DATA ITEM DESCRIPTION

Form Approved
OMB No. 0704-0188

2. TITLE	1. IDENTIFICATION NUMBER
Mathematical Model Report, Dynamic Shock Analysis	DI-ENVR-81031

3. DESCRIPTION/PURPOSE

3.1 This report describes the structural and functional characteristics and the mathematical model of a shipboard equipment or structure, with its foundation, for purposes of dynamic shock analysis.

3.2 This report is used to provide assurance that equipment or structure will be properly modelled prior to submittal of the dynamic shock analysis report.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTIC APPLICABLE	6b. GIDEP APPLICABL
900926	SH/55X13		

7. APPLICATION/INTERRELATIONSHIP

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

7.2 This Data Item Description supersedes UDI-E-23118.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
		N4989

10. PREPARATION INSTRUCTIONS

10.1 Format. The report shall be in contractor's format.

10.2 Content. The report shall contain the following information:

10.2.1 An introductory description of the equipment or structure being analyzed and its normal function or operation.

10.2.2 The planned location and orientation of the equipment or structure with respect to the ship's axes.

10.2.3 The shock grade (A or B) to which the equipment is to be qualified.

10.2.4 Mounting location (hull, deck or shell) of the equipment.

10.2.5 Type of shock design value (elastic or elastic-plastic) to be used in the analysis.

10.2.6 Procurement specifications under which the equipment is procured.

10.2.7 Description of proposed method of analysis.

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11. DISTRIBUTION STATEMENT

11. Distribution Statement A: Approved for public release; distribution is unlimited.

Block 10: Preparation Instructions (Continued):

10.2.8 A list of specific areas of concern of the equipment or structure which might be subject to high stresses or deflections under shock loading.

10.2.9 Assumptions which have been made in the preparation of the model and justifications for such assumptions.

10.2.10 An estimate of the weight and location of the center of gravity of the equipment or structure. A listing of weights of components which are used to arrive at the equipment or structural weight shall also be included.

10.2.11 Description of the proposed breakdown of the equipment or structure for analysis. The description shall indicate how the proposed mass breakdown permits determination of stresses and deflections in the previously defined areas of concern. The magnitude of major masses and their locations with respect to a specified coordinate system shall be indicated.

10.2.12 Description of the extent and structural characteristics of the foundation. Sketches or drawings shall be included in the report to indicate the arrangement of the equipment and its foundation.

10.2.13 Properly labeled figures and text to describe the model for each direction of shock. The text shall discuss:

a. Formulation of the model.
b. List of representative element properties.
c. Method of combining shock stresses with continuing operating stresses.

When the model is prepared for computer analysis, the following information shall also be included:

d. A description of the applied portion of the computer program and the characteristics of the elements to be used.
e. A complete printout and description of the input data used.
f. The node and element numbering system and plots of the model to help the reviewer correlate specific nodes or elements with the input data.
g. Boundary conditions used in the model.

10.2.14 Fixed-base natural frequency of suspected low frequency system components, e.g., shafts, cantilevered equipment, yardarms and a comparison of these frequency values to the cut-off frequency of the system and the components modelled accordingly.

10.2.15 References to the source of analysis method, formulas, constants, curves and all other sources used. Shock tested items which are a part of the equipment or structure to be analyzed must be included in the model but need not be modelled in detail. The specific shock test report and Navy letter of approval of the tested item shall be cited.

10.2.16 Equipment outline and assembly drawings, support, sub-base and foundation plans. The report shall include preliminary drawings when final drawings are not available. If no drawings are available, sketches shall be provided. These drawings or sketches shall disclose a level of design detail commensurat with the analysis. Detailed working drawings are not required.