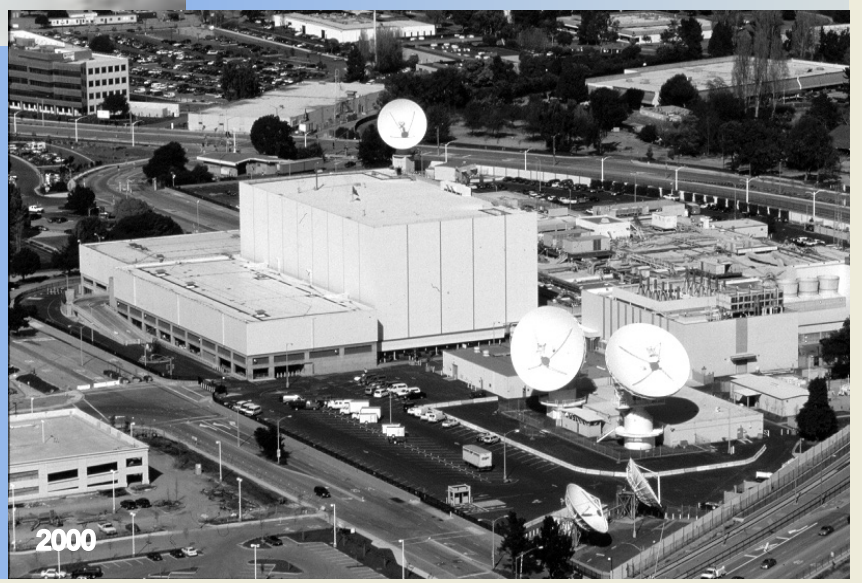
FINAL

Lesson Plan

US Air Force Satellite Test Center: Supporting America's "Eyes in Space" During the Cold War

Onizuka Air Force Station
City of Sunnyvale, Santa Clara County, California



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February 2011

Table of Contents

Introduction....1

About This Lesson....3

Inquiry Question....5

Setting the Stage....7

Locating the Site: Maps....9

Determining the Facts: Readings....13

Visual Evidence: Images....21

Putting it all Together: Activities....31

Supplementary Resources....39

Answers for Teachers....41

List of Preparers....49

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In 1967, President Lyndon Johnson remarked "*I wouldn't want to be quoted on this but we've spent 35 or 40 billion dollars on the space program and if nothing else comes out of it except the knowledge we've gained from space photography, it would be worth 10 times what the whole program has cost. Because tonight we know how many missiles the enemy had and it turned out our guesses were way off. We were building things that we didn't need to build. We were harboring fears that we didn't need to harbor.*[1]"

In his statement, President Johnson was referring to the Corona Program, the first satellite reconnaissance program, developed by the US Air Force and the CIA during the Cold War (1946-91). Initiated in 1958, the Corona Program was designed to take photographs from space and return the film to earth to provide the United States with information about the Soviet Union's weapons capabilities. However, the program was classified, and its objectives hidden from the public by a cover-story known as the Discoverer Program. The Discoverer Program was touted as a scientific satellite program, and captured the public's imagination with its goal of sending monkeys, and later humans, into space.

Building 1001, also known as the US Air Force Satellite Test Center, and later Onizuka Air Force Station (AFS) in Sunnyvale, California, was constructed in 1959 to serve as the command and control center for the Corona Program. As new satellite technologies were developed, the installation expanded in 1962-64 to include Building 1002, which provided administrative support; in 1968-70 to include Building 1003, which provided satellite support, and Building 1004, which provided power to the installation; and in 1984 to include Buildings 10031 and 10032 which also provided satellite support. In addition to the

Corona Program, countless other satellite programs were also supported from the installation throughout the Cold War. These included classified programs, such as the next-generation of reconnaissance satellites, the National Aeronautics and Space Administration (NASA) Space Shuttle Program, and other space exploration programs.

In 2005, Onizuka AFS was selected for closure in accordance with the federal Defense Base Closure and Realignment Act (DBCRA) of 1990, commonly known as Base Realignment and Closure (BRAC). Following this decision, the US Air Force Satellite Test Center Historic District was determined eligible for listing in the National Register of Historic Places as a satellite reconnaissance facility associated with crucial intelligence-gathering activities during the Cold War. Buildings 1001, 1002, 1003, 1004, 10031, and 10032 contribute to the district. Onizuka AFS was transferred from the US Air Force in 2011, and will be re-developed for non-military uses.

[1]Norris, Pat. 2008. *Spies in the Sky: Surveillance Satellites in War and Peace*. Chichester, UK: Praxis Publishing Ltd.

About This Lesson

In 2005, Onizuka Air Force Station (AFS) in the City of Sunnyvale, Santa Clara County, California was selected for closure under the federal Defense Base Closure and Realignment Act (DBRAC) of 1990, commonly known as Base Closure and Realignment (BRAC). In 2009, the Air Force Center for Engineering and the Environment (AFCEE) and the California State Historic Preservation Office (CA SHPO) concurred that the US Air Force Satellite Test Center Historic District is eligible for listing in the National Register of Historic Places under Criterion A and Criteria Consideration G for its national, state, and local significance as a satellite reconnaissance facility associated with crucial intelligence-gathering activities during the Cold War. Buildings 1001, 1002, 1003, 1004, 10031, and 10032 contribute to the district.

Furthermore, in accordance with Section 106 of the National Historic Preservation Act (NHPA), AFCEE and the CA SHPO concurred that the transfer of the installation out of federal hands constituted an adverse effect on the National Register-eligible US Air Force Satellite Test Center Historic District. AFCEE and the CA SHPO agreed that a Historic American Building Survey (HABS) Level II-type documentation and this lesson plan should be prepared to partially mitigate the adverse effect. The HABS Level II-type document is on file at the CA SHPO in Sacramento, California, and is available for review upon request.

This lesson plan is based on the HABS Level II-type documentation for the National Register-eligible US Air Force Satellite Test Center Historic District at Onizuka AFS, as well as other sources related to the installation. It was prepared by the US Air Force in accordance with the National Park Service (NPS) Teaching with Historic Places Lesson Plans guidance.

Where it Fits Into the Curriculum

Topics: The lesson can be used in American history, social studies, and geography courses in units on modern American history, the Cold War, and the development of satellite programs, including those used for reconnaissance. This lesson can also be used in a science course, such as a unit on astronomy.

Time period: Late 1950s through early 1990s.

According to the *History-Science Content Standards for California Public Schools-Kindergarten Through Grade Twelve*, Cold War-related events are taught during the 10th and 11th grades. Therefore, this lesson plan is appropriate for those grade levels.

Objectives for Students

1) To identify events that led to the decision to develop satellite reconnaissance systems.
2) To outline the development of the Corona Program, and level of secrecy that surrounded it and subsequent satellite programs.
3) To outline the role Onizuka AFS played in satellite reconnaissance efforts throughout the Cold War.
4) To conduct oral histories to learn how the Cold War and activities at Onizuka AFS impacted their community.
5) To research and understand how satellite technology has evolved from the 1960s through today.

Materials for Students

Materials listed below are presented in a portable document format (PDF), which can be viewed directly on the computer, or printed out, photocopied, and distributed to students. In addition, the maps, illustrations, and photographs are also provided separately in Portable Network Graphics (PNG) format for optimal viewing on the computer.

1) Two maps that show the location of Onizuka AFS in northern California and a detailed view of the layout of the installation.
2) Three readings on the beginnings of the Cold War, development of reconnaissance satellites and development of Onizuka AFS.
3) Six photographs related to satellites and Onizuka AFS.

Visiting the Site

It is anticipated that Onizuka AFS will be transferred from the US Air Force in September 2011. A portion of the installation, including Building 1002, a contributing resource to the US Air Force Satellite Test Center Historic District, and Buildings 1018 and 1034, which are outside the district boundary, would be occupied by the Department of Veterans Affairs (VA). It is anticipated that the remainder of the installation would be redeveloped. Therefore, the US Air Force Satellite Test Center Historic District would no longer be extant following redevelopment. However, it is anticipated that the VA would develop an interpretive display about the history of the installation that would be located in Building 1002 and open to the public.

Inquiry Question

What purpose do you think this group of buildings served?

Photo Analysis Worksheet[1]

Step 1:
Examine the photograph for 10 seconds. How would you describe the photograph?

Step 2:
Divide the photograph into quadrants and study each section individually. What details, such as objects and activities, do you notice?

Step 3:
What other information--such as time period, location, season, reason photo was taken, can you gather from the photo?

Step 4:
How would you revise your first description of the photo using the information noted in Steps 2 and 3?

Step 5:
What questions do you have about the photograph? How might you find answers to these questions?

[1]Photo Analysis Worksheet Questions taken from NPS Teaching with Historic Places website, available online at: http://www.nps.gov/nr/twhp/PHOTOANA.HTM

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Setting the Stage

Following World War II (1939-45), tensions escalated between the United States and the Soviet Union, marking the beginning of the Cold War (1946-91). The Cold War was a struggle between democracy, represented by the United States, and communism, represented by the Soviet Union. Although there was no direct armed combat during the Cold War, the United States and the Soviet Union each existed in a state of defensive readiness, and raced to develop more powerful weapons. In fact, it was the threat of the other country's weapons that held each country in check.

In addition to weapons, the United States also began to develop reconnaissance satellites, which would provide evidence of the Soviet Union's weapons capabilities. In 1958, the US Air Force, in conjunction with the Central Intelligence Agency (CIA), began to develop a reconnaissance satellite program, known as the Corona Program. However, they realized that this type of program needed complete secrecy in order to be effective. Therefore, they classified the Corona Program, and created a cover-story known as the Discoverer Program. The Discoverer Program was touted as a scientific satellite program, and captured the public's imagination with its goal of sending monkeys, and later humans, into space.

Meanwhile, in reality, the top-secret Corona satellites contained specialized cameras that could take photographs from space, and return the film to earth to be developed and analyzed, primarily to determine the Soviet Union's weapons capabilities. The US Air Force constructed Building 1001 to serve as a command and control center for Corona satellites in Sunnyvale, California. The building was known as the US Air Force Satellite Test Center (STC). A launch site was established at Vandenberg Air Force Base (AFB), in Lompoc, California, and tracking stations were also established worldwide, which were in constant communication with the STC during the launch, orbit, and retrieval of satellites.

In August 1960, the first successful launch and recovery of an object from space in the United States was supported from the STC. Later that month, Corona satellites returned the first reconnaissance photographs taken from space. However, because of the classified nature of the program, the public, and even members of the US Air Force who assisted with the mission, were unaware of this accomplishment.

The Corona Program continued to be supported from the STC through 1972, and provided photographs of the Soviet Union and other communist countries, such as China, throughout the Cold War. However, this was not the only classified program supported from the STC. As technology advanced, new programs, such as those whose purposes were communications, early missile warning, meteorology, navigation, and nuclear detonation detection, were developed and supported from the STC.

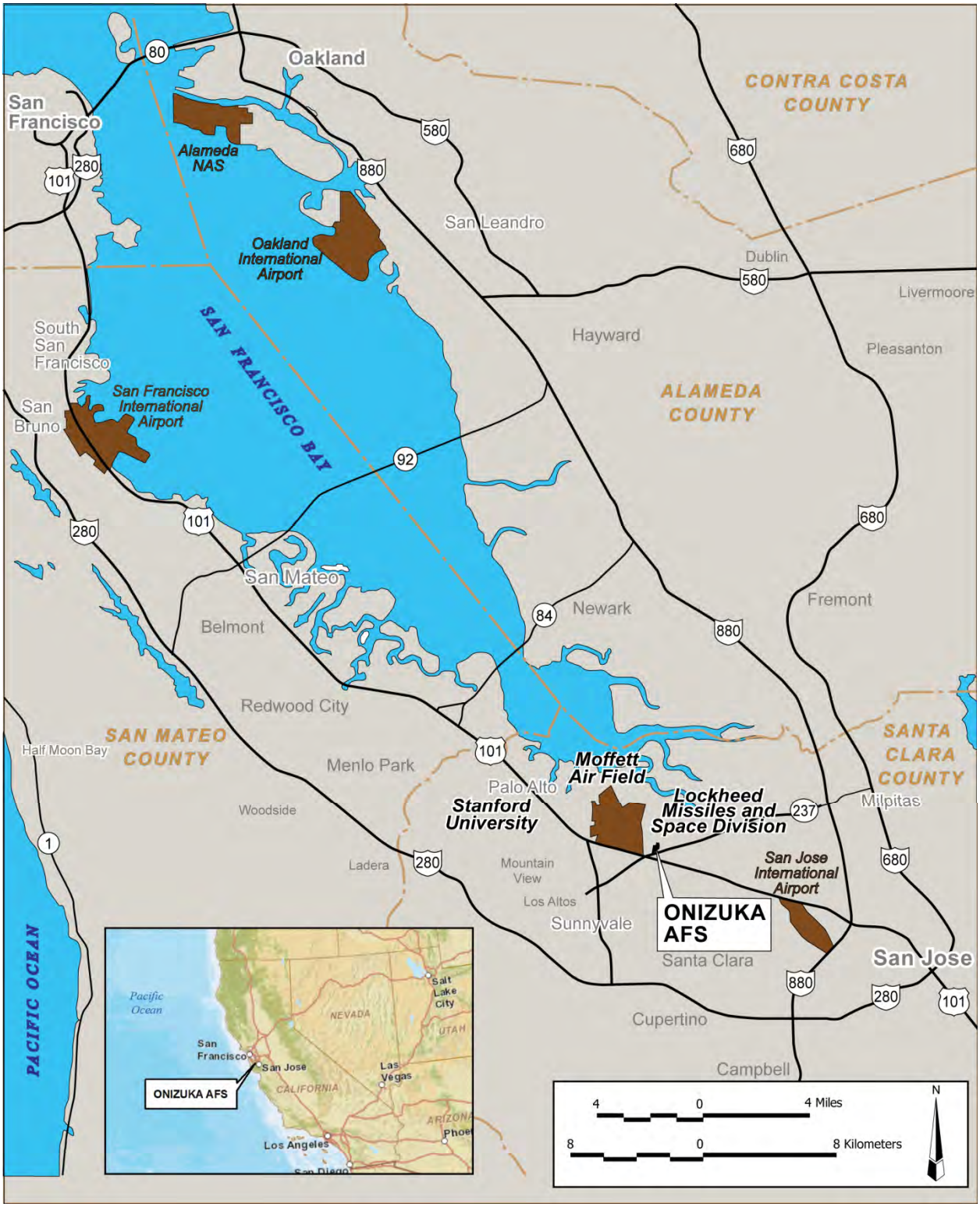
As a result of the increase in satellite programs supported, the STC expanded. In 1962, just a few years after Building 1001 was constructed, Building 1002 was constructed to provide administrative space. Two short years later, in 1964, Building 1002 was expanded to provide additional administrative space. However, the biggest expansion occurred in 1969, when Building 1003, commonly known as the "Blue Cube" was constructed to provide satellite support. The following year, Building 1004, a power plant, was constructed to supply the installation with power. As the STC continued to support so many programs, the US Air Force realized that they required a separate and reliable source of power to ensure that satellites, spinning in space, would be able to be controlled from the installation. Finally, the last significant expansion occurred in 1984, when Buildings 10031 and 10032 were constructed to provide satellite support.

By the late-1980s, the Soviet Union began to weaken, and by 1991 it had dissolved, signaling the end of the Cold War. Now that the United States no longer had to defend itself from potential attack by the

Soviet Union, military spending decreased. Although Onizuka AFS continued to provide satellite support, responsibility for many of the programs it formerly supported were transferred to the Consolidated Space Operations Center (CSOC) at Schriever AFB in Colorado Springs, Colorado. The CSOC was constructed in the 1980s as a satellite control center that operated in conjunction with Onizuka AFS. In 2005, Onizuka AFS was selected for closure under the Defense Base Closure and Realignment Act (DBCRA). In 2011, Onizuka AFS was closed, and control of operations formerly supported at Onizuka AFS was relocated to the CSOC and Vandenberg AFB.

Locating the Site

Map 1: Northern California



The US Air Force Satellite Test Center Historic District at Onizuka Air Force Station (AFS) is located in the City of Sunnyvale, Santa Clara County, California. It was constructed in 1959 to serve as the command and control center for the Corona Program, a satellite reconnaissance program developed by the US Air Force and CIA, in conjunction with private contractors, including the Lockheed Missiles and Space Division. In fact, the US Air Force acquired land from Lockheed Missiles and Space Division to develop the installation. This location was selected in part, based on its proximity to Lockheed Missiles and Space Division. In addition, Sunnyvale was a prime location for industrial development with its temperate weather, airport access, and proximity to technical experts at Stanford University in Palo Alto. Furthermore, the military already had a presence in the area at Moffett Field, which was established in the early-1930s as a US Navy dirigible air base. However, by the late-1930s it was transferred to the US Army and used for other purposes.

Questions for Map 1:

1. Locate Sunnyvale and describe its location within California.

2. Locate Onizuka AFS and surrounding industries and businesses.

3. Why do you think that it would be beneficial for the US Air Force Satellite Test Center to be located near Lockheed Missiles and Space Division and Stanford University?