highly

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<sup>25</sup> Holloway, *Stalin and the Bomb*, 326–328; Zubok, *A Failed Empire*, 126–127; Central Intelligence Agency, *The Soviet Atomic Energy Program*, NIE 11-2A-63 (McLean, VA: Director of Central Intelligence, 2 July 1963), 40, <https://www.cia.gov/library/readingroom/document/cia-rdp79r01012a022200020001-4>.

The Soviets reported this event in 1996. See V. N. Mikhailov, ed., *USSR Nuclear Weapons Tests and Peaceful Nuclear Explosions: 1949 through 1990* (Moscow: The Ministry of the Russian Federation for Atomic Energy, 1996). For perspective, see also "Totskoye Nuclear Exercise," Wikipedia, last updated 27 September 2019, [https://en.wikipedia.org/wiki/Totskoye\\_nuclear\\_exercise](https://en.wikipedia.org/wiki/Totskoye_nuclear_exercise); Iamandris, "Totskoye Nuclear Exercise (The Red Bomb)," YouTube Video, 9:53, 1994, [https://www.youtube.com/watch?v=kk\\_nVyhLIMI](https://www.youtube.com/watch?v=kk_nVyhLIMI).

<sup>26</sup> Jean R. Moenk, *A History of Large-Scale Army Maneuvers in the United States, 1935–1964* (Fort Monroe, VA: U.S. Continental Army Command, 1969), 167.

<sup>27</sup> *Ibid.*, 203–219.

<sup>28</sup> Ricky Robertson, "The Atomic Cannons of Exercise Sagebrush," May 2016, <http://www.sfasu.edu/heritagecenter/9795.asp>.



trained and mobile forces with an integrated atomic capability ... to prevent a rapid over-running of Europe ...”<sup>29</sup> In 1954, NATO conducted its first publicized FTX involving atomic weapons. BATTLE ROYALE involved six divisions and the 2<sup>nd</sup> Allied Tactical Air Force and included firing of the 280mm atomic cannon with a ground-effects simulator that produced a mushroom cloud.<sup>30</sup>

In NATO’s 1955 CPX, CARTE BLANCHE,<sup>31</sup> air forces simulated dropping thirty-three atomic bombs on Soviet ground forces that had attacked NATO, producing an estimated one million dead and wounded. Public concern over such devastation became a lasting conundrum of NATO defense and deterrence policy.<sup>32</sup>

In sum, NATO conducted about a dozen nuclear exercises in the 1950s, culminating in fall 1959 with SIDE STEP—a NATO shipping and logistics CPX. There was no maneuver and no atomic strike planning. All national military headquarters and civilian authorities participated and discovered enormous unexpected challenges in logistics, shipping, civilian catastrophe, and refugee control that would arise if the Soviets were to launch a nuclear first strike.<sup>33</sup>

## 5. Warsaw Pact Perceptions of Early U.S. and NATO Nuclear Field Exercises

The documentation of collection efforts by East German military intelligence begins with the 1954 CPX BATTLE ROYALE. Their assessment minimized NATO’s nuclear advantage, concluding that only three of nine tactical nuclear weapons worked and that nuclear troop training was weak. Their conclusion carried for decades: “Finally, we must conclude that the exercise has proved that a weak adversary with a sufficient number of

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<sup>29</sup> North Atlantic Military Committee, “The Most Effective Pattern of NATO Military Strength for the Next Few Years,” Decision on M.C. 48, Final Report, 22 November 1954, in *NATO Strategy Documents 1949–1969*, ed. Gregory W. Pedlow, (Brussels: Supreme Headquarters Allied Powers Europe, October 1997), 241–242, <https://www.nato.int/docu/stratdoc/eng/a541122a.pdf>.

<sup>30</sup> Imperial War Museums, “NATO Maneuvers of 1954,” <https://www.iwm.org.uk/collections/item/object/1060018687>.

<sup>31</sup> Robert T. Davis, II, “Cold War Infamy: NATO Exercise Carte Blanche,” in *Military Exercises: Political Messaging and Strategic Impact*, ed. Beatrice Heuser, Tormod Heier, and Guillaume Lasconjarias (Rome: NATO Defense College, Research Division, 2018), 47–64, <http://www.ndc.nato.int/download/downloads.php?icode=546>.

<sup>32</sup> Donald A. Carter, “War Games in Europe: The U.S. Army Experiments with Atomic Doctrine,” in *Blueprints for Battle: Planning for War in Central Europe, 1948–1968*, ed. Jan Hoffenaar and Dieter Krüger (Lexington: University Press of Kentucky, 2012), 140.

<sup>33</sup> Military Commander, *A Report by the Military Committee to the North Atlantic Council on Exercise SIDESTEP*, MC 43/8 (Brussels: NATO Archives, 25 May 1960), [http://archives.nato.int/uploads/r/nato-archives-online/f/c/8/fc8530423b16c06844f902c9ff0c0fa159326cc64ee39c237d08169964cb36a7/MC\\_0043\\_8\\_ENG\\_PDP.pdf](http://archives.nato.int/uploads/r/nato-archives-online/f/c/8/fc8530423b16c06844f902c9ff0c0fa159326cc64ee39c237d08169964cb36a7/MC_0043_8_ENG_PDP.pdf).

nuclear weapons, but fewer troops, is not capable of repelling an attacker with fewer nuclear weapons but more troops.”<sup>34</sup>

Soviet intelligence on NATO exercises provided East German military intelligence with an understanding of U.S. concepts of how a war would begin. They concluded, correctly insofar as NATO’s perceptions were concerned, that NATO envisioned a situation in which the “East” (Soviets) attacks and NATO’s armies hold them off while reinforcements arrive. Soviet planning assumed that NATO would then launch a counterattack, including the use of nuclear weapons.<sup>35</sup> In 1959, Warsaw Pact Supreme Commander, Soviet Marshal Ivan Konev, contended that they had been collecting intelligence on U.S. and NATO exercises in which the road to war envisioned by the West starts with a Soviet attack into NATO territory. Konev went on to assert that NATO atomic exercises (accompanied by regular alerts) and air patrols with nuclear weapons on board (coupled to the stationing of U.S., UK, French, and Belgian forces side-by-side with a reborn German army) instead signaled NATO’s intent to conduct a surprise invasion of the Warsaw Pact.<sup>36</sup>

The Soviets, in their own exercises, employed atomic weapons once they detected covert NATO preparations for an attack and before NATO could strike first.<sup>37</sup> They purposefully misrepresented what had happened in SIDE STEP. Chief of the Main Operations Directorate of the Soviet General Staff, Colonel General S. Ivanov, reported that analysts examining the correlation of forces concluded that NATO conventional forces were too few to offer serious resistance. He asserted that NATO was first to use nuclear weapons in the exercise:

... SIDE STEP confirms the existence of plans by NATO command for use of sudden, massed [nuclear strikes] ... with the aim of winning nuclear superiority, inflicting defeat on enemy troops, changing the strategic situation to their advantage, and insuring that their ground troops can go over to the offensive.<sup>38</sup>

Western analysts who have examined archives conclude that such interpretations were contrived as alarmist exaggeration to keep Soviet allies from wandering from the fold. Both Ivanov and Konev knew better. They had detailed understanding of NATO’s nuclear

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<sup>34</sup> Jan Hoffenaar, “East German Military Intelligence for the Warsaw Pact in the Central Sector,” in *Blueprints for Battle: Planning for War in Central Europe, 1948–1968*, ed. Jan Hoffenaar and Dieter Krüger (Lexington: University Press of Kentucky, 2012), 77 (note 8).

<sup>35</sup> Vojtech Mastny and Malcom Byrne, eds., *A Cardboard Castle? An Inside History of the Warsaw Pact, 1955–1991* (New York: CEU Press, 2005), 97.

<sup>36</sup> *Ibid.*, 106.

<sup>37</sup> *Ibid.*, 97–98.

<sup>38</sup> Richard Helms, “MILITARY THOUGHT: Some Conclusions on the NATO Armed Forces’ Exercise SIDE STEP (by Colonel-General S. Ivanov)” (memorandum for the Director of Central Intelligence, McLean, VA: CIA, Deputy Director (Plans), 22 January 1962), 9, <https://www.cia.gov/library/readingroom/docs/CIA-RDP10-00105R000402970001-4.pdf>.

exercises and knew that NATO's intent was not to initiate a war, but to win it once the Soviets started it. Nevertheless, the contrivance that the Soviets would intercept NATO orders for an atomic strike and then execute their own preemptive nuclear blitz before NATO forces could carry out the strike became the unvarying operational concept for Soviet nuclear exercises until the 1980s.

By the 1960s, the Soviets had concluded that NATO would have the advantage in tactical nuclear weapons for some time. They failed to replicate the five-year U.S. progression through live-fire atomic maneuvers. The Soviet perception of America's atomic exercises was that U.S. forces had become so adept at integrating nuclear weapons into operational concepts that they would have to find ways to defeat U.S. nuclear weapons employment during operations.

The Soviets could not believe that the United States would not leverage its nuclear advantage when the correlation of forces was obviously against the United States in the conventional forces balance in Europe. In their methodology for campaign planning, the only way to overcome the U.S. nuclear advantage was to go first and go big with their conventional forces advantage and use their strategic nuclear weapons against tactical targets. In 1961 the Soviets began to find ways to overcome their perceived vulnerability to U.S. first use of tactical nuclear weapons.

The Soviets established a requirement for all commanders and staffs to develop plans for operations to gain fire superiority over the enemy. Their primary objective was the rapid destruction of U.S. means of nuclear attack; however, combat with nuclear weapons would not be the same as combat had been with artillery fires of World War II. Planning preeminence was directed at calculating U.S. and NATO nuclear capabilities to enable their outnumbered nuclear forces to strike a decisive blow on NATO's nuclear capabilities. This planning process led early Soviet nuclear planners—applying classic Soviet norms—to conclude that they would have to destroy not less than 50 percent of NATO tactical nuclear forces in a Warsaw Pact preemptive atomic strike.<sup>39</sup>

Soviet nuclear signaling began with their first operational level exercises in 1961 during the Berlin Wall Crisis.

### **C. Nuclear Exercises under Strategic Nuclear Equivalence: 1960–1974**

Strategic nuclear postures raced ahead in the 1960s and 1970s to a position of parity in which both sides assured themselves that they would have sufficient surviving forces to

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<sup>39</sup> Richard Helms, "MILITARY THOUGHT: Some Questions of Combat with Enemy Nuclear Means (by Colonel S. Lyshak and Colonel V. Parkhomenko)" (memorandum for the Director of Central Intelligence, McLean, VA: CIA, Deputy Director (Plans), 3 July 1962), 6, <https://www.cia.gov/library/readingroom/docs/CIA-RDP80T00246A029700360001-3.pdf>.

launch a counterstrike if the other should go first.<sup>40</sup> However, at the operational level, exercises divulged a mutual perception that equivalence at the strategic level might not prevent an outbreak of a tactical- or theater-level nuclear conflict.

## 1. Highlights of Soviet Exercises

The kickoff year for operational-scale Soviet nuclear exercises was 1961. “TUMAN,” in May, practiced a Soviet nuclear first strike preempting a U.S. and NATO surprise attack. This exercise employed 460 medium-range missiles and 108 ICBMs on military-industrial centers, strategic airfields, and missile launching facilities. A field maneuver followed the missile salvo, exercising a coordinated attack across the Rhine, at which point NATO and the United States had nothing left to stop a Soviet march to the Atlantic coast.<sup>41</sup>

The next month, in staff exercise BURIA-61, the Soviets modeled a massive invasion of Western Europe, with extensive employment of nuclear weapons as they practiced a march through France to the Pyrenees.<sup>42</sup> Troops moved through radiologically contaminated areas to achieve the required rate of advance toward their objectives.<sup>43</sup> The Soviets repeated the BURIA exercise every year through 1970,<sup>44</sup> with more than 2,200 nuclear warheads available for planning.<sup>45</sup>

In the BURIA-61 exercise, the Soviets dissembled in assuming the effects of their own nuclear strikes vs. those of the United States. NATO nuclear weapons strikes across the front resulted in Soviet losses of only seven companies, forty tanks, and one missile launcher by the six regiments in the target area. Yet, Soviet nuclear strikes had devastating effect on NATO units and negligible impact on the population. Soviet military academy

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<sup>40</sup> Friedberg, “A History of U.S. Strategic ‘Doctrine,’” 47–53.

<sup>41</sup> Matthias Uhl, “Soviet and Warsaw Pact Military Strategy from Stalin to Brezhnev: The Transformation from ‘Strategic Defense’ to ‘Unlimited Nuclear War,’ 1945–1968,” in *Blueprints for Battle: Planning for War in Central Europe, 1948–1968*, ed. Jan Hoffenaar and Dieter Krüger (Lexington: University Press of Kentucky, 2012).

<sup>42</sup> Richard Helms, “MILITARY THOUGHT: The Forms and Methods of Operational Training According to the Experience of Exercises (by Lieutenant-General V. Mernov) (memorandum for the Director of Central Intelligence, McLean, VA: CIA, Deputy Director (Plans), 7 December 1962), 14–16, <https://www.cia.gov/library/readingroom/docs/1962-12-07.pdf>.

<sup>43</sup> Jan Hoffenaar and Christopher Findlay, eds., *Military Planning for European Theatre Conflict During the Cold War: An Oral History Roundtable, Stockholm, 24–25 April 2006* (Zurich: Center for Security Studies (CSS), 2007), 93, <http://www.css.ethz.ch/content/dam/ethz/special-interest/gess/cis/center-for-securities-studies/pdfs/ZB-79.pdf>.

<sup>44</sup> Danilevich recalled three such exercises in the early 1970s (see Hines, *Soviet Strategic Intentions*, 145).

<sup>45</sup> Uhl, “Soviet and Warsaw Pact Military Strategy,” 37.

theorists directed operational planners to leverage contaminated zones as avenues of attack.<sup>46</sup>

General-Colonel Adrian Danilevich, former Director of the Soviet General Staff, recalled that all the senior political and military leadership participated in the 1972 BURIA exercise, including President Leonid Brezhnev, Premier Alexei Kosygin, and Defense Minister Marshall Andrei Grechko. The exercise was a CPX, but, at the end, a live test launch of three ICBMs with dummy warheads was to take place. Danilevich reported that “[w]hen the time came to push the button, Brezhnev was visibly shaken and pale, and his hand trembled and he asked Grechko several times for assurances that the action would not have any real-world consequences. ‘Andrei Antonovich, are you sure this is just an exercise?’”<sup>47</sup>

The Soviets rehearsed the movement and transfer of live nuclear rounds during some FTXs, often experiencing difficulties. A 1961 logistics exercise included movement of thirty-nine functioning nuclear weapons, delivered to the Front (a Front typically consisted of two to four armies, each army with two to four divisions) by air, rail, and motor vehicle transport over distances of 20 to 300 kilometers. These movements were accomplished in seven hours—a remarkable logistics achievement if true<sup>48</sup>; however, the operations were not flawless. Nuclear weapons often arrived at locations that had already been vacated by fast-moving units striving to maintain their prescribed rate of advance.<sup>49</sup> Soviet logistics planners from Cold War times relate that such nuclear weapons movements were a substantial part of several Soviet operational level exercises in the 1960s.

Soviet field communications in nuclear exercises were often constrained by complexity and overloaded with a volume of message traffic that crowded out critical nuclear weapons reports and orders.<sup>50</sup> The critique of one senior General probably ended several staff officers’ careers: “Really important and urgent documents were buried and held, for

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<sup>46</sup> Torsten Diedrich, “The German Democratic Republic,” in *Blueprints for Battle: Planning for War in Central Europe, 1948–1968*, ed. Jan Hoffenaar and Dieter Krüger (Lexington: University Press of Kentucky, 2012), 195.

<sup>47</sup> Hines, *Soviet Strategic Intentions*, 38.

<sup>48</sup> Central Intelligence Agency, “Critique of Soviet Rear Services Exercise” (memorandum for the Director of Central Intelligence, McLean, VA: CIA, 14 March 1962), 55. <https://www.cia.gov/library/readingroom/document/cia-rdp10-00105r000403190001-9>.

<sup>49</sup> *Ibid.*, 81.

<sup>50</sup> Central Intelligence Agency, *Polish Critique of the Warsaw Pact “Lato-67” Command Post Exercise*, Intelligence Information Special Report (McLean, VA: CIA, July 7, 1967), 67. <https://www.cia.gov/library/readingroom/docs/1967-07-07.pdf>.

example, the attack order for the 3<sup>rd</sup> Army Corps. The parties responsible for such a disgraceful state of affairs should be punished.”<sup>51</sup> Time and practice did not seem solve such challenges.<sup>52</sup>

Warsaw Pact planners normally conjured up unfounded NATO attack campaigns into their exercise scenarios. In the January 1967 exercise TROJKA, NATO attacked through Poland with 5 corps, 20 divisions, and 418 nuclear strikes in an attempt to reach the Oder River in six to eight days. For their response, the Soviets allocated 365 nuclear warheads to this Front, with an objective to counterattack and reach the western coast of France within twelve days. Soviet exercise designers scripted a NATO flank attack into the exercise. This flank attack was to be defeated by a Warsaw Pact nuclear strike, along with strategic rocket nuclear strikes on NATO troop concentrations, missile bases, and other military installations deep into the sector of advance all the way into France.<sup>53</sup> It was a mirror image of the Soviets’ own war plans for an attack into NATO Western Europe.

The Soviets conducted their first ZAPAD exercise in 1969. Coming after the 1968 invasion of Czechoslovakia, ZAPAD-69 was the first major exercise for the newly formed Group of Soviet Forces Czechoslovakia. It was also an initial test of a new Soviet operational and organizational concept for conducting theater operations by a Front.<sup>54</sup> In this exercise, Soviet troops conducted a massive conventional attack, reaching the French-German border on Day 3,<sup>55</sup> and then launched their own preemptive nuclear strike to maintain a favorable conventional force ratio.<sup>56</sup>

Operational commanders could become frustrated with how long it took their staffs to make the necessary calculations for firing atomic weapons on key targets. Army commanders and their staffs often did not analyze the situation and targets for nuclear strikes to the necessary depth, and nuclear strikes were frequently delivered against an empty area or against lesser targets.<sup>57</sup> At other times, subordinates were blamed for not making calculations correctly in the first place:

The commander and the staff of the front clearly overestimated the results of their strike against the enemy with 27 nuclear warheads. This seems to

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<sup>51</sup> Central Intelligence Agency, “Critique of Soviet Rear Services Exercise,” 14 March 1962, 35.

<sup>52</sup> Central Intelligence Agency, *Polish Critique of the Warsaw Pact*, 67.

<sup>53</sup> Diedrich, “The German Democratic Republic,” 184–194.

<sup>54</sup> Diego A. Ruiz Palmer, *Theatre Operations, High Commands and Large-Scale Exercises in Soviet and Russian Military Practice: Insights and Implications*, Fellowship Monograph 12 (Rome: Research Division, NATO Defense College, May 2018), 8 (footnote 16), <http://www.ndc.nato.int/news/news.php?icode=1172>.

<sup>55</sup> Uhl, “Soviet and Warsaw Pact Military Strategy,” 47.

<sup>56</sup> Mastny and Byrne, *A Cardboard Castle?*, 342–346. See also Uhl, “Soviet and Warsaw Pact Military Strategy,” 47.

<sup>57</sup> Uhl, “Soviet and Warsaw Pact Military Strategy,” 53.

be the only way to explain that only 8 missiles in all were used by the front in the zone of the offensive after the first strike right up to the middle of the day. Moreover, not a single strike with aerial nuclear bombs was delivered against the advancing Western troops. Only after the appropriate directions from the directing staff did the Commander of the 2<sup>nd</sup> Front make the decision to deliver a second nuclear strike.<sup>58</sup>

Such piecemeal firing of atomic weapons was also singled out by senior commanders in subsequent exercises in the 1960s<sup>59</sup> and the 1970s.<sup>60</sup>

Exercise KRAJ-73 was only twenty-four hours long, beginning after a hypothesized West German invasion of East Germany and a NATO air campaign against Poland. NATO then employed tactical nuclear weapons first along the front as the West realized that it was losing the initiative in the face of the Warsaw Pact defenses. As the East's rapid mobilization turned the tide in its favor, NATO provoked global nuclear war, involving 107 nuclear strikes (including 21 surface bursts) on Polish territory while the East preemptively carried out a simultaneous nuclear attack. In the subsequent critique of the exercise, Polish Defense Minister Wojciech Jaruzelski pointed out the need for vigilance in the face of continued NATO force modernization, expressing particular concern for the six-fold increase in the number of Pershing I missiles in Germany from 28 in 1970 to 180 in 1973 and for the planned deployment of Lance missiles with three times the range of currently deployed (Honest John) tactical missiles.<sup>61</sup>

## 2. U.S. Perceptions of Soviet Nuclear Exercises

U.S. intelligence collection on Soviet nuclear exercises was methodical, but the interpretation of those exercises was erratic.

It was evident in 1966 that the Soviets, having achieved nuclear parity with the United States, also recognized that their ambitions to expand their empire into Western Europe were unreachable. The Soviets believed that to try for even limited territorial gain would

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<sup>58</sup> Central Intelligence Agency, "Critique of Soviet Rear Services Exercise," 61.

<sup>59</sup> Central Intelligence Agency, *Polish Critique of the Warsaw Pact*," 17, 19, 50, 51.

<sup>60</sup> Central Intelligence Agency, *The Warsaw Pact Soyuz-78 Exercise*, Intelligence Information Special Report (Washington, DC: CIA, 22 September 1978), 9. <https://www.cia.gov/library/readingroom/docs/1978-09-22.pdf>.

<sup>61</sup> Central Intelligence Agency, *Polish Critique of Military Exercise KRAJ-73*, Intelligence Information Special Report (McLean, VA: CIA, 23 May 1974), 12, 22, <https://www.cia.gov/library/readingroom/docs/1974-05-23.pdf>. The plan for this exercise was explicitly based on conclusions drawn from Warsaw Pact analysis of 1973 NATO exercises REFORGER, CRESTED CAP, WINTEX, and others.

risk U.S. strategic nuclear retaliation and the destruction of Mother Russia.<sup>62</sup> Soviet understanding of NATO exercises FALLEX-68 and WINTEX-71 was that the new Flexible Response Strategy had the effect of lowering the threshold at which nuclear use would be initiated by NATO. U.S. interpretations of Soviet exercises indicated no change in emphasis by the East on preempting NATO nuclear use.<sup>63</sup>

In nine exercises reported for 1961–1970, U.S. intelligence had observed in every case that the Warsaw Pact crossed the nuclear threshold at the same point in exercise time that NATO did. Most often, this crossover was within the first two days of hostilities.<sup>64</sup> Despite some contrary intelligence community (IC) opinion in the 1970s,<sup>65</sup> no primary source evidence indicates that the Soviets ever contemplated an extended conventional phase of a war in Europe.<sup>66</sup> A 1970 IC working group concluded that exercise scenarios confirmed the view that the “Warsaw Pact force structure and strategy are posited on the assumption that any major NATO military action would be detected in time to permit reaction by Warsaw Pact forces, perhaps including some preemptive measures.”<sup>67</sup> This U.S. perception of Warsaw Pact nuclear exercises persisted through 1983: “The stated doctrine regarding the nuclear strikes has not changed since the 1960s.... In the typical scenario, the Warsaw Pact will detect NATO preparations and launch nearly simultaneous strikes to preempt .... The academic discussion at the Soviet General Staff Academy support these tenets.”<sup>68</sup>

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<sup>62</sup> Department of State, “Soviet Intentions and Warning of Soviet or Warsaw Pact Attack on NATO,” Trilateral Talking Points (Washington, DC: DOS, 1966), <https://www.cia.gov/library/readingroom/docs/CIA-RDP85G00105R000100190028-4.pdf>.

<sup>63</sup> K. Wayne Smith, “Soviet Concepts of War in Europe” (memorandum for Dr. Kissinger, Washington, DC: National Security Council, June 8, 1971), 1, 3. <https://www.cia.gov/library/readingroom/docs/1971-06-08.pdf>.

<sup>64</sup> *Ibid.*, 10–11.

<sup>65</sup> Central Intelligence Agency, *Evolution of Soviet Concepts and Forces for Nuclear War in Europe*, Intelligence Report SR IR 74-4-S (McLean, VA: CIA, November 1974), 7–8. <https://www.cia.gov/library/readingroom/docs/1974-05-01.pdf>.

<sup>66</sup> Central Intelligence Agency, “Soviet Concepts of War in Europe: Transition from Conventional to Nuclear Conflict” (intelligence memorandum, McLean, VA: Directorate of Intelligence, 5 May 1971), 11, 25–26. <https://www.cia.gov/library/readingroom/docs/1971-05-01b.pdf>. The CIA assessed Warsaw Pact Exercise NAREW-65 as a one-time experimental excursion—an attempt by the Soviets to see if they could still win after engaging in an extended conventional phase. This experiment was not repeated (see pp. 17–18).

<sup>67</sup> Central Intelligence Agency, “The Warsaw Pact Threat to NATO,” National Security Study Memorandum 84, SR JS 70-3, Final Report (McLean, VA: Interagency Working Group 5, May 1970), 14, <https://www.cia.gov/library/readingroom/docs/CIA-RDP79B00939A000600020002-9.pdf>.

<sup>68</sup> Central Intelligence Agency, *National and Multinational Polish Strategic, Operational, Tactical, Combined Division-Level, Specialist and Transit Exercises, War Games, Staff and Training Drills*, Intelligence Information Report (McLean VA: CIA, 30 June 1983), 12, <https://www.cia.gov/library/readingroom/docs/1983-06-30.pdf>.



Nevertheless, despite clear and consistent evidence from Soviet exercises that indicated their intent to go first and go big with nuclear strikes, some U.S. analysts persuaded themselves that the Soviets would not do so in the real event. A 1970 IC working group was divided in its assessment of whether exercises indicated a Warsaw Pact shift toward reliance on conventional operations. Defense Intelligence Agency (DIA) principal authors wrote that the Soviet force was designed primarily for offensive operations, but Central Intelligence Agency (CIA) dissenting views concluded that Soviet forces could not mobilize quickly enough nor sustain themselves logistically for a “standing start” extended conventional force offensive campaign. Mainstream DIA analysts were more willing to attribute a preemptive nuclear first strike to Soviet intentions.

The analytic dispute over whether Warsaw Pact forces were postured for offense vs. defense persisted but was masked in a coordinated DIA-CIA paper in 1973 that did not present dissenting views. This time, consensus language asserted that the Warsaw Pact would likely conduct a preemptive strike if it was convinced that NATO intended to employ nuclear weapons; however, there was no disagreement with the primary conclusion: “Beating NATO to the nuclear punch, therefore, is not only regarded as militarily advantageous but also as potentially decisive.”<sup>69</sup>

These contending perceptions stem from a fundamental difference in analytic methodology. Inductive reasoning, the DIA way, was based on empirical observation of what happened in Warsaw Pact exercises and what was taught in Soviet academies. This “inductive school” concluded that preemptive nuclear strikes formed the prescribed Soviet way of war and that Warsaw Pact military forces *would* fight the way they trained. Deductive reasoning, the CIA way, was based on how a Warsaw Pact campaign would likely develop in fact—despite prescribed scenarios, school solutions, and doctrinal principles. This reasoning led deductive school analysts to conclude that the Soviets *would* not preempt because they *could* not—logistically, mobilization-wise, and politically—and, according to the logic of nuclear deterrence, *should* not in the first place.

John Hines was a key U.S. military intelligence analyst of the Soviet military from the 1970s through the 1990s and became one of the most qualified analysts of the Cold War Soviet military. His own analytic journey epitomized the discourse between the inductive and deductive approaches in their attempts to understand likely Soviet nuclear behavior. In his post-retirement PhD dissertation, he confesses that he came to realize that the more he learned of the Soviet military in its historical, cultural, and even linguistic context, the less certain he grew about his conclusions. Also, the less certain he became of his own views, the more discouraged he grew of the certitude professed by other analysts.

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<sup>69</sup> Central Intelligence Agency, “Warsaw Pact Forces for Operations Against NATO,” Paper 2, NSSM 168-1 (McLean, VA: Office of Strategic Research, 15 May 1973), 33, <https://www.cia.gov/library/readingroom/docs/1973-05-15.pdf>.

Dr. Hines acknowledges that his former self, Major Hines, tended to overstate the Soviet's aim to conduct aggressive conventional attacks against NATO. He says now that too many analysts at the time overstated the propensity of the Soviets to contemplate preemptive nuclear strikes. He relates that his advocacy at the time was tempered by the experienced evidentiary habits of senior leaders to whom his analysis was directed—the likes of Harold Brown, James Schlesinger, and Zbigniew Brzezinski in particular. However, he holds fast to his then-contemporary (1970s and early 1980s) view that the Soviets were not likely to initiate a nuclear exchange at any level.<sup>70</sup>

Hines' post-Cold War primary source research included archival documents and an impressive set of interviews with former Soviet military senior leaders. He acknowledges that in the late 1960s and into the early 1980s, the Soviets had indeed adopted an operational doctrine of tactical and theater nuclear preemption, but he points out that senior U.S. officials were divided on whether the Soviets would, in fact, preempt when the moment of decision arrived. Zbigniew Brzezinski, Fred Ikle, Fritz Ermarth and the Joint Chiefs of Staff believed the Soviets would preempt. James Schlesinger and Harold Brown doubted that they would. Hines now discounts the interpretations of other archive researchers (Beatrice Heuser) that Soviet exercise behaviors reflected what would in fact happen.

Hines also acknowledges, based on his previous access to intelligence sources, that much of the Soviet General Staff analysis and modeling of nuclear warfare had led some Soviet analysts to dissent from the party-line conclusion that nuclear warfighting of any type—preemption or retaliation—would be catastrophic and therefore should be avoided. However, in the Soviet military hierarchy, analysts with contrarian views were not as valued as they might have been in the U.S. military.

Hines asserts that a realization of the futility of preemption finally took hold under Marshal Nikolai Ogarkov in the early 1980s and led to development of doctrines and systems to implement a conventional war campaign concept that exploited Operational Maneuver Groups under a deterrent umbrella of intermediate-range ballistic missiles (IRBMs). In Hines' post-Cold War view, contrary to the 1981 statement of Defense Minister Dmitry Ustinov, the Soviets did not intend the SS-20 to be warfighting weapon. In the end, Hines observed that such ambiguity about preemption was probably purposeful—a way to enable political leaders to straddle the Kremlin's bureaucratic and policy fences:

For example, stated policy (even for internal consumption) often co-existed with contradictory planning and preparation in several areas, the most noteworthy being a policy of no-first-use of nuclear weapons (a deterrence posture) and preparation for preemption (primarily a “warfighting” posture).<sup>71</sup>

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<sup>70</sup> Hines, *Soviet Strategic Intentions*, x–xi.

<sup>71</sup> *Ibid.*, 64.

### 3. Highlights of U.S. Tactical Nuclear Exercises

The United States conducted only nine nuclear exercises between 1961 and 1970, as the Vietnam War disrupted the pace of operationalizing nuclear missions. The archetypal nuclear exercise was DESERT STRIKE in 1964.

DESERT STRIKE was a hastily planned joint exercise involving nearly 90,000 troops in a Corps vs. Corps joint exercise that was to be the graduation exam for the recently formed United States Strike Command. It was conducted in a vast maneuver area in the Desert Southwest that had been used for training during World War II. U.S. ground and air forces practiced large-scale employment of tactical nuclear weapons. In a first-time innovation, a simulated War Cabinet, played by retired generals and senior former political officials, served as decision-making authority that provided political judgment and direction about when and how nuclear weapons could be employed. Both sides conducted tactical and theater nuclear strikes in a fast-moving, far-reaching field maneuver during which units often lost communications with higher headquarters. The wear and tear on combat vehicles was extensive, leaving only one of the two armored divisions capable of executing its contingency plan requirement. The Army would not attempt anything like it again for more than a decade.<sup>72</sup>

The REFORGER concept was born in 1968 from political pressure to reduce U.S. troop levels in Germany. At the peak of the Vietnam War, Congress moved to withdraw two full divisions from Europe. In a holding action, the Pentagon reached agreement with Britain and Germany to withdraw only one division and conduct annual exercises in which that division would return for a time to demonstrate Allied solidarity and send a deterrent message to the Soviets.<sup>73</sup> The earliest REFORGER exercises did not attempt to operationalize nuclear missions.<sup>74</sup>

In 1971, during REFORGER III, both sides employed simulated nuclear weapons. Notably, the Orange force employed Atomic Demolition Munitions (ADMs), which slowed but failed to halt "... the relentless Blue advance." Orange employed its nuclear artillery, precipitating Blue use of tactical nuclear weapons in response.<sup>75</sup> The 4<sup>th</sup> Canadian Mechanized Brigade Group (CMBG) was to conduct a forward passage of lines and take

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<sup>72</sup> Moenk, *A History of Large-Scale Army Maneuvers*, 311–326.

<sup>73</sup> Department of the Army, "After-Action Report Exercise REFORGER I" (memorandum, Fort Sheridan, IL: Headquarters, Fifth United States Army, 28 April 1969), <https://apps.dtic.mil/dtic/tr/fulltext/u2/854087.pdf>. FOR OFFICIAL USE ONLY.

<sup>74</sup> Department of the Army, "After Action Report for Exercise REFORGER IV" (memorandum, Fort Riley, KS: Headquarters 1st Infantry Division (MECH), 11 June 1973). (See U.S. Army Heritage and Education Center (USAHEC), <https://arena.usahec.org/web/arena>.)

<sup>75</sup> Department of the Army, "REFORGER III Final After Action Report" (memorandum, Headquarters, VII Corps, 25 February 1972), 3. (See USAHEC, <https://arena.usahec.org/web/arena>.)

the offensive for Blue forces. A passage of lines is one of the most complicated and difficult tactics to execute, and, this one was an embarrassment for the CMBG. “The lack of interoperability with the 1<sup>st</sup> (U.S.) Infantry Division resulted in a great deal of confusion, particularly when 4 CMBG had to call down nuclear fires and did not have the proper codes and communications.”<sup>76</sup> This introduction of nuclear operations into REFORGER may not have appeared so problematic to NATO in Soviet perceptions.

REFORGER V, in the fall of 1973, showed improvements in U.S. forces’ employment of nuclear weapons. The 1<sup>st</sup> Infantry Division noted that nuclear play during the FTX “... was conducted in a far more precise and professional manner than on previous exercises.”<sup>77</sup> At the conclusion of REFORGER V, all U.S.-based combat units were held over in Germany in case they were needed during the 1973 Arab-Israeli War, setting the stage for more extensive nuclear employment in future REFORGER exercises.

#### 4. Soviet Perceptions of U.S. Nuclear Exercises

East German military intelligence was proficient at understanding almost everything about NATO nuclear forces—the result of closely following NATO exercises. Regularly recurring intelligence reports on FALLEX and WINTEX CPXs appear in the East German military archives. These reports were collected from informants planted in NATO headquarters and among exercise participants and evaluators, drivers of high-ranking officials, journalists, and resident observers—Soviet sympathizers tagged to keep designated locations under surveillance.<sup>78</sup> However, “... the operational planning and prewar targeting of the Western nuclear weapons [were elusive to them]. Until the end of the Cold War, they were able to present only hypotheses on the subject, based on analyses of various exercise scenarios.”<sup>79</sup>

By the mid-1960s, Warsaw Pact intelligence analysts grew concerned with how NATO nuclear exercises had changed since the 1950s. They concluded that NATO exercises had transformed from the old strategy of “Massive Retaliation” to a new strategy of “Flexible Response,” indicating NATO’s intent to wage limited nuclear war.<sup>80</sup> In 1962, based on exercise observations, these analysts calculated that NATO would employ nuclear

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<sup>76</sup> Sean M. Maloney, *War Without Battles: Canada’s NATO Brigade in Germany 1951–1993* (Toronto: McGraw-Hill Ryerson Limited, 1997), 309.

<sup>77</sup> Department of the Army, “REFORGER V Final After Action Report” (memorandum, Headquarters, VII Corps, 15 January 1974). (See USAHEC, <https://arena.usahec.org/web/arena>.)

<sup>78</sup> Benjamin B. Fischer, “CANOPY WING: The U.S. War Plan That Gave the East Germans Goose Bumps,” *International Journal of Intelligence and CounterIntelligence* 27, no. 3 (2014): 432, 453, <https://doi.org/10.1080/08850607.2014.900290>.

<sup>79</sup> Hoffenaar, “East German Military Intelligence,” 81 (see Endnote 30).

<sup>80</sup> Mastny and Byrne, *A Cardboard Castle?*, 171–173.

weapons by Day 2—within 46 hours—to stop a Warsaw Pact advance. In 1963, the Warsaw Pact’s perception was that NATO had accelerated to using nuclear weapons on Day 1, within 10 hours of the start of combat:

The completed exercises indicate that the Allied armed forces are not capable of waging combat activities successfully for a longer period without employing nuclear weapons. This is due to the adverse ratio of forces, which would become even more apparent during the opening days of conventional warfare.<sup>81</sup>

The Soviet conviction that NATO would start a war and that it would go nuclear within days was embodied in their war plans. One example of such a plan was the 1964 “Plan of Action of the Czechoslovak People’s Army for War Period.”<sup>82</sup> The plan calculates a one-to-one force ratio for the Czech Front vs. U.S. and West German forces. This wartime plan of action referred specifically to Soviet assessment of NATO exercises to anticipate NATO attack objectives, to include the following:

- Surprise (NATO) nuclear strikes against the main political and economic centers of the country;
- Change to correlation of forces in its own (NATO’s) favor by strikes against the troops, airfields, and communications centers (of Warsaw Pact forces); and
- Disrupt the arrival of (Warsaw Pact) strategic reserves by nuclear strikes against targets deep in our territory and by sending airborne assault troops.

Employing 131 nuclear missiles and bombs, the Pact Czech Front would attack into West Germany, advance on across the Rhine, and be well into France by day 7.<sup>83</sup>

At a Warsaw Pact Defense Ministers conference in March 1971, Soviet Defense Minister Grechko told of the seriously deteriorating situation revealed by intelligence assessments of NATO WINTEX CPXs. He asserted that NATO was weakening, but this perception of weakening U.S. conventional forces did not give them greater confidence in the overmatch of their own conventional force superiority. The U.S. “Hollow Army” of the 1970s served instead to heighten Soviet anxiety over their perceived NATO intent to compensate for conventional weakness by launching a preemptive strike.<sup>84</sup>

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<sup>81</sup> Ibid., 173.

<sup>82</sup> “Plan of Action of the Czechoslovak People’s Army for War Period,” trans. Svetlana Savranskaya and Anna Locher, 008074/ZD-OS 64 (Washington, DC: Woodrow Wilson International Center for Scholars, History and Public Policy Program, October 11, 1964), 1–18, <http://digitalarchive.wilsoncenter.org/document/111624>.

<sup>83</sup> Ibid.

<sup>84</sup> Mastny and Byrne, *A Cardboard Castle?*, 41.

Soviet exercise planners wrote articles indicating that they had examined REFORGER to derive correlation of forces data and formulas for use in Warsaw Pact exercises.<sup>85</sup> Their conviction that a war in Europe would rapidly escalate to the use of tactical nuclear weapons was based on their analysis that this is what happened regularly in NATO exercises.<sup>86</sup>

## **D. Exemplar Exercises from the Heights of the Cold War**

NATO exercises generally practiced Corps-on-Corps free play FTX. The Exercise Director, normally a three-star Corps Commander, would provide an AAR, including critiques by each subordinate command level. The predominant Soviet form, whether for FTX or CPX, was the scripted, one-sided exercise in which the participants solved an operational problem, after which the senior commanders running the exercise would grade their solution against a prescribed “school solution” for that type of problem.<sup>87</sup>

### **1. REFORGER-75**

The main effort for REFORGER-75<sup>88</sup> took place just south of the Fulda Gap.<sup>89</sup> The Warsaw Pact (Orange) was represented by a division with three mechanized infantry brigades and an armor brigade. NATO (Blue) was played by an Armored Cavalry Regiment screening along a line representing the intra-German border in front of a division with three mechanized infantry brigades and an armor brigade. As the screening forces withdrew in the face of the initial Orange assault, Blue forces stymied the initial attack by Orange forces, which then, on D+3, employed thirteen low-altitude air burst nuclear strikes to break through Blue positions in an attempt to envelop the south. See Figure 2.

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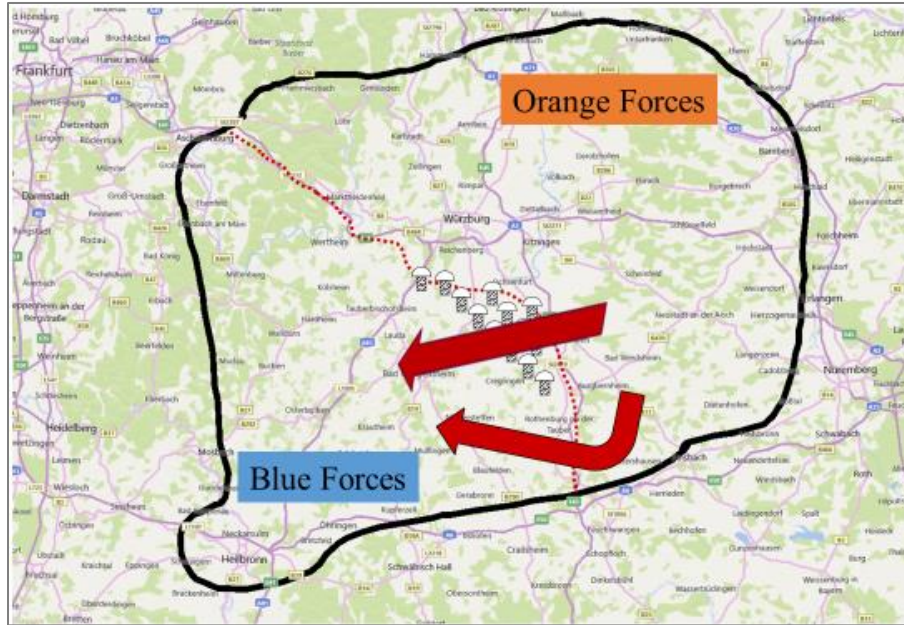
<sup>85</sup> N. Nikitin, “NATO’s Militarist Displays,” *Krasnaya Zvezda*, 8 July 1977 (U.S. Joint Publications Research Service (JPRS): Translations from *Krasnaya Zvezda*, 3).

<sup>86</sup> Mastny and Byrne, *A Cardboard Castle?*, 47.

<sup>87</sup> Central Intelligence Agency, *Planning, Preparation, Operation and Evaluation of Warsaw Pact Exercises*, Intelligence Information Report (McLean, VA: CIA, 1981), 89, <https://www.cia.gov/library/readingroom/docs/1981-01-01.pdf>.

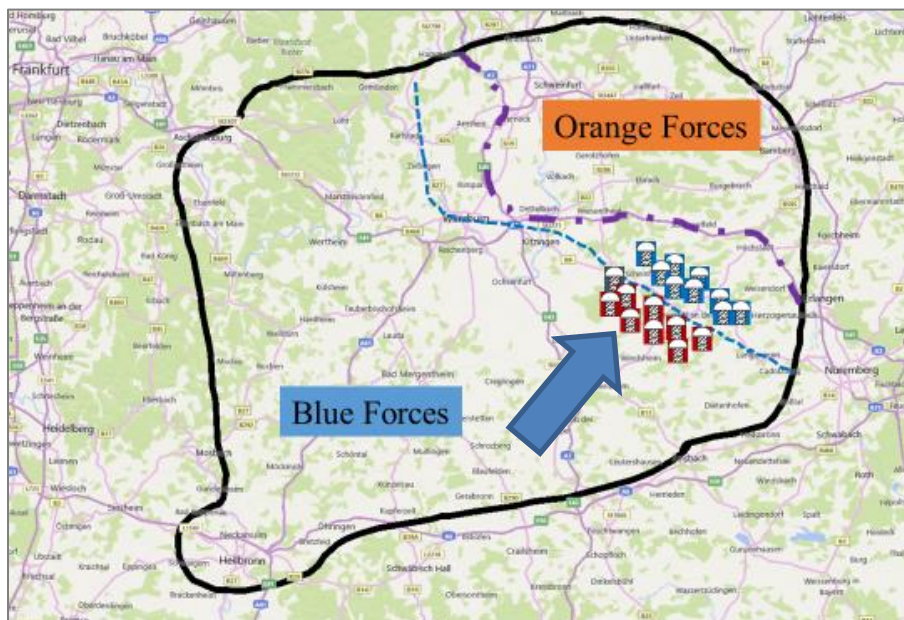
<sup>88</sup> Department of the Army, “After Action Report for Exercise REFORGER-75” (memorandum, Headquarters, United States Army Europe (USAREUR) and Seventh Army, 15 January 1974). (See USAHEC, <https://arena.usahec.org/web/arena>.)

<sup>89</sup> The Fulda Gap is a lowland corridor running southwest from the German state of Thuringia to Frankfurt am Main. There was also a sizable conventional exercise in the north of Germany.



: [ i fY' "CdYb]b[ 'Acj Yg'cZF9: CF; 9F!+) '

In the process, Orange reconnaissance forces located the Blue division command post and immediately attacked with a hasty nuclear strike and follow-up maneuver. In response, Blue launched a counterattack directly into the advancing Orange force, pushing Orange back across the Tauber River by D+6. Orange responded with nuclear strikes, at which point exercise controllers ordered a temporary halt to disentangle the troops. The exercise ended at D+9, with a final mutual exchange of tactical nuclear strikes. See Figure 3.



: [ i fY' "7`cg]b[ 'Acj Yg'cZF9: CF; 9F!+) '

The Exercise Director was blunt in his AAR:

Initially, special (nuclear) weapons fire planning was divorced from the current tactical situation. Both Orange and Blue requests for chemical and nuclear weapons did not include clear indications of how the weapons were to be used in relation to the scheme of maneuver.<sup>90</sup>

Also, planning was flawed and execution was faulty:

There was an apparent lack of understanding of nuclear selective release procedures, and the serious problem of nuclear strike warning to subordinate units was not resolved. Both sides received more practice in the use of nuclear and chemical weapons although no large-scale successes were achieved because of difficulties in acquiring targets and the small size of the targets that were acquired.<sup>91</sup>

Although Warsaw Pact military intelligence and General Staff were concerned with NATO's ability to use ADMs to slow or stop Warsaw Pact advances, REFORGER ADM teams and training weapons were taken to the field but were not employed. The ADMs were not employed because when nuclear release was given, the engineer units had not planned ADM employment enough in advance to execute appropriate targets in a timely manner.<sup>92</sup>

## 2. SH'CHIT-76

The next year, Soviet and Warsaw Pact forces conducted an exercise that was more ambitious than any other in their recent experience. SH'CHIT-76 (SHIELD)<sup>93</sup> included a theater-level CPX, a multi-division FTX, a large-scale logistics exercise that included movements of nuclear weapons, and a multi-national civil-military mobilization drill that doubled as a deception operation intended to mislead Western intelligence about exactly what was involved in the exercise. Soviet, Polish, Czech, and East German forces took part within an exercise box that covered nearly all of Poland.

The scenario involved a NATO build-up under cover of a REFORGER-like redeployment exercise into the North German sector. After about a fifteen-day mobilization and build-up, NATO forces attacked from across the entire West European continent, from Jutland to Bavaria, concentrating axes of attack to reunite Germany and then seize Poland and Czechoslovakia.

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<sup>90</sup> Department of the Army, "After Action Report for Exercise REFORGER-75," 10-2.

<sup>91</sup> *Ibid.*, 4-6.

<sup>92</sup> *Ibid.*, 8-2.

<sup>93</sup> Central Intelligence Agency, *Warsaw Pact Exercise "Shield-76,"* Intelligence Information Special Report (McLean VA: CIA, 23 December 1976), <https://www.cia.gov/library/readingroom/docs/1976-12-23.pdf>.



Among the three primary exercise goals of SH'CHIT-76 was "[t]o increase the capability for converting to operations utilizing nuclear weapons."<sup>94</sup> Exercise designers postulated that Warsaw Pact Front forces would have available 324 nuclear munitions, totaling 17.1-megaton yield, including 203 tactical missiles, 96 air-delivered bombs, and 25 strategic missiles to strike targets designated by the Front. NATO would have 390 nuclear weapons (14.3 megatons), including 80 rounds for the 203mm guns, 180 Honest John rocket warheads, and 140 air-delivered bombs (130 Air Force, 10 carrier-based aircraft). Warsaw Pact nuclear weapons were to be used immediately when it became clear that the West was about to unleash any form of a nuclear strike.

The mission of the Warsaw Pact forces was to repel the NATO attack, switch to the offensive, and, within eight days, reach well into West Germany in the North. This attack would be followed by that of a second echelon Front that would march across the North German Plain and then swing south and west to seize all of East and West Germany within twelve to fourteen days of the initial NATO attack.

SH'CHIT-76 provides insight into how the Soviets applied their Correlation of Forces and Means (COFM) methodology in operational planning. COFM was the primary cognitive framework governing Soviet perceptions and decision making in theater nuclear operations. Every operation required a basic tabulation of military capabilities available to both sides. Exercises provided an environment to practice this particularly Soviet approach to military operations. Table 2 shows Soviet COFM calculations for exercise SH'CHIT-76.

HUV'Y'&'Gc j Yh7 cffY Ujcb'cZ: cfWg'UbX'A YUbg'7 UW`Ujcbg'Zf'9I YfWjgY'G<E <#I!+\*

	: fcbh			A Ujb'5 HUW'NcbY		
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T ä•q ^Šæ } & @!•Á	JÍ Á	JÍ Á	FKÁ	Ì GÁ	Ì GÁ	FÈKÁ
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Ö` )•BÁ [! : çæ•Á	HÈÍ HÁ	FÈJÈÁ	FÈKÁ	GÈÈÈÁ	FÈFÈÁ	GKÁ
Ç çæj\ Á ^æj[]•Á	FÈÍ Í Á	FÈÌ ÈÁ	FÈKÁ	FÈHÍ FÁ	FÈÌ ÈÁ	FÈKÁ
Ùcá ^A&æÁ	GÍ GÁ	FÍ GÁ	FÈKÁ	FÌ ÈÁ	FHÍ Á	FÈKÁ

The Front Commander would select a course of action that found the right point of vulnerability of NATO forces on which to concentrate nuclear fires and then would maneuver armored forces to punch through the rupture in NATO's positions. This nuclear

<sup>94</sup> Ibid., 6.

tank one-two punch would create a deep and wide breach that second echelon forces would race through to great depth. Although across the Front the Warsaw Pact had a quantitative advantage (especially in numbers of equivalent large units and tanks), for some measures (in particular, personnel and numbers of nuclear weapons), NATO outnumbered the Warsaw Pact. The Soviet doctrinal principle from the 1950s had been that a weak adversary with enough nuclear weapons but fewer troops is not capable of repelling an attacker with fewer nuclear weapons but more troops. In SH'CHIT-76, NATO was the attacker with more troops and more nuclear weapons, but it was repulsed by a defending Warsaw Pact force with fewer troops yet greater total yield of nuclear weapons. The preemptive nuclear strike was apparently the key to this calculation in the Soviet theory of victory.

Coinciding with the Front level CPX, separate divisions were to conduct conventional live-fire maneuver drills at training facilities across Poland.<sup>95</sup> These exercises were not two-sided free-play, as was the case with REFORGER FTX. They were scripted run-throughs of tactical fire and movement scheduled to coincide with phases of the CPX. These drills were conducted on training areas and in firing lanes familiar to the units. Commanders and staffs of the CPX were not in direct communication with the division FTX units.

As it happened, NATO forces advanced only fifty kilometers when Warsaw Pact forces repulsed them on D+3. On D+4, just as the Soviet-led force was about to launch its counterattack, it discovered an imminent NATO nuclear strike, so the Soviets ordered their own preemptive nuclear strike at 0800 on D+5 to the full depth of NATO territory. This Soviet first strike involved 172 tactical nuclear weapons, including 18 surface bursts, detonating a total yield of 4.6 megatons. The NATO nuclear strike followed. In the exchange, NATO lost 30 percent of its nuclear delivery means and the force equivalent of four corps. Warsaw Pact forces lost 23% of their nuclear forces and three Fronts but were subsequently strong enough to encircle NATO forces and resume the offensive into West Germany.

SH'CHIT-76 also included a Soviet exercise practice that had long been abandoned by Western forces. Soviet forces were directed to move 430 nuclear weapons across Poland to give logistics and tactical units experience in handling these weapons and in interfacing with the Soviet special nuclear weapons handling units.<sup>96</sup> From the declassified Exercise AAR, it is apparent that these were movements of live nuclear warheads, rather than training rounds, surrogates, or paperwork, as was the practice in U.S. nuclear logistics exercises of the period.

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<sup>95</sup> National Photographic Interpretation Center (NPIC), *Shield-76 Summary, Poland*, PIR 006-77 (McLean VA: CIA, March 1977), 6, <https://www.cia.gov/library/readingroom/docs/CIA-RDP78T05162A000500010006-0.pdf>.

<sup>96</sup> Central Intelligence Agency, *Warsaw Pact Exercise "Shield-76,"* 122–127.

The Soviet 24<sup>th</sup> Air Army was to receive twelve nuclear bombs for its 37<sup>th</sup> Fighter-Bomber Division.<sup>97</sup> For the exercise, these weapons were to be targeted at NATO nuclear command and control (C2) sites, HAWK anti-aircraft missile launchers, nuclear weapons emplacements and storage facilities, and airfields where NATO nuclear strike aircraft were based. Each air regiment was to upload one flight (two aircraft) of Su-7B “prepared to carry (two) special bombs in suspended position.” This practice of 1976 is strikingly similar to an indicator noted in 1990 by the President’s Foreign Intelligence Advisory Board during the so-called “war scare” of the 1983 ABLE ARCHER exercise. However, what was noted in 1983 was probably routine, as it had been since at least the time of SH’CHIT-76. Uploading a nuclear weapon in the context of a scheduled exercise was not an indicator of the Soviets putting their nuclear forces on a “hair trigger” alert.

### **E. Nuclear Signals Recede into Military Exercise Noise in the 1980s**

SH’CHIT-76 and REFORGER-75 epitomized the expression of Soviet and U.S. nuclear capabilities and intentions during the Cold War era. However, by 1982, nuclear signaling through military exercises shifted to less visible types of maneuvers. On both sides, large-scale exercises almost exclusively demonstrated conventional operations. Nuclear missions were conducted in more latent events.

In 1980, U.S. V Corps introduced an innovative form of Map Exercise—the Battlefield Exercise Without Troops (BEWT). The BEWT practiced uploading ammunition basic loads and then reconnoitering routes of march to assigned deployment areas. The event was to be conducted in real time but on a large map that had been taped to a gym floor on a military base. While a few units were selected to send trucks to their ammunition supply points and a small number reconnoitered their actual deployment routes, the vast majority of V Corps simulated the process in the gym. Index cards represented loads, and placards carried by soldiers walking across the map in time steps at map scale replicated moving vehicle formations. Bottlenecks, conflicts, and gaps became readily apparent.<sup>98</sup>

REFORGER-82 featured the debut of the M-1 Tank on the European battlefield. The U.S. Army 3<sup>rd</sup> Mechanized Infantry Division was the first to be equipped with the Abrams tank and employed it to pronounced effect during the exercise. It was powerful and fast, with its ultra-quiet turbine engine, lower silhouette, and advanced thermal imaging. The division found that it could penetrate deep beyond adversary formations virtually undetected, engage enemy positions kilometers outside of traditional engagement ranges, and speed deep into the enemy formation to disrupt and destroy the opposing force’s center of gravity. C2 became a weapon system in REFORGER-82, as the division also employed a

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<sup>97</sup> *Ibid.*, 285–286.

<sup>98</sup> Department of the Army, “V (U.S.) Corps Exercise Operation Order (EXOPORD) 80-1 for Deployment/Upload BEWT” (Headquarters, V Corps, 23 April 1980). (See USAHEC, <https://arena.usahec.org/web/arena>.)

developmental tactical computer and wireless internet capability known as Maneuver Control System (MCS). MCS enabled wide dissemination of intelligence data, electronic preparation and distribution of orders, and automated, rapid synchronization and concentration of fast-paced operations. Longer range precision fires were integrated with targeting systems to enable the development of the U.S. AirLand Battle and NATO Follow-On Forces Attack doctrines.<sup>99</sup>

Future REFORGERS would concentrate on exploiting such revolutionary conventional weapons capability. For NATO, nuclear missions seemed far less necessary, and, through the remainder of the Cold War, these missions were operationalized in procedural drills in the NATO WINTEX and ABLE ARCHER series of CPX and Communications Exercises. By 1989, large-scale FTXs gave way to computer simulations that drove CPXs.<sup>100</sup>

Warsaw Pact FTXs also took on a different character, while its nuclear missions similarly shifted to the CPX. In many ways, ZAPAD-81 epitomized a new Soviet emphasis on internal political messaging through military exercises, and the time and effort spent on indoctrination surely came at the expense of resources available for military training. Soviet military literature of the time is riven with such propaganda.<sup>101</sup> At the same time, Soviet Defense Minister Marshal Dmitry Ustinov, in a speech during ZAPAD-81, refuted the notion among some Western analysts that the exercise signaled a shift in Soviet military doctrine to conventional operations. Contrary to John Hines' later conclusion, Ustinov confirmed that the newly deployed SS-20 IRBM was indeed intended as a first strike weapon that would target "... all European NATO states and the adjacent seas."<sup>102</sup>

ZAPAD-81 contained the classic Soviet operational concept of a preemptive tactical nuclear first strike, this one preceding a NATO nuclear strike by one minute.<sup>103</sup> Although Marshal Nikolai Ogarkov highlighted their shortcomings by conducting this by-then well-practiced nuclear concept, the conventional phase of the operation focused on new weapons and tactics associated with the Operational Maneuver Group (OMG). With the OMG, the Soviet military hoped to strike deep into the NATO defense and preclude NATO

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<sup>99</sup> Department of the Army, "The Marne Division REFORGER-82 Initial Impressions" (Headquarters, 3<sup>rd</sup> Infantry Division (Mechanized), n.d.). (See USAHEC, <https://arena.usahec.org/web/arena>.)

<sup>100</sup> Patrick Allen et al., *Observations of the Caravan Guard 89 Exercise*, RAND Note N-3151-A (Santa Monica, CA: RAND Corporation, 1992), <https://www.rand.org/pubs/notes/N3151.html>.

<sup>101</sup> From the Joint Publication Research Service (JPRS), Arlington, VA: (1) *USSR Report, Military Affairs No. 1684*, JPRS 81204, 2 July 1982; (2) *USSR Report, Military Affairs No. 1689*, JPRS 81271, 13 July 1982; (3) *USSR Report, Military Affairs No. 1677*, JPRS 80947, 1 June 1982; (4) *USSR Report, Military Affairs No. 1678*, 15 June 1982; (5) *USSR Report, Military Affairs No. 1725*, JPRS 82379, 3 December 1982 (6) *Soviet Union Military History Journal*, no. 3, March 1987, JPRS-UMJ-87-001, 10 August 1987; (7) *Soviet Union Military History Journal*, no. 3, March 1987, JPRS-UMJ-87-001, 10 August 1987.

<sup>102</sup> Mastny and Byrne, *A Cardboard Castle?*, 449.

<sup>103</sup> *Ibid.*, 409–410.

nuclear weapons first use.<sup>104</sup> However, even when the Warsaw Pact reached the nuclear threshold, it intended to preempt.<sup>105</sup> Only now, it would do so with newly fielded theater nuclear IRBMs rather than tactical and strategic nuclear weapons.

In 1982, the Soviets conducted an exercise that simulated a massive, all-out first nuclear strike on the United States and Western Europe in what Russian media has termed a “seven-hour war.”<sup>106</sup> Diego Ruiz-Palmer revealed later that this exercise involved live-test launches of unarmed Soviet land- and sea-based strategic nuclear ballistic missiles.<sup>107</sup> In SOIUZ-83, the Warsaw Pact postulated that the beginning of the war with NATO would involve a NATO first strike with 2,800 nuclear weapons, followed by a second NATO strike with 2,200 nuclear weapons.<sup>108</sup>

In the last nuclear exercise of the Cold War, NATO CPX WINTEX-89, British forces conducted a nuclear first strike on Warsaw Pact troops that had invaded West Germany. The British wanted to signal the Germans that even if the United States hesitated in employing nuclear weapons in response to a Soviet-led conventional attack, they could rely on their British Allies to uphold NATO’s Article 5 commitment with a nuclear strike. However, the West German military leaders in the exercise, perhaps mindful of the widespread anti-nuclear sentiment in the 1980s and with the subsequent signing of the Intermediate-Range Nuclear Forces (INF) Treaty in 1987, were appalled. They walked out of the Command Post.<sup>109</sup>

It is not jumping to conclusions to recognize the effects that U.S. nuclear exercises had on the heuristic framework of the Soviets for perceiving and deciding during military operations. A long procession of U.S. FTXs and CPXs had demonstrated that the advantages that had accrued to the United States of greater numbers of tactical nuclear

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<sup>104</sup> Arch Shero and Richard Oden, “Exercise Zapad-81,” in *Review of the Soviet Ground Forces*, RSGF 1-82, ed. Betsy Bree (Washington, DC: DIA, Soviet Warsaw Pact Division, Directorate for Research, April 1982), 1–9; John G. Hines, “The Operational Maneuver Group,” in *Review of the Soviet Ground Forces*, RSGF 2-83, ed. Sharon A. Houy (Washington, DC: Defense Intelligence Agency Soviet Warsaw Pact Division, Directorate for Research, August 1983), 1–7.

<sup>105</sup> Hines, *Soviet Strategic Intentions*, 121.

<sup>106</sup> Boris Egorov, “5 Most Impressive and Important Drills of the Soviet Army,” *Russia Beyond*, March 19, 2018, <https://www.rbth.com/history/327837-5-most-impressive-soviet-drills>.

<sup>107</sup> Diego Ruiz-Palmer, “Military Exercises and Strategic Intent Through the Prism of NATO’s Autumn Forge Exercise Series, 1975–1989,” in *Military Exercises: Political Messaging and Strategic Impact*, Research Division Forum Paper 26, ed. Beatrice Heuser, Tormod Heier, and Guillaume Lasconjarias (Rome: NATO Defense College, 2018), 78, <http://www.ndc.nato.int/news/news.php?icode=1157#>.

<sup>108</sup> Mastny and Byrne, *A Cardboard Castle?*, 480.

<sup>109</sup> Beatrice Heuser, “Reflections on the Purposes, Benefits and Pitfalls of Military Exercises,” in *Military Exercises: Political Messaging and Strategic Impact*, Research Division Forum Paper 26, ed. Beatrice Heuser, Tormod Heier, and Guillaume Lasconjarias (Rome: NATO Defense College, 2018), 18, <http://www.ndc.nato.int/news/news.php?icode=1157#>.

weapons, a faster decision cycle, and a capacity to slow the Soviet rate of advance, particularly with ADMs, meant that the Soviets could not advance their empire beyond the German border. As John Hines discovered in his post-Cold War analysis and interviews with former Soviet military leaders, the logic of deterrence led the Soviets intuitively to avoid nuclear war and to prevent the United States from using any nuclear weapons against Soviet forces and territory.<sup>110</sup> Those perceptions also led Marshal Ogarkov to impose significant reforms in the 1980s.<sup>111</sup> However, by the time these reforms began to bear fruit, the United States had demonstrated in exercises—from 1982 on—a capability to defend Europe without having to resort to nuclear weapons.<sup>112</sup> Then, the Soviet Union as we knew it in the Cold War was gone.

## **F. What Cold War Nuclear Exercises Communicated**

The empirical evidence indicates that communicating nuclear intent through military exercises was fraught with uncertainty, ambiguity, deception, and bluff. The intended message was rarely received. Unintended messages abounded. The record reveals three types of cognitive dissonances in nuclear messaging through military exercises.

### **1. Distorted Perceptions of Nuclear Capabilities**

U.S. nuclear exercises convinced Soviet military planners that they would be hard pressed to sustain the rates of advance prescribed in Soviet operational norms. Nevertheless, senior Soviet officials continued to insist on unreasonably high rates of advance. Defense Minister Grechko had the General Staff double the standard in the 1970s to 150 kilometers per day.<sup>113</sup> Aside from the fact that the fairly compartmented German terrain would not likely permit such an advance even if unopposed,<sup>114</sup> apparently no consideration was given for the fact that the troops would have been decimated by the radiological contamination from their own nuclear strikes of the areas that they would have to traverse.<sup>115</sup> The staffs who had to complete those rear area exercises knew that they could not support more than sixty kilometers per day.<sup>116</sup> When these ground-level Soviet planners saw the United States employ ADMs in Europe, they concluded even forty kilometers a day was virtually impossible, and a steady diet of U.S. exercises

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<sup>110</sup> Hines, *Soviet Strategic Intentions*, 13.

<sup>111</sup> *Ibid.*, 122, 206, 221.

<sup>112</sup> *Ibid.*, 58–59.

<sup>113</sup> Hoffenaar and Findlay, *Military Planning for European Theatre Conflict*, 67.

<sup>114</sup> *Ibid.*, 91–92.

<sup>115</sup> *Ibid.*, 77.

<sup>116</sup> *Ibid.*, 67.

employing ADMs, however inelegantly, unwittingly fed that perception throughout the Cold War.

The U.S. Army in Europe fielded two tactical-level atomic weapons that had been developed in the 1950s especially for the European theater: the ADM and the Davy Crockett recoilless rifle. In practical U.S. exercise experience, these weapons were determined to be almost useless, but the Soviets convinced themselves that these weapons were highly effective.<sup>117</sup>

The Davy Crockett had been disclosed publicly in a demonstration for President Eisenhower at Fort Benning, Georgia, in 1960.<sup>118</sup> The eleventh and culminating U.S. atomic live-fire exercise was Operation IVY FLAT, conducted in the summer of 1962. During this exercise, an Infantry-Tank-Artillery force assaulted an objective after firing a war-reserve atomic round from a Davy Crockett recoilless rifle.<sup>119</sup> This event, which was also the last ground-burst atmospheric nuclear test before entry into force of the Partial Test Ban Treaty, was observed by Attorney General Robert F. Kennedy and Chairman of the Joint Chiefs of Staff General Maxwell Taylor.<sup>120</sup>

We know that the Soviets were concerned with the Davy Crockett. One seasoned platoon leader from the 1960s recalled deployment throughout the West German countryside on multiple exercises involving simulated nuclear release and firing in plain view of the public and Soviet Military Liaison Mission observers.<sup>121</sup> By 1967, the Soviets had become concerned with what they saw as the proliferation of the Davy Crockett alongside nuclear artillery. They developed a doctrine for destroying these nuclear systems in a preemptive operational level nuclear strike.<sup>122</sup>

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<sup>117</sup> Central Intelligence Agency, *MILITARY THOUGHT (USSR): The Use of Nuclear Means When Constructing Obstacles During an Operation*, Intelligence Information Special Report (McLean, VA: CIA, 28 June 1974), 6, <https://www.cia.gov/library/readingroom/docs/CIA-RDP10-00105R000100720001-6.pdf>.

<sup>118</sup> “Davy Crockett Adds Nuclear Punch,” *The Army Reservist* 6, no. 5 (July–August 1960): 8.

<sup>119</sup> U.S. Department of Energy, National Nuclear Security Administration, “The U.S. Army Presents MF20 9811,” Ivy Flats Film Report, Video, 17:35, 1962, <https://archive.org/details/IvyFlatsFilmReport>.

<sup>120</sup> U.S. Department of Energy, “Davy Crockett Makes History with a Little Feller at the NTS,” DOE/NV - 1200 - REV 1 (Las Vegas: National Nuclear Security Administration, Nevada Field Office, Office of Public Affairs, August 2013), [https://www.nnss.gov/docs/fact\\_sheets/DOENV\\_1200.pdf](https://www.nnss.gov/docs/fact_sheets/DOENV_1200.pdf).

<sup>121</sup> Waldo Freeman, “Limited Personal Experience with Nucs: Atomic Cannon (‘54) to Alliances’ New Strategic Concept (Nov ‘91) with Davy Crockett and P-5 Course In-Between” (briefing, Alexandria, VA: Institute for Defense Analyses, October 17, 2018).

<sup>122</sup> Central Intelligence Agency, *MILITARY THOUGHT (USSR): Combat with Enemy Tactical Means of Nuclear Attack in Offensive Operations*, Intelligence Information Special Report (McLean, VA: CIA, 25 October 1974), <https://www.cia.gov/library/readingroom/docs/CIA-RDP10-00105R000100890001-8.pdf>.

The Davy Crockett was short-lived in the U.S. Army. In the words of Donn A. Starry, “Davy’s usefulness was even more in question than the nuclear landmine.”<sup>123</sup>

The United States developed the ADM in the early 1960s, believing it would be critical to stopping a Soviet armored advance. U.S. operational planners wanted it employed to channelize the Soviet assault into fewer and narrower avenues of approach where nuclear rocket, missile, and artillery fires could be concentrated.<sup>124</sup> In U.S. exercises, the procedures for getting ADMs emplaced, combined with the release and execution controls imposed on them, led many military planners to conclude that they probably would be used sparingly if at all.<sup>125</sup>

Yet, the Soviets seemed convinced that the United States would employ thousands of ADMs and that they would be highly effective in slowing or even stopping advances by just about every attacking Warsaw Pact Front. Warsaw Pact exercises from the mid-1960s to the early 1980s required staffs to solve ADM problems at each operational echelon. Overcoming ADMs also became mandatory in officer education.<sup>126</sup>

The first time that Warsaw Pact military planners included consideration of how to deal with NATO’s ADM was in exercise NAREW-65.<sup>127</sup> They also tried to deal with the ADM in their January 1967 exercise TROJKA<sup>128</sup> and in LATO-67.<sup>129</sup>

In a 1973 exercise, the advance of two Soviet Armies was halted by detonation of only five ADMs by NATO.<sup>130</sup> A subsequent 1974 exercise dealt with a different NATO ADM tactic involving two ADMs that stopped two Soviet tank battalions.<sup>131</sup> The Soviets’

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<sup>123</sup> General Donn A. Starry, “Fifty Years at the Business End of the Bomb,” unpublished manuscript released to author January 2017.

<sup>124</sup> Adam Rawnsley and David Brown, “The Littlest Boy,” *Foreign Policy*, January 30, 2014, <https://foreignpolicy.com/2014/01/30/the-littlest-boy/>.

<sup>125</sup> General Donn A. Starry, “Atomic Demolition Munitions: Message to Lieutenant General E. C. Meyer, Deputy Chief of Staff for Operations, 5 March, 1979,” in *Press On! Selected Works of General Donn A. Starry, Volume II*, ed. Lewis Sorley (Fort Leavenworth, KS: Combat Studies Institute Press, U.S. Army Combined Arms Center, 2009), 733–734, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p16040coll3/id/190>.

<sup>126</sup> Central Intelligence Agency, *GENERAL STAFF ACADEMY LESSON No. 24a: The Transition of Front Troops to the Conduct of Combat Actions Under the Conditions of Employment of Nuclear Weapons by the Sides*, Intelligence Information Special Report (McLean, VA: Deputy Director for Operations, 23 January 1981), 5. [https://www.cia.gov/library/readingroom/docs/DOC\\_0001197576.pdf](https://www.cia.gov/library/readingroom/docs/DOC_0001197576.pdf).

<sup>127</sup> Smith, “Soviet Concepts of War in Europe,” 4.

<sup>128</sup> Diedrich, “The German Democratic Republic,” 192–193.

<sup>129</sup> Central Intelligence Agency, *Polish Critique of the Warsaw Pact*.

<sup>130</sup> Central Intelligence Agency, “Soviet Concepts for Employment of Nuclear Weapons in a Conflict with NATO--Evidence from Warsaw Pact Military Exercises” (memorandum for Colonel William Odom and Dr. Samuel Huntington, National Security Council, Washington, DC: CIA, 24 March 1978), <https://www.cia.gov/library/readingroom/docs/1978-03-24.pdf>.

<sup>131</sup> *Ibid.*, 7



concern with this weapon and the fact that it showed up as a problem to be solved in so many of their exercises are not clear.<sup>132</sup>

We get an image of the Warsaw Pact view of its ADM problem from a critique of exercise LATO-74 by the Polish Chief of the General Staff, who pointed out that just one frontal axis of advance "... was saturated with [nuclear mines], with NATO clusters totaling 1,145 mine chambers, a density of 8 clusters per 100 square kilometer, or 4 clusters per 1 kilometer of the front in the border zone."<sup>133</sup>

We now know that by 1982, NATO's war plans had been compromised by insider betrayals and extensive East German and Hungarian intelligence collection.<sup>134</sup> One result was the acceleration of Soviet concern over NATO intent to employ nuclear mines as an escalation measure and to slow a Warsaw Pact advance.<sup>135</sup>

## 2. Discerning True Intentions

Soviet exercise behavior communicated a measure of certainty about when they would employ nuclear weapons in a shooting war with NATO and the United States. General Vitaliy Tsygichko misremembered, or misrepresented, his experience in saying, "I do not remember any exercise, or any plan, which envisaged a first strike or an initiation of hostilities by us."<sup>136</sup> Warsaw Pact exercises contradict General Tsygichko.

While the Soviets said they would not be the first to go nuclear, they, in fact, went first in just about every nuclear exercise that they conducted. The fact that their scenarios invariably began with a NATO conventional attack never served to persuade the West that their ambition was anything other than to conquer Western Europe. Although there was a range of uncertainty as to whether it would happen on Day 1, Day 4, or sometime between, the United States and its NATO allies interpreted adversary exercise behavior to indicate the Soviets would go nuclear first, early, and often.

The USSR constructed all its exercise scenarios such that it would have to preempt imminent NATO nuclear strikes with a first strike of its own. In Soviet exercises, NATO always started the fight. For the cover exercise in the 1968 invasion of Czechoslovakia, SUMAVA, the rationale was an impending NATO invasion, as revealed by NATO FALLEX-68. The FALLEX-68 exercise occurred two months after the Warsaw Pact

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<sup>132</sup> Ibid., 5.

<sup>133</sup> Central Intelligence Agency, *Exercise "LATO-74"—A Nuclear War Scenario*, Intelligence Information Special Report (Washington, DC: CIA, 20 October 1978), 60, <https://www.cia.gov/library/readingroom/docs/1978-10-20.pdf>.

<sup>134</sup> Joe Navarro, *Three Minutes to Doomsday: An Agent, a Traitor, and the Worst Espionage Breach in US History* (New York: Scribner, 2017); Fischer, "CANOPY WING," 432, 453.

<sup>135</sup> Mastny and Byrne, *A Cardboard Castle?*, 469.

<sup>136</sup> Ibid., 79.

invasion, but East German military leadership said that FALLEX proved NATO was planning to invade and was stopped only by the Warsaw Pact operation.<sup>137</sup>

Early on, the Warsaw Pact alleged that the United States would attack because of U.S. imperialism.<sup>138</sup> For SOYUZ-75, NATO started the war, “after a sharp aggravation of the military and political situation in Europe . . . .”<sup>139</sup> Sometimes, the United States attacked as a result of revanchist German factions that conspired to lure the U.S. and NATO Allies into an attack to forcibly reunify with East Germany and dominate the subsequent European geopolitical landscape.<sup>140</sup>

In Soviet and Warsaw Pact exercises, no matter what sparked the war, it nearly always escalated to a nuclear exchange within no more than four days, usually between D-Day and D+2.<sup>141</sup> While the Soviet script always said that NATO had decided to go nuclear first and was in the process of executing a strike, for Soviet exercises, the scenarios almost always had the Soviets conducting a preemptive nuclear strike starting the moment their intelligence analysis concluded that a NATO nuclear strike decision was imminent.<sup>142</sup> As a result, Soviet exercises nearly always contained a deception operation intended to mislead NATO military intelligence as to Soviet nuclear intent.<sup>143</sup>

Soviet confidence that they would be able to preempt rested in their near total awareness of NATO and U.S. nuclear strike tactics, techniques, and procedures (TTPs). During NATO exercises, the Warsaw Pact intercepted requests by NATO commanders for permission to use nuclear weapons, monitored authorizations releasing them for use, and identified the delivery systems to be used. These intelligence capabilities attest to Warsaw Pact confidence to preempt NATO.<sup>144</sup>

The Soviet’s message was aimed as much at the Warsaw Pact as at NATO. Benjamin Fischer assessed that many East German intelligence analysts had accurately concluded that Soviet intent was aggressive and that the United States was defensive, but these analysts concealed their assessments from their Soviet masters. Such “insiders” kept their

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<sup>137</sup> Ibid., 36–37, 312–316.

<sup>138</sup> Helms, “MILITARY THOUGHT: Some Conclusions,” 1, 4, 17, 22.

<sup>139</sup> “March 1975: Task for the Operational Command Staff Exercise Soyuz-75 for the 4th Army” (Washington, DC: The Wilson Center, History and Public Policy Program Digital Archive, Cold War International History Project (CWIHP), n.d.), 2, <https://digitalarchive.wilsoncenter.org/document/113511>.

<sup>140</sup> Central Intelligence Agency, *Polish Critique of the Warsaw Pact*, 8.

<sup>141</sup> Smith, “Soviet Concepts of War in Europe,” 10–11.

<sup>142</sup> Central Intelligence Agency, *GENERAL STAFF ACADEMY LESSON No. 24a*, 3, 6–7, 12–13.

<sup>143</sup> Central Intelligence Agency, “1) Relationship of Military Exercises to War Plans; 2) Wiosna-69 Exercise,” Intelligence Information Report (McLean, VA: CIA, 30 July 1982), 3, <https://www.cia.gov/library/readingroom/document/5166d4f999326091c6a60968>.

<sup>144</sup> Smith, “Soviet Concepts of War in Europe,” 8.

analyses to themselves because it contradicted the drumbeat of the official Soviet line that the West was determined to launch an all-out attack on Communism.<sup>145</sup> “In effect, the Warsaw Pact High Command kept two sets of briefing books, one for those at the very top and another for their armed forces, propaganda purposes, and public consumption.”<sup>146</sup> The motivation behind the invariable Warsaw Pact exercise road-to-war scenario was an attempt to conceal their true intent to strike first.

The strategic risk of such a deception campaign is that it can become self-deceiving. Not only did the West never believe that Soviet intentions were defensive, Warsaw Pact exercise behavior belied their rhetorical messaging. The Warsaw Pact’s deception efforts eventually became so unbelievable to themselves that they had to devote substantial information campaigns directed at their own people. All these actions took place even though the Warsaw Pact, by 1981, had in its possession classified U.S. war plans that showed unequivocally the defensive intent of U.S. concepts of operations.

Evidence from Warsaw Pact exercises also sheds new light on the nuclear messaging in the storied 1983 “War Scare,” alleged by many commentators to have been precipitated by NATO nuclear communication exercise ABLE ARCHER-83. The widespread notion that this exercise brought the world closer to nuclear Armageddon, second only to the Cuban Missile Crisis, has been propagated by weak analysis of circumstantial evidence.<sup>147</sup>

In 1990, the President’s Foreign Intelligence Advisory Board (PFIAB) report asserted that the alleged key event indicating that the Warsaw Pact was preparing for war in response to ABLE ARCHER-83 was the alert of a nuclear-capable strike fighter regiment in East Germany.<sup>148</sup> The author of the 1983 National Intelligence Estimate, Fritz Ermarth, challenged that PFIAB conclusion at the time.<sup>149</sup> Ermarth was probably right. As illustrated by Warsaw Pact Exercise SH’CHIT-76, uploading nuclear weapons by selected Soviet Air Regiments was routinely practiced during annual exercises. The 1983 exercise in Poland cited by the PFIAB in 1990 was probably nothing more than a continuation of this routine.

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<sup>145</sup> Fischer, “CANOPY WING,” 436.

<sup>146</sup> *Ibid.*, 437.

<sup>147</sup> Christopher Andrew and Oleg Gordievsky, eds., *Instructions from the Centre: Top Secret Files on KGB Foreign Operations 1975–1985* (London: Hodder & Stoughton, 1991), 67–90. This is the primary source cited by the alarmist interpreters of ABLE ARCHER-83. However, Andrew and Gordievski provide no evidence of Soviet military activity and interpret Soviet intelligence actions as essentially a contrived and self-fulfilling conspiracy theory.

<sup>148</sup> President’s Foreign Intelligence Advisory Board (PFIAB), *The Soviet “War Scare”* (Washington, DC: The White House, February 15, 1990), 8, <https://nsarchive2.gwu.edu/nukevault/ebb533-The-Able-Archer-War-Scare-Declassified-PFIAB-Report-Released/2012-0238-MR.pdf>.

<sup>149</sup> Fritz W. Ermarth, “Observations of the ‘War Scare’ of 1983 from an Intelligence Perch,” in *Parallel History Project on NATO and the Warsaw Pact: Stasi Intelligence on NATO*, ed. Bernd Schaefer and Christian Nuenlist (Washington, DC: PHP Publications Series, 11 November 1993), 27–30, [https://www.files.ethz.ch/isn/108634/04\\_Stasi\\_Intelligence.pdf](https://www.files.ethz.ch/isn/108634/04_Stasi_Intelligence.pdf).

The other side of this coin is that NATO allies, however certain they may have been of Soviet aims, could not be sure among themselves of their own nuclear intentions. The prime example is in Beatrice Heuser's revelation that German military leaders walked out of the WINTEX-89 command post after the British conducted a nuclear strike in response to the Warsaw Pact invasion of West Germany after the United States had not.

### **3. Which Side Had Nuclear Decision Superiority**

Although the Soviets professed to be able to make and execute operational nuclear employment decisions faster than NATO, they constantly second-guessed themselves based on their interpretations of U.S. nuclear exercises. The time required for U.S. forces to request and secure nuclear release authority, prepare the warheads for employment, and subsequently place nuclear fires on targets in a fast-moving exercise is not disclosed. However, U.S. commanders believed that it was difficult and, in large part, not timely. For example, for the 1<sup>st</sup> Infantry Division (Forward) in REFORGER-76, the Commanding General concluded the following:

We were not successful in our efforts to employ nuclear weapons effectively.... Lag time between target planning and target approval is perhaps the most critical problem of all. Target approval often took 12 hours to achieve, and the intervening time period often witnessed major tactical changes.<sup>150</sup>

Yet, the Soviets did not seem to share this perception. They believed that the speed with which U.S. nuclear forces could employ tactical nuclear weapons accurately on key targets was measured in minutes, not hours. This concern with pinpointing the moment in time when NATO would initiate a nuclear strike became something of an obsession with Warsaw Pact intelligence. They observed that in NATO FALLEX-66, the first strike came just fifteen to twenty minutes after the opposing forces representing the Soviets had launched their attack. Such an assessment might be optimistic in terms of how fast an atomic strike could be in fact be executed, but these analysts believed the FALLEX practice was, in fact, a NATO deception operation. Warsaw Pact intelligence benchmarked NATO nuclear exercises at five minutes from order to impact of a NATO nuclear strike.<sup>151</sup>

In a revealing 1967 article, two Soviet colonels wrote of their analysis of Soviet CPX and war games conducted by the Frunze Academy: "... enemy rocket units are capable of delivering a nuclear strike 30 to 60 minutes after receiving the signal ... and that artillery

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<sup>150</sup> Department of the Army, "After Action Report, EXERCISE LARES TEAM" (Headquarters 1<sup>st</sup> Infantry Division Forward, 11 October 1976), 3, C10. (See USAHEC, <https://arena.usahec.org/web/arena>.)

<sup>151</sup> Mastny and Byrne, *A Cardboard Castle?*, 244.

can do the same after 10 to 20 minutes.”<sup>152</sup> In the Soviet General Staff College, the established lesson plan in the 1980s for nuclear strike planning held students to a standard of having a Front nuclear strike package of 380 nuclear weapons delivered by 180 rockets and 200 aircraft within one hour.<sup>153</sup> By 1985, the CIA had assessed that this standard was indeed the Soviet’s nuclear decision cycle time.<sup>154</sup>

The Soviets believed that the United States had decision superiority in tactical nuclear weapons employment. Nevertheless, in their exercises, they communicated a message to the United States that they would be able to execute a preemptive strike. The United States, from its own exercise experience, concluded that NATO would not be able to execute a tactical nuclear strike before the Soviets could launch their first strike. Yet, U.S. exercise behavior continued to practice the execution of a tactical nuclear first strike to halt a Warsaw Pact conventional attack. Such nuclear messaging in exercises was more noise than signal.

## **G. Nuclear Deterrence is War in the Cognitive Domain<sup>155</sup>**

The challenge with conducting exercises to influence others’ perceptions is that one must be proficient at understanding how they perceive things in the first place. It was difficult to do so in the Cold War, even after decades of exercising by both sides and of observing each other’s behaviors. It will be much more challenging today. Yet, it is vital to learn how to perceive and decide accurately on nuclear employment. Deterrence strategy in Great Power Competition requires it.

Roberta Wohlstetter, in her ground-breaking analysis of how the Japanese achieved technical, tactical, operational, and strategic surprise at Pearl Harbor on December 7, 1941, was the first to point out empirically that in the intelligence business, signal not only competes with noise but is, in fact, often overwhelmed by multiple sources of cognitive bias

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<sup>152</sup> Central Intelligence Agency, *MILITARY THOUGHT USSR: The Transition by Troops from Combat Operations with the Exclusive Use of Conventional Means of Destruction to the Use of Nuclear Weapons*, Intelligence Information Special Report (Washington, DC: CIA, 16 April 1974), 5, <https://www.cia.gov/library/readingroom/docs/1974-04-16.pdf>.

<sup>153</sup> Ibid.

<sup>154</sup> Central Intelligence Agency, *Warsaw Pact Tactical Forces: Capabilities and Readiness for Nuclear War*, Research Paper (McLean, VA: Directorate of Intelligence, Office of Soviet Analysis, June 1985), 20–24, <https://www.cia.gov/library/readingroom/docs/1985-06-01b.pdf>.

<sup>155</sup> James Blackwell, “The Cognitive Domain of War,” *International Economy*, Summer 2007, 33–35, [http://www.international-economy.com/TIE\\_Su07\\_Blackwell.pdf](http://www.international-economy.com/TIE_Su07_Blackwell.pdf); James Blackwell, “Deterrence at the Operational Level of War,” *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 30–51, [https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-05\\_Issue-2/Blackwell.pdf](https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-05_Issue-2/Blackwell.pdf).

that stifle the analytic capacity to assess a mass of collected data to discern the operationally critical knowledge.<sup>156</sup>

The nuclear messaging challenge is not simply distinguishing signal from noise by sender and receiver. In fact, the electronic signal-to-noise analogy breaks down entirely. Nuclear messaging is not an electronic phenomenon. It is human behavior. We do not perceive, decide, and act via metal or silicon circuits, diodes, transistors, and capacitors, and we are not governed by Ohm's law. We need to turn to behavioral science to understand how military exercises send nuclear signals.

## 1. Nuclear Heuristics Can Make Us Smart

Classic nuclear deterrence theory was deductive in nature. Cold War theories presumed a rational actor approach to figuring out how to prevent a nuclear war from happening. After 1945, no further instances of nuclear weapons use occurred from which to build a theory of military strategy after the fashion of Thucydides, Clausewitz, Jomini, Mahan, Douhet, or Warden. Therefore, theorists explored a variety of logical and mathematical approaches. Although these methods will not lead us to full understanding of how real humans comprehend nuclear signaling from military exercises, an alternative inductive approach portends greater insights: heuristics.

Gerd Gigerenzer, a psychologist at the Max Planck Institute for Human Development, has led the most extensive research into how humans use heuristics to make effective decisions in the real world.<sup>157</sup> The essence of heuristic decision making is that individuals and organizations often rely on simple heuristics to choose how to act. Indeed, in a departure from Kahneman and Taversky's prospect theory,<sup>158</sup> Gigerenzer finds that "fast and frugal heuristics that embody simple psychological mechanisms can yield inferences about a real-world environment that are at least as accurate as standard linear statistical strategies embodying classical properties of rational judgment."<sup>159</sup> By ignoring some information,

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<sup>156</sup> Roberta Wohlstetter, *Pearl Harbor: Warning and Decision* (Stanford, CA: Stanford University Press, 1962), 392–395.

<sup>157</sup> Gerd Gigerenzer, Peter M. Todd, and the ABC Research Group, *Simple Heuristics That Make Us Smart* (New York: Oxford University Press, 1999); Gerd Gigerenzer and Wolfgang Gaissmaier, "Heuristic Decision Making," *Annual Review of Psychology* 62 (2011): 451–482, <https://www.annualreviews.org/doi/abs/10.1146/annurev-psych-120709-145346>; Gerd Gigerenzer and Henry Brighton, "Homo Heuristicus: Why Biased Minds Make Better Inferences," *Topics in Cognitive Science* 1, no. 1 (2009): 107–143, <https://www.ncbi.nlm.nih.gov/pubmed/25164802>.

<sup>158</sup> In an extensive review of evidence-based research in behavioral economics and other cognitive approaches to nuclear deterrence, Nicholas Wright concludes that evidence-based research is lacking and in need of expansion (see Nicholas D. Wright, *Global Strategy Amidst the Globe's Cultures: Cultures in Individual Cognition, States and the Global System* (London: UCL, December 2019), <https://www.intelligentbiology.co.uk/latest-report>. See also Anne I. Harrington and Jeffrey W. Knopf, eds., *Behavioral Economics and Nuclear Weapons* (Athens: The University of Georgia Press, 2019).

<sup>159</sup> Gigerenzer, Todd, and the ABC Research Group, *Simple Heuristics*, 95.

humans often make more accurate judgments than they do by adding more information and exerting more computational effort, especially under conditions of time urgency and limited information. Applying heuristics allows a real human decision maker to handle greater uncertainty more efficiently and robustly than a purely rational actor who relies on more resource-intensive cognitive strategies.

Field researchers have investigated the heuristics that humans use to solve problems. Each heuristic is comprised of a search rule, which is used to limit the search for information, a stopping rule, which is used when enough information has been gathered to make a choice that is good enough, and a decision rule, which is applied to make that choice. Heuristics have found many applications, including trauma treatment, firefighting, and military decision making.<sup>160</sup> We would benefit from taking such a behavioral science approach to empirical research on understanding deterrence in general and nuclear signaling through military exercises in particular.

Soviet Cold War military doctrine, in fact, explicitly recognized a role for heuristic decision making in operationalizing nuclear missions. The Soviets did so when applying their prescriptive mathematical approach—COFM. Before turning to the tabulation of weapons and forces, commanders were expected to rely on heuristic judgment in developing potential decision paths and then select the most appropriate path for more detailed planning and transmission to subordinate units.<sup>161</sup> Ample evidence from Soviet sources suggests that COFM and heuristic components of military decision making applied to theater nuclear operations.<sup>162</sup>

## 2. Applied Nuclear Heuristics

Despite the absence today of much of the explicit nuclear exercising by the United States and its allies approaching the scale and scope of the Cold War, nuclear messages are being transmitted and received. The Cold War exercise experience should give us caution

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<sup>160</sup> Gigerenzer and Gassmaier, “Heuristic Decision Making,” 457; Gigerenzer, Todd, and the ABC Research Group, *Simple Heuristics*, 3–5; Gary Klein, *Sources of Power: How People Make Decisions* (Cambridge: The MIT Press, 1998), 1, 287.

<sup>161</sup> James K. Womack, “Soviet Correlation of Forces and Means: Quantifying Modern Operations” (master’s thesis, U.S. Army Command and General Staff College, 1990), 46, 52, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a227427.pdf>; G. Biryukov, “Book Stresses Psychological Aspect of Commander’s Battle Decisions,” in *Translations on USSR Military Affairs No. 1301*, JPRS 69807 (Arlington, VA: U.S. Joint Publications Research Service, 16 September 1977), 5–6, [https://archive.org/details/DTIC\\_ADA376160](https://archive.org/details/DTIC_ADA376160).

<sup>162</sup> Maj Gen Engr-Tech Serv I. Anureyev, “Determining the Correlation of Forces in Terms of Nuclear Weapons,” in *Selected Readings from Military Thought 1963–1973: Studies in Communist Affairs*, Vol. 5, Pt. 1, ed. Joseph D. Douglass, Jr. and Amoretta M. Hoeber (Washington, DC: U.S. Government Printing Office, 1982), 161–172; Col B. Khabarov et al., “Methodology for Determining the Correlation of Nuclear Forces,” in *Selected Readings from Military Thought 1963–1973: Studies in Communist Affairs*, Vol. 5, Pt. 1, ed. Joseph D. Douglass, Jr. and Amoretta M. Hoeber (Washington, DC: U.S. Government Printing Office, 1982), 234–243.

about how exercises send nuclear messages and just what messages others are receiving. Understanding human heuristic perception and decision-making approaches can contribute to more effective message sending and understanding and aid in making responsible nuclear escalation decisions. Two initiatives would address these concerns.

#### **a. Rehabilitate nuclear exercise programs**

Every nuclear-armed state must critically review its exercise program with a view to rehabilitating its nuclear messaging through exercises. There is nothing “routine” about operationalizing nuclear missions; however, without a regular program of exercising nuclear capabilities, nuclear-armed states will not only fail in their responsibility for stewardship of their nation’s nuclear deterrent, but they will also send an explicit message about the credibility of nuclear deterrence in their national security strategy. During the Cold War, exercising nuclear capabilities let the other side know that its nuclear capabilities were real although intentions to use these capabilities were purposefully ambiguous or duplicitous.

Consider how Russia and the United States have perceived each other’s nuclear exercises in recent years. Russia’s approach—apparent in several recent Russian exercises—has been to signal an intention to escalate to nuclear weapons use as a means of coercion.

Former U.S. national security official Frank Miller has revealed that shortly after hostilities ended in the 2008 Georgia War, Russia initiated a nuclear alert when the United States deployed three warships that the Russians mistakenly presumed had nuclear weapons on board. The Russians initiated this action despite U.S. assurances that these warships were on a humanitarian relief mission into the Black Sea.<sup>163</sup> Polish analyst Jacek Durkalec asserts that the 2008 Russo-Georgian War initiated a pattern of Russian nuclear escalation behavior<sup>164</sup> that would be more nuanced and more effectively applied in subsequent operations in Crimea and Ukraine.

The Russians encumbered their annexation of Crimea and invasion of Ukraine with nuclear posturing through various types of exercises. They conducted “snap drills” as a signal of escalatory potential and to provide training and force development value. These drills were unannounced in advance but were highly publicized on execution. Soon after reoccupying Crimea, the Russians deployed nuclear-capable Tu-22 bombers to the air base there. Moreover, within a year of reoccupying Crimea, Russia declared its right to store

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<sup>163</sup> Franklin C. Miller, “Keynote, 2015 USSTRATCOM Deterrence Symposium,” La Vista, NE, July 29, 2015, <http://www.stratcom.mil/Media/Speeches/Article/986412/keynote-2015-usstratom-deterrence-symposium/>.

<sup>164</sup> Jacek Durkalec, *Nuclear-Backed “Little Green Men:” Nuclear Messaging in the Ukraine Crisis* (Warsaw: The Polish Institute of International Affairs, July 2015), 18, <https://www.stratcomcoe.org/jdurkalec-nuclear-backed-little-green-men-nuclear-messaging-ukraine-crisis>.



nuclear weapons on the peninsula as it “leaked” indications that it was refurbishing a former Soviet nuclear weapons storage facility. During these events, Russian forces also conducted live-fire exercises with simulated nuclear weapons, including a particularly escalatory move in September 2014 when Russian bombers maneuvered to forward “launch boxes” for simulated cruise missile strikes on the United States. Russian forces also began executing new types of nuclear exercises, such as bomber missions over Arctic regions previously not routinely patrolled.<sup>165</sup>

Russian military exercises during this period included various harassment tactics: violations of national airspace, transiting international civil airspace with transponders turned off, close encounters at sea, dangerously low passes over Western warships, and unsafe aerial maneuvers perilously close to NATO aircraft. In some cases, Russians simulated nuclear bombing runs at NATO countries, including one in January 2015 when two Tu-95 aircraft approached British airspace armed with plainly visible nuclear cruise missiles. In another harassment operation, two Tu-95s simulated a nuclear cruise missile strike on the United States from a “launch box” over the Labrador Sea.<sup>166</sup>

The U.S. and NATO nuclear messaging has been muted by comparison. In 2012, the United States began nuclear-capable bomber missions in support of Baltic allies.<sup>167</sup> The United States followed these Baltic flights with the deployment of B2 and B52 bombers to Fairford, United Kingdom, in June 2014 and again in 2015.<sup>168</sup> The U.S. Strategic Command (USSTRATCOM) conducted its annual GLOBAL LIGHTNING and GLOBAL THUNDER exercises as planned, and the U.S. Air Force conducted its regular nuclear weapons systems evaluation program tests with a Minuteman III ICBM launch from Vandenberg Air Force Base (California) and surrogate nuclear bombs tested by nuclear-capable aircraft at instrumented ranges.

NATO’s nuclear-burden-sharing members continue to conduct nuclear proficiency exercises and have expanded the participation of non-nuclear members in an affiliated program for Support of Nuclear Operations With Conventional Air Tactics (SNOWCAT) by newer members.<sup>169</sup> NATO raised its nuclear messaging in its annual STEADFAST NOON

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<sup>165</sup> Hans M. Kristensen and Robert S. Norris, “Nuclear Notebook: Russian Nuclear Forces, 2016” *Bulletin of the Atomic Scientists* 72, issue 3 (2016): 125–134, <https://doi.org/10.1080/00963402.2016.1170359>.

<sup>166</sup> Kristensen and Norris, “Nuclear Notebook”, 167; Durkalec, *Nuclear-Backed “Little Green Men,”* 9–13.

<sup>167</sup> “Allied Landing Demonstrates Crisis Response Efficiency,” *The Baltic Times*, June 13, 2016, <https://www.baltictimes.com/news/articles/31379/>.

<sup>168</sup> “RAF Fairford Recap: Bombers Deploy to UK for Training Operations,” 501<sup>st</sup> Combat Support Wing, June 23, 2014, <https://www.501csw.usafe.af.mil/News/Article-Display/Article/727359/raf-fairford-recap-bombers-deploy-to-uk-for-training-operations/>.

<sup>169</sup> Ludo Mennes, “2017 Exercise Steadfast Noon Kleine Brogel AB,” January 28, 2018, <https://www.northernskiesaviation.com/back-office-1/2017-exercise-steadfast-noon-kleine-brogel-ab/>; Hans M. Kristensen, “NATO Nuclear Exercise Underway With Czech and Polish Participation,” October 17, 2017, <https://fas.org/blogs/security/2017/10/steadfast-noon-exercise/>; Julian E. Barnes,

strike evaluation by including Poland for the first time in a SNOWCAT role in October 2014.<sup>170</sup>

In accordance with the three “noes” of the 1997 NATO-Russia Founding Act,<sup>171</sup> NATO and U.S. nuclear messaging has been de-escalatory. Secretary General Anders Fogh Rasmussen reiterated the three “noes” in May 2014, just two months after Russia’s annexation of Crimea. NATO’s rhetorical reassurance was met four months later with the Russian military incursion into Ukrainian territory in the Donbass area.

Perhaps the U.S. intent is to keep its nuclear messaging low key in the face of Russian nuclear sabre rattling, Chinese stealthy nuclear advances, and North Korean nuclear swagger. This intent would reflect a game-theoretic strategy of “Relative De-Escalation”—always responding by lowering the level of its response to some fraction below the assertiveness level of the adversary.<sup>172</sup> Some analysts argue that such U.S. and NATO nuclear messaging communicates weakness, not resolve.<sup>173</sup> If so, maybe NATO should also exhibit capability to escalate and imply intent to do so in its nuclear exercise program.

With nuclear exercises by Russia, China, and North Korea, the 2018 U.S. Nuclear Posture Review directs a new program of nuclear exercises by the United States:

Combatant Commands and Service components will ... plan, train, and exercise to integrate U.S. nuclear and non-nuclear forces and operate in the face of adversary nuclear threats and attacks ... demonstrate with allies our joint commitment to deterrence through military exercises.<sup>174</sup>

Matthew Kroenig and Jacek Durkalec<sup>175</sup> recommend injecting nuclear scenarios into NATO’s Crisis Management Exercises to show greater credibility of nuclear resolve.

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“NATO Launches Its Main Nuclear Drill, Showcasing Its Defenses,” *Wall Street Journal*, October 16, 2017, <https://www.wsj.com/articles/nato-launches-its-main-nuclear-drill-showcasing-its-defenses-1508155670>.

<sup>170</sup> Durkalec, *Nuclear-Backed “Little Green Men,”* 20.

<sup>171</sup> “The member States of NATO reiterate that they have no intention, no plan, and no reason to deploy nuclear weapons on the territory of new members nor any need to change any aspect of NATO’s nuclear posture or nuclear policy and do not foresee any future need to do so.” See North Atlantic Treaty Organization, “Founding Act on Mutual Relations, Cooperation and Security between NATO and The Russian Federation, Signed in Paris, France,” 27 May 1997, last updated 12 October 2009, [https://www.nato.int/cps/en/natohq/official\\_texts\\_25468.htm](https://www.nato.int/cps/en/natohq/official_texts_25468.htm).

<sup>172</sup> Jonathan Proctor, “A Quantitative and Spatial Model of Escalation” (master’s thesis, Creighton University, 2014), 50, <https://dspace2.creighton.edu/xmlui/bitstream/handle/10504/74263/A%20Quantitative%20and%20Spatial%20Model%20of%20Escalation.pdf;sequence=1>.

<sup>173</sup> Matthew Kroenig and Jacek Durkalec, “NATO’s Nuclear Deterrence: Closing Credibility Gaps,” *Polish Quarterly of International Affairs* 25, no. 1 (2016): 41–49.

<sup>174</sup> Department of Defense, *Nuclear Posture Review 2018*, 21, 37.

<sup>175</sup> Kroenig and Durkalec, “NATO’s Nuclear Deterrence.”

However, a Cold War lesson suggests that nuclear signaling through military exercises must be prudently tailored to the messages intended and to how the adversaries will interpret nuclear exercises. NATO, for example, might do as Kroenig and Durkalec suggest only to find out that doing so would reconfirm in the 21<sup>st</sup> century the old Soviet conclusion that NATO had nuclear decision superiority. Is there a 21<sup>st</sup> century analog to exercising the ADM capability that would so captivate Russian military attention that it would impose a disproportionate level of effort on their perceptions and planning?

This research suggests that the nuclear message one intends to send with an exercise is not likely to be the message that adversaries or allies receive. The primary purpose of nuclear operations in military exercises should be to provide troops with practice in TTPs while providing commanders and staffs experience in the military art of nuclear operations. Demonstrating those capabilities are a prerequisite to communicating a credible nuclear operations capability. However, beyond capabilities, notwithstanding adversary distorted perceptions, nuclear messaging about intentions should be a broadly stated goal. Exercises cannot be finely tuned to send a specific signal as to intent.

Nuclear-armed states rehabilitating their nuclear exercise programs should also work to acquire a better understanding of how their exercises communicate nuclear messages. Likewise, they should improve their understanding of their adversaries' nuclear intentions. Military professionals did not do this well during the Cold War. While intelligence sources and methods have improved the collection of raw data on capabilities, discerning intentions remains largely intuitive—indeed heuristic. Advances in behavioral science research can provide improvements in this aspect of operationalizing nuclear missions.

#### **b. Change deterrence theory: From open skies to open minds**

Deterrence theory must change from the Cold War paradigm. We need to expand empirical behavioral science research and development to understand human heuristic decision making as it applies to nuclear signaling. Thomas Schelling, Richard Betts, Albert Wohlstetter, Bernard Brodie, Herman Kahn, and all the other giants of Cold War thinking about the unthinkable recognized the role of human psychology in calculations of nuclear deterrence but could only begin to include it in their analysis. Now is the time to add to that knowledge and advance our understanding by opening scientific windows into how the mind works when contemplating nuclear weapons employment.

One promising approach has been pioneered by Joshua Kerzer at Harvard University.<sup>176</sup> Building on his work toward a behavioral theory of resolve in international relations, he has modeled the role of heuristic perception and decision making based on

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<sup>176</sup> Joshua D. Kerzer, *Resolve in International Politics* (Princeton: Princeton University Press, 2016); Michelle Nicholasen, "In Conversation with Joshua D. Kerzer," *Centerpiece* 32, no. 2 (Spring 2018), [https://wcfia.harvard.edu/publications/centerpiece/spring2018/feature\\_kerzer](https://wcfia.harvard.edu/publications/centerpiece/spring2018/feature_kerzer).

extensive empirical data. Starting from the premise that much of human decision making is heuristic, after the fashion of the Gerd Gigerenzer school of fast, frugal heuristics, Kerzer and his colleagues show empirically that military measures perceived to be “costly” (e.g., mobilization of military forces) have greater influence on perceptions of national security interests.<sup>177</sup> This research suggests that military exercises involving nuclear weapons capabilities are relatively costly actions that send messages. We need, therefore, to reexamine current approaches to signaling nuclear messages through military exercises to discern the content of such messaging in the minds of senders and receivers.

One of Gigerenzer’s collaborators, Peter Todd, concurs that further research on heuristics would be useful in understanding nuclear deterrence and that the key would be to pick the right heuristics and to know when and when not to rely on them.<sup>178</sup> In a 2014 report, the National Research Council endorsed further research into the appropriate application of the heuristic approach, including a suggested model for doing so as a starting point for developing research hypotheses.<sup>179</sup> The survey by Erik Gartzke and Matthew Kroenig shows that the International Relations Community is receptive to the application of quantitative methods and must now “make up for lost time” in doing so.<sup>180</sup> Such methods should be applied to conduct field research on human perception and decision making in nuclear matters. We have plenty of nuclear exercise data with which to begin.

The United States could embark on such a research program in its own government-sponsored behavioral science community. However, since nuclear risks are global, why not also invest in collaborative transnational research that would benefit the entire international security system? Several research centers have demonstrated the capacity to engage scientists from rival states. The Stockholm International Peace Research Institute (SIPRI) and the Max Planck Institute for Human Cognitive and Brain Sciences, for example, have such a track record. The International Atomic Energy Agency (IAEA) does not support behavioral science research, but its program of Coordinated Research Activities<sup>181</sup> offers

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<sup>177</sup> Joshua D. Kerzer, Jonathan Renshon, and Keren Yarhi-Milo, “How Do Observers Assess Resolve?” *British Journal of Political Science* (July 15, 2017), <https://doi.org/10.1017/S0007123418000595>; “Joshua D. Kerzer,” <http://people.fas.harvard.edu/~jkertzer/>.

<sup>178</sup> National Research Council, *U.S. Air Force Strategic Deterrence Capabilities in the 21st Century Security Environment: A Workshop Summary* (2013) (Washington, DC: The National Academies Press, 2013), 31, <https://doi.org/10.17226/18337>.

<sup>179</sup> National Research Council, *U.S. Air Force Strategic Deterrence Capabilities: An Assessment of Tools, Methods, and Approaches for the 21st Century Security Environment* (Washington, DC: The National Academies Press, 2014), 37 (footnote 33), 66, 73, 76, 125, <https://doi.org/10.17226/18622>.

<sup>180</sup> Erik Gartzke and Matthew Kroenig, “Nukes with Numbers: Empirical Research on the Consequences of Nuclear Weapons for International Conflict,” *Annual Review of Political Science* 19 (2016): 401, <https://www.annualreviews.org/doi/abs/10.1146/annurev-polisci-110113-122130>.

<sup>181</sup> “IAEA Coordinated Research Activities,” International Atomic Energy Agency (IAEA), <https://www.iaea.org/services/coordinated-research-activities>.

an experienced model for how states can collaborate on nuclear-related projects of common interest in promoting transparency.

Collaborative research on heuristics of nuclear decision making might also prove to be a fruitful avenue for progress toward renewed nuclear arms control. Former U.S. State Department official Frank Rose has argued that

“[f]or the last 25 years, we were focused on a strategic stability framework that was fundamentally about reducing the number of nuclear weapons. We are at the end of that era and probably won’t return to the reductions process for the foreseeable future.... We need to think about it [arms control] differently.”<sup>182</sup>

Collaborative research into the behavioral science of nuclear decision making could explore paths toward new forms of confidence-building measures that would make nuclear messaging more effective while producing mutual confidence about nuclear intent. A potentially productive start would be to convene a trilateral (the United States, Russia, and China or the United States and Asia-Pacific Allies) Track 1.5 dialogue toward that end.

## **H. Summary**

Archival documents and oral histories have disclosed how the United States and the Soviet Union operationalized their nuclear missions during the Cold War. Today’s nuclear-armed states have been arrogant and ignorant in understanding how military exercises send nuclear messages. As nuclear-armed states rehabilitate their nuclear exercise programs for the era of Great Power Competition, they also need to reinvent their approach for sending and receiving nuclear messages from military exercises. To do that, new collaborative research programs should be established to understand human perception and decision making that are not based on lore, but, instead, are based on knowledge.

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<sup>182</sup> Kate Hewitt and Bruce Jones, eds., “Managing Risk: Nuclear Weapons in the New Geopolitics: A Brookings Interview” (Washington DC: The Brookings Institution, February 2019), 3, [https://www.brookings.edu/wp-content/uploads/2019/02/FP\\_20190211\\_nonproliferation\\_interview.pdf](https://www.brookings.edu/wp-content/uploads/2019/02/FP_20190211_nonproliferation_interview.pdf).

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# Appendix A. Illustrations

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## Appendix C. Abbreviations

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AAR	After Action Report
ADM	Atomic Demolition Munition
ALF	Atomic Live Fire
BEWT	Battlefield Exercise Without Troops
C2	command and control
CEU	Central European University
CIA	Central Intelligence Agency
CMBG	Canadian Mechanized Brigade Group
COFM	Correlation of Forces and Means
CPX	Command Post Exercise
CSS	Center for Security Studies
DIA	Defense Intelligence Agency
DNA	Defense Nuclear Agency
DOS	Department of State
DTRA	Defense Threat Reduction Agency
EXOPORD	Exercise Operation Order
FTX	Field Training Exercise
IAEA	International Atomic Energy Agency
IC	intelligence community
ICBM	intercontinental ballistic missile
INF	Intermediate-Range Nuclear Forces
IRBM	intermediate-range ballistic missile
JPRS	Joint Publications Research Service
LOGEX	Logistics Exercise
M.C.	Military Committee
MCS	Maneuver Control System
MIT	Massachusetts Institute of Technology
NATO	North Atlantic Treaty Organization
NIE	National Intelligence Estimate
NPR	Nuclear Posture Review
NSSM	National Security Study Memorandum
OMG	Operational Maneuver Group
OSD	Office of the Secretary of Defense
PFIAB	President's Foreign Intelligence Advisory Board
PHP	Parallel History Project
PIR	Photographic Interpretation Report
REFORGER	Return of Forces to Germany
SIPRI	Stockholm International Peace Research Institute

SNOWCAT	Support of Nuclear Operations With Conventional Air Tactics
TTPs	tactics, techniques, and procedures
U.S.	United States
UCL	University College London
UK	United Kingdom
USAEUR	United States Army Europe
USAHEC	United States Army Heritage and Education Center
USSR	Union of Soviet Socialist Republics
USSTRATCOM	U.S. Strategic Command

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14. ABSTRACT Military exercises provide practice in the art of war. They also send messages of political resolve. The Cold War record of signaling nuclear intent through military exercises reveals that the sender and the receiver misperceive each other's messages most of the time. The principal utility of nuclear exercises is to develop and maintain the military proficiency of the forces involved. Nuclear-armed states also intend their exercise programs to communicate the messages they want others to understand. To ensure that messages are sent, received, and understood as intended, the international security community needs to provide better basic research into the human behavioral nature of messaging, perceptions, and decision making as they apply to nuclear deterrence. Such research would not only make nuclear messaging through military exercises more competent, it could also lead to a less risky global security environment through development of new mutual confidence-building measures.					
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