RA 2370 – Test and Evaluation

Rationale

Test and Evaluation (T&E) activity provides evidence that is used to support the Air System Safety Case (ASSC). The Risks to Life (RtL) associated with this activity are two-fold: firstly the process of evidence gathering has the potential to present a greater RtL than that associated with the routine operating environment, and secondly the generation of flawed evidence may negatively impact on the subsequent ASSC. Therefore T&E activity, and the associated evidence-generation, needs to be conducted and supervised by approved organizations and Suitably Qualified and Experienced Person (SQEP).

Applicability

Applicability of this Regulatory Article

The T&E activities covered by this Regulatory Article are defined as flights, ground taxi, ground runs and/or other on-Air System assessments that generate evidence in support of the ASSC.

Contents

2370(1): Test and Evaluation Governance
2370(2): Test and Evaluation Personnel
2370(3): Test and Evaluation Activity

Regulation 2370(1)

Test and Evaluation Governance
2370(1) T&E activity shall be subject to governance by SQEP.

Acceptable Means of Compliance 2370(1)

Test and Evaluation Governance

1. Endorsement.
   a. Aviation Duty Holders (ADH) or Accountable Manager (Military Flying) (AM(MF)) who manage or conduct T&E activity should be endorsed by the Military Aviation Authority (MAA)\(^1\).
   b. When not themselves T&E SQEP, ADH or AM(MF) should appoint SQEP to oversee T&E activity. In these cases ADH or AM(MF) should provide evidence of said individual’s SQEP when submitting their application for endorsement by the MAA\(^1\) and note that accountability remains with the endorsed ADH or AM(MF).
   c. ADH facing organizations that manage or conduct T&E activity should do so in accordance with RA 1020\(^2\) and RA 1205\(^3\).

2. Nomination of Units and organizations. ADH or AM(MF) should:
   a. Nominate Units and organizations for T&E activity and its associated T&E category in accordance with the endorsement issued by the MAA.
   b. Nominate SQEP\(^4\) for T&E activity.

3. Approval of T&E activity. ADH or AM(MF) should:
   a. Detail in orders the manner in which T&E activity is to be approved as follows:

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\(^1\) Refer to Annex A.
\(^2\) Refer to RA 1020 – Roles & Responsibilities: Aviation Duty Holder and Aviation Duty Holder – Facing Organizations
\(^3\) Refer to RA 1205 – Air System Safety Cases.
\(^4\) In accordance with Annexes B and C.
Acceptable Means of Compliance

2370(1)

(1) The scope of involvement of the ADH or AM(MF) in the approval process.

(2) The composition and competency of the Approval Board, which is to be SQEP for the activity being conducted, include minimum T&E qualifications in accordance with Annex B and include representatives from the following areas as appropriate: Design Organization, T&E, Continuing Airworthiness, Type Airworthiness and flight operations.

(3) The categorization of T&E activity.

Guidance Material

Test and Evaluation Governance

6. ADH facing organizations. To ensure that evidence generated in support of the ASSC is reliable, ADH facing organizations that manage or conduct T&E activity may wish to consider adopting the processes described in this Regulation.

7. Remotely Piloted Air System (RPAS) categorization. RPAS T&E activity may warrant a different RPAS classification to the eventual, envisaged or in-use RPAS categorization. The scope of any T&E activity will be considered during the classification process; as such a separate submission may be appropriate for RPAS classification during T&E flying activity.

Regulation

2370(2)

Test and Evaluation Personnel

T&E activity shall only be designed, planned, supervised and conducted by SQEP.

Acceptable Means of Compliance

2370(2)

8. ADH or AM(MF) should detail in orders the T&E competencies required of those designing, supervising and conducting T&E across the T&E categories. These T&E competencies should meet or exceed the minimum qualification requirements and include appropriate experience in the following:

a. Test programme management, risk management and T&E governance.

b. The planning, conduct and reporting of T&E activity.

c. The intended functionality of the Air System and/or the system under test.

d. The application of relevant test techniques.

9. ADH or AM(MF) should record evidence of T&E competencies (including training, qualifications, and experience) and T&E currency.
Test and Evaluation Personnel

10. Nil.

Test and Evaluation Activity

2370(3) ADH or AM(MF) shall issue orders detailing the governance, categorization, planning, conduct and reporting of T&E activity.

Test and Evaluation Activity

11. **T&E categorization.** ADH or AM(MF) should categorize T&E activity as follows:
   a. **Cat 1.** Experimental / Developmental T&E.
   b. **Cat 2.** Flight Safety-critical T&E.
   c. **Cat 3.** Production T&E.
   d. **Cat 4.** Non-Flight Safety-critical T&E.
   e. **Cat 5.** Operational T&E.

12. **T&E documentation.** ADH or AM(MF) should detail in orders the processes for determining:
   a. T&E objectives.
   b. Hazard identification and risk management processes specific to T&E.
   c. Test plans, flight test cards, post-flight reports and trial reports.
   d. Ground, simulator and air trials specific training.
   e. Specific currency requirements for the T&E activity.
   f. Additional / specific safety and survival training requirements.
   g. Any T&E specific procedures for engineering and flight line personnel.
   h. SQEP to approve, supervise, plan and conduct T&E activity.
   i. SQEP to author and release trials reports.

Test and Evaluation Activity

13. **Determination of T&E objectives.** When formulating test plans containing the T&E objectives, ADH or AM(MF) may refer to the Integrated Test and Evaluation Acceptance Plan.

14. **Categorizing T&E activity.** Advice for Contractor Flying Approved Organization Scheme (CFAOS) and MOD units and organizations is available from MOD Air Warfare Centre (AWC) or the Maritime Warfare Centre.

15. **T&E categories.** The following provides guidance for determining the category of T&E Activity:
   a. **Cat 1. Experimental / Developmental T&E.** T&E that expands the flight envelope, extends the flight limitations or develops the handling techniques of an Air System. This entails operations outside, or to the limits of, existing temporary or proposed airworthiness and flight limitations of the Air System. It may include, but is not exclusive to, assessment of:
      (1) Initial flight or significantly modified Air Systems.
      (2) Changes in flight characteristics or flight envelope definition or expansion.
      (3) Novel or unusual design, features or techniques.
(4) Changes to handling qualities of an Air System that might include changes to visual references, flight instruments and symbology, flying controls, flying control systems, Air System performance, external stores and weapons carriage/release/jettison and underslung loads.

b. **Cat 2. Flight Safety-critical T&E.** T&E that is conducted on a production standard Air System that provides evidence for an airworthiness clearance of Flight Safety-critical systems. This will entail operating to the limits of existing, temporary or proposed airworthiness and flight limitations of the Air System. It may include, but is not exclusive to, assessment of:
   1. Communications systems.
   5. Collision avoidance systems.
   6. Secondary role systems.

c. **Cat 3. Production T&E.** This may be referred to as post-manufacture test flying or post-factory flight test. This activity assures the production standard of a newly built Air System and/or associated systems that have been newly installed; this activity is not maintenance test flying.

d. **Cat 4. Non-Flight Safety-critical T&E.** Assessment of new systems or software whose operation does not directly affect Flight Safety, but which requires T&E activity for clearance. Flying conducted by an Air System to facilitate the testing of a system with which it would not normally be fitted in order to assess that system in the airborne environment. It may include, but is not exclusive to, assessment of:
   1. New cabin installations.
   2. Passenger radio systems.

e. **Cat 5. Operational T&E.** T&E aimed at determining the performance or effectiveness of an Air System’s non-Flight Safety-critical systems/software and developing or ensuring the validity of tactics, techniques and procedures of the Air System and associated doctrine. It is normally carried out within the limits of existing or temporary airworthiness limitations of the Air System. It may include, but is not exclusive to, assessment or development of the following:
   1. Tactics, Techniques and Procedures if they directly affect the ASSC.
   2. Weapon effectiveness.
   3. The operational employment of mission systems.

16. **Trials supervisors.** Trial supervisors are responsible to the endorsed ADH or AM(MF) for ensuring that T&E Activity is carried out safely in accordance with (iaw) the direction of the T&E Approvals Board. They are not required to be flying supervisors or authorisers.
### ANNEX A

APPLICATION FOR T&E ENDORSEMENT

<table>
<thead>
<tr>
<th>ADH/AM(MF) (as appropriate)</th>
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<tbody>
<tr>
<td>Unit/Organization</td>
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<tr>
<td>ADH/AM(MF) T&amp;E SQEP competencies&lt;sup&gt;5&lt;/sup&gt;</td>
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<table>
<thead>
<tr>
<th>T&amp;E Categories iaw RA 2370 (3).</th>
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<tbody>
<tr>
<td>T&amp;E Cat 1</td>
<td></td>
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<tr>
<td>T&amp;E Cat 2</td>
<td></td>
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<tr>
<td>T&amp;E Cat 3</td>
<td></td>
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<tr>
<td>T&amp;E Cat 4</td>
<td></td>
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<tr>
<td>T&amp;E Cat 5</td>
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<table>
<thead>
<tr>
<th>Nominated T&amp;E Units</th>
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<tr>
<td>List or provide reference if detailed in orders</td>
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| T&E Governance Process |                         |

<table>
<thead>
<tr>
<th>Organization's T&amp;E References</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Orders, mandates, primary source of T&amp;E SQEP etc (hyperlinked)</td>
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</tbody>
</table>

| Amplifying comments |                         |

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<sup>5</sup> Where the ADH or AM(MF) is not T&E SQEP they should detail the name(s) of the individual(s) nominated to provide T&E SQEP, their competencies and the manner in which their competencies will be utilized.
## Annex B

### T&E Categories and Minimum Qualification Requirements for Manned Air Systems

<table>
<thead>
<tr>
<th>T&amp;E Category</th>
<th>T&amp;E Activity Description</th>
<th>Minimum DDH or CFAOS Post Holder Qualification</th>
<th>T&amp;E Approval Board Qualification (Minimum one per Approval Board)</th>
<th>Trial Supervisor Qualification</th>
<th>Aircrew Qualification (Minimum one per Air System Crew)</th>
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<tbody>
<tr>
<td>CAT 1</td>
<td>Experimental / Developmental T&amp;E</td>
<td>Class A Test Pilot (TP) / Flight Test Engineer (FTE)</td>
<td>Class A TP / FTE</td>
<td>Class A TP / FTE</td>
<td>Class A TP</td>
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<tr>
<td>CAT 2</td>
<td>Flight Safety-critical T&amp;E</td>
<td>Class B TP / FTE</td>
<td>Class B TP / FTE</td>
<td>Class B TP / FTE</td>
<td>If pilot workload or Human Machine Interface assessment required: Class B TP. For all else: Evaluator Aircrew (EA)</td>
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<tr>
<td>CAT 3</td>
<td>Production T&amp;E</td>
<td>N / A</td>
<td>N / A</td>
<td>N / A</td>
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<td>CAT 4</td>
<td>Non-Flight Safety-critical T&amp;E</td>
<td>Nil</td>
<td>Class B TP / FTE</td>
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<td>CAT 5</td>
<td>Operational T&amp;E</td>
<td>Nil</td>
<td>Qualified Aerosystems (QAS)</td>
<td>EA</td>
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</tbody>
</table>

Notes:

1. Class A TP - Long Course Test Pilot graduate of Empire Test Pilot School (ETPS), United States Navy Test Pilot School (USNTPS), United States Air Force Test Pilot School (USAF TPS), L'Ecole du Personnel Navigant d'Essais et de Reception (EPNER) or an equivalent course that is approved and assured by AWC on behalf of the Air T&E Operating Duty Holder (ODH).
2. Class B TP - Short Course Test Pilot graduate of ETPS or EPNER or an equivalent course that is approved and assured by AWC on behalf of the Air T&E ODH.
3. Class A FTE - Long Course Flight Test Engineer graduate of ETPS, USNTPS, USAF TPS, EPNER or an equivalent course that is approved and assured by AWC on behalf of the Air T&E ODH.
4. Class B FTE - Short Course Flight Test Engineer graduate of ETPS or EPNER or an equivalent course that is approved and assured by AWC on behalf of the Air T&E ODH.
5. QAS - Graduate of the AWC Aerosystems Course or an equivalent course that is approved and assured by AWC on behalf of the Air T&E ODH.
6. EA - Aircrew who have successfully completed a dedicated training course that includes the competencies listed at paragraph 8 and who are deemed SQEP and are authorised to participate in T&E by the ADH or AM(MF).
7. Production Pilot - Aircrew approved as SQEP, competent and endorsed by the ADH or AM(MF) to conduct Production T&E.
8. Hierarchy - For the purposes of the table above, when determining SQEP minima the qualification hierarchy is (in descending order): Class A TP / FTE, Class B TP / FTE, QAS, EA and Production Pilot.
## ANNEX C
### RPAS T&E GOVERNANCE

<table>
<thead>
<tr>
<th>Minimum T&amp;E Qualification Requirements</th>
<th>I(a)</th>
<th>I(b) / I(b) mil</th>
<th>I(c)</th>
<th>I(d)</th>
<th>II/III</th>
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<tbody>
<tr>
<td>Nil</td>
<td>Nil</td>
<td>As per Cat 5, Annex B</td>
<td>As per Cat 4, Annex B</td>
<td>As per Annex B</td>
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