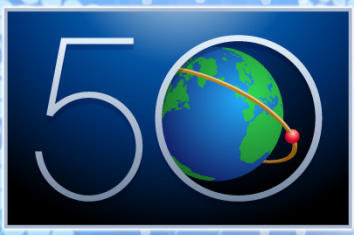

50 YEARS OF VIGILANCE FROM ABOVE

A NATIONAL RECONNAISSANCE POCKET HISTORY:
FOUNDATION FOR THE FUTURE

Winston Churchill famously described the descension of the "iron curtain" across Europe as the Soviet Union isolating itself from most of the world. Amid the friction between the United States and the U.S.S.R., the U.S. looked for ways to peer over the curtain. These Cold War tensions resulted in the birth of modern reconnaissance, and eventually, the formation of the National Reconnaissance Office (NRO). In the five decades since the creation of the NRO, the organization has adapted its mission to accommodate changes in the political climate and in intelligence priorities. It has weathered reorganizations from within the agency as well as within the intelligence community. Through these changes, the NRO continues to push the boundaries of innovation and technology.

THE NATIONAL RECONNAISSANCE OFFICE AND THE COLD WAR: 1945-1989

THE "BOMBER GAP" AND THE U-2: BEGINNINGS OF OVERHEAD RECONNAISSANCE

In the early days of the Cold War, the United States' possession of nuclear weapons gave it a strategic advantage over the Soviet Union. This dynamic began shifting in 1949 when the Soviets tested their first atomic bomb, thereby joining the United States as a nuclear power. As the Soviet Union denied access to large parts of Europe and Asia, fears of Soviet aggression deepened and the U.S. recognized the need for a new method of gathering intelligence on Soviet military capabilities.

By 1953, some U.S. officials were concerned that either the Soviets possessed or were in the process of building a significantly higher number of heavy bombers than the United States. Worries over a possible "bomber gap" and growing Soviet strategic capabilities prompted President Eisenhower to establish the Technological Capabilities Panel (TCP) in 1954. The panel's objective was to review the ability of U.S. military and intelligence to prevent a Soviet surprise attack. On the recommendation of the TCP, Eisenhower commissioned the Lockheed Corporation and the CIA, in cooperation with the Air Force, to build a high-altitude reconnaissance aircraft to provide photographic intelligence on the Soviet bomber fleet.

Less than ten months passed between the time President Eisenhower authorized the project and when the U-2 flew for the first time. On 5 July 1956, a U-2 flight over the U.S.S.R. provided what DCI Allen Dulles referred to in later years as the "million dollar photo." It showed the Soviets commanded far fewer heavy bombers than originally believed. The photograph put the bomber gap debate to rest and eased American apprehensions. However, the shoot down and capture of U-2 pilot Francis Gary Powers over the U.S.S.R. in 1960 put an end to airborne reconnaissance flights over that nation, forcing the U.S. to rely on space reconnaissance.

CORONA AND GRAB: THE FIRST RECONNAISSANCE SATELLITES

In 1946, RAND Corporation published a paper for the U.S. Air Force that suggested the potential of an "Experimental World-Circling Spaceship." At the same time, German rocketry experts were brought to the United States. They joined U.S. scientists in improving rocket technology by using captured German V-2 rockets. Despite these advances, the RAND proposal generated little interest due to its perceived lack of military application and available technology.

As early as 1956, the Air Force was developing a photoreconnaissance satellite, code-named Samos. A year later, the Soviets launched the world's first artificial satellite, Sputnik I. The urgency for a successful American satellite program increased. The Eisenhower administration renewed its support for reconnaissance satellites at the time when U-2 missions became increasingly risky and amid amplified fears of growing Soviet space capabilities. By 1958, it became apparent that Samos would not operate before 1963, leading President Eisenhower to designate the CIA to manage an interim satellite program.

This highly classified project, code-named Corona, was known to the outside world as a biomedical research venture named Discoverer. Corona became the first operational U.S. photoreconnaissance satellite program, and rather than acting as a stopgap until Samos could be fully developed, continued operating 14 years after its conception. The program achieved success in August 1960 after suffering through 13 failures.

Corona was the more prominent early reconnaissance satellite, but was not the first to become operational. That honor belongs to the Galactic Radiation and Background experiment or "Grab" satellite. Reid D. Mayo, an engineer at the Naval Research Laboratory (NRL) and a Pioneer of National Reconnaissance, was one of those who saw potential for signals reconnaissance from space. While stranded by a snowstorm at a Pennsylvania mountain restaurant, Mayo performed calculations on the back of a place mat while his family slept around him. These calculations led him to conclude that the extreme height of a space-based system would yield greater signals coverage than existing submarine or airborne systems. Although officially approved after Corona, the signals satellite Grab successfully deployed some eight weeks ahead of Corona. Officials originally titled the program Tattletale because of its ability to intercept Soviet radar signals, but it is more often referred

to by its cover name, Grab. Once operational, the coverage provided by Grab exceeded even Mayo's expectations.

FORMATION OF THE NRO

The Kennedy administration sought to advance the early successes of the CIA, Air Force, and Navy satellite reconnaissance programs. The administration also wanted to establish an overarching structure for promoting collaboration and preventing friction between the different agencies and services. In an effort to resolve potential disputes and prevent conflict, the Department of Defense and the CIA established the National Reconnaissance Program on 6 September 1961, and created the National Reconnaissance Office to manage it.

Under subsequent agreements, the Programs A, B, C and D formed the covert organization. The Air Force managed satellite programs under Program A in California and the CIA operated Program B in Washington, D.C. The Navy staffed Program C. The NRO formed Program D for CIA and DoD airborne reconnaissance assets. This operating structure for satellite programs remained through the Cold War. The NRO transferred Program D assets to the Air Force in 1974.

Poppy, Grab's successor, was the first system the new organization launched. Program C updated the satellite to supply data on a broader range of Soviet activities. Thus, Poppy surpassed its predecessor and cemented overhead electronic intelligence as a vital component in winning the intelligence Cold War.

Although Samos was the nation's first attempt at employing near-real-time imagery techniques for use in reconnaissance satellites, the program encountered many difficulties that prevented it from adequately carrying out its intended mission. By 1961, Director of the NRO, Joseph Charyk, cancelled the Samos program, but transferred key technology to the National Aeronautics and Space Administration (NASA) for use in exploring the moon's surface. The newly formed NRO continued to manage the Corona program.

As the Cold War continued, the NRO pursued new technology to meet the intelligence needs arising from regional conflicts in the 1960's and 1970's. For example, the 1973 Arab-Israeli War demonstrated the limitation of film return systems, such as Corona, and the need for near-real-time imagery. These film-based systems would send back to earth a film canister that a specially equipped aircraft snatched out of the air, after which the film had to be processed before reaching analysts. Decisionmakers often needed intelligence delivered quicker than the system was capable. Thus, despite the cancellation of Samos, NRO engineers continued to look for ways of delivering real-time imagery.

VERIFYING ARMS CONTROL

After the Cuban Missile Crisis in 1962, the U.S. and Soviet Union looked for ways to keep tensions between the two countries from escalating. Arms control treaties provided an obvious solution, but such treaties hinged on the ability of each side to monitor compliance by the other. For the United States, treaty monitoring depended on the ability of the NRO to collect intelligence about the numbers and capabilities of Soviet forces, specifically nuclear-armed missiles and aircraft. Previously, agreements to limit the number of armaments would have been contingent upon "on-site inspections" of military bases and defense plants—something the Soviets adamantly refused to allow.

The development of satellite photoreconnaissance made possible the Strategic Arms Limitation Talks (commonly known as SALT I and II). The American public remained apprehensive of entering into such an agreement with the Soviets, prompting President Carter to acknowledge the existence of U.S. imagery satellites in 1978. SALT II, a round of talks between the U.S. and Soviet Union in the late 1970's, sought to curtail the manufacture of strategic nuclear weapons. Agreements reached during the talks eventually led to the Strategic Arms Reduction Treaty (START). NRO capabilities made monitoring the treaty, and therefore the treaty itself possible, as the mission of national reconnaissance evolved. These developments helped to stabilize relations between Washington and Moscow.

NATIONAL RECONNAISSANCE IN THE POST-COLD WAR ERA: 1989-2001

The NRO provided intelligence that helped end the Cold War by monitoring nuclear arms treaties that led to a reduction of tensions around the world. After the dissolution of the Soviet Union on 25 December 1991, the United States faced a new and varied set of challenges. Director of Central Intelligence, James Woolsey, described the transition:

"It is as if we were struggling with a large dragon for 45 years, killed it, and then found ourselves in a jungle full of poisonous snakes—and the snakes are much harder to keep track of than the dragon ever was."

The NRO needed to accommodate new intelligence requirements. Humanitarian assistance and agricultural monitoring also competed for resources in addition to terrorism and tracking weapons of mass destruction.

Despite these new demands, the national security community faced defense and intelligence cost savings after the collapse of the U.S.S.R., generally referred to as "the Peace Dividend." The intelligence community, including the NRO, also came under increased scrutiny. Review panels reevaluated the NRO's relevance and determined the need for reorganized processes. These reviews resulted in two significant changes for the organization: public acknowledgement of the NRO's existence and its restructuring from the organization-based alphabetic programs to functional programs.

In September 1992, the Office of the Secretary of Defense publicly acknowledged the "fact of" the NRO, although most aspects of the organization remained classified. Operating in the open for the first time forced the organization to examine its structure. In December 1992, the NRO received Congressional permission to reorganize Programs A, B and C into new directorates corresponding to its primary reconnaissance missions. This structure was intended to increase efficiency, cut expenses, and eliminate competition between the programs. Personnel from all three parent organizations staffed the new directorates. This was by far the largest and most sweeping reorganization in the 50-year history of the NRO.

The NRO underwent changes beyond organizational restructuring. During the Gulf War of 1990-1991, satellite reconnaissance was widely used in providing tactical support to military units. Although bureaucratic factors limited the usefulness of real-time reconnaissance for tactical support during that conflict, the lessons learned from the experience proved invaluable. The NRO reformed the way it worked with the military and began providing support for military activities -in places such as Iraq and the Balkans during the 1990's. The evolution of the NRO's mission during this era broadened the agency's scope and set the stage for countering even greater challenges in the 21st century.

THE NATIONAL RECONNAISSANCE OFFICE AT 50 YEARS

The events of September 11, 2001 changed much about the way the Intelligence and Defense communities conduct their business, including use of satellite reconnaissance. 9/11 introduced a new set of threats and conflicts for the intelligence community to monitor at a time when demands on the NRO were already considerable. Yet the NRO has played an indispensable role in the war against the Taliban in Afghanistan, the subsequent Global War on Terror, and in Operation Iraqi Freedom. In the words of former DNRO Donald Kerr, the NRO continually strives to "keep pace with the need to address adversaries whose capabilities evolve rapidly and in unpredictable ways."

In addition to supporting national security, the NRO also fulfills requirements to monitor the natural environment. National reconnaissance systems can monitor desertification issues, measure crop sizes, warn against volcanic eruptions, and track geological and glacial change. The NRO capabilities helped assess the damage of the 2004 tsunami in Southeast Asia and of Hurricane Katrina in 2005. It helped save lives by supporting responders fighting wildfires in the American West in 2007 and 2008.

The NRO's innovations have impacted our daily lives by improving the technology many of us use regularly. NRO research has contributed to the development of high definition television, GPS systems, lunar imaging, video recording, and cellular phones. It has impacted the commercial camera and film industries. NRO technologies are also used to fight breast cancer by improving both its detection and treatment.

Although the National Reconnaissance Office has operated since the beginning of the Cold War, primarily to monitor the Soviet threat, its mission has evolved. The work accomplished in the NRO has influenced developments not only in the intelligence community and for national security, but also in space exploration, agriculture, meteorology, communications, medicine, and technology. After 50 years, the NRO is as relevant as it was when Americans were worried about a Soviet attack. In the words of the Director of National Reconnaissance Bruce Carlson, "The NRO is doing amazing things today. Our reconnaissance satellites are saving lives, protecting our nation from those who would do us harm and informing our national command authorities and policy makers. In the past, the process had built-in delays. Days passed before Intelligence Community analysts could analyze imagery that we recovered from space. That has all changed. Today we are putting data into the hands of analysts, products into the hands of warfighters, and critical information into the hands of policy makers in time to make a difference."

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