

NASA Glenn Safety Manual

CHAPTER 1 - SAFETY MANAGEMENT

Revision Date: 10/01 (Editorial Review)

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1.1 PROGRAM

1.1.1 Scope

The Glenn Safety Management Program includes a Center-wide Glenn Safety Organization that provides the technical expertise and the safety orientation necessary to execute the Program functions and responsibilities; a safety control and accident reporting system that handles all the potential hazards known to exist at Glenn; a safety education and training system; and a Glenn safety publication.

1.1.2 Applicability

The instructions of the Glenn Safety Management Program apply to the Cleveland Center and the Plum Brook Station.

1.1.3 Authority

The authority for the Program is derived from NPG 8715.5 NASA Safety Manual Procedures and Guidelines

1.1.4 Policy

It is Glenn policy to administer its operations so as to reduce or eliminate all potential hazards, thereby avoiding undue risk and accidents that can result in loss of life, injury to personnel, damage to property, or loss of research operating time and effectiveness. To this end, a definite, comprehensive Safety Management Program encompassing every applicable phase of Center activity shall be established and implemented. Using the dictates of sound engineering judgment, Glenn will follow recognized safety codes and standards in all operations, including the modification or construction of facilities.

1.1.5 General Considerations

The Glenn Safety Management Program must consider both the Glenn safety environment and basic safety management.

The Glenn safety environment: Safety considerations at the Center are many and complex as a result of the following:

- a. The diversity of R&D operations in propulsion, power, and energy-related research
- b. The potentially hazardous character of the materials, fluids, test equipment, and processes involved
- c. The continual turnover of experiments and the constantly changing nature of research test operations
- d. The range and depth of the technical competence that is required to manage a safety program in such an environment

Basic safety management: For effective operation, Center safety management must provide

- a. The means of identifying, locating, and eliminating or controlling all potential hazards known to exist at Glenn
- b. The means of establishing and maintaining such employee safety data as specific hazard exposure, training, medical examinations, accident reports, and so on
- c. General compliance with "Occupational Safety and Health Administration (OSHA) Standards" (29 CFR).
- d. The means of integrating all of these into a coordinated Center-wide safety operations plan

1.1.6 Basic Responsibilities

Glenn Director - The Center Director is responsible for the establishment of a Glenn Safety and Accident Prevention Program in accordance with federal regulations, the "NASA Basic Safety Manual," NHB 1700.1, Vol. 1 B, and other related guidelines set up by NASA Headquarters.

Glenn Safety Organization - The Glenn Safety Organization includes the Executive Safety Board (ESB); the Glenn Safety Office (GSO); Area Safety Committees; the Aviation Safety Officer; the Electrical Applications and the Process Systems Safety Committees; Plum Brook Reactor Facility Safety Committee; the Office of Health Services; the Labor Management Safety and Health Committee; the Environmental Management Office (EMO), including the Radiation Safety Committee (RSO) and the Environmental Pollution Control Board (EPCB).

It is broadly responsible for:

- a. Promulgating Glenn safety policies and developing an effective Safety Management Program, including definition and implementation of the Center safety and accident prevention plan
- b. Evaluating Program effectiveness
- c. Developing appropriate recommendations and corrective actions to improve Program effectiveness
- d. Establishing and/or approving in-house safety standards, regulations, and criteria, and reviewing and monitoring operational compliance therewith
- e. Reviewing installations and equipment and issuing Safety Permits to operate facilities

Chief of the Glenn Safety Office - The Chief of GSO is responsible for the overall management, coordination, and documentation of the Glenn Safety Management Program and, in conjunction with the ESB, for the implementation of Center safety policies and directives. The GSO Chief serves as the Center focal point of communications on all life safety matters and on functional safety relationships between the Center and NASA Headquarters.

Supervisors - All organization supervisors have a prime responsibility for compliance with pertinent safety requirements (including those related to housekeeping and shop safety) and for ensuring the effectiveness of the Glenn Safety Management Program as it affects their specific activities.

This responsibility includes, but is not limited to, the following:

- a. Knowing pertinent Glenn safety requirements; communicating these requirements to subordinate personnel; mandating compliance with these requirements; and monitoring this compliance
- b. Knowing about and ensuring adherence to Glenn safety approval procedures
- c. Reviewing the work proposals of subordinates to ensure that all potential hazards are properly identified and evaluated, that procedures for safe operation and effective emergency rescue have been developed, and that the cognizant Area Safety Committee evaluation is obtained
- d. Personally surveying their work areas and recognizing potential hazards therein; analyzing statistics on accidents and near accidents in these areas; and initiating or recommending corrective action where required
- e. Supplying the Glenn Safety Office with the necessary technical input for the development of safe operating procedures, emergency rescue procedures, or any other safety documentation deemed necessary by the Safety Office
- f. Providing direction for continuing safety education and training for subordinate personnel in accordance with the standards and criteria established by the Safety Office Employees.

Each Glenn employee is responsible for:

- a. Exercising reasonable care and caution in the safe performance of his or her work assignments and in the conduct of any activity at the Center
- b. Possessing knowledge of Glenn safety regulations, safe operating procedures, and emergency rescue procedures affecting his or her individual work area and work assignments and complying therewith
- c. Reporting the development or appearance of any potentially hazardous condition to his or her supervisor, to the Division Safety Representative, to the Safety Office, or to the Area Safety Committee chairman

1.1.7 Operating Responsibilities and Procedures

The specific operating responsibilities, procedures, and related requirements for the implementation of the Safety Management Program are reflected in the chapters of this Manual.

1.2 GLENN SAFETY ORGANIZATION

1.2.1 Scope

The Glenn Safety Organization includes the Executive Safety Board; the Glenn Safety Office; Area Safety Committees; the Aviation Safety Officer; the Electrical Applications and the Process Systems Safety Committees; Plum Brook Reactor Facility Safety Committee; the Occupational

Medical Services; the Labor Management Safety and Health Committee; the Environmental Management Office, including the Radiation Safety Committee and the Environmental Pollution Control Board.

The responsibilities and authorities of the Glenn Safety Organization are described in subsequent paragraphs.

1.2.2 Applicability

The Glenn Safety Organization directives apply to the Cleveland Center and the Plum Brook Station.

1.2.3 Authority

The authority for this organization comes from the "NASA Basic Safety Manual," NHB 1700.1, Vol. 1 B, and the "NASA Safety and Health Handbook," NHB 2710.1.

1.2.4 Objectives

The Glenn Safety Organization is structured to:

- a. Ensure a safe work environment for conducting Glenn operations
- b. Avoid loss of life, injury of personnel, damage to or loss of property, and disruption of operations
- c. Ensure that an organized and systematic approach is used to identify and control potential safety hazards
- d. Obtain thorough and timely safety reviews and approvals for all technical operations at Glenn
- e. Instill safety awareness in all Glenn employees
- f. Provide specialized technical knowledge essential to continuing safety maintenance on a Center-wide basis

1.2.5 Executive Safety Board

The ESB serves as the Center's safety policy and decisions making board and is responsible for the overall direction of the Glenn Safety Program. The ESB reports to the Center Director and is responsible for ensuring that all aspects of safety at Glenn are properly addressed and that the objectives of the program are met. The Center Deputy Director or his/her appointee serves as chairman of the ESB.

Authority

The ESB has authority over all operations at Cleveland and the Plum Brook Station. This includes stopping and forbidding any operation about which is a safety concern, until an appropriate review and determination can be made. Exercise of this authority requires immediate notification to the chairman of the ESB. The ESB has the authority to overrule any subordinate Glenn Safety Organization element except where the Nuclear Regulatory Commission requirements are involved.

Responsibilities

- a. Advise the Director on safety policy and organizational requirements.
- b. Establish the criteria to be used by the Glenn Safety Organization for the management of risk at the Center. Safety issues related to Research and Center Operations will be addressed by assessing the risk associated with the particular operations, determine the potential of loss related to the risk, possible actions to be taken to reduce the potential loss acceptance of risk by the management of the Center (ESB).
- c. Review and approve proposed management issuance on safety.
- d. Take necessary action on safety problems not covered by existing documentation or precedent.

- e. Establish a system of safety committees, advisory panels, and investigating committees to conduct detailed third-party reviews of specified Glenn Operations and take necessary action to ensure safe operations.
- f. Oversee and monitor the activities of the committees and panels comprising the Glenn Safety Organization to ensure that they are appropriately staffed and operating.
- g. Report to the Center Director at least annually, providing a summary of principal activities of the Glenn Safety Organization that includes an evaluation of its accomplishments and progress and an identification of problems or other matters requiring the attention of Glenn Management.
- h. Meet at the call of the Chairman.

1.2.6 Glenn Safety Office

The primary function of the Chief of the Safety Office is to implement, manage, and coordinate the Glenn Safety Program through his/her staff. The Chief of GSO reports on the overall Glenn Safety Program to the Executive Safety Board. The Staff supporting the GSO Chief shall provide competent engineering judgment and analysis in executing safety policy and responsibility.

Responsibilities

- a. Implement safety policies formulated by the Executive Safety Board (ESB) and perform those safety functions required by this Manual and other applicable regulations and directives
- b. Manage, implement, coordinate, and review the Glenn Safety Permit program
- c. Serve as consultant on safety matters to Glenn senior staff and management
- d. Assist the Glenn Procurement Officer in determining the adequacy of contractor safety programs and approve the content and the scope of the programs
- e. Maintain the Glenn Safety Manual and ensure that drafts of all proposed chapters for the Manual are distributed to the members of the ESB and to the chairmen of cognizant safety committees and advisory panels, for review before publication
- f. Ensure that all material to be included in the Glenn Safety Manual has received prior written approval of the ESB, as appropriate
- g. Serve as the executive secretary to the ESB and as an ex-officio member of all safety committees and those investigating committees and advisory panels associated with the ESB.
- h. Implement safety policies and perform those safety functions required by this Manual and other applicable regulations and directives
- i. Administer the expiration notification process for the Glenn Safety Permit program
- j. Maintain a safety information library containing codes, manuals, handbooks, the hazards inventory, information files, records, and references
- k. Monitor, through safety staff, contractor activities onsite to ensure compliance with all applicable safety standards and regulations

- l. Keep illness and injury records in accordance with OSHA regulations and prepare quarterly and annual reports to the Department of Labor and other relevant government agencies
- m. Manage, and coordinate emergency responses to Center accidents and mishaps

Authority

The Chief of the GSO has the authority to terminate any operation of questionable safety until an appropriate review and determination can be made. Exercise of this authority requires immediate notification to both the chairman of the ESB and the chairman of the Area Safety Committee involved

1.2.7 Aviation Safety Officer

The Glenn general safety program concerned with airworthiness and flight safety is implemented by the Aviation Safety Officer (ASO). This officer participates with the designated Area Safety Committee in the review of Safety Permit Requests for proposed operations involving flight research and program support aircraft assigned to Glenn. The ASO also serves as an ex-officio member of the Area Safety Committee.

Responsibilities

- a. Review and evaluate proposed modifications to Glenn aircraft and the aircraft assigned to support Glenn programs, and review and evaluate operating procedures, performance requirements, and restrictions for missions on these aircraft

NOTE: The term "modification" refers to any alteration, addition, or removal of aircraft structure, components, equipment, or instrumentation, including equipment or instrumentation used for research purposes. The term "mission" refers to any flight of Glenn aircraft or aircraft assigned to support Glenn programs.

- b. Provide technical guidance on safety aspects of flight programs
- c. Maintain surveillance of aviation activities for conformance with prescribed directives, standards, procedures, and Safety Permit (NASA Form C-919) restrictions, and initiate corrective action when required
- d. Review aviation training and assess personnel qualifications to ensure safety of operations
- e. Review and approve Flight Work Order forms (NASA Form C-500) as required
- f. Report to the ESB at designated meetings

Authority

In addition to the authority necessary to implement assigned responsibilities, the ASO has the authority to shut down any operation or activity on which there is a question of

aircraft flight safety, until an appropriate technical review can be conducted. Exercise of this authority requires immediate notification to the chairman of the ESB, the chairman of the Aviation Safety Committee, and the Chief of the SO. The ASO, should the need arise; also has unrestricted access to the Center Director on matters of flight safety.

1.2.8 Aviation Safety Committee

The Aviation Safety Committee reviews research operations, R&D modifications and experiments placed on Glenn aircraft. The Committee is the sole authority for issuing aircraft/flight experiment Safety Permits. The Committee also ensures that the proposed design or installation is consistent with the dictates of sound engineering practices and acceptable health and safety standards.

The Aviation Safety Committee will have a minimum composition of six members who have extensive experience in their field of expertise.

- a. Chairperson
- b. Electrical Engineer
- c. Mechanical Engineer
- d. Fluid System Engineer
- e. Laser Safety Officer (as required)
- f. Glenn Safety Office representative
- g. Aviation Safety Officer (ex-officio)

Responsibilities

- a. Review proposals for research flight activities involving R&D modification to aircraft and for any projects that may affect safety within the Aviation Safety Committee's area including hangar and facilities.
- b. Approve permits for those experiments or programs that meet Glenn safety requirements.
- c. Maintain technical surveillance and remain cognizant of activities involving aircraft operations and hangar activities.
- d. Obtain comments and advice from the Aviation Safety Officer, the Airworthiness Review Panel, the Glenn Safety Office and the Environmental Management Office concerning matters that may affect the Aviation Safety Program.
- e. Ensure that activities presenting significant risk to persons or property have a formal readiness review by senior management (Directorate Level) prior to issuing a Safety Permit.
- f. Submit to the ESB significant concerns or unresolved questions regarding the granting of permits and the assessment of major risk.
- g. Report findings or concerns through the committee chairman, to the ESB at designated meetings or sooner if necessary.
- h. The Chairman is responsible for approval of Safety Permit Requests. He also may approve changes or modifications to an existing Safety permit of Flight Test Plan if there is no safety impact to the experiment, program or operation.

Authority

In addition to the authority necessary to implement assigned responsibilities, the Aviation Safety Committee has the authority to shut down any operation or activity on which there is a question of aircraft flight safety, until an appropriate technical review can be conducted. Exercise of this authority requires immediate notification to the chairman of the ESB, the Aviation Safety Officer and the Chief of the GSO.

1.2.9 Airworthiness Review Panel

Members of the Airworthiness Review Panel are nominated by the Chairman of the Aviation Safety Committee and appointed by the Executive Safety Board. This Panel can be activated in order to bring expertise in specific disciplines to the safety process and to assure management that an independent review team can be called upon, should the need arise, as determined by the Chairman of the Aviation Safety Committee. The ARP reports their findings to the Aviation Safety Committee and can be used to assess the impact of:

- a. R&D modifications to Glenn operated aircraft.
- b. Installation of research hardware
- c. Changes to the flight envelope or aircraft limitations
- d. Operational procedures
- e. Mission profiles of these aircraft.

The Airworthiness Review Panel reports their findings to the Aviation Safety Committee.

1.2.10 Process Systems Safety Committee

The Process Systems Safety Committee (PSSC) ensures that the central service systems of the Center are designed to, and in fact do, operate in a safe manner. Central service systems include the systems and equipment for conveying, supplying, generating, removing, distributing, or processing liquids and gases and the prime machinery for each process system leading to and terminating at the test cell or an area of a research setup.

NOTE: The following systems are specifically included: central air and exhaust systems, fire and domestic water systems, carbon dioxide systems, steam systems, natural gas systems, heating plants, cooling tower water systems, cooling towers, wet and dry coolers, industrial waste basins and the lines leading to them, general purpose and mobile cryogenic equipment, pressure vessels and related systems, and the Engine Component Research Laboratory underground fuel storage and distribution system.

Responsibilities

In order to ensure the safe operation of the central service systems of the Center, the Process Systems Safety Committee has been charged with the following specific responsibilities:

- a. Establish acceptable safety standards and review specific proposals for modifications or additions to facilities, equipment, or operations involving process systems
- b. Oversee application of NHB 1700.6, "Guide for In-service Inspection of Ground-Based Pressure Vessels and Systems"
- c. Approve and issue the Safety Permit for those proposals that meet Glenn safety requirements
- d. Supply the cognizant Area Safety Committee chairman with copies of the Safety Permits issued by the PSSC, calling attention to approved modes or levels of operation of the central systems so that Area Safety Committees do not approve research operations exceeding authorized bounds (Conversely, Area Safety Committees and Safety Permit requesters are expected to notify the PSSC of activities that are likely to affect the process systems.)
- e. Recommend, subject to the review and approval of the Executive Safety Board (ESB), minimum acceptable safety standards within the scope of the functions set forth in Section 1.2.8
- f. Advise Area Safety Committees and other organizational elements, upon request, about the safety aspects of specific proposals involving process systems
- g. Maintain technical surveillance of and keep informed of current activities in assigned area of responsibility, to anticipate problems and minimize safety-related conflicts between organizational elements
- h. Submit to the ESB significant concerns or unresolved questions regarding the granting of permits and the assessment of major risks
- i. Report, through the Committee chairman, to the ESB at its designated meetings

Authority

In addition to the authority necessary to implement the Committee's assigned responsibilities, the chairman of the Process Systems Safety Committee has the authority to shut down any operation or activity on which there is a question of process systems safety, until an appropriate technical review can be conducted. Exercise of this authority requires immediate notification to the chairman of the ESB, the chairman of the Area Safety Committee concerned, and the Chief of the GSO.

1.2.11 Electrical Applications Safety Committee

The Electrical Applications Safety Committee reviews all major electrical power systems leading to facility test cells or research setups and issues the Safety Permit to cover activities that cross safety area boundaries.

The prime safety responsibility of the Committee is the high voltage systems, including all substations, power transformers, and switchgear rated above 600 volts.

For systems rated at 600 volts or less that lead to facility test cells or research setups, the power system interface is at the main distribution panels. The Committee is charged by GSO with reviewing novel electrical applications. It provides copies of its Safety Permit forms to cognizant Area Safety Committees and ensures that Area Safety Committees do not approve research operations exceeding authorized bounds.

As with the Process Systems Safety Committee (see Sec. 1.2.8), Area Safety Committees and originators of a Safety Permit Request are expected to notify the Electrical Applications Safety Committee when proposals are likely to impact the safety of electrical power systems.

Responsibilities

Specific responsibilities of the Electrical Applications Safety Committee are to:

- a. Review specific proposals for the design, construction, alteration, or removal of electrical power systems rated above 600 volts or special electrical applications, and approve and issue a Safety Permit for those proposals that meet Glenn safety requirements
- b. Recommend, subject to review and approval of the ESB, minimum acceptable safety standards within the scope of the functions set forth in Section 1.2.9
- c. Advise Area Safety Committees, the Process Systems Safety Committee, and other organizational elements, upon request, about the safety aspects of specific proposals involving electrical applications
- d. Maintain technical surveillance of and keep informed of activities in assigned area of responsibility, to anticipate problems and minimize safety-related conflicts between organizational elements
- e. Submit to the ESB significant concerns or unresolved questions regarding the granting of permits and the assessment of major risk
- f. Report, through the Committee chairman, to the ESB at its designated meetings

Authority

In addition to the authority necessary to implement the Committee's assigned responsibilities, the chairman of the Electrical Applications Safety Committee has the authority to shut down any operation or activity on which there is a question of electrical power systems safety, until an appropriate technical review can be conducted. Exercise of this authority requires immediate notification to the chairman of the ESB, the chairman of the Area Safety Committee concerned, and the Chief of the SO.

1.2.12 Plum Brook Reactor Facility Safety Committee

The Plum Brook Reactor Facility Safety Committee ensures compliance with the Nuclear Regulatory Commission (NRC) licenses for the Plum Brook Reactor Facility (PBRF) and the Mockup Reactor contained within the PBRF. The current licenses are in effect until the reactor is decommissioned. The decommissioning process is scheduled to be completed by 2007.

The PBRF Safety Committee reviews all matters with safety implications, to ensure that plans, technical specifications, safety analyses, the radiator safety program, and written procedures provide protection to the worker, the facility, and the environment. In addition, it ensures that activities authorized under the license are conducted without endangering the health and safety of the public. The Committee concerns itself with radiation safety, industrial hygiene, and industrial safety; minimizing public and employee radiation exposure is a prime consideration. The Committee consists of four or more members, at least one of which shall have a nuclear background and one a familiarity with the conditions of the facility. The Radiation Safety Officer shall also be a member.

Responsibilities

The Plum Brook Reactor Facility Safety Committee responsibilities are to:

- a. Approve new and revised PBRF procedures and facility changes that have safety implications, thereby ensuring that such procedures and changes are safe and consistent with NRC licenses and regulations
- b. Review any license change request prior to submitting it to the NRC
- c. Conduct periodic reviews and inspections of activities and records, to determine if the radiation controls and other safety controls required at the PBRF are being met
- d. Review and approve corrective actions that are proposed to preclude repetition of incidents, malfunctions, and personnel errors affecting facility safety
- e. Maintain technical surveillance of and keep informed of current activities at the PBRF, to anticipate safety-related problems
- f. Approve the method to control and maintain inventories of radioactive materials procured and disposed of
- g. Provide review, surveillance, and guidance as directed by the charter of the Committee
- h. Submit to the ESB significant concerns or unresolved questions regarding the granting of permits and the assessment of major risks
- i. Report, through the Committee chairman, to the ESB at its designated meetings

Authority

In addition to the authority necessary to implement the Committee's assigned responsibilities, the chairman of the Plum Brook Reactor Facility Safety Committee has

the authority to shut down any operation or activity on which there is a question of safety, until an appropriate technical review can be made. Exercise of this authority requires immediate notification to the chairman of the ESB and the Chief of the GSO.

1.2.13 Laser Safety Committees

The Laser Safety Committee conducts third- party reviews for all operations that use lasers at the Center. The committee ensures that all proposed installations and operations are consistent with the dictates of sound engineering judgment and acceptable health and safety standards.

Responsibilities

Laser Safety Committee responsibilities are to:

- a. Review specific proposals for all research operations that will require the use of lasers as a stand-alone unit or as part of another permitted operation. Approve and issue permits for those activities proposals that meet Glenn safety requirements.
- b. Maintain technical surveillance of and keep informed of current activities of laser operations in order to anticipate problems and minimize safety-related conflicts between organizational elements
- c. Obtain comments and advice from advisory panels, the Glenn Safety Office, and the Environmental Management Office concerning matters that fall within the area of laser operations.
- d. Make periodic surveys (at least annually) of all lasers and report results thereof to the Chief of the EMO.
- e. Ensure that activities presenting significant risk to persons or property have a formal readiness review by the requester's line management prior to issuing a Safety Permit
- f. Submit to the ESB significant concerns or unresolved questions regarding the granting of permits and the assessment of major risks
- g. Report, through the Committee chair, to the ESB at designated meetings

Authority

In addition to the authority necessary to implement the Committee's assigned responsibilities, the chairman of the Laser Safety Committee has the authority to shut down any operation or activity in the assigned area on which there is a question of safety, until an appropriate technical review can be made. Exercise of this authority requires immediate notification to the chairman of the ESB and the Chief of the GSO.

1.2.14 Area Safety Committees

The Area Safety Committees conduct third-party reviews of all proposed installations and operations in their assigned areas to ensure that the proposed design and/or operation is

consistent with the dictates of sound engineering judgment and acceptable health and safety standards.

Responsibilities

Area Safety Committee responsibilities are to:

- a. Review specific proposals for all research operations, for modifications or additions to facilities and equipment, or for any project that may affect safety within the assigned safety areas
- b. Approve and issue permits for those proposals that meet Glenn safety requirements.
- c. Maintain technical surveillance of and keep informed of current activities in assigned area of responsibility to anticipate problems and minimize safety-related conflicts between organizational elements
- d. Recommend, subject to the review and approval of the ESB, minimum acceptable safety standards within the scope of the functions set forth in Section 1.2.5
- e. Obtain comments and advice from advisory panels, the Glenn Safety Office, and the Environmental Management Office concerning matters that fall within their areas of specialization
- f. Make periodic surveys (at least annually) of plant and research operations within assigned areas and report results thereof to the Chief of the GSO
- g. Ensure that activities presenting significant risk to persons or property have a formal readiness review by the requester's line management prior to issuing a Safety Permit
- h. Submit to the ESB significant concerns or unresolved questions regarding the granting of permits and the assessment of major risks
- i. Report, through the Committee chairman, to the ESB at designated meetings

Authority

In addition to the authority necessary to implement the Committee's assigned responsibilities, the chairman of each Area Safety Committee has the authority to shut down any operation or activity in the assigned area on which there is a question of safety, until an appropriate technical review can be made. Exercise of this authority requires immediate notification to the chairman of the ESB and the Chief of the GSO.

1.2.15 Labor Management Safety and Health Committee

The Labor Management Safety and Health Committee's function is to provide a forum for GRC labor and safety and health management to discuss potential problem areas. The Committee will ensure appropriate resolution of problems.

Responsibilities

- a. The Committee will meet quarterly to address and discuss safety and health issue affecting the employees at GRC.
- b. The Safety Office, the Environmental Management Office and the Office of Occupational Medicine will provide technical support in assessing issues and concerns, and developing corrective action plans or programs.
- c. These plans and/or programs will be discussed within the Committee.
- d. Once a consensus is reached, the Committee will forward the plan/program to the ESB for approval.

Authority

In addition to the authority necessary to implement the Committee's assigned responsibilities, the chairman of the Committee has the authority to shut down any operation or activity, which there is a question of safety, until an appropriate technical review can be made. Exercise of this authority requires immediate notification to the chairman of the ESB and the Chief of the GSO.

1.2.16 Occupational Medical Services

For the protection of employees Glenn maintains a comprehensive occupational medicine program under the direction of the Glenn Medical Director. Services provided under the program include investigation of the medical aspects of personal injury cases, medical diagnosis and treatment of occupational injuries, first aid, a physical fitness program, and the Health Screening Clinic. The responsibilities of the Occupational Medical Services are described in Section 1.4, Glenn Occupational Medicine Program.

1.2.17 Environmental Management Office (EMO)

EMO is responsible for the recognition, measurement, and recommended control of hazardous factors in the work environment that can cause illness, disease, or impaired well-being. EMO serves as consultant to the Glenn staff on matters of environmental quality, industrial hygiene, and health physics (including radiation safety). The responsibilities of EMO are described in Section 1.3.8.

1.3 GLENN ENVIRONMENTAL QUALITY ORGANIZATION

1.3.1 Scope

The Glenn Environmental Quality Organization includes the Environmental Pollution Control Board (EPCB), the Occupational Medical Services, EMO, and the Radiation Safety Committee (RSC).

The responsibilities and authority of the Environmental Quality Organization are described in the following paragraphs.

1.3.2 Applicability

The provisions listed herein are applicable to the Cleveland Center and the Plum Brook Station.

1.3.3 Authority

The authority of the Glenn Environmental Quality Organization comes from NHB 8800.11, "Implementing the Provisions of the National Environmental Policy Act"; "The Occupational Safety and Health Act (1970)," Section 19;

Executive Order 11514, "Protection and Enhancement of Environmental Quality"; Executive Order 12196, "Occupational Safety and Health Programs for Federal Employees"; Executive Order 12088, "Federal Compliance with Pollution Control Standards"; Executive Order 11752, "Prevention, Control, and Abatement of Environmental Pollution at Federal Facilities"; and the

"NASA Basic Safety Manual," NHB 1700.1 (Vol. 1 B).

1.3.4 Objectives

The Glenn Environmental Quality Organization is structured to:

- a. Instill environmental awareness in all Glenn employees
- b. Provide specialized technical knowledge essential to continuing protection and enhancement of environmental quality on a Center-wide basis
- c. Maintain control over potential environmental hazards, consistent with pertinent environmental standards and guidelines and sound engineering and operating practices
- d. Provide Glenn management with a centralized source of information on matters of environmental quality and control

1.3.5 Policy

It is Glenn policy to operate in a manner that provides a safe and healthful workplace for employees; that complies with all laws and regulations pertaining to health and the environment; and that protects and enhances the surrounding community and the environment, consistent with the mission of the Center.

Responsibility for implementing this policy lies with line management and all employees. The Environmental Quality Organization is responsible for providing guidance and oversight of implementation and for making periodic reports to regulatory agencies and others. Line management must ensure that operations under its control are operated

consistent with these instructions and guidance from the Environmental Quality Organization.

1.3.6 Environmental Pollution Control Board

The Glenn Environmental Pollution Control Board serves as the Center environmental policy- and decision- making board. It is responsible for the overall direction of the Glenn Environmental Quality Organization. The Board is responsible for assuring the Center Director that all aspects of environmental quality are properly addressed and that program objectives are met.

Responsibilities

Specific responsibilities of the Board are to:

- a. Recommend, to the Center Director, policies and practices for improvement in environmental health
- b. Provide environmental policy and direction to the Chief of the Environmental Management Office
- c. Coordinate with the Glenn Safety Organization to ensure third-party functional review of all Glenn R&D activities
- d. Serve as an appeal channel on unresolved questions pertaining to the environmental sensitivity of Glenn operations, and review, evaluate, and resolve any disputes
- e. Review existing or potential environmental problems and submit to the Center Director, along with the Board's evaluation and recommendations, any disputes that warrant the Director's attention and decision
- f. Develop systematic procedures to ensure a timely transfer of information and an understanding of programs affecting the environment, taking alternative courses of action into consideration
- g. Ensure that information about existing or potential environmental problems is made available to all appropriate levels of Glenn management
- h. Review NASA regulations, policies, and procedures relating to environmental pollution control and inform the Center Director of any Glenn operational deficiencies or inconsistencies therewith
- i. Review environmental impact assessments and statements related to Glenn operations; transmit assessments or statements with applicable recommendations to the cognizant NASA Headquarters organization
- j. Exchange pollution control data and research results with other Governmental agencies
- k. Meet quarterly, or as otherwise necessary, and submit to the Director a written report of the results of the meetings

Authority

In addition to the authority necessary to ensure performance of its stated responsibilities, the Environmental Pollution Control Board, or any member thereof, has the authority to close down any operation having a serious negative impact on the environment, until an appropriate review and assessment can be made. Exercise of this authority requires immediate notification to the chairman of the Environmental Pollution Control Board, the Chief of the Office of Environmental Programs, the chairman of the Area Safety Committee having jurisdiction in the area involved, and the chairman of the Executive Safety Board.

1.3.7 Occupational Medical Services

For the protection of employees, Glenn maintains a comprehensive occupational health program under the direction of the Glenn Medical Officer. This program provides investigation of the medical aspects of personal injury cases, medical diagnosis and treatment of occupational injuries, a physical fitness program, health screening clinic, and first aid. The Glenn Medical Officer serves as a member of the Environmental Pollution Control Board. The responsibilities of the Occupational Medical Services are described in LMI 1800.1, as revised, "Glenn Occupational Medicine Program," and Section 1.4.5 herein.

1.3.8 Environmental Management Office (EMO)

EMO is responsible for recognizing, measuring, and recommending control of hazards in the work environment that can cause illness, disease, or impaired well-being. The EMO serves as a consultant to the Glenn staff on matters of environmental quality, industrial hygiene, and health physics, and ensures compliance in these areas.

The responsibilities of the EMO are to:

- a. Implement policies formulated by the Environmental Pollution Control Board
- b. Maintain appropriate handbooks, information files, and references, and serve as consultant on environmental quality, industrial hygiene, and radiation safety matters to the Glenn staff
- c. Assist the Glenn Procurement Officer in reviewing the environmental quality programs of contractors
- d. Make surveys of work areas on a periodic basis, collect samples associated with potentially toxic or other environmental hazards, and coordinate these efforts with cognizant personnel in the required technical specialties
- e. Advise Area Safety Committees (1) on the pollution control aspects of specific proposals to install, remove, or alter waterborne waste disposal facilities or air pollution control equipment in their areas; and (2) on the industrial hygiene aspects of specific proposals to install, remove, or alter systems, equipment, or operations

- f. Review requests for a Safety Permit to determine whether such requests concern matters under the cognizance of the Office, and when necessary, coordinate with Area Safety Committees in third-party reviews of proposed activities
- g. Review the precautions taken by operating officials with respect to controlling the acquisition of unusually toxic or radioactive materials; supervising the distribution, use, accountability, and disposal of toxic or radioactive materials; disposing of waterborne wastes through the various Glenn sewer systems; discharging exhaust, vent, or waste gases into the atmosphere; and monitoring systems designed to safeguard the health of persons associated with sources of pollution or exposed to toxic materials
- h. Evaluate these precautions, report to the Environmental Pollution Control Board on their effectiveness, and recommend changes if necessary
- i. Recommend, subject to review and approval by the Environmental Pollution Control Board, minimum acceptable environmental quality standards for operations involving toxic and noxious materials and pollution sources
- j. Request special experiments and investigations to delineate potential environmental hazards and evaluate the proposed methods of their control
- k. Verify compliance throughout Glenn with all pertinent regulations applicable to the prevention, control, and abatement of air and water pollution
- l. Keep abreast of developments and requirements in the fields of industrial hygiene, air and water pollution control, and health physics
- m. Review each Purchase Request for chemicals and hazardous materials, evaluate the hazard potential for each commodity, obtain copies of the Material Safety Data Sheet for hazardous materials, and distribute copies to interested persons
- n. Fulfill additional responsibilities pertaining to the Glenn Occupational Medicine Program described in LMI 1800.1
- o. Report to the Environmental Pollution Control Board at its regularly scheduled meetings. The Chief of the Environmental Management Office serves as the executive secretary to the Environmental Pollution Control Board and as the chairman of the Radiation Safety Committee.

Authority

The Chief of the Environmental Management Office is authorized to shut down any operation on which there is a question of health hazard or on which there is a source of contamination that exceeds established air and water pollution control limits, pending an appropriate review. Exercise of this authority requires immediate notification to the chairman of the Environmental Pollution Control Board, the chairman of the Area Safety Committee involved, and the chairman of the Executive Safety Board.

1.3.9 Radiation Safety Committee

The Radiation Safety Committee provides advice, technical expertise, and guidance to minimize and/or eliminate health hazards associated with using, transporting, storing, and handling radioactive materials and sources of ionizing radiation. The Committee was established under the broad nuclear byproduct material license for the Cleveland Center

to review the associated radiation program and to verify compliance with Nuclear Regulatory Commission regulations.

Responsibilities - The Radiation Safety Committee responsibilities are to:

- a. Review quarterly, or at more frequent intervals as directed by the Environmental Pollution Control Board, the precautions taken by operating officials with respect to regulating the acquisition of radioactive sources, materials, and equipment; and controlling the distribution, use, accountability, and disposal of radioactive materials and equipment
- b. Evaluate these precautions and their effectiveness, and report to the Environmental Pollution Control Board, recommending changes or improvements considered appropriate
- c. Recommend, subject to review and approval by the Environmental Pollution Control Board, minimum acceptable environmental quality standards for operations involving radioactivity
- d. Advise Area Safety Committees about ionizing radiation safety aspects of specific proposals to install, remove, or alter radioactive sources, materials, equipment, or operations
- e. Review each Safety Permit request referred by the Environmental Management Office
- f. Keep abreast of developments in and requirements for radiation safety
- g. Request special experiments and investigations when such activities are consistent with Glenn environmental quality objectives and policies
- h. Report to the Environmental Pollution Control Board at its regularly scheduled meetings

Authority

The chairman of the Radiation Safety Committee is authorized to shut down any operation on which there is a question of radiation safety, until an appropriate review can be made. Exercise of this authority requires immediate notification to the chairman of the Environmental Pollution Control Board, the chairman of the Area Safety Committee involved, and the chairman of the Executive Safety Board.

NOTE: Because of Nuclear Regulatory Commission requirements, the Radiation Safety Committee will not be overruled on decisions that reject experiments, facility modifications, or operating procedures on the basis of NRC safety requirements.

1.4 GLENN OCCUPATIONAL MEDICINE PROGRAM

1.4.1 Scope

The Glenn Occupational Medicine Program, administered by the Occupational Medical Services, is a comprehensive health and safety management program that includes all aspects of health protection for Glenn employees. In order to provide continuity within

these health and safety functions, the Glenn Medical Director is a consultant/ advisor to the Executive Safety Board and the Environmental Pollution Control Board. The Glenn Occupational Medicine Program practices such preventive medicine techniques as appropriate physical examinations and appraisal of health hazards in the work environment, along with emergency care, and diagnosis and treatment of occupational diseases and injuries.

1.4.2 Authority

The authority for the Glenn Occupational Medicine Program comes from Public Law 89 554, "Government Organization and Employees," Public Law 90 83,

"Federal Employees Pay and Allowances, Etc.," and Public Law 91 596, "Occupational Safety and Health Act, 1970"; Executive Order 12196,

"Occupational Safety and Health Programs for Federal Employees"; NHB 2710.1, "NASA Safety and Health Handbook, Occupational Safety and Health Programs"; and NMI 3792.1, "NASA Employee Assistance Program."

1.4.3 Applicability

These instructions apply to all Glenn organizational elements.

1.4.4 Policy

The Glenn Occupational Medicine Program is to be used to maintain, conserve, and improve the health of Glenn employees and to evaluate any physical, chemical, or bacteriological hazards that may be present in the employee's work environment.

Nothing in this section is to be construed as running counter to or establishing standards less comprehensive than those set forth in local, state, and Federal health regulations.

1.4.5 Responsibilities

Glenn Executive Safety Board and Environmental Pollution Control Board. These Boards are responsible for monitoring the Glenn Occupational Medicine Program, which is coordinated and implemented by them and the following Glenn health and safety groups: the Occupational Medical Services; the Environmental Management Office; the Safety Office; the Radiation Safety Committee; and the cognizant Area Safety Committee.

Glenn Medical Director - Through the Director of the Office of Health Services, the Medical Director

- a. Provides professional services for examining, diagnosing, and treating employee illness or injury and maintains records needed in the operation of the program

- b. Furnishes medical information to and assists the Glenn Human Resources Management Division, as required, in resolving questions about the placement and utilization of employees
- c. Consults with appropriate supervisors regarding employees who, in the judgment of a physician, may be allowed to work only if limitations on their physical activity are observed. (This applies also to new employees with physical handicaps and to employees returning to work after an illness or injury. The judgment of the employee's physician is given full consideration in such situations.)
- d. Keeps the Center Director informed, through the Chief of the Safety Office, of all cases of significant accidental injury to personnel, especially about the diagnosis, nature, and extent of injuries. This is done by direct and timely oral communication and includes subsequent follow-up medical reports. The severity of injuries (first aid, reportable, or lost time) is classified in accordance with Occupational Safety and Health Administration (OSHA) recordkeeping requirements.
- e. Ensures that kitchens and cafeterias are periodically inspected for conformance with local, state, and Federal health regulations
- f. Approves, prior to installation or introduction into the work area, such items as footpaths, first aid kits, salt tablets, air fresheners, and so forth
- g. Establishes procedures in conjunction with local medical facilities for emergency referral and treatment of injuries and illnesses
- h. Serves as Medical Review Official for the Glenn Drug-Free Workplace Program
- i. Serves as consultant to the Environmental Pollution Control Board
- j. Administers the Health Screening Program
- k. Administers the Physical Fitness Program

The Chief of the Environmental Management Office

- a. Coordinates with the Glenn Medical Director to provide professional services, and maintains the records necessary for operating the environmental health programs
- b. Provides advice on and criteria for environmental systems, shielding and absorption materials, sanitation provisions, illumination standards, noise, dust, ionizing and non-ionizing radiation, vibration, temperature-humidity standards, air- and water-pollution controls, and exposure to toxic substances and biological agents
- c. Maintains a work area surveillance program that includes collecting and analyzing samples associated with potentially toxic hazards; performs periodic and special surveys of the physical environment for noise, dust, vibration, radiation, and such
- d. Develops or obtains environmental health and safety facilities and monitoring equipment commensurate with program needs
- e. Provides technical support as required by the Occupational Medical Services
- f. Recommends medical monitoring of certain Glenn personnel after reviewing Safety Permit Requests, Purchase Requests, and in-field monitoring and inspection activities. (Medical monitoring may include periodic physical

examinations and/or laboratory analyses as appropriate to the potential hazard exposure of each employee.)

The Chief of the Glenn Safety Office:

- a. Coordinates with the Glenn Medical Director to provide professional services and maintains records necessary for the operation of the safety programs
- b. Monitors illness and injury records in accordance with OSHA regulations
- c. Provides quarterly and annual reports to the Department of Labor

First-line supervisor - It is the responsibility of the first-line supervisor to discuss with employees under his or her jurisdiction the potential exposures and health hazards in their work assignments and to make arrangements to monitor those who are exposed to potential environmental hazards. The supervisor also semiannually reviews the changes in work assignments and facilities that influence the health monitoring program. The names of employees with potential hazard exposure are forwarded to the cognizant division office along with the identity of the material or condition of concern. The division chief collects and forwards these names to the Environmental Management Office for forwarding to the Medical Director

Employees - It the responsibility of all employees to maintain high standards of personal hygiene, health, and physical fitness and to notify their first-line supervisor of potential exposures to environmental health hazards in their work assignments.

1.4.6 Program Elements

Procedures for service-connected medical conditions and emergencies. There are procedures in place for the following conditions:

Illness or injury - When any illness, service-connected injury, or health emergency occurs during work hours, the employee notifies his or her supervisor, if possible, and immediately reports to Medical Services. If a service-connected illness becomes apparent during off-duty hours, the employee notifies his or her supervisor and Medical Services within 24 hours unless the incident occurs during a weekend or similar off-duty period, in which case notification is made at the start of the next workday. If the employee is treated by his or her personal physician for a work-related condition during off-duty hours, this fact must be reported. First-line supervisors are to inform all personnel under their jurisdiction of these requirements.

Accidental spill or exposure - If an accidental spill of hazardous substance or exposure to a hazardous material or condition occurs, the employee concerned immediately notifies Medical Services of the incident and then notifies his or her supervisor of the incident, even if no injury is apparent.

First aid - Selected personnel are trained and properly equipped to render first-aid treatment on all shifts in critical areas of operation at the Center.

Health examinations - Health examinations are offered as follows:

- a. Special health examinations are conducted for some replacement employees, and periodic reexaminations are required for certain jobs. Such periodic examinations are required for special vehicle operators, crane operators, pilots, and employees in critical occupations where job performance could affect the health or safety of other Glenn employees.
- b. A medical monitoring program has been established for the protection of the health and safety of employees exposed to a potentially hazardous environment in a regular work assignment. First-line supervisors must notify Medical Services whenever there is a change in the potential exposure of any of their employees to hazardous substances or conditions.
- c. Each employee may take advantage of a complete physical examination once every 3 years and partial examinations in the intervening years.

Emergency services - Ill or seriously injured personnel at the Center are transported to Medical Services by emergency vehicle unless otherwise instructed by that office. Emergency transportation at the Plum Brook Station is to the appropriate local medical facilities or hospital.

Emergency vehicle service - Emergency vehicle service may be obtained by dialing 911 at the Cleveland Center or Plum Brook Station and stating the location of the patient and the nature of the injury or illness, if known. The individual making the call should ensure that someone is at an appropriate place to direct emergency vehicle attendants to the patient. Details of the Glenn Emergency Call System are given in the Glenn Safety Manual, Chapter 21, Mishap Reporting and Accident Investigation. Emergency treatment: Medical Services provides emergency treatment to employees to the extent feasible within the capability of available staff and facilities. If the treatment required is outside the scope of available staff or facilities, the employee is provided transportation to suitable external medical facilities. Upon return from treatment at such external medical facilities, the employee is to report to Medical Services.

Contractor emergency care - Contractor employees may receive medical care from Medical Services for such emergency services as control of bleeding, application of dressings or splints, treatment and evaluation of potentially life-threatening injuries or illness, or alleviation of pain and suffering prior to being transported to a medical facility off the Center. The ambulance service responds to contractor injuries and illnesses when necessary, and it may transport contractor employees to the hospital if the Glenn Medical Officer, a Glenn nurse, or the ambulance squad leader judges it appropriate.

Therapeutic service - Therapeutic service is a normal dispensary function available from Medical Services for the treatment of nonemergency occupational and nonoccupational injuries and illnesses. Many of these services, including follow-up on emergency treatment, are rendered by nurses under the supervision of a physician.

The scope of the program does not permit extensive treatment of nonoccupational injury or illness; this is the province of the employee's private physician. However, in the interest of keeping the employee on the job, reducing lost time, or relieving suffering, employees may be afforded care for minor medical-office-type illnesses or injuries.

At the written request of an employee's private physician and under his or her prescription and with the concurrence of the Glenn Medical Director, Medical Services administers medicines, changes dressings, and provides available therapy in the interest of keeping the employee on the job and saving the time he or she might spend in seeking treatment at his or her personal physician's office.

Medical release - Following any illness or injury that results in an absence from work of 10 or more consecutive work days, the employee must obtain a medical release from his or her physician or hospital, as applicable, and report to Medical Services prior to returning to his or her duty station.

This requirement is established to safeguard employees and to determine their fitness to return to duty. This requirement applies to Exchange employees as well as to other NASA employees. If there is any question about the advisability of returning to work, the lack of a physician's written medical release precludes the employee from returning to work until such permission is obtained.

Preventive services - Annually, Glenn civil service employees are offered an extensive physical examination. Employees are contacted automatically around the time of their birthdays to set up appointments; no independent action on the part of the employee is required. Employees are also encouraged to take advantage of other preventive services offered, such as health education programs on topics important to employee health, and the immunization service for overseas travelers.

Review and modification of facilities - Periodic reviews are conducted to investigate the existence of potential environmental health hazards in the work areas of the Center. When, in the professional opinion(s) of the Medical Director, the Environmental Health Officer, the Radiation Safety Committee, the cognizant Area Safety Committee, or the Safety Officer, environmental conditions are deemed to constitute a hazard to the health of an employee, studies are to be conducted to determine a means of modifying or eliminating such hazardous conditions. The Safety Officer is responsible for implementing the recommendations of such studies.

Records - The Medical Director establishes and maintains a medical file for each employee who is examined by Medical Services, including those whose work requires exposure to potential health hazards. This file is maintained in accordance with the Privacy Act and is considered to be privileged information; information there from is conveyed to persons outside Medical Services only as follows:

- a. To an employee's private physician or to the employee's representative upon the request and written permission of the employee

- b. To the chairman of the Executive Safety Board, the chairman of the Environmental Pollution Control Board, cognizant members of the Human Resources Management Division staff, and appropriate management officials, in the form of findings of fact, conclusions, and recommendations, when such information is necessary to evaluate the employee's ability to do his or her job, the employee's eligibility for disability retirement, or the employee's conformance with prescribed health standards Radiation exposure records of individual employees are maintained by the Environmental Management Office.

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