

Early Warning Systems and the Role of Humans

Jordan Waldroop

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“...we must continue to place our confidence in the human element of our missile attack warning system.”

-Harold Brown, US Secretary of Defense (1977-1981)

Introduction

When military personnel receive an alert from an early warning system, there are many decisions to be made in minutes. These decisions include determining which bases and personnel put on high-alert, sending the alert up the chain of command – especially whether this alert is credible enough to inform the President – and making a quick plan of defense. Another aspect of receiving an attack alert from an early warning system is to determine whether the threat alert is credible. Early warning systems are the result of software designed to have indicators inputted at a determined threat level, of which the computers run a statistical analysis on and subsequently issue a threat report. The intelligence analysts who work with the raw data, develop the software, and analyze the final threat reports are some of the most integral components of strategic intelligence. They also carry the weight of the world on their shoulders. If an analyst messes up at any point, there is a decent chance that a false alert will be issued. If not correctly identified as a false alert up the chain of command, or even by one of many at the same level of command, then there could be catastrophic consequences.

This thesis looks at the role of humans in early warning systems and strategic intelligence. This includes looking at many examples of false alerts issued by warning systems, and in each instance, did the role of humans help or hinder, or even possibly both, the events that followed the false alarm. Before looking at these examples, it is first essential to understand precisely what early warning systems and strategic intelligence are, and why the intelligence community is so dependent on this information.

To accurately portray the crucial human role in warning systems, this thesis will look at the Soviet Union's Operation RYaN and the Able Archer '83 incident, some notable incidents with the US-Canada joint operation under NORAD (North America Aerospace Defense Command), and the 2018 Hawaii incident. This thesis will also have a quick look at the Global Information and Early Warning System (GIEWS) ran by the UN, which predicts food supply shortages and supply chain issues, providing an interesting and different perspective on early warning systems.

In early warning systems, the role of humans can be three-fold: first, it is human software developers that have created and continuously maintain warning system technology; second, at the time when the indicator information is gathered, quantified, and the raw data put into the early warning system; and third, when the threat level and warning information has already been run by the computer and is put in front of an analyst for interpretation, along with deciding whether the threat is credible enough to be acted upon by the appropriate persons. Warning systems many times receive the initial raw data from satellites and radar systems, such as when incoming missiles are detected; though, sometimes, the indicator's input into the system is done through obtaining human intelligence (HUMINT). One of many examples of HUMINT that cannot be done by satellite detection is when the intelligence community is monitoring a region in civil unrest, and suddenly a state actor begins making military preparations to attack an ally, such as mobilizing troops or disrupting another regions supply chain. The number of indicators that must be continuously monitored, observed, reported, and input into predictive warning systems is incredible as the indicator list that was created by the Soviets in their RYaN system contained over 270 indicators.¹

¹ "Committee for State Security (KGB), 'Indicators to Recognize Adversarial Preparations for a Surprise Nuclear Missile Attack,'" November 26, 1984, History and Public Policy Program Digital Archive, BStU, MfS, HA II, Nr. 11792, S. 25-38. Translated by Bernd Schaefer. <https://digitalarchive.wilsoncenter.org/document/119338>.

With technological capabilities today, it is impossible to speculate on how many indicators are observed and reported continuously.

Early warning systems are a country's first line of defense when it comes to an impending attack and therefore is a crucial technological advancement that deserves recognition in the protection of non-combatant populations. The role of humans at the front and back end of warning systems is integral to maintaining the primary goal of military intelligence: survivability and protection of the civilian population.

Brief Overview of Cold War Era Nuclear Deterrence Theory

During the Cold War, there were periods of high and low tensions between the United States and the Soviet Union. In the period of détente in the 70s, there were attempts at arms reduction and maintaining peace through a variety of agreements, though this period of détente did not last as long as many hoped. The US doctrine throughout the entirety of the Cold War was nuclear deterrence theory and mutually assured destruction. In response to the Cold War warming back up, the United States military ramped up its live wargaming, and in response to increasing paranoia about a first strike by the US, the Soviets developed a human intelligence-based predictive indication and warning system. The primary question addressed in this paper is how did command post exercises, otherwise known as 'wargames,' in conjunction with a human intelligence-based predictive indication and warning system, nearly cause nuclear deterrence theory to fail? In the discussion of this matter, it is essential to remember that many of the resources available for study are American, with significantly fewer sources being from the KGB and the Stasi. However, the release of KGB, Politburo, and Stasi documents are becoming more available than in the past.

To address this, it is first important to recognize the misunderstanding of nuclear deterrence theory between the US and the Soviet Union. As time has passed, deterrence theory has transformed. However, during the period that discussed in this paper, the 'version' of deterrence theory that will be applied is based on a 1984 review of the differing schools of thought with deterrence theory and Secretary Robert McNamara's ideology of 'assured destruction,' as they are most relative to the topic.² The US subscribed to the view that nuclear deterrence theory is based upon the rationality of leaders and their fear of destruction, complemented by the knowledge of mutual vulnerability. US doctrine of deterrence theory depends on the assumption that the leaders involved are rational, as any irrational leader would not be afraid of the nuclear destruction of their homeland and citizens. The US assumed that "sane" Soviet leaders would mirror-image, or think and behave in the same way, as their US counterparts. This ideology that Soviet leaders subscribed to the US definition of rationality was incorrect.³

The knowledge of mutual vulnerability to retaliation was considered a stabilizing factor and was the engine behind deterrence theory. The increased defense of the US against a Soviet attack can be considered a destabilizing factor as it might deny Soviet confidence in a retaliatory threat. Given those points, the US had to be willing to accept mutually assured destruction and base their defensive designs as not to disrupt the balance. Throughout the Cold War, many of those making decisions failed to fully realize that the Soviets decision-making processes were based on Marxist-Leninist dogma and never thought in the same terms of Western deterrence theory and the concept of stability.⁴

² Colin S. Gray, "Nuclear Strategy: The Case for a Theory of Victory," *International Security* 4, no.1 (1979): 54-87, doi:10.2307/2626784; Keith B. Payne, "Cold War Deterrence Theory and Practice," in *The Fallacies of Cold War Deterrence and a New Direction*, (Lexington: University Press of Kentucky, 2001), 17-38.

³ Keith B. Payne, "Cold War Deterrence Theory and Practice," 17-38.

⁴ Ibid.

As tensions increased and the arms race continued, the US and USSR both continued working to prepare for the event of a nuclear first strike by the other. One US military preparation was the conduction of live (non-computer simulation) wargames. Live wargaming is the actual maneuver of forces and the application of game theory to depict armed conflict to gain insight and simulating decisions made by opposing parties, which may affect the future state.⁵ A Soviet reaction to the increased tensions was the development of human intelligence-based predictive indication and warning system under the code name "Operation RYaN."

Operation RYaN and Able Archer '83

RYaN was the Russian acronym for *Raketno Yadernoe Napadenie* when translated to English means "nuclear missile attack." RYaN, while ultimately unsuccessful and the primary driving factor of the War Scare of 1983, could have wholly accelerated and altered the course of predictive indication and warning systems, strategic intelligence, and concentrated warning systems if it was executed and operated correctly. RYaN continued being operational until at least April 1989 and likely until the fall of the Soviet Union, though after the Able Archer 83 incident, it seems that the reports were much more accurate.⁶ To understand the War Scare of 1983 and the development of RYaN, it is first necessary to realize some of the specific circumstances that contributed to these events.

Starting in the 1960s and pre-détente, the United States learned that the Soviet Union was mass-producing intercontinental ballistic missiles (ICBMs). In January 1967, President Lyndon B. Johnson announced that the Soviet Union was constructing an Anti-Ballistic Missile (AMB)

⁵ "Intelligence Warning Terminology," Joint Military Intelligence College, accessed November 17, 2019, <https://www.hsdl.org/?view&did=7443>.

⁶ Nate Jones, *Able Archer 83: The Secret History of the NATO Exercise That Almost Triggered Nuclear War*, (New York: The New Press, 2016), 52-53.

defense system to protect Moscow.⁷ Referring back to the elements of nuclear deterrence theory, as seen through an American perspective, the development of this defense system would likely be considered a destabilizing factor and threatened to throw the balance of power off. In order to realign the balance, President Johnson requested the start of strategic arms limitations talks (SALT) with the Soviet Union.⁸ In 1967, Johnson and Soviet Premier Alexei Kosygin met to discuss the future limitation of either side, further developing offensive or defensive systems.⁹

One of the first steps towards détente and nuclear disarmament was the signing of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), signed by three of the original nuclear-weapon states (NWS), namely being the United States, United Kingdom, and the Soviet Union, as well as being signed by other non-nuclear states.¹⁰ The NPT states, amongst other items, that to prevent a “wider dissemination of nuclear weapons,” all signor states must: cooperate with the International Atomic Energy Agency (IAEA) and accept safeguards set by the IAEA; nuclear weapon states agree not to transfer any nuclear weapons to a non-nuclear-weapon state, directly or indirectly; non-nuclear-weapon states agree not to receive nuclear weapons or ask for assistance in the development of nuclear weapons; and agree to negotiations for nuclear disarmament.¹¹ The NPT does allow for the development of “research, production and use of nuclear energy for peaceful purposes” and for the sharing of new developments in the nuclear field, if used for

⁷ Office of the Historian, “Strategic Arms Limitations Talk/Treaty (SALT) I and II,” accessed November 17, 2019, <https://history.state.gov/milestones/1969-1976/salt>.

⁸ Ibid.

⁹ Ibid.

¹⁰ Office of the Historian, “Strategic Arms Limitations Talks/Treaty (SALT) I and II”; “Treaty on the Non-Proliferation of Nuclear Weapons (NPT),” opened for signature July 1, 1968, *United Nations*, accessed November 17, 2019, <https://www.un.org/disarmament/wmd/nuclear/npt/text>; United Nations, “Treaty on the Non-Proliferation of Nuclear Weapons (NPT),” accessed November 17, 2019, <https://www.un.org/disarmament/wmd/nuclear/npt/>.

¹¹ Ibid.

peaceful purposes.¹² The NPT is still in effect today with many more States as parties to the agreement and is considered a landmark arms agreement.¹³

Two years later, leadership had changed, and formal SALT talks began. Finally, on May 26, 1972, President Nixon and Secretary Brezhnev signed the ABM Treaty and an interim SALT agreement while Nixon was in Moscow.¹⁴ Some of the SALT I terms dictated that the parties (the United States and the Soviet Union) would not construct additional ICBMs and limit submarine-launched ballistic missiles (SLBM).¹⁵ As SALT I was an interim treaty, SALT II negotiations started in November 1972, intending to be a long-term treaty with "broad limits on strategic offensive weapons systems."¹⁶ SALT II negotiations took an astounding seven years to reach an agreement, and President Carter and Secretary Brezhnev signed the agreement on June 18, 1979.¹⁷ SALT II was pending ratification in the Senate when on January 3, 1980, Carter asked the Senate to delay the ratification due to the Soviet invasion of Afghanistan; despite being unratified, international law dictated that the parties were still legally bound "until it had made its intentions clear not to become a party to the Treaty."¹⁸ Presidents Carter and Reagan in 1980 and 1982, respectively, stated the US would comply with the Treaty as long as the Soviet Union would also, to which the Soviet Union agreed.¹⁹ President Reagan would later announce on multiple occasions that the Soviet Union had violated the Treaty, but the United States would "...continue to exercise

¹² Ibid.

¹³ United Nations, "Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

¹⁴ Office of the Historian, "Strategic Arms Limitations Talks/Treaty (SALT) I and II"; "Interim Agreement Between The United States of America and The Union of Soviet Socialist Republics On Certain Measures With Respect to the Limitation of Strategic Offensive Arms (SALT)," opened for signature May 26, 1972, accessed November 17, 2019, <https://fas.org/nuke/control/salt1/text/salt1.htm>.

¹⁵ "Interim Agreement Between The United States of America and the Union of Soviet Socialist Republics On Certain Measures With Respect to the Limitation of Strategic Offensive Arms (SALT)."

¹⁶ "Treaty Between The United States of America and The Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms (SALT II)," U.S. Department of State, signed on June 18, 1979, accessed November 17, 2019, <https://2009-2017.state.gov/t/isn/5195.htm>.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Ibid.

the utmost restraint, while protecting strategic deterrence...” and asked the Soviets to join in exercising “...truly mutual restraint.”²⁰ Again referring back to the elements of deterrence from the US perspective, the Soviets were not on the same page – the Soviets were not concerned with damage, like the US, in so much as defeat.²¹

When President Carter stopped the ratification of SALT II by the Senate due to the Soviet invasion of Afghanistan, this was a turning point in the Cold War, and many recognize this as when the détente era was ending.²² In response to the invasion, the United States boycotted the 1980 Olympics in Moscow, as well as a ban on US grain exports to the Soviet Union.²³ Reagan took office in January 1981, but he had vocalized his opinion of the Soviet Union during his campaigning, and his opinion of the Soviet Union and communism did not change while he was in office.²⁴ One of Reagan's most notable speeches was on March 8, 1983, at the National Association of Evangelicals in Orlando, FL. In this speech, Reagan calls the Soviet Union an "evil empire" with "aggressive impulses."²⁵ In a Stasi document on a meeting between Minister Mielke and KGB Chairman Andropov (who would later become General Secretary of the USSR), on July 11, 1981, Andropov calls Reagan's speeches "vulgar" and mentions Reagan at various points.²⁶ This again points to the theory that the Politburo was not viewing deterrence theory through the

²⁰ Ibid.

²¹ Gray, “Nuclear Strategy,” page 61.

²² “Strategic Arms Limitations Talks/Treaty (SALT) I and II”; “U.S.-Soviet Relations, 1981-1991,” Office of the Historian, accessed November 24, 2019, <https://history.state.gov/milestones/1981-1988/u.s.-soviet-relations>.

²³ “U.S.-Soviet Relations, 1981-1991.”

²⁴ Annelise Anderson, “Remarks on Ronald Reagan, Intelligence, and the End of the Cold War,” Hoover Institution, accessed November 17, 2019, <https://www.hoover.org/research/remarks-ronald-reagan-intelligence-and-end-cold-war>; Reagan Library, “Reagan Library Topic Guide – Soviet Union,” accessed November 17, 2019, <https://www.reaganlibrary.gov/sites/default/files/digitallibrary/topicguides/sovietunion.pdf>.

²⁵ Ronald Reagan, “Presidential Address: National Association of Evangelicals,” Change Your World, Orlando, March 8, 1983, accessed at <https://www.reaganlibrary.gov/sites/default/files/digitallibrary/smf/speechwriting-researchoffice/box-085/40-533-5708464-085-014-2017.pdf>, pg. 16.

²⁶ “Stasi Note on Meeting Between Minister Mielke and KGB Chairman Andropov,” July 11, 1981, History and Public Policy Program Digital Archive, Office of the Federal Commissioner for the Stasi Records (BStU), MfS, ZAIG 5382, p. 1-19. Translated from German for CWIHP by Bernd Schaefer. <https://digitalarchive.wilsoncenter.org/document/115717>.

same lens as the Americans. The Soviet intelligence agency, the KGB, and the German Democratic Republic intelligence agency, the Stasi, made a formal agreement of cooperation on December 6, 1973, which was necessary to the implementation of Operation RYaN in the near future.²⁷

In the same meeting, Andropov asks, "why the imperialists were initially in favor of détente and are now coming out against it..." and that when the US agreed to détente, they thought that it would further their international objectives but realized "maintaining the policy of détente will benefit us ... and cause greater damage to them... they have attempted ... to abandon ... détente (increase of anti-Sovietism, Reagan's electoral campaign, etc.)"²⁸ Additionally, Andropov predicted that the motivations of the United States were to "prepare for war but it is not willing to start a war... they strive for military superiority ... then declare 'checkmate' against us without starting a war... we will not allow it."²⁹ This is one example of miscommunication between the US and the Soviet Union based on a disagreement on fundamental principles (e.g., capitalism vs. communism/socialism). This is also one of the first documents showing that Andropov had fears regarding the US and the changing of the "international correlation of forces" and to gain "superiority over us [Soviets]."³⁰

Beginning in the early days of the Reagan Administration, the US conducted psychological operations (PSYOPS) to evaluate Soviet technology, such as their satellites and early warning systems and did so by at times crossing into Soviet territory.³¹ This threw the Soviets off-balance

²⁷ "Agreement on Cooperation between the Stasi and the KGB, 6 December 1973," December 06, 1973, History and Public Policy Program Digital Archive, Office of the Federal Commissioner for the Stasi Records (BSTU), MfS, MfS, ZAIG 13730, pp. 1-15. Translated from German for CWIHP by Bernd Schaefer. <https://digitalarchive.wilsoncenter.org/document/115715>.

²⁸ "Stasi Note on Meeting Between Minister Mielke and KGB Chairman Andropov," July 11, 1981.

²⁹ Ibid.

³⁰ Ibid.

³¹ Jones, *Able Archer* 83, 26-27; Peter Grier, "Able Archer," *Air Force Magazine*, September 2014, <http://www.airforcemag.com/MagazineArchive/Magazine%20Documents/2014/September%202014/0914archer.pdf>; Command History Division, Office of the Joint Secretary, "Commander In Chief: U.S. Pacific Command History,"

and raised internal tensions, as documented in the above conversation between Andropov and Mielke as one example of this fear. In response to this, Andropov formulated the idea for “measures to strengthen intelligence work in order to prevent a possible sudden outbreak of war by the enemy.”³² While not mentioned by name, this ‘intelligence work’ refers to RYaN, which was implemented in May 1981.³³

Logistically, Operation RYaN was an extensive and prestigious program within the KGB. According to Stasi documents released in recent years, the KGB created approximately 300 various positions “...so that RYaN operatives could report on and monitor incoming intelligence and implement the real-time ‘transmission and evaluation’ of reported indicators showing the likelihood of a Western first strike.”³⁴ KGB operatives were given orders of a “permanently operative assignment” to “uncover any plans in preparation by the main adversary [USA] for RYAN and to organise a continual watch to be kept for indications of a decision [for] ... immediate preparations being made for a nuclear missile attack.”³⁵ A "summarizing catalogue" of the indicators that operatives were to report on was published on November 26, 1984, by the KGB, consisting of over 270 indicators divided into five different focus areas: political, military, activities of intelligence services, civil defense, and economical.³⁶

Camp H.M. Smith: 1984, accessed November 17, 2019, https://nautilus.org/wp-content/uploads/2012/01/c_eightythree.pdf.

³² KGB Chairman Yuri Andropov to General Secretary Leonid Brezhnev, “Report on the Work of the KGB in 1981,” May 10, 1982.

³³ Bernd Schaefer, et al., “Forecasting Nuclear War,” Wilson Center, last modified November 13, 2014, <https://www.wilsoncenter.org/publication/forecasting-nuclear-war>.

³⁴ Jones, *Able Archer* 83, 13.

³⁵ “Permanent Operational Assignment to uncover NATO preparations for a nuclear missile attack on the USSR,” KGB to London Residency, February 17, 1983, accessed at <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB426/docs/9.Permanent%20Operational%20assignment%20to%20uncover%20NATO%20preparations%20for%20a%20nuclear%20missile%20attack%20on%20the%20USSR-February%20201983.pdf>

³⁶ Schaefer, "Committee for State Security (KGB), 'Indicators to Recognize.'"

Upon Moscow receiving reports from operatives of the indicators observed, “a large computer model in the Min[istry] of Defense ... calculate[d] and monitor[ed] the correlation of forces ... to assign numbers and relative weights.”³⁷ During the President’s Foreign Intelligence Advisory Board’s 1990 review of the 1983 War Scare, Operation RYaN was described as “... the creation of a special KGB unit to manage a computer program (the VRYAN model) that would objectively measure the correlation of forces and warn when Soviet relative strength had declined to the point that a preemptive Soviet attack might be justified... [and] when the US had achieved decisive military superiority”³⁸ Though the United States had more comprehensive knowledge about RYaN in 1990, the US and UK intelligence communities were aware of RYaN in the 1980s thanks to Oleg Gordievsky, a Soviet defector and double-agent for the British.³⁹ The US documents released regarding the situation have been so heavily redacted that at this time, it is unknown when exactly in the 80s that the West’s intelligence communities became aware of the program.

To add to the Soviet paranoia that the US was preparing for a nuclear attack on the USSR, the Soviets were already aware that Lockheed Martin would be delivering Pershing II missiles to West Germany in late 1983, which had a range of 1,500 miles, which exceeded the distance necessary to hit Moscow.⁴⁰ According to Lockheed Martin and NASA, the Pershing II’s could destroy Soviet “hard targets, including command-and-control bunkers and missile silos.”⁴¹ The

³⁷ Jones, *Able Archer* 83, 13.

³⁸ President’s Foreign Intelligence Advisory Board, “The Soviet ‘War Scare,’” February 15, 1990, Top Secret UMBRA GAMMA WNINTEL NOFORN NOCOTRACT ORCON, vi & viii.

³⁹ President’s Foreign Intelligence Advisory Board, “The Soviet ‘War Scare,’” viii.

⁴⁰ “The Pershing Missile: Peace Through Strength,” Lockheed Martin, accessed November 17, 2019, <https://www.lockheedmartin.com/en-us/news/features/history/pershing.html>; “Missile, Surface-to-Surface, Pershing-II,” National Air and Space Museum, last modified March 29, 2016, accessed November 17, 2019, <https://airandspace.si.edu/collection-objects/missile-surface-surface-pershing-ii>.

⁴¹ Ibid.

Pershing II's were also expected to be able to land in European Russia from Germany in under six minutes, giving minimal time for Soviet warning, much less preparation.⁴²

The Soviets were so motivated to have a predictive indicator and warning system because other Soviet early warning systems were failing to detect invasions and were producing false alarms.⁴³ Prior to the War Scare in November of 1983, there were two severe incidents of failure in Soviet technology that had consequences of their own besides the simple fact that the Soviet technology was faulty. The first incident occurred on September 1, 1983, when the Soviet Union shot down Korean Air Lines flight 007, killing all 269 souls on board.⁴⁴ With the PSYOPs that were being conducted by the United States in Soviet airspace, such as FLEETEX 83-1, combined with Soviet technology unable to identify whether or not this was a civilian aircraft without setting eyes on the aircraft played a part in this disaster.⁴⁵ It is important to mention, though, that there is a level of fault that lies with the crew of KAL 007, inasmuch as they deviated off the flight plan by more than 200 miles, crossing into two different sensitive areas of Soviet territory.⁴⁶

The second instance that Soviet technology almost led to a disastrous end was on September 27, 1983. At Serpukhov-15's early warning monitoring station, there were reports from one of the Soviet Oko satellites that Minuteman intercontinental missiles were heading towards the Soviet Union from the United States.⁴⁷ There were seven Oko satellites in orbit at that time,

⁴² Ben B. Fischer, "A Cold War Conundrum: The 1983 Soviet War Scare," CIA, September 1997, accessed at <https://www.cia.gov/library/readingroom/docs/19970901.pdf>.

⁴³ Jones, *Able Archer* 83, 28.

⁴⁴ Jones, *Able Archer* 83, 28; Alexander Dallin et al., "BLACK BOX: KAL 007 AND THE SUPERPOWERS: KAL FLIGHT 007: THE HIDDEN STORY," *Los Angeles Times* (1923-1995), April 21, 1985, <http://proxy195.nclive.org/login?url=https://search.proquest.com/docview/154161311?accountid=14968> (accessed November 23, 2019).

⁴⁵ Asaf Degani, "Intelligent Systems Division," NASA, accessed November 17, 2019, <https://ti.arc.nasa.gov/m/profile/adegani/Crash%20of%20Korean%20Air%20Lines%20Flight%20007.pdf>; Command History Division, "Commander In Chief," 401-10; Jones, *Able Archer* 83, 28.

⁴⁶ Degani, "Intelligent Systems Division."

⁴⁷ Jones, *Able Archer* 83, 28.

with over a dozen previously failures.⁴⁸ In the minutes following the alerts being received by Serpukhov-15, the on-duty officer, Colonel Stanislav Petrov, decided to relay that the alerts were false alarms.⁴⁹ Petrov said that he made this decision out of ‘gut instinct’ that the US was not trying to start a nuclear war with the Soviet Union and decided to essentially not react at all to the alerts.⁵⁰ Eventually, it was determined that the Oko satellite had again failed and was issuing the alerts based off of sunlight reflecting off of clouds.⁵¹ The Colonel’s gut saved the world from entering World War III and is a perfect example of how human interference in computer alerts is unwaveringly integral to operating early warning systems.

In 1983, Andropov, the mind behind the implementation of Operation RYaN, was very aware of how miscalculation on the part of either party could result in an accidental start to a nuclear war. It has been reported that in a conversation with Hans-Jochen Vogel, Andropov indicated that through a simple mistake that Armageddon could be started, though he only suggested that this would be caused by American action.⁵² This conversation is not able to be accessed remotely or online, though, as the Russian government has not given the National Archives permission to publish the document publicly.⁵³ On June 2 of the same year, during a meeting with Averell Harriman, former US Ambassador to the Soviet Union, Andropov acknowledged that "this war may perhaps not occur through evil intent, but could happen through miscalculation."⁵⁴ It seems fair to assume that Andropov was highly aware of the sensitivities that

⁴⁸ Ibid.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Jones, *Able Archer* 83, 29; Notes of a Meeting between Yuri Andropov and Hans-Jochen Vogel, January 11, 1983, Secret, accessed November 17, 2019, <https://nsarchive2.gwu.edu//dc.html?doc=5028359-Document-07-Notes-of-a-Meeting-between-Yuri>.

⁵³ Ibid.

⁵⁴ Memorandum of Conversation Between General Secretary Yuri Andropov and Averell Harriman, CPSU Central Committee Headquarters, Moscow, 3:00 p.m. June 2, 1983, 2-3.

surrounded US-Soviet relations and how one simple “miscalculation” could bring the world to its knees. This awareness would prove to be important as November 1983 approached, though Andropov did not realize how right he was.

Operation RYaN, established in May 1981, was well underway in November 1983 when the US and NATO initiated Able Archer 83. Able Archer 83 was a "culmination of SACEUR's [Supreme Allied Commander Europe] annual AUTUMN FORGE exercise series," though the Autumn Forge 83 After Action Report does not mention Able Archer as one of its exercises.⁵⁵ Able Archer 83 was a live military exercise, or more simply, a wargame, that took place from November 7-11, 1983.⁵⁶ Able Archer consisted of 3 days of “low spectrum” conventional play followed by two days of ‘high spectrum’ nuclear warfare, being called “primarily a nuclear procedures exercise” and could be considered an example of active deception as defined by the Joint Military Intelligence College’s Intelligence Warning Terminology handbook.⁵⁷

Soviet anxiety and paranoia had been increasing throughout the Autumn Forge 83 exercise, as it was more extensive than it had been in past years, including the movement of approximately 40,000 troops to Western Europe, with 19,000 of those being American who were airlifted under radio silence, and the United States transferring approximately 1,500 tons of cargo to Europe.⁵⁸ Autumn Forge 83 After Action Report states that the exercises involved were: Cold Fire, Crested Cap, Display Determination, Oksboel, and Reforger; Reforger was the largest and most extensive

⁵⁵ “Exercise Able Archer 83 After Action Report 1 December 1983 | National Security Archive,” accessed November 17, 2019, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB427/docs/7.%20Exercise%20Able%20Archer%2083%20After%20Action%20Report%201%20December%201983.pdf>; “Autumn Forge 83 After Action Report 1 February 1984 | National Security Archive,” accessed November 23, 2019, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB427/docs/4.Autumn%20Forge%2083-%20Final%20After%20Action%20Report.%201%20February%201984.pdf>.

⁵⁶ “Exercise Able Archer 83 After Action Report 1 December 1983 | National Security Archive.”

⁵⁷ Ibid.

⁵⁸ Jones, *Able Archer 83*, 29; Nate Jones, “Countdown to declassification: Finding answers to a 1983 nuclear war scare,” *Bulletin of the Atomic Scientists*, 47-57, doi: 10.1177/0096340213508630; Fischer, “Cold War Conundrum.”

of these exercises.⁵⁹ When Able Archer began, operatives in the West began sending flash alerts indicating that NATO bases had gone on alert and troops were being mobilized, and though those observations were not exactly correct, those reports were entered into the RYaN system as indicators.⁶⁰ Of the indicators reported throughout Able Archer 83, there were at least four of the ten “main measures/indicators of immediate preparations for a nuclear missile attack in the military area” that this author has identified with a high degree of certainty.⁶¹

The UK Ministry of Defense noted after the end of Able Archer that if NATO was attempting to scale back the level of operations during the wargame to indicate to the Soviets that it was, in fact, just an exercise and not an attack, that the Soviets did not receive the signal.⁶² In part, Nate Jones of the National Security Archives argues that Soviet military doctrine said that “a nuclear attack could be ... obscured by war games or military exercises,” and that the Soviet military consistently had concerns about American *maskirovka* (deception), though many in the Soviet Union and East Germany thought that Soviet paranoia was getting the best of Soviet leadership, particularly Andropov.⁶³ When the GRU and KGB received the flash alerts from their operatives, Moscow and the Warsaw Pact started mobilizing their own forces, including loading planes in East Germany and Poland with bombs, missile launchers placed on high-alert, and putting nuclear submarines under the Arctic ice to remain undetected.⁶⁴

Because there are no minutes available from Politburo meetings or Warsaw Pact documents regarding this specific incident and some give little weight to the claims of Oleg

⁵⁹ “Autumn Forge 83 After Action Report.”

⁶⁰ Jones, “Countdown to Declassification,” 50; Jones, *Able Archer 83*, 31.

⁶¹ “Committee for State Security (KGB), ‘Indicators to Recognize Adversarial Preparations for a Surprise Nuclear Missile Attack.’”

⁶² Jones, *Able Archer 83*, 30.

⁶³ Jones, *Able Archer 83*, 31-32.

⁶⁴ Atomic Heritage Foundation, “Nuclear Close Calls: Able Archer 83,” accessed November 18, 2019, <https://www.atomicheritage.org/history/nuclear-close-calls-able-archer-83>.

Gordievsky's reports from within the Soviet Union, what actually happened on the Soviet side of the War Scare is unknown/secret, and assumptions based on the information available is all that can be made. Some historians have argued that the "War Scare" was simply Soviet propaganda and that it never actually happened; that Soviet leadership never received the warnings from RYaN during Able Archer.⁶⁵ The 1984 CIA Special National Intelligence Estimate (SNIE) concluded that "Soviet leaders do not perceive a genuine danger of imminent conflict or confrontation..." and "[r]ecent Soviet 'war scare' propaganda ... do[es] not reflect authentic leadership fears of imminent conflict."⁶⁶ Though the SNIE were very certain in their conclusions, the SNIE did include the statement that in the event their judgments were wrong, there was "...some uncertainty as to current Soviet leadership perceptions ... and by our inability at this point to conduct a detailed examination of how the Soviets might have assessed recent US/NATO military exercises and reconnaissance operations."⁶⁷

These claims are disputed by reports of Soviets, such as from Commander Victor Tkachenko, who was a member of a crew in a nuclear silo that was placed on raised combat alert awaiting the green light for launch. This is also corroborated by Colonel-General Viktor Yesin, who stated he was highly confident that the "chief of the General Staff of the USSR, Marshal Nikolai Ogarkov, participated in the alert from a central control bunker near Moscow."⁶⁸ The SNIE insistence in 1984 that the 1983 War Scare never really happened was challenged by a report by the President's Foreign Intelligence Advisory Board in 1990. The 1990 report describes in great detail where the SNIE erred, particularly in the fact that they did not accept nor analyze every

⁶⁵ Jones, *Able Archer* 83, 35.

⁶⁶ Central Intelligence Agency, Special National Intelligence Estimate, "Implications of Recent Soviet Military-Political Activities," May 18, 1984, Top Secret, iii.

⁶⁷ Central Intelligence Agency, "Implications of Recent Soviet Military-Political Activities," iv.

⁶⁸ Jones, *Able Archer* 83, 35-36.

possible scenario for the evidence found in comparative risk analysis, especially that which contradicted their initial conclusions.⁶⁹ The report challenges the US ideology of mirror-imaging and rebukes US consideration of Soviet doctrine and interpretation of US and international actions.⁷⁰ This one of the first major governmental reports to assert that in 1983 US-Soviet relations were on a "hair trigger" and that it would be ill-advised to presume that the Soviet Union would not act "...from misunderstanding or malevolence, in ways that puts the peace in jeopardy."⁷¹

The issue of misunderstanding and miscalculation between the Soviet Union and the US is one that is repeated throughout the 80s and is the essence of how relations got to the brink of nuclear war and nearly caused deterrence theory to fail. Of course, there are many contributing factors that lead to the major misunderstandings and miscalculations, and they occurred on both sides of the Iron Curtain; the Soviets had excessive paranoia about US intentions and the US never gave thought to the fact that the Politburo could possibly have a different perspective on international relations. The RYaN/Able Archer '83 scare is a shining example of how both the warning systems and humans can be horrifically wrong, but it is the human role that is the true safeguard in the relationship.

In addition to the lack of evidence on the Soviet side of the War Scare, the United States has gone to great lengths to avoid releasing information about Able Archer 83 and the War Scare. Nate Jones of the National Security Archive fought a legal battle with the US Government for over ten years to have the formerly classified documents declassified; upon receipt of the documents, there are still many redactions. In addition, NATO has released very little information regarding

⁶⁹ President's Foreign Intelligence Advisory Board Report, "The Soviet 'War Scare,'" February 15, 1990, accessed November 17, 2019 at <https://www.archives.gov/files/declassification/iscap/pdf/2013-015-doc1.pdf>, ix-xiii.

⁷⁰ Ibid.

⁷¹ President's Foreign Intelligence Advisory Board Report, "The Soviet 'War Scare,'" xiii.

the War Scare. Thanks to the release of the US documents, we are now able to come to a more educated assumption about how the events of 1983 played out.

Furthermore, when looking at RYaN outside of the events of 1983 and looking at it from a technological point of view, it is worth noting that even though there were alerts set off from incorrect reporting of indicators, RYaN was an interesting and revolutionary system. During the Cold War, NATO also used an indication and warning system to warn of “strategic attack and track developments.”⁷² While RYaN used an extensive list of political, military, activities of intelligence services, civil defense, and economic, NATO states that their system primarily focused on military indications that were mostly quantitative in nature.⁷³ Because of “changes in the security environment at the end of the Cold War,” NATO altered its indicator-based warning system, actually broadening the scope of indicators, the actors contributing to the input of indicators, and developed their New Intelligence Warning System (NIWS).⁷⁴ In NATO’s NIWS, the alerts are based on the “informed judgment of analysts” rather than the “mechanical measurement of multiple, precisely defined and specific events.”⁷⁵ This again reiterates the importance of the integral role humans play in operating early warning systems.

Using NIWS as an example and point of comparison, it is relatively safe to say that one of the biggest issues with RYaN was less human interpretation. This may be because analysts were reporting what they were expected to report rather than what they actually believed because of the hierarchy, worry of repercussions, and general environment of the Politburo and KGB, which can be considered hostile and not an arena where it is safe to dissent from the leadership’s expectations.

⁷² John Kriendler, “Anticipating crises,” NATO Review, accessed November 14, 2019, <https://www.nato.int/docu/review/2002/issue4/english/art4.html>.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Ibid.

Despite this, RYaN can be considered relatively successful for the duration that it existed within the Soviet Union, coming to an end at the fall of the USSR, especially given the fact that it was early in the days of intelligence and a predictive indication and warning system was a very revolutionary idea.⁷⁶ Since NATO, for obvious reasons, is protecting their trade secrets regarding their own indication and warning system, it is unknown which party's system was developed first. Regardless, these are the two earliest examples of this type of system that this author has been able to identify. The US had its NORAD system well before the time of RYaN's creation, but at the time, it was primarily based on satellite and radar readings rather than the input of indicators. It is relatively safe to assume that both NATO and the USSR were continuously developing and correcting their methodology as they went.

It is worth pointing out that Operation RYaN was announced in May 1981 – but the technology had not been built yet – and given the relatively short amount of time from May 1981 to November 1983, there had been little time to work out the kinks of the system and too much reliance was placed on the decision made by computer technology rather than a human's critical analysis of the alerts being produced. The 80s were a time of computer and technological development which was relatively new to all of the world, unlike today where technology that could not have even been imagined in the 80s is in the palm of our hands; there should have been weight given to the fact that computer systems like RYaN were revolutionary and technology was moving into a new frontier.

Without having full access to RYaN documents from sources within and outside the US, it is hard to determine where exactly the program went wrong, particularly in 1983. Was it the technology itself (or lack thereof); was it false/inaccurate indicator reporting by operatives; was it

⁷⁶ Jones, *Able Archer* 83, 52-53.

the lack of human critical analysis; or was it a critical human analysis that was suppressed by the fear of repercussion from authority? In this author's opinion, it is a combination of all of these elements, in addition to the paranoia, miscommunication, and miscalculation between the parties previously discussed.

The failure of nuclear deterrence theory almost happened because of the convergence of many elements: miscommunication and misunderstanding; miscalculation; false alerts from a new type of technology that had been given very little time to be fully developed; extreme Soviet paranoia; and an abundance of other smaller contributing factors that slowly built up to give us the War Scare of 1983. Many agree that November 7-11, 1983, was the closest that the world had come to nuclear war since the Cuban Missile Crisis.⁷⁷ While the world as we know it is lucky that a nuclear war wasn't started, this is an important lesson for anyone interested in this field should be aware of and educated on, and with the release of new documents, it is easier to reach education conclusions on the War Scare of 1983 and the successes and failures of Operation RYaN.

North American Aerospace Defense Command (NORAD)

The North American Aerospace Defense Command (NORAD) is a joint operation between the US and Canadian military, whose mission is “aerospace warning, aerospace control and maritime warning in the defense of North America.”⁷⁸ An important aspect of NORAD is that the commander of NORAD is responsible to both the US President and the Canadian Prime Minister, which brings about another level of assurance that no decision will be made in haste in regards to

⁷⁷ Jones, *Able Archer* 83, 34, 54; Christopher Andrew and Oleg Gordievsky, *KGB: The Inside Story of Its Foreign Operations from Lenin to Gorbachev, 1975-1985*, (New York: Harper Collins, 1991), 605.

⁷⁸ “North American Aerospace Defense Command,” Fact Sheet Article View, North American Aerospace Defense Command, last modified April 25, 2013, <https://www.norad.mil/Newsroom/Fact-Sheets/Article-View/Article/578770/north-american-aerospace-defense-command/>.

the missions of NORAD.⁷⁹ The origins of NORAD, like so many other programs, is rooted in the Cold War.

A product of the Air Defense Command under the US Air Force, the first “defensive air shield” program was created in 1948.⁸⁰ As the Cold War began getting warm, the program was consolidated into the Continental Air Defense Command (CONAD) under the Navy, Army, and Air Force, though the Air Force played the largest role in CONAD.⁸¹ Headquartered at Ent AFB in Colorado, the Air Force provided interceptor aircraft, planned upgrades, and developed and operated early warning radar sites and systems.⁸² After many years of discussions between the US and Canada, in 1957 a plan was put in place to create NORAD, located at Ent AFB in Colorado Springs, Colorado, and was formally announced as an operational bi-national command on May 12, 1958.⁸³ In 1966, NORAD moved operational command to the infamous Cheyenne Mountain Complex in Colorado.⁸⁴ During the time in which NORAD was being created, Soviet technology was rapidly advancing as well, and in response, the USAF developed space-surveillance satellites and missile warning systems; these systems became operational under NORAD.⁸⁵

The technological advancements done under NORAD are impressive, but there were flaws, like any other groundbreaking technology. A plan to revamp NORAD computers was formulated in 1968, but in May 1981, there was still much to be desired; the plan to upgrade what was called

⁷⁹ “NORAD History,” North American Aerospace Defense Command, last modified May 2016, <https://www.norad.mil/About-NORAD/NORAD-History/>.

⁸⁰ Office of the Command Historian, “A Brief History of NORAD,” North American Aerospace Defense Command, May 13, 2016, https://www.norad.mil/Portals/29/Documents/History/A%20Brief%20History%20of%20NORAD_May2016.pdf?ver=2016-07-07-114925-133, 4.

⁸¹ Ibid.

⁸² Ibid.

⁸³ Ibid., 5

⁸⁴ Comptroller General of the United States, General Accounting Office, “NORAD’s Missile Warning System: What Went Wrong?”, Report to the Chairman, Committee on Government Operations, House of Representatives, May 15, 1981, <https://www.gao.gov/assets/140/133240.pdf>.

⁸⁵ Office of the Command Historian, “A Brief History of NORAD,” 6.

the 427M system was over three years late and \$80 to \$100 million over budget.⁸⁶ Under the 427M system, there were at least three significant false alerts sent out – November 9, 1979, June 3, 1980, and June 6, 1980.⁸⁷ All three occurred in the midst of the Cold War and could have easily resulted in the US starting a nuclear war due to an erroneous alert being raised.

The first significant false alert issued by the NORAD computer system occurred on November 9, 1979, where “false indications of a mass raid were caused by inadvertent introduction of simulated data into [the NORAD computer system].”⁸⁸ Secretary of Defense Harold Brown subsequent issued a report to President Carter stating that at no point during the incident were strategic forces activated and the situation was identified and contained quickly, and the malfunction was reassuring due to “the redundancy of indicators, responsible human judgment and adequacy of safeguards in a very short decision time frame.”⁸⁹

Looking further into what an “inadvertent introduction of simulated data” means in regards to the November 1979 incident, it is known through now declassified documentation that a “war game” or test scenario tape was mistakenly uploaded to the live warning system rather than into the testing system, causing a report to be issued that a strategic attack was about to hit US soil.⁹⁰ Though the false alarm triggered a threat assessment conference to be convened after the fact, the false alarm incident was wrapped up in about six to eight minutes from the time of alert to the

⁸⁶ Comptroller General, “NORAD’s Missile Warning System: What Went Wrong?”

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Harold Brown to President Jimmy Carter, “NORAD False Alarm,” November 20, 1979, Top Secret, Excised Copy, <https://nsarchive2.gwu.edu/dc.html?doc=6796163-National-Security-Archive-Doc-07-Secretary-of>.

⁹⁰ Brown to Carter, “NORAD False Alarm”; “False Warning of Soviet Missile Attacks Put U.S. Forces on Alert in 1979-1980,” National Security Archive, last modified March 16, 2020, <https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2020-03-16/false-warnings-soviet-missile-attacks-during-1979-80-led-alert-actions-us-strategic-forces>; “History of ADCOM/ADC(U), 1 January-31 December 1979,” Aerospace Defense Command, n.d., Secret, excised copy, accessed March 20, 2020, <https://nsarchive2.gwu.edu/dc.html?doc=6796169-National-Security-Archive-Doc-13-Aerospace>.

determination it was incorrect.⁹¹ This event is significant because although it didn't make its way up the chain of command to the President on the morning it occurred, it is a perfect example of how one small mistake can have unforeseen consequences.⁹²

Though the mistake began with the human introduction of test scenario data into the live warning system, reports seem to indicate that some blame was placed on the 427M system.⁹³ The reason this is speculated is because of the creation of a \$16 million off-site testing facility capable of software development and system stress testing outside of the live system to avoid a reoccurrence.⁹⁴ There is another recollection in which it was suggested that it was more than a mistake, as the NORAD analysts lacked knowledge of the system's complexity nor the consequences of testing in relation to operations.⁹⁵ In one report, it was stated that "the system must have redundancies built in and that human judgment played a crucial role in such circumstances," providing evidence that the role of humans in early warning systems is integral to the accurate and proper functioning of warning systems.⁹⁶

In this instance, we see both the pros and cons of human interaction with the operational virtual environment. If the technicians wouldn't have mistakenly loaded the test scenario into the system and if they would have continued watching the program run, then the situation could have been averted completely; but on the other hand, if the more senior officials at NORAD and the bases that the alert was transmitted to wouldn't have been aware enough to realize that this was

⁹¹ National Security Archive, "False Warning."

⁹² Brown to Carter, "NORAD False Alarm"; National Security Archive, "False Warning."

⁹³ Comptroller General, "NORAD's Missile Warning System: What Went Wrong?"; Aerospace Defense Command, "History of ADCOM/ADC(U)."

⁹⁴ Comptroller General, "NORAD's Missile Warning System: What Went Wrong?"

⁹⁵ Aerospace Defense Command, "History of ADCOM/ADC(U)."

⁹⁶ Ibid.

indeed a test scenario, then there may have been more negative consequences than the scrutiny by news outlets, senior intelligence officials, and even prompted Soviet leader Leonid Brezhnev.⁹⁷

Brezhnev scolded President Carter for the false alarm, but Brezhnev was even more concerned with the fact that the false alarm had not reached Secretary of Defense Brown nor the President, and felt that “it turns out that the world can find itself on the brink of a precipice without the knowledge of the President or of other US leaders.”⁹⁸ Even further, Brezhnev didn’t accept the reported story that it was a computer failure, but rather “it is clear that in the final analysis appropriate decisions were made by people,” truly underscoring the important role that humans play in the handling of warning system alerts.⁹⁹ The truly ironic portion of the message relayed from Brezhnev to Carter was, “...a false signal of nuclear missile attack did take place... what kind of mechanism it is which allows a possibility of such incidents?”¹⁰⁰ As stated earlier, the Soviets would put the world much closer to the precipice of nuclear war only a few years later with the RYaN/Able Archer 83 incident.

The second and third serious incidents of NORAD false alerts happened only three days apart – on June 3 and 6, 1980. These two false alerts occurred because of a faulty computer chip that reportedly only cost about 46 cents to replace, and with tens of millions of dollars in the

⁹⁷ Aerospace Defense Command, “History of ADCOM/ADC(U)”; Richard Halloran, Special to The New York Times, “Senators Report False Warnings Of Soviet Strikes: 151 of the Norad Alarms Called Relatively Serious,” *New York Times*, October 29, 1980; A.O. Sulzberger Jr., Special to The New York Times, “Error Alerts U.S. Forces To a False Missile Attack: No B-52’s Ordered Aloft,” *New York Times*, November 11, 1979; USSR General Secretary Leonid Brezhnev to President Jimmy Carter, “Brezhnev Message to President on Nuclear False Alarm,” U.S. State Department, November 14, 1979, Secret, <https://nsarchive2.gwu.edu/dc.html?doc=6796159-National-Security-Archive-Doc-03-State>.

⁹⁸ Brezhnev to Carter, “Brezhnev Message to President.”

⁹⁹ Ibid.

¹⁰⁰ Ibid.

NORAD budget, these alerts were indeed avoidable.¹⁰¹ The computer chip error that caused the June 3 and 6 false alerts started writing numbers into blank spaces that typically were the indication of a test.¹⁰² The test communications transmissions would typically read along the lines of “000” ICBMs (or other types of missiles) had been launched, but with this computer error, the zeros began to be replaced with “2,” so the first erroneous transmission read that 002 SLBMs were on their way, then that transmission was replaced by 220 SLBMs, then again with 2,200 SLBMs.¹⁰³ While the November 1979 alert had not reached senior officials, the June 3, 1980 alert was rapidly sent up the chain of command, waking National Security Advisor Zbigniew Brzezinski around 2:30 A.M. to a frantic phone call informing him of the 220 SLBMs, which was then followed by a second call alerting him to the updated number of 2,200 SLBMs, and then a third call was made to Brzezinski informing him it was a false alert due to the computer glitch.¹⁰⁴

Due to the glitch, one of the steps taken to remediate the problem was the replacement of blank warning messages with standard communications test transmission messages. The June 3, 1980 false alert was reportedly handled within 2-3 minutes of the alert being sent to defense officials.¹⁰⁵ The June 6, 1980 false alert happened after testing was done to try and replicate the alert so that technicians would be able to pinpoint any faulty system or hardware issues, leading to

¹⁰¹ National Security Archive, “False Warning”; Brown to Carter, “NORAD False Alarm”; Comptroller General, “NORAD’s Missile Warning System: What Went Wrong?”; Special to The New York Times, “Missile Alerts Traced to 46¢ Item: Decision Is President’s Alone,” *New York Times*, June 18, 1980; Halloran, “Senators Report False Warnings”; Secretary of Defense Harold Brown to President Jimmy Carter, “False Alerts,” July 12, 1980, Top Secret, excised copy, <https://nsarchive2.gwu.edu/dc.html?doc=6796188-National-Security-Archive-Doc-28-Secretary-of>.

¹⁰² National Security Archive, “False Warning”; Brown to Carter, “False Alerts”; Comptroller General, “NORAD’s Missile Warning System: What Went Wrong?”; Secretary of Defense Harold Brown to President Jimmy Carter, “False Missile Alerts,” June 13, 1980, Secret, excised copy, <https://nsarchive2.gwu.edu/dc.html?doc=6796181-National-Security-Archive-Doc-25-Secretary-of>.

¹⁰³ Ibid.

¹⁰⁴ Eric Schlosser, “World War Three, By Mistake,” *The New Yorker*, December 23, 2016, <https://www.newyorker.com/news/news-desk/world-war-three-by-mistake>.

¹⁰⁵ National Security Archive, “False Warning”; Brown to Carter, “False Alerts”; Comptroller General, “NORAD’s Missile Warning System: What Went Wrong?”; Brown to Carter, “False Missile Alerts.”

the determination of the 46¢ computer chip problem.¹⁰⁶ Another DoD response to the chip failure was “consequently made human safeguards an integral element of the overall warning system,” and that the DoD was assured that the human element of the warning systems would “call all false alerts no matter how they are generated.”¹⁰⁷

Since the 1980 false alerts, if there have been any subsequent NORAD false alerts generated that were not immediately caught, they have not been publicized, and this author is not able to find documentation to speculate otherwise; this may be because none have happened, but also the time limitations that can be set regarding classified documentation may be preventing public awareness of any kind of false alert. Because of the lack of evidence to support subsequent serious false alerts by the NORAD system, one can only assume that there were significant technological repairs and replacements done to the NORAD system. This is further evidenced by the construction of the off-site system testing facility, as previously mentioned. Further, by lack of evidence to support otherwise, it can be speculated that there was an overhaul internally of the analyst and technician side of operations to ensure that the “human safeguards” were indeed safeguarding the system, rather than being the ones to cause false alerts to stem from the system.

Black Brant Scare

Fifteen years after the 1980 NORAD false alerts and shortly after the fall of the Soviet Union, a Norwegian scientific research rocket put the world on edge. On January 25, 1995, Norwegian scientists, with the assistance of NASA, launched a military-grade rocket to study the Northern Lights.¹⁰⁸ Similar in size to an America SLBM, the Black Brant XII was the largest

¹⁰⁶ Ibid.

¹⁰⁷ Brown to Carter, “False Missile Alerts.”

¹⁰⁸ “Nuclear Close Calls: The Norwegian Rocket Incident,” Atomic Heritage Foundation, last modified June 15, 2018, <https://www.atomicheritage.org/history/nuclear-close-calls-norwegian-rocket-incident>.

rocket of the over 600 rockets launched since the early 1960s, providing the initial reasoning for Russian radar and warning system technicians to raise alerts.¹⁰⁹

Though the Andoya Rocket Range based scientists had, like always, given instruction to the Norwegian federal government to give notice to neighboring countries that the rocket was going to be launched within a certain block of time (January 15-February 10, 1995), the Norwegian Foreign Ministry failed to alert Russian Federation officials.¹¹⁰ This breakdown in communications resulted in radar crews working the Russian Missile Attack Warning System (MAWS) to put leaders in Moscow on alert, as “a civilian missile and a nuclear missile, especially at the initial stage of [flight], look practically the same.”¹¹¹

In 1987, radar technicians failed to report a radar detection, which led to a German teenager landing a plane in the Red Square, and not wishing to repeat the fallout from such a breach in defenses, the radar technicians followed standard operating procedure and sent the alert up the chain of command.¹¹² This rapid notification resulted in Russian President Boris Yeltsin to take possession and activate the *cheget*, or nuclear briefcase and defensive forces placed on high alert, ready to converge on any attacking force.¹¹³ Once Yeltsin viewed the radar, he saw that Russia was indeed not under any sort of full-scale nuclear attack, and did not launch any nuclear weapons in a preemptive counterattack.¹¹⁴

Although the Cold War was over and US-Russian tensions were at a record low, this was an immediate about-face, and the world was again on the precipice of nuclear war. The failure of proper diplomatic communication for something as simple as a Northern Lights scientific

¹⁰⁹ Ibid.

¹¹⁰ Ibid.

¹¹¹ Ibid.

¹¹² Ibid.

¹¹³ Ibid.

¹¹⁴ Ibid.

observation could have easily resulted in a nuclear war, where one nuclear power felt provoked, and the rest of the world was left in confusion as to why. In this instance, the human error came in not from the radar technicians, the scientists, nor any Russian leader, but rather with the bureaucrats who failed to notify the Russian government of the rocket launch. Some may try to place blame with Yeltsin, but truly, he is at no fault himself, as he was acting in a reactionary fashion appropriate with the warnings he received. It is arguable that if Yeltsin had launched Russian nuclear forces after activation of the nuclear briefcase, inevitably starting a nuclear war with the Western powers, the blame would have fallen solely on him; luckily, Yeltsin reviewed all the information sent to him and made the appropriate judgment call to not proceed with a retaliatory nuclear strike.

Hawaii Emergency Management Agency 2018 Alert

For over two decades, there was not any kind of significant false attack alert; that is until a worker at the Hawaii Emergency Management Agency sent Hawaiians literally running for their lives. Home to one of two infamous attacks on American soil, the massacre that was Pearl Harbor resonated in the minds of Hawaiians on January 13, 2018. At 8:09 A.M., an alert was sent to all Hawaiians through their mobile devices reading, “BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL”.¹¹⁵ The message was also repeated over the radio waves and television stations, sending Hawaiians running for their

¹¹⁵ Laurel Wamsley, “Worker Who Sent Hawaii False Alert Thought Missile Attack Was Imminent,” *NPR*, January 20, 2018, <https://www.npr.org/sections/thetwo-way/2018/01/30/581853255/hawaii-missile-drill-stated-this-is-not-a-drill-resulting-in-false-alert>; HNN Staff, “1 year ago, a missile alert scare caused panic across Hawaii. Here’s what’s changed since,” *Hawaii News Now*, last modified January 13, 2019, <https://www.hawaiinewsnow.com/2019/01/11/nearly-year-after-hawaiis-false-missile-alert-hi-ema-says-ballistic-missile-alarms-have-been-shelved/>.

lives to find shelter, many afraid they were going to die.¹¹⁶ What Hawaiians didn't know until 38 minutes later, was this alert was indeed a drill and there had been a terrible mistake at the Hawaii Emergency Management Agency.¹¹⁷

As this event happened so recently, government documentation regarding the situation has not been released, so all information regarding the incident comes from news outlets. According to *NPR*, during a shift change, one agency shift worker decided to run a drill to prepare staff for a tricky situation.¹¹⁸ The shift supervisor who developed the plan called into the next shift's supervisor, pretending to be US Pacific Command, and when relaying the message, correctly said at both the beginning and end of the message "EXERCISE, EXERCISE, EXERCISE," but incorrectly said "THIS IS NOT A DRILL," only adding to the confusion.¹¹⁹

The recording was reportedly played over speakerphone, and while it seems that all the other workers in the office were aware that this was indeed a drill, one worker either didn't understand or misheard the entirety of the message and assumed that there was an imminent attack headed for Hawaii.¹²⁰ The Hawaii Emergency Management Agency has a two-pronged alert system: first, the alert message was entered; and second, a prompt that one has to select "Yes" in order to transmit the alert.¹²¹ The reason for this two-step verification is for situations like this *not* to happen, but unfortunately, the worker sending the alert was the reason for the breakdown.¹²²

¹¹⁶ "Man Who Sent Hawaii False Missile Alert Speaks Out | NBC Nightly News," YouTube video, 2:00, posted by "NBC News," February 2, 2018, <https://www.youtube.com/watch?v=WWNI6Vv65fQ>; "People In Hawaii React To False Missile Alert | NBC News," YouTube video, 1:16, posted by "NBC News," January 14, 2018, <https://www.youtube.com/watch?v=KiNIJXEF-NA>.

¹¹⁷ Wamsley, "Worker Who Sent Hawaii False Alert"; HNN Staff, "1 year ago."

¹¹⁸ *Ibid.*

¹¹⁹ *Ibid.*

¹²⁰ *Ibid.*

¹²¹ *Ibid.*

¹²² *Ibid.*

The worker refused to speak with the FCC, and subsequently, an FCC attorney stated that because of this, it's hard to pinpoint exactly where communications broke down in this situation: the belief that this was an actual threat and the worker intentionally sent the live alert; or, did the worker believe it was a drill and accidentally sent the live alert?¹²³ Only a few weeks later, the worker was interviewed anonymously by NBC News and indicated that he did believe there was an imminent attack and purposely sent the live alert.¹²⁴

According to *NPR*, the FCC public safety bureau publicly stated that the false alert was caused by “a combination of human error and inadequate safeguards: there was no procedure in place to prevent a single person from mistakenly sending a missile alert to the state of Hawaii...” in conjunction with the lack of technology to withdraw the live alert, which has since been rectified, along with other areas of a communications breakdown.¹²⁵ This event highlights that there are times when the system *should* be working correctly and in such a manner to prevent false alerts, but when human interference happens, sometimes it can make the system worse – not better. This is the argument made by Eric Schlosser in his book *Command and Control*.¹²⁶ Schlosser argues that “[nuclear weapons systems], like all complex technological systems, are inherently flawed. They are designed, built, installed, maintained, and operated by human beings.”¹²⁷ While this argument may be sound when looking at each instance individually, when looked at as a collective, it seems that ultimately, there is no system that can replace the human safeguards put in place in relation to early warning systems.

¹²³ Wamsley, “Worker Who Sent Hawaii False Alert.”

¹²⁴ NBC News, “Man Who Sent Hawaii False Missile Alert Speaks Out | NBC Nightly News.”

¹²⁵ Wamsley, “Worker Who Sent Hawaii False Alert.”

¹²⁶ Schlosser, “World War Three, By Mistake.”

¹²⁷ *Ibid.*

Global Information and Early Warning System on Food and Agriculture (GIEWS)

While the majority of this paper has been on military early warning systems, it is necessary to bring to light a different type of early warning system to provide a different perspective outside of the realm of weapons defense systems. The system looked at in this section is the Global Information and Early Warning System on Food and Agriculture (GIEWS), which was founded by the United Nations in 1975 in response to the world food crisis.¹²⁸ The purpose of GIEWS is to provide information on food production and security, along with predicting food or supply chain shortages across the world.¹²⁹

The massive undertaking by GIEWS is supported by 115 countries, many NGOs, and various international organizations, including other departments within the UN.¹³⁰ While the support received from the above actors is incredibly important in gathering the data needed for GIEWS predictions, another integral component of data gathering is done through satellites and databases that monitor real-time environmental information, agrometeorological assessments, locust emergencies, and transboundary animal and plant pests and diseases.¹³¹ Working with both real-time and historical data, GIEWS analysts are continuously updating data and predictions on production, trade, food aid, stockpiles, consumption, and subnational food security.¹³² GIEWS credits its computer technology and ability to gather data via real-time satellite footage to funding from the European Commission.¹³³ Other government organizations GIEWS works closely with

¹²⁸ “GIEWS: The Global Information and Early Warning System on Food and Agriculture,” Food and Agriculture Organization of the United Nations, n.d., accessed April 4, 2020, http://www.fao.org/ES/GIEWS/english/giews_en.pdf.

¹²⁹ Food and Agriculture Organization of the United Nations, “GIEWS”; “Our Mandate,” GIEWS- Global Information and Early Warning System, Food and Agriculture Organization of the United Nations, n.d., accessed April 4, 2020, <http://www.fao.org/giews/background/en/>.

¹³⁰ Food and Agriculture Organization of the United Nations, “GIEWS.”

¹³¹ Ibid.

¹³² Ibid.

¹³³ Ibid.

to monitor food supplies are the US NASA and NOAA programs; these organizations help them predict weather and crop conditions via satellite in regions where food security is weak – particularly Africa, Latin America, and the Caribbean.¹³⁴

The reasoning behind why this thesis is covering what seems at first to be an outlier early warning system is because not only does GIEWS take into account meteorological and production aspects in predicting food shortages, but they also take into account conflicts or the aftermath of conflicts which ties in with military actions where weapons defense systems may play a part.¹³⁵ But going even further, food shortages and supply chain issues affect more people daily than an error in a weapons defense system do, and in the event that GIEWS produces inaccurate information, it is possible whole regions of people would die from food shortages. GIEWS also ties in with the majority of this paper insomuch as arguably the world's most unstable nuclear power – the Democratic People's Republic of Korea – is one of the countries that predicted to require external assistance for food.¹³⁶ The lack of a solid food supply chain is indicative of civil unrest, an indication that is very commonly put into predictive military early warning systems. Other states that are also seen as being food insecure in 2020 that are militarily significant are places such as Yemen, Iraq, Afghanistan, Pakistan, Syria, and Venezuela, and food shortages can result in one outside state actor getting the upper hand in conflicts if the information is accurately reported.

The role of humans in respect to GIEWS is one that is unique, just as the early warning system itself. It is people reporting, inputting, and analyzing the data, people who are the subjects affected by accurate or inaccurate data analysis, and people who are assisting through NGOs,

¹³⁴ Ibid.

¹³⁵ “Crop Prospects and Food Situation: Quarterly Global Report #1,” Food and Agriculture Organization of the United Nations, March 2020, <http://www.fao.org/3/ca8032en/CA8032EN.pdf>.

¹³⁶ Ibid.

international organizations, governmental organizations, and private donors to provide external sources of food for those areas affected by food shortages. It is people who are the collateral damage if the predictions are wrong, just in a different way than military early warning systems.

Conclusion

This thesis essay has covered different situations in which either technology failed, humans failed, and when neither technology or humans, or both, failed. Also discussed was the possible consequences of those failures, as well as the integral dependence on both early warning systems and the human counterparts to be dependable, accurate, and aware. As discussed with Operation RYaN and the Able Archer '83 incident, the technology failed, and without the role of humans in the process, the world would have been thrust into a nuclear war. Without the actions of actors such as Colonel Stanislav Petrov's refusal to launch the nuclear missiles because of a "gut feeling," the world was kept from experiencing a nuclear winter.

With the NORAD false alerts that were issued in November 1979 and June 1980, both humans and technology failed in their roles. In the November 1979 alert, the failure was undeniably placed with human error, when a technician accidentally loaded a war-game tape into the live alert system, got distracted, and nearly sent bomber jets scrambling. Thanks to the awareness of more senior defense officials, the alert was quickly realized to be an error. Shortly after the November 1979 alert, in June 1980, it was the technology's turn to fail. When a measly 46¢ computer chip sent attack alerts so high that the National Security Advisor was woken in the middle of the night to a phone call alerting him that 2,200 SLBMs were headed for the United States, one has to question whether the result was truly a computer chip failure or rather the lack of attention to the maintenance of the technology and the chip was failed to be replaced?

Regardless, both situations gained enough attention that the failures were publicized, and very quickly, a solution was found for both the human and technological errors.

In 1995, fifteen years after the last publicized NORAD false alert, Norwegian bureaucracy's lack of diplomatic finesse nearly plunged the world into a nuclear war, not long after tensions had finally eased after the end of the Cold War. The role of humans in early warning systems don't involve just those associated with developing, using, or analyzing alerts on warning systems, but goes even further up the chain of command and involves so many working parts. One small breakdown in communication caused the only known activation of a Russian nuclear briefcase in history, and without the awareness of Russian leaders to check the information they were being sent and make their own assessment, the world again could have been sent into a nuclear winter.

Over twenty years later, another breakdown in communication resulted in a false alert from an early warning system. This time, it wasn't a nuclear country put on alert, but the home of the worst attack on American soil of the twentieth century. In Hawaii in 2018, an emergency services worker failed to listen to an exercise message closely enough, and despite having a two-step authentication, the same worker sent a missile alert warning to the citizens of Hawaii, sending them running for their lives. The world should feel thankful that this worker only had access to the alert system rather than launch codes to nuclear weapons. This 38-minute scare is a very recent incident that should not fade from our memories anytime soon.

The last example of early warning systems discussed was GIEWS, the UN early warning system responsible for identifying worldwide, regional, national, and subnational food shortages and weak points in the supply chain. While GIEWS was intended to bring a different perspective on early warning systems, this system is just as integral as military early warning systems. In a world where

food insecurity is a very real problem, even in developed first-world countries, if GIEWS analysts fail to predict a supply chain or food shortage issue accurately, large portions of the population would end up being collateral damage. While the US and Russia may remain on a hair-trigger response to nuclear weapons and defense, which would result in millions of people dying, this event has yet to occur. In reality, food insecurity kills more people every year than any false alert from a military early warning system ever has. The humans that not only collect and report the data for GIEWS, analyze the data, and those who support the early warning system are integral, but also the humans that will be affected by a failure in the system or a breakdown in communication also play an important role – they are the ones who matter in an early warning system of this type.

We must learn from our mistakes or be doomed to be stuck in a cycle of failure. Cooler heads have prevailed in the various military early warning system false alerts that have been covered in this paper, of which we should be thankful. The successes of these systems are not heard about, only the failures. It is the successes that should be praised, but that is not the world we live in. Ultimately, we must stay vigilant and keep faith in those humans who are involved, directly or indirectly, in making the systems the successes that they are.

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