Human Factors Policy
FAA Order 9550.8A

1.   PURPOSE. This order establishes policy, procedures, and responsibilities for incorporating and coordinating human factors considerations in Federal Aviation Administration (FAA) programs and activities to enhance aviation safety, capability, efficiency, and productivity.

2.   DISTRIBUTION. This order is distributed to the division level in Washington, regions, and centers with a limited distribution to all field offices and facilities.

3.   CANCELLATIONS. This order supercedes FAA Order 9550.8 dated October 27, 1993, which is canceled.

4.   EXPLANATION OF CHANGES. This order clarifies the meaning of human factors considerations, provides the background for the human factors approach, and establishes basic policy and responsibilities for incorporating human factors in agency functions.

5.   DEFINITIONS.
        a.   Human Factors. Within the FAA, human factors entails a multidisciplinary effort to generate and compile information about human capabilities and limitations and apply that information to equipment, systems, facilities, procedures, jobs, environments, training, staffing, and personnel management for safe, comfortable, and effective human performance.

        b.   Appendix 1, Human Factors Study Areas, provides a list of elements that further identify the scope of human factors considerations for study, analysis, and resolution.

        c.   Appendix 2, Definitions, provides descriptions of other key terms used in this order.

6.   BACKGROUND.
        a.   The human factor has been widely recognized as critical to aviation safety and effectiveness. In the July 1988 report entitled "Safe Skies for Tomorrow," the U.S. Congress Office of Technology Assessment concluded that long-term improvements in aviation safety will come primarily from human factors solutions. Further, such solutions will be established through consistent, long-term support for human factors research and development, analysis, and the application of human factors information. Subsequent to the Office of Technology Assessment report, Congress enacted the Aviation Safety Research Act of 1988 (PL 100-591) calling for the FAA to augment its research effort in human factors and ensure coordination with other agencies performing such research. These assessments and directions resulted in the FAA's emphasizing new and coordinated efforts in the area of human factors with the National Aeronautics and Space Administration, Department of Defense, and a multitude of professional aviation and technical groups whose members include pilot and controller unions, airframe and parts manufacturers, as well as major airlines. One product of such efforts includes the "National Plan for Civil Aviation Human Factors" which outlined a coherent national agenda aimed at achieving progress toward safety and productivity goals, increased coordination, funding, and long-term, high level

management support in government and industry. Subsequent to establishing the National Plan, the application of human factors research and engineering has gained continued attention and emphasis in aviation certification, regulation, operations, and acquisitions.

    b.   Benefits derived from this systematic approach to human factors research and engineering include:
        1) Increased personnel efficiency, effectiveness, and productivity;
        2) Improved system performance and usability;
        3) Reduced operations and maintenance costs;
        4) Increased availability of objective data in formulating FAA policies, standards, regulations, and business case and investment decisions; and
        5) Enhanced aviation safety.

7.   SCOPE: This order establishes a policy to foster an integrated human factors program that meets FAA long and short range needs covering both research and engineering applications. The FAA Human Factors Policy Order supports regulation and operation of the National Airspace System by providing an agenda for the conduct and institutionalization of human factors activities relative to achieving regulatory goals and objectives, executing research and development programs, facilitating Capital Investment Plan acquisitions, and responding to operational mission performance requirements.

8.   OBJECTIVES. The human factors-oriented approach is to:
    a.   Conduct the planning, reviewing, prioritization, coordination, generation, and updating of valid and timely human factors information to support agency needs;

    b.   Develop and institutionalize formal procedures that systematically incorporate human factors considerations into agency activities; and

    c.   Establish and maintain organizational infrastructure that provides the necessary human factors expertise to agency programs and activities.

9.   HUMAN FACTORS COORDINATING COMMITTEE. This order prescribes the organization, composition, functions, and responsibilities of an intra-FAA committee to coordinate the generation, distribution and application of human factors information through a representative Human Factors Coordinating Committee as stated in Appendix 3, Human Factors Coordinating Committee. The committee will serve to enhance the identification of human factors requirements, facilitate the integration of human factors into activities within the agency, promote the improvement of existing policies and processes, and monitor the efficacy of human factors efforts within FAA.

10.   HUMAN FACTORS POLICY. Human factors shall be systematically integrated into the planning and execution of the functions of all FAA organizational elements and activities associated with National Airspace System acquisitions and operations.

FAA organizations shall emphasize human factors and usability considerations to enhance system performance and capitalize upon the relative strengths of people and machines. These considerations shall be integrated at the earliest phases of FAA projects and incorporated within the processes for fulfilling OMB Exhibit 300 requirements. The FAA's Human Factors Policy Order is

achieved through a human-centered emphasis in operations, research, applications, and infrastructure support resulting in safe and effective human-system interfaces. Program managers shall employ human factors research and engineering best practices to acquire systems that require minimal staffing, provide cost-effective training, allow efficient operation and maintenance, and are operationally suitable within the intended environment.

Human performance shall be integrated into procedure development, system performance evaluation, rulemaking, system acquisitions (including business and administrative systems), architecture engineering, and other activities within the agency.

Human factors considerations and human-system performance data shall be an integral element of and incorporated into activities and decisions related to mission analyses and mission need statements, performance baselines and measures, safety risk management analyses, investment analyses and reports, requirements documents, program plans, source selection criteria, design reviews, test and evaluation plans and reports, implementation plans, and post-deployment assessment plans and reviews.

FAA organizations shall cause to be available for their programs the essential information required to integrate human factors considerations appropriately and successfully, inter alia:

- How human factors research and engineering is organized and accomplished (e.g., personnel and funding resources; organization, roles, and relationships; human factors plans or road map; roles, content, and purpose of human factors working groups)
- Quantitative human performance measures and criteria
- Human factors risks and means/methods to mitigate them
- Life cycle costs and benefits including staffing and training
- Analytical methods and technical tools to conduct human factors activities
- Conventions, guidelines, and standards needed to apply human factors
- Measures, databases, and related information on human-in-the-loop operational performance
- Results from human-in-the-loop analyses, modeling, simulations, demonstrations, and
- Lessons learned about addressing human factors in FAA programs (e.g., in requirements, investment analysis, research, analysis, design, specifications, statements of work, source selection criteria, test and evaluation, post-deployment assessment)

for research and engineering programs and applications.

11.   RESPONSIBILITIES.

11.1 All FAA Organizations:
To ensure that human factors are systematically included in FAA endeavors, Assistant and Associate Administrators, Executive Directors, and Air Traffic Organization Vice Presidents shall establish and assign responsibilities to accomplish the policy and objectives cited in Paragraphs 8 (Objectives) and 10 (Human Factors Policy) within their organizational purview, to include:

   a. Execution. Conduct activities to:
   - Apply human factors information and methods to FAA system acquisitions, operations,

certification, and regulatory activities in the promotion of civil aviation.

- Ensure operational human performance constraints and enhancements are routinely incorporated in mission analysis and capability/requirements determination processes, life cycle cost and benefit analyses, risk assessments, system operational performance specifications, system baseline measurements, solicitation package preparation and source evaluation, system critical operational issues and criteria (as well as measures of effectiveness and measures of performance), operational test and evaluation plans, program reviews, post-contract activities, program implementation, and post-deployment assessments.
- Acquire necessary human performance information by means of the research, engineering, and development processes.
- Assess the supportability and affordability of human resource requirements (e.g., staffing and training) to meet plans for the future NAS architecture and systems.
- Implement error prevention and mitigation strategies to emphasize human error reduction.
- Integrate human factors into fault tree analyses and other risk management techniques for operation and maintenance activities.
- Assess and report on usability so as to identify and enable resolution of human factors issues throughout a product's lifecycle, to include coordinating with appropriate authorities on issues related to accessibility and accommodation for people with disabilities and special needs.

b. Human Factors Coordinator. Designate a Human Factors Coordinator who will perform, direct, or assist in:

- Serving as the organization's representative to the Human Factors Coordinating Committee
- Defining human factors risks and mitigation plans during mission analysis, investment analysis, and requirements determination.
- Identifying human-system interfaces and computer-human interfaces for market surveys, trade studies, and prototypes.
- Preparing and updating human factors portions of acquisition and engineering management plans, procurement packages, test and evaluation plans, performance measures and criteria, and data collection efforts.
- Developing and analyzing operational scenarios, human-system modeling, and human-in-the-loop simulations for operators and maintainers.
- Reviewing and assessing human factors concepts and designs (e.g., in requirements reviews, system reviews, product reviews, change proposals).
- Coordinating human factors engineering efforts and user working group activities.
- Coordinating human factors in training development, integrated logistics support, safety, configuration management, and other system engineering functions.

c. System Engineering. Establish mechanisms to incorporate human factors risk considerations in system engineering plans, products, functions, and activities at the product, service area, and National Airspace System architecture level.

d. Safety Management System. Include human factors considerations in safety management system plans, programs, projects, functions, activities, and risk assessments. The

necessary components to incorporate human factors into the definition, development, implementation, and monitoring of safety management system risks include:

- The scope of human factors areas of interest
- Tools and techniques used, and their frequency of use
- Data and databases used, and their quality and availability
- Metrics and measures used, and how they are scored
- Standards and conventions used, and compliance with them
- Principles and guidelines applied, and how widely they are followed
- Policy and processes implemented, and to what degree they are executed
- Lessons learned and best practices followed, and how consistently they are employed

e. Program Performance Measurement. Establish mechanisms by which to continuously improve the human factors program across the stakeholders, customers, internal business processes, and learning and growth perspectives using program performance measures and tools such as the human factors balanced scorecard approach.

f. Processes and Procedures. Establish and apply:
- Processes and procedures that systematically identify the human factors expertise essential to applying human factors to acquisition, operations, certification, and regulatory activities.
- Mechanisms by which agency long range planning initiatives incorporate forecasts with a human dimension.

g. Education and Training. Support, participate in, and conduct:
- Managerial and executive level awareness training for human factors.
- Program management team and engineering staff technical training for management of human factors in acquisition and operations.
- Operational level human factors familiarization training.
- Academic-Industry-Government coordination and technology transfer on the application of human factors.
- Professional training and education for human factors coordinators and support employees on topics and issues related to the human factors discipline.

h. Staffing, Facilities, and Funding. Plan and conduct resource activities to ensure:
- Accessibility of human factors specialists for analysis, design, evaluation, and implementation activities throughout the agency.
- Availability of human factors quality control personnel for oversight, direction, and support.
- Adequate funding for human factors technical support.
- Sufficiency of funding for human performance research, engineering, and data collection projects.
- Availability of sufficient research subjects and access to facilities so as to ensure the scientific validity of approved research and studies.

11.2 Human Factors Research and Engineering Division. The Human Factors Research and Engineering Division enhances the safety and efficiency of the National Airspace System by managing human factors aviation research for the agency, coordinating activities for the human factors "community of practice" across the agency, and providing human factors support to research

and engineering activities within the Air Traffic Organization Operations Planning service area and other organizational elements as appropriate. The Program Director for Human Factors serves as the principal advisor on human factors research and engineering to the Administrator, the Air Traffic Organization Chief Operating Officer, and the Federal Acquisition Executive. The functions of the Human Factors Research and Engineering Division are organized as follows:

I. Principal advisor and focal point to the FAA Administrator, Air Traffic Organization Chief Operating Officer, and the Federal Acquisition Executive on human factors agency research and air traffic management engineering.

a. Acts as the human factors focal point within and outside the agency for FAA human factors research management, human factors policy, and broad Air Traffic Organization human factors engineering applications.

b. Provides recommendations and advice on human factors research and engineering to the FAA Administrator, Air Traffic Organization Chief Operating Officer, and Federal Acquisition Executive as required.

c. Provides human factors guidance, direction, sponsorship, and representation to internal and external, national and international FAA work groups, committees, symposia, and conferences.

d. Ensures human factors are integrated in other FAA organizations' activities as appropriate.

II. Manages FAA Human Factors Research, Engineering, and Development Program.

e. Serves as Human Factors Research Program Manager and provides strategic, budgetary, and technical direction for agency resource Research, Engineering, & Development planning and execution.

f. Performs technical quality assurance for human factors research.

g. Ensures coordination and integration between research and application areas (i.e., acquisition, certification, regulation, and standards).

h. Serves as primary interface on human factors for Research, Engineering, & Development air traffic management and safety programs with domestic and international agencies such as Department of Defense, National Aeronautical Space Administration, and Eurocontrol.

i. Serves as the Designated Federal Official for the Research and Development Advisory Committee Subcommittee on Human Factors. Also, provides human factors programmatic support to Research and Development Advisory Committee Subcommittee on Aircraft Safety, and Subcommittee on Air Traffic Services.

III. Conducts support activities for the human factors "community of practice" across the agency.

j. Chairs, directs, and orchestrates activities of the FAA Human Factors Coordinating Committee as set forth under Appendix 3 (Human Factors Coordinating Committee) of this order.

k. Coordinates for the agency the communication, evaluation, advice, and support for the human factors community of practice on strategic planning, risk management, and organizational infrastructure requirements and capabilities for human factors activities and expertise.

l. Supports education, training, and professional development programs to meet the human factors community of practice needs.

m. Advises and provides research and engineering assistance, consultation, or augmentation to agency programs for human factors products and services.

n. For Air Traffic Organization, assesses and supports development of quantitative measures, analytical methods, conventions and guidelines, technical tools, data and database availability, human performance criteria, life cycle costs, human-in-the-loop analyses, and "lessons learned" for human factors research and engineering applications.

o. For Air Traffic Organization, serves as clearinghouse, quality assurance, and document control for human factors policy and standards.

IV. Provides human factors research and engineering support to activities within the Air Traffic Organization Operations Planning (ATO-P) service area and other organizational elements as appropriate.

p. Serve as a member of the ATO-P sponsored System Engineering Council to ensure incorporation of human factors considerations in NAS Enterprise Architecture developments and modifications and to enhance human-system integration in other system engineering endeavors.

q. Ensures human factors is coordinated and integrated in Air Traffic Organization Operations Planning service area planning, analysis, development, and implementation activities.

r. Provides human factors research and engineering support to Air Traffic Organization Operations Planning activities.

s. Provides human factors leadership and services in support of other Air Traffic Organizations as required.

11.3 Checklist for Human Factors Research and Engineering. Appendix 2, Organizational Checklist for Human Factors Research, Applications, and Infrastructure Support, provides an outline of key items for tailoring and review within all FAA organizations.

Administrator

APPENDIX 1
HUMAN FACTORS STUDY AREAS

1. **Allocation of Function:** Assigning those roles/functions/tasks for which the human or equipment performs better while enabling the human to maintain awareness of the operational situation.
2. **Anthropometrics and Biomechanics:** Accommodating the physical attributes of its user population (e.g., from the 1st through 99th percentile levels).
3. **CHI (Computer-Human Interaction):** Employing effective and consistent user dialogues, interfaces, and procedures across system functions.
4. **Communications and Teamwork:** Applying system design considerations to enhance required user communications and teamwork.
5. **Culture:** Addressing the organizational and sociological environment into which any change, including new technologies and procedures, will be introduced.
6. **Displays and Controls:** Designing and arranging displays and controls to be consistent with the operator's and maintainer's tasks and actions.
7. **Documentation:** Preparing user documentation and technical manuals in a suitable format of information presentation, at the appropriate reading level, and with the required degree of technical sophistication and clarity.
8. **Environment:** Accommodating environmental factors (including extremes) to which the system will be subjected and understanding the associated effects on human-system performance.
9. **Functional Design:** Applying human-centered design for usability and compatibility with operational and maintenance concepts.
10. **Human Error:** Examining design and contextual conditions (including supervisory and organizational influences) as causal factors contributing to human error, and consideration of objectives for error tolerance, error prevention, and error correction/recovery.
11. **Information Presentation:** Enhancing operator and maintainer performance through the use of effective and consistent labels, symbols, colors, terms, acronyms, abbreviations, formats, and data fields.
12. **Information Requirements:** Ensuring the availability and usability of information needed by the operator and maintainer for a specific task when it is needed, and in a form that is directly usable.
13. **I/O Devices:** Selecting input and output (I/O) methods and devices that allow operators or maintainers to perform tasks, especially critical tasks, quickly and accurately.
14. **KSAs (Knowledge, Skills, Abilities):** Measuring the knowledge, skills, and abilities (KSAs) required to perform job-related tasks, and determining appropriate selection requirements for users.
15. **Operational Suitability:** Ensuring that the system appropriately supports the user in performing intended functions while maintaining interoperability and consistency with other system elements or support systems.
16. **Procedures:** Designing operation and maintenance procedures for simplicity, consistency, and ease of use.
17. **Safety and Health:** Preventing/reducing operator and maintainer exposure to safety and health hazards.
18. **Situational Awareness:** Enabling operators or maintainers to perceive and understand

elements of the current situation, and project them to future operational situations.

19. **Special Skills and Tools:** Minimizing the need for special or unique operator or maintainer skills, abilities, tools, or characteristics.
20. **Staffing:** Accommodating constraints and efficiencies for staffing levels and organizational structures.
21. **Training:** Applying methods to enhance operator or maintainer acquisition of the knowledge and skills needed to interface with the system, and designing that system so that these skills are easily learned and retained.
22. **Visual/Auditory Alerts:** Designing visual and auditory alerts (including error messages) to invoke the necessary operator and maintainer response.
23. **Workload:** Assessing the net demands or impacts upon the physical, cognitive, and decision-making resources of an operator or maintainer using objective and subjective performance measures.
24. **Work Space:** Designing adequate work space for personnel and their tools or equipment, and providing sufficient space for the movements and actions that personnel perform during operational and maintenance tasks under normal, adverse, and emergency conditions.

Human Factors Engineering. Human factors engineering entails the application of human factors considerations concurrent with other engineering disciplines during the analysis, design, development, testing, and fielding of a system, service, or facility in which human performance is essential in meeting safety and capability objectives.

Human Factors Research. Human factors research entails the scientific acquisition of information about human capabilities and limitations related to hardware, software, facilities, procedures, jobs, organizations, environments, training, staffing, errors, situational awareness, workload, personnel management, decision support tools, and other performance implications in which the human is a component in meeting safety and capability objectives.

Human-Centered. The concept and structured process of concept and requirements definition, design, development, and implementation that identifies the user as the focal point of the effort for which procedures, equipment, facilities, and other components serve to support human capabilities and compensate for human limitations; sometimes also called "user-centered."

Human-System Integration. The concept and processes associated with optimizing total system performance via fully incorporating human factors considerations (including manpower levels, personnel attributes, training, safety and occupational health, ergonomics and human engineering) in program definition, analysis, design, development, testing, and implementation.

OMB Exhibit 300 Requirements. The analyses, information, and documentation associated with OMB Circular 11, Part 7, Exhibit 300 requirements and all attachments necessary to initiate, baseline, develop, and manage a program effectively and efficiently.

System Acquisitions. System acquisitions encompass functions related to all FAA major and non-major acquisitions including developmental items, non-developmental items, commercial-off-the-shelf procurements, research and technical services, hardware and software acquisitions, and facilities.

System Operations. System operations encompass all functions related to the operation, maintenance, and regulation of the National Airspace System under the purview of FAA.

APPENDIX 2
ORGANIZATIONAL CHECKLIST FOR HUMAN FACTORS RESEARCH,
APPLICATIONS, AND INFRASTRUCTURE SUPPORT

The following checklist items support the implementation and compliance with this order:

For Research: Plan, review, and prioritize human factors research which supports the organization's needs.
- Are human factors efforts responsive and synchronized to your organizational needs in a timely basis?
- Are you provided with an adequate strategy to conduct human factors efforts at the appropriate location (e.g., contractor, laboratory)?
- Are human factors efforts communicated and coordinated across other Research, Engineering & Development efforts and with organizations outside the FAA to maximize leveraging?
- Does the proper mix exist between short-term vs long-term, in-house vs extra-mural, and contract vs university to satisfy specific human factors requirements?
- Are mechanisms adequate to transfer and apply information generated from human factors research to organizational functions?

For Applications: Develop and institutionalize formal mechanisms that systematically incorporate human factors considerations into the organization's activities.
- Are human resource constraints and human-system performance considerations identified early in organization program activities?
- Are human resource impacts of the program identified?
- Do system operational performance specifications (including system integration requirements) consider human factors?
- Is human performance for the program/project quantitatively measured?
- Is human performance and usability an explicit item in contract/vendor evaluation criteria and contract award?
- Have analyses been done and data been made available to address human performance?
- Does user involvement in the program/project follow a structured, performance data-driven strategy?
- Do critical operational issues and criteria in requirements and testing reflect human performance in operational terms?
- Do life cycle costs reflect total human resource commitments?
- Has the system been stressed to its performance limits (including human-in-the-loop analysis)?
- Do program/project decisions use human performance data?
- Are human performance issues and "lessons learned" captured for subsequent applications?

For Infrastructure Support: Establish and maintain the infrastructure that provides the organization with the necessary human factors expertise and capabilities.
- Are human factors experts available and involved?
- Is there appropriate representation and coordination of organizational human factors efforts?
- Is there continuity of human factors effort?
- Are there adequate funds for required human factors tasks?
- Are the appropriate human factors tools, techniques, and technical capabilities available?
- Does training provide the proper level of human factors awareness/understanding?

- Do policies, processes, and procedures enhance the consideration of human performance?
- Are job aids and practitioner tools available to support and apply human factors considerations?

<u>For Program Reviews:</u>
- Are sufficient human factors resources available to ensure the program's success?
- Is the responsibility for human factors centrally directed for coordination and efficiency?
- Is human factors expertise integral to the team decision making and processes?
- Is human factors integrated into system engineering activities?
- Are human factors issues regularly raised and resolved in program/project deliberations, functions, activities, and decisions?
- Are system requirements, specifications, and evaluations replete with operator and maintainer performance parameters?

APPENDIX 3
HUMAN FACTORS COORDINATING COMMITTEE

The Human Factors Coordinating Committee shall continue in force to facilitate FAA human factors endeavors constructively and enhance the use of human factors information. Composition and functions of the Human Factors Coordinating Committee are as follows:

1.   Organization. The committee shall be organized as a steering and coordinating body that is facilitated by temporary or permanent subcommittees or working groups as required.

2.   Composition. The committee shall be sponsored and chaired by the FAA Human Factors Research and Engineering Program Director. The composition of the Human Factors Coordinating Committee will be as deemed necessary to promote and support the execution and implementation of human factors best practices within the FAA and to ensure the best interests of the government. Under the provisions of Paragraph 11 (Responsibilities) of this order, candidate organizations shall each designate one member (or more if necessary) who shall have the authority to represent that organization in human factors matters. A recording secretary shall be appointed by the committee for the purpose of preparing minutes of the meetings. The Human Factors Coordinating Committee shall encourage participation in its activities by others with significant human factors responsibilities. Candidate organizations include:
- Air Traffic Organization Service Areas
- Associate Administrator for Aviation Safety
- Associate Administrator for Airports
- Associate Administrator for Commercial Space Transportation
- Assistant Administrator for Information Services
- Assistant Administrator for Region and Center Operations
- Research Development & Human Factors Laboratory, William J. Hughes
   Technical Center
- Human Resources Research Division, Civil Aeromedical Institute, Office of
   Aerospace Medicine
- Aeromedical Research Division, Civil Aeromedical Institute, Office of
   Aerospace Medicine

3.   Functions. The Human Factors Coordinating Committee shall function as an intra-FAA committee to coordinate human factors information, matters, and activities among the executives, associate administrators, and assistant administrators and their organizations. Specific functions of the Human Factors Coordinating Committee are to:

        a.   Enhance the identification of human factors research requirements and the coordination of research results;

        b.   Foster the dissemination and exchange of human factors information among agency organizations;

c.   Facilitate the integration of human factors into procedure development, system performance evaluation, rulemaking, system acquisitions, and other activities within the agency;

d.   Identify the need for changes to existing policies, processes, research programs, regulations, or other human factors-related activities and programs; and

e.   Monitor the efficacy of human factors efforts and programs within FAA.

4.   <u>Administration.</u> The HFCC shall develop internal operating procedures that define the frequency of meetings, the structure and relationship of working groups and subcommittees, and the processes and procedures by which its activities are to be carried out.

5.   <u>Responsibilities.</u>

a.   <u>The Chairperson.</u> The chairperson shall be responsible for:

(1)   Ensuring that the functions of the committee are accomplished;

(2)   Establishing agenda, schedules, and locations for meetings;

(3)   Reviewing committee documentation prior to publication or distribution; and,

(4)   Ensuring appropriate representation, organization, documentation, and administration to support the committee.

b.   <u>Committee Members.</u> Committee members shall be responsible for:

(1)   Supporting subcommittees, working groups, and other means of coordinating human factors program activities within and across their organizations;

(2)   Supporting their respective human factors research and engineering programs within their organizations;

(3)   Monitoring their respective human factors research requirements development processes within their organizations;

(4)   Providing information, briefings, and documentation to the committee on human factors matters within their organizations;

(5)   Attending committee meetings or designating an alternate if attendance is not possible; and

(6)   Participating in committee and other activities such as workshops, seminars, and human factors research and engineering program reviews, as appropriate.