**CHINOOK MAINTENANCE SCHOOL - VIRTUAL MAINTENANCE TRAINER**

**DRAFT REQUIREMENTS**

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| 1.0 | **Operation** |
| 1.1 | The Virtual Maintenance Trainer (VMT) solution shall support and enable delivery of all training priorities. |
| 1.2 | The VMT solution shall provide diagnostic and functional test requirements for the Chinook (CH-47). |
| 1.3 | The VMT solution shall incorporate an Integrated Learning Environment (ILE) capability. |
| 1.4 | The VMT solution shall be modelled and/or constructed to a high fidelity; capable of achieving the relevant training priorities by meeting performance and training standards. |
| 1.5 | The VMT solution shall replicate the interdependencies across all modelled tasks; including applicable procedures, documentation and authorization/supervisory responsibilities. |
| 1.6 | The VMT solution shall include references and links to an up-to-date document & media library. |
| 1.7 | The VMT solution shall be accessible via portable and fixed interfaces. |
| 1.8 | The VMT solution shall have the capability to operate in either ‘Teach’ or ‘Assess’ modes. |
| 1.9 | The VMT solution shall have remote access capability. |
| 1.10 | The VMT solution shall provide automatic data collection to enable through training evaluation on students. |
| 2.0 | **Availability** |
| 2.1 | The VMT shall have the required student capacity. |
| 2.2 | The VMT shall have the required availability. |
| 3.0 | **Support and sustainability** |
| 3.1 | The VMT shall remain relevant until the platform Out of Service Date (OSD) |
| 3.2 | The VMT solution shall have an open architecture. |
| 3.3 | The VMT shall have a suitable Configuration Control Board (CCB). |
| 3.4 | The VMT shall be located with the Chinook Maintenance School (ChMS) in a facility that adequately supports the solution. |
| 4.0 | **Personnel** |
| 5.0 | **Doctrine and Concepts** |
| 6.0 | **Mandatory** |
| 6.1 | The VMT solution shall comply with the extant UK Safety Health Environmental & Fire (SHEF) legislation. |
| 6.2 | The VMT shall meet Health and Safety at Work legislation. |
| 6.3 | The risks to health of the VMT shall be both tolerable and As Low As Reasonably Practicable (ALARP). |
| 6.4 | The VMT solution shall adhere to Joint Service Publication (JSP) 440. |
| 6.5 | The VMT solution shall adhere to JSP 441. |
| 6.6 | The VMT solution shall adhere to JSP 375. |
| 6.7 | The VMT solution shall adhere to JSP 604. |
| 6.8 | The VMT solution shall adhere to JSP 939. |

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**REQUIREMENT DETAILS**

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| **ID** | **User Requirement** | **Priority** | **Justification** | **Threshold Measure of Effectiveness** | **Objective Measure of Effectiveness** | **Validation Criteria** | **Remarks** |
| **1.0** | **Operation** | | | | | | |
| 1.1 | The VMT solution shall support and enable delivery of all training priorities. | Key | Modernise training by providing a high-fidelity Hands On Training System (HOTS).  JSP 822.  Mechanical Role Performance Statement (RPS).  Avionics RPS.  Chinook Engineering Training Strategy 2021 (CETS 21). | 1. The VMT shall achieve Training Objectives (TOs)/Enabling Objectives (EOs) that require a ‘remove’, ‘install’, ‘diagnose’ or ‘functionally test’ set of actions. 2. The VMT shall replicate the components and all attached hardware. 3. Deliver areas of training that are currently unachievable within the classroom learning environment due to training categories and/or training standards assigned to them. 4. A reduction in Workplace Training Statement (WTS) tasks, therefore reducing the amount of training passed on to the Forward environment. | 1. A reduction in tasks currently residing in the Residual Training Gap Statement (RTGS). 2. A reduction in (WTS) tasks being completed as a ‘desktop’ exercise within the workplace. | 1. Demonstration  2. MoD Subject Matter Expert (SME) Validation |  |
| 1.2 | The VMT shall provide diagnostic and functional test requirements for the CH-47. | Key | Modernise training by providing a high-fidelity Hands On Training System (HOTS).  Aircraft Maintenance Manuals (AMMs).  Mechanical RPS.  Avionics RPS. | 1. The VMT shall provide a diagnostic and functional test capability, allowing students to follow the applicable AMMs. 2. The VMT shall model/compliment all necessary test and measuring equipment used to diagnose/functionally test systems given in the respective RPS/Formal Training Statement (FTS). | 1. The VMT could provide diagnostic and functional test procedures for higher training category tasks. | 1. Demonstration  2. MoD SME Validation |  |
| 1.3 | The VMT shall incorporate an ILE capability. | 2 | Chinook Engineering Training Strategy 2021 (CETS 21). | 1. The VMT shall work in harmony with the ILE capability introduced through the ChMS Optimisation (ChMSO) package. | 1. Elements of the VMT shall operate through the ‘Cloud’ based server providing:  a. Capability for student remote access.  b. Student performance results transferred into the Learning Management System. | 1. Demonstration  2. MoD SME Validation |  |
| 1.4 | The VMT solution shall be modelled and/or constructed to a high fidelity; capable of achieving the relevant training priorities by meeting performance and training standards. | Key | Modernise training by providing a high-fidelity Hands On Training System (HOTS).  JSP 822.  Mechanical RPS.  Avionics RPS.  Chinook Engineering Training Strategy 2021 (CETS 21).  Aircraft Maintenance Manuals (AMMs).  Flight Ref Cards.  Enhanced ability to troubleshoot systems/components. | 1. A high level of fidelity shall be modelled to ensure current and future TOs defined as ‘work-based’ within the FTS can be achieved. 2. High fidelity to ensure students can complete all aspects of the required AMM with realistic/genuine consequence and outcomes. 3. Warnings, cautions and safety-critical related actions should all be alerted to the student and staff during all activity. 4. The fault library shall be baselined with key system/component faults as agreed by the MoD SME with the ability to update/amend as additional common faults are identified. 5. All faults shall be modelled so that all interdependent systems and/or components respond accurately to the failure. 6. A user-interface for the instructor shall be available, providing an ability to toggle faults as necessary. | As Threshold. | 1. Demonstration  2. MoD SME Validation |  |
| 1.5 | The VMT shall replicate the interdependencies across all modelled tasks; including applicable procedures, documentation and authorization/supervisory responsibilities. | Key | Effective use of resources and learning outcomes.  Aircraft Maintenance Manuals (AMMs).  Authorised Document Set (ADS).  MAM-P. | 1. The VMT shall include associated procedures, documentation requirements and authorization/supervisory responsibilities. 2. The VMT shall have all ‘required conditions’ (e.g. electrical power, hydraulics, aircraft jacking etc.) modelled as complete tasks.   a. The VMT shall provide the instructor with the option to undertake all ‘required conditions’ in full or provide an option whereby this is completed already.  b. All necessary Airfield Support Equipment (ASE) required for diagnostics and functional testing is to be modelled.   1. The VMT shall support concurrent activity on other systems; allowing multiple TOs/EOs to be achieved simultaneously with multiple student users. | As Threshold. | 1. Demonstration  2. MoD SME Validation |  |
| 1.6 | The VMT shall include references and links to an up-to-date document & media library. | 1 | See 3.3 | 1. The VMT shall provide access to up-to-date a/c Interactive Electronic Technical Manual System (IETMS), publications and references required to undertake each task correctly. 2. The VMT shall provide access to all courseware and images associated with the task being carried out, enabling real-time system situational changes to be viewed/accessed by students and staff (live schematics). | See 3.3 | 1. Demonstration  2. MoD SME Validation |  |
| 1.7 | The VMT Shall be accessible via portable and fixed interfaces. | 2 | Accessibility. | 1. The VMT shall be accessible via a portable means as well as fixed interfaces to enable flexibility of use when training is being delivered. | As Threshold. | 1. Demonstration  2. MOD SME Validation |  |
| 1.8 | The VMT shall have the capability to operate in either ‘Teach’ or ‘Assess’ modes. | Key | Differentiated learning outcomes.  Improved formative assessment.  JSP 822. | 1. Independent ‘Operator/Instructor’ station for exercise control, fault setting and intervention monitoring. 2. The VMT shall operate within differing ‘modes’ to allow teaching and assessment to be carried out. 3. The VMT shall contain programmable prescriptive assessment criteria to allow summative or formative assessment to be carried out.   a. The VMT shall ‘mark’ events or highlight necessary interventions during procedural or troubleshooting activity.  b. The VMT shall log safety critical failures, alerting the operator/instructor. | As Threshold. | 1. Demonstration.  2. MoD SME Validation |  |
| 1.9 | The VMT shall have remote access capability. | 2 |  | 1. The VMT shall allow for remote access to allow freedom of delivery away from ChMS, MOB. 2. Allows support of engineering tasks at Forward and Depth whilst supporting ‘refresher’ training to engineers outside of ChMS. |  | 1. Demonstration  2. MoD SME Validation |  |
| 1.10 | The VMT solution shall provide automatic data collection to enable through training evaluation on students. | 1 | Differentiated learning outcomes.  Improved formative assessment.  Efficiency.  JSP 822.  Mechanical RPS.  Avionics RPS. | 1. The VMT shall support data capture and analysis to enable instructors to identify areas of weakness whether operating within the training or assessment mode.  2. The VMT shall support targeted revision of systems with individual students based on performance criteria. | As Threshold. | 1. Demonstration  2. MoD SME Validation |  |
| 2.0 **Availability** | | | | | | | |
| 2.1 | The VMT shall have the required student capacity. | 1 | ChMS Statement of Training Requirement (SOTR).  ChMS Statement of Training Task (SOTT). | 1. Available to all users 241 days per year at the ChMS.      1. Up to 20 hours (core) of training per week. 2. Up to 4 x 3.5 hours additional training/coaching per week. 3. Monday to Friday working week. | As Threshold. | 1. Demonstration  2. MoD SME Validation |  |
| 2.2 | The VMT shall have the required availability. | Key | ChMS Statement of Training Requirement (SOTR).  ChMS Statement of Training Task (SOTT). | 1. The VMT shall be available for access when required in support of both staff and/or student requirements.   a. Suitable maintenance/operating support available during access times.  b. Major updates or maintenance activity is scheduled outside of core teaching requirement. | As Threshold. | 1. MoD SME Validation |  |
| 3.0 **Support and Sustainability** | | | | | | | |
| 3.1 | The VMT shall remain relevant until the platform OSD (2040). | Key | Mechanical RPS.  Avionics RPS.  Chinook Engineering Training Strategy 2021 (CETS 21). | 1. See 3.3 | As Threshold | 1. Demonstration  2. MoD SME Validation |  |
| 3.2 | The VMT solution shall have an open architecture. | 1 | Protection from obsolescence. | 1. The VMT solution shall be based on and, if required, integrate with widely available open-market hardware, software and firmware. | As Threshold. | 1. Demonstration  2. MoD SME Validation |  |
| 3.3 | The VMT shall have a suitable Configuration Control Board (CCB). | Key | Currency and relevance of training solution.  Protection from obsolescence.  Aircraft Maintenance Manuals (AMMs).  Mechanical RPS.  Avionics RPS.  Authorised Document Set (ADS). | 1. The VMT solution shall have a dedicated CCB that is an independent function of ChMS, implementing all modifications and system upgrades.  a. Capture aircraft modifications and system upgrades, both Service and Design Organisation (DO). | As Threshold. | 1. Demonstration  2. MoD SME Validation |  |
| 3.4 | The VMT shall be located with the Ch MS in a facility that adequately supports the solution. | Key | Infrastructure requirements. | 1. The VMT shall be located in a building that is accessible to ChMS students and staff per the availability requirement at 2.0.  2. The VMT shall be adequately supported in terms of all logistical and infrastructure requirement (utilities, space etc.) | As Threshold. | 1. Demonstration  2. MoD SME Validation  3. Inspection if req’d |  |
| 4.0 **Personnel** | | | | | | | |
| 5.0 **Doctrine and Concepts** | | | | | | | |
| 6.0 **Mandatory** | | | | | | | |
| 6.1 | The VMT solution shall comply with the extant UK Safety Health Environmental & Fire (SHEF) legislation. | MAN | Mandatory requirement.  Safety.  SHEF.  H&SAW. | The installed VMT solution shall meet UK Safety Health Environmental & Fire (SHEF) legislation. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. Inspection if reqd |  |
| 6.2 | The VMT shall meet Health and Safety at Work legislation. | MAN | Mandatory requirement.  Safety.  SHEF.  H&SAW. | The installed VMT solution shall meet Health and Safety at Work legislation. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. Inspection if reqd |  |
| 6.3 | The risks to health of the VMT shall be both tolerable and As Low As Reasonably Practicable (ALARP). | MAN | Mandatory requirement.  Safety.  SHEF.  H&SAW. | The risks to health of The VMT solution shall be both tolerable and As Low As Reasonably Practicable (ALARP). | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. Inspection if reqd |  |
| 6.4 | The VMT solution shall adhere to JSP 440. | MAN | Mandatory requirement.  Policy & Guidance. | Adhere to latest version of: JSP 440 Defence Manual of Security. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. MoD SME validation |  |
| 6.5 | The VMT solution shall adhere to JSP 441. | MAN | Mandatory requirement.  Policy & Guidance. | Adhere to latest version of: JSP 441 Managing Information in Defence. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. MoD SME validation |  |
| 6.6 | The VMT solution shall adhere to JSP 375. | MAN | Mandatory requirement.  Policy & Guidance. | Adhere to latest version of: JSP 375 MOD Management of Health and Safety in Defence. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. MoD SME validation |  |
| 6.7 | The VMT solution shall adhere to JSP 604. | MAN | Mandatory requirement.  Policy & Guidance. | Adhere to latest version of: JSP 604 Defence Management of Information and Communications Technology. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. MoD SME validation |  |
| 6.8 | The VMT solution shall adhere to JSP 939. | MAN | Mandatory requirement.  Policy & Guidance. | Adhere to latest version of: JSP 939 Defence Management of Information and Communications Technology. | As Threshold. | 1. Design reviews.  2. Policy and guidance  3. MoD SME validation |  |