

**Environmental Impact Statement/
Overseas Environmental Impact Statement**

Point Mugu Sea Range

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3.14 Public Health and Safety

3.14.1 Introduction

Public health and safety issues include potential hazards inherent with in-flight operations, missile firings, ordnance operations, and gun firings; operation of Navy vessels; target operations; and abatement of munitions items that fail to operate as intended. Public health and safety also addresses issues of public proximity and access. The safety policy of Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu is to observe every reasonable precaution in the planning and execution of all operations that occur on the Point Mugu Sea Range (PMSR) in order to prevent injury to people and damage to property (U.S. Department of the Navy, 2002).

3.14.2 Region of Influence

The PMSR is fundamentally a missile test range, although other activities occur, such as Fleet training, which may also include any or all of the activities described above in Section 3.14.1 (Introduction). The primary priority when planning and conducting missile tests and during Fleet training is safety, both for military personnel and for the public. Most testing and training are conducted in outer parts of the PMSR, usually away from areas heavily used by commercial and recreational users. NAWCWD implements advance Notices to Airmen (NOTAMs) and Notices to Mariners (NTMs) as well as range safety clearance prior to conducting any tests that might be hazardous to non-participants. In more than 65 years of Navy operations on the PMSR, no safety incidents involving non-military personnel have occurred (U.S. Department of the Navy, 2002).

The region of influence for public health and safety includes the NAWCWD PMSR, the Channel Island National Park, and Channel Islands National Marine Sanctuary. The islands within the region of influence are San Miguel, San Nicolas (SNI), Santa Cruz, Santa Rosa, and Anacapa. These islands are addressed since they have heavy tourism as well as visitors that visit the Channel Islands National Park daily; however, no land activities are being proposed in areas that are accessible to the public as part of the Proposed Action.

3.14.3 Approach to Analysis

Factors considered in determining whether an alternative would have a significant public safety impact include the extent or degree to which implementation of the alternative would subject a non-participant to increased risk of personal injury. For all testing and training activities conducted on the PMSR, specific and documented procedures are in place to ensure that non-participating personnel are not endangered by Navy actions. NAWCWPNSINST 5090.2, Sea Range Operational Clearance Plan, provides specific guidance and requirements for range operators and users regarding clearance of the PMSR during Navy testing and training activities. Included in the Range Safety Instruction are procedures for developing Range Safety Approvals (RSA) and Range Safety Operations Plans (RSOPs). Also covered are the requirements and specifications of Flight Termination Systems (FTSs) as described in Section 3.14.4.3 (Safety Procedures). Requirements for range surveillance by aircraft prior to operational testing and training activities are also provided in the safety instruction.

3.14.4 Affected Environment

3.14.4.1 Range Safety

The PMSR safety policy, procedures, and guidance are covered in NAVAIR Instruction 3700.3 dated July 20, 2007. This document defines range safety requirements, range safety criteria, the safety planning process, and operational procedures. Although the Commander of NAWCWD has the ultimate

responsibility for range safety, the authority for execution of these safety programs is delegated to the PMSR Safety Officer in the Range Safety Office (U.S. Department of the Navy, 2002).

3.14.4.2 Public Access and Proximity

Public access and proximity to the PMSR is a principal safety consideration since most of the PMSR is in non-Territorial Waters and open to the public. The airspace over the Naval Base Ventura County Point Mugu airfield, beaches, and to 3 nautical miles (NM) offshore is a Restricted Area in accordance with 33 Code of Federal Regulations 334.1126, and non-participating aircraft are precluded from entering this area. Another Restricted Area encompasses airspace over SNI to prevent access of unauthorized aircraft. The Navy also has control of the Naval Danger Zone at San Miguel Island in accordance with 33 Code of Federal Regulations 334.1140. NAWCWD has the authority to control access of individuals, aircraft, and ships to these areas of the PMSR.

When the PMSR is used for military testing and training activities, the Navy notifies commercial, civilian, and other military aviation through a NOTAM, which provides appropriate information to the Federal Aviation Administration and its Air Traffic Control agencies to route traffic around the Warning Areas and Restricted Areas when they are active (Figure 1-1). Warning Areas are located over non-Territorial Waters of the United States (U.S.), while Restricted Areas are located over Territorial Waters of the U.S. Although a NOTAM does not preclude uncontrolled air traffic from entering a Warning Area even when the area is active, Department of Defense (DoD) Directive 4540.1, *Use of Airspace U.S. Military Aircraft and Firings Over the High Seas*, provides guidance for operating within Warning Areas (U.S. Department of Defense, 2015). Non-participating aircraft are identified by radar, and contact with these aircraft is made by radio; if aircraft remain in a clearance area, even after being requested to leave, the PMSR will delay, cancel, or move a test to a clear area.

3.14.4.3 Safety Procedures

Civilian recreational and industrial craft occupy the 36,000 square miles of the PMSR daily. To ensure the safety of these users, the Navy communicates upcoming operations to area watercraft through NTMs and conducts routine range clearance for surface vessels. These procedures exist for notification of the commercial shipping and recreational boating communities of potentially hazardous activities on the PMSR. Notifications are made through NTMs and daily very high frequency-FM marine radio (Channel 16) broadcasts. The PMSR has established procedures to ensure that non-participating surface vessels are not present (U.S. Department of the Navy, 2002). Any vessels, if present, are warned that they are in an area of an impending hazardous activity and are requested to leave the area. Contact with vessels is made by marine band FM radio; however, loudspeakers can be used if the boat is not radio-equipped. Since most of these areas are in Territorial Waters, the Navy requests that ships leave the clearance areas. If vessels remain in the clearance area, the PMSR will delay, cancel, or move the test to a clear area. A test will not normally be initiated if a non-participating vessel is present in the clearance area (U.S. Department of the Navy, 2002).

Safety analyses and planning are integral parts of operations prior to the execution of any event on the PMSR. The safety documentation begins with the preparation of either a RSA or an RSOP (U.S. Department of the Navy, 2002). An RSOP or RSA must be prepared for each distinctly different program involving missile flight. The RSOP or RSA may be valid for more than one launch if the launch or missile parameters have not changed (U.S. Department of the Navy, 2002). These are similar planning documents, except an RSOP applies to missiles requiring an FTS controlled by a Missile Flight Safety

Officer (MFSO). At a minimum, the safety documentation is required to include the following information:

- The location of the launch site and conditions under which the launch will be made
- A description of the missile air safety hazard pattern, ground safety hazard pattern, surface safety hazard pattern, and impact areas
- A description of regions to be surveyed and cleared of aircraft and surface vessels
- A description of the ground safety hazard pattern that must be cleared of personnel
- A list of all essential personnel approved to be in the safety hazard pattern
- A list of any waivers of safety criteria, special instructions, or stipulations
- A list of specific requirements or guidelines for range safety briefings for the operation.

In addition, the RSOP requires a description of the operational procedures and equipment by which the MFSO will monitor missile performance and exercise FTS control over the missile.

The FTS establishes clear guidelines and procedures for flight termination, when required, for missiles fired on the PMSR (U.S. Department of the Navy, 2002). Generally, an FTS is required when a missile or any portion or stage of a missile flight possesses the capability to exceed its designated impact limits. An FTS is capable of terminating thrust or aerodynamic lift; it can also destroy the missile at any point during the powered portion of its flight. Three methods of FTS are equally used on the PMSR: (1) dive the vehicle into the water, (2) command recovery, and (3) explode the fuel tank. For liquid-propelled missiles, flight termination action causes engine shutdown and zero thrust by fuel dispersion or intermixing. For solid propellant missiles, a condition of zero thrust is imposed, and any residual thrust causes the vehicle to tumble. For aerodynamic missiles, flight termination creates a condition of zero lift by separation of the wings or the control surfaces, or complete disintegration of the missile. While most of the FTS methods used on the PMSR do not use an explosive charge, if one is used for FTS, the weight of the charge is dependent on the size of the missile. In all cases, the vehicle is destabilized or severed into the minimum number of pieces required to produce tumbling.

The altitude at which the FTS is used varies considerably, from sea level to the missile's maximum operational altitude. Flight termination is normally initiated by the MFSO under the following conditions: (1) if there is an indication of an impact limit violation; (2) if the position of the missile is unknown due to loss of tracking data, and the missile has the capability of violating the impact limit; or (3) due to unsatisfactory performance, which creates a safety hazard and loss of range safety control. Flight termination thus provides an additional margin of safety for PMSR testing and training activities (U.S. Department of the Navy, 2018a).

According to the Naval Air Systems Command Instruction 3700.3, Range Safety Policy, the Naval Air Systems Command Range Department is responsible for implementing command range safety policy and establishing a range safety program consistent with that policy (U.S. Department of the Navy, 2007). During the safety planning process, the extent of each safety hazard pattern is established. A safety hazard pattern is the surface area that could be endangered by a missile if it does not follow its prescribed flight path. Safety hazard patterns are highly variable in size and are dependent on the altitude of launch, total missile energy available (time of flight), and turning ability. A clearance area is an area larger than the safety hazard pattern, which is kept clear of non-participants for safety purposes. Impact areas are much smaller and fall within the defined safety hazard pattern of a missile. The impact area (or debris pattern) is the predetermined maximum area where a missile or its components could strike the surface. Since most missiles fired on the PMSR do not carry live warheads, most impact areas

are relatively small. Computer models are used to determine the size and location of the impact areas in which debris may fall. These predictions are calculated based on altitude, speed, mass of debris pieces, angle of impact, and winds. Impact areas for missiles used on the PMSR are generally oval and can be up to 10 NM long and 7 NM wide (U.S. Department of the Navy, 2002).

NAWCWD Point Mugu has an extensive surveillance system to implement real-time safety clearance procedures prior to initiation of an operation on the PMSR. These systems include the use of land-, sea-, and air-based radar in addition to aircraft surveillance of the range, which is necessary to ensure that the public remains clear of designated operation areas where they could be subjected to hazardous conditions. The PMSR uses specially modified aircraft, which provides extended PMSR surveillance. A review of past Range Safety Office records shows that accidents involving the public on the PMSR have never occurred (U.S. Department of the Navy, 2018b).

3.14.5 Environmental Consequences

This section evaluates how and to what degree the activities described in Chapter 2 (Description of Proposed Action and Alternatives) potentially would impact public health and safety. The testing and training activities associated with the Alternatives vary in intensity, frequency, duration, and location within the PMSR. Potential public health and safety impacts analyzed are associated with the following:

- In-Air Energy (high-powered microwave and high-energy lasers)
- Physical Interactions (aircraft, vessels, targets, and ordnances)

The analysis presented below applies to all of the testing and training scenarios (air-to-air, air-to-surface, surface-to-air, surface-to-surface, subsurface-to-surface, and Electronic Warfare [EW]/Directed Energy [DE]), as described in Section 2.1 (Proposed Action).

3.14.5.1 No Action Alternative

Under the No Action Alternative, proposed testing and training activities would not occur within the PMSR. Other military activities not associated with this Proposed Action would continue to occur. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing testing and training activities.

Discontinuing the testing and training activities would result in fewer conflicts with activities where testing and training activities have historically been conducted. Therefore, discontinuing testing and training activities under the No Action Alternative would lessen the impact on public health and safety in the ROI, but would not measurably improve the public health and safety of the area.

3.14.5.2 Alternative 1 (Preferred Alternative)

A comparison of operational tempo proposed for each alternative, and proposed types and level of activities, are provided in Section 2.1.1 (Current and Proposed Activities).

3.14.5.2.1 In-Air Energy

Potential impacts are associated with DE weapons testing. The potential for in-air energy impacts include exposure to sources of electromagnetic energy and lasers. These systems operate similarly to other navigational aids and radars at civilian airports and television weather stations throughout the United States (U.S. Department of the Navy, 2018b). The Navy follows documented safety procedures to protect Navy personnel and the public from electromagnetic energy hazards. These procedures include setting the heights and angles of electromagnetic energy transmissions to avoid direct human exposure, posting warning signs, establishing safe operating levels, and activating warning lights when radar

systems are operational (U.S. Department of the Navy, 2018b). High-energy lasers are used as weapons to disable surface targets. The Navy operates high-energy laser equipment in accordance with procedures defined in the Office of the Chief of Naval Operations Instruction 5100.23G, *Navy Safety and Occupational Health Program Manual* (U.S. Department of the Navy, 2011). These high-energy light sources can cause eye injuries and burns to the skin. The Office of the Chief of Naval Operations Instruction 5100.27B/Marine Corps Order 5104.1C, *Navy Laser Hazards Control Program*, prescribes Navy and Marine Corps policy and guidance in the identification and control of laser hazards. The Navy observes strict precautions and has written instructions in place for laser users to ensure that non-participants are not exposed to intense light energy (U.S. Department of the Navy, 2018b).

To avoid excessive exposures to electromagnetic energy, military aircraft are operated in accordance with standard operating procedures that establish minimum separation distances between electromagnetic energy emitters and people, munitions, and fuels (U.S. Department of Defense, 2015). Thresholds for determining hazardous levels of electromagnetic energy to humans, munitions, and fuel have been determined for electromagnetic energy sources based on frequency and power output, and practices are in place to protect the public from electromagnetic radiation hazards (U.S. Department of Defense, 2015).

A comprehensive safety program exists for the use of lasers. Current Navy safety procedures protect individuals from the hazard of injuries caused by laser energy. Laser safety requirements for aircraft and vessels mandate verification that target areas are clear before commencement of an exercise. In the case of aircraft, during actual laser use, the aircraft run-in headings are restricted to preclude inadvertent lasing of areas where the public may be present (U.S. Department of the Navy, 2018b) and to avoid unintentional contact with personnel or non-participants. Personnel participating in laser training activities are required to complete a laser safety course (U.S. Department of the Navy, 2018b). Under Alternative 1, the Navy would conduct DE testing activities, involving electromagnetic energy sources and lasers (see Table 2-2). Locations for construction of new DE facilities are proposed for SNI and NBVC Point Mugu as described in Section 2.1.8.2 (Directed Energy Weapons Test). Under Alternative 1, the DE testing activities would not be conducted until vessels and all non-military personnel are clear of the area in accordance with range clearance procedures described above. As a result, public health and safety impacts from in-air energy associated with DE testing activities under Alternative 1 would not increase the risk to public health and safety. Therefore, impacts would be less than significant.

3.14.5.2.2 Physical Interactions

Potential impacts are associated with the interaction of Navy aircraft, vessels, ordnance, and equipment with the public. Public health and safety could be impacted by physical collisions between Navy assets and the public. Navy aircraft, vessels, targets, munitions, and ordnances could be directly and physically encountered by recreational, commercial, institutional, and governmental aircraft and vessels and also individuals such as swimmers, divers, and anglers (U.S. Department of the Navy, 2018b). The greatest potential for a physical interaction would be along the coasts of Santa Barbara and Ventura County near populated areas, where public activities are concentrated. Physical interaction is evaluated in terms of Range Safety, Public Access and Proximity, and Safety Procedures.

3.14.5.2.2.1 Range Safety

NAVAIRHQ 3700.3, Range Safety Policy, provides specific guidance and requirements for range operators and users. Included in the Range Safety Instruction are procedures for developing RSAs and

RSOPs (U.S. Department of the Navy, 2007). Also covered are the requirements and specifications of FTS. Requirements for range surveillance by aircraft prior to testing activities are also provided in the safety instruction. In addition to current safety procedures in use on the range and at Point Mugu, the accident history for operations on the PMSR was considered. There have been no accidents involving non-military personnel on the PMSR as a result of Navy testing and training activities. Although Alternative 1 would increase the tempo of testing and training activities compared to the baseline (see Table 2-2), given the distance from public use areas and extensive safety procedures, implementation of Alternative 1 would not increase the risk to public health and safety. Therefore, impacts would be less than significant.

3.14.5.2.2.2 Public Access and Proximity

The general public includes private and commercial vessels traversing the PMSR that could potentially interact with Navy vessels, munitions, and surface targets. Both Navy and public vessels operate under maritime navigational rules requiring them to observe and avoid other vessels (U.S. Department of the Navy, 2018b). In addition, NOTAM and NTM advise aircraft and vessel operators about when and where Navy testing and training activities and associated range closures are scheduled. Navy personnel are required to verify that the range is clear of non-participants before initiating any potentially hazardous activity (U.S. Department of the Navy, 2018b). The Navy has Explosive Ordnance Disposal and unexploded ordnance technicians available to assess and mitigate residual hazards from munition items that remain accessible to and threaten public safety, as described in PMSR policy 008.00 (Naval Air Warfare Center Weapons Division, 2016). Ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when moving through the water (underway). Watch personnel (e.g., officers of the deck) detect and report floating or partially submerged objects (U.S. Department of the Navy, 2018a). Abatement actions on munitions and ordnance items that fail to operate as intended will continue to be performed under Alternative 1. Together, these procedures minimize the potential for adverse interactions between Navy and non-military aircraft and vessels. Recreational and commercial vessels could potentially be in areas north and northwest of SNI. Given the advance notice system and the highly controlled nature of tests, implementation of Alternative 1 would not increase the risk to public health and safety. Therefore, impacts would be less than significant.

3.14.5.2.2.3 Safety Procedures

Extensive safety procedures are implemented when hazardous activities occur on the PMSR. An example of these procedures is the use of “boundary boats” along the shore near Building 55 and off SNI during the launch of targets over the beach on the PMSR. These boats ensure that non-participants remain clear of the launch area. On SNI, the entire west end of the island is secured, and no personnel are allowed in the operations area when the target is used (U.S. Department of the Navy, 2002). A NOTAM is issued in advance of gunnery activities to alert the public to stay clear of the area, except for small-caliber crew-served weapons training when the immediate area around the firing ship is cleared visually. Locations where explosive bombing activities occur often have a standing NOTAM. NOTAMs are issued in advance of explosive bombing activities conducted in locations that do not already have a standing notice (U.S. Department of the Navy, 2018b). Navy personnel are required to verify that the range is clear of non-participants before initiating any potentially hazardous activity. Together, these procedures minimize the potential for adverse interactions between Navy and non-participant vessels. Navy explosives safety policy is based on the requirements of DoD 6055.9-STD, *Ammunition and Explosives Safety Standards*. This DoD standard establishes uniform safety requirements applicable to ammunition and explosives and to associated and unrelated personnel and property exposed to the potentially damaging effects of an accident involving ammunition and explosives used during, among

other things, training, testing, transportation, handling, storage, maintenance, and disposal (U.S. Department of the Navy, 2018b). As the result of the safety procedures, implementation of Alternative 1 would not increase the risk to public health and safety. Therefore, impacts would be less than significant.

3.14.5.3 Alternative 2

A comparison of operational tempo proposed for each alternative, and proposed types and level of activities, are provided in Section 2.1.1 (Current and Proposed Activities).

3.14.5.3.1 In-Air Energy

Under Alternative 2, specialized radar positions and land target site for lasers would be in the same locations as described under Alternative 1. Safety procedures of EW would not change. The Navy would continue to implement standard operating and safety procedures. DE activities would not change, and existing safety procedures as described under Alternative 1 would remain in place. As such, implementation of Alternative 2 would not increase the risk to public health and safety. Therefore, impacts would be less than significant.

3.14.5.3.2 Physical Interactions

Under Alternative 2, there would be an increase in tempo of testing and training activities compared to the baseline (see Table 2-2); however, potential physical disturbance and strike impacts would be the same as those described under Alternative 1. Therefore, impacts would be less than significant.

3.14.5.3.2.1 Range Safety

Range Safety procedures would remain the same under Alternative 2 as described above under Alternative 1. Testing and training activities that have the potential to adversely affect public health and safety would be conducted by technically qualified personnel and in accordance with applicable Navy, other federal, and state safety standards and requirements. While the tempo of testing and training activities would increase under Alternative 2 compared to the baseline (see Table 2-2), the existing safety procedures described under Alternative 1 would remain in place, and no increase in the risk to public health and safety would occur. Therefore, impacts would be less than significant.

3.14.5.3.2.2 Public Access and Proximity

Public access and proximity of the public would remain the same under Alternative 2 as described above under Alternative 1. The established warning protocols and procedures would continue to be carried out under Alternative 2. Abatement actions on munitions and ordnance items that fail to operate as intended will continue to be performed under Alternative 2. While the tempo of testing and training activities would increase under Alternative 2 compared to the baseline (see Table 2-2), no increase in the risk to public health and safety would occur related to public access and proximity. Therefore, impacts would be less than significant.

3.14.5.3.2.3 Safety Procedures

Safety procedures on the PMSR would remain the same under Alternative 2, as described under Alternative 1. Navy safety procedures are implemented to address the location and type of activity being conducted, irrespective of the number of activities concurrently conducted. While the tempo of testing and training activities would increase under Alternative 2 compared to the baseline (see Table 2-2), there would be no increase in the risk to public health and safety because of the established safety procedures. Therefore, impacts would be less than significant.

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