PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001
Location: Tower Road
China Lake, Vicinity
San Bernardino County
UTM Coordinates: Building 70021 = 11.0477360 mE/3932406 mN
Building 70022 = 11.0477509 mE/3932291 mN
USGS Quadrangle Pine Knob Valley West, 1984

Date of Construction: 1951-1952

Engineer: Holmes & Narver, Inc.

Present Owner: US Navy
Naval Air Weapons Station China Lake
Ridgecrest, Kern County, California 93555-6100

Present Use: Naval Air Weapons Station

Significance: The Randsburg Wash Target Test Towers (Buildings 70021 and 70022) are significant for their role in the naval testing of proximity or variable-timed (VT) fuzes, a vital element of the Navy's weapons program. The towers played a key role in the Cold War proximity fuze test program at the Randsburg Wash facility, a program that eventually led to the Navy adapting the use of these fuzes to guided missiles. The towers are important on a national level during the period of significance between 1952 and 1960; the years in which the most important achievements in the Navy's development of the properties and attributes of proximity fuzes. The towers are also significant for their unique engineering achievement, as 360 foot-tall, pyramidal wood towers.
PART I: HISTORICAL NARRATIVE

The facility now called Naval Air Weapons Station (NAWS) China Lake was established by the Navy in late 1943, during the most difficult period of American involvement in World War II. Originally designated Naval Ordnance Test Station (NOTS) Inyokern, the base was established on an emergency basis to test several promising weapons developed by California Institute of Technology (CalTech) scientists with the hope that these weapons could be mass-produced and released to the fleet during the war. The initial purpose of the station, then, was testing and evaluation, a fact that is reflected in its name. Before NOTS was established, CalTech had access only to limited testing facilities at Goldstone Lake, part of the Army’s Camp Haan, later Fort Irwin.¹

Before any construction had begun at NOTS, Navy and CalTech leaders decided that the station would be a multiple-purpose facility, concerned as much with weapons research and development as with testing and evaluation. The original base commander, Captain Sherman Burroughs, described his intent to create another Peenemunde, a reference to the great German missile complex that was responsible for research and development, testing and evaluation, as well as the manufacture of the German battery of missiles. For a time, the Navy leadership at the base fought application of NOTS designation for fear the name would help seal the fate of the station as an exclusive test facility.²

The need for vast, open space to test and evaluate weaponry led Navy and CalTech planners to the remote site in the Mojave Desert, near the present-day City of Ridgecrest, California. Along with the administrative, residential, and laboratory facilities, the Navy constructed an airfield just north of Ridgecrest, and established a number of ranges in the desert lands surrounding the station. These remote areas, such as Area R, and the B, K and G ranges, were constructed during the war, while the SNORT and LARK areas and Randsburg Wash facilities, were constructed after the end of World War II.

The Randsburg Wash facility was a relatively late addition to the testing ranges at Naval Ordnance Test Station (NOTS) Inyokern. The property (and most of the rest of South Range) were transferred to NOTS from the Marine Corps Air Station, Mojave in 1947. The Randsburg Wash test facility was established in 1950 but was not in use until 1952. The initial use of the area was to test proximity fuzes, i.e. fuzes that would detonate an explosive prior to impact with

¹ The pre-NOTS testing program is summarized in: Naval Ordnance Test Station, “Facilities and Services Available for Rocket Development Testing,” NAVORD Report 1221, NOTS 277, March 9, 1950. The Goldstone facility was closed in 1945.
the target. An equivalent fuze research facility had previously operated in New Mexico but was forced to move because the testing interfered with civilian and military flight patterns. With the acquisition of the vast and secure South Range area in 1947, NOTS planners and scientist immediately began planning for a highly unusual facility for testing proximity fuzes under conditions that simulated tactical conditions.

The proximity fuze was one of the great success stories of American science during World War II, often held to be one of the four great advancements of the war, along with radar, the jet-propelled airplane, and the atomic bomb. The Navy was the principal American sponsor of research and development for the proximity fuze, recognizing an important use for shipboard antiaircraft shells that could detonate near, but not necessarily on contact with, an incoming aircraft. Great Britain had initiated research into proximity fuzes in 1939, when it was at war but America was not. British research focused on proximity fuzes for bombs and rockets. When the US Office of Scientific Research and Development (OSRD) was created in 1940 to guide American weapons research, the Navy was first to request an early and intensive effort to develop a proximity fuze for use in anti-aircraft shells. Although the fuzes received widespread application, their initial purpose was defense of American ships from dive-bombers. In the US, the proximity fuze was called a Variable-Time, or VT Fuze.

Research conducted before the attack on Pearl Harbor indicated that a radio-oscillator could be installed into a shell and could serve to activate the fuze when radio contact was made with a metal object. The American approach to the proximity fuze involved including a small radio transmitter and receiver in the head of the shell. The receiver could activate the fuze and thus detonate the shell when it received a signal from the transmitter that it was near an object. Enormous problems were involved, not least of which was protection of the vacuum tube of the radio from the force of the firing at thousands of times the force of gravity. The research and development was centered on the Carnegie Institution, although numerous private corporations and Navy personnel were also involved. The fuzes were tested by the Navy at the Dahlgren Naval Proving Ground in Virginia. Much more sophisticated tests were conducted at the New Mexico test facility, which was the direct predecessor of the Randsburg Wash facility. The VT-fuze antiaircraft shells were first used in the Pacific in January 1943 and were immediately successful in downing enemy planes attacking the fleet. The Army and the British Navy and Army soon wanted the fuze for other purposes, including defense against incoming German V-1
rockets. By the end of the war, more than 12 million fuzes had been produced for use in a variety of weapons, from howitzer shells to the early guided missiles.\(^7\)

The bulk of the early work on proximity fuzes was conducted on the East Coast and in New Mexico. As noted, research and development was centered in Maryland and the early experiments were conducted at the Dahlgren Naval Proving Ground in Virginia and in a specialized test range in New Mexico. The bulk of the full-scale testing was done at what was called the New Mexico Experimental Range. In early 1943, the University of New Mexico, under contract to the OSRD, developed a test range for the VT fuze. As discussed, the New Mexico range was the immediate predecessor of the test range at Randsburg Wash, and was established nearly a decade earlier. The earlier test range was built near Socorro, New Mexico, in what now is called the Energetic Material Research Test Center.\(^8\) In a 1956 NOTS report, the location of the older VT fuze range is described as “at the New Mexico School of Mines,” noting that the range was closed down because it began to interfere “with commercial and military flight lanes.”\(^9\) The towers and other key elements of the original proximity fuze test facility in New Mexico no longer exist.

The New Mexico tests were under the control of E. J. Workman of the University of New Mexico. Workman was one of the key figures in the development and testing of the proximity fuze. In addition to controlling the testing in New Mexico, Workman had been part of the original group conducting research and development in the Carnegie Institution. Many individuals contributed to this effort; Workman’s accomplishments are among the most widely-recognized. Workman built 250 foot-tall test towers in New Mexico in 1943 or early 1944.\(^10\) The towers were specifically designed to test the sensitivity of VT fuzes when fired at an incoming aircraft, dramatically underscoring that work on the fuzes was initiated by the Navy to protect its ships from dive bombers. Wood was selected over steel as the construction material for the towers, as steel towers would have activated the fuzes. Separated by 400 feet, targets (mostly mock-up aircraft) were suspended by rope (not steel cables, as they too would have interfered with experiments) and bombarded with VT-fuze activated shells. Smoking powder was substituted for high explosives to avoid damage to the targets or the towers. The tests facilitated an assessment of the accuracy of the fuzes and for re-calibration of the fuzes to increase their efficiency. The target for most tests was a mock-up of a Nakajima B5N, or “Kate,” a torpedo bomber that had been used effectively in the Japanese attack on Pearl Harbor.

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\(^7\) JRP, “Inventory and Evaluation of National Register Eligibility for Buildings and Structures on the Ranges Naval Air Weapons Station China Lake, California,” (April 1999) p 249.


Joseph Boyce, who worked on the fuzes, stated: “Data secured at the New Mexico Experimental Range proved invaluable throughout the VT program.”

There is scant information about what, if any, work may have been done at NOTS Inyokern during the war to support the testing of proximity fuzes. The only mention of such testing is found in J. D. Gerard-Gough and Albert B. Christman, *The Grand Experiment at Inyokern*. In a section referring to testing conducted late in the war effort, the authors observed:

But tests [at NOTS] were not limited to rockets. Other significant work included testing of fire-control systems for guns, incendiary bombs, machine gun packages, proximity fuzes, and radars.

Aside from that brief mention, however, little is known about what those tests may have been. It seems, however, that these tests were not major contributors to the larger proximity fuze program on the basis of two salient facts: the tests were given only a brief mention in the very detailed history of NOTS; and the tests are not mentioned at all in several very detailed histories of the VT fuze program during World War II.

The decision to establish a VT fuze testing facility at NOTS in the early 1950s was made jointly by the Navy and the civilian Atomic Energy Commission (AEC). The interest of the Navy in the fuze program stemmed from the demonstrated utility of the fuze during the war and from the fact that the wartime testing facility in New Mexico had been shut down. The interest of the AEC is not as clearly understood. The AEC, successor to the wartime Manhattan Project, was active at NOTS from 1945 through 1954, principally through its operation of the Salt Wells Pilot Plant, which manufactured conventional explosives used in nuclear weapons. The exact role of the AEC in planning this facility has not been documented. Available records indicate, however, that the AEC was the primary force behind it. In a 1952 account of work at the plant, a NOTS observer noted that more than 60 percent of construction funds had come from the AEC. Thus, the facility was planned, at least in part, with the nuclear arsenal in mind, although there is little indication that such testing dominated the work there. Indeed, most of the fuze testing involved naval guns and small missiles, missiles too small to be useful to the AEC. Nonetheless, the historical record clearly indicates that the AEC funded most of the work in the area and may be presumed to have had an important stake in the testing program planned for the site. The AEC

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13 See Boyce and Baldwin. The only reference to NTOS Inyokern in either volume related to the use of proximity fuzes is the Sidewinder guided missile, developed by NTOS Inyokern in the 1950s. The Sidewinder fuze was an infrared fuze rather than a radio fuze. Baldwin, p 302.
14 Memorandum, NOTS Head of Test Department, to Captain Clyde B. Stevens, Bureau of Ordnance, Subject: NOTS Facilities under Test Department Cognizance, January 18, 1952. The AEC had contributed nearly $3 million to the project.
abandoned its Salt Wells plant in 1954 and may have severed its relationship with Randsburg Wash at the same time.

As noted, the area of NOTS roughly doubled in 1947 when the huge South Range was transferred to the Navy from the Marines. The Navy’s decision to relocate the highly-secret proximity fuze testing program to NOTS was no doubt influenced by the existence of this vast, remote, vacant, and secure area. In addition, NOTS scientists, who had relatively little experience with the fuze, had unparalleled experience in developing and testing rockets and missiles, weapons for which the fuze was uniquely fitted.

Early in planning for the proximity fuze test range, NOTS planners elected to develop a multiple-purpose facility, capable of testing fuzes for guided missiles and aircraft rockets, as well as projectiles from large naval guns – all of which used the same general class of fuzes. As noted, the VT fuze had gained its initial successes in shells fired from anti-aircraft, howitzers and other land-based guns, and in 1951, this was still the principal use for the device. While proximity fuzes became essential elements in guided missile design, that use was still in its infancy, when Randsburg Wash was developed in 1951. Going into the Korean conflict, only the US and Great Britain had access to VT-fuze shells and they were used with great impact during that war.\footnote{Alfred Price, \textit{The History of U.S. Electronic Warfare}, Volume II: The Renaissance Years, 1946 to 1964, (Washington D.C.: Association of Old Crows, 1989) p 54.}

Thus, the Randsburg Wash area was unusual among the ranges at NOTS in that it was designed for the testing of guns as well as rockets and missile; all other ranges at NOTS in the early 1950s were oriented chiefly toward developing air weapons, whether missiles or bombs.

The essential purpose of the testing area, as noted in a 1956 report, was to allow “for accurate fuze testing in an environment similar to tactical conditions.”\footnote{Naval Ordnance Test Station, “Randsburg Wash Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions,” NOTS Technical Publication 1433, March 1956, p 1.} In practical terms, this meant providing for live firing (of guns, rockets, or missiles) at targets. Of particular interest was the ability to fire at suspended aircraft, leading to construction of aircraft suspension towers, the central focus of the Randsburg Wash test area and the structural elements of the greatest interest. These towers were refinements of tower designs first used in New Mexico.

Initial planning for the facility was begun by the scientists and structural engineers at NOTS, although the final design was accomplished by a consulting architect-engineering firm. The central focus of early planning was the sets of towers from which aircraft targets would be suspended. The nature of the testing – fuzes, sensitive to metal – dictated that the towers could not be made of steel, the otherwise obvious material for these very tall structures. In a letter of May 1950, Carl Heilbron, structural engineer with the test department at NOTS, wrote to the Douglas Fir Plywood Association (predecessor of APA-Engineered Wood Association),
inquiring about the usefulness of plywood for the towers. Although circumspect in his description of the use of the towers, Heilbron indicated that basic requirements:

In connection with a Projectile Range to be constructed soon, it is necessary to support targets for projectiles at a central distance of 250 feet from the ground and probably farther from supporting structures. It appears that the best solution is to use two freestanding towers 350 feet high at 600-foot centers, from which cables support targets in the configuration sketched. [The letter included a pencil sketch.] Targets will simulate combat aircraft in sizes up to that of the B-29... They may be carried in any aspect of flying position to 90 degrees therefrom, and will be raised and lowered by winches ... The properties with respect to radio waves of short wave-length are important. For this reason, it is desirable to eliminate metal parts from the towers to the maximum extent feasible, towers completely without metal being the optimum.

Later in May 1950, NOTS selected the Los Angeles firm of Holmes and Narver to design the complex. Holmes and Narver had been active at NOTS almost since it was established. The firm had designed nearly all of the China Lake and Salt Wells Pilot Plant buildings and structures during the war. After the war, the firm designed many of the test buildings in the North Range, including most of the permanent buildings in the G, K and other test areas in the North Range. In early design memoranda, the area was not called Randsburg Wash, but was specifically designated the “VT Fuze Range.” The requirements of the facility were relatively simple. Three groups of structures were required: a headquarters and shops area to manage the work; the towers themselves; and a series of buildings and structures to house and control the guns (called the Gun-Line Area).

The Headquarters Area actually involved the greatest number of buildings, owing to its remote location and the sensitive nature of the work there. The security precautions were no doubt multiplied by the involvement of the AEC, an agency that was almost obsessive in its security measures, particularly during the early years of the Cold War. The security consciousness is best indicated by the inclusion of a substantial Marine Corps barracks as one of the first buildings constructed at the complex; that building (Building 70002) still exists. The complex

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17 Heilbron was an extremely active civil engineer during these years. At the same time that he was planning the towers at Randsburg Wash, he was in charge of planning for the great research track at SNORT.
18 Carl H. Heilbron, Jr. to Douglas Fir Plywood Association, May 1, 1950, found in the collection of Base Historian, NOTS.
19 The corporate biography of this firm is presented in Engineering Field Activity West, “Historic Context for Evaluating the National Register Eligibility of World War II-Era and Cold-War-Era Buildings and Structures, Naval Air Weapons Station, China Lake, California, November 1996.”
20 Memorandum dated April 11, 1950, OinCC to BuYardD, Subject: “Arch and Eng Services required to develop ‘VT’ Fuze Range,” in position of Base Historian, NAWS China Lake.
included a predictable set of administrative and service buildings: a headquarters building (70001); a firehouse (70005); a machine shop (7004); as well as numerous magazine and utility buildings, such as substations. The project, of course, also involved huge expenditures in roads, water lines, and other basic infrastructure to serve this previously undeveloped and remote location.

The heart of the complex, however, comprised the towers and Gun-Line Buildings – the beginning and end point of the fuze tests. These were, of course, built several miles from the Headquarters Area and two miles away from one another. The two-mile distance between the guns and the towers gives some indication of the caliber of guns used in the tests. Different guns were used from time to time as the program evolved. In a 1956 report, the guns were described as “about 24 Army and Navy guns.”22 The variety of guns available allowed for “the testing of fuzes for nearly every type of Army and Navy projectiles from 75 millimeter to 8 inches in diameter.” In a 1979 report, the guns were described as strictly Navy guns, in three- five- and six-inch diameter.23

The Randsburg Wash complex, as built in 1950-53, included more buildings and test areas than are present today. The operation of the complex in 1956, shortly after it was built, was described in a lengthy NOTS publication, “Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions.” At that time, the Randsburg Wash area comprised at least four separate test areas, or “ranges.” The active areas included: the Headquarters Area; and four test ranges: the Gun Target Range; the Rocket Target Range; the Vertical Firing Range; and the Howitzer Range. Of these, the Headquarters Area, Gun Target Range, and Rocket Range had permanent buildings; the Howitzer Range was deliberately left devoid of buildings for testing purposes while the Vertical Firing Range was closely-related to the Gun Target Range. The Rocket Target Range and the Gun Target Range were duplicative. Each had a set of the 360-foot towers as well as firing control buildings. In other words, there originally were two sets of towers at Randsburg Wash: the gun-line towers (Buildings 70021 and 70022), and an identical set of towers used for rocket testing. The rocket test towers have since been demolished, along with a launching tower. What remains of the areas with buildings, then, are the Headquarters Area, the Gun-Line, and the towers from the gun target range.

The functions of the Gun-Line and target buildings were described in some detail. The towers (Buildings 70021 and 70022) were used for:

... suspending targets on the gun target range and are located 3,200 yards downrange from the Gun-Line Area. They are 360 feet high and are located 640 feet apart. Between the towers, targets as large as 50,000-pound stripped B-29
bombers may be suspended 250 feet above ground level. These target towers [Buildings 70021 and 70022] on the gun target range, built of wood, are constructed similarly to those on the rocket target range to minimize reflections that would affect fuze test.  

Since 1952 the proximity test ranges have evolved through abandonment of some of the test facilities and inclusion of other functions. In 1979 only the gun-line and gun-line towers were still in place and being used at the Randsburg Wash facility; the area was identified as the “Fuze Ranges.” However, the general Randsburg Wash area had already been adapted for other uses, most having to do with the general field of electronic warfare. Since 1979, the gun-line range and tower have been abandoned. Although the towers are sometimes used for specialized tests, the original test range of the gun-line buildings, guns, and the tower is no longer in operation.

PART II: DESCRIPTION OF TEST TOWERS

The target test towers are located approximately 23 miles southeast of the main area of Naval Air Weapons Station China Lake, within a flat, isolated section of the South Range. A modern, paved road passes between the two towers, connecting with the gun-line buildings found approximately two miles south. Graded dirt roads also serve the complex. The two structures (Building 70021 and 70022) are nearly identical in construction and both have received little alterations since their construction.

The structures are tapered, three-sided, pyramidal towers approximately 360’ from three concrete footings. A sheave support (approximately 4'-6” in height) tops each tower, making the total height of each structure about 361’-6”. Each side of both towers is 80’0” wide at the base and 4’-3” at the top. The towers’ leg joints are incased in the footings, which are 13’x 11’ at the base and 8’-6” at top. Both towers are constructed with glued-laminated timber beams and posts, with a succession of K-trusses of the same material secured with plastic bolts and plywood gussets. The beams, posts and diagonal members that make up the trusses measure approximately 18” wide and 12” deep. All connectors are non-metallic; plastic is used for rope thimbles, sheaves, ratchet wheels, bolts, washers, shafts, etc., while wood is used for ship cleats and all gussets. The only metal used in the construction of each tower is found where the tower is bolted to the three concrete slabs by a steel gusset plate, which in turn is bolted to the slab. The Navy has replaced the original wood ladders with a fiberglass ladders within the last ten years.

27 Holmes and Narver Incorporated, Naval Ordnance Test Station Inyokern, California, “Randsburg Wash Test Range Target Towers: Monkey Stick and Wire Rope Rigging,” Y & D Drawing No. 540767, July 11, 1952;
To suspend the target, two stationary diesel-motor hoists are located on the east side of the northern tower (Building 70021) and on the west side of the southern tower (Building 70022), each approximately 350' from the tower. A steel cable runs from each hoist approximately 80' into a tackle block. The steel cable then extends about 150' where it attaches to three manila ropes that pass through the sheave at the top of each tower, and then attach to the target. Six down and trip cables attach to the target to stabilize it when raised. The down and trip cables, also composed of non-metallic material, are secured either by wood cleats (attached to the base of each tower) or by hoists placed on concrete footings. Camera stations are situated around the towers, sheltered by shed-roof enclosures, sided with plywood and with doors opening toward the towers. The camera shelters were likely added within the last 30 years.

PART III. PROJECT INFORMATION:

This project was sponsored by NAWS China Lake Public Works Directorate and the Environmental Projects Office. Rand Herbert of JRP Historical Consulting, LLC conducted the field inspection in August 2006 and Toni Webb prepared description and historical narrative, which is based on the report entitled “Inventory and Evaluation of National Register Eligibility for Buildings and Structures on the Ranges Naval Air Weapons Station China Lake, California, completed by Stephen Mikesell, then of JRP, in April 1999. Research conducted for the 1999 report was undertaken within the records and technical libraries located on NAWS China Lake, secondary sources at the University of California, Davis’ Shields Library, the California State Library, and from primary documents found at the National Archives and Records Administration at Laguna Niguel. William B. Dewey prepared the photographic images for the project.
PART IV: SOURCES OF INFORMATION

1. Bibliography:


Heilbron, Carl H. Jr. Letter to Douglas Fir Plywood Association, May 1, 1950


Memorandum, NOTS Head of Test Department, to Captain Clyde B. Stevens, Bureau of Ordnance, Subject: NOTS Facilities under Test Department Cognizance, January 18, 1952.

Memorandum, OinCC to BuYardD, Subject: “Arch and Eng Services required to develop ‘VT’ Fuze Range,” April 11, 1950


2. Interviews:

Eccles, Jim; Public Affairs Office, White Sands Missile Range, and Dennis Hunter; Energetic Material Research Test Center. Personal communications, with July 16, 1997.

3. Early Views:

Figures 1, 3, 4, 6 and 7 are from Naval Ordnance Test Station, “Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions,” March 1956.

Figure 2 and 5 are from the NAWS China Lake Historic Photograph Collection on file at China Lake Naval Air Weapons Station Curation Facility.

4. Architectural Drawings:

On file with the Department of Engineering, Naval Air Weapons Station China Lake.


________. Naval Ordnance Test Station Inyokern, California, “Randsburg Wash Test Range Target Hoist: Miscellaneous Details,” Y & D Drawing No. 491958, May 2, 1951.
Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Target Towers: Foundation Plan and Details," Y & D Drawing No. 491959, May 2, 1951.


Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Target Hoist: General Arrangement A," Y & D Drawing No. 491956, May 2, 1951.


Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Target Towers: Elevations and Details," Y & D Drawing No. 491361, May 2, 1951.

Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Target Towers: Sheave Support Details, As Built Details" PWO Drawing No. RW-302/6A, March 20, 1957.

Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Target Towers: Ladder Cage and Platform Details," Y & D Drawing No. 491962, May 2, 1951.
LOCATION MAP

NAVAL ORDNANCE TEST STATION INYOKERN,
RANDSBURG WASH FACILITY TARGET TEST TOWERS
(Naval Air Weapons Station China Lake, Buildings 70021 and 70022)
HAER No. CA-353
(Page 15)

SITE MAP
Figure 1. Map showing the Randsburg Wash area in 1956. [Source: Naval Ordnance Test Station, “Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions,” March 1956.]
Figure 2. Historic Navy photograph showing the Test Target Towers at Randsburg Wash, ca. 1950s. [Source: NAWS Historical Photographs, n.d., China Lake NAWS Curation Facility.]
Figure 3. Historic photograph ca. 1956 showing a stripped B-17 bomber (the target) suspended between the target towers at the Rocket Range Towers, which were nearly identical to Buildings 70021 and 70022. The variable-angle launcher, which launched rockets and guided missiles, is shown in foreground. [Source: Naval Ordnance Test Station, “Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions,” March 1956.]
Figure 4. Historic photograph ca. 1956 showing a stripped F6F Navy fighter target suspended by hemp hawsers between the target towers for use in fuze tests. [Source: Naval Ordnance Test Station, "Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions," March 1956.]
Figure 5. Historic Navy photograph ca. 1950s showing Buildings 70021 (left) and 70022 (right) with suspended target. [Source: NAWS Historical Photographs, n.d., China Lake NAWS Curation Facility.]
Figure 6. Historic photograph ca. 1956 showing a K-24 camera that was permanently installed near the towers. The camera stands are now covered by simple plywood shelters. [Source: Naval Ordnance Test Station, “Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions,” March 1956.]
Figure 7. Historic photograph ca. 1956 showing an inverted F6F Fighter target suspended between the two test towers. With this test setup, rounds were fired over the target to allow for the collection of lower quadrant data with minimal ground interference. [Source: Naval Ordnance Test Station, “Randsburg Wash Test Activities: A Facility for Ordnance Testing Under Simulated Tactical Conditions,” March 1956.]
Figure 8. Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Test Buildings and Facilities: Target Area Layout," Y & D Drawing No. 491963, May 2, 1951.
Figure 9. Naval Ordnance Test Station Inyokern, California, “Randsburg Wash Test Range Target Towers: Elevations and Details,” Y & D Drawing No. 491361, May 2, 1951.
Figure 10. Naval Ordnance Test Station Inyokern, California, “Randsburg Wash Test Range Target Towers: Foundation Plan and Details,” Y & D Drawing No. 491959, May 2, 1951.
Figure 11. Naval Ordnance Test Station Inyokern, California, “Randsburg Wash Test Range Target Hoist: General Arrangement A,” Y & D Drawing No. 491956, May 2, 1951.
Figure 12. Naval Ordnance Test Station Inyokern, California, "Randsburg Wash Test Range Target Hoist: Miscellaneous Details," Y & D Drawing No. 491958, May 2, 1951.