

Finding of No Significant Impact

Environmental Assessment for Electromagnetic Pulse Test Facility, Joint Base San Antonio-Lackland, Texas

Introduction

Joint Base San Antonio (JBSA)-Lackland, located in the southwest part of San Antonio, Texas, proposes to construct and operate a new Electromagnetic Pulse (EMP) test site at JBSA Lackland, Kelly Field Annex, Texas.

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.) and the United States Air Force (USAF) Environmental Impact Analysis Process (EIAP) (32 CFR Part 989), to evaluate the potential environmental impacts associated with implementation of the Proposed Action.

The purpose of the Proposed Action is to ensure the VC-25B aircraft meets EMP exposure performance criteria as defined in military standards and Department of Defense (DoD) instructions.

The Proposed Action is needed because existing EMP testing facilities cannot accommodate the VC-25B aircraft. As the lead agency responsible for EMP testing, the Air Force Materiel Command (AFMC) must establish an adequate facility to support the EMP resiliency testing of the VC-25B and other aircraft of similar size. Failure to do so would mean AFMC would not be able to properly test the EMP countermeasures of the VC-25B, the selected model intended to serve as the future Air Force One.

Background

An EMP is a high-intensity, extremely rapid, and short duration burst of electromagnetic energy that occurs over a wide frequency range which, when coupled to metallic conductors associated with electrical and electronic systems, produces damaging current and voltage surges that may render such systems inoperable. An EMP is caused by either a naturally occurring event involving solar interference or a thermonuclear device detonated several hundred miles above the Earth's surface (known as a High-Altitude EMP [HEMP]).

Objects such as aircraft without proper shielding or countermeasures may suffer catastrophic effects from an EMP. Military Standard (MIL-STD) 3023, *High-Altitude Electromagnetic Pulse (HEMP) Protection for Military Aircraft*, defines the performance criteria for protection against HEMP threat environments as defined in MIL-STD-2169, *High-Altitude Electromagnetic Pulse Environment*. In addition, Department of Defense (DoD) Instruction 3150.09, *The Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability Policy*, establishes policy, assigns responsibilities, and establishes procedures for the execution of the DoD CBRN Survivability Policy (including EMP radiation).

The Boeing VC-25 is a military version of the Boeing 747 airliner, modified for presidential transport and commonly operated by the Department of the Air Force (DAF) as Air Force One, the call sign of any U.S. Air Force aircraft carrying the President of the United States. Only two variations of this aircraft type are in service. One is the highly modified Boeing 747-200Bs, designated VC-25A. Two new aircraft, based

on the Boeing 747-8I and designated VC-25B, have been ordered by the USAF to replace the aging VC-25A.

Since at least the 1970s, engineers have designed and built EMP simulators, which are used in designing and evaluating the shielding present on aircraft and other test objects. The Air Force Materiel Command (AFMC) currently has the capability to conduct EMP testing on aircraft at other installations. However, these existing test systems cannot accommodate larger aircraft, and in particular, the VC-25B. The VC-25B must undergo testing over its lifetime to verify the airframe and associated components are properly configured to resist the potential effects of an EMP. Existing EMP testing sites across the country are unable to meet the criteria necessary for testing aircraft at the scale of the VC-25B.

It has been determined that an EA is required to analyze the impacts associated with the EMP Test Facility project under NEPA.

1. Description of Proposed Action and Alternatives

Proposed Action

Under the Proposed Action, AFMC would receive and operate a mobile antenna at The Bubble to support EMP testing on the VC-25B and similar aircraft. The antenna would be a portable Continuous Wave Measurement System (CWMS) antenna. The CWMS would provide Low-Level Continuous Wave (LLCW) testing of the VC-25B and similar aircraft and would create a low-intensity electromagnetic field which would approximate EMP effects in a controlled setting.

The CWMS would be used to measure the integrity of the shielding on an EMP hardened aircraft. It would illuminate the aircraft with a side and overhead-incident, uniform field of approximately 1-volt per meter and wave impedance of 377 ohms. The test system would consist of a transmitter and antennas that would illuminate the aircraft over the frequency range of 100 kilohertz (kHz) to 1 gigahertz (GHz), and a receiver that would measure the aircraft's responses to the radiated energy.

For the required 100 kHz – 1 GHz frequency range, there would be at most approximately 3,000 discrete frequency points, with a dwell time of 0.3 seconds and a 50% duty cycle, requiring a total sweep time of approximately 30 minutes.

The portable CWMS antenna would be erected by a crew of approximately seven personnel using supporting equipment such as boom lifts and trucks. Once erected, the mobile CWMS would remain for approximately one week for testing operations, after which it would be dismantled and returned to storage. A portable generator would be used during the one-week test period to provide power and area lighting while the system is in use.

The portable CWMS would be oriented to the side of the aircraft for testing. Only one aircraft would be tested at a time.

Action Alternative

Under the Action Alternative, JBSA-Lackland would install and operate a permanently affixed 30-meter Extended Elliptic Antenna to support LLCW testing on aircraft. Because this would be a permanent test site, the following site improvement activities would occur:

- Site preparation and foundation work: This includes constructing a personnel support structure, winch foundations, and pouring a concrete pad for a climate controlled, 8' x 10' personnel shelter.
- Site preparation: This includes preparation of the vertical-launch ground plane surface from the edge of the pad to one of the Ellipticus supporting poles. The existing sloped soil grade in this area would be raised to approximately 6 inches below the elevation of The Bubble. A ground plane of 2-inch x 2-inch welded hardware cloth would be placed in contact with the soil and tied to 5-foot rebar grounding rods spaced every 8 feet around its perimeter. One foot of the grounding rods will remain above grade. A protective concrete pavement would be poured over the mesh; the elevation of the top of this pavement will be roughly level with the elevation of The Bubble. A protective barrier or barriers would be emplaced for the exposed grounding rods.
- Amplifier structure: An 8' x 10' metal, climate-controlled structure would be constructed to house the amplifier. It would be placed on a pad and anchored in place at the base of the northwest antenna pole.
- Power supply: Dedicated power would be installed for the amplifier structure (for lighting, climate control, additional 110-volt outlets, 220-volt 30-amp for the amplifier) and the support structures (for the winches and emergency lighting system). All power would be installed underground from the nearest point of connection.
- Antenna emplacement: The two support structures would be erected and secured with down-guys and cross-guys between the structures, followed by installing powered winches to raise/lower the antenna and lightning protection system. The antenna and ground plane would then be installed.
- Lighting and lightning protection: An Aircraft Warning Light System, Aerial Markers, and a Lightning Protection System for the antenna and supporting shelter would be installed.
- Coordination with airfield operations for any waivers or approvals for permanent structures would be completed.

The antenna would be a center fed, resistively loaded dipole with each end of the dipole terminated to earth ground. This configuration would focus the energy on the aircraft with the required intensity.

No Action Alternative

The No Action Alternative serves as a benchmark against which the effects of the Proposed Action can be evaluated. For this project, the No Action Alternative is defined as not implementing and operating an EMP test facility at JBSA-Lackland. The No Action Alternative would limit AFMC's ability to test the resiliency of VC-25B and other aircraft to simulated EMP events. The No Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Proposed Action. However, the No Action Alternative does provide a description of the baseline conditions against which the impacts of the Proposed Action can be compared.

2. Environmental Analysis

The following table summarizes the potential environmental impacts of the Proposed Action, Action Alternative, and No Action Alternative. Any potential adverse effects on these technical resource areas would be further reduced or avoided through the implementation of standard environmental Best Management Practices (BMP) or optional management measures as discussed in the EA.

Resource Area	Proposed Action	Action Alternative	No Action Alternative
Airspace	No Impact	No Impact	No Impact
Air Quality	Negligible Impact	Negligible Impact	No Impact
Cultural Resources	No Impact	No Impact	No Impact
Biological and Natural Resources	No Adverse Effects	No Adverse Effects	No Effect
Water Resources	No Impact	No Impact	No Impact
Floodplains, Wetlands, and Coastal Zone Management	No Impact	No Impact	No Impact
Geology and Soils	No Impact	No Impact	No Impact
Noise and Vibration/Acoustic Environment	Minor, Not Significant	Minor, Not Significant	No Impact
Land Use and Aesthetics	No Impact	No Impact	No Impact
Infrastructure and Utilities	Minor, Not Significant	Minor, Not Significant	No Impact
Solid and Hazardous Materials/Waste	Minor, Not Significant	Minor, Not Significant	No Impact
Transportation and Parking	Negligible Impact	Negligible Impact	No Impact
Electromagnetic Field	Minor, Not Significant	Minor, Not Significant	No Impact
Safety and Occupational Health	Minor, Not Significant	Minor, Not Significant	No Impact
Socioeconomics	Minor, Not Significant	Minor, Not Significant	No Impact
Community Services	Minor, Not Significant	Minor, Not Significant	No Impact
Environmental Justice	No Disproportionate Impact	No Disproportionate Impact	No Impact

3. Resource Management Measures

Per established protocols, procedures, and requirements, USAF and its construction contractor(s) would implement best management practices (BMP) and would satisfy all applicable regulatory requirements in association with the design, construction, and operation of the EMP test facility. “Management measures” are defined as routine BMPs and/or regulatory compliance measures that are regularly implemented as part of proposed activities, as appropriate, across the State of Texas. In general, implementation of such management measures would maintain impacts at acceptable levels for all resource areas analyzed. These are different from “mitigation measures,” which are defined as project-specific requirements, not routinely implemented as part of construction projects, necessary to reduce identified potentially significant adverse environmental impacts to less than significant levels. Management measures for air quality, wetlands, noise, and solid and hazardous materials/waste are provided in the EA.

4. Agency and Public Comment

As stated in the USAF’s EIAP (32 CFR Part 989), public involvement for an EA may include public engagement during scoping and drafting and finalizing the EA through publication of notices or public

meetings. The public involvement process for this EA consisted of publication of a Notice of Availability of the Draft EA and a public comment period on the Draft EA. Public comments will be taken into consideration during preparation of the Final EA and FONSI.

The USAF's NEPA guidance states that the EA process must include at least a 30-day public comment period on the Draft EA, which starts with the publication of a Notice of Availability (NOA). The NOA for the Draft EA was published in the San Antonio Express and News on 6/18/2025, in the La Prensa on 6/18/2025, and in the San Antonio Observer on 6/18/2025 to initiate the 30-day public review period. The Draft EA was made available from 6/18/2025 to 7/21/2025. A copy of the Draft EA will be made available from 6/18/2025 to 7/21/2025 at the San Antonio Central Library. An electronic version of the Draft EA will also be made available on the Joint Base San Antonio Environmental Information website. (<https://www.jbsa.mil/Resources/Environmental>).

5. Finding of No Significant Impact

As a result of the analysis of impacts in this EA, summarized and incorporated by reference herein, it is the conclusion of the USAF that the Proposed Action would not have a significant adverse impact on the quality of the natural or human environment within the meaning of Section 10 2(2c) of the NEPA. Therefore, preparation of an environmental impact statement is not required.

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