UNITED STATES DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY

RECORD OF DECISION

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE AIRBORNE LASER PROGRAM

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969, Public Law (P.L.) 91-90 (as amended) and the regulations promulgated by the Council on Environmental Quality at 40 Code of Federal Regulations (CFR) § 1505.2, the Department of Defense (DOD), Missile Defense Agency (MDA), has prepared the following Record of Decision (ROD) on the Supplemental Environmental Impact Statement (SEIS) for the Airborne Laser (ABL) Program. The ROD contains the statement of decision, identifies the alternatives considered, and discusses the factors on which the decision was based, and any mitigating measures deemed necessary to avoid or minimize environmental impacts.

OVERVIEW

The United States (U.S.) requires a more accurate and effective defense against ballistic missiles by destroying them during the boost phase, just after launch. Currently, the U.S. and its allies are limited to defense of troops or high-value assets within a small area of a theater of operations as the missile nears its target. Improvements in missile range and accuracy and the rapid increase in the number of missile-capable nations increase the threat.

The ABL aircraft is a modified Boeing 747 aircraft that accommodates a laser-weapon system and laser fuel storage tanks. The ABL aircraft incorporates an Active Ranging System (ARS) laser, a Track Illuminator Laser (TILL), and a Beacon Illuminator Laser (BILL); a laser-beam control system designed to focus the beam on target; and a High-Energy Laser (HEL) (i.e., chemical, oxygen, iodine laser [COIL]) designed to destroy the target. The ARS is a lower-power gas laser, and the BILL and TILL are lower-power solid-state lasers. An onboard Battle Management Command Center provides computerized control of aspects of the laser-weapon system, communications, and intelligence. The ABL aircraft would fly at high altitudes and would detect and track launches of ballistic missiles using onboard sensors. During flight-test activities, active tracking of the missile with the BILL and TILL would begin at approximately 35,000 feet above mean sea level.

The ABL program is one of the elements of the MDA Ballistic Missile Defense System (BMDS) that is intended to provide an effective defense for the U.S., its deployed forces,

and its friends and allies from limited missile attack during all segments of an attacking missile's flight. The ABL element of the BMDS is being developed to provide an effective defense to limited ballistic missile threats during the boost segment of an attacking missile's flight.

The Final Environmental Impact Statement for the Program Definition and Risk Reduction Phase of the Airborne Laser Program (FEIS) was published in April 1997. The 1997 FEIS analyzed several alternatives for establishing the Home Base, the Diagnostic Test Range, and the Extended-Area Test Range that are required to effectively demonstrate the ability of the ABL system. The 1997 FEIS considered Edwards Air Force Base (AFB), California, and Kirtland AFB, New Mexico, as possible Home Base locations; White Sands Missile Range (WSMR), New Mexico, and China Lake Naval Air Warfare Center, California, as the Diagnostic Test Range; and the Western Range, including Vandenberg AFB and/or Point Mugu Naval Air Warfare Center Weapons Division, both in California, as the Extended-Area Test Range.

The ROD for the 1997 FEIS identified Edwards AFB as the Home Base (to support the ABL aircraft and conduct ground-test activities of the ABL system), WSMR as the Diagnostic Test Range, and the Western Range as the Expanded-Area Test Range (both for supporting proposed flight-test activities of the ABL systems). Based upon operational and environmental concerns in that FEIS, Edwards AFB was chosen as the primary location for conducting ground-test activities. Kirtland AFB and WSMR were identified as alternative ground-test locations in the event that ground testing was not possible at Edwards AFB.

PURPOSE AND NEED

The SEIS sets forth the supplemental environmental analysis required based on changes in the proposed test program that have occurred since the 1997 FEIS was completed and examines proposed test activities at Edwards AFB, Kirtland AFB, WSMR/Holloman AFB, and Vandenberg AFB. Holloman AFB is a U.S. Air Force installation that shares most of its boundary with WSMR. The 1997 FEIS previously examined test activities and test locations and is considered the No-Action Alternative for this SEIS. The following is a list of new or refined actions that require the preparation of an SEIS:

- Testing of two ABL aircraft (referred to as the Block 2004 aircraft and an improved follow-on aircraft, the Block 2008) rather than the individual aircraft addressed in the 1997 FEIS
- Proposed ground testing that was not considered in detail in the 1997 FEIS
- Potential effects due to off-range lasing during test activities

- Potential effects of lowering the test altitude of the ABL aircraft from 40,000 feet to 35,000 feet or higher
- Testing of the ARS laser, the BILL, the TILL, and the Surrogate High-Energy Laser (SHEL) systems that were not considered in detail in the 1997 FEIS
- Refinement of proposed ABL test activities (i.e., location of tests, types of tests, and number of tests).

These new or refined actions will maximize testing efficiencies and realism, and provide further clarification of the ABL weapon system test program

DECISION

The MDA will proceed with the Proposed Action as described in the SEIS and summarized below. Appropriate management plans and regulations would be adhered to and suitable mitigation measures would be initiated to minimize potential adverse effects.

PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is to conduct test activities of the ABL system at test ranges associated with Edwards AFB and Vandenberg AFB, California, and Kirtland AFB and WSMR/Holloman AFB, New Mexico. Test activities would involve testing the laser components on the ground and in flight to verify that laser components operate together safely and effectively. Two ABL aircraft (Block 2004 and Block 2008) would be utilized during test activities. Software upgrades to the Block 2004 aircraft would be tested and added to that test aircraft under a Block 2006 effort. Once upgraded with the newer operating system, the Block 2004 aircraft would be designated as the Block 2006 aircraft. Ground testing of the ABL system is proposed at Edwards AFB. Kirtland AFB and WSMR/Holloman AFB have been identified as alternative ground-test locations if ground tests cannot be conducted at Edwards AFB. Flight testing is proposed at the R-2508 Airspace Complex (Edwards AFB), Western Range (Vandenberg AFB), and WSMR (including Federal Aviation Administration [FAA]-controlled airspace and airspace utilized by Fort Bliss).

The ABL aircraft would be housed at an existing hanger at Edwards AFB. Edwards AFB is also the location where the laser systems would be integrated into the aircraft, where ground tests would occur, and is the location for initial aircraft flight tests. Although flight testing of the ABL system would occur within the R-2508 Airspace Complex, Western Range and WSMR, ABL test flights would begin and end at Edwards AFB. The ABL aircraft could be used to support other BMDS incidental exercises and deployments from other locations. These operations would be supported by other environmental analysis as appropriate.

Ground-Testing Activities. Ground testing of the lower-power laser systems (i.e., ARS, BILL, TILL, and SHEL) would be performed at Edwards AFB. Ground-testing activities would be conducted from an aircraft parking pad or the end of a runway with the laser beam directed over open land toward ground targets with natural features (e.g., mountains, hills, buttes) or earthen berms as a backstop. Lower-power lasers could also be fired from the System Integration Laboratory (SIL) at the Birk Flight Test Facility to range targets for atmospheric testing. Appropriate automatic hard-stop limits and beam path restrictors would be incorporated into the test design to ensure that laser energy does not extend beyond natural features and backstops. Additionally, the proposed ground test area would be cleared of personnel prior to initiating test activities. The ground-testing activities could also be conducted using a ground-based simulator within Building 151 at Edwards AFB. No open range testing of the HEL (COIL) would be conducted. Ground testing of the HEL would be conducted at Edwards AFB within Building 151 and the SIL using a ground-based simulator or an enclosed test cell. In the event that ground testing is not possible at Edwards AFB, ground testing of the ARS, BILL, TILL, and SHEL systems only could be conducted at Kirtland AFB or Holloman AFB/WSMR.

Flight-Testing Activities. Flight tests at ranges associated with WSMR (including FAA-controlled airspace and airspace utilized by Fort Bliss), Edwards AFB (R-2508 Airspace Complex), and Vandenberg AFB (Western Range) would be used to test the ARS, BILL, TILL, SHEL, and HEL systems.

The ABL tests would include acquisition and tracking of targets at short-range as well as high-energy tests. These tests would be conducted against instrumented diagnostic target boards carried by balloons, missiles, or aircraft. Missiles would incorporate a flight-termination system, when required, to ensure that debris would be contained on the range in the event the target must be destroyed during flight. Proteus aircraft (a manned aircraft with a target board attached) and Missile Alternative Range Target Instrument (MARTI) drops (balloon with a target board attached) would be utilized for testing of the lower-power laser systems (i.e., ARS, BILL, TILL, and SHEL). MARTI drops would also be used for testing the HEL.

The MARTI is a diagnostic target for ABL that is similar in size and geometry to a ballistic missile. The basic construction consists of a shell of aluminum with aluminum fins attached, coated with paint selected to represent the properties of the paint on ballistic missiles (no fuel would be onboard). The balloon would rise to an approximate height of 100,000 feet and may pass over private and BLM-managed lands, depending on wind conditions aloft. When the balloon is over the target drop box and at the desired altitude the MARTI payload would be released. The MARTI would free-fall to 50,000 feet allowing approximately 55 seconds of engagement time, allowing multiple engagements on each drop. A nominal three engagements per MARTI drop are planned. Approximately 60 pounds of flare attached to the MARTI would burn during the entire ABL engagement to provide an infrared source for the ARS. The flare would be

exhausted prior to the MARTI reaching the ground. After the ABL engagement is complete, a parachute system would be deployed to slow down and recover the complete MARTI unit for reuse.

During flight tests with the ABL aircraft, up to two "chase aircraft" may be utilized to monitor test activities. The ABL aircraft would fly at an altitude of 35,000 feet or higher. The laser systems would be directed above horizontal in an upward direction to minimize potential ground impact or potential contact with other aircraft. The energy from the HEL would heat the missile's booster components and cause a stress fracture, which would destroy the missile.

Missile debris would be contained within the range boundaries. The geometry of the tests would preclude operation of the laser except at an angle that is above the horizon. The onboard sensors and laser clearinghouse data would be used to confirm that no other aircraft or satellites are within the potential path of the beam, although controlled airspace would be utilized during ABL test activities and would be verified cleared. Airborne diagnostic testing would revalidate and expand on-the-ground test activities, confirm computer model predictions, and enable complete system tests.

No-Action Alternative. The No-Action Alternative is to proceed with ABL testing activities as addressed in the 1997 FEIS and associated ROD.

NEPA PROCESS

The Notice of Intent (NOI) to prepare an SEIS for ABL Program test actions was published in the Federal Register on March 22, 2002, initiating the public scoping process. Public scoping meetings were held in April 2002 in communities perceived to be affected by the ABL tests. The Notice of Availability (NOA) of the ABL Draft SEIS was published in the Federal Register in September 2002. This initiated a public review and comment period for the Draft SEIS. Four public hearings were held in October 2002 in the same locations as the public scoping meetings. Comments on the Draft SEIS were considered in the preparation of the Final SEIS. A Department of Defense NOA for the Final SEIS was published in the Federal Register on June 16, 2003. An Environmental Protection Agency NOA for the Final SEIS was published on July 3, 2003, initiating an additional 30-day comment period. Comments were considered in the decision process, culminating in this ROD.

ENVIRONMENTAL ISSUES

The proposed activities addressed in the SEIS do not change the scope, quantity, or quality of the actions analyzed in the 1997 FEIS; therefore, only the following resources were analyzed in the SEIS for potential impacts: airspace, hazardous materials and hazardous waste management, health and safety, air quality, noise, biological resources,

cultural resources, and socioeconomics. Environmental issues identified during the analysis are summarized below. The complete SEIS is available at the following website: "http://www.afcee.brooks.af.mil/ec/eiap/eis/abl/ABL_F-SEIS_Apr_03.pdf".

Environmental Effects of the Proposed Action. The current regional airspace restrictions would continue due to ABL testing activities. Flight-testing activities occurring within FAA-controlled airspace would be coordinated with the FAA prior to conducting test activities. Hazardous materials used and hazardous waste generated during ABL testing activities would be managed in accordance with applicable federal, state, DOD, and Air Force regulations regarding the use, storage, and handling of hazardous materials, hazardous waste, and hazardous chemicals identified under the Hazardous Materials Management Plan. ABL testing activities would involve ground-level and in-flight lasing. Performance of ABL testing activities in accordance with appropriate safety measures would reduce the potential for health and safety impacts. There would be short-term, negligible increases in pollutant emissions due to ground- and flight-testing activities. The minimal increases would not delay regional progress toward attainment of any air quality standard. The negligible increases in pollutants would not exceed the *de minimus* threshold of any regional air basin. Due to the location of the ground-test activities and the altitude of the flight-test activities, no residential areas would be exposed to continuous noise levels exceeding 65 decibels (dBA). Because ABL testing activities would be conducted in accordance with applicable regulations and existing standard operating procedures for debris recovery, adverse biological resource and cultural resource impacts are not anticipated. The proposed ABL testing activities would require a long-term increase of approximately 750 personnel at Edwards AFB to support the ABL program and a short-term increase of up to 50 program related temporary personnel during test activities. These personnel would provide a small, positive, yet largely unnoticeable effect on population, income, and employment in the vicinity of the installations.

Environmental Effects of the No-Action Alternative. ABL test activities would continue in accordance with those actions addressed in the 1997 FEIS and associated ROD. The regional airspace restrictions at the installations would continue due to ongoing mission activities. Management of hazardous materials and waste at the installations would continue in accordance with current practices. Current range safety measures at the installations would continue to ensure public safety and the environment are protected. Based on the 1997 FEIS, no adverse air quality, noise, biological, cultural, or socioeconomic impacts are anticipated.

Preferred Alternative. The Proposed Action is the preferred alternative. This would involve conducting test activities of the ABL system at test ranges associated with Edwards AFB and Vandenberg AFB, California, and Kirtland AFB and WSMR/Holloman AFB, New Mexico. Test activities would involve testing the laser components on the ground and in flight to verify that laser components operate together

safely and effectively. Edwards AFB has been selected as the Home Base and will be the primary location for ground-testing activities. White Sands Missile Range has been selected as the Diagnostic Test Range and the Western Range has been selected as the Expanded-Area Test Range.

Environmentally Preferred Alternative. The environmentally preferred alternative is the no-action alternative.

Cumulative Impacts. The SEIS found no cumulative impacts on the human environment from proposed ABL testing activities. However, due to the nature of test activities at the Western Range and WSMR, other missile test and rocket launch activities within the ranges to support other military and commercial functions would be occurring. These missile tests and rocket launches have been addressed in Environmental Assessments (EAs) and Environmental Impact Statements (EISs) that limit the number of launches and are carefully scheduled/coordinated to prevent conflicts with overlapping missions.

In the event that ground tests are conducted at Holloman AFB, potential mission conflicts could occur at Holloman AFB due to parking the ABL aircraft and associated support equipment at the western end of the base runway. This arrangement would prevent aircraft from taking-off or landing (i.e., require closure of the runway). In order to avoid mission conflicts at Holloman AFB, other less frequently or unused runways, taxiways, or aircraft apron locations could be identified/dedicated to support the ABL aircraft during the short period of ground-test activities. If a suitable ground-test location that avoids Holloman AFB mission activities cannot be identified, the ABL ground-test program would be postponed until conditions at Edwards AFB or Kirtland AFB are suitable. In addition, during ABL flight-test activities, conflicts with the Holloman AFB flying mission could occur due to the ABL test activities using restricted airspace that is also used by Holloman AFB aircraft. This potential concern would be avoided through scheduling of test activities so that mission conflicts would not occur.

Measures to Minimize Impacts. All practicable means to avoid, minimize, or mitigate harm to the environment would be taken under the selected alternative. Because of the negligible impacts that ABL test activities would have on most environmental factors and measures already take by the MDA, Air Force, and Army, no separate mitigation plan beyond adherence to applicable laws, regulations, and DOD guidelines is deemed necessary. ABL test activities would comply with applicable federal, state, DOD, Air Force, and Army regulations regarding the management of hazardous materials and hazardous waste. Evacuation plans and emergency response plans will be developed and implemented as required. Emergency planning documents will be updated and emergency response personnel trained and equipped prior to introduction of new ABL hazardous materials.

To minimize potential laser hazards, multiple controls would be used to reduce the potential for off-range lasing and accidental lasing of unsuspecting receptors. These controls include the use of backdrops and enclosures, horizontal and vertical buffer zones, administrative controls, and removal of mirror-like reflecting surfaces from the test area. Safety interlocks associated with the laser systems are in place to stop lasing activities in the event that the beam control steers the beam from the anticipated beam path. Evacuations, clearances, and road closures would be implemented to ensure worker and public health and safety. Any debris from target missile impact areas would be recovered in accordance with established Standard Operating Procedures (SOPs) and regulations.

Consultation with appropriate federal and state agencies (e.g., U.S. Fish and Wildlife Service, SHPO) will be completed. Notice of launch activities will be provided to any concerned agencies, local communities, and recreational users. Efforts will be made to schedule ABL test activities to avoid impacts on other activities at the installations.

With regard to airspace, avoidance of the R-5119 Restricted Area associated with WSMR would mitigate the potential impact to the J13 and J57 high-altitude jet routes that transit through the Restricted Area. In order to avoid operational impacts at Holloman AFB, other less frequently used or unused runways, taxiways, or aircraft apron locations could be identified/dedicated to support the ABL aircraft during the short period of ground-test activities. If a suitable ground-test location that avoids Holloman AFB mission activities cannot be identified, the ABL ground-test program would be postponed until conditions at Edwards AFB or Kirtland AFB are suitable.

In the event that target debris affects White Sands pupfish habitat, specific operational steps for emergency responses would be determined on a case-by-case basis in accordance with the WSMR Missile Mishap Plan, Annex P to the Disaster Control Plan.

CONCLUSION

The refinements in the original testing program analyzed in the SEIS serve to increase testing efficiencies and realism, and provide further advancement of the ABL testing program.

The factors and considerations offered above justify the selection by MDA of the Proposed Action as presented in the Final Supplemental Environmental Impact Statement for the Airborne Laser Program.

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