Appendix C. Human Factors Data Item Descriptions
(from HF-ST-D004a)

6.1. Intended Use. This standard is intended for use in specifying human factors engineering tasking requirements for FAA systems, equipment (hardware and software), and facilities, cited contractually in statements of work (SOW). The use of this standard for acquisition does not preclude its utilization for in-house efforts.

6.2. Acquisition Requirements. Acquisition documents should specify the title, number, and date of this standard.

6.3. Associated Data Item Descriptions. The FAA Data Item Descriptions (DIDs), listed below, may be beneficial for a human factors engineering effort. Not all DIDs will be applicable to every acquisition. The application of these DIDs should be evaluated on a program-by-program basis.

6.3.1. Access and Ownership of Human Factors Engineering Data. For all of the DIDs, the contractor must give copies of the human factors engineering related data to the Government as requested and must turn over all human factors engineering related data and materials to the government at the end of the effort or the end of the contract, whichever comes first.

6.3.2. Transparency. For all of the tasks related to these DIDs, the relationship between a prime and subcontractor must be transparent to the Government and must not have a negative impact on the products received by the Government or Government data access.

6.3.3. Human Factors Engineering. The DIDs listed in this section are available in the appendices.

FAA-HF-DID-001A, Human Factors Program Plan
FAA-HF-DID-002A, Human Engineering Design Approach Document – Operator
FAA-HF-DID-003A, Human Engineering Design Approach Document – Maintainer
FAA-HF-DID-004A, Critical Task Analysis Report
FAA-HF-DID-005A, Human Factors Simulation Concept
FAA-HF-DID-006A, Human Factors Graphical User Interface (GUI) Design Document
FAA-HF-DID-007A, Human Engineering Systems Analysis Report
FAA-HF-DID-008A, Human Factors Training Analysis Report
FAA-HF-DID-009A, Early User Involvement Event Report
FAA-HF-DID-010A, Personnel Qualifications Report
FAA-HF-DID-011A, Human Factors Heuristic Evaluation

FAA-HF-DID-012A, Human Factors Engineering in System/Subsystem Review
FAA-HF-DID-013A, Human Factors Engineering Closeout Report

6.3.4. System Safety and Health Hazards.

FAA-DI-SAFT-101, Preliminary Hazard Analysis
FAA-DI-SAFT-102, System Safety Program Plan
FAA-DI-SAFT-103, Sub-System Hazard Analysis
FAA-DI-SAFT-104, System Hazard Analysis
FAA-DI-SAFT-105, Operating & Support Hazard Analysis
FAA-DI-SAFT-106, Health Hazard Assessment
FAA-DI-SAFT-107, System Safety Assessment Report
FAA-DI-SAFT-108, Safety Requirements Verification Table

6.3.5. Staffing, Personnel, and Training.

FAA-STD-028, DID-1, Personnel Qualification Report
FAA-STD-028, DID-2, Task and Skills Analysis Report
FAA-STD-028, DID-3, Cognitive Task Analysis Report
FAA-STD-028, DID-4, Commercial-Off-The-Shelf Training Materials Report
FAA-STD-028, DID-5, Training Development Plan

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Program Plan (HFPP)	**HF-DID-001A**

3. DESCRIPTION / PURPOSE

3.1 The Human Factors Program Plan is the single document which describes the contractor's entire human factors program, identifies its elements, and explains how the elements will be managed.

3.2 This document is used by the procuring activity as the principal basis for approval of the contractor's program and is one basis for review of the contractor's progress.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)
June 03, 2016	ANG-C1

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Human Factors Program Plan (HFPP) resulting from the work tasks delineated in FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Format. The HFPP format must contain all of the elements below.

7.2 Content. The HFPP must contain the following sections:

7.2.1 Table of contents, list of illustrations and introduction. The introduction must state the purpose of the HFPP and the scope describing the application of the plan and the Human Factors program.

7.2.2 Tailoring. The HFPP must be tailored to reflect the program needs, acquisition strategy, and phase of development.

7.2.3 Strategy. The HFPP must identify the Objectives of the system, the Goals and Requirements, the Constraints, and the Approach to be taken. This section must also describe the method(s) by which the contractor will identify and conduct trade-offs between human factors elements to enhance system performance; reduce total system costs; and ensure the system is designed to accommodate the characteristics of the user population that will operate, maintain, and support the system.

7.2.4 Organization. This section must identify and describe the contractor's primary organizational element responsible for complying with human factors requirements. The functions and internal structure of this element must be defined, including the main human factors point of contact, the human factors organization and roles and responsibilities. Structural definition must include the number of proposed personnel on an annual basis and summary job descriptions for each person. The structural definition must define how the human factors resources will be organized and managed to support the program. In addition, the relationships of this element to other organizational elements responsible for areas impacted by human factors, such as those charged with equipment and software design, safety, training, test and evaluation, integrated logistic support, and other engineering specialty programs (such as availability, reliability, maintainability, configuration management, and risk management) must be fully explained.

7.2.4.1 Human factors in subcontractor efforts. If any work related to system components or software having human interface is to be performed under subcontract, the subcontractor's organizational element responsible for human factors must be described to the same extent as the prime engineering requirements proposed for inclusion in each of these subcontracts. The method(s) by which the prime contractor monitors subcontractor compliance must be fully described and must be transparent to the government.

7.2.5 Program background. This section must describe the program including performance, features, Operational Concepts, the Program Schedule, and the Target Population Description. The contractor should use existing data where available and only include relevant information.

7.2.6 Human factors engineering risks and opportunities. This section should describe the potential human factors risks, problems, or enhancements. This section must describe the approach for identifying, documenting, validating, prioritizing, tracking, reporting, resolving, and mitigating human factors issues and risks over the life of the program. Describe the process for the trade-off of human factors issues and risks among human factors elements, and between human factors and other disciplines. Describe the procedure(s) for communication and conflict resolution.

Block 7, PREPARATION INSTRUCTIONS (continued).

7.2.7 Human factors tasks and activities. This section must identify the tasks and activities that need to be done to support the objectives of the human factors program. The tasks and activities must be described in terms of who, what, when and how and must specify the monitoring process for key requirements and progress points. Not all of the sections below will be applicable to every program.

7.2.7.1 Human factors in system analysis. This section must identify the human factors efforts in system analysis (or, where contractually required, in system engineering), as described in FAA HF-STD-004, which are contractually applicable, and the organizational element(s) responsible for their performance. Human factors participation in system mission analysis; determination of system functional requirements and capabilities; allocation of system functional requirements to human, hardware, or software; development of system functional flows; and performance of system effectiveness analyses, studies, and modeling must be fully described. Describe any analyses to be conducted in support of system definition. Any data required from the procuring activity must also be described.

7.2.7.2 Human factors in system detail design. This section must describe the human factors effort in system detail design to ensure compliance with the applicable provisions of the Human Factors Design Standard (FAA HF-STD-001) and other human factors requirements specified by the contract. Human factors participation in studies, tests, mock-up evaluations, dynamic simulation, detail drawing reviews, systems design reviews and system/equipment/component design and performance specification preparation and reviews must be fully described. Describe the planned involvement of end-user personnel in design activities and assessments. Finally, this section must propose tailoring of the Human Factors Design Standard as specifically applicable to the contract, additional to any tailoring already accomplished by the procuring activity or where exceptions and other tailoring changes are warranted. This proposed tailoring of the Human Factors Design Standard must identify specific provisions, by paragraph, as applicable. If no tailoring of the Human Factors Design Standard is proposed beyond that specified by the procuring activity, this must be stated.

7.2.7.3 Human factors in procedure development. This section must describe the human factors effort in procedure development to ensure compliance with FAA HF-STD-004. The methods must be stated by which the contractor must ensure that:

7.2.7.3.1 Operator and maintainer functions and tasks are allocated, organized, and sequenced for efficiency, safety, and reliability.

7.2.7.3.2 The results of this effort are reflected in operational, technical and training publications, and in training system design.

7.2.7.4 Derivation of staffing, personnel, and training requirements. This section must describe the methods by which the contractor must ensure that operator and maintainer staffing, personnel, and training requirements are based upon human performance requirements developed from system analysis data.

7.2.7.5 Human factors in test and evaluation. This section must describe human factors test and evaluation as an integrated effort within the contractor's total test and evaluation program and must contain specific information to show how and when the contractor will follow human factors test and evaluation requirements of FAA HF-STD-004. Design milestones must be identified at which human factors tests are to be performed to assess compatibility among human performance requirements, personnel aptitude and skill requirements, training requirements, and equipment design aspects of personnel hardware and software interfaces. Major test and demonstration objectives must be identified and proposed test methods must be described. This section must also identify the human factors personnel involved in test and evaluation, and a summary of the human factors test schedule. The summary test schedule must depict major human factors tests, evaluations, analyses, and demonstrations in relationship to major project milestones such as 90 percent design release, project level design reviews, first article demonstration tests, and commencement of procuring activity testing.

7.2.8 Human factors deliverable data products. This section must identify and briefly describe each human factors deliverable data product specified in the contract.

7.2.9 Time-phase schedule and level of effort. This section consists of a milestone chart which identifies each separate human factors effort to be accomplished and must state the level of effort (in person-months) for each task.

7.2.10 HFPP updating. This section must identify the administrative handling procedures for reviewing and revising the HFPP.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Engineering Design Approach Document – Operator	**HF-DID-002A**

3. DESCRIPTION / PURPOSE

The Human Engineering Design Approach Document – Operator (HEDAD-O) provides a source of data to evaluate the extent to which equipment having an interface with operators meets human performance requirements and human engineering criteria.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the HEDAD-O related to the work tasks delineated in the FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Reference documents. The applicable issues of the documents cited herein (including their approval dates and dates of any applicable amendments, notices, and revisions) must be as specified in the contract.

7.2 General. The HEDAD-O must describe the layout, detail design, and arrangement of workstation equipment having an operator interface; it must also describe operator tasks (see below) associated with the equipment. The HEDAD-O must describe the extent to which human performance requirements, the Human Factors Design Standard (HFDS) (FAA HF-STD-001), and other applicable human engineering documents specified in the contract have been incorporated into the layout, design, and arrangement of equipment having an operator interface. Findings from analysis of operator tasks must be presented as part of the rationale supporting the layout, design, and integration of workstation equipment.

7.3 Content. The HEDAD-O must contain the following workstation and operator-related information:

7.3.1 Equipment list. A list of each item of equipment having an operator interface and a brief statement of the purpose of each item of equipment. Separate lists must be provided for each operator's station.

7.3.2 Specification and drawing list. A list of specifications and drawings approved by human engineering at the time of HEDAD-O preparation. When contractually required to prepare and submit the HEDAD-O early in the development process, the list must also address documents where human engineering approval is planned.

7.3.3 Workstation description. Description(s) of the workstation(s), emphasizing human engineering design features. The following aspects of each workstation must be described:

7.3.3.1 Layout and arrangement. One sketch, drawing, or photograph of each workstation. These sketches, drawings, or photographs must contain operator and equipment related reference points (e.g., operator eye position, seat reference point) and scale. One sketch, drawing, or photograph of each item of workstation equipment must also be provided; the point of reference must be normal to the item of equipment and scale must be indicated.

7.3.3.2 Controls and displays. The layout and detail design of each control/display panel (or control/display areas independent of panels) must be described (e.g., brightness, resolution, contrast, color or other coding, control/display ratio, control force, and range characteristics). Display symbology, display formats, and control/display operation logic must be described with regard to intended use by the operator(s).

7.3.3.3 Operator vision. Operator vision to workstation items of equipment must be described using the operator's normal eye position(s) as the point of reference. When applicable, operator external vision must also be described using the operator's normal eye position(s) as the point of reference; extent of external vision must be related to system mission requirements.

7.3.3.4 Environmental factors. Noise, vibration, radiation, temperature, ambient illumination, climatic effects, and other relevant environmental parameters.

7.3.3.5 Workstation lighting. Workstation lighting characteristics and lighting control systems.

7.3.3.6 Workstation signals. Workstation signals including warning, caution, and advisory signals must be described with regard to signal characteristics, signal meaning, signal consequences, operator procedures, cause of signal activation, and operator control over signal characteristics.

7.3.3.7 Operator posture control. Operator posture control including seating, restraint systems, and other postural control techniques.

7.3.3.8 Communication systems. Communication systems and communication systems control.

7.3.3.9 Special design. Special design, layout, or arrangement features if required by mission or system environment.

7.3.3.10 Multiple operator stations. Multiple operator station design must be described where applicable. Rationale for number of operators, arrangement of operators, and allocation of functions to the operators must also be described.

Block 7, PREPARATION INSTRUCTIONS (continued).

7.3.4 Workstation geometry. Workstation geometry must be described using the seat reference point or operator's eye position(s) as a reference point. The position of each control, display, panel, etc., must be described in terms of three - dimensional space (X, Y, Z coordinates); operator eye position must be described in terms of system design coordinates or as zero (X), zero (Y), and zero (Z). The center of each panel, display, control, etc., must be used as the equipment point of reference. True angle to vision to each item of equipment must also be shown.

7.3.5 Human engineering design rationale. Rationale for human engineering design, layout, and arrangement of each item of workstation equipment having an operator interface must be described. The specific considerations of system function; equipment operation; operator selection, training, and skill requirements; operator task performance requirements; and limitations imposed on designs by the procuring activity or state-or-the-art must be described. The basis for reaching specific design, layout, and arrangement decisions must be presented (e.g., HFDS criteria, other human engineering requirements specified in the contract, system engineering analyses, systems analyses, human engineering studies, trade-off analyses, mock-up results, simulation results, and human engineering results).

7.3.6 Analysis of operator tasks. Results from analysis of operator tasks must be presented as part of the rationale for workstation design, integration, and layout. The following must be described: methodology used to generate task analysis results (e.g., paper and pencil, computer-based simulation, dynamic simulation); system function(s), or other exogenous information used to "drive" the task analysis; human performance data (i.e., time and error) against which task analysis results are compared; and operator assumptions (e.g., level of skill, training). Critical tasks must be clearly identified. If the required data is available through other reporting media, such as a task inventory report or task performance analysis report, they must not be duplicated, but must be referenced or appended to the HEDAD-O along with appropriate supplementary information fulfilling the intent of this provision.

7.3.7 Deviations. Narrative which provides rationale for any need to deviate from, or take exception to, the HFDS or other human factors engineering best practices.

7.3.8 Alternatives to baseline design. Sketch, drawing, or photograph of each item of equipment being considered as alternatives or changes to the selected (baseline) workstation design.

7.3.9 Design changes. Design, arrangement, or layout changes made since the last HEDAD-O preparation.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Engineering Design Approach Document – Maintainer	**HF-DID-003A**

3. DESCRIPTION / PURPOSE

The Human Engineering Design Approach Document – Maintainer (HEDAD-M) provides a source of data to evaluate the extent to which equipment (hardware and software) having an interface with maintainers meets human performance requirements and human engineering criteria.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the HEDAD-M resulting from the work tasks delineated in FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Reference documents. The applicable issues of the documents cited herein (including their approval dates and dates of any applicable amendments, notices, and revisions) must be as specified in the contract.

7.2 Format. The HEDAD-M format must present the information in two major parts:

7.2.1 Information pertaining to maintenance actions performed at the deployed site.

7.2.2 Information pertaining to maintenance actions performed at other maintenance levels.

7.3 General. The HEDAD-M must describe the characteristics, layout, and installation of all equipment (hardware and software) having a maintainer interface; it also must describe maintainer tasks associated with the equipment. The HEDAD-M must describe the extent to the requirements of the Human Factors Design standard (HFDS), FAA HF-STD-001, and other applicable human engineering documents specified in the contract have been incorporated into the design, layout, and installation of equipment having a maintainer interface. Results from analysis of maintainer tasks must be presented as part of the rationale supporting the layout, design, and installation of the equipment. The requirement for this information is predicated on the assumption that analytic and study information is developed sufficiently early to influence the formulation of other system data such as maintenance allocation charts, special repair parts, tool lists, and logistic support data. If the required data is available through other reporting media, such as those noted above, a task inventory report or task performance analysis report must not be duplicated, but must be referenced or appended to the HEDAD-M along with appropriate supplementary information fulfilling the intent of this provision.

7.4 Content. The HEDAD-M must contain the following:

7.4.1 Equipment list. A list of each item of equipment having a maintainer interface, and a brief statement of the purpose of each item of equipment and types of maintenance required on each item of equipment (e.g., troubleshoot, remove, inspect, test, repair).

7.4.2 Specification and drawing list. A list of specifications and drawings, approved by human engineering at the time of HEDAD-M preparation. The list also must address documents where human engineering approval is planned.

7.4.3 System equipment description. Description(s) of the system equipment, emphasizing human engineering design features. The following aspects of each workstation must be described:

7.4.3.1 Layout and arrangement. The location and layout of all system equipment requiring maintenance with emphasis on human engineering features that facilitate maintenance. Equipment located in areas assessed through common doors, panels, openings, etc., must be indicated. The location of each item of equipment must be noted in terms of three-dimensional space (i.e., X, Y, and Z coordinates); the reference point for each item of equipment must be its center as viewed by the maintainer while gaining access to the equipment.

7.4.3.2 Design of equipment. The design of each item of equipment with emphasis on human engineering features that facilitate maintenance such as handles, self-test capability, labeling, connector spacing, and keying.

7.4.3.3 Installation of equipment. The installation of each item of equipment with emphasis on human engineering features that facilitate maintenance such as fasteners, clearances, relationship between accessibility and failure rate (or scheduled maintenance frequency) of each item of equipment, and visual access afforded.

7.4.4 Rationale. The specific considerations of equipment maintenance requirements (e.g., frequency, criticality, equipment failure rate), maintainer requirements (e.g., personnel selection, training, and skills), maintainer tasks requirements, environmental considerations, safety, and limitations imposed by the procuring activity or state-of-the-art. The bases for reaching specific design, layout, and installation decisions must be presented (e.g., HFDS criteria, other human engineering requirements specified in the contract, human engineering studies, trade-off analyses, mock-up results, and human engineering test results).

7.4.5 Special tools, support equipment, and aids. A list of special tools, support equipment, and job aids/devices required for maintenance of each item of equipment.

Block 7, PREPARATION INSTRUCTIONS (continued).

7.4.6 Analysis of maintainer tasks. Results from analysis of maintainer tasks must be presented as part of the rationale supporting layout, design, and installation of items of equipment. Analysis of maintainer tasks must consist of the following: task number, task title, task frequency (for scheduled maintenance actions) or estimated task frequency (based on equipment mean-time-between-failures for unscheduled maintenance actions), data source used (e.g., drawing number, sketch number, development hardware, actual production equipment), detailed task sequence, support equipment required, tools required, job aids required, estimated task time, estimated personnel requirements (e.g., number of personnel required, skills and knowledge required), and human engineering considerations which reflect specific human engineering requirements incorporated into the design (e.g., maintainer fatigue, potential hazards, safety or protective clothing/equipment required or recommended, access problems, maintainer communication requirements, special task sequence requirements, labeling). As applicable, the following types of maintainer tasks must be addressed by the analyses of maintainer tasks: remove/replace, troubleshoot (fault location), repair, adjust, inspect, service, and test. Tasks requiring critical human performance must be clearly identified.

7.4.7 Deviations. Narrative which provides rationale for any need to deviate from, or take exception to, the HFDS or other contractual human engineering requirements.

7.4.8 Maintainer interface depictions. A sketch, drawing, or photograph of each item of equipment having a maintainer interface. Each item of equipment must be depicted:

7.4.8.1 By itself from top, front, and side (three-view trimetric or exploded trimetric view) and

7.4.8.2 Installed as the maintainer would normally view it during maintenance.

7.4.9 Alternative installations or layouts. A sketch, drawing, or photograph of each item of equipment being considered as an alternative to the selected, or baseline design. A sketch, drawing, or photograph of alternative equipment installations or layouts that exist at the time of HEDAD-M preparation must be provided.

7.4.10 Design changes. Design, arrangement, or layout changes made since the last HEDAD-M preparation.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Critical Task Analysis Report	**HF-DID-004A**

3. DESCRIPTION / PURPOSE

The Critical Task Analysis Report describes the results of analyses of critical tasks performed to provide a basis for evaluation of the design of the system, equipment, or facility, verifying that human factors technical risks have been minimized and solutions are in hand.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the data product(s) generated by the specific and discrete task requirements as delineated in FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Process. Existing task analyses, workload models, and other relevant data provided as government-furnished information must be used during the development of the task analysis so that existing data are not duplicated. The analysis must be provided in draft form and the contractors must incorporate FAA comments and submit a revised draft for review until the FAA considers the deliverable adequate. After the analysis has been approved in draft form, the contractors will track all changes made in the sequence of content or training.

7.2 Content. Introductory information. Introductory information must include name of system, date, contractors name and contractor number, applicable source references, purpose and scope of document, organization of document, description of procedures used to conduct the analysis.

7.3 Content. Body of report. The Critical Task Analysis Report must describe the results of the analysis of each critical task including:

7.3.1 Task data including the Job, duty, Task, Subtask, Element, and Subelements that are essential to job performance regardless of the frequency with which they are performed.

7.3.2 The name and description of each critical task for all affected missions and phases including degraded modes of operation. Information on each critical task must be provided to a level sufficient to identify operator and maintainer problem areas that can adversely affect mission accomplishment and to evaluate proposed corrective action. For each critical task, identify the following:

7.3.2.1 Information required by the operator and maintainer, including cues for task initiation.

7.3.2.2 Information available to the operator and maintainer.

7.3.2.3 Actions that each performer must complete to accomplish the critical task, including responses to specific information, responses to combinations of information, and self-initiated actions.

7.3.2.4 Decision evaluation process.

7.3.2.5 Decision reached after evaluation.

7.3.2.6 Action taken.

7.3.2.7 Body movement required by action taken.

7.3.2.8 Workspace envelope required by action taken.

7.3.2.9 Workspace available.

7.3.2.10 Location and condition of the work environment.

7.3.2.11 Frequency and tolerances (permissible limits or limits of variation) of action.

7.3.2.12 Time available for completion of the task.

7.3.2.13 Feedback informing operator or maintainer of the adequacy of action(s) taken.

7.3.2.14 Tools and equipment required.

7.3.2.15 Number of personnel required, their specialties, and experience.

7.3.2.16 Job aids, training, or references required.

7.3.2.17 Communications required, including type of communication.

7.3.2.18 Hazards involved.

7.3.2.19 Operator or maintainer interaction where more than one crewmember is involved.

7.3.2.20 Performance limits of personnel.

7.3.2.21 Operational limits of hardware and software.

7.3.3 Rate the level of criticality for the tasks from 1 (Low) = incorrect or delayed performance does not affect safety or system operations, 2 (Moderate) = incorrect or delayed performance has no direct or indirect effect on extreme critical tasks and/or incorrect or delayed performance could indirectly affect system operations, 3 (High) = incorrect or delayed performance could indirectly affect safety and/or incorrect or delayed performance could directly affect system performance, 4 (Extreme) = incorrect or delayed performance could directly affect safety (result in the loss of life and/or p[property).

7.3.4 Identify the functional consequences and cumulative consequences of each operator or maintainer critical task with respect to the effects upon the immediate subsystem functions and the overall system mission.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Simulation Concept	**HF-DID-005A**

3. DESCRIPTION / PURPOSE

The Human Factors Simulation Concept describes the contractor's intended use of mockups and simulators in support of human factors analysis, design support, and test and evaluation.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Human Factors Simulation Concept resulting from applicable tasks delineated in FAA HF-STD-004. This document may be used by the procuring activity to assist and assess simulation approaches when there is a need to resolve potential human performance problems, particularly where government facilities, models, data, or participants are required.

7. PREPARATION INSTRUCTIONS

7.1 Reference documents. Any reference documents used in the development of the simulation concept must be properly cited.

7.2 Content. The Human Factors Simulation Concept must contain the following information:

7.2.1 General description and rationale. The need for a mockup or simulator program, the overall simulation concept, and the anticipated benefits must be described. The interrelationships between mockups, simulators, and other human factors analysis, design support, and test and evaluation techniques must be described.

7.2.2 Techniques. Each simulation technique and procedure proposed by the contractor must be fully described, including the rationale for the selection of the technique(s). The specific contributions of each technique to human factors analysis, design support, and test and evaluation must be identified. Previous efforts conducted by the contractor or others to validate each proposed technique must be described, including a discussion of results.

7.2.3 Intended Use. The intended use of each simulation technique must be described with regard to the following:

7.3.2.1 Human performance and workload analysis, test, and demonstration.

7.3.2.2 System design development, test, and demonstration.

7.3.2.3 System effectiveness studies, operational and use concepts development, and verification.

7.3.2.4 Development and verification of operator skill, knowledge, and other training data.

7.3.2.5 Operator procedures development and verification, including degraded mode and emergency procedures.

7.3.2.6 Training equipment design and verification studies.

7.3.2.7 Development and verification of technical publications.

7.2.4 Schedule. A detailed schedule must be provided. Compatibility between the simulation schedule and the release of program analyses, design, and test products for each area of utilization listed above, must be described.

7.2.5 Facilities and special requirements. Simulation facilities must be described. Any requirements to utilize government facilities, models, data, or other government property must be identified. If the contractor requires participation by government personnel (e.g., as subjects in simulation studies), appropriate information must be provided, such as number and qualifications of personnel, desired level of participation, and schedule of participation.

7.2.6 Scenarios description. The scenarios to be simulated must be described. Information on mission objectives, location, weather conditions, workload, or any other data relevant to system simulation must be presented.

7.2.7 Organizational personnel. The simulation concept must identify the organizational elements responsible for executing the simulation(s). The relationships between the organizational elements must be described, including the authority delegated to each element. The number of personnel, level of effort, and responsibilities and authorities of key personnel must be identified.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Graphical User Interface (GUI) Design Document	**HF-DID-006A**

3. DESCRIPTION / PURPOSE

The Human Factors GUI Design Document provides a visual representation of the results of GUI prototyping along with explanations and the documentation of the history behind the decisions.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Human Factors GUI Mockup Walkthrough resulting from applicable GUI prototyping tasks delineated in FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Content. The Human Factors GUI Design Document must contain the following information:

7.1.1. Title, date, description of prototyping methods, description of participants.

7.1.2. Visual representation (such as screen shots) of the graphical user interface.

7.1.3. Identification of relevant graphic element.

7.1.4. Explanation of how the graphical user interface works including the function of the relevant elements.

7.1.5. Relevant history of the graphical user interface elements including design decisions stemming from the evaluation of the prototype, how each element was changed, why it was changed, and relevant tradeoffs that were considered in the decision-making.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Engineering Systems Analysis Report	**HF-DID-007A**

3. DESCRIPTION / PURPOSE

3.1 The Human Engineering Systems Analysis Report (HESAR) describes the human engineering efforts conducted as part of system analysis and provides data resulting from that analysis.

3.2 The data are used by the procuring activity to evaluate the appropriateness and feasibility of system functions and roles allocated to operators, maintainers, and support personnel.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the data delivered resulting from the work task(s) delineated in the contract statement of work (SOW).

7. PREPARATION INSTRUCTIONS

7.1 Content. The Human Engineering Systems Analysis Report (HESAR) must contain the following sections:

7.1.1. Systems objective(s). The system objective(s) must be described. If the objective(s) are to be met by the system operating in conjunction with other systems not within the scope of the contract, the following must also be described:

7.1.1.1 The overall (or higher level) objective(s) to be met through the combined operation of systems.

7.1.1.2 The sub-objective(s) to be met by the system being developed under the contract.

7.1.1.3 Interactions required between systems to meet the overall objective(s).

7.1.2. System mission(s). The system mission(s) must be described. The mission description(s) must describe the operational and physical environmental context(s) within which the system will meet its objective(s).

7.1.2.1 The organizational structure of the system and required communication with other operators or support personnel must be described. This may include the various system or operational modes and associated environments.

7.1.2.2 For legacy systems, any changes between the current and future mission environment must be identified and described.

7.1.2.3 Any special requirements or considerations due to environmental factors or equipment must be identified.

7.1.3. Scenarios. The system scenarios must be identified as follows:

7.1.3.1 Mission use scenarios. Mission scenarios must be provided that describe the high-level system functionality.

7.1.3.2 Operational use scenarios. Operational use scenarios must be provided that describe the individual operations that are used to fulfill the mission scenarios, either individually or in sequence to complete the mission scenarios. The operational use scenarios must be representative of actual system use. The operational use scenarios must describe the sequence of actions taken by the operator and performed by the system for different system operations, and may include high-level scenarios as well.

7.1.4. System functions. The system functions that must be performed to meet the system objective(s) within the mission context(s) must be described.

7.1.5. Allocation of system functions. The allocation of system functions must be described and must specifically address:

7.1.5.1 Information flow and processing.

7.1.5.2 Estimates of potential operator, maintainer, and support personnel requirements.

7.1.5.3 Allocation of functions to the system and to the human.

7.1.6. Equipment identification. The selected design configuration must be described. Hardware and software component descriptions, including remote or external elements, must be provided.

7.1.7. Subsystems. Any subsystems defined during the system analysis and design process must be identified.

7.1.8. Internal interfaces. The interfaces between internal system elements must be described.

7.1.9. External interfaces. The interfaces to external elements must be described.

7.1.10. Personnel elements. The personnel required to operate, maintain, and support the system must be identified.

7.1.10.1 Personnel descriptions. The numbers and types of operators, maintainers, and support personnel of the system must be identified. This must include the minimum number of personnel required to operate, maintain, and support the system during any given shift.

(a) Any special requirements that personnel must possess must be identified.

(b) Any assumptions made about the system or the personnel that influence the design of the system must be identified.

Block 7, PREPARATION INSTRUCTIONS (continued).

(c) Any derived requirements that are a result of analysis that influence design decisions or that are critical to system performance must be identified.

(d) An estimate (in percent) of the target population, by gender, that the system design will accommodate must be provided.

(e) Any special strength requirements that personnel must possess must be identified.

7.1.10.2 Roles. The specific roles in the system (e.g., supervisor, operator, maintenance technician) must be identified.

(a) The specific function(s) performed for each role must be identified.

(b) Any assumptions made about the personnel roles that affect or influence design decisions must be identified.

(c) Any assumptions made about the roles or the ability of personnel to fulfill these roles must be identified.

7.1.10.3 Profiles and skills. The personnel who will fulfill the system roles, including prerequisites such as rank and years of experience, must be identified and described.

(a) The required skill sets of the system personnel (e.g., education, reading level, technical prerequisites, and occupational specialties) must be identified.

(b) Any assumptions made about the system personnel must be identified.

7.1.11. Operational procedures.

7.1.11.1 Setup. Any required setup operations must be described.

7.1.11.2 Startup. System startup operations must be described.

7.1.11.3 Normal operations. Operations under normal working conditions must be described.

7.1.11.4 Failure modes. Operations when failure conditions occur must be described.

7.1.11.5 Emergencies. Operations under emergency situations must be described.

7.1.11.6 Shutdown. System shutdown operations must be described.

7.1.12 Support. A description of the system support must be provided.

7.1.12.1 Provisioning. The provisioning requirements and operations to fulfill those requirements must be listed.

7.1.12.2 Maintenance. The maintenance requirements and operations that need to be performed on the system must be listed.

(a) Any special maintenance needs, tools, or equipment must be identified.

(b) All assumptions regarding who will complete the maintenance and where the maintenance will be performed must be provided.

(c) If there is a legacy system, any changes in maintenance requirements between the legacy system and the system being developed must be described.

7.1.12.3 Training. Any training that needs to be developed to educate personnel on the use, operation, and maintenance of the system must be described.

(a) The training type, duration, and format must be identified.

(b) Any additional training, specialized training, or prerequisites must be identified.

(c) If there is a legacy system, any changes in training requirements between the legacy system and the system being developed must be described.

7.1.12.4 Deployment. Where the system is to be deployed and in what configuration must be identified.

7.1.12.5 Upgrade methodology. The process for upgrading the system hardware and/or software over the lifecycle of the program must be described.

7.1.13 Security. A description of the physical and information security requirements of the system must be provided. This description must include the security requirements for the operational and non-operational environment (e.g., trusted systems, multi-level security schemes, or multi-tiered physical security levels).

7.1.13.1 The concepts for addressing the security issues in the system must be identified.

7.1.13.2 A description of where security requirements are addressed and met (e.g., when log-on and passwords are required and performed) must be provided.

7.2 Referring to other content. For any section above whose content is substantially covered in another document (e.g., system architecture documentation, concept of operations, system design analyses), the contractor has the option to provide the required content in the HESAR, or to provide a summary of the content and reference or link to the document section(s) that contain(s) the content.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Training Analysis Report	**HF-DID-008A**

3. DESCRIPTION / PURPOSE

The Human Factors Training Analysis Report describes the results of the training analysis as described in HF-STD-004.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Human Factors Training Analysis Report resulting from the training analysis tasks delineated in FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Content. The Training Analysis Report must contain the following information:

7.1.1. Personnel who require training.

7.1.2. Tasks that require training.

7.1.3. Training systems and aids, including any requirements for embedded training.

7.1.4. Training support required for the system, including refresher training.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Early User Involvement Event Report	**HF-DID-009A**

3. DESCRIPTION / PURPOSE

The Early User Involvement Event Report describes the results of an Early User Involvement Event.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the content preparation instructions for the Early User Involvement Event Report resulting from tasks delineated in FAA HF-STD-004.

7. PREPARATION INSTRUCTIONS

7.1 Content. The Early User Involvement Event Report must contain the following information:

7.1.1 Date.

7.1.2 System and description of system elements evaluated.

7.1.3 Description and number of participants.

7.1.4 Description of methods.

7.1.5 Page/location or description of element along with description of issue as specific as possible.

7.1.6 Description of why the item is problematic.

7.1.7 Severity of problem (taking into account frequency, impact, and persistence of potential issues).

7.1.8 Recommendation for mitigation.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Personnel Qualifications Report	**HF-DID-010A**

3. DESCRIPTION / PURPOSE

A Personnel Qualifications Report contains a description of the contractor personnel who will be involved in the development, execution, and/or delivery of the Human Factors efforts as described in this Standard. The report includes a description of their minimum experience, education, knowledge, and skills.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

The purpose of this Data Item Description (DID) is to establish the requirements for the content and format of the Personnel Qualifications Report. This DID is applicable to all contract Human Factors Engineering efforts.

7. PREPARATION INSTRUCTIONS

7.1 Process. The deliverable must be submitted as a draft for FAA review. Any deficiencies in the quality of the human factors personnel will be noted and communicated to the contractors. The contractors must correct any noted deficiencies, incorporate the changes into the personnel qualifications report, and submit a revised draft to the FAA. The contractor must notify the FAA if there are any changes in human factors personnel described in the personnel qualifications report and update the personnel qualifications report to reflect changes. The FAA reserves the right to approve changes in personnel for human factors efforts, based on qualification requirements.

7.2 Source material. The source material for the personnel qualifications report includes contract documents, resumes, and other related information.

7.3 Deliverable. The deliverable is the Personnel Qualifications Report.

7.3.1 Content requirements. The Personnel Qualifications Report must contain the following information:

7.3.2 Cover sheet. A Personnel Qualifications Report must contain a cover sheet displaying the following information:

7.3.2.1 Document title.

7.3.2.2 FAA solicitation number.

7.3.2.3 Contract number.

7.3.2.4 Contractor name, address, phone number, and email address.

7.3.2.5 Submission date.

7.3.3 Task and personnel matrix. List of human factors tasks and personnel associated with the tasks, with the amount of time each person will spend on the specific task.

7.3.4 Resumes. Resumes must be provided for all project personnel. Resumes must include:

7.3.4.1 Summary of experience, which includes the number of years of experience in major skill areas relevant to the tasks in this Standard.

7.3.4.2 Education including the year graduated, major, and degree.

7.3.4.3 Work experience, beginning with the most recent and indicating the name of the organization and years of employment with each organization.

7.3.4.4 Professional recognition awards and relevant publications.

7.4 Format requirements. The contactor must use a format agreed upon by the FAA.

7.5 Special instructions. Individual programs may specify minimum or unique personnel qualification requirements. If so, they will be included in the contract.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Heuristic Evaluation	**HF-DID-011A**

3. DESCRIPTION / PURPOSE

The Human Factors Heuristic Evaluation identifies the data that should be captured and reported from a Heuristic Evaluation.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Heuristic Evaluation.

7. PREPARATION INSTRUCTIONS

7.1 Content. The Human Factors Heuristic Evaluation must contain the following information:

7.1.1 Date.

7.1.2 Contract number.

7.1.3 Contractor name and address.

7.1.4 Name of evaluators.

7.1.5 System name.

7.1.6 Page/location/description of issue.

7.1.7 Heuristic violated.

7.1.8 Severity (frequency, impact, persistence).

7.1.9 Recommended resolution.

7.1.10 List of heuristics used.

7.1.11 Definition of severity ratings.

7.1.12 Summary data across evaluators.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Engineering in System/Subsystem Review	**HF-DID-012A**

3. DESCRIPTION / PURPOSE

The Human Factors Engineering in System/Subsystem Review identifies the data that should be captured and reported from a system or subsystem review.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Human Factors Engineering in system/subsystem reviews.

7. PREPARATION INSTRUCTIONS

7.1 Content. The Human factors engineering in system/subsystem reviews must contain the following information:

7.1.1 Cover page. The report must contain a cover and title page identifying the following:

7.1.1.1 Date of issue.

7.1.1.2 Document number/revision number or letter.

7.1.1.3 Contract number.

7.1.1.4 Contractor name and address.

7.1.1.5 Name of review.

7.1.1.6 Program.

7.1.1.7 Security classification, if classified.

7.1.1.8 Distribution statement.

7.1.2 Revision control. The report must contain a list of all revisions identifying the following information:

7.1.2.1 Each revision number or letter.

7.1.2.2 Date of each revision.

7.1.2.3 Pages affected by each revision.

7.1.3. Table of contents. The table of contents must identify each major section title, paragraph number, and starting page number for each major section.

7.1.4. Main body. The report must address in depth each major section identified below:

7.1.4.1 Introduction

7.1.4.2 Scope.

7.1.4.3 Description of review.

7.1.4.4 Participants.

7.1.4.5 Conditions.

7.1.4.6. Compliance of system with HF-STD-001 or other relevant standards.

7.1.4.7. Human factors issues identified.

7.1.4.8. Recommendations for issue resolution.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Human Factors Engineering Closeout Report	**HF-DID-013A**

3. DESCRIPTION / PURPOSE

The Human Factors Engineering Closeout Report is used to ensure that human factors issues have been closed or that there are risk mitigation strategies in place prior to system deployment.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

6. APPLICATION / INTERRELATIONSHIP

This Data Item Description (DID) contains the format and content preparation instructions for the Human Factors Engineering Closeout Report.

7. PREPARATION INSTRUCTIONS

7.1 Content. The Human factors engineering in system/subsystem reviews must contain the following information:

7.1.1 Cover page. The report must contain a cover and title page identifying the following:

7.1.1.1 Date of issue.

7.1.1.2 Document number/revision number or letter.

7.1.1.3 Contract number.

7.1.1.4 Contractor name and address.

7.1.1.5 Name of review.

7.1.1.6 Program.

7.1.1.7 Security classification, if classified.

7.1.1.8 Distribution statement.

7.1.2. Table of contents. The table of contents must identify each major section title, paragraph number, and starting page number for each major section.

7.1.3. Human factors issues identified.

7.1.4 Status of human factors issues.

7.1.5 Risk mitigation strategies.

7.1.6 Remaining risks.

7.1.7 Lessons learned.