

Administrative Changes to AFSCI21-102, Engineering Hierarchy of Controls

OPR: AFSC/EN

References throughout to “AFMAN 48-146” are hereby changed to “DAFMAN 48-146”.
14 December 2022

References throughout to “AFMCI21-100” are hereby changed to “AFMCI21-100V1”.

5 MARCH 2024

**BY ORDER OF THE COMMANDER
AIR FORCE SUSTAINMENT CENTER**

**AIR FORCE SUSTAINMENT CENTER
INSTRUCTION 21-102**



**13 OCTOBER 2022
Certified Current, 2 September 2025
Maintenance**

**ENGINEERING
HIERARCHY OF CONTROLS**

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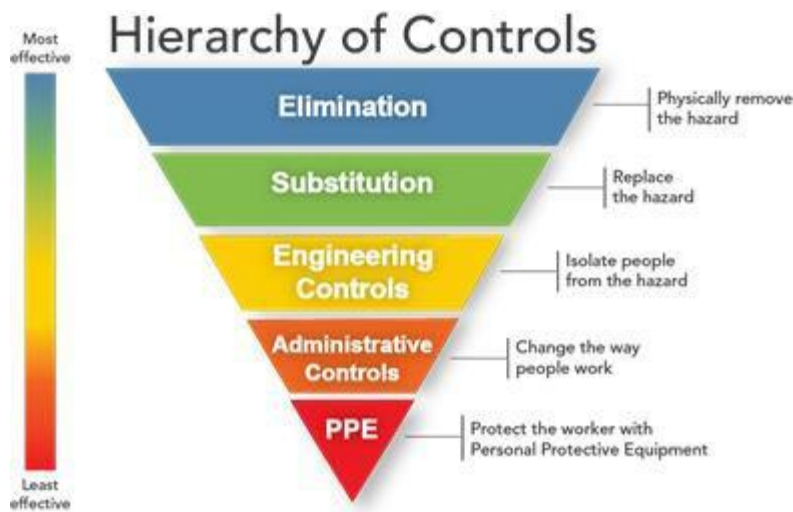
This is a new publication and should be reviewed in its entirety. This instruction implements AFMCI 21-100, Depot Maintenance Management. Additional guidance can be found in AFSCMAN 21-102, Depot Maintenance Management. This instruction provides a standardized process for applying the hierarchy of controls (HoC) when addressing occupational and health hazards relating to production engineering. It applies to the Air Force Sustainment Center. Refer recommended changes and questions about this publication to the Office of primary Responsibility (OPR) using the AF Information Management Tool (IMT) AF 847, Recommendation for Change of Publication. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AF Manual (AFMAN) 33-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>. The use of a name of any specific commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This revision has been rewritten to address a broader range of occupational and environmental health hazards (e.g. vibration, noise). In addition, the rewritten instruction also includes an emphasis on prevention through design (PtD) and new roles and responsibilities to accomplish engineering hierarchy of controls impacting occupational and health hazards relating to production engineering.

1. Overview. The Engineering Hierarchy of Controls (HoC) system shall be used when addressing Environment, Safety, and Occupational Health (ESOH) hazards including chemical hazards using toxic, corrosive, or explosive compounds, material hazards including disposing or handling of byproducts such as asbestos, paints, or industrial waste and physical hazards from process related work exposing workers to heat, stress, vibration, radiation, and other ergonomic factors. Per DoDI 6055.01, *DoD Safety and Occupational Health (SOH) Program*, the order in which to apply hierarchy of controls is: elimination, substitution, engineering and/or administrative controls, and the appropriate use of Personal Protective Equipment (PPE) when other options fail to mitigate the hazard. **Figure 1** (Hierarchy of Controls) provides a visual representation of the order of hierarchy of controls and their attributes.

Figure 1. Hierarchy of Controls.



2. Hierarchy of Controls Roles and Responsibilities. **Attachment 2** (Hierarchy of Controls Process Map) shows a breakdown of responsibilities when applying the hierarchy of controls. Reference AFMAN 91-203 for definitions, responsibilities, and applications for engineering controls. This instruction focuses on engineering guidance for HoC, IAW OSHA 29 CFR 1910, and prevention through design (PtD) at the highest level of safety for the workplace. “PtD involves all of the efforts to anticipate and design out hazards to workers in facilities, work methods and operations, processes, equipment, tools, products, materials, new technologies, and the organization of work. NIOSH [2013]”. The engineering community are uniquely positioned to eliminate hazards and control risks to workers to as early as possible in the life cycle of equipment, products, or workplaces. Reference AFMAN 48-146, Occupational and Environmental Health Program Management, for detailed definitions of engineering controls, administrative controls, and personal protective equipment.

2.1. Workplace Supervisor.

2.1.1. Understands hierarchy of controls and ensures that hazard controls are implemented and functioning correctly.

2.1.2. Consults with engineering to implement controls for potential ESOH hazards.

2.2. Bioenvironmental Engineering (BE).

2.2.1. Upon request, recommends and assists production engineer and workplace supervisor on ways to reduce ESOH hazards through implementation of PtD/HoC.

2.2.2. Assists workplace supervisor, production engineer, and supply chain management (SCM) engineer with the completion of a feasibility study.

2.3. Air Logistics Complex Occupational Safety & Health.

2.3.1. Reviews feasibility study prior to final acceptance.

2.3.2. Provides member for integrated product team (IPT) when feasibility determination is questioned.

2.4. **Production Engineer (Air Logistics Complex).** AFSCMAN 21- 102, *Depot Maintenance Management*, assigns the role of technical authority of an industrial process to the Production Engineer. When addressing occupational and environmental hazards, the Production Engineer shall address the engineering controls step in the hierarchy of controls and make elimination/substitution recommendations to the appropriate System Program Office (SPO) Engineering or SCM engineering authority on a commodity item, as delegated by the SPO. A Production Engineer shall be aware of the triggers that may initiate the need for hierarchy of controls. Examples of triggers are included in the following table:

Table 1. Engineering Hierarchy of Control triggers.

Engineering Hierarchy of Control Triggers
BE recommended and justified health risk assessment (HRA)
BE recommended and justified risk assessment code (RAC)
SPO/SCM Engineering Authority item identified in a modification program
Programmatic Environmental, Safety and Occupational Evaluation (PESHE)
New equipment or facility update for a process with ESOH hazards
Current or new component or programmatic environment
Depot support initiative
Safety hazard reports

2.4.1. In addition, a Production Engineer can self-identify occupational and environmental health hazards that requires the need for hierarchy of controls, or identify an opportunity to move up the hierarchy of controls to reduce exposure levels. For cases where elimination or substitution is suggested, the SPO/SCM Engineering Authority for the item shall address and make a determination.

2.4.2. When BE recommends a feasibility study, the Production Engineer shall follow the instructions to complete a feasibility study in section 2.6. Otherwise, the production engineer shall perform a locally developed documented application of the hierarchy of controls. This documentation should serve as supporting information and as the basis for HoC Statement Form within the Capital Investment Program (CIP) process.

2.5. Supply Chain Management (SCM) Engineer. When addressing ESOH hazards, a SCM Engineer will be aware of the triggers that may initiate the need for hierarchy of controls and make engineering control suggestions to the Production Engineer. Examples of triggers are included in [Table 1](#) When an opportunity to apply the hierarchy of controls occurs, the SCM engineer will address elimination and/or substitution. When appropriate, will consult with the Production Engineer when addressing elimination and prior to changing technical data or a T.O. substitution. This will ensure that any required updates to facilities, procedures and/or training prior to use of the substitution. The SCM Engineer will coordinate with the production engineer to consult with the ALC Occupational Safety & Health offices to ensure the substitution is added to the complex for purchase.

2.5.1. When the SCM Engineer is the engineering authority over the commodity item and the associated T.O., SCM engineer will complete the elimination/substitution portion of the feasibility study or the elimination/substitution portion of the documented application of hierarchy of controls. A feasibility study may be recommended with the completion of an ESOH SME RA (risk assessment); otherwise, a locally developed documented application of the hierarchy of controls is acceptable. Feasibility study responsibilities are addressed in detail in section 2.6. The SCM engineer has the authority to make decisions on part/process substitutions but should inform BE of changes. If there is the potential for airworthiness impact, then the engineer will consult the SPO and/or Product Support Engineering Division (AFLCMC/EZP).

2.6. Feasibility Study. A feasibility study documents the application of the hierarchy of controls centered around an industrial process (e.g. paint). The preferred order of following controls (hierarchy of controls) are elimination; substitution of less hazardous materials, processes, operations, or equipment; engineering controls; administrative controls; and personal protective equipment. Feasible application of this hierarchy of controls shall take into account: the nature and extent of the risks being controlled; degree of risk reduction desired; requirements of applicable statutes, standards and regulations; recognized best practices; available technology; and cost effectiveness IAW AFMAN48-146. A combination of controls may be necessary to reduce exposure to an acceptable level, especially while engineering controls are being designed/installed, or are not feasible. An example of a feasibility study can be seen in [Attachment 3](#). The study shall include all potential technical solutions. The study shall provide justification for alternatives that are determined not feasible, and an implementation schedule for the feasible solutions be provided (see [Attachment 4](#) for implementation schedule example). Lastly, the study shall be revisited and addressed for updates upon request from BE, IAW [paragraph 2.6.2.3](#) of this instruction.

2.6.1. Per AFI 48-145, Occupational and Environmental Health Program, para 2.11.6.4., BE communicates OEH exposure, health risks, recommended controls, and/or corrective actions to Squadron Commanders, workplace supervisor, affected individual(s), and members of a similar exposure group. Therefore, BE may recommend a feasibility study with a justified documentation (HRA or RAC) of an opportunity to exceed the current occupational exposure limit (OEL). If the finding occurred during a deviation from standard operating procedure (SOP) or outside normal equipment or process operations, the Production Engineer shall perform an assessment on the process. Once the process is back in SOP, the HRA shall be reassessed. If an opportunity to exceed the current OEL still exists, then a feasibility study should be recommended. A feasibility study is especially

critical in demonstrating that every effort has been made to reduce exposures in chemical, physical, or industrial hazards below the permissible exposure limit (PEL) (e.g. hexavalent chromium, asbestos, and noise).

2.6.2. Production engineering shall act as the office of primary responsibility (OPR) for the overall feasibility study (while keeping BE, ALC Occupational Safety & Health offices involved); however, the SPO/SCM Engineering Authority for the T.O. is responsible for completing the portion of the study that focuses on elimination and/or substitution. When appropriate, the SPO/SCM Engineering Authority for the item may consult with the Production Engineer when addressing elimination and/or substitution. If elimination and/or substitution is not a viable option, the SPO/SCM Engineering Authority for the item should justify this in writing in the elimination/substitution section of the feasibility study. After which the Production Engineer shall address the engineering controls portion of the feasibility study and when appropriate, consult with the SPO/SCM Engineering Authority for the engineering controls portion of the feasibility study.

2.6.2.1. When performing the engineering controls portion of the feasibility study, the Production Engineer shall consider the types of hazards employees are exposed to, the severity of the hazards and the risks the hazards pose to employees. The following are examples of engineering controls from AFMAN 91-203, Air Force Occupational Safety, Fire, and Health that can be implemented:

Table 2. Engineering Controls.

Engineering Controls
Ergonomic tools/equipment (i.e. PPE, noise reduction techniques)
Egress and workspace configuration (including lighting)
Ventilation (i.e. confined spaces, welding, chemical exposure)
Fall protection systems
Secondary protective measures (i.e. foam edge bumpers, guarding, partitions...)
Signage and labeling for equipment and processes

2.6.2.1.1. The Production Engineer will decide feasibility of the engineering controls; however, if feasibility is questioned, an integrated product team (IPT) will need to be formed. The IPT will have representation from production engineering, BE, and ALC Occupational Safety & Health offices. Together, the team shall document a decision on the feasibility of the engineering controls. (See [Attachment 5](#) for example of Engineering Control of Noise Hazard).

2.6.2.2. When an engineering control solution is not feasible, the Production Engineer shall identify a technology gap for the technology development and insertion process per AFSCI 61-101, Technology Development and Insertion Process.

2.6.2.3. Once the feasibility study is completed, the MXG Group Engineering Chief and the MXG/CC/CL will coordinate. Next, the production engineering office (as the OPR) shall coordinate the completed study with ESOH SME utilizing an e-staff summary document. Upon request from the ESOH SME, recommend the feasibility study be reviewed and re-coordinated to consider up-to-date technology utilizing an e-staff summary document.

3. Engineering Controls Projects Data Call. A data call for engineering control projects will occur annually by AFSC/EN. AFSC/EN will assign an office of primary responsibility (OPR) to send out the data call to collect information on engineering control projects from the Air Logistics Complex budgets: Maintenance & Repair (M&R), Capital Investment Program (CIP), and indirect material. The percent of each budget spent on engineering control projects will also be reported and justification will be provided for any engineering control project that falls below the funding line. The data will be reported to the AFSC Technology Governance Board, Hazardous Materials Reduction Governance Board, and the AFMC ESOH council for visibility.

3.1. Prioritization for Engineering Control Projects. The M&R program and the CIP will use established prioritization criteria that incorporates safety in the workplace and encompass the reduction of exposure to ESOH hazards.

TOM D. Miller
Lieutenant General, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

29 CFR 1910, Subpart G - *Occupational Health and Environmental Control*
29 CFR 1910, Subpart H - *Hazardous Materials*
AFI 48- 145, *Occupational and Environmental Health Program*, 11 July 2018
AFSCI 61-101, *Sustainment Technology Enterprise Process*, 17 March 2020
AFMAN 91-203, *Air Force Occupational Safety, Fire, and Health Standards*, 11 Dec 2018
AFMAN 48-146, *Occupational and Environmental Health Program Management*, 15 Oct 2018
AFSCMAN 21-102, *Depot Maintenance Management*, 11 Sept 2020
DoDI 6055.01, *DoD Safety and Occupational Health (SOH) Program*, 14 Oct 2014
NIOSH, *Prevention through Design*, <https://www.cdc.gov/niosh/topics/ptd/pubs.html>, 2013

Adopted Form

AF 847, *Recommendation for Change of Publication*

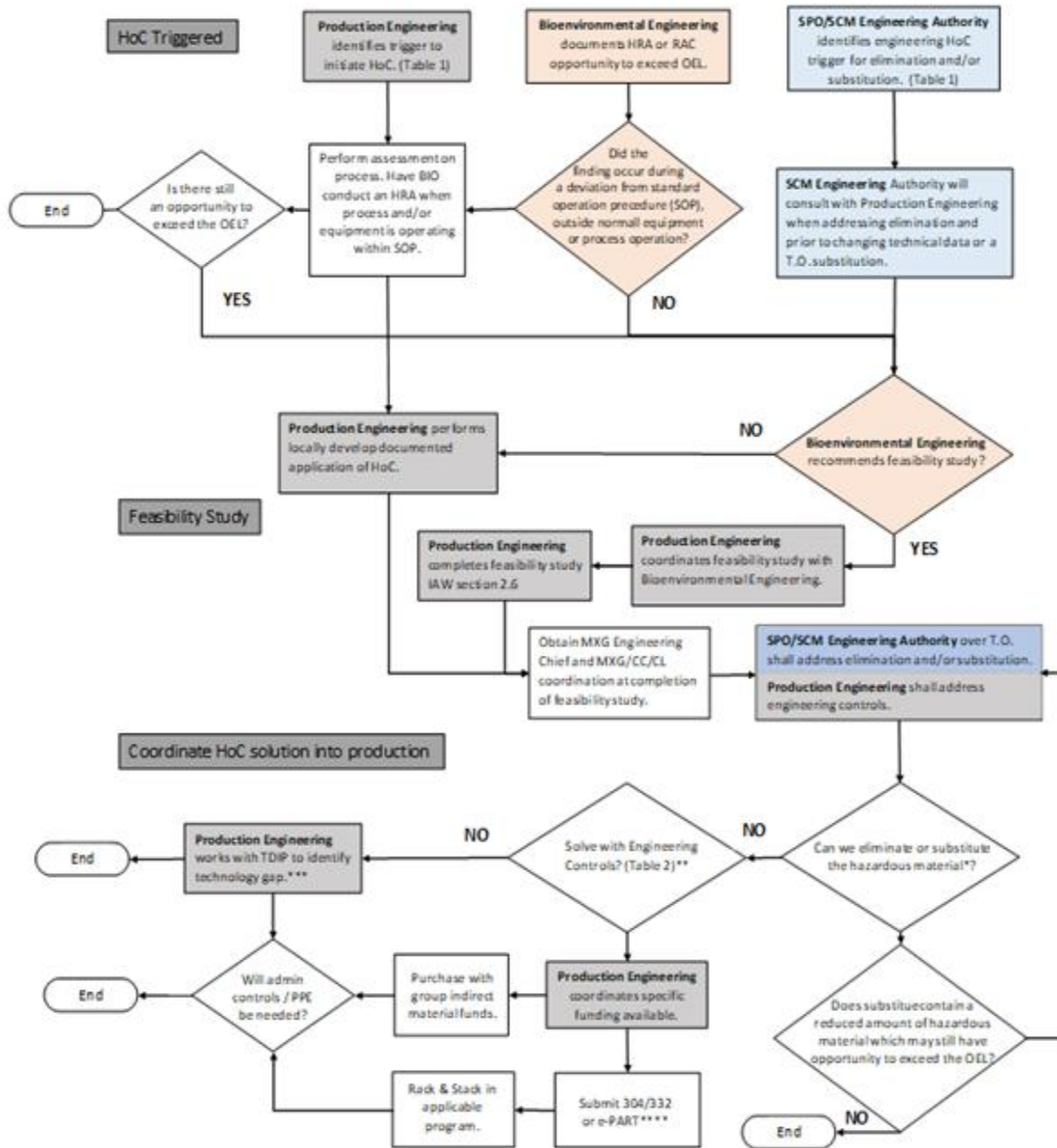
Abbreviations and Acronyms

AFSC—Air Force Sustainment Center
ALC—Air Logistics Complex
CIP—Capital Investment Program
HoC—Hierarchy of Controls
HRA—Health Risk Assessment
IAW—In Accordance With
IPT—Integrated Product Team
M&R—Maintenance and Repair
OPR—Office of Primary Responsibility
PPE—Personal Protection Equipment
PtD—Prevention through Design
RCA—Risk Assessment Code
SCM—Supply Chain Manager
SME—Subject Matter Expert
SPO—System Program Office
TO—Technical Order

Attachment 2

ENGINEERING HIERARCHY OF CONTROLS PROCESS MAP

Figure A2.1. Engineering Hierarchy of Controls Process Map.



*If there is a potential impact to airworthiness, consult with Product Support Engineering Division (AFLCMC/EZP)
 **Engineering controls can include: equipment, real property, etc.
 *** If engineering controls cannot be applied, see AFSCI 61-101, *Technology Development and Insertion Process (TDIP)*
 ****Form 332 used for real property, Form 304 used for non-real property, e-PART used for the Capital Investment Program.

Attachment 3

FEASIBILITY STUDY EXAMPLE

Figure A3.1. Feasibility Study Example.



DEPARTMENT OF THE AIR FORCE
OKLAHOMA CITY AIR LOGISTICS COMPLEX (AFMC)
TINKER AIR FORCE BASE OKLAHOMA

30 March 2015

MEMORANDUM FOR 72 AMDS/SGPB
FROM: 76 AMXG/CC
Building 3001, Suite Y58
Tinker Air Force Base, OK 73145

SUBJECT: 76 AMXG Responses to Notice of Hazards – Paint Section

1. The Process Control and Improvement Division (76 AMXG/QP) was notified on 12 June 2014, that Bioenvironmental Engineering Flight (BEF) has issued three (3) Notice of Hazards, AF Form 1118, in which personnel have the potential to exceed the OSHA Permissible Exposure Limit (PEL) for Chromium VI per 29 CFR 1910.1026 in the Aircraft Paint Section. 76 AMXG/QP provides engineering support to the Aircraft Paint Section and has been tasked with conducting a feasibility study of the engineering and work practice controls. The feasibility study shall investigate the hierarchy of controls (elimination, substitution, and engineering controls); document results of investigation and determine implementation schedule for the engineering controls deemed feasible; implement feasible engineering controls.

2. The following Risk Assessment Codes (RACs) were issued IAW 29 CFR 1910.1026 Chromium VI, paragraph (f)(1)(i) engineering and work practice controls must be used to reduce and maintain employee exposure to Chromium (VI) to or below the PEL unless the employer can demonstrate that such controls are not feasible:

a. Control Number: WWYK-XXXX, RAC 2 (Serious) has been assigned to Building 21XX, 21XX and 22XX for potential to exceed PEL during spray priming operations on outjobs.

i. Interim Controls:

1. Personnel responsible for spraying primer on aircraft or aircraft parts must continue to utilize current engineering controls (High Velocity Low Pressure (HVLP) spray guns, Global Finishing Systems Environmental Control System (ECS), polysheeting for barrier), work practices (written housekeeping and Personnel Protective Equipment (PPE) doffing

procedures, regulated areas), PPE (air supplied loose fitting hoods, or powered air purifying respirator with HEPA cartridges, coveralls with booties and nitrile gloves) to control potential exposure to Chromium VI (strontium chromate).

2. Respiratory protection currently used by the employees provides a protection factor of 1000 which effectively controls potential inhalation hazards.

ii. Permanent Control Measures (Application of Hierarchy of Controls):

1. Elimination/Substitution (to be completed by the engineering authority):

Non-chrome Coating Systems:

Currently there are no approved non-chrome coating systems available for use on the weapon systems painted at OC-ALC. Previous field demonstrations have resulted in a non-chrome replacement for alodine that eliminated over two (2) years of usage. Lab tests by AFRL for Aerodur 2100 Magnesium Rich primer were successful. Materials successfully tested in the laboratory have not always performed well in the field. Previous flight test of non-chromated systems on the KC-135 weapon system were unsuccessful and led to early induction into Program Depot Maintenance (PDM) due to high levels of corrosion.

Two (2) of the System Program Offices at OC-ALC have initiated 24 month field demonstrations to test and validate Aerodur 2100 Magnesium Rich primer. 76 AMXG is providing support to the SPO during field demonstrations. The SPOs have developed test and evaluation plans to assess the performance of the Magnesium Rich coating system on fielded aircraft. The tests will be accomplished on E-3 tail number 76-1604 in March 2015 and on a total of two (2) KC-135s, one in FY15 and one in FY16. Successful field demonstrations and SPO approval to use the non-chrome coatings will eliminate harmful exposure to chrome during application. If implemented, the process for converting all the KC-135 and E-3 aircraft to non-chrome systems would take approximately six (6) years. Additional testing may be required to receive approval to use these coatings for the B-1B and B-52 weapon systems.

Bioenvironmental Engineering Flight (BEF) will be notified when the spray priming operation takes place to perform personal breathing zone air sampling on employees. The sampling will allow BEF to determine if there are any potential inhalation hazards during spray priming operations with the Aerodur 2100 Magnesium Rich primer.

Until we have successful field testing and SPO approval, this engineering control is not feasible.

2. Engineering Controls (to be completed by the production engineer):

Robotic Painting:

Robotic painting is an innovative technology that is currently being investigated for application in the Aerospace industry. Technology advancements in robotic laser paint stripping have led to consideration of the use of robotics to paint aircraft. This technology could isolate hazardous airborne materials from workers during spray priming operations.

Technological advancements in robotic laser paint stripping are being pursued on the F-16 and C-130 weapon systems at Hill AFB. The use of robotic painting is currently in the conceptual phase, but we will continue to stay abreast of any new technology developments. However, system cost will need to be addressed since the robotic systems can cost in excess of \$10M, and may require additional aircraft hangars.

Due to the immaturity of the robotic painting technology and the excessive cost of the system, this engineering control currently is not feasible.

Portable Air Pollution Control Equipment (PAPCE):

The PAPCE is a portable suction-type control device used to capture fugitive vapor, mist gases, fumes, odors, and other liquid and solid particulates during spraying, sanding, and grinding operations.



This engineering control is feasible with proper testing/prototyping in AMXG environments to validate the equipment effectiveness. Demonstrations will be considered successful after documented exposure levels are shown to be reduced for the various AMXG areas.

Roller Brush Applications:

Roller brushing techniques may be used in place of atomizing spray primers to reduce personnel exposure levels. The geometry of the surface and aesthetics of the coating system will play a critical role in the determination of the areas in which the roller application will be most effective. Weapon System Program Office (SPO) managers will be required to determine if the appearance is acceptable to meet technical data.

This engineering control is not feasible for all applications and would increase process times. The use of roller brushes on flat surfaces may be acceptable with weapon System Program Office concurrence if the technical data requirements for quality and appearance are met.

Captured Air Pollutants System II (CAPS II):

CAPS II is a piece of equipment designed to prevent overspray from escaping into the workplace during small spray priming and spot painting operations. The unit uses a vacuum type system to capture paint overspray as it is applied.



This engineering control is feasible with proper testing/prototyping in AMXG environments to validate the equipment effectiveness. Demonstrations will be considered successful after documented exposure levels are shown to be reduced for the various AMXG areas.

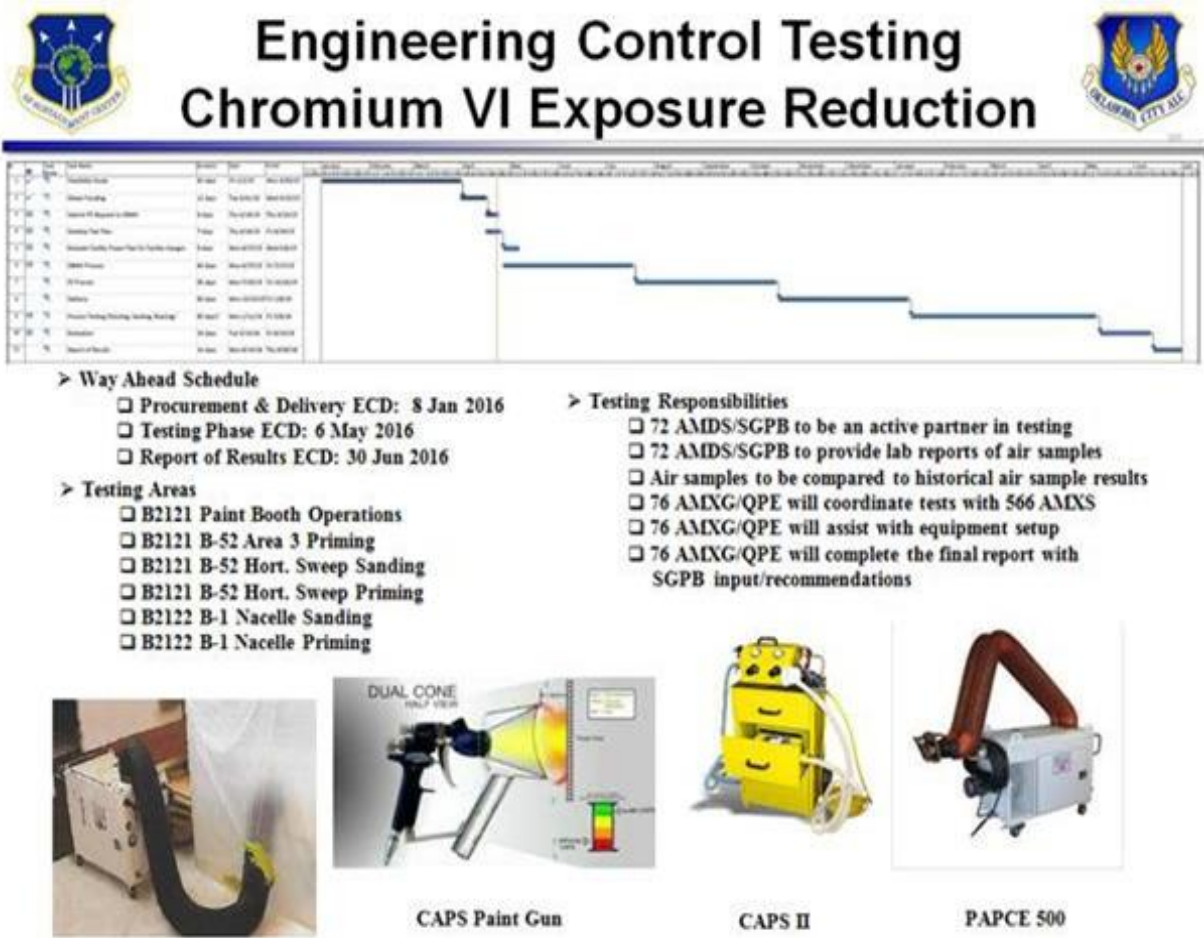
Group Engineering Chief
76 AMXG/QP

Group
76 AMXG

Attachment 4

ENGINEERING CONTROLS IMPLEMENTATION SCHEDULE EXAMPLE

Figure A4.1. Engineering Controls Implementation Schedule Example.



Attachment 5

ENGINEERING CONTROLS FEASIBILITY STUDY EXAMPLE

Figure A5.1. Noise Hazards during Blasting or Peening Operations.



DEPARTMENT OF THE AIR FORCE
 OKLAHOMA CITY AIR LOGISTICS COMPLEX (AFMC)
 TINKER AIR FORCE BASE OKLAHOMA

November 13, 2020

MEMORANDUM FOR 76 AMXG/CL

FROM: 76 AMXG/MXDEC
 Building 2122, Suite D35
 Tinker Air Force Base, OK 73145

SUBJECT: Engineering Controls Project Feasibility Study in Response to Noise Hazards During Blasting or Peening Operations.

1. The Aircraft Production Engineering Group (76 AMXG/MXDEC) was notified that Bioenvironmental Engineering Flight (BEF) has issued a Notice of Hazards, AF Form 1118, in which personnel in the 569th Corrosion Control Section have potential to experience noise exposure above the criterion level set for the Hearing Conservation Program (HCP).
2. Engineering Controls are required to lessen hazardous noise exposures IAW AFI 48-127, paragraph 2.12.2. 76 AMXG/MXDE provides engineering support to the 569th Corrosion Control Section and has been tasked with conducting a feasibility study of the engineering and work practice controls. The feasibility study shall investigate the hierarchy of controls (elimination, substitution, engineering controls, administrative controls, and PPE), document results of investigation, determine implementation schedule for the engineering controls deemed feasible, and implement feasible engineering controls.
3. Table 1 below shows the interim controls that are in place while feasibility of new controls are evaluated by engineering.

Table 1: Interim Controls

Interim Controls		
Control Type	Method	Usage
PPE	Dual Hearing Protection	On personnel
Administrative	4 Hour Blasting Time Limitation	During blasting and peening operations

4. After investigating current controls and completing market research, engineering plans to test several methods to reduce the sound levels during blasting and peening operations. The methods are listed in Table 2.

Table 2: Proposed Controls

Proposed Controls				
Identifier	Control Type	Method	Usage	AOR
[1]	Subsitution	Chemically strip paint	Paint removal	MXDE
[2]	Subsitution	Robotic paint stripping	Paint removal	MXDE

[3]	Engineering	Noise reducing blast nozzle	Paint removal	MXDE
[4]	Engineering	Install sound deadening panels in B3228	Paint Removal	MXDE
[5]	Engineering	Sound Dampening Curtains	Blasting or peening	MXDE

Note: Visual representation of methods above can be seen in [Appendix A](#).

5. Aircraft engineering has either already researched, procured, and tested the feasibility of the controls proposed or plans to do so in the future. Table 3 explains reasoning behind feasible/not feasible controls.

Table 3: Control Feasibility Discussion

Control Feasibility Discussion			
Option	Feasibility	Discussion	Recommendation
[1]	Not Feasible	Chemical paint removal is not authorized on the B-1 aircraft due to potential damage to composite panels and intrusion issues.	Not Pursue
[2]	Not Feasible	B3228 is used to chemically wet strip and dry media blast aircraft. Converting B3228 to a robotic blast dock would impact the ability to chemically strip aircraft and would reduce aircraft throughput. Building a new robotic blast dock to strip aircraft would not be cost effective due to B-1 aircraft switching from a scuff sand to a full blast requirement every PDM cycle and being the only aircraft with a blast depaint requirement at Tinker.	Not Pursue
[2]	Feasible	Robotic blast booths are in use across the air force. Tinker was quoted \$1.4 million to convert a B3705 blast barn to a robotic blast booth. Robotic blast booths work best for large quantities of similar simple parts. The B3705 blast booth is used for depainting a variety of complex parts off the aircraft. Setting up the robotic code for a variety of parts is labor intensive and prone to errors. The parts would likely require additional manual blasting work in complex areas.	Not Pursue
[3]	Feasible	A noise reducing blast nozzle was tested and a noise reduction of 6 decibels was observed. Nozzles have been purchased and are to be further evaluated in the B3705 plastic blast barn.	Pursue
[4]	Feasible	Due to the blasting dusts and depaint chemicals, traditional foam and fabric noise absorption panels will not work. Metal acoustic panels are rated for outdoor use and could be used within the hangar. A vendor quoted \$250,000 for 10,000 sqft of panels to mount within B3228 but was concerned that it would not be enough to attenuate the noise levels. This solution does not address the source of the noise, only the reverberations from the walls. Due to the cost, other solutions will be pursued.	Not Pursue
[5]	Feasible	Sound dampening curtains absorb noise, which prevents the noise from dispersing into surrounding areas or reflecting back to the operator. The curtains would not address the source of the sound so they would have minimal impact to the blast operator. 76 AMXG/MXDE will be evaluating sound curtain effectiveness during riveting processes.	Not Pursue

6. For further questions or updates on the status of the proposed controls, please contact Evan Mertes at evan.mertes@us.af.mil or 405-582-4603.

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David Mays
76 AMXG/MXDEC
Sentry and Services Engineering Chief

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Attachment 6

PROPOSED CONTROL VISUAL REPRESENTATIONS

Figure A6.1. Proposed Control Visual Representations,.



[2]

A robotic blast booth at Warner Robins AFB. The blast nozzle is mounted on a robotic arm. The operator supervises the process from outside the booth via cameras and monitors. The robot can be pre-programmed or manually taught by the operator how to blast parts.

[3]

StealthStrip™ blast nozzles reduce blasting noise at the source. The nozzles reduce the blast air exit velocity while maintaining the blast particle velocity. This reduces noise without impacting productivity.



[4]

Metal sound absorption panels can be wall mounted or hung from the ceiling. The exterior of the panels is made from perforated metal. The panels contain absorption material made from fiberglass and mineral wool. The absorption material is contained in bags to prevent water logging, allowing the panels to be rinsed off.

[5]

Sound curtains are acoustic barriers that are highly noise absorbent. They are designed to absorb sound and prevent reflection in a variety of applications. The barriers can be hung or used with a rolling racks as shown.

