

Army Regulation 40-10

Medical Services

**Health Hazard
Assessment
Program in
support of the
Army Materiel
Acquisition
Decision Process**

**Headquarters
Department of the Army
Washington, DC
01 October 1991**

Unclassified

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SUMMARY of CHANGE

AR 40-10

Health Hazard Assessment Program in support of the Army Materiel Acquisition Decision Process

This revision--

- o Parallels the systems acquisitions policy and procedures in AR 70-1.
- o Addresses the coordination of the health hazard assessment with manpower and personnel integration to include system safety engineering and human factors engineering portions of the Materiel Acquisition Decision Process (paras 1-5l, 2-1, 2-4, and 2-7a).
- o Updates the assessment of health hazards during market investigations and in the acquisition strategy (para 1-5b).
- o Redefines and provides guidance on using and identifying risk assessment codes (para 1-5d, and app B).
- o Establishes guidance for the independent medical assessors (para 1-5e).
- o Updates the health hazard standards or criteria to be used or developed (para 1-5i).
- o Incorporates guidance on toxicity clearances of developmental items (para 1-5o).
- o Clarifies the requirements for the Long Range Research, Development, and Acquisition Plan (para 2-13b).
- o Updates the responsibilities given to the program executive officers; program, project, and product managers; Assistant Secretary of the Army (Research, Development, and Acquisition); Deputy Chief of Staff for Operations and Plans; Deputy Chief of Staff for Operations and Plans; Deputy Chief of Staff for Personnel; and Commanding General, U.S. Army Training and Doctrine Command and other combat developers and trainers (paras 2-1, 2-3, 2-4, 2-8, 2-12, and 2-13).
- o Establishes who will coordinate medical aspects of the Materiel Acquisition Decision Process with The Surgeon General (paras 2-1, 2-3, and 2-5).
- o Redefines when The Surgeon General Provides Guidance on the medical aspects of the Materiel Acquisition Decision Process (para 2 -6c).
- o Deletes The Surgeon General's responsibility for developing appropriate data item descriptions to guide data collection for the health hazard assessment.
- o Redefines when U.S. Army Materiel Command and other materiel developers address health considerations (para 2-7a).
- o Establishes the approving authority regarding the medical aspects of safety releases (para 2-7c).

- o Establishes the reimbursement guidance for the program executive officers, product managers, and U.S. Army Materiel Command and other materiel developers (para 2-7d).
- o Assigns responsibility to the U.S. Army Environmental Hygiene Agency for assessing the medical efficacy of material systems (para 2-9c).
- o Adds guidance on performance medical research in support of the health hazards assessment (para 3-2).
- o Redefines the phases of a health hazard assessments and provides guidance in completing the needed procedures (chap 3).
- o Provides information on obtaining assistance while performing the health hazard assessment (para 3-8).
- o Deletes the explanation of health hazard assessment procedures during a model Materiel Acquisition Decision Process.
- o Deletes the example of a Health Hazard Assessment Report.
- o Updates the description of the model Materiel Acquisition Decision Process and related health hazard assessment actions (fig 3-1).
- o Defines the health hazard categories addressed by the Health Hazard Assessment Program (para 4-1 and app C).

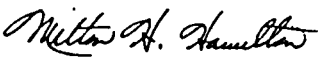
Medical Services

Health Hazard Assessment Program in support of the Army Materiel Acquisition Decision Process

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:


MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army

History. This UPDATE printing publishes a revision of this publication. Because the publication has been extensively revised, the changed portions have not been highlighted.

Summary. This regulation describes the Army's Health Hazard Assessment Program in support of the Material Acquisition Decision Process. It lists objectives and policies of the program, define responsibilities, describes

specific procedures, and discusses preparation and distribution of the Health Hazard Assessment Report (RCS MED-388).

Applicability. This regulation applies to all Active Army elements involved with the Materiel Acquisition Decision Process. It does not apply to the Army National Guard and U. S. Army Reserve.

Proponent and exception authority. Not applicable.

Army management control process. This regulation is subject to the requirements of AR 11-2. It contains internal control provisions but does not contain checklists for conducting internal control reviews. These checklists are published in DA Circular 11-87-2.

Supplementation. Supplementation of this regulation and establishment of command and local forms are prohibited without prior approval from HQDA (SGPS-PSP), 5109Leesburg Pike, Falls Church, VA 22041-3258.

Interim changes. Interim changes to this

regulation are not official unless they are authenticated by the Administrative Assistant to the Secretary of the Arm. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Suggested Improvements. The proponent agency of this regulation is the Office of The Surgeon general. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to HQDA (SGPS-PSP), 5109 Leesburg Pike, Falls Church, VA 22041-3258.

Distribution. Distribution of this publication is made in accordance with the requirements of DA Form 12-09-E, block number 3447, intended for command level D for Active Army. This publication is not distributed to the Army National Guard and United States Army Reserve.

Contents (Listed by paragraph and page number)

Chapter 1

Introduction, page 1

Purpose • 1-1, page 1

References • 1-2, page 1

Explanation of abbreviations and terms • 1-3, page 1

Proponency and exceptions • 1-4, page 1

Program objective • 1-5, page 1

Policies for the HHA Program • 1-6, page 1

Chapter 2

Responsibilities, page 2

Section I

Headquarters Elements, page 2

Assistant Secretary of the Army (Research, Development, and Acquisition)(ASA(RDA)) • 2-1, page 2

Assistant Secretary of the Army (Installations, Logistics, and Environment) • 2-2, page 2

Deputy Chief of Staff for Operations and Plans • 2-3, page 2

Deputy Chief of Staff for Personnel • 2-4, page 2

Deputy Chief of Staff for Logistics • 2-5, page 2

The Surgeon General • 2-6, page 2

Commanding General, U.S. Army Materiel Command and other MATDEVs • 2-7, page 2

Commanding General, U.S. Army Training and Doctrine Command, and other CBTDEVs and trainers • 2-8, page 3

Commanding General, U.S. Army Health Services Command • 2-9, page 3

Commanding General, U S Army Medical Research and Development Command • 2-10, page 3

Commanding General, U S Army Operational Test and Evaluation Agency • 2-11, page 4

Section II

Program Executive Officers, Program, Project, and Product Managers, page 4

Program executive officers • 2-12, page 4

Program, project, and product managers • 2-13, page 4

Chapter 3

Health Hazard Assessment Procedures, page 4

Introduction • 3-1, page 4

Medical research In support of the HHA • 3-2, page 4

HHA during the preconcept exploration phase • 3-3, page 5

HHA during the concept exploration and definition phase • 3-4, page 5

HHA during the concept demonstration and validation phase • 3-5, page 6

HHA during the full-scale development-low rate Initial production phase • 3-6, page 6

*This regulation supersedes AR 40-10, 15 September 1983.

Contents—Continued

HHA during the full rate production and initial deployment phase

- 3-7, *page 6*

HHA assistance • 3-8, *page 6*

Chapter 4

Health Hazard Assessment Report (Requirement Control

Symbol MED-388), *page 6*

Purpose of the Health Hazard Assessment Report • 4-1, *page 6*

Preparation • 4-2, *page 6*

Distribution • 4-3, *page 6*

Appendixes

A. References, *page 8*

B. Risk Assessment Codes, *page 9*

C. Health Hazard Categories Addressed by the HHA Program,
page 10

Table List

Table 4-1: HHAR format and instructions, *page 7*

Table B-1: Hazard probability, *page 10*

Table B-2: Risk assessment codes, *page 10*

Table B-3: Risk decision authority major defense acquisition
programs and Army designated acquisition programs, *page 10*

Table B-4: Risk decision authority for non-major programs,
page 10

Figure List

Figure 3-1: Detailed Description of Model MADP and Related
HHA Actions, *page 5*

Glossary

Index

Chapter 1 Introduction

1-1. Purpose

This regulation—

a. Implements the Army Health Hazard Assessment (HHA) program according to DOD Directive 5000.1, DOD Instruction 5000.2, and DOD Manual 5000.2-M, and supplements basic Army policies, procedures, and responsibilities outlined in AR 70-1, AR 70-10, AR 71-3, AR 385-16, AR 602-1, and AR 602-2.

b. Prescribes specific responsibilities of developers for HHAs in support of the Army Materiel Acquisition Decision Process (MADP).

c. Describes the HHA program as an integrated effort, throughout the entire MADP. Specifically, it considers—

- (1) Mission needs.
- (2) Concept analysis.
- (3) Research.
- (4) Development.
- (5) Testing.
- (6) Evaluation.
- (7) Production (in government facilities).
- (8) Procurement.
- (9) Training.
- (10) Use.
- (11) Storage.
- (12) System maintenance.
- (13) Transportation.
- (14) Demilitarization.
- (15) Disposal.

d. Addresses coordination of the HHA with manpower and personnel integration (MANPRINT) to include system safety engineering and human factors engineering (HFE) portions of the MADP.

e. Prescribes policies and procedures to identify and eliminate or control health hazards associated with the MADP.

f. Describes preparation and distribution of the Health Hazards Assessment Report (HHAR)(RCS MED-388).

1-2. References

Required and related publications are listed in appendix A.

1-3. Explanation of abbreviations and terms

Abbreviations and special terms used in this regulation are explained in the glossary.

1-4. Proponency and exceptions

The proponent for this regulation is The Surgeon General (TSG). TSG has the authority to approve exceptions to this regulation. Only exceptions that are consistent with controlling law and regulation may be approved. TSG may delegate this authority in writing to a division chief within the Office of The Surgeon General who holds the rank of at least colonel or the civilian grade equivalent. The approval authority will coordinate all exceptions with Headquarters, Department of the Army, Office of the Judge Advocate General, ATTN: DAJA-AL, Washington, DC 20310-2200.

1-5. Program objective

a. The Primary objective of the HHA Program is to identify and eliminate or control health hazards associated with the life cycle management of—

- (1) Weapons.
- (2) Equipment.
- (3) Clothing.
- (4) Training devices.
- (5) Materiel systems.

b. The specific objectives which support the primary objective are as follows:

- (1) To preserve and protect the health of the individual soldier and other personnel.
- (2) To reduce degradation of the soldier's performance and of the system's effectiveness.

(3) To enhance the original system design so that retrofits needed to eliminate or control health hazards are reduced.

(4) To reduce readiness deficiencies, that are attributable to health hazards, which cause training or operational restrictions.

(5) To reduce personnel compensation claims by eliminating or reducing injury or illness caused by health hazards associated with the use of Army systems.

(6) To reduce the health hazards due to the potential environmental contamination associated with the use of Army System.

1-6. Policies for the HHA Program

a. The HHA procedures will be integrated throughout all phases of the MADP. Health hazards will be identified, evaluated, and eliminated or controlled to give personnel maximum protection. These actions will be consistent with mission requirements and cost effectiveness considerations.

b. The HHA will be accomplished on each material system, component, item, and product improvement, including nondevelopment items (NDIs). Health Hazards will be assessed during market investigations and will be considered in the acquisition strategy. (See table 4-1 for the HHAR format and instructions.)

c. There will be no compromises of health protection criteria and standards without formal documentation of the accepted risks. (See app B.)

d. Risk assessment codes (RACs) will be assigned to each identified health hazard. (See app B.) Competent Army Medical Department (AMEDD) personnel will estimate and assign the RACs. The RACs will—

(1) Estimate the degree of risk associated with each hazard resulting from noncompliance with recommended control measures.

(2) Establish priorities for control actions.

e. For each system within the MADP, independent medical assessors will—

(1) Review historical health hazards data on predecessor or similar systems.

(2) Review new system designs to determine if health hazards exist and to recommend corrective action.

(3) Make recommendations to resolve issues and to acquire data to verify controls for health hazards.

f. All data or results on health hazards will be considered in all applicable system documents. (The assessment procedure is described in chap 3.)

g. The potential health hazards will be considered in all applicable system documents. The assessment of potential health hazards will be based on training and combat scenarios.

h. When health hazard criteria or standards do not exist, initiate appropriate medical research to develop the necessary biomedical data base. Use this data base in HHA process.

i. Health hazard standards used or developed will be—

(1) Compatible with Federal occupational safety and health standards, American Conference of Governmental Industrial Hygienists Threshold Limit Values, or specifically adopted consensus standards (when conflicting standards exist, the more stringent applies); or

(2) Consistent with Military-Unique requirements, design, or specification when compliance with standards in (1) above are rendered infeasible or when no regulatory or consensus standard exists for military application.

j. Existing HHA data (acquired in earlier research, development, test, and evaluation (RTDE) and used in developmental and fielded systems) from all sources will be appropriately applied to—

(1) Preclude duplication of effort.

(2) Take advantage of lessons learned with other material systems.

(3) Exempt material which falls under the regulatory guidelines of other Federal agencies. The applies when the military application is equivalent to the intended use of the material.

k. Health standards or criteria, test operating procedures, and other criteria pertaining to HHAs will be written or revised to reflect state-of-the-art practices.

l. Manpower, personnel, training, system safety, health, and HFE

organizations, agencies, and personnel will coordinate health hazard matters of mutual interest.

m. To accomplish the HHA, researchers, developers, testers, evaluators, trainers, and independent medical assessors will plan, program, and budget for adequate resources.

n. To support the provisions of this regulation, researchers, developers, tests, or evaluators may establish memorandums of understanding with appropriate AMEDD elements, with TSG's concurrence.

o. All requests for medical support needed to conduct the HHA of material according to this regulation and for toxicity clearances (AR 40-5) will be sent through command medical channels to TSG, HQDA (SGPS-PSP), 5109 Leesburgs Pike, Falls Church, VA 22041-3258.

Chapter 2 Responsibilities

Section I Headquarters Elements

2-1. Assistant Secretary of the Army (Research, Development, and Acquisition)(ASA(RDA))

The Assistant Secretary of the Army (Research, Development, and Acquisition (ASA(RDA)) will—

a. Implement the HHA program throughout the MADP per this regulation.

b. Include RTDE funds for HHAs in the annual submission of the Army budget.

c. Coordinate with the TSG in matters regarding the medical aspects of the MADP.

d. Document risk acceptance decisions for materiel systems within their risk decision authority.(See app B.)

2-2. Assistant Secretary of the Army (Installations, Logistics, and Environment)

The Assistant Secretary of the Army (Research, Development, and Acquisition (ASA(RDA)) will provide policy oversight regarding the establishment under the HHA program of medical policies, health standards, and exposure limits or other policies that relate occupational exposure of personnel to actual or potential health hazards.

2-3. Deputy Chief of Staff for Operations and Plans

The Deputy Chief of Staff for Operations and Plans (DCSOPS) has Army general staff responsibility for ensuring the HHA is considered when Army policy and guidance is developed for—

a. Materiel requirement documents.

b. User Test (UT) Programs. DCSOPS will work with the Commanding General, U.S. Army Operational Test and Evaluation Agency (CG, USAOTEA) and the Army acquisition executive (AAE) to ensure that the HHA is considered.

c. Training and training devices policies.

d. Coordinating with TSG in matters regarding the medical aspects of the MADP.

2-4. Deputy Chief of Staff for Personnel

The Deputy Chief of Staff for Personnel has Army general staff responsibility to ensure that—

a. The MANPRINT process is considered throughout the materiel acquisition cycle.

b. HHA high level hazards are presented to the Army systems acquisition review council (ASARC) (see para 2-12e) and defense acquisition board reviews.

c. HHA is integrated into the MANPRINT assessment during MADP.

d. Medical aspects of the MADP are coordinated with TSG.

2-5. Deputy Chief of Staff for Logistics

The Deputy Chief of Staff for Logistics has Army general staff responsibility to ensure that—

a. HHA considerations are incorporated into integrated logistics support policy and guidance (AR 700-127).

b. Logistics impacts of the HHA are considered in the Integrated Logistics Support Program Assessments.

c. Medical aspects of the MADP are coordinated with TSG.

2-6. The Surgeon General

TSG has Army staff responsibility for the HHA program in support of the MADP per AR 70-1. TSG will also—

a. Assess HHA data, establish and Issue all medical policies, health standards, exposure limits, or other policies that relate exposure of personnel to actual or potential health hazards.

b. Maintain coordination with test organizations and provide consultation to the Army staff, materiel developers (MATDEVs), combat developers (CBTDEVs), and test organizations in matters regarding the medical aspects of the MADP.

c. Provide guidance on medical aspects prior to the issue of safety releases for (Technical Test (TTs) and UTs.

d. Coordinate with the U.S. Army Health Services Command (USAHSC) and the U.S. Army Medical Research and Development Command (USAMRDC) on all HHA medical support requests received from developers and testers.

e. Provide representatives to MADP committees, boards, working groups, and in-process reviews, as applicable.

2-7. Commanding General, U.S. Army Materiel Command and other MATDEVs

The Commanding General, U.S. Army Materiel Command (CG, USAMC) and other MATDEVs will—

a. Address health considerations subsequent to milestones 0 of the MADP so that—

(1) The HHA is accomplished on each development system, component, and item.

(2) Sufficient health hazard data are acquired through RDTE to resolve any health issues.

(3) Corrective actions are taken to eliminate, reduce, or control health risk before systems are fielded.

b. Ensure that health considerations are addressed during the evaluation of new technology in the Concept Based Requirements Systems (CBRS) process.

c. Serve as approving authority regarding the medical aspects of safety releases for TTs and UTs of nonmedical materiel.

d. Provide reimbursement for all—

(1) Onsite HHA support as requested through command Channels.

(2) HHA research related to materiel specific, military-unique health effects.

e. Incorporate HHA requirements into all acquisition and decision point (milestone) documents.

f. Ensure that commanders, test planners, and test directors of all test agencies engaged in TTs that support the MADP will—

(1) Address the HHA issues in detailed test plans for systems.

(2) Seek professional medical consultation from TSG when it is needed in planning or designing HHA-related tests.

(3) Conduct or monitor HHA testing on behalf of the MATDEV and include the AMEDD HHA in independent evaluation reports.

(4) Incorporate medical input in all test documentation when needed for the nonroutine assessment of health hazards in testing. For example, when HHA requirements are not clearly defined in standardized test requirements, specifications, or directives.

(5) Ensure that health hazards and related safety hazards observed during assigned tests are reported, documented in test reports, and are assessed in evaluation reports, as appropriate. Furnish a copy to Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-MO-A, Aberdeen Proving Ground, MD 21010-5422, and Commander, U.S. Army Test and Evaluation Command, ATTN: AMSTE-ST, Aberdeen Proving Ground, MD 21005-5055.

g. Document risk acceptance decisions for materiel systems within their risk decision authority. (See app B.)

h. Initiate and fund requests for conducting and preparing HHAs for all non-major systems for which USAMC has oversight through Commanding General, Headquarters, U.S. Army Materiel Command, ATTN: AMCSG, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001 to HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 220413258 per this regulation.

i. Incorporate the HHA as part of the MANPRINT assessment (AR 602-2).

j. Ensure that matrix support includes the HHA implementation of this regulation.

k. Perform the following actions through the Director, U.S. Army Human Engineering Laboratory:

(1) Incorporate accepted medical and biomedical principles of health hazard prevention and control in HFE services provided to the CBTDEV and MATDEV.

(2) Identify gaps and voids in biomedical data bases during the performance of the HFE in the MADP. Ensure that the Director, U.S. Army Human Engineering Laboratory alerts TSG of the medical research requirements needed to identify, prevent, or control health hazards in the establishment of appropriate exposure criteria or medical standards.

(3) Maintain liaison with on-site medical department activities (MEDDACs) who provide HHA support to CBTDEVs and MATDEVs.

(4) Advise on-site MEDDACs of potential health hazards identified during the performance of HFE support.

2-8. Commanding General, U.S. Army Training and Doctrine Command, and other CBTDEVs and trainers

The CG, U.S. Army Training and Doctrine Command (USATRADO) and other CBTDEVs and trainers will—

a. Address the health considerations during the assessment and corrective action phase of the CBRS.

b. Address health considerations in program management documents prior to milestone 0 of the MADP.

c. Include and correctly reference health criteria and procedures to control risk in the appropriate Army system training procedures and publications provided to the user.

d. Provide reimbursement for—

(1) On-site HHA support as requested through command channels.

(2) HHA related medical studies for military unique health effects prior to milestone 0.

e. Provide system training and combat use scenarios for use in performing HHAs.

f. Ensure that issues and criteria and CBTDEV and training support packages for UTs of Army materiel systems adequately address the HHA.

g. Perform the following actions when functioning as a test agency for assigned tests:

(1) Provide copies of health hazard data to TSG for assessment.

(2) Obtain an HHAR from ISG, and promptly provide it to the test unit or board conducting the test so that there will be enough time for test planning.

h. Ensure that health hazards and related safety hazards observed during assigned tests are reported, documented in test reports, and are assessed in evaluation reports, as appropriate. Furnish a copy to Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-MO-A, Aberdeen Proving Ground, MD 21010-5422 and Commander, U.S. Army Test and Evaluation Command, ATTN: AMSTE-ST, Aberdeen Proving Ground, MD 21005-5055.

i. Initiate coordination with their supporting MEDDAC's or medical center's (MEDCEN's) preventive medicine (PVNTMED) service to allow the PVNTMED service to provide technical input into all requirements documents and MANPRINT joint working groups (MJWGs) to identify potential health hazards early in the materiel acquisition process.

j. Staff all requirements documents with Commandant, Academy

of Health Sciences, U.S. Army, ATTN: H-SHA-CDM, Fort Sam Houston, TX 78234-6100 for medical review.

2-9. Commanding General, U.S. Army Health Services Command

The CG, USAHSC will plan, program, and budget resources required by the MEDCENs or MEDDACs, Academy of Health Sciences (AHS), and U.S. Army Environmental Hygiene Agency (USAEHA) to carry out the responsibilities below.

a. Through the PVNTMED service, designate MEDDAC or MEDCEN personnel to serve on system MJWGs and system safety working groups. The personnel will provide reviews and written comments on system MANPRINT management plans (SMMPs) and will coordinate medical reviews with other AMEDD HHA elements.

b. Through the Commandant, AHS, with assistance from supporting MEDDACs or MEDCENs, provide CBTDEVs with a review of requirements, development, and testing documents of materiel systems (to include medical materiel). This review will be provided to ensure adequate consideration of known and potential health hazards. Also, AHS will provide HHA training for AMEDD personnel.

c. Through Commander, USAEHA,

(1) Assist TSG, during the MADP, in the analysis of health hazards inherent to or resulting from the operation and maintenance of materiel systems. If the system is intended to protect the health of the soldier or if the system produces a product consumed by the soldier, then an assessment of the medical efficacy of the system will be performed. Pharmaceuticals, biological, and devices, which are regulated by the Food and Drug Administration for efficacy, are exempt from this process. The CG, USAMRDC will assess this medical materiel, which is regulated under parts I through 1399, title 21, Code of Federal Regulations (21 CFR I through 1399). Upon request, prepare and submit HHARs to TSG for input to MADP's decision point milestones and materiel releases. (See AR 700 142.)

(2) Provide technical services to evaluate developers' data gathering methods and to interpret test results.

(3) Conduct on-site data gathering for those materiel systems where user health hazards cannot be addressed by the developer or where developer's data require further resolution. Obtain reimbursement per paragraphs 2-7d and 2-8d.

(4) Develop for TSG the recommended health protection criteria standards, and exposure limits. Coordinate these criteria standards, and limits with USAMRDC as appropriate.

(5) Maintain liaison with developmental and operational test and evaluation agencies. Assist in developing state-of-the-art test methods and standardization of the test operating procedures.

(6) Maintain the HHA data base and records. Identify voids in biomedical data bases, health protection criteria, standards, and HHA procedures. Make recommendations on research requirements and procedural changes to TSG for the development of these data bases. Maintain and publish an index quarterly of all HHA data base information currently available.

2-10. Commanding General, U S Army Medical Research and Development Command

The CG, USAMRDC will—

a. Plan, program, budget, and execute medical RDTE tasks that support Army system development and acquisition programs. These tasks include, but are not limited to, the development of biomedical data bases on the mechanism of human physiological and toxicological responses to military unique exposures, especially those exposures that are common to many weapon systems.

b. Coordinate with ASA(RDA), MATDEVs, and CBTDEVs in establishing HHA funding levels, per paragraphs 2-1, 2-7, 2-8, which are appropriate and adequate to support USAMRDC's HHA program.

c. Develop and maintain a biomedical science and technology base to be used for—

(1) Setting health and safety standards and practices for Army personnel, as appropriate. This is done in coordination with USAEHA. (See para 2-9c(4).)

(2) Enhancing soldier effectiveness and improving the soldier-machine interface to the degree affected by health factors.

(3) Decision making by the MATDEV during the MADP.

(4) Early identification and resolution of potential or known health hazards of emerging weapons and other materiel system technologies.

d. Identify and develop the physiological and medical data bases required to support health hazard, system safety engineering, and HFE assessment of the MADP.

e. Assist MATDEVs and CBTDEVs in the designing of studies, and direct the conduct of studies to define physiological limits of human exposure, tolerance, and safety.

f. Assist TSG, during the MADP, in the analysis of health hazards inherent to or resulting from the operation and maintenance of materiel systems. Upon request, prepare and submit HHARs to TSG for input to MADP decision point milestones.

g. As medical MATDEV, ensure that health considerations are addressed during the development of specific medical materiel.

h. Ensure that HHA issues are considered for non-major medical systems and that high level hazards, RACs I and 2, are addressed and controlled. (See app B.)

2-11. Commanding General, U S Army Operational Test and Evaluation Agency

The CG, USAOTEA will-

a. Provide an operational evaluation of health and safety hazards of materiel systems operationally tested using-

(1) System operational issues and criteria.

(2) The test and evaluation master plan.

(3) Other requirements and guidance.

b. Ensure health and safety hazards observed during operational tests are reported, documented in operational test reports, and addressed in operational evaluation reports, as appropriate.

c. Coordinate with DCSOPS to ensure HHA is considered.

Section II

Program Executive Officers, Program, Project, and Product Managers

2-12. Program executive officers

Program executive officers (PEOs) will-

a. Include in program, project, and product managers' (PMs) charters the responsibility for executing the HHA program.

b. Monitor PM and contractor execution of the HHA program requirements.

c. Rate assigned PM execution of HHA responsibilities.

d. Develop policy and procedures to ensure PMs obtain the HHA and make them available to responsible headquarters.

e. Ensure that the HHA status and issues are briefed during the MANPRINT portion of each system review, for example pre-ASARC and ASARC (AR 15-14).

f. Ensure that the PMs plan, program, and budget for the HHA and any medical research.

g. Document risk acceptance decisions for materiel systems within their risk decision authority. (See app B.)

2-13. Program, project, and product managers

The PMs will-

a. Ensure HHA program implementation on major defense acquisition, Army designated acquisition, and level I non-major programs. (See AR 70-1.)

b. Provide adequate support for effective HHA program implementation and maintenance. Include HHA program requirements in the Long Range Research, Development, and Acquisition Plan.

c. Plan, program, and budget for the HHA.

d. Ensure that the HHA is identified as an integrating function for MANPRINT in the design process.

e. Initiate requests for the conduct and preparation of HHAs from HQ, U.S. Army Materiel Command (USAMC), ATTN: AMCSG, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001 or HQDA (SGPS- PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258.

f. Conduct HHA reviews to determine the status and adequacy of HHA efforts.

g. Annotate the status and adequacy of HHAs in program documents and brief at milestone decision reviews.

h. Brief HHA status and issues during each review of a materiel system.

i. Include HHA issues and resolutions in the TT and UT Programs and other tests and evaluations.

j. Monitor materiel system contractors' accomplishments of HHA objectives and requirements as specified in the statement of work.

k. Document risk acceptance decisions for materiel systems within their risk decision authority. (See app B.)

Chapter 3

Health Hazard Assessment Procedures

3-1. Introduction

This chapter-

a. Outlines the procedures of the HHA program during the entire MADP.

b. Identifies the AMEDD elements that support the developer for each phase of the MADP.

c. Identifies the required HHA action for each phase of the MADP. See figure 3-1 for a detailed description of a model MADP and the related HHA actions.

3-2. Medical research In support of the HHA

a. Medical research is performed to develop a biomedical data base on actual or potential health hazards in equipment and systems being developed, modified, or procured as an NDI.

b. The data base supports the preparation of HHARs. (See chap 4.) It is also used to identify military-unique hazards inherent to the materiel under consideration, thereby supporting military-unique health protection criteria.

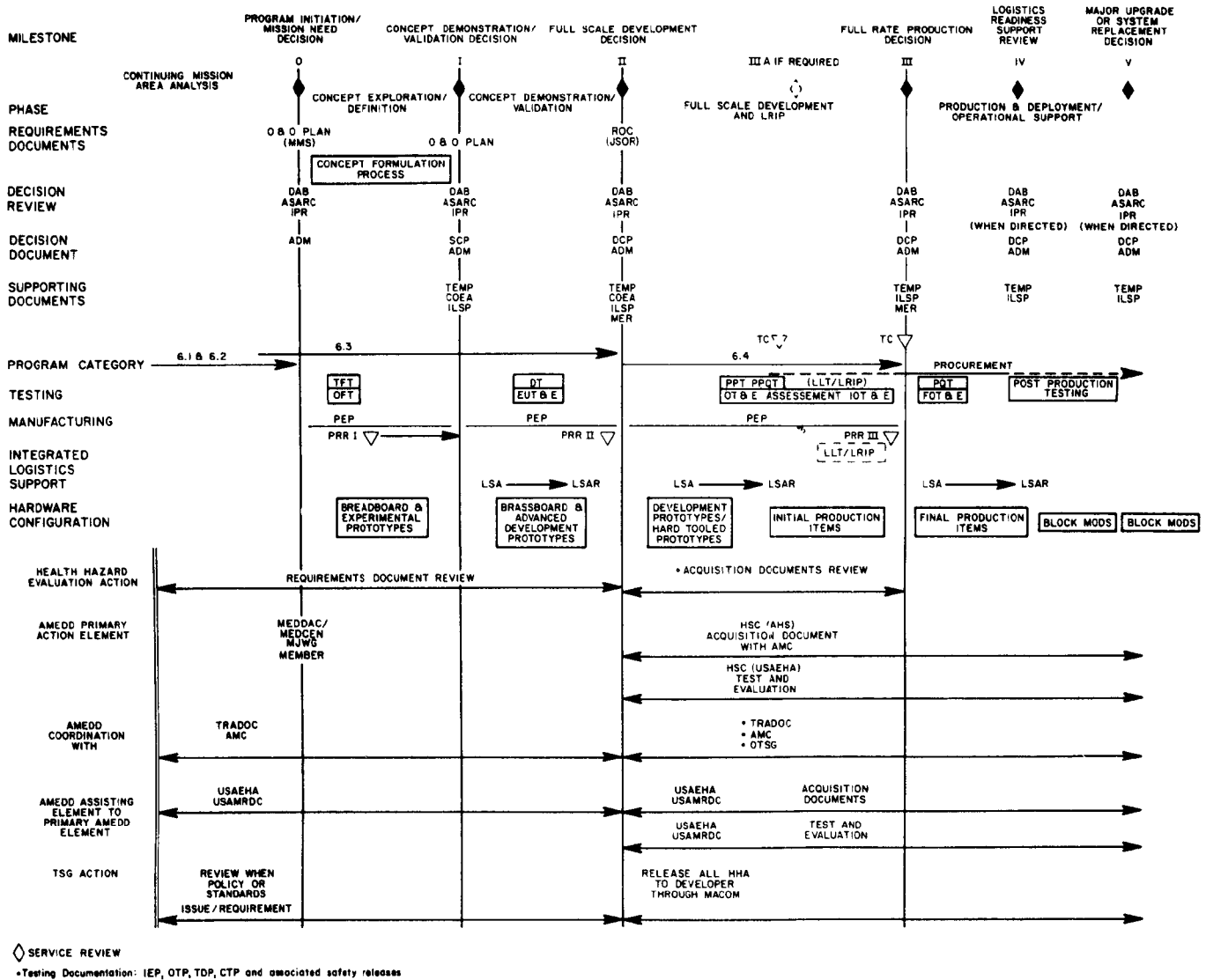


Figure 3-1. Detailed Description of Model MADP and Related HHA Actions

3-3. HHA during the preconcept exploration phase

a. Mission area analysis or mission area materiel plan. Formal collaboration between—

(1) The Commandant, Academy of Health Sciences, U.S. Army, ATTN: HSHA-CDM, Fort Sam Houston, TX 78234 6100 and other CBTDEV and MATDEVs will identify potential health hazard issues associated with Army deficiencies during the corrective action phase of the mission area analysis. These deficiencies are used by the CBTDEV mission area proponents (USATRADOC centers and schools), in coordination with appropriate MATDEV major subordinate commands and laboratories, whose publications are synchronized with the DA prioritization process and the DA long range research, development, and acquisition plan to develop mission area development plans.

(2) USAMRDC and MATDEVs will identify HHA data base requirements to support the development of new technologies during the CBRS process.

b. Concept requirement or technology base activities phase. During the concept requirement or technology base activities phase leading to the program decision memorandum, the—

(1) CBTDEVs will identify potential health hazard issues in the

SMMP that support the program requirements document (specifically the operational and organizational plan, mission need statement, and required operation concept).

(2) MATDEVs will identify the potential health hazards during the preparation of the acquisition strategy. This is normally incorporated into and approved with the system concept paper or decision coordinating paper.

(3) AMEDD will support the development of the SMMP when needed by providing representatives to the MJWG.

(4) USAMRDC will coordinate with each MATDEV for an annual review of new technological. Following this review, USAMRDC will propose, in coordination with TSG, HQDA (SGPS-PSP) to the MATDEV, a plan of medical research for each technology for consideration in developing the planning acquisition strategy.

3-4. HHA during the concept exploration and definition phase

During the initiation period leading to the concept exploration or definition phase decision point, the CBTDEVs and MATDEVs will identify specific responsibilities and tasks to quantify, eliminate, or

control real or potential health hazards. The initial HHAs will provide the HHA input into appropriate MADP supporting documentation. Program management documents are identified and included to support the next milestone. Obtain AMEDD assistance—

a. Through the supporting MEDDAC or MEDCEN PVNTMED service, which will provide technical input into requirements documents developed by the CBTDEV.

b. Through command channels to HQDA (SGPS–PSP), 5109 Leesburg Pike, Falls Church, VA 22041–3258, on staffing the medical input to and review of program documents developed by the MATDEV. This review will be in the form of an HHA.

3–5. HHA during the concept demonstration and validation phase

During this phase, test and evaluation plans prepared by the MATDEV for TTs and by the CBTDEVs or USAOTEA for UTs will include health issues and will identify biomedical data sources and evaluation methods aimed at evaluating health hazard risks.

a. During the TT cycle, the collection of health hazard data is primarily a MATDEV's responsibility.

b. TSG will evaluate the health hazard data. The MATDEVs will ensure that this evaluation is completed by requesting it through channels from HQDA (SGPS–PSP), 5109 Leesburg Pike, Falls Church, VA 22041–3258. The MATDEV should make sure the request reaches HQDA (SGPS–PSP) at least 90 days before the assessment is required. The evaluation will be in the form of an HHAR. (See chap 4.) TSG will submit the evaluation through command channels to the appropriate MATDEV organizations and independent evaluators as part of the system evaluation material.

3–6. HHA during the full–scale development–low rate Initial production phase

a. During this phase, the MATDEV will—

(1) Collect sufficient data.
(2) Submit the data to TSG according to the procedures in paragraph 3–5b above for preparation of the HHAR. (See chap 4.)

b. Testers and independent evaluators will send health hazard data collected during TTs and UTs to an independent medical assessor appointed by TSG. This data will be for incorporation into the HHAR. TSG will appoint the independent medical evaluator upon initiation of procedures in paragraph 3–4 above.

3–7. HHA during the full rate production and initial deployment phase

a. Based on the HHAR provided by TSG, developers will ensure incorporation of special operational procedures required to mitigate or control health hazards into doctrinal, operational, maintenance, and training publications and materials.

b. Post–production testing (AR 702–10) will be coordinated with TSG for those systems or items where unresolved health hazard issues exist.

c. For NDI systems, an HHAR will be provided by TSG based on initial production test data. Test data will be provided to TSG by the testing organization.

3–8. HHA assistance

The MATDEVs, CBTDEVs, and independent evaluators may request additional AMEDD assistance from TSG for—

a. Designation of AMEDD representation on the special task force or special study group and test integration working group when health hazard issues are being assessed.

b. Medical review of—

- (1) Independent evaluation reports.
 - (2) Outline test plans.
 - (3) Test design plans.
 - (4) Test and evaluation master plans.
- c. Technical consultation and direct test support.
- d. Health hazard input into the Safety Assessment Report (AR

385–16), safety and health data sheets, and occupational HHARs. This input will be in the form of an Initial Health Hazard Assessment Report (IHHAR) or HHAR as appropriate. (See chap 4.)

Chapter 4 Health Hazard Assessment Report (Requirement Control Symbol MED–388)

4–1. Purpose of the Health Hazard Assessment Report

The HHAR is the formal document used by TSG to provide the developer, tester, evaluator, and user of new materiel an analysis and assessment of health hazard issues. See table 4–1 for the format and instructions to be used in writing the HHAR.

a. The HHAR will provide a discussion of health hazard issues, by using the health hazard categories defined in appendix C.

b. The HHAR also provides recommendations for eliminating or controlling identified hazards.

c. The HHAR is developed from data made available to the health hazard assessor. This data is gathered from a variety of sources and includes results of TTs, UTs, and initial production tests. The MATDEV must ensure that appropriate health hazard data are available to make the assessment. The health hazard assessor is normally the AMEDD element tasked by TSC to provide direct support to the MATDEV as described in paragraphs 3–5 and 3–6.

4–2. Preparation

a. Requests for an HHAR will be submitted by the MATDEVs and CBTDEVs through command channels to HQDA (SGPS–PSP). The MATDEVs will send copies to Commander, U.S. Army Environmental Agency, ATTN: HSHB–MO–A, Aberdeen Proving Ground, MD 21010–5422 and to Commanding General, U.S. Army Medical Research and Development Command, ATTN: SGRD–PLC, Fort Detrick, MD 217015012. When TSG approves the request, direct communication between the assessor and the MATDEVs or CBTDEVs is essential to ensure that all necessary information is made available to the assessor.

b. During the early stages of a developmental effort, the assessor will usually prepare an IHHAR because sufficient information will not be available to prepare a complete HHAR. (Format and instructions for an IHHAR are the same as for an HHAR.) The IHHAR should usually—

(1) Identify the areas where data or standards do not allow for a complete HHAR.

(2) Recommend to the MATDEV the areas where more data must be obtained or where further developmental effort must be focused.

c. As additional data becomes available to the health hazard assessor, the IHHAR will be refined and used to develop an updated or final HHAR. This step normally occurs as a result of the TT or UT cycles. However, more data from subsequent testing may be needed if insufficient biomedical data prevents earlier completion of the HHAR. This additional data must be provided, along with a request for an updated IHHAR or final HHAR, through the command medical channels presented in paragraph 1–6 O.

4–3. Distribution

a. The AMEDD assessor who prepares the HHAR will submit the report to TSG for approval. TSG, upon approval, will submit the HHAR (or IHHAR) back through command channels to the original MATDEVs or CBTDEVs requester.

b. The requester will use the report as described in chapter 3.

**Table 4-1
HHAR format and instructions**

Paragraph	Title	Instructions
1	References	List source materials used in preparing the report. Include office consultations and telephone conversations. Summarize telephone conversations and consultations in memorandums for record and retain the memorandum for record with the file copy of the HHAR. If the references are numerous, put them in a bibliography as an appendix
2	Summary	In a single paragraph, briefly identify the system and its purpose. Address significant health hazard issues that are unidentified in paragraph 4. Summarize the major recommendations from paragraph 6.
3	Background	Describe the system being assessed. Include pertinent components, intended use of the system, intended users, systems being superseded or augmented, and any prior assessments performed on earlier system prototypes. Also use this paragraph to summarize prior evaluations of the system.
4	Identification of health hazards issues	For each component of the system, describe and discuss each potential or actual health hazard issue of concern. Use subparagraphs for each component, with additional subparagraphs for each health hazard discussion to assist reader clarity. Provide enough detail so the reader will understand the specific problem, issues involved, and reasoning behind the analyses.
5	Assessment of health hazards issues	Analyze data against health standards or criteria. Provide conclusions regarding the medical impact of the health hazards identified in paragraph 4.
6	Recommendations	Recommended actions that should resolve (reduce, control, or eliminate) actual or potential health hazards described. Give a separate statement for each hazard. Following each statement, assign an overall RAC and, in parentheses, show the hazard severity and hazard probability categories. An example would be " RAC 3 (Hazard Severity 2, Hazard Probability D)."
7	Preparer identification	Include a statement that the HHA was prepared by the U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD 21010-5422, in (month and year). Point of contact is the HHA office, DSN 584-2925. List contributing divisions.

Appendix A References

Section I Required Publications

AR 70-1

Systems Acquisition Policy and Procedures. (Cited in paras 1-1a, 2-6, and 2-13a.)

AR 700-142

Materiel Release, Fielding, and Transfer. (Cited in para 2-9c(1)-)

Section II Related Publications

ANSI S3.18-1979

Guide for the Evaluation of Human Exposure to Whole-body Vibration. (ANSI publications are available from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018, (212) 6424900.)

ANSI Z87.1-1979

Practice for Occupational and Educational Eye and Face Protection

AR 15-14

Systems Acquisition Review Council Procedures

AR 40-5

Preventive Medicine

AR 40-14/DLAR 1000.28

Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materiel's

AR 40-46

Control of Health Hazards from Lasers and Other High Intensity Optical Sources

AR 40-60

Policies and Procedures for Acquisition of Medical Materiel

AR 70-6

Management of the Research, Development, Test and Evaluation Army Appropriation

AR 70-10

Test and Evaluation During Development and Acquisition of Materiel

AR 70-15

Product Improvement of Materiel

AR 70-16

Department of the Army System Coordinator (DASC) System

AR 70-25

Use of Volunteers as Subjects of Research

AR 71-2

Basis of Issue Plans (BOIP), Qualitative and Quantitative Personnel Requirements Information (QQPRI)

AR 71-3

User Testing

AR 71-9

Materiel Objectives and Requirements

AR 200-1

Environmental Protection and Enhancement

AR 200-2

Environmental Effects of Army Actions

AR 385-9

Safety Requirements for Military Lasers

AR 385-10

Army Safety Program

AR 385-11

Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, and Radiation Safety)

AR 385-16

Systems Safety Engineering and Management

AR 602-1

Human Factors Engineering Program

AR 602-2

Manpower and Personnel Integration (MANPRINT) in the Materiel Acquisition Process

AR 700-127

Integrated Logistic Support

AR 702-3

Army Materiel Systems Reliability, Availability, and Maintainability (RAM)

AR 702-10

Post-Production Testing of Army Materiel

DA Pam 40-501

Hearing Conservation

DOD Directive 5000.1

Defense Acquisition. (DOD Directive, DOD Manuals, and DOD Instructions, as well as Military Specifications, Military Handbooks, and Military Standards are available from Commanding Officer, Naval Publications and Forms Center, S801 Tabor Avenue, Philadelphia, PA 19120- S099, DSN telephone number 442-3321.)

DOD Instruction 5000.2

Defense Acquisition Management Policies and Procedures

DOD Manual 5000.2-M

Defense Acquisition Management Documentation and Reports

FM 21-10

Field Hygiene and Sanitation

ISO 2631-1978

Guide for the Evaluation of Human Exposure to Whole-body Vibration. (This publication is available from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018, (212) 6424900.)

MIL-H-46855

Military Specifications: Human Engineering Requirements for Military Systems, Equipment and Facilities

MIL-HDBK 141

Optical Design

MIL-HDBK 759

Human Factors Engineering Design for Army Materiel

MIL-STD 454

Standard General Requirements for Electronic Equipment

MIL-STD 490
Specification Practices

MIL-STD 882
System Safety Program Requirements

MIL-STD 1180
Safety Standards for Military Ground Vehicles

MIL-STD 1294
Acoustical Noise Limits in Helicopters

MIL-STD 1425
Safety Design Requirements for Military Lasers and Associated Support Equipment

MIL-STD 1472
Human Engineering Design Criteria for Military System, Equipment and Facilities

MIL-STD 1474
Noise Limits for Army Materiel

NIOSH Publication No. 80-106
CD-Working in Confined Spaces (NIOSH publications are available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

NIOSH Publication No. 87-113
A Guide to Safety in Confined Spaces

TB MED 81/NAVMED P-5052-29/AFP 161-11
Cold Injury

TB MED 269
Carbon Monoxide: Symptoms, Etiology, Treatment and Prevention of Overexposure

TB MED 288
Medical Problems of Man at High Terrestrial Elevations

TB MED 502/DLAM 1000.2
Occupational and Environmental Health: Respiratory Protection Program

TB MED 503
The Army Industrial Hygiene Program

TB MED 506
Occupational and Environmental Health: Occupational Vision

TB MED 507/NAVMED P-5052-5/AFP 160-1
Occupational and Environmental Health: Prevention, Treatment and Control of Heat Injury

TB MED 513
Guidelines for the Evaluation and Control of Asbestos Exposure

TB MED 521
Management and Control of Diagnostic X-ray, Therapeutic X-ray and Gamma Beam Equipment

TB MED 522
Occupational and Environmental Health: Control of Health Hazards from Protective Materiel Used in Self-Luminous Devices

TB MED 523
Control of Hazards to Health from Microwave and Radio Frequency Radiation and Ultrasound

TB MED 524
Occupational and Environmental Health: Control of Hazards to Health from Laser Radiation

TB MED 530
Occupational and Environmental Health: Food Service Sanitation

TB MED 576
Occupational and Environmental Health: Sanitary Control and Surveillance of Water Supplies at Fixed Installations

TB MED 577
Occupational and Environmental Health: Sanitary Control and Surveillance of Field Water Supplies

USAEHA TG No. 144
Guideline for Controlling Health Hazards in Painting Operations. (This publication is available from the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-CI-O, Aberdeen Proving Ground, MD 21010-5422.)

USAEHA TG No. 153
Guidelines for Controlling Potential Health Hazards from Radio frequency Radiation. (This publication is available from the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-CI-O, Aberdeen Proving Ground, MD 21010-5422.)

Unnumbered Publication
Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment and Biological Exposure Indices with Intended Changes for the current year. (This publication is available from the American Conference of Governmental Industrial Hygienists, Cincinnati, OH.)

Appendix B

Risk Assessment Codes

B-1. Introduction

The goal of the HHA program is to eliminate health hazards by design. When health hazards are not eliminated during the early design stage, a risk assessment procedure based on hazard severity and mishap probability will be used to establish priorities for corrective action and the resolution of identified health hazards. RACs (adapted from MIL-STD 882, para 4.5) are used to quantify risk to personnel (users and testers) operating or maintaining a system or conducting an operation. The RACs show the adverse health effect or possible loss of bodily systems described in categories of hazard severity and hazard probability. Descriptions and categories of these two terms are as follows:

a. Hazard severity- Hazard severity is an assessment of the worst potential consequence. This assessment is defined by degree of bodily injury, occupational illness, health-related performance degradation, or bodily system damage which could occur. Hazard severity categories are assigned by a Roman numeral as explained below:

(1) *Category I*- Catastrophic: Hazard may cause death or total loss of a bodily system.

(2) *Category II*- Critical: Hazard may cause severe bodily injury, severe occupational illness, or major damage to a bodily system.

(3) *Category III*- Marginal: Hazard may cause minor bodily injury, minor occupational illness, or minor damage to a bodily system.

(4) *Category IV*- Negligible: Hazard would cause less than minor bodily injury, minor occupational illness, or minor bodily system damage.

b. Hazard probability- Hazard probability refers to the likelihood that a hazard will occur. This probability is based on an assessment of such factors as location, exposure in terms of cycles or hours of

operation, and affected population. Qualitative hazard probability levels are assigned by a capital letter as explained in table B-1.

**Table B-1
Hazard probability**

Descriptive word	Level	Specific individual item	Fleet or inventory
FREQUENT	A	Likely to occur frequently.	Continuously experience
PROBABLE	B	Will occur several times in the life of an item	Will occur frequently.
OCCA-SIONAL	C	Likely to occur sometime in the life of an item	Will occur several times
REMOTE	D	Unlikely but possible to occur in the life of an item	Unlikely but can reasonably be expected to occur
IMPROBABLE	E	So unlikely, it can be assumed occurrence may not be experienced.	Unlikely to occur, but possible

B-2. Risk assessment code

a. This code shows the degree of risk assessment by combining the elements of hazard severity and hazard probability.

b. Rank order is assigned using table B-2.

(1) The lower the number assigned, the higher the assessed risk. For example, a hazard severity category of IV and a hazard probability level of C would give a RAC of 5.

(2) The assessed risk levels are RACs 1 and 2 equaling high level risks, RAC 3 equaling medium level risks, and RACs 4 and 5 equaling low level risks.

**Table B-2
Risk assessment codes**

Hazard severity	Hazard Probability levels categories				
	A	B	C	D	E
I	1	1	1	2	3
II	1	1	2	3	4
III	2	3	3	4	5
IV	3	5	5	5	5

B-3. Action on identified health hazards

Actions will be taken to eliminate identified health hazards or reduce the associated risk. Catastrophic and critical health hazards will be eliminated or their associated risk reduced to a level acceptable to the AAE.

B-4. Risk decision authority

The risk decision authority will serve as a guide for reporting and obtaining acceptance decisions and will be included in the acquisition strategy. See tables B-3 and B-4.

**Table B-3
Risk decision authority major defense acquisition programs and Army designated acquisition programs**

Hazard risk assessment code	Risk Level	Decision authority
RACs 1 and 2	High	AAE or designee.
RAC 3	Medium	PEO or equivalent
RACs 4 and 5	Low	PM or equivalent

**Table B-4
Risk decision authority for non-major programs**

Hazard risk assessment code	Risk Level	Decision authority
RACs 1 and 2	High	PEO/CG, USAMC/CG, USAMRDC.
RAC 3	Medium	Major subordinate command commander.
RACs 4 and 5	Low	PM/item manager

Appendix C Health Hazard Categories Addressed by the HHA Program

C-1. Introduction

The references listed are not all inclusive. Use additional Occupational Safety and Health Administration, DOD, consensus, or special DA occupational safety and health standards developed for military-unique equipment, systems, and operations to evaluate systems. Appendix A contains additional references related to the HHA program.

C-2. Acoustical energy (steady-state noise, impulse noise, and blast overpressure)

a. Acoustical energy is the potential energy that exists in a pressure wave that is transmitted through the air which may interact with the body to cause hearing loss or damage to internal organs.

b. This may include-

(1) Continuous noise from engines and helicopter rotors.

(2) Impulse noise from shoulder fired weapons.

(3) Blast overpressure created from the firing of mortars, towed artillery (free-field wave), and heavy weapons on crew served vehicles (complex wave).

c. References: AR 40-5, MIL-STD 1474, and DA Pam 40-501.

C-3. Biological substances (pathogenic microorganisms and sanitation)

a. Exposures to microorganisms, their toxins, and enzymes. This category addresses sanitation concerns, such as human waste disposal, food handling, and personal hygiene.

b. References: AR 40-5, FM 21-10, and TB MED 577.

C-4. Chemical substances (weapon or engine combustion products and other toxic materials)

a. Hazards arising from excessive airborne concentrations of mists, gases, vapors, fumes, or particulate matter. Exposure via inhalation, ingestion, skin contact, or eye contact may cause toxic effects. Hazards may also be caused by exposure to toxic liquids and solids by ingestion, skin contact, or eye contact.

b. References: AR 40-5, MIL-STD 1472, MIL-HDBK 759, TB MED 269, TB MED 502/DLAM 1000.2, TB MED 503, TB MED 513, USAEHA TG No. 144, 29 CFR 1910, and Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment and Biological Exposure Indices with Intended Changes for the current year, American Conference of Governmental Industrial Hygienists.

C-5. Oxygen deficiency (crew/confined spaces and high altitude)

a. Under certain conditions, atmospheric oxygen concentrations may be decreased below that which is commonly found in air (21 percent by volume). Large reductions in oxygen concentrations can cause-

(1) Shortness of breath.

(2) Impaired coordination and judgment with progression to unconsciousness and death.

b. This hazard may occur when atmospheric oxygen is displaced

from an enclosed space or when a system is operated at high altitudes. High altitudes may involve a condition called hypoxia (decrease in oxygen supplied or used by body tissues) which can create visual, mental, and motor impairment.

c. References: TB MED 288, Occupational Safety and Health Administration regulations, NIOSH Publications Nos. 80-106 and 87-113.

C-6. Radiation energy (ionizing and nonionizing radiation, including lasers)

a. Ionizing radiation is any form of radiation sufficiently energetic to cause ionization when interacting with living or inanimate matter. This includes-

- (1) Alpha and beta particles.
- (2) Gamma rays.
- (3) X-rays.
- (4) Neutrons.

b. Nonionizing radiation refers to emissions from the electromagnetic spectrum that have insufficient energy to produce ionization of molecules. This includes-

- (1) Ultraviolet.
- (2) Visible.
- (3) Infrared.
- (4) Radio frequencies (including microwave radiation). Lasers emit amplified electromagnetic radiation within the nonionizing spectrum.

c. References: AR 40-5, AR 40-14/DLAR 1000.28, AR 40-46, AR 385-9, AR 385-11, MILSTD 1425, TB MED 522, TB MED 523, TB MED 524, 10 CFR 0-199, USAEHA TG No. 153, and 21 CFR 1040.

C-7. Shock (acceleration/deceleration)

Delivery of a mechanical impulse or impact to an individual transmitted from the acceleration or deceleration of a medium with which he or she has contact. Examples of this include opening forces of a parachute harness and forces delivered to the body as the result of weapon recoil.

C-8. Temperature extremes and humidity (heat and cold injury)

a. This hazard category includes the human health effects associated with high or low temperatures (possibly in conjunction with high humidity) which may be exacerbated by the use of a materiel system. Heat stress can result in heat disorders, such as heatstroke and hypothermia. Cold induced disorders include frostbite and hypothermia.

b. References: AR 40-5, MIL-STD-1472, TB MED 81/NAVMED P-5052-29/AFP 161-11, TB MED 288, and TB MED 507/NAVMED P-5052-5/AFP 160-1.

C-9. Trauma (blunt, sharp, or musculoskeletal)

a. Physical trauma may occur because of sharp or blunt object impact to the eyes or body surface. Trauma to the musculoskeletal system may occur during the lifting of heavy objects, such as projectiles or ammunition boxes. Personal protective equipment, such as chemical protective masks, eyewear, or helmets are often assessed in terms of their ability to preclude traumatic injuries.

b. References: AR 40-5, TB MED 506, 29 CFR 1910, and ANSI Z87.1-1979.

C-10. Vibration (whole body and segmental)

a. This hazard category is used to address health effects arising from contact of a mechanically oscillating surface with the human body. Sources of whole body and segmental vibration include riding in or driving vehicles and aircraft and operating certain hand-operated tools.

b. References: MIL-STD 1472 (not directly applicable for health), ANSI S3.18-1979, and ISO 2631-1978.

Glossary

Section I Abbreviations

AAE

Army acquisition executive

ADM

acquisition decision memorandum

AHS

Academy of Health Sciences, U S Army

AMEDD

Army Medical Department

ANSI

American National Standards Institute

APG

Aberdeen Proving Ground

AR

Army regulation

ARNG

Army National Guard

ASARC

Army systems acquisition review council

ASA(RDA)

Assistant Secretary of the Army (Research, Development, and Acquisition)

CBRS

Concept Based Requirements Systems

CBTDEV

combat developer

CFR

Code of Federal Regulations

CG

commanding general

COEA

cost and operational effectiveness analysis

CTP

coordinate test plans/program

DA

Department of the Army

DAB

defense acquisition board

DCP

decision coordinating paper

DCSOPS

Deputy Chief of Staff for Operations and

DOD

Department of Defense

DT

development test

EUT&E

early user test and evaluation

FM

field manual

FOT&E

follow-on operational test and evaluation

HFE

human factors engineering

HHA

health hazard assessment

HHAR

Health Hazard Assessment Report

IEP

independent evaluation plan

IHHAR

Initial Health Hazard Assessment Report

ILSP

integrated logistics support plan

IOT & E

initial operational test and evaluation

IPR

in-process review

ISO

International Standards Organization

JSOR

joint statement of requirement

LLT

long lead time

LRIP

low rate initial production

LSA

logistics support analysis

LSAR

logistics support analysis report

MADP

Materiel Acquisition Decision Process

MANPRINT

manpower and personnel integration

MATDEV

materiel developer

MEDCEN

medical center

MEDDAC

Medical Department activity

MER

manpower estimate report

MIL-HDBK

military handbook

MIL-STD

military standard

MJWG

MANPRINT joint working group

MNS

mission needs statement

NDI

nondevelopment item

O&O

operational and organizational

OFT

operational feasibility testing

OT&E

operational test and evaluation

OTP

operational test plan

PEO

program executive officer

PM

program, project, and product manager

PPQT

pre-production and disqualification test

PPT

production provement test

PQT

production qualification test

PRR

production readiness review

PVNTMED

preventive medicine

RAC

Risk Assessment Code

RCS

Requirement Control Symbol

RDTE

research, development, test, and evaluation

ROC

required operational capability

SCP

systems concept paper

SMMP

system MANPRINT management plan

TB MED

technical bulletin, medical

TC

type classification

TDP

technical data package

TFT
technical feasibility testing

TG
technical guide

TSG
The Surgeon General

TT
technical test

USAEHA
U.S. Army Environmental Hygiene Agency

USAHSC
U.S. Army Health Services Command

USAMC
U.S. Army Materiel Command

USAMRDC
U.S. Army Medical Research and Development Command

USAOTEA
U.S. Army Operational Test and Evaluation Agency

USAR
U.S. Army Reserve

USATRADO
U.S. Army Training and Doctrine Command

UT
user test

Section II **Terms**

Combat developer
Any organization responsible for developing or modifying doctrine on how the Army will fight.

Consensus standards
Standards prepared and written by industry, regulatory, and general interest groups. Based on known data, the standards reference the construction, usability, and safety of a product.

Data Item description
Specific description of the data the government expects to receive from a contractor. The data item description will refer the contractor to pertinent reference documents containing format and requirements for preparing the data.

Health hazard
An existing or likely condition, inherent to the operation or use of materiel, that can cause death, injury, acute or chronic illness,

disability, and reduced job performance of personnel by exposure to—

- Acoustical energy.
- Biological substances.
- Chemical substances.
- Oxygen deficiency.
- Radiation energy.
- Shock.
- Temperature extremes and humidity.
- Trauma.
- Vibration.

Health hazard assessment
The application of biomedical knowledge and principles to document and to quantitatively determine the health hazards of Army systems. This assessment identifies, evaluates, and controls the risks to the health and effectiveness of personnel who test, use, or service Army systems. This assessment includes—

- The evaluation of hazard severity, hazard probability, risk assessment, consequences, and operational constraints.
- The identification of required precautions and protective devices.
- Training requirements.

Health hazard assessment program
An Army program implemented through the MADP. This program identifies, evaluates, prevents, and controls actual or potential health hazards in order to—

- Enhance soldier effectiveness.
- Provide maximum protection to personnel consistent with mission requirements and cost effectiveness.

Health hazard assessor
The health hazard assessor is normally the AMEDD element tasked by TSG to provide direct support to the program manager.

Human factors engineering
A comprehensive technical effort to integrate all personnel characteristics (skills, training implications, behavioral reactions, human performance, anthropometric data, and biomedical factors) into Army doctrine and systems. The integration is to assure operational effectiveness, safety, and freedom from health hazards (AR 602-1). Human factors engineering considerations are addressed during the preparation of the justification for major system new start.

Human factors engineering assessment
An assessment that will—

- Support the milestone decision review.
- Identify any human factors engineering problems that are critical enough to prevent an Army system from developing into the next phase of the MADP and any other problems that are not as critical or are noncritical but still must be addressed in the subsequent phase (AR 602-1).

Independent medical assessor
Personnel independent of materiel developers and combat developers who are tasked by the

AMEDD to provide the appropriate HHA support of Army materiel systems.

Manpower and personnel integration
The process of integrating the full range of HFE, manpower, personnel, training, HHA, and system safety to improve soldier performance and total system performance throughout the entire MADP.

Materiel acquisition decision process
The sequence of acquisition activities starting with the identification of an unmet mission need and extending through the introduction of a system into operational use.

Materiel developer
Any organization responsible for developing or modifying materiel.

Nondevelopment Item
The acquisition of commercially available, other source, or foreign items that can be used without extensive modification or other development efforts.

Operational and organizational plan
The program initiation document in the MADP. Its purpose is to provide an early agreement between the MATDEV and CBTDEV on the requirement to initiate the MADP in order to meet a new need.

Risk assessment code
RACs quantify risk to personnel (users and testers) operating or maintaining a system or conducting an operation. They also show the adverse effect on or possible loss of bodily systems described in categories of hazard severity and hazard probability.

Safety assessment report
A formal summary of the safety data collected during the design and development of the system. In it, the MATDEV summarizes the hazard potential of the item, provides a risk assessment, and recommends procedures or other corrective actions to reduce these hazards to an acceptable level.

Soldier-machine Interface
Where the soldier controls the equipment and where information regarding equipment status is provided to the operator.

System safety
The application of engineering and management principles, criteria, and techniques to optimize safety within the constraints of operational effectiveness, time, and cost throughout all phases of the system or facility life cycle.

System safety engineering
An engineering discipline requiring specialized professional knowledge and skills in applying scientific and engineering principles, criteria, and techniques to identify and eliminate hazards or reduce the risk associated with the hazards.

Section III
Special Abbreviations and Terms

This section contains no entries.

Index

This index is arranged alphabetically by topic and by subtopic within topic. Topics and subtopics are identified by paragraph number.

Acquisition

- Strategy, 1-5, 3-3, and B-1.
- Army executive (AAE), 2-3.
- Documents, 2-7.
- Major acquisition programs, 2-13, B-1, and B-4.

American Conferences of Governmental

- Industrial Hygienists Threshold Limit Values, 1-5 and C-3.

Army Medical Department

- Assessor, 4-3.
- Assistance, 3-4 and 3-8.
- Elements, 1-5, 2-9, 3-1, and 4-1.
- Health hazard assessment, 2-7.
- Health hazard assessment elements, 2-9.
- Personnel, 1-5 and 2-9.
- Representation, 3-8.

Assessment of, 1-5, 2-9, 4-1, and B-1.

Biological

- Exposure indices, C-3.
- Substances, C-2.

Biomedical

- Data, 4-2.
- Data base, 1-5, 2-7, 2-9, 2-10, and 3-2.
- Data sources, 3-5.
- Principles, 2-7.
- Science and technology base, 2-10.

Combat

- Developer, 2-6, 2-7, 2-8, 2-9, 2-10, 3-3, 3-4, 3-5, 3-7, 3-8, 4-1, 4-2 and 4-3.
- Developer mission area proponents, 3-3.
- Developer requester, 4-3.
- Use scenarios, 2-8.
- Scenarios, 1-5.

Concentrations

- Airborne, C-3.
- Atmospheric oxygen, C-4.

Concept

- Analysis, 1-1.
- Based requirement system, 2-7, 2-8, and 3-3.
- Paper, 3-3.
- Requirement or technology base activities phase, 3-3.

Data gathering methods, 2-9.

Decision

- Coordinating paper, 3-3.
- Point documents, 2-7 and 3-4.
- Point milestones, 2-9 and 2-10.

Defense acquisition board, 2-4.

Deficiencies

- Army, 3-3.
- Readiness, 1-4.

Design process, 2-13.

Designated acquisition programs, B-1 and B-4.

Development documents, 2-9.

Developmental

- And operational test and evaluation agencies, 2-9.
- Items, 2-7 and 3-7.
- System, 1-5 and 2-7.

Effectiveness

- Cost, 1-5.

Soldier, 2-10.

Energy

- Acoustical, C-1.
- Radiation, C-5.

Environmental

- Contamination, 1-4.
- Hygiene Agency, U.S. Army, 2-7, 2-8, 2-9, 2-10, 4-1, and 4-2.

Evaluation

- Methods, 3-5.
- Plans, 3-5.
- Reports, 2-8.

Exposure

- Chemicals, C-4.
- Criteria, 2-7.
- In terms of hours of operation, B-1.
- Limits, 2-2, 2-6, and 2-9.
- Of personnel, 2-2 and 2-6.
- To toxic liquids and solids, C-4.

Eye

- Contact, C-3.
- Impact to, C-8.

Food

- And Drug Administration, 2-9.
- Handling, C-2.

Hazard

- Identified, 4-1.
- Probability, 4-1, B-1, B-2, and B-3.
- Severity, 4-1, B-1, and B-3.

Health

- And Human Services, U.S. Department of, C-4.
- Considerations, 2-7, 2-8, and 2-10.
- Criteria, 2-8, 2-9, and 3-2.
- Effect, 2-7, 2-8, B-1, C-8, and C-10.
- Hazard, 1-4, 1-5, 2-2, 2-6, 2-8, 2-9, 2-10, 2-11, 3-3, 3-4, 3-7, and B-1.

Hazard assessments

- Action, 3-1.
- Budget, 2-1, 2-12, 2-13, and 2-7. Considerations, 2-5.
- Coordination with MANPRINT, 1-1 2-7, and 2-13.
- Data, 1-5 and 2-6.
- Data base, 2-9.
- Data base requirements, 3-3.
- Funding levels, 2-10.
- Initial, 3-4.
- Input, 3-4.
- Issues, 2-7, 2-10, 2-12, and 2-13.
- Medical support requests, 2-6.
- Medical studies, 2-8.
- Nonroutine assessment, 2-7.
- Preparation, 2-13 and 2-7.
- Procedures, 1-5, 2-9, and chapter 3.
- Report, 2-8, 2-9, 2-10, 3-2, 3-5, 3-6, 3-7, 3-8, 4-1, 4-2, and 4-3.
- Requirements, 2-7, 2-12, and 2-13.
- Research, 2-7.
- Responsibilities, 2-12.
- Reviews, 2-13.
- Status, 2-12 and 2-13.
- Support, 2-7 and 2-8.
- Testing, 2-7.
- Training, 2-9.

Hazard assessor, 4-1 and 4-2.

Hazard categories, 4-1.

Hazard criteria or standards, 1-5.

Hazard data, 1-5, 2-7, 2-8, 3-5, 3-6, and 4-1.

Hazard input, 3-8.

Hazard issues, 3-3, 3-7, 3-8, and 4-1.

Hazard risks, 3-5 and C-1.

Hazard standards, 1-5.

Hazard testing, 1-5.

- Issues, 2-7, 3-5, 3-7, 3-8, and 4-1.
- Of the soldier, 1-4 and 2-9.
- Protection criteria, 3-2.
- Related performance degradation, B-1.
- Risks, 2-7 and 3-5.
- Sciences, Academy of, 2-8, 2-9, and 3-3.
- Services Command, U.S. Army, 2-6, 2-8, and 2-9.
- Standards, 1-5, 2-2, 2-6, 2-9, 2-10, and 4-1.

Heat

- Disorders, C-8.
- Stress, C-8.

High level hazards, 2-4 and 2-10.

Human Engineering Laboratory, U.S. Army, 2-7.

Human Factors engineering

- Assessment of the MADP, 2-10.
- In the MADP, 2-7.
- Organizations, agencies, and personnel, 1-5.
- Portions of the MADP, 1-1.
- Services, 2-7.
- Support, 2-7.

Human Physiological and toxicological responses, 2-10.

Human Waste disposal, C-3.

Illness

- Occupational, B-1.
- Reducing, 1-4.

Independent

- Evaluators, 3-5, 3-6, and 3-8.
- Evaluation reports, 2-7 and 3-8.
- Medical assessors, 1-5 and 3-6.

Initial

- Health hazard assessments, 3-4.
- Health hazard assessment report, 3-8 4-2, and 4-3.
- Production test data, 3-7 and 4-1.

Injury

- Bodily, B-1.
- Reducing, 1-4.
- Traumatic, C-9.

Integrated

- Logistics support policy, 2-5.
- Logistics support program assessments 2-5.

In-process reviews, 2-6.

Item manager, B-4.

Life

- Cycle management, 1-4.
- Of an item, B-1 and B-2.

Logistics

- Deputy Chief of Staff for, 2-5.
- Impacts of the HHA; 2-5.

Long range research, development and acquisition

- Plan, 2-13.
- Process, 3-3.

Major subordinate commands and laboratories, 3-3 and B-4.

Manpower and personnel integration, 2-13.
 Assessment, 2-4 and 2-7.
 Coordination with the HHA, 1-1.
 Joint working groups, 2-8, 2-9, and 3-3.
 Management plans, 2-9 and 3-3.
 Portion of each system review, 2-12.
 Process, 2-4.

Manpower organizations, 1-5.

Market investigations, 1-5.

Materiel
 Acquisition cycle, 2-4.
 Acquisition process, 2-8.
 Acquisition decision process, 1-1, 1-5, 2-1, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 3-1, and 3-4.
 Command, U.S. Army, 2-7.
 Developer, 2-6, 2-7, 2-10, 3-3, 34, 3-5, 3-6, 3-8, 4-1, 4-2, and 4-3.
 Item, 1-5.
 Releases, 2-9.
 Requirement documents, 2-3.
 System, 1-4, 1-5, 2-1, 2-7, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, and C-8.
 System contractors, 2-13.
 System technologies, 2-10.
 Use of, 1-5.

Matter
 Inanimate, C-6.
 Living, C-6.
 Particulate, C-4.

Mechanical impulse, C-7.

Mechanically oscillating surface, C-10.

Medical
 Centers, 2-8, 2-9, and 3-4.
 Consultation, 2-7.
 Data bases, 2-10.
 Department activities, 2-7, 2-8, 2-9, and 3-4.
 Efficacy, 2-9.
 Impact of the health hazard, 4-1.
 Materiel, 2-9 and 2-10.
 Research and Development Command, U.S. Army, 2-6, 2-10, 3-3, and 4-2.
 Policies, 2-2 and 2-6.
 Research, 1-5, 2-7, 2-12, 3-2, and 3-3.
 Review, 2-8, 2-9, and 3-8.
 Standards, 2-7.
 Support, 1-5 and 2-6.

Memorandum of understanding, 1-5.

Milestone
 Decision reviews, 2-13.
 Milestone 0, 2-7 and 2-8.

Military-unique
 Exposures, 2-10.
 Hazards, 3-2.
 Health effects, 2-7 and 2-8.
 Health protection criteria, 3-2.
 Requirements, 1-5.

Mission
 Area analysis or mission area materiel plan, 3-3.
 Area development plans, 3-3.
 Area proponents, 3-3.
 Need statement, 3-3.
 Needs, 1-1.
 Requirements, 1-5.

Noise, C-2.

Nondevelopment items, 1-5, 3-2, and 3-7.

Non-major
 Programs, 2-13 and B-4.
 Systems, 2-7 and 2-10.

Operational
 Evaluation reports, 2-11.
 Issues and criteria, 2-11.
 Procedures, 3-7. Restrictions, 1-4.
 Test and evaluation agencies, U.S. Army, 2-3, 2-11, and 3-5.
 Test reports, 2-11.
 Tests, 2-11.

Operations and Plans, Deputy Chief of Staff for, 2-3.

Oxygen, C-5.

Personal
 Hygiene, C-3.
 Protective equipment, C-9.

Personnel
 Compensation claims, 1-4.
 Deputy Chief of Staff for, 2-4.

Physical trauma, C-9.

Physiological
 Data bases, 2-10.
 Limits of human exposure, 2-10.
 Responses to military-unique exposures, 2-10.

Post-production testing, 3-7.

Preventive medicine service, 2-8, 2-9, and 3-4.

Procurement, 1-1.

Product manager, 2-12 and 2-13.

Production, 1-1.

Program
 Decision memorandum, 3-3.
 Documents, 2-13 and 3-4.
 Executive officer, 2-12 and B-4.
 Management documents, 2-8 and 3-4.
 Managers, 2-12 and 2-13.
 Requirements document, 3-3.

Project managers, 2-12 and 2-13.

Publications, 2-8, 3-3, and 3-7.

Radiation, C-6

Requirements documents, 2-8, 2-9, and 3-4.

Research
 Assistant Secretary of the Army for (Research, Development, and Acquisition), 2-1 and 2-10.
 Development, test, and evaluation, 1-5, 2-1, 2-7, and 2-10.

Researchers, 1-5.

Retrofits, 1-4.

Risk
 Accepted risks, 1-5.
 Assessment codes, 1-5, 2-4, 2-10, 4-1, B-1, B-3, and B-4.
 Decision authority, 12-1, 2-7, 2-12, 2-13, B-1, and B-4.

Safety
 And health data sheets, 3-8.
 Assessment report, 3-8.
 Hazards, 2-7, 2-8, and 2-11.
 Releases, 2-6 and 2-7.
 Standards, 2-10.

Sanitation concerns, C-3.

Segmental vibration, C-10.

Shock, C-7.

Special task force or study group, 3-8.

Storage, 1-1.

Surgeon General, 1-5, 2-1, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 3-3, 3-5, 3-6, 3-7, 4-1, 4-2, and 4-3.

System
 Acquisition Review Committee, 2-12 and 2-4.
 Documents, 1-5.
 Evaluation material, 3-5.
 Maintenance, 1-1.
 Musculoskeletal, C-9.
 Prototypes, app B.
 Safety, 1-5.
 Safety engineering, 1-1 and 2-10.
 Safety working groups, 2-9.
 Use of, 1-4 and 4-1.

Technical
 Consultation, 3-8.
 Input, 2-8 and 3-4.
 Services, 2-9.
 Test, 2-6, 2-7, 2-13, 3-5, 3-6, 4-1, and 4-2.

Technology base activities phase, 3-3.

Test
 Agency, 2-7 and 2-8.
 And evaluation command, U.S. Army, 2-7 and 2-8.
 And evaluation master plan 3-8.
 And evaluation plans, 3-5.
 Design plans, 3-8.
 Documentation, 2-7.
 Integration working group, 3-8.
 Methods, 2-9.
 Operating procedures, 1-5 and 2-9.
 Organizations, 2-6.
 Planning, 2-8.
 Plans, 2-7 and 3-8.
 Reports, 2-7, 2-8, and 2-11.
 Results, 2-9.

Testing, 1-1.

Threshold limit values (See American Conference of Governmental Industrial Hygienists)

Toxicity clearances, 1-5.

Training
 And Doctrine Command, U.S. Army, 2-8 and 3-3.
 Devices, 1-4.
 Materials, 3-7.
 Policies, 2-3.
 Procedures, 2-8.
 Restrictions, 1-4.
 Scenarios, 1-5.

Transportation, 1-1.

U.S. Army Environmental Hygiene Agency (See environmental)

User test, 2-3, 2-6, 2-7, 2-8, 2-13, 3-5, 3-6, 4-1, and 4-2.

Weapon systems, 2-10.

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