FNPT II Validation Data Requirements

Reference: JAR STD 3A, Change 1, June 1999

When JAR STD 3A was created, the design and validation requirements were carefully defined by specifically taking into account the intended use of these new devices. As the number of FNPTs has increased, the number of FNPT manufactures increased and the number of NAAs qualifying these devices has increased; points requiring clarification of the original intent of JAR STD 3A have arisen from time to time.

One particular issue that now needs wider clarification is the validation data requirements for the Qualification Test Guide.

Unlike Flight Simulators (JAR STD 1A) and Flight Training Devices (JAR STD 2A), Flight and Navigation Procedures Trainers (JAR STD 3A) are intended to be generic devices (although, if desired, they can of course be type specific). By allowing these devices to be generic, the ownership costs are minimized, whilst the JAR FCL 1 training objectives for students using these devices can still be fully supported.

If the device is generic, the validation data will also be generic.

The definitions and Minimum Technical Requirements supporting the generic nature of FNPTs are summarized below:

> (JAR-STD 3A.035)
> **FNPT II: A ground based training device which represents the flight deck environment of a multi-engine aeroplane type or class to the extent that the systems appear to function as in an aeroplane**……..

> (Appendix 1 to JAR STD 3A.030, Table 2, para 7 & 8)
> **Control forces and control travels which respond in the same manner under the same flight conditions as in the aeroplane or class of aeroplane being simulated**

And

> **Aerodynamic modeling shall reflect (a) the effects of airframe icing and (b) the rolling moment due to yawing.**

The key points when determining the acceptability of Validation Data for use within the QTG are summarized below:

> (AMC STD 3A.030 paras 1.5.4 & 1.5.5)
> **For the initial qualification testing of FNPTs Validation Data will be used. They may be derived from a specific aeroplane within the class of aeroplane**

the FNPT is representing or they may be based on information from several aeroplanes within the class……..…

And

The substantiation of the set of data used to build the Validation Data should be in the form of an engineering report and shall show that the proposed Validation Data are representative of the aeroplane or the class of aeroplane modeled…..…..…..…..…

Further guidance for manufacturers is given to ensure that the device is "representative" of a class of aeroplane, typically JAR FCL "MEP":

(IEM STD 3A.030, Para 2.1)
Simulated Aeroplane Configuration

Unlike Flight Simulators, FNPT I and FNPT II are intended to be representative of a class of aeroplane (although they may in fact be type specific if desired)

……**control type, control force and position, performance and handling and powerplant configuration should be representative of the class of aeroplane or the aeroplane itself**.

As most of the regulatory experience was based on qualifying flight simulators, the paragraph below was specifically included in JAR STD 3A by the 3A Working Group to ensure that FNPTs were not subject to inappropriate regulatory objective testing standards:

(IEM STD 3A.030, Para 5)
Testing/Evaluation

……..For initial evaluation, it is highly desirable that the device should meet its design criteria within the listed tolerances, however unlike the tolerances specified for Flight Simulators, the tolerances contained within this document are specifically intended to be used to ensure the repeatability during the life of the device and in particular at each recurrent regulatory inspection……

In summary, FNPTs are generic devices representing, to the extent necessary, a class of aeroplane sufficient to support the intended use of these devices as training tools. The initial validation testing process is heavily dependant on subjective acceptance. The objective validation testing is required to ensure that these devices remain unchanged

during their lives. An acceptable mean to substantiate the objective Handling Qualities tests would be to subjectively check the FNPT device with a qualified pilot approved by the Authority, and determine whether or not the FNPT device is relevant of the aircraft or class of aircraft simulated. Hence subjective assessment from both the operator and the manufacturer could be accepted as validation data for the Handling Qualities tests.

This approach is directly opposite to that used for the initial and recurrent qualification of type specific synthetic training devices (Flight Training Devices and Flight Simulators). Flight test data is not required for objective testing.