

Maritime Command and Staff Trainer (MCAST)

Appendix C to SoW – Integrated Test, Evaluation and Acceptance Plan (ITEAP)

Version: 2.0

Date: November 2023

Defence Equipment & Support

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Integrated Test, Evaluation and Acceptance Plan (ITEAP)

MARITIME COMMAND AND STAFF TRAINING (MCAST)

File Name: MCAST_ITEAP

Version: 2.0 Dated: 15/12/2023

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Security

i. The degree of protection given to the equipment and Marked Documentation must be in accordance with JSP 440, The Government Manual of Protective Security. The security aspects associated with this equipment will be detailed in a Security Aspects Letter (SAL) prior to contract award.

Approval

Date	Version	Signature	Name	Role
Mar 23	1.0			SRO

Version Control

ii. This ITEAP is maintained under change control as below and only approved versions should be used. The document configuration management strategy will be outlined in the underdevelopment Project Management Plan, with any necessary changes to this process made following that publication. It will be reviewed and revised as directed by the ITEA Manager until the Engineering Management Plan is completed, setting the required review frequency.

Version	Date	Change	Lead Author
0.1	04/05/2020	First Iteration Draft.	
0.5	13/10/2021	Fifth Iteration Draft	
0.6	15/12/2021	Sixth Iteration Draft	
1.0	01/02/2023	Incorporation of VVRM	
1.1	06/07/2023	Amendment to Annex A: Capability Milestones List Table A1.	
2.0	30/11/2023	Alternate Means of Achieving Capability Milestones (para 19)	

- iii. The routine re-issue of this Plan will be incorporated into the engineering delivery schedule which will then form part of the baseline against which periodic progress or development is measured. The Plan may also be subjected to unplanned updates if deemed necessary by the ITEA manager, following the same process. This will ensure that documentation remains current and can be used with authority.
- iv. The table above will be updated to include details of updates since the last major version release only.

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Section 1: Introduction

Background

This Integrated Test, Evaluation and Acceptance Plan (ITEAP) is part of the Maritime 1. Combat Systems (MCS) Delivery Team's (PT) Through Life Management Plan (TLMP) for the MCAST capability. The Maritime Command and Staff Trainer (MCAST) is a RN synthetic training capability that will provide a Maritime Battle Staff (MBS) Command and Control (C2) training capability for the 2-star Commander Strike Force (CSF), the 1-star Carrier and Littoral Strike Groups (CSG and LSG), Littoral Response Groups (LRG) and Mine Warfare Battle Staff (MWBS). MCAST will be used for Collective Training (CT) at the Tier 1, 2 and 2+ level¹ for both teamwork and taskwork, and potentially, Tier 1 CT for HQ pillars or warfare groups. It could also be used to provide pre-deployment training to other fixed location MBS for operational duties. MCAST could also support mission rehearsal and experimentation of Maritime Warfare Centre (MWC) developed tactical procedures and processes. The intent is for the MCAST to be linked to the wider Defence synthetic training environment. Adherence to Defence Modelling and Simulation Coherence (DMaSC) principles will enhance coherence and interoperability, enable efficiencies, and facilitate integration with other synthetic

¹ JSP 822 Part 2.

- environments. Links to NATO, other international partners and, potentially, component level organisations are expected to follow².
- 2. The Endorsed Single Statement of User Need for MCAST states
 - "Commander Fleet Operational Standards and Training requires support to deliver synthetic training and assurance exercises in order to prepare Maritime Battle Staffs to meet their operational readiness requirements."
- 3. For further background please refer to the Context Documents.

Capability

4. MCAST will deliver a capability predominately to support the collective training for CSF, CSG and LSG Battle Staffs against Collective Training Objectives. The MCAST capability will provide Maritime 1* and 2*, LRG and MWBS Battle Staffs with training in the context of operational command and control; with simulated inputs from Higher Control (HICON), Side Control (SIDECON) and Lower Control (LOCON) sufficient to train for current operations, planning, and assessment by external injects. The MCAST capability may also provide a LOCON to training and assurance at Tier 3. An overview of this operating capability is at Figure 1.



 $^{^2}$ Connections to UK FE will use a UK Defence network, connection to coalition partners will be achieved by connecting the UK Defence network to an appropriate coalition network.

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ITEAP Scope & Development

- 5. This MCAST project ITEAP details the Acceptance processes and Test and Evaluation activities required to bring the defined baseline capability into service. This includes defining responsible parties for the various ITEA requirements.
- 6. It remains the contractor's responsibility to prove the capability meets its requirement as set out in the Invitation to Negotiate (ITN), Statement of Work (SOW) and Systems Requirements Document (SRD). This ITEAP provides guidance³ on the necessary stages to meet the requirement so contractor can inform their own T&E activity to de-risk acceptance. Opportunities highlighted (such as use of live exercises) does not constitute guarantee of involvement or benefits realised. The contractor should be prepared to run/support independent capability acceptance testing if required.
- 7. This ITEAP should be considered a live document owned by the ITEA manager and expected to develop and mature during the progression of the project. It should inform and remain consistent with the contractors T&E plans and is an endorsed baseline document that will be agreed by all parties at Contract Award, with only minor adjustments or additional details expected beyond that point.
- 8. Once FOC has been achieved, the capability is considered to have entered the In-Service phase and the ITEA Plan will be archived as a record of what was done. Modification of the capability, or any system it links to after FOC, is outside the scope of this plan.

Procurement Strategy

- 9. MCAST will be competed using an Invitation to Negotiate (ITN) process, in accordance with the MCAST Procurement Strategy document. Tender submissions will be assessed against the SOW, before a final submission and announcement of the preferred bidder.
- 10. Supplier T&E costs are to be included within contractual costs. Authority (DE&S) Test, Evaluation & Acceptance (TE&A) activities have yet to be costed. The Full Business Case for the implementation of the MCAST capability will set the financial and resource constraints for ITEA Activity.

Requirement Set Integrity

- 11. The User Requirements are established in the endorsed MCAST User Requirement Document (URD). The evolving nature of the MCAST capability means that URD changes are possible. Where this happens prior to contract award the SRD will be updated to reflect the changes. Post Contract Award all changes must be agreed with both the Authority and Contractor. The Authority cannot assess the contractor against System Requirements generated or modified post-Contract Award without the contractors' agreement.
- 12. The System Requirements are detailed in the SRD. The SRD requirements are configuration controlled in DOORS and provide an audit trail and linkage to the URD. In areas where the URD was incomplete or more detail was required, the user community was engaged to generate a complete SRD. Verification categories predicting the expected type of verification activity needed to assure the capability are assigned to each SR in the SRD.

³ The information within this ITEAP is therefore not contractually binding, but essentially sets the 'Mark Scheme' for the procurement.

Section 2: Acceptance Strategy

Acceptance Goals

- 13. The ultimate goal of the MCAST acceptance process is to:
 - Accept a system⁴ into Service that meets the user defined capability requirement.
- 14. To achieve this, there are two parallel paths:
 - a. The build-up of **Capability** equipment, training, information etc. This will primarily be delivered by the Contractor against the defined SoW.
 - b. The build-up of evidence to support **Acceptance** of that capability, primarily through reviews and tests in accordance with regulatory and MoD requirements.
- 15. Each path has a set of defined **milestones** used to direct the teams and act as review checkpoints, both following a functional approach of Service Delivery. The milestones are planned in accordance with a 'V' Diagram approach, advocated in the 'Knowledge in Defence' (KiD) website, with a defined V&V Strategy.

Capability Milestones (CMs)

- 16. There are eight Capability Milestones (CMs) in alignment with the Project Plan. The CMs along with definitions can be found at Annex A. The CMs are owned by the SRO and deliver a change in capability to the user.
- 17. A plan for delivering against CMs should be included within the bidders ITN bid submission⁵, with the winning contractor expected to revise and agree this plan with the Authority. Progress against this plan will be monitored and managed through the Capability Integration WG (CIWG), involving both the contractor and Authority.
- 18. Where the contractor's test plan does not align with this ITEAP, justification is expected, in the form of an acceptance plan from the bidder before signature of a delivery contract, and any impact on Acceptance signed off by the ITEA Manager.
- 19. CMs are set against the delivery of the Training Requirement that de facto needs a Navy training audience in place along with critical military augmentation within the White Force. When the appropriate battle staff is not available, the Authority will require a demonstration of the ability to deliver the full scope of training associated with the CM from planning to after action review as detailed within Acceptance Milestones. The Test Plan for the CM demonstration will set the conditions and warfare elements required within an exercise specification. The Authority Acceptance Manager will select which vignettes and events to be demonstrated, as a sample of the full vignettes/MELMIL catalogue generated for the CM Exercise to award the CM/AM acceptance status.

Acceptance Milestones (AM)

20. The second pathway contains Acceptance Milestones (AMs). AMs are acceptance activities and decision points, where the Party Responsible for capability development will be required

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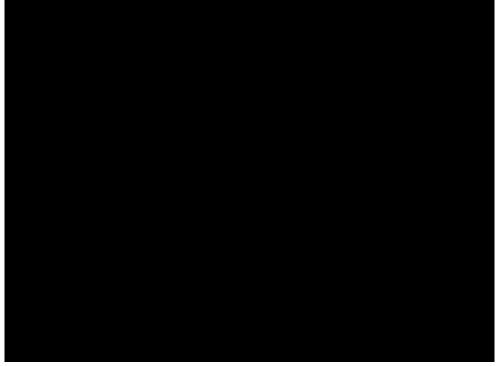
⁴ Where the 'System' includes all capability aspects, not just the physical components, as well as a service provided by industry for the delivery of the training.

⁵ It is recognised the first CM: Contractor Suitably Empowered is the responsibility of the Lead User, with no contractor deliverables required.

- to submit evidence to the Acceptance Authority (AA) to prove that a predetermined capability has been reached. The full schedule of AMs can be found at Annex B.
- 21. The AMs are structured in a functional approach such that compliance can be demonstrated independently and sequentially if the planning training schedule has been disrupted by operational contingencies (see para 19). It is envisaged that many AMs relating to the development of the full synthetic environments, their effectors, entities, and vignettes will be across test points from FAC or SIL through to FOC.
- 22. Due to the structure of MCAST being discrete elements of Core Systems & Services and Exercise Service Support, the Acceptance Process has been split into two key groups covering very different aspects of the MCAST capability: **Service** being the 'Core' and real-life support elements, and the **Simulation and Software** tools being digital assets.

ITEA Organisational Structure

- 23. Due to the small user community, DLoD responsibilities will be undertaken by the Lead User, including delivery and management of capability integration.
- 24. The ITEA relevant delivery hierarchy is shown in Figure 2 below and detailed in Table 1.



25. The ITEA Manager for MCAST is currently the PT Requirements Manager (RM) chairing both the RM and ITEA WGs.

Role	Key ITEA Responsibilities	Post
Sponsor	Supporter of the project mandate, providing the necessary resources to develop the capability, including ITEA.	NCHQ

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Senior Responsible Officer (SRO)	Responsible in the Command space for delivering capability. Responsible for final acceptance of the capability.	COM FOST
Delivery Team (DT):	Responsible in the Procurement space for delivering MCAST.	DES Ships MCS- MTAO-AW-ProgMgr
Project Manager (PM)	Responsible for managing the capability delivery programme day to day, including stakeholder management.	DES Ships MCS- MTAO-AW-MCAST- PM
ITEA Manager	Chairperson of the ITEA WG. Responsible for managing the TE&A activity against the ITEA schedule, including evidence collation, and maintaining this ITEAP as a living document.	MCAST RM
Lead User PoC	Chairperson of the Capability Integration WG (CIWG) (through the DOTC(M) CIWG forum). Will complete validation against their produced URD. Responsible for SME support to SRD and ITEAP	JTEPS TREG SO1

Table 1: Key Roles and Responsibilities relating to MCAST ITEA.

ITEA Meetings

26. This section gives an overview of the working groups or other parties responsible for the delivery of AMs. The ITEA WG has been fully detailed in Annex D. The chair of each group is responsible for organising the meetings, and ensuring progress, including necessary inputs and outputs, is in line with the Organisational Structure, this ITEAP and the Project Constraints.

MCAST Integrated Test Evaluation and Acceptance Working Group (ITEA WG)

27. The ITEA WG is the primary means for coordinating ITEA Activities across the MCAST Programme. It provides the forum for the PT, Users and contractor to interact with test organisations to ensure their ITEA needs are being met and a focal point for evidence collation. The ITEA should use this ITEAP as a living article to document and communicate its aims and activities. A full Terms of Reference for the ITEA WG in included at Annex D.

MCAST Capability Integration Working Group (CIWG)

- 28. The CIWG will form part of the Project Board. It will be led by the Lead User and involving the contractor in order to progress and monitor capability development post contract award.
- 29. The key aims of the CIWG, as part of the Project Board, can be summarised as;
 - a. Manage and assist with capability development (both contractors and military support).
 - b. Provide a forum for feedback to the contractor, de-risking acceptance.
 - c. Manage information/access interfaces, resolving issues where possible.
 - d. Ensure MCAST development does not impact BaU for CSF/ CSG/ LSG stakeholders.

Acceptance Processes

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- 30. Annex B details the AMs that must be completed for the project to reach CMs. Many of these AMs are mandatory regulatory reviews or audits and as such have a defined process, both for T&E and Acceptance. Where these processes exist, they shall be followed. It is the ITEA Manager's responsibility to ensure evidence received from the respective Acceptance Authority (AA) is of suitable quality and collated to provide a clear audit trail of decisions made and by whom.
- 31. Where an extant acceptance process does not already exist, a Responsible Party will collect and present evidence of achievement for evaluation in an Acceptance Case, including a recommendation for the Acceptance Status.

Acceptance Status

- 32. The Acceptance Status for each milestone can be one of three categories:
 - a. Not met. The milestone is yet to be reached, is in progress or has been rejected. Further work is required to reach the milestone.
 - b. Under Review. The responsible party has submitted the required evidence to the appropriate AA and is awaiting a decision.
 - c. Achieved. The milestone is considered to have been met and the project can progress.

Acceptance Cases

- 33. The respective lead of the delegated Responsible Party is responsible for raising and submitting Acceptance Cases to the Acceptance Authority.
- 34. A sample template for an Acceptance Case is presented at Annex E, however Acceptance Cases should be tailored to suit, with the presented template a guideline only. For CMs, assurance from the Lead User of Readiness (typically through a Readiness Letter) is a base requirement.
- 35. When reporting acceptance to the SRO, the Sponsor is to report in writing, highlighting acceptance decisions and recommendations. In addition, the SRO is to be made aware, at each key Milestone, of any concessions granted or where the capability will fall short of the endorsed URD.

Evidence Management

36. The AM Structure detailed at Annex C shall be expanded within the Contractor's Compliance Demonstration Plan to detail all SOW deliverables and/or/ user and system requirements that will be satisfied within each AM or CM. This should link all requirements to validation and verification method, the results and evidence. The ITEA WG will approve validation and verification plans and subsequently recommend acceptance of the evidence and results to the Capability Manager.

Evidence Contributions

37. Defined evidence for all TE&A activities is to be passed to the ITEA manager for inclusion in the evidence repository. The output evidence from each activity should be defined in the Milestone Details table presented at Annex B. Responsible Parties should ensure evidence from preceding milestones or activities is suitable for Acceptance of milestones under their responsibility.

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38. Lead users will assess technical and associated requirements (URD & SRD) to ensure that their considerations are adequately addressed, and that the methods of verifying and validating them are suitable, as detailed in this ITEAP and contractors T&E plan.

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Section 3: Stakeholders

- 39. Responsibility for stakeholder management for MCAST ITEA remains with the MCAST PM. Thus, the Stakeholder Matrix and Communication and Stakeholder Management Plan is held by the PM. These documents will be reviewed at least every 6 months.
- 40. Organisational structures specific to the Acceptance or T&E Strategy can be found in their respective sections (2 and 4).

Wider Stakeholder Community

- 41. The wider stakeholder community includes Interested Parties; and Parties who do not directly influence capability development but wish to remain informed for project progress and outcomes.
- 42. The MCAST PM is responsible for informing these parties of progress at appropriate milestones (CMs as a minimum).

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Section 4: Test and Evaluation (T&E) Strategy

43. The T&E Strategy is progressive acceptance whereby each element of the system is examined at the earliest practicable opportunity in order to ensure that the solution is progressing towards full satisfaction of the programme's User, System and Contracted requirements.

T&E Goals

44. The ultimate T&E goal is to:

Collect and analyse evidence to allow for an objective decision as to whether the delivered capability meets the User Need, as defined in the contracted requirements.

This must be done within the time and budget constraints of the project, with opportunities to achieve better Value for Money delivered.

T&E Organisation

- 45. T&E activities will primarily be managed and co-ordinated through the ITEA WG. The full Terms of Reference for the MCAST ITEA WG is presented at Annex E. Full details of parties responsible for delivering test activities, and the acceptance authority charged with evaluating those activities are listed within Annex B.
- 46. Design and integration T&E activities up to and including FATs will be organised and run by the Contractor. User involvement is encouraged during these phases, helping to increase familiarity with the capability and de-risk acceptance. The primary forum for this is expected to be the CIWG, as part of the Project Board. Authority oversight is expected at significant Factory Acceptance Tests (FATs) and the User Trial.
- 47. The DT ITEA Manager should lead all evaluation of Service Acceptance Tests (SATs) with User support. While the DT will focus on Verification, the User will have a natural tendency towards Validation. The contractor should provide all necessary resources to deliver the SATs.
- 48. Post FOC, the Capability Manager would be expected to coordinate any subsequent ITEA activity.

T&E Process

49. T&E will be driven by the milestones identified in Annexes A and B. This is demonstrated in Figure B1. A full Verification and Validation Strategy is presented at ANNEX C.

Expected T&E Activities

50. This section provides a breakdown of the Verification Categories which are quoted in the SRD for each requirement, proving an expected breakdown of the activities required during the T&E process. Note these activities are almost all Acceptance Milestones, containing evidence collation and submission before being signed off as passed.

Scaling and Phasing

51. It is accepted that for many requirements the resources required to run a demonstration makes a full test prohibitive. The capability delivery concept if for a phased approach through Capability Milestones 1 to 5 with CM 5 being FOC. The growth of the synthetic products portfolio to support the exercise simulation will be coordinated with the Training Delivery Plan (Statement of Training Requirement (SOTR). An element of scaling will be required, with

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every performance element of the System's Requirements (SR) proven, with the only outstanding functional element being the scale of capability delivery. Where the authority has approved 'Scaling' for the acceptance of a requirement, the contractor must also provide a 'Scaling plan' within their test plan to achieve Acceptance Milestones. This should include highlighting any potential risks associated with the scale increase and possible mitigating actions. The authority has indicated requirements where scaling is permitted and the acceptable evidence requirements in the VVRM.

Validation and Verification Requirements Matrix (VVRM)

- 52. The Requirements Manager (RM) within MCS PT will generate and maintain the project VVRM,. The following key points will be determined for each SR and validated by the respective Owner:
 - a. The Owner Usually the respective DLoD Owner.
 - b. The Verification Categories how it will be verified.
 - c. The Validation Status Pass/Fail as per Requirement Set Validation Criteria⁶.
 - d. Any certification that is required to verify the Requirement.
 - e. Inclusion at PDR, status following and the supporting evidence.
 - f. Inclusion at CDR, status following and the supporting evidence.
 - g. Inclusion in FATs, status following and the supporting evidence.
 - h. Inclusion in the Service Review, status following and supporting evidence.
 - i. Inclusion in SATs, status following and the supporting evidence.
 - Requirement sentence at Capability Acceptance Review.
- 53. The contractor has been delegated full responsibility for all tests up to SATs. The respective trial manager should make the PT aware of any major⁷ test or trial underway so that the PT can arrange oversight or other attendees.
- 54. A full list of the VVRM attributes can be seen in Table C1, within ANNEX C: Verification and Validation Strategy and Management. The VVRM framework is at ANNEX D

Test Plans

- 55. Once the VVRM has been generated, definitive lists of which SRs are to be tested when will allow for detailed, configuration managed Test Plans to be produced. A simple filter by inclusion on the VVRM allows for a test requirement detailing all SRs to be assessed at that stage to be generated. Plans will be generated by the respective test organisation.
- 56. Test plans may use previous exercises/inputs to make test preparation and enactment as efficient and effective as possible.
- 57. Each Test Plan will contain:
 - a. Trial management information.
 - b. When the Trials Readiness Review (TRR) will take place.

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⁶ Annex C lists these criteria.

⁷ Definition of 'Major' to be agreed at contract award

- c. The Test Organisation that is responsible for the trial (detailed in Annex C.
- d. Which Requirements are verified by each test.
- e. How the requirements will be tested⁸.
- f. How the evidence will be gathered and recorded.
- 58. The ITEA Manager will generate and maintain the ITEA Schedule of Activities (evidence identification and collection). This schedule will provide an audit trail to support capability acceptance. Review of this schedule will be a key agenda item at each ITEA WG.

Evidence Management

- 59. T&E activity generates a large amount of data that must be converted into a format that can be easily evaluated and from which knowledge can be generated and Stakeholder Acceptance decisions made. In general, the data will be presented in reports. Examples of the expected reports for MCAST include:
 - a. Review Reports: various reviews will take place over the acceptance process, including those under GEAR and external Safety Auditors. The report detailing the decision made and why should be collected from each review. Other evidence such as minutes should be collected if possible.
 - b. Test / Trial Reports: each test or trial will produce a completed test report, which will include performance data together with Trials Officer and Acceptance Officer assessments of the trial.
 - c. Exception Reports: where a specific occurrence takes place that presents a risk to the T&E Schedule and wider Acceptance, an Exception Report will be raised to highlight the details and the potential risk.
 - d. Non-Equipment DLoD Reports: throughout the project, non-Equipment DLoD will be required to submit reports to indicate satisfactory completion of a milestone or achievement of a requirement. This includes Letters of Readiness.
- 60. Reports must clearly articulate compliance with the targeted requirements and provide data to support these conclusions. Where there is non-compliance, the reports must clearly identify the gap in performance and the impact this will have on overall System performance, the defined non-compliant category (see Table 2), and if appropriate any remedial action that is required and a date by when that action must be complete.

Evidence Portfolio

- 61. Ensuring the consolidation and appropriate distribution of Test data and reports is a fundamental ITEA activity. An evidence Portfolio will be maintained throughout the Project, available to those who require it and have the appropriate clearance.
- 62. Individual requirements in the VVRM will be linked to evidence documents in the evidence Portfolio. This will enable full traceability from the evidence documents to the requirements. The PT will own and maintain the evidence Portfolio, ensuring that it is logically organised and that the links from the requirements remain up to date and valid.

⁸ Within security limits, see Evidence Classification Section

63. Trial managers are to ensure that all suitable test reports are passed to the ITEA Manager so that they can be stored within the evidence Portfolio.

Requirement Acceptance

64. Following each acceptance event or activity, each tested system requirement will be given a Sentencing Statement by the Acceptance Case. This will be set from one of the options outlined in Table 2 below and will allow the tracking of Acceptance progress throughout the Project. Once approved by the Acceptance Authority, the ITEA Manager is responsible for ensuring the agreed Sentencing Statement is recorded in the VVRM.

65.

Sentence	Description
Accept outright	The evidence is sufficient to demonstrate that the acceptance goal has been achieved.
Accept with Concession	The evidence shows that the acceptance goal has not been achieved and so a permanent relaxation of the requirement is proposed.
Accept with Proviso	The evidence shows that the acceptance goal has not been achieved and so a temporary relaxation of the requirement is proposed subject to corrective work that will be carried out by the relevant agency by an agreed date.
Rejected	The evidence fails to demonstrate that the acceptance criteria have been achieved; compromising the capability to the extent that it should not be accepted without some form of remedial action.
Not yet considered	Activities relating to testing this acceptance goal have not yet been completed so a recommendation cannot be provided.
N/A	This activity is not included in this testing regime as is it is Not Applicable.

Table 2: SR Sentencing Statements

Requirement Authority

66. The SRO must agree to any Acceptance with Concession. The ITEA Manager is responsible for ensuring the SRO receives a copy of the Acceptance Case with the recommended Sentence. The SRO shall endeavour to reply within five working days to allow for the project to progress without risk to project constraints.

Non-Compliance

67. If a concession is not granted and negotiations cannot resolve the issue, severance of the contract will be sought, governed by DEFCON538 (Edn.06/02). The contractor should be aware failure to meet Key, Mandatory or Priority 1 SRs.

Maturing the T&E Process

- 68. In order to fully mature the T&E process, providing an agreed and costed ITEA schedule, the following stages are expected:
 - a. **Strategy generation:** the draft ITEA strategy has been documented in this ITEAP to be agreed by stakeholders and endorsed by SRO.

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- b. **ITEAP V1.0 Released:** the ITEAP detailing the overarching strategy is agreed with the ITEA WG and endorsed by the SRO. Iterative releases are expected as the project advances.
- c. VVRM generation: The initial version of the VVRM has be drafted in EXCEL to logically group requirements, covering the entire SRD. This outlines all evidence requirements and the T&E methodologies for each SR. The VVRM will be issued as part of the Tender documentation. The Contractor will produce a Compliance Demonstration Plan (CDP) that will at inception detail how Acceptance Milestone Test Plans will be generated and how SRs will be captured within each AM Test Plan. The CDP will be matured post Contract Award in accordance with the SOW Contract Deliverables. The CDP will only be confirmed once the full ITEA schedule has been delivered by the Contractor and accepted by the MoD.
- d. **ITEAP/VVRM Development:** the ITEAP and VVRM will continue to be developed iteratively in order to reflect the contracted SRD, contract negotiations and any other necessary changes identified during the Assessment Phase.
- e. **Test Schedule Development:** This phase will involve detailed planning of all T&E activities with the Prime Contractor, PT and User community to develop a fully costed timetable for T&E. The VVRM should be updated to include Success Criteria for all tests. The test schedule will be developed in line with the maturing process, linking AM Test Plans to the Training Deli very Calendar as shown in Figure 3, based on the Acceptance Milestones detailed in Annex B.

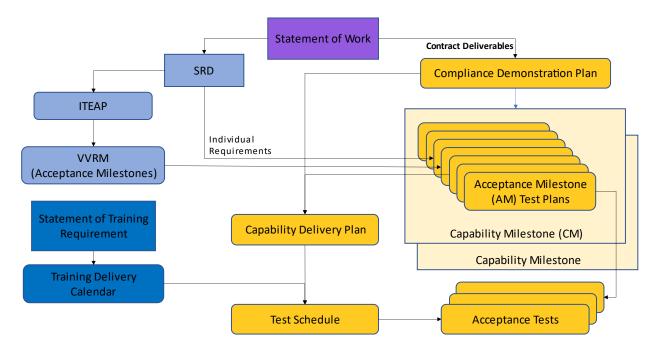


Figure 3. Test Schedule Development

f. ITEAP V2 Released: The second major version of the ITEAP should detail and link to the full T&E plan developed by the Contractor and agreed at the ITEA WG for endorsement by the SRO.

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g. **Post-Contract Award:** The ITEA WG will be accountable for maintaining the overall verification T&E schedule and managing delivery of it up to ISD. The Prime Contractor's T&E plans should be in line with strategy presented within this ITEAP.

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Section 5: Resources

Personnel

- 69. The organisation⁹ responsible for delivering the trial will be responsible for providing the required personnel. Witnessing Authorities will provide their own staff-
- 70. It is highly unlikely significant additional military personnel will be available for Validation purposes, thus the only true opportunity to fully validate the MCAST capability comes in the planned exercises. Attendance of the ITEA and CI WGs by the user shall be accounted for in resource scheduling.
- 71. Engagement between the Users and Contractor is to be encouraged throughout the programme. Including during the Demonstration Phase, particularly through Design and Integration, increasing User familiarity with the capability and provided feedback, reducing risk to acceptance and subsequent military augmentation.

Facilities

- 72. The ITEA Manager, with the support of the ITEA WG should identify and arrange facility access. The contractor will have to demonstrate their solution at their premises prior to the first user trials. Where the contractor requires use of additional MoD facilities, or additional GFA, this shall be identified within their T&E Plan and agreed at Contract Award. The MoD will then be responsible for arranging and providing all agreed GFA facilities as requested.
- 73. Discussion between the ITEA Manager and the contractor will take place to identify where SATs need to be conducted, whether it is at the contractor's premises or if GFA facilities are required. Suitable facilities will be identified if GFA is required.

Equipment and Logistics

74. The contractor shall be responsible for providing all non-GFE equipment and associated logistics support for test activities that are within the scope of their contract (the MoD will provide all other GFE required for test activities).

Budgets

75. Costs for Authority T&E activities will be identified during the Test Schedule Development and must be budgeted for with each Authority's plans. All contractors T&E costs are to be included in the contract cost.

Government Furnished Assets

- 76. The MCAST GFA list can be found at ITN Annex F.
- 77. The GFA Management Plan is owned by DE&S and will be managed by the selected contactor. The Authority will undertake a GFA Audit at various points through the contract duration, in line with contractual requirements.
- 78. The GFA available also constrains acceptance activity, as BaU exercises will take priority on the limited GFA resources available. Therefore, any acceptance activity will have to be planned so that it does not conflict with pre-planned exercises.

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⁹ This could be the contractor or the authority.

Section 6: Key Project ITEA Interdependencies

Related Programme/ Project/Event	Interaction	Opportunities for combined testing

Table 3: The project interdependencies with any potential opportunities for combined testing highlighted.

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Section 7: Risks, Assumptions and Learning from Experience (LFE)

ITEA Risk

- 79. The overall responsibility for MCAST risk management resides with the SRO. It is imperative that all risks identified through the ITEA process directly inform wider risk management activity and are escalated accordingly. ITEA risks are those which affect the achievement of the Acceptance Milestones defined within this document.
- 80. ITEA related risks will be owned and managed locally as part of the extant risk management processes. The ITEA WG provides a forum for reviewing ITEA risks, with a top five risk review a standing item on the ITEA WG agenda. All attendees are encouraged to share risks and contribute to risk management.

Risk Reporting

81. The contractor and test teams must raise any T&E risk rated as high¹⁰ or above to the ITEA WG. The ITEA Manager should maintain a record of the pertinent ITEA risks, including their owner, reference number and location.

Assumptions

82. All assumptions including those related to ITEA will be recorded in the Project MDAL. The MDAL will be regularly reviewed by the ITEA Manager to ensure that all ongoing assumptions are correct. This ITEAP should be reviewed upon any update of the MDAL, to ensure the effect of the modified assumptions list on ITEA is reflected, particularly those assumptions relating directly to the ITEA process.

Learning from Experience

83. LFE aids in anticipating risks and issues and increases the probability of future success.

Throughout the MCAST acceptance process previously identified LFE from other projects will be utilised to ensure best practice, including in the writing of this ITEAP.

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¹⁰ 'High' Risks are those in the top 40% of the applicable scoring scheme.

Abbreviations & Acronyms

AA	Acceptance Authority
ACR	Acceptance Case Report
ADS	Automatic Detection System
AM	Acceptance Milestone
ASG	Acquisition System Guidance
BAU	Business as Usual
BC	Business Case
BCM	Business Change Manager
CA	Capability Acceptance
CDR	Critical Design Review
CIWG	Capability Integration Working Group
СМ	Capability Milestone
DAIS	Defence Assurance and Information Security
DE&S	Defence Equipment and Support
FATs	Factory Acceptance Tests
FOC	Full Operating Capacity
GFA	Government Furnished Assets (GFA) - includes Government Furnished Equipment (GFE), Services (GFS), Facilities (GFF), and Information (GFI)
IOC	Initial Operating Capacity
ISD	In-Service Date
ITEA (P)	Integrated Test, Evaluation and Acceptance (Plan)
JSP	Joint Service Publication
LFE	Learning from Experience
MDAL	Master Data Assumptions List
MG	Main Gate
MoD	Ministry of Defence (UK)
PDR	Preliminary Design Review
PgM	Programme Manager
PM	Project Manager
R&M	Reliability and Maintainability
RFTD	Ready for Training Date

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RM	Requirements Manager
SATs	Service Acceptance Tests
SME	Subject Matter Expert
SOW	Statement of Work
SR (D)	System Requirement (Document)
SRO	Senior Responsible Owner
SRR	System Requirements Review
T&E	Test and Evaluation
TLM (P)	Through Life Management (Plan)
TRR	Trial Readiness Review
UAR	User Acceptance Review
UK	United Kingdom
URD	User Requirements Document
V	Version
V&V	Verification and Validation
VVRM	Verification and Validation Requirements Matrix
(W) SOI	(Wider) System of Interest
WAF	Work Authorisation Form
WG	Working Group

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ANNEX A: Capability Milestone List

1.	
Milestone	Description

Table A1: Capability Milestones.

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¹¹ Capability Milestones are defined at CONOPS V1.0.

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ANNEX B: Acceptance Milestone List

1. Figure B1 shows the framework of |Acceptance Milestones relating to system acceptance and Table B1 provides descriptions of all Acceptance Milestones.



AM	Description

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Table B1: Acceptance Milestones.

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ANNEX C: Verification and Validation Strategy and Management

Validation

- 1. On this project, validation is divided into three distinct activities:
 - Validation of the requirements.
 - b. Validation of the design.
 - c. Validation of the delivered capability.

Validation of Requirements

- 2. Requirements validation will be conducted in two areas: DE&S and the Supplier.
- 3. DE&S Requirement set Validation will ensure the SRD:
 - Fully traces to the URD.
 - Fully satisfies the requirements of the URD.
 - c. Captures all enabling requirements needed to ensure the delivered capability meets the stakeholder needs.
 - d. Identifies all interfaces and the data exchanges across them.
- 4. Supplier Requirement set Validation will ensure the supplier requirements:
 - a. Fully trace from the DE&S SRD through all Supplier requirement documents (expected to be System / Sub-System, Software, Electronic Hardware, Mechanical.
 - b. Fully satisfy the next highest level in the requirements chain.
 - c. Capture all enabling requirements needed to ensure the delivered capability meets the stakeholder needs.
 - d. Are captured in a configuration managed environment.
 - e. Are reviewed and endorsed by all relevant stakeholders.
 - f. Identify all interfaces and the data exchanges across them.
- 5. Satisfactory Requirement set Validation will be captured in a Validation Statement, generated by the ITEA Manager / Supplier equivalent. The statement will contain:
 - a. Date Requirements set Validation carried out.
 - b. Baseline details of all documents included in the activity (including referenced material) capturing reference title / number and version details.
 - c. Details of those carrying out the validation (names / staff numbers).
 - d. Pass / Fail status of every requirement against the validation criteria.
 - e. Statement of impact for any requirements which fail the validation criteria.
 - f. Plan for correction of any failures.
 - g. Statement of acceptance by Sponsor / Supplier equivalent for every requirement which fails validation and is not to be corrected.
- 6. DE&S Requirement set Validation shall be conducted during the System Requirements Reviews (SRR) and repeated whenever the URD or SRD is changed (such as during tender negotiations). Likewise, whenever the Supplier up-issues a requirements document, a revalidation of the requirement set will need to be conducted.

- 7. It is assumed the URD will not change significantly throughout the remainder of the project. It is expected that the SRD will change during the negotiation phases, and a re-validation activity must be conducted to ensure the revised document continues to fulfil the needs of the URD.
- 8. It is expected that the supplier requirements suite will be updated many times during the design phase.
 - a. The ITEA Manager is responsible for ensuring the SRD in use (i.e. the version forming part of the current document baseline) has a valid Validation statement.
 - b. The ITEA Manager is also responsible for ensuring re-validation of the Supplier requirements documents is carried out at appropriate times (as a minimum, pre CDR).
 - c. The Project Engineer is responsible for ensuring the SRD is re-validated after each round of updates have been incorporated.

Validation of Design

- 9. Design Validation is a Supplier activity, achieved through internal reviews of the designs of the different domains (Systems, Software, Electronic Hardware, Processes) at two major reviews: Preliminary Design Review and Critical Design Review (PDR and CDR).
- 10. The output of these reviews will be assessed by DE&S as part of the assurance that the supplier designs meet the requirements and are being developed in accordance with the contractually agreed processes. Passing CDR indicates the supplier has a validated, compliant, detailed design and allows them to progress onto the Implementation phase: building / procuring the system for V&V activities.
- 11. The ITEA Manager is responsible for liaising with the supplier to agree and then attend / assess any design reviews deemed appropriate to gathering design evidence. They will be supported by members of the user community as requested by the ITEA Manager.

Validation of Delivered Capability

12. The delivered capability will be Validated by delivery of an Exercise and subsequent assessment of performance by the user.

Verification

- 13. During Integration, the contractor will be performing verification activities to successively prove their output, culminating in an Integrated Test, Certification and Analyses. The contractor is responsible for informing the ITEA Manager of significant test outcomes, including any barriers or changes to the technical risk. Initially this will be at the Module/Unit/Component level, but then at Subsystem and finally System level to show compliance of their total product against the specification.
- 14. The ITEA Manager is responsible for collating evidence provided by the contractor to assist with reviews and programme management.
- 15. The DT will approve the SATs, as planned and run by the Contractor. These tests aim to demonstrate compliance to all System Requirements. The tests will be the primary source of evidence when assessing equipment owned SRs in the System Acceptance Meetings.
- 16. The final Verification will be the Capability Acceptance Meeting, where the VVRM and collected evidence is used to sentence each SR. Only once all SRs are passed (outright or with proviso or concession) will the capability be verified and IOC able to be declared.

Capturing V&V evidence

- 17. The ITEA Manager shall ensure every UR and every SR is assigned to one-or-more V&V events, which will provide evidence of compliance to the requirements. The assignment to events will be captured in the Verification and Validation Requirements Matrix (VVRM).
- 18. The actual evidence gathered during each event will vary. Some evidence can be 'pass/fail' status for each requirement. Other evidence will be in the form of statements or test reports saved in the ITEA area of the project folder structure. A link to these files should be included in the appropriate VVRM comments section as evidence.
- 19. In addition to the formal V&V events that demonstrate the requirements are satisfied, several other activities will be required to confirm that the evidence being collected is robust and of sufficient quality. Although these are not V&V events in their own right, it is important that these activities occur and evidence for these is collected, such that formal V&V events can be demonstrated to be valid.

Verification and Validation Requirements Matrix (VVRM) Management

- 20. The VVRM outlines the anticipated test and acceptance events / activities required to accept the contractors' solution. Each System Requirement is assigned a minimum of one Verification Method and on occasion more where the requirement is of importance and specific elements can be verified or accepted early. The VVRM should be kept updated in line with the following events:
 - a. Any changes to the URD or SRD should be reflected in the VVRM¹²;
 - b. Any changes to the verification categories or methods.
- 21. VVRM test planning shall identify the high-level test action and the acceptance threshold and objective taken from the SRD. Any test schedules produced should use these VVRM checklist to ensure all expected test activities are covered in the schedules.
- 22. Once the test and acceptance activities have commenced the VVRM should be updated to track the acceptance and any test observations. For example, test schedule references, test results (pass, pass with concession, fail) any recorded values (specially to note differences with the SRD Measures of Performance) and test observations for contractor review can be recorded within the VVRM. This will allow management the complete equipment and capability acceptance case and provide visibility of test results prior to the issue of the formal test reports. The results and evidence will be used in the Acceptance Case arguments to accept the capability.

VVRM Evidence Structure

23. The VVRM Evidence report must identify the capability requires being met with a descriptor and the associated SR covered within the evidence report. The evidence structure may be refined within the ITEA WG as part of the planned ITEAP review.

¹² Note DOORs is not being used for this project; tracking of VVRM will be in live EXCEL books.

Capability Element		SR/SOW Refences
Attribute	Permitted Values	Purpose
Validation Status	Not Yet Conducted / Pass / Fail	Used to indicate that the requirement has passed or failed when reviewed against the Requirement Set Validation criteria (see start of section).
PDR Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate whether the design solution to this requirement is reviewed at PDR, and the status following. It is NOT an indication that the design has passed or failed PDR – the SRD requirements themselves are not under review at PDR, only progress towards those SRs.
PDR Comment	Free Text	Used to capture notes relevant to a PDR (failure / reason / suggested fix etc).
		A link to supporting evidence (minutes/report) should be included.
CDR Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate whether the design solution to this requirement is reviewed at CDR, and the status following. It is NOT an indication that the design has passed or failed CDR – the SRD requirements themselves are not under review at CDR, only progress towards those SRs.
CDR Comment	Free Text	Used to capture notes relevant to a CDR (failure / reason / suggested fix etc).
		A link to supporting evidence should be included.
Supplier Analysis	Free Text	Used to describe the methods used to analyse the requirement (e.g. R&M Case etc)
		Requirement should also be linked to the analysis procedure and supporting evidence.
		Leave blank if not applicable.
Certification Required	EMC Safety	Used to Indicate the category used to certify the requirement.
	Environmental Software Security	Leave blank if not applicable.
Certification Status	Not Specified / Not Assessed / Incomplete / Partial Failure / Failure / Passed	An assessment against the above certification categories.
Certification Comment	Free Text	Used to capture notes of the Certification methods used, including any accreditation methods or evidence.
		Leave blank if not applicable.
FATs: Individual Capability Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate that the design solution for the required sub-capability has passed a FAT when tested individually (where multiple SRs can make up one individual sub-capability).

Capability Element		SR/SOW Refences
Attribute	Permitted Values	Purpose
FATs: Individual Capability Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).
FATs: Integrated Test Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate that the design solution for the required sub-capability has passed a FAT when tested as part of an integrated suite of software on a device or test bed.
		Where the capability within the SR need not be assessed during that activity, N/A should be awarded, and no test requirement specified.
FATs: Integrated Test Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).
FATs: System Test Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate that the design solution for the required capability has passed a FAT when tested as part of an integrated capability with functional use verified.
		Where the capability within the SR need not be assessed during that activity, N/A should be awarded, and no test requirement specified.
FATs: System Test Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).
Service Review Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate that the design solution for the service element of MCAST has been approved by the CIWG, with a high confidence it can deliver the desired benefit.
		Where the capability within the SR need not be assessed during that activity, N/A should be awarded, and no test requirement specified.
Service Review Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).
Authority Analysis	Free Text	Used to describe the methods used by the Authority to analyse the requirement
		Requirement should also be linked to the analysis procedure and supporting evidence.
		Leave blank if not applicable.
SAT: Performance Test Status	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	Used to indicate that the produced capability meets the required performance threshold during a flight test.
		Where the capability within the SR need not be assessed during that activity, N/A should be awarded, and no test requirement specified.
SAT: Performance Test Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).
SAT: Functional Test Status	Accept outright / Accept with concession / Accept	Used to indicate that the produced capability meets the required functional threshold during a flight test.

Capability Element		SR/SOW Refences
Attribute	Permitted Values	Purpose
- Attailed to	with proviso / Rejected / Not yet considered / N/A	Where the capability within the SR need not be assessed during that activity, N/A should be awarded, and no test requirement specified.
SAT: Functional Test Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).
Capability Acceptance Sentencing	Accept outright / Accept with concession / Accept with proviso / Rejected / Not yet considered / N/A	The ITEA WG shall ensure each SR has been Sentenced from the options defined in Section 4, Table 2 Requirement Acceptance Statements Note if SRs are rejected the capability had failed to pass System Acceptance, with further capability development required before the capability can be accepted into service.
Capability Acceptance Comment	Free Text	Used to add any further details, including the method used and a link to the supporting evidence (reports).

Table C1: VVRM Attributes to be assigned per VVRM line.

Note: UAR is not included within this SRD VVRM view as that will take place against the URD. The User is expecting to create a similar view and determine evidence requirements for acceptance against the URD in an Excel spreadsheet.

ANNEX D: MCAST ITEA WG Terms of Reference

- The MCAST ITEA WG is a working level meeting chaired by the ITEA Manager for coordinating Test, Evaluation and Acceptance activities within the MCAST Programme. Its frequency reflects the compressed nature of the programme and provides the additional monitoring and co-ordinating function required to ensure the effective synchronisation of TE&A activities and collection of evidence, pan-DLoD.
- 2. The MCAST ITEA WG will:
 - a. Generate then develop an ITEAP to provide guidance on the acceptance strategy, how test and evaluation will be conducted and how this combines to form an integrated schedule.
 - b. Monitor ITEA progress against the developed schedule.
 - c. Manage ITEA related Risks and Opportunities, including identification of Combined Testing Opportunities.
 - d. Provide a forum for DLoDs to communicate with Test Organisations and SMEs. This is particularly pertinent for ITEA Risk management.

Inputs

- 3. The MCAST ITEA WG requires the following inputs:
 - a. Previous RoDs and Actions Register.
 - b. MCAST ITEAP.
 - c. MCAST Test Schedule.
 - d. MCAST Risk Register.
 - e. Feedback from relevant WGs.
 - f. Feedback/reports from any completed testing.

Outputs

- 4. The MCAST ITEA WG outputs are:
 - a. Meeting RoDs and Actions Register.
 - b. Updated MCAST ITEAP.
 - c. AM and CM test plan approvals.
 - d. Updated MCAST Risk Register, including top risks to be escalated to the Risk and Issues WG;
 - e. Pan-DLoD and user coherence of the programme tests and reviews.

Agenda

5. The standing agenda for the MCAST ITEA WG is shown in the table below. Additional agenda items may be included where appropriate and circumstances require.

Item	Agenda Item
1.	Welcome/Introduction
2.	Review of Previous Actions
3.	Development of artefacts (ITEAP, test plans etc)

Item	Agenda Item
4.	Review of ITEA Schedule/Key Issues
5	ITEA Risk Review and opportunities LFE documentation
6	AOB
7	DoNM & Close

Table D1. ITEA WG Agenda

Reporting

6. All MCAST ITEA WG materiel is available on an 'information pull' basis from the ITEA Manager. Minutes and context Documents will also be distributed by the secretary following all meetings.

Meeting Frequency

7. The MCAST ITEA WG will normally meet monthly to reflect the rapid nature of the programme. This may be reduced to as little as quarterly in periods of low activity.

Attendees

8. The MCAST ITEA WG has the following members.

Role	Post
ITEA Manager (Chairman)	MCAST RM
ITEA Secretary	tbd
MCAST PM	MCAST PM
Contractor ITEA PoC	TBC following Contract Award
Sponsor	COMFOST (JTEPS)
Lead user	CSF
Test Org ITEA PoC (if necessary)	TBC following Contract Award

Table D1. ITEA WG

Other stakeholders may be invited as observers or participants in the event of a specific need or subject being discussed.

Behaviours

- 9. The following behaviours are encouraged:
 - a. The MCAST ITEA WG membership should be limited to the least number of members required to accept the programme. Attendees can be co-opted for fixed periods to support specific activities.
 - b. The compressed timelines for MCAST mean there is no contingency to allow for incomplete progress of ITEAP development. Attendees should endeavour to complete all assigned actions by the necessary date.
 - c. The ITEA WG should be used to agree and progress actions, not review previous work. This should be done prior, with only contentious issues brought to the ITEA WG.

ANNEX E: Sample Template Acceptance Case

10. A Sample Template for an Acceptance Case generated using best practice from other projects is outlined below. This should be scaled to suit the significance of Milestone. Recorded assurance evidence from all required DLoDs is essential (typically through a 'Readiness Letter'). Further guidance is presented in the Acquisition System Guidance (ASG) Handbook under Acceptance Case Report (ACR).

MCAST at Capability/Appearance Milestone # Acceptance Case Report

From: Name Post
Tel: #
Date: #

Aim

The aim of this report is to provide the Acceptance Authority (AA) with the confidence that all the required elements of military capability have been developed to a sufficient level and thus formally accept the MCAST capability at Milestone # (AM or CM#) into service.

Milestone # High Level Capability Objective

At AM/CM# the MCAST capability shall...

Recommendation

The AA ... is invited to accept MCAST at AM/CM#.... With an acceptance Status of ..., meaning....

Supporting Evidence

DLoD Achievement

The necessary stakeholders have reported in writing to ... to assert that they can support MCAST at AM/CM#. Copies of these letters are appended to this report.

Exception Resolution

What is the state of any capability shortfalls/plan to address them, eg.:

'Deliverers aim to resolve all MCAST AM/CM# provisos prior to acceptance of MCAST at AM/CM# +1.'

'Deliverers have raised all MCAST AM/CM# concessions to the SRO, with the sponsor aware of areas where the capability is likely to fall below the endorsed URD capability.'

Conclusion

The Chairman of the ... WG is content that:

- Notwithstanding the understood and agreed exceptions identified in the DLoD letters, the MCAST at CM# solution is
- Sufficient support is in place across the DLoDs to accept MCAST at CM# into service.

Enclosures

- 1. DT Readiness Letter
- User Readiness Letter