APPENDIX 4-3

LICENSES AND RATINGS

LICENSING DISCUSSION. UAV T-F, WG III

1. Summary

- A UAV system crewmember and technician crewmember should have a license
- A basic aviation knowledge level is equal to manned aviation and should be given within the JAR-FCL framework
- UAV "flight" crew member should have a medical approval, but without the physical aerial requirements
- JAR-FCL should contain requirements for theoretic training and checking and procedures addressed to JAR-OPS for checking, checking functions and how to issue license and ratings
- JAR-OPS should have requirements for basic and type system training, recurrent training, experience and checking of these activities. Also how to issue a license after checking the results from theoretical and practical training.
- Details of these topics, exact border between JAR-FCL and JAR-OPS have to be further discussed and considered

2. Background

To enable international UAV operation, as manned aviation operation are functioning, essential safety responsibility human functions must have an authorisation acknowledged by the concerned communities. This means a need for a licence with criteria's based on the Annex 1 framework, and this requirement will be met by the JAR-FCL system.

JAR-FCL matches the manned aviation world with defined airworthiness standards, training requirements and facilitations synchronised accordingly and harmonised with corresponding operational requirements. Within the JAR-FCL system an individual find his way from the basic license up a certain type specific rating. JAR-FCL "deliver" a type rated pilot to an operator and the operator has "only" to adopt the crewmember to the organisation within the requirements in JAR-OPS 1. The operator will train and authorise, via a conversion course, the crewmember for his appointed tasks, e g as a commander. So all basic skills and type knowledge is within JAR-FCL and how to use that skills in a certain organisation is within JAR-OPS.

In the UAV world there are no current airworthiness standards, or defined "type" criteria's. A UAV system using the same air vehicle could be different in system structure and operational use of the system, which could act in different air environments with different amount of freedom. It is likely to believe that most of the skill and operational knowledge of a system lies, or will lie, within operator. (Or manufacture, acting as operator, when system is being designed and tested)

Because of the varied UAV world, but the limited number of system and operators, most of the skill and operational training could be performed within the operational requirements (JAR-OPS) and a basic aviation and UAV generic system training within the JAR-FCL system.

Checking of license and type ratings prerequisite is also within JAR-FCL for manned aviation. To perform an operational proficiency checks according to JAR-OPS 1 (Check the crews ability to perform their duties within the operators standards) the checkpilot doing this must be

trained and authorised via JAR-FCL requirements. Preserve this principle will secure a consequent level of assessment as " UAV checkpilots" will have a similar basic ground. The "type system" knowledge is within an operator and that part of the "UAV check pilots" training must be performed within an operator.

An UAV commander/pilot do not have to meet the same medical requirements as a flying pilot. To perform the safety tasks the circumstances (Activities, environmental, human factor situation) are very similar to a flight controller. Therefore a medical ability similar to theirs could be sufficient. For a technician there are no differences as the ground operations are concerned compared to a manned aircraft technician functions.

UAV operation is exposed in the same way as a manned system for Human Performance influence. UAV system, as well as manned system, has to be designed and operated within the field of Human limitations and performance. In flight operations CRM (Crew resource management) is a inseparable component in a safe operation. Procedures and training in this aspect is essential for safety reason but also for the effectiveness of an operation. Certain efforts have to be done to implement the specific UAV conditions into training and operation as well as for designing systems.

3. Direction

Several details have to be discussed and considered regarding applicable and needed conformity with existing JAR-FCL as relevant parts with specific UAV influence that should be added. Among these could following be;

- At what level of required theoretical and practical skill level should UAV enter JAR-FCL to be accepted by other regulations with major impact, e g FARs.
- Certain crew and technician functions, which exactly have to be discussed, should have a UAV license.
- The theoretic base for such a license is the same as for a manned aircraft license, excluded certain part that are not applicable for UAV systems. Added to that base knowledge a generic UAV system block, covering UAV specific fundamental facts, possibilities and limitations.
- The base requirements should be stated within JAR-FCL system that should compromise knowledge needed for crewmembers and check functions and procedures how to within JAR-OPS obtain certain system skill and ratings.
- A license could be issued as a result of approved basic training and subsequent type system training. Procedures for that should be stated in JAR-FCL.
- Minimum experience and recurrent requirements should be discussed.
- Provisions in the procedures for an UAV license should enable individuals with "normal" license to convert to a UAV rating.

4. Further considerations

- For who in a UAV system is a license essential? (operational and technical activities, checking functions)
- Should there be different levels of UAV license, synchronised with a UAV system classification of any kind?
- How close to existing requirements for base knowledge, skills, checking, validation periods, should UAV activities come?
- For "wide" intercontinental and overseas activities, as well as for exchanging of control for a system, the JAR-FCL system for UAV must be equivalent in a reciprocal way to concerned states and their license system. (In manned aviation there is a conversion procedure of a JAA license if to be used in a FAA registered aircraft or vice verse.)
- How to implement Human factor knowledge and principles, understanding its great importance in manned aircraft operations and all human activities, in training and operations.
- As a consequence of the above UAV adapted CRM (crew resource management) influence in training and operations