The regulatory challenges facing industry
EASA-Thales TAC
Watchkeeper Airworthiness
Analysis of TAC meetings outcomes
Tuesday 24th March 4th 2015
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Thales in the framework of a Technical Advice Contract (TAC) held a series of meetings related to the EASA regulatory procedures for civil type certification of Watchkeeper.

Thales provided EASA with a detailed introduction into the Watchkeeper system including the military certification process and the intended civil operation.

**Rationale:**
- Watchkeeper is MAA certified and released to service by UK MOD
- Watchkeeper establishes a strong basis for Civil Certification ~ EASA/UK CAA

**WK design and test programme is compliant with, or exceeds, the majority of the requirements of the UK Military Airworthiness Standards Def Stan 00-970 (design and airworthiness requirements) and Def Stan 00-55 (software)**
  - Compliance has been assessed against NATO STANAG 4671 by the MAA
  - Certification requirements for UAS are specifically contained in Def Stan 00-970 which effectively uses NATO STANAG 4671 as the core requirements document
  - STANAG 4671 (USAR) was based on CS-23 manned civil certification standard
  - UK MAA has awarded (October 2013) Statement of Type Design Assurance (STDA) to the WK system
EASA provided an introduction into the main topics of Civil Certification and Operation:
- Organization Approvals (DOA / POA)
- Procedures for Civil Certification
- Procedures including restricted type certification
- Operational aspects (airspace classes, special areas, etc.)

The main technical topics for discussion were:
- Detect and avoid
- Automation of flight
- Data Link system and provider (mobile, satellite, etc.)
- Safety of complete RPAS
- Flight Conditions for Permit to Fly

The desired outcomes of the TAC, as agreed with Thales were:
- Thales to better understand civil certification process and issues as well as civil operation
- Identification of Special Conditions for civil certification
- Identification of potential critical and challenging issues
Analysis – overview of conclusions

- Agreement on the basis of certification
- Approach to a restricted type certification
- An audit of the Watchkeeper safety assessment process
- Design assurance and production approval process
- Required levels of autonomy and pilot interaction
- Discussions with NAA to establish type of operation
Fundamental to an application for civil certification would be a formal discussion to agree the Basis for Certification

- In the absence of RPAS airworthiness standards this would be essential to ensure a successful outcome.
- It could act as a cut-off point beyond which an application would continue or be deferred or suspended depending on outcomes and market interest
  - This stage is considered crucial to help break the cycle of “no market – no certification”
An audit of the Watchkeeper safety assessment process should be conducted to establish the additional requirements to achieve a civil safety process.

An assessment of the Watchkeeper design assurance process will be required to establish the additional requirements to achieve the required equivalent civil design assurance levels.

To achieve civil DOA and POA, analysis of the relationship and structure of the organisations involved in Watchkeeper design and manufacture should be undertaken to establish compatibility with civil requirements.
Levels of autonomy and pilot interaction will need to be established in order to satisfy civil legal requirements for timely pilot intervention to the flight process.

Discussions with the national aviation authorities would be required to establish an acceptable civil type of operation for Watchkeeper.

Discussions with EASA to establish the extent of fees and charges for an application for civil certification should be undertaken.
### Certification analysis – a way forward

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<thead>
<tr>
<th>Restricted airspace</th>
<th>Controlled airspace</th>
<th>Un-controlled airspace</th>
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<tbody>
<tr>
<td><img src="image" alt="Airplane" /></td>
<td>DAA with collision avoidance</td>
<td>DAA with separation provision</td>
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**Certified by UK MAA for operations in restricted airspace**

**Regulated**

- EASA Airworthiness and type certification x 11 requirements
- System safety approval (AMC 1309)
- Flight crew licencing
- C2 approval
- Operator authorisation

**Specific approval**

- Airworthiness: Risk mitigation
- Licencing: Specific training
- C2: demonstrations
- Operator authorisation: with limitations
RPAS certification – a way forward

A route to certification

**Route 1**

1. **RPAS Operator** → **RPAS CONOPS**
2. **NAA**
   - **Risk**
   - **Mitigation**
3. **Certification**

**Route 2**

1. **RPAS manufacturer**
2. **EASA**
   - **Type certificate**
   - **Specific operations**

RPAS manufacturer submits airworthiness application and jointly agrees basis for certification with EASA.

NAA agrees risk assessment and mitigations.

Restricted type certification issued.
That completes
EASA-Thales TAC
Watchkeeper Airworthiness
Summary of TAC meetings analysis