
Executive Summary

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Introduction

Wake Island is a possession of the United States under the jurisdiction of the U.S. Department of the Air Force and administered by Detachment 1 of the 15th Logistics Group, 15th Air Base Wing, Hickam Air Force Base, Hawaii. The current mission of Wake Island is varied. The island supports trans-Pacific military operations and Western Pacific military contingency operations, serves as an in-flight emergency airfield, and provides transient military/civilian aircraft servicing and emergency sealift capability. In addition, Ballistic Missile Defense Organization (BMDO) activities have been taking place on Wake Island, requiring support from the staff and use of the facilities. This environmental assessment provides an analysis of the environmental consequences of conducting activities in support of the planned development tests of Theater Missile Defense (TMD) target and defensive missile systems on Wake Island as well as other reasonably foreseeable BMDO program-related facilities.

Testing Activities

TMD target and defensive missile systems are being considered for launch activities from Wake Island. The target system would be designed to deliver target vehicles toward the U.S. Army Kwajalein Atoll (USAKA) located within the Republic of the Marshall Islands. For target launches from Wake Island, the defensive missile would be launched from the USAKA. If defensive missiles are launched from Wake Island, the targets would be launched from the USAKA or from a Missile Launch Ship (MLS) located south of Wake Island. To meet the requirements of Article VII, paragraph 12 (d), of the Intermediate-Range Nuclear Forces Treaty, all target missiles launched from Wake Island or Kwajalein Atoll with a demonstrated flight range of 500 kilometers (km) (311 miles [mi]) but less than 5,500 km (3,418 mi) and will be launched from fixed, above-ground facilities. Target systems launched from a MLS will have a demonstrated range of less than 500 km (311 mi).

Purpose and Need

The proposed test activities would include target and defensive missile intercept tests to provide realistic test situations for ground-based defenses to operate within a simulated theater of operation, which includes engaging and intercepting notional target missiles. This requires conducting target and other missile system flights over long distances (i.e., in excess 1,150 kilometers [715 miles]). These long-distance missile flight tests would support the developmental and operational effectiveness of U.S. Army TMD missile and sensor systems. Currently, there are no operational overland ranges and few over-water ranges operated by the United States that provide realistic distances for testing within such a simulated theater of operations.

Methodology

Twelve broad environmental components were evaluated to provide a context for understanding the potential effects of the proposed actions and to provide a basis for assessing the significance of potential impacts. The areas of environmental consideration are air quality, airspace, biological resources, cultural resources, hazardous materials/waste, health and safety, infrastructure, land use, noise, physical resources, socioeconomics, and water resources. The evaluation indicated that implementation of the TMD test activities and related facility upgrades will not pose a potential for short- or long-term impacts to these components on Wake Island.

To assess the significance of any impact, a list of the activities necessary to accomplish the proposed action was developed. The affected environment on Wake Island was then described. Next, those activities with potential for causing environmental consequences were identified. If a proposed activity was determined to have potential for causing environmental impact, then it was evaluated by considering the intensity and context in which the impact would occur.

Results

This section summarizes the conclusions of the evaluations made for each of the areas of environmental consideration for the proposed TMD test activities on Wake Island based on the application of the above methodology. Table S-1 shows the land area and vegetation clearing required for each of the planned activities.

Air Quality

The hardening and interior modification of the Launch Support Building and a dormitory, refurbishment of Building 1203, and repair of the Peale Island bridge are activities that would have no potential for air emissions and thus no potential for air quality impacts. The proposed construction activities at launch pads 1 and 2 (including the utility, communication, and fiber optic cable trenching), the new incinerator pad, a new Missile Storage Building (MSB) and Missile Assembly Building (MAB), and a concrete radar pad would generate fugitive dust and mobile electric generator emissions. These emissions would be of short duration and represent only a minor increase in total emissions produced on the island. Operation of an additional incinerator would create a long-term, relatively small increase in total island emissions and would also have a beneficial effect in the elimination of wet refuse deposited in the landfill.

Launch operations constitute the largest sources of uncontrolled emissions on Wake Island. Air emissions from sea-based launches in the open ocean area south of Wake Island would be similar to the emissions from the ground-based launches. Flight testing of the TMD missile systems would involve the use of mobile and stand-alone radar systems. The mobile power generator used for the radar systems during missile launches would have emissions associated with its operation. All of these effects are small relative to current island emissions or are very transient, and the cumulative effects on air quality are considered to be not significant.

Table S-1: Area Affected by Theater Missile Defense-Related Programs

| TMD Launch-Related Facility Requirements | Land area required in hectares (acres) | Vegetation clearing required in hectares (acres) |
|--|--|--|
| Missile Storage Building | 0.04 (0.1) | 0.04 (0.1) |
| Missile Assembly Building | 0.04 (0.1) | 0.04 (0.1) |
| Launch Support Building | none | none |
| Dormitory | none | none |
| Launch Facilities | | |
| Pad 1 | 0.04 (0.1) | none |
| Pad 2 | 0.1 (0.3) | 0.1 (0.3) |
| Range support equipment (mobile) | 0.1 (0.3) to 0.8 (2.0) | none |
| Range support equipment (permanent) | 0.04 (0.1) | 0.04 (0.1) |
| Incinerator | 0.04 (0.1) | none |
| Fiber optic cable trenches | 0.04 (0.1) | 0.04 (0.1) |
| Bridge repair | none | none |

Airspace

The modification of existing facilities and construction of new facilities on Wake Island would have no impact on airspace and, thus, no potential for significant impacts. Wake Island is located in international airspace; therefore, there are no formal airspace restrictions surrounding it. Missile launches remaining clear of air route A-450, the only jet route that passes near the island, should pose no serious impacts. Missile launches from the MLS stationed in the open ocean area south of Wake Island would have no significant impacts to airspace. Since the number of aircraft flying over or near Wake Island is small, the impacts to airspace are considered not significant.

Biological Resources

The hardening and interior modification of the Launch Support Building and dormitory and refurbishment of Building 1203 are activities that would occur within existing structures and thus have no potential for biological resource impacts. The proposed construction activities at launch pads 1 and 2 (including trenching for the utility, communication, and fiber optic cables), the new incinerator pad, a new MSB and MAB, and a concrete radar pad would have the potential to impact biological resources since some ground disturbance would be necessary.

Construction activities would require removal of less than one percent of the vegetation on Wake Island. Since proposed project actions will take place primarily on Wake Island and are located away from the primary bird nesting areas and no sensitive flora are located in the construction area, it is judged that impacts to botanical resources as a result of project implementation will be reduced to a not-significant level with implementation of the proposed mitigation measures.

Flight testing of the TMD defensive missile systems, involving the use of mobile and stand-alone radar systems that would be placed on existing paved or previously disturbed areas only, would not have any direct impacts to the island's flora and fauna, other than the potential for noise impacts from the missile launches and biological effects from electromagnetic radiation emissions from operation of the radars.

Protected sea turtles and marine mammals would be at risk from reef blasting associated with placement of the fiber optic cable and from falling flight vehicle boosters and debris, although the chance of this occurring is extremely remote. The taking of a protected species would be significant, but risks from off-shore blasting would be minimized by visual inspection prior to detonation, and the probability of an accidental taking due to falling debris is judged to be extremely remote; thus impacts are expected to be reduced to a not-significant level with the implementation of the proposed mitigation measures.

Cultural Resources

The hardening and interior modification of the Launch Support Building and a dormitory, refurbishment of Building 1203, and repair of the Peale Island bridge are activities that would occur within existing structures and thus have no potential for cultural resource impacts. The proposed construction activities at launch pads 1 and 2 (including trenching for the utility, communications, and fiber optic cables), the new incinerator pad, a new MSB and MAB, and a concrete radar pad have the potential for impacting cultural resources since some ground disturbance would be necessary.

The additional personnel on Wake Island as a result of TMD activities have the potential to impact cultural resources due to their presence, recreational activities, and incidental collecting of archaeological and historical resources while on the island. However, TMD-related personnel would be indoctrinated on the historic significance of structures and resources. Precautionary measures to be enacted for ground-disturbing activities and if cultural resources are inadvertently discovered will ensure that there would be no significant impact to cultural resources due to the implementation of this project.

Flight testing of the TMD defensive missile systems, involving the use of mobile and stand-alone radar systems that would be placed on existing paved or previously disturbed areas only would not have any direct impacts to the island's cultural resources other than the extremely remote potential for debris impacts from a launch abort or launch mishap. These impacts are similarly believed not to present significant impacts for the TMD defensive missiles. The potential for indirect impacts resulting from the increased human presence on the island is believed to be not significant.

Hazardous Materials/Waste

The hardening and interior modification of the Launch Support Building and a dormitory, refurbishment of Building 1203, and repair of the Peale Island bridge are activities that would have no hazardous materials/waste impacts since no hazardous materials usage associated with TMD target missile systems renovation/modification activities are identified. Although hazardous materials usage would not be expected as a result of proposed launch facility modification activities, modification of facility structures may

involve the removal of small quantities of asbestos-containing material. Electrical system upgrades may involve removal and disposal of equipment containing polychlorinated biphenyls. The quantities of waste generated during modification activities will be small and can easily be accommodated by the current waste disposal system or establishment of an independent system by the TMD program. The impact to hazardous materials/waste management at Wake Island due to facility upgrades will be not significant.

Activities involved with the preparation and launch of the TMD missile systems from Wake Island have the potential to increase the quantities and types of hazardous materials used at Wake Island and quantities and types of hazardous waste generated. TMD target missiles will utilize "off-the-shelf" solid-propellant rocket motors. Such systems contain large quantities of Class 1.1 explosives, which are considered relatively safe for normal handling. No wastes would be generated as a result of explosive-handling operations.

Operation of the additional equipment in the refurbished and newly constructed facilities should not have any direct adverse hazardous materials/waste impacts, with the exception of the use of small quantities of solvents and cleaning materials that may be required during launch preparation activities.

Minimal quantities of hazardous waste would be produced by launch activities and would consist of small quantities of used or excess solvents and cleaners. These materials are similar to wastes already generated and handled at Wake Island and can be accommodated within the current waste disposal system. Slight increases in quantities of hazardous waste generated as a result of launch activities will not adversely impact waste disposal activities.

Sea-based flight testing of the TMD target missiles would utilize much of the same hazardous materials (solvents and explosives) and generate similar minimal quantities of hazardous waste as would be utilized and generated by the ground-based system flight testing. Hazardous materials would be handled in accordance with applicable regulations and guidelines, and hazardous wastes generated aboard the MLS would be contained and appropriately disposed of when the MLS returns to port. Sea-based flight testing is expected to have hazardous materials/waste impacts that are not significant.

Health and Safety

The hardening and interior modification of the Launch Support Building and a dormitory, refurbishment of Building 1203, and repair of the Peale Island bridge are activities that would have no potential for health and safety impacts to the residents of Wake Island. The proposed construction activities would also have no potential for health and safety impacts to the residents of Wake Island. Building renovation/modification and new facility construction have the potential for construction-related accidents and injuries to the construction personnel themselves. Construction activities may involve the use of heavy equipment, work on elevated platforms, electrical safety hazards, and other hazards associated with general construction. Construction activities such as those proposed are considered to be routine renovation/construction operations, and the safety hazards associated with these operations are not considered to be significant. However, because

of the potential for uncovering buried World War II ordnance during ground-disturbing construction activities, explosive ordnance disposal personnel are required to be on site.

Target missile launches from the MLS stationed in the open ocean area would have the potential for health and safety impacts due to the potential of a missile launch failure.

Operation of the X-band phased-array TMD-GBR system and the C-band PATRIOT radar set during defensive missile test flights would produce electromagnetic radiation. While the potential for grating and side lobe illumination from the radar antennas would not exceed the permissible personnel exposure levels of 5 milliwatts (mW)/square centimeter (cm²) outlined in both the U.S. Army and U.S. Air Force regulations and standards for electromagnetic radiation, non-biological effects may occur. These include the potential for: interference with communication equipment, particularly airborne and shipborne weather radars; effects on avionics equipment; and effects on electroexplosives and refueling operations. With the exception of the potential for wide chirp interference with aircraft weather radars, all are believed to be mitigable by an appropriate Notices to All Mariners and Airmen.

Infrastructure and Transportation

The hardening and interior modification of the Launch Support Building and dormitory and refurbishment of Building 1203 are activities that would have no potential for significant impacts to infrastructure and transportation on the island. Repair of the Peale Island bridge would have a beneficial effect on the island's transportation network. The proposed construction activities at launch pads 1 and 2 (including trenching for the utility, communications, and fiber optic cables), the new incinerator pad, a new MSB and MAB, and a concrete radar pad would essentially have no or minimal potential for adverse direct impacts to infrastructure and transportation.

Both the renovation/modification and construction activities would draw on the island's power supply and generate some solid waste. However, both the power plant and Wake Island's landfill/burning pit are capable of handling any modification/construction-related requirements. The temporary personnel required to support TMD activities along with the present island population would still represent less than one-third of the population previously supported by the infrastructure on the island. Consequently, the direct impacts to infrastructure and transportation are not considered significant. Scheduling of the launch and launch-related activities would prevent cumulative impacts.

Flight testing of the TMD defensive missile systems, involving the use of mobile, stand-alone systems that would be placed on existing paved or previously disturbed areas only, would not have any direct impacts on Wake Island's infrastructure and transportation.

Land Use

The hardening and interior modification of the Launch Support Building and a dormitory, refurbishment of Building 1203, and repair of the Peale Island bridge are activities that would have no impacts on current or planned land use since they involve only changes or modifications to a facility or structure already in place. The proposed construction

activities at launch pads 1 and 2 (including trenching for the utility, communications, and fiber optic cables), the new incinerator pad, a new MSB and MAB, and a concrete radar pad would have no adverse impacts on current land use or land use plans, policies, and controls since they are all proposed for areas of the island that already are designated for these kinds of land uses. Therefore, no significant impacts to land use are anticipated. Operation of the additional equipment in the refurbished and newly constructed facilities and flight test operations would not have any direct or indirect adverse land use impacts over and above those noted for renovation and construction activities.

Noise

The hardening and interior modification of the Launch Support Building and dormitory and refurbishment of Building 1203 are activities that would have no or minimal impacts on the noise environment. The proposed construction activities at launch pads 1 and 2 (including trenching for the utility, communications, and fiber optic cables), the new incinerator pad, a new MSB and MAB, a concrete radar pad, and repair of the Peale Island bridge would have noise environment impacts.

Blasting of the reef area to lay fiber optic cables off shore has the potential for noise impacts. The higher-frequency portions of the pressure wave are audible and are the sound that accompanies a blast; the lower-frequency portion is not audible but excites structures and in turn can cause a secondary and audible rattle within structures. Sonic booms would occur with each TMD system launch after the vehicle exceeds the speed of sound. The sonic boom would be directed toward the front of the vehicle downrange of Wake Island over the ocean.

Flight testing of the TMD missile systems may involve the use of mobile, stand-alone radar systems or permanent radar systems located in renovated facilities. The mobile power generator, used during the defensive missile launches, would have generator noise associated with its operation. All noise impacts would be reduced to a not-significant level with the implementation of standard personnel protection procedures.

Physical Resources

All construction materials for the proposed action will be shipped to the island; no island resources will be required. Ground excavation and trenching during construction are not expected to cause any soil erosion or significant fugitive dust because of the very low relief of the island and the coarse-grained, porous nature of the soil. Therefore, there would be no direct or indirect physical resource impacts.

Socioeconomics

As a result of Wake Island's mission, socioeconomic issues are essentially confined to the availability of housing. The renovation/construction activities would employ approximately 40 unaccompanied transient construction workers over an 8-month period. Defensive missile launch activities, including the TMD-GBR, would require about 140 personnel for approximately 2 weeks. These transient personnel would be housed in existing USASSDC-controlled billets, in which up to 170 beds are available, with additional beds available in

U.S. Air Force-controlled billets. Consequently, there would be no significant housing and, thus, no socioeconomic impacts.

Water Resources

Other than the freshwater catchment basins that are located away from all proposed TMD activities, there are no freshwater bodies on the island. Construction and flight testing activities associated with TMD activities will likely require the desalination of additional renewable, brackish groundwater during the dry season. Consequently, there would be no potential for significant direct impacts on water resources.