

Helicopter Mission Definition

1. SCOPE:

1.1 Purpose:

The purpose of this recommended practice is to establish a standard format for the presentation of helicopter mission data, which will provide data required to establish airframe and/or engine component life.

1.2 Application:

The primary application of the data presented by the procedures of this document is in the preliminary design phases of a life cycle. Due to the lack of actual in-service data, the information gives the designer the initial estimate of the expected engine duty cycle.

The preliminary design data should be modified as additional data are obtained from service experience. Examination of flight recordings of the pertinent parameters will provide a more clear definition of the mission.

2. DEFINITION OF TERMS:

2.1 Mission Element:

Each specific operating condition of the mission is divided into component units. Each element represents an essentially constant power condition of the engine(s).

2.2 Elapsed Time:

The duration for which the engine operates at a particular mission element is recorded as the elapsed time for that element.

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2.3 Transient Time:

The elapsed time period between two successive mission elements is recorded as the transient time between these power level changes.

2.4 Aircraft Required Horsepower:

The total power required by all engines to generate the mission element is the Aircraft Required Horsepower. Power required to operate aircraft accessories is included.

2.5 Helicopter Velocity:

An average value is recorded for helicopter velocity during each mission element.

2.6 Altitude:

The altitude recorded represents an average pressure altitude above sea level during the mission element.

2.7 Ambient Temperature:

The average temperature of the environment in which the helicopter is operated is given by Ambient Temperature.

3. DATA PRESENTATION:

The data of the helicopter mission shall be presented essentially as shown in Figure 1. This chart should be supplemented with a histogram of the mission. Typical examples are given in Figures 2 through 4.

The minimum data required are as follows:

3.1 Mission:

A brief definition of the mission type, e.g., search mission, pilot training mission, etc. shall be given. Frequency of non-repetitive elements, such as power checks shall be given.

3.2 Mission Duration:

A summation of the elapsed times for the mission elements and the transient times between elements yields the duration of the mission.

3.3 Mission Data:

Data which describes the elements of the mission and the values of all required variables to be recorded are the Mission Data.

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3.4 Ambient Temperature:

The “average low”, “average” and “average high” temperatures corresponding to each mission element shall be indicated. These three values are required since the defined mission may be carried out over calendar periods during which varying ambient temperatures will be encountered. Note that the “average low” and “average high” values are not synonymous with minimum and maximum, but represent representative values for the left and right hand end portions of the temperature distribution curve. Refer also to 3.5.

3.5 Ambient Temperature Distribution:

Information is required as to what percentage of flights are carried out under the “average low” and “average high” ambient temperature conditions.

3.6 Transient Time for Changes in Power Levels:

Transient time describes the acceleration and deceleration times for any change in the power generated by the engines.

3.7 Remarks:

This will include any supplementary explanations considered desirable by the helicopter manufacturer, e.g., the information referred to in 3.3.

3.8 Power Extractions:

The amount of accessory loading, bleed air extraction, or other engine power used for other than propulsion should be noted.

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