# MIL–STD-705

## *Military Standard Generator Sets, Engine Driven, Methods of Test and Instructions*

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# MILITARY GENERATOR SET TEST METHODS

- MIL-STD-705, and its companion hand book MIL-HDBK-705, are the definitive reference standards for testing of military generator sets and components.
- MIL-STD-705 and MIL-HDBK-705 establish uniform test equipment, facilities, and procedures for conducting the tests.
- This standard does NOT specify the limiting values for the tests, nor does it specify the tests required for a specific generator set.

# LEGAL AUTHORITY

- MIL-STD-705 traces its legal authority through the Defense Standardization Program (DSP), to the Defense Cataloging and Standardization Act, Public Law 82-436, as codified by USC, Title 10, Chapter 145 Cataloging and Standardization, sections 2451 and 2452.
- The Public Law 82-436 required the Secretary of Defense to develop a single catalog system and program of standardizing supplies.
- The Secretary of Defense issued DoD Instruction 4120.24, which authorizes:
  - Publication of DoD Instruction 4120.24-M.
  - DSP Policies and Procedures.
  - Charters the Defense Standardization Council (DSC).
- The lead Standardization Activity for MIL-STD-705 under the authority listed above is the US Army Communications Electronic Command (CECOM), Logistics and Readiness Center (LRC).

# HISTORY

- The Defense Cataloging & Standardization Act 10 USC 145 § 2451-2457 was approved on 1 July 1952.
- MIL-G-10228, first published 7 April 1950, specified various Test Methods used in procurement.
- Based on MIL-G-10228, MIL-STD-705 was first issued on 17 October 1958.
- Since the initial issuance, MIL-STD-705 was revised to:
  - MIL-STD-705A, issued on 5 March 1963.
  - MIL-STD-705B, issued on 26 June 1972.
  - MIL-STD-705C, the current revision, issued on 24 April 1989.
- MIL-STD-705C is currently under review.

# DEVELOPMENT AND MAINTENANCE OF THE STANDARD AND HANDBOOK

- MIL-STD-705 is formatted in accordance with MIL-STD-962, *DEFENSE STANDARDS FORMAT AND CONTENT* , which is the standard for writing DoD standards.
- MIL-STD-962 specifically includes information on how to write interface standards, standard practices, design criteria standards, manufacturing process standards, and test method standards.
- The requirements for DoD handbooks are similarly covered by MIL-STD-967, *DEFENSE HANDBOOKS FORMAT AND CONTENT* .

# HOW MIL-STD-705 IS USED

- Purpose
  - MIL-STD-705 is intended to explain, establish and standardize specific methods for measurements associated with the evaluation of electric generators, generator sets, and related components.
  - The intended use of this standard is to determine compliance with characteristics represented by procurement documents.
  - In no case is failure criteria established within MIL-STD-705.

# HOW MIL-STD-705 IS USED

- During the Development Phase.
  - Government
    - Combat developer (TRADOC) establishes requirements.
    - Program Manager (PM-MEP) refines these requirements and defines the required MIL-STD-705 testing needed to establish compliance to these requirements in Purchase Descriptions.
  - Contractor
    - Proposes designs with test plans based on MIL-STD-705 test methods.

# HOW MIL-STD-705 IS USED

- During the Procurement Phase
  - All Generator Sets coming off the production line are subjected to selected MIL-STD-705 tests and must:
    - Pass three generator only tests and one test of the generator and excitation system.
    - Pass nineteen tests that are designed to test the total system's readiness to be fielded.
      - These tests are mainly concerned with safety, fault indication, power quality, power rating, and the performance of the generator set.
  - Sample units are selected from each production lot and subjected to selected MIL-STD-705 tests and must:
    - Undergo a more severe test of the generator's mechanical strength.
    - Pass seven additional generator set tests :
      - Noise, endurance, operation at high temperature, reverse battery polarity, and three tests for power quality.

# HOW MIL-STD-705 IS USED

- During the Sustainment Phase (30 to 40 years)
  - Second Source Qualification under MIL-STD-705 Test Methods.
    - Lack of resources and cost dictate bench testing.
    - Multiple vendors require standardized test methods.
  - Spare part obsolescence requires new source qualification under MIL-STD-705 Test Methods.
    - Repair parts.
    - New technology.
      - Electrical and mechanical requirements.
      - Environmental requirements.

# CHALLENGES FOR THE FUTURE

- Changing technology may require new test methods for MIL-STD-705.
  - Generator Set Design:
    - Fixed Speed Alternators.
      - Brushes.
      - Brushless, rotating excitation field.
    - Variable Speed Alternators.
      - Permanent magnet alternator with an electronic inverter to create alternating current at 60 Hz.
  - Fuel Cells.
  - Wind Turbines and Solar Cells.
- Aging Work Force.

# Useful links

- PROJECT MANAGER - MOBILE ELECTRICAL POWER Website,
  http://www.pm-mep.army.mil/
- DEFENSE STANDARDIZATION PROGRAM Website
  http://www.dsp.dla.mil/
- DEFENSE STANDARDIZATION PROGRAM, STANDARDIZATION DIRECTORY Website,
  http://www.dtic.mil/whs/directives/