DATA ITEM DESCRIPTION

Title: NUCLEAR SURVIVABILITY DESIGN PARAMETERS REPORT

Number: DI-NUOR-80927A

Approval Date: 20130201

AMSC Number: F9319

Limitation:

DTIC Applicable: N/A

GIDEP Applicable:

Preparing Activity: 27 (AFNWC)

Applicable Forms: N/A

Use/Relationship: The Nuclear Survivability Design Parameters Report shall describe the system features/parameters that constitute and control the system's nuclear survivability. Documenting and controlling these features/parameters throughout the acquisition process will support the assurance of the system's nuclear survivability during production, assist in retaining survivability during system maintenance and overhaul, aid in retaining survivability during product improvements and engineering change proposals, preserve the operational procedures related to nuclear survivability, and aid in controlling the life-cycle cost of nuclear survivability.

a. Application. When a solicitation or contract contains a requirement for nuclear survivability, this Data Item Description (DID) shall be listed on the Contract Data Requirements List (CDRL) (DD Form 1423). The documents sited in this DID are to be used for guidance and are not mandatory for the CDRLs.

b. This DID contains the format and content preparation instructions for the data product generated by the specific and discrete task requirements as delineated in the contract.

c. Interrelationship: The information in this report is the basis for the Nuclear Survivability Assurance Plan. This data can also be used for Detailed Test Plans, Functional Configuration Audits, Physical Configuration Audits, Configuration Items, Allocated Configuration Identification, Repair Parts and Special Tool List, Logistic Plans, Field Manuals, Technical Manuals and Producibility, Engineering, and Planning. If the nuclear Survivability Design Parameters Report was a requirement in the preceding acquisition phase, that report shall form the baseline for the current report. Some of the data in this report should be drawn from the output of the Nuclear Survivability Program Plan. When a solicitation or contract has this report as a requirement, the Nuclear Survivability Program Plan shall be listed on DD Form 1423.

d. Air Force Instruction (AFI) 10-2607, *Air Force Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability*, contains the AF policy applicable to nuclear survivability.

(Copies of the AF Instruction are available online at http://www.e-publishing.af.mil/.)

e. This DID is related to DI-NUOR-80926, the *Nuclear Survivability Assurance Plan*.

(Copies of the DID are available online at https://assist.dla.mil/quicksearch/ or from the Standardization Document Order Desk, 700 Robbins Ave., Bldg 4D, Philadelphia PA 19111-5094.)

Requirements:

1. Reference documents. The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices and revisions, shall be as specified in the solicitation or contract.

2. General. The Nuclear Survivability Design Parameters Report shall contain a detailed description of those features/parameters of the system that constitute and control the system's nuclear survivability. All contractor furnished equipments, to include non-development items (NDI) and proprietary designs, materials, components or equipments, shall be included in this report.

3. Format. The Nuclear Survivability Design Parameters Report shall be in the contractor's format.

4. Assumptions.

a. Any assumptions that were made in the interpretation of the nuclear survivability requirements and the systems' operational specifications during or after the nuclear event, the various configurations, vehicles and enclosures that affect the system's nuclear response, and the Government Furnished Equipment (GFE) associated with the system shall be included in the Nuclear Survivability Design Parameters Report.

b. The assumptions concerning the deployment and the operation of the equipment designed to ameliorate NWE shall be provided as in these examples: (1) modification of the environments by enclosures or vehicles, (2) operator functions that are expected to be performed during routine setup, (3) operator functions that are expected to be performed after a nuclear event to restore the equipment to full operational capability, (4) packaging or handling functions required for survivability of stored equipment, components and parts, (5) measures taken during transportation, loading , handling and storage.

c. The nuclear survivability criteria levied on the contract shall be included.

5. Specific information contained in the report:

a. The report shall identify the system, assembly, circuit, module, component, piece part, or material parameters that are critical to the system's operation in the specified nuclear environments, including both the specification of these parameters in detail and the limits of acceptable variation of these parameters.

b. The report shall provide the design analysis information including the specific levels of degradation that can be tolerated for each hardness critical item (HCI) and for each specific circuit, configuration or applications of such in the system. A complete HCI list is a critical ingredient in the capability to manage and preserve survivable configurations and shall be provided.

c. A statement of the rationale for the choice of design criteria shall be provided, identifying particular parameters with the appropriate parts of the nuclear survivability criteria environment and explaining the association of these parameters with the environments.

d. The report shall provide a description and the results of all tests, calculations, and/or analyses that support the choice of these parameters.

e. The report shall discuss considerations made in the design phase to specifically exclude certain unacceptable designs, piece parts or piece part technologies, components, or materials.

f. Minimum acceptable design margins and justification for the use of HCIs and harness critical processes (HCPs) shall be discussed.

g. When failure modes and effects analysis (FMEA) or failure modes and effects criticality analysis (FMECA) are required elsewhere in the contract, how the impact of the survivability degradation risks will be integrated shall be defined.

6. Typical information. The Nuclear Survivability Design Parameters Report shall contain the following items:

a. For transient radiation effects: The critical semiconductor parameters, the selection or the exclusion of specific device technologies, specific circuit design considerations such as, feedback, current limiting and circuit parameters, and critical subassembly electrical parameters. The implementation of crowbars or circumvention or write-protect for critical memory data shall also be documented.

b. For electromagnetic pulse (EMP): Shielding effectiveness parameters. Shielding design, filter and arrestor designs, choice of cables, connectors, the assumptions concerning EMP coupling sources and the system's GFE, the system's configurations that were considered in the analysis, and the methods used and the assumptions made in the system's response analysis shall be described.

c. For blast: Critical structural members or designs, mechanical details of the structure that provide protection against dust, impact, shock, and the considerations given for the blast-thermal synergism shall be described.

d. For thermal radiation: The identification of critical external components and the worst-case analysis of the response of these parts, to include the operational impacts, shall be defined.

7. The Nuclear Survivability Design Parameters Report shall document:

a. The operational or functional consequences of implementing or ignoring each of the nuclear survivability measures cited.

b. Survivability maintenance and surveillance considerations as they apply to the selected design features.

c. Data and interface requirements with survivability assurance, system test, Logistic Support Analysis Record (LSAR), and other related design functions.

8. End of DI-NUOR-80927A.