DATA ITEM DESCRIPTION

Form Approved
OMB No. 0704-0188

1. TITLE	2. IDENTIFICATION NUMBER
TRAINER ENGINEERING REPORT	DI-FACR-81216

3. DESCRIPTION / PURPOSE

3.1 This report provides the necessary data to define detail design and performance characteristics for operational and maintenance support of the training device.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
910621	N/NTSC-224		

7. APPLICATION / INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by the specific and discrete task requirement as delineated in the contract.

7.2 This DID supersedes UDI-E-25555, UDI-E-25561, and UDI-S-25591.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
		N6648

10. PREPARATION INSTRUCTIONS

10.1 Reference documents. The applicable issue of the document cited herein, including its approval date and dates of any applicable amendments, notices, and revisions, shall be as specified in the contract.

10.2 Content. The Trainer Engineering Report shall contain two major sections as follows:

10.2.1 Section I. This section shall describe and discuss the engineering design of the trainer with necessary narrative, diagrams, drawings, schematics, sketches, and illustrations. It shall be organized into subsections to include information as follows:

10.2.1.1 General arrangement.

a. General description and arrangement. This subsection shall contain a general description of the trainer and the proposed layout and arrangement of all major components. It shall include a pictorial illustration showing the relative location and appearance of the trainer components.

(Continued on Page 2)

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Block 10, Preparation Instructions (Continued)

b. Design considerations. Describe the design considerations leading to the recommended general arrangement for the equipment. All basic assumptions, design parameters,and space location objectives shall be clearly set forth. In addition, the space requirements for maintenance and accessibility for servicing and replacement shall be described. Specific characteristics of the trainer arrangement shall include the following:

(1) Size or floor space for building or enclosing structures.

(2) Space requirements and installation in or on vehicles or weapons.

(3) Size and loading requirements of raised floor for computer system and related components.

(4) Fire protection.

(5) Grounding system.

(6) Electromagnetic suppression.

(7) Intercommunication facilities.

(8) Aisle areas.

(9) Cable and duct routing.

(10) Hydraulics system, if applicable.

(11) Computer system and related interface cabinet spacing, power, and cooling requirements.

(12) Visual system requirements, if applicable.

(13) Motion system requirements, if applicable.

c. Design Approach. This subsection shall include the following:

(1) Layout drawings.

(2) Electrical load analysis and distribution.

(3) Power requirements.

(4) Fault analysis.

(5) Air-conditioning.

lock 10, Preparation Instructions (Continued)

(6) Hydraulics distribution, if applicable.

(7) Noise control.

(8) Safety.

10.2.1.2 Engineering Detail Design.

a. Design considerations. Describe the considerations leading to the recommended trainer design. A comparison of the operational system(s) and the required simulation system(s), as well as a discussion of such items as inputs, outputs, size, configuration, proposed locations, extent of simulation, techniques to provide simulation (simulate versus stimulate), extent of modification to, and use of, operational system components, computer hardware requirements (timing, memory, computational speed, other capabilities), computer software requirements, visual system requirements, motion,and control loading systems, and any other information required to clearly describe the proposed simulation design shall be included. This section shall also note and explain all instances where the design performance requirements of the simulated system do not exactly simulate the performance of the operational system. In addition, if the technical proposal is incorporated in the final contract, full justification shall be provided for any government approved variances from the originally proposed design.

b. Design approach. In this subsection, the selected design approach shall be described with sufficient background information, design theory, inputs, outputs, extent of simulation, techniques to provide simulation/stimulation, computer hardware and software, applicable motion, visual and control loading systems, and any other information to clearly describe the design. The description shall be supplemented by functional flow and block diagrams (showing mnemonics and typical waveshapes), drawings, and photographs to the extent required to fully support and clarify the discussion.

c. Performance. Describe the operation of the trainer and all supporting systems to substantiate compliance with each of the performance requirements of the applicable specifications.

d. Test criteria. This subsection shall set forth the operational and environmental characteristics of the trainer and all related systems to enable a comparison to be made between the trainer test results and these characteristics. The trainer performance characteristics shall be established and presented for each major system and related subsystems.

Block 10, Preparation Instructions (Continued)

e. Construction. Describe the general design features and construction of the trainer and all related systems to substantiate compliance with design and construction requirements of the applicable specifications. The section shall include or be referenced to general assembly drawings showing typical construction features, as well as drawings or sketches with descriptions of the trainer's major components showing method of assembly and provisions for maintenance access.

10.2.1.3 Instructor/Operator Area Detail Design.

a. Design requirements. Describe the considerations leading to the recommended instructor/operator area design. All standards established and basic assumptions made in developing the design of the indicators, displays, and controls shall be clearly set forth. Sufficient discussion of the human engineering aspects of the design shall be provided to substantiate the final configuration.

b. Design Approach. Include a description of the theory of operation including a block diagram and schematic showing signal flow and the function of each circuit; outline scale drawings of instructor/operator areas showing plan view, elevation, and section views of the display console(s) and miscellaneous equipment; drawings of all panel layouts and a complete description of the function of each indicator, display or control; a description of the functions necessary for the instructor/operator to set up and control operational problems; installation and adjustment requirements; and an outline of the required and proposed system accuracies and tolerances.

c. Miscellaneous equipment. Describe specific characteristics of any miscellaneous equipment provided. Equipment interface characteristics shall be specified wherever specific operation conditions must be met for satisfactory integration of the equipment into the system.

10.2.1.4 Trainee Area Detail Design.

a. Design requirements. Include those areas specified under the Design Requirements section of the Instructor/Operator Area Detail Design (see 10.2.1.3.a) as they apply to the trainee area.

b. Design approach. Include those areas specified under the Design Approach section of the Instructor/Operator Area Detail Design (see 10.2.1.3.b) as they apply to the trainee area.

c. Miscellaneous. Include those areas specified under the Miscellaneous section of the Instructor/Operator Area Detail Design (see 10.2.1.3.c) as they apply to the trainee area.

lock 10, Preparation Instructions (Continued)

10.2.1.5 Computer System Detail Design.

a. Design requirements. Describe the considerations leading to the recommended computer system's hardware and software design. All standards established and basic assumptions made in developing the computer system design shall be clearly set forth. Sufficient discussion of the human engineering aspects of the design shall be provided to substantiate the final configuration.

b. Design approach. Include a description of the theory of operation including a block diagram and schematic showing signal flow, interface points, and the function of each circuit; outline scale drawings of the computer system and interface cabinet layout showing plan view, elevation, and section views of the cabinets and miscellaneous equipment; a complete description of the function of each display console and control; installation and adjustment requirements; and an outline of the required and proposed system accuracies, timing and memory capacity, computational speed, and other capabilities.

c. Miscellaneous. Describe specific characteristics of any miscellaneous equipment provided. Equipment interface characteristics shall be specified wherever specific operation conditions must be met for satisfactory integration of the equipment into the system.

.2.1.6 Motion/Control Loading System Detail Design.

a. Design requirements. Describe the considerations leading to the recommended motion/control loading system's hardware design. All standards established and basic assumptions made in developing the mechanical design shall be clearly set forth. Sufficient discussion of the maintenance aspects of the design shall be provided to substantiate the final configuration.

b. Design approach. Include a description of the theory of operation including a block diagram and schematic showing hydraulic flow, coupling points, and the function of each individual flow circuit; outline scale drawings of the motion/control loading system's hardware layout showing plan view, elevation, and section views of the plumbing, connections, pumps, and miscellaneous equipment; a complete description of the function of each valve and control; installation and adjustment requirements; and an outline of the required and proposed system capacities and other capabilities.

c. Miscellaneous. Describe specific characteristics of any miscellaneous equipment provided. Equipment interface characteristics shall be specified wherever specific operation conditions must be met for satisfactory integration of the equipment into the system.

Block 10, Preparation Instructions (Continued)

10.2.1.5 Computer System Detail Design.

10.2.2 Section II. Describe the design of the trainer to meet the specified requirements, the test criteria to be used to ensure conformance to the specified requirements, and all necessary information concerning site preparation and support facilities requirements to allow the user to prepare for receipt, installation and operation of the trainer. It shall be organized into chapters and sections to include the information as follows:

a. System analysis. A description of the training problem which the trainer is intended to solve shall be presented. A brief description of the proposed technical approach shall be included in this section.

b. Design approach. The design consideration and assumptions made in arriving at the design approach shall be described. Drawings, sketches, diagrams, calculations and similar devices as necessary to describe the proposed technical approach should be used.

c. Test plans and criteria. Test plans and the plan for test of each component of the device and for test of the complete trainer system shall be discussed. A brief description of the method to be used to implement the test plan shall be included.

d. Test procedures and measurements. Describe in general terms the tests to be performed. Reference shall be made to the Acceptance Test Procedures developed under separate action as specified on the respective DD1423 contained in the contract.

e. Test equipment. List all the test equipment required to conduct the test including the method of application, special instructions, calibration curves, and required test equipment accuracies.

f. Reliability. Discuss the considerations, techniques, analysis, and calculations employed to ensure that the basic design meets the minimum reliability requirements as specified in the detail specification.

g. Construction. Discuss the considerations and techniques employed to assure that equipment is constructed in accordance with the trainer specification.

h. Maintainability. Discuss the maintainability design considerations, design criteria and planning, quantitative maintainability goals predicted to meet specified availability criteria, maintenance concept used for maintainability planning and establishment of quantitative goals, and the establishment of the extent of participation of maintainability personnel in design reviews.

Block 10, Preparation Instructions (Continued)

i. Installation requirements. Include all the information required for installation of the trainer, including facilities requirements and a description of the general arrangement of the trainer with appropriate drawings, photographs, and sketches.

j. Electromagnetic interference suppression. Include the engineering techniques and practices that will be incorporated to ensure compliance with Electromagnetic Interference Suppression requirements of the detailed specification.

10.3 Format. Contractor format is acceptable.