

# **GUIDELINES FOR CONSTITUTION, CONDUCT AND CONCLUDING OF TEST ADEQUACY REVIEW BOARD (TARB)**



## **CENTRE FOR MILITARY AIRWORTHINESS AND CERTIFICATION (CEMILAC)**

DRDO, MOD  
MARATHAHALLI COLONY POST  
BENGALURU-560037

## Documentation Page

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<b>Abstract</b>	In accordance with DDPMAS Ver 1.0, during development, TARB may be constituted by the Main Contractor to review the adequacy of ground testing of systems/subsystem as part of design validation. The document covers the procedure for constitution of TARB committee, the inputs to be provided to the committee, recording the proceeding and documenting the recommendations.
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# **1 Introduction**

## **1.1 Purpose**

Test & Evaluation (T&E) is one of the important phases of system development and certification. To ensure that the test plans and procedure adequately capture the testing requirements, it is important that test cases and procedures are independently reviewed. DDPMAS V1.0 and IMTAR-21 have in multiple sections emphasized the importance of independent review through Test Adequacy Review Board (TARB). This document gives means to comply with the DDPMAS / IMTAR-21 requirements for constitution, conduct and concluding of TARB.

## **1.2 Scope**

The document covers the procedure for constitution of TARB committee, the inputs to be provided to the committee, recording the proceeding and documenting the recommendations.

## **1.3 Applying the Document**

The main contractor shall include these requirements in the Type Approval Basis (TAB) document along with the means of compliance. The Airworthiness Certification Plan (ACP) document shall cover the roles/responsibilities of Main Contractors/ D&D agencies/QA Department, the project milestones

## **1.4 Applicable Documents**

1. DDPMAS Ver 1.0 Framework and Procedure for Design, Development and Production of Military Air systems and Airborne Stores dated Feb 2021.
2. IMTAR-21, Version 1.0 Indian Military Technical Airworthiness Requirements dated Feb 2021.

## **1.5 Definitions**

### **Acceptable Means of Compliance (AMC)**

AMC represents the preferred means by which the Technical Airworthiness Authorities (TAA) expect the intended regulation / criteria to be met.

### **Airworthiness Certification Plan (ACP)**

ACP is a document that brings out the details towards compliance to the agreed Type

Certification Basis (TCB)/Type Approval Basis (TAB) of the Air System/Airborne Stores and the level of involvement of TAA and other stakeholders at each stage of the development.

### **Flight Test Agency of the Respective User Services**

Flight Test Agency within the services, that is authorized by the Service HQ to carry out flight testing of Air System/ Airborne Stores for the Services, such as ASTE, NFTS, AATT, etc., herein referred to as the flight-testing agency of the respective User Services.

### **Indian Military Technical Airworthiness Requirements (IMTAR)**

IMTAR is a document that mandates the technical airworthiness requirements to be followed by organisations/stakeholders involved, under which necessary Clearances, Approvals and Certificates related to airworthiness and certification of Indian military Air System for various scenarios and aspects of Air System life cycle, shall be issued by the Technical Airworthiness Authorities (TAA) of India.

### **Main Contractor**

Main Contractor is the development/modification/ production agency who is entrusted with the total responsibility for development/modification/production/delivery and follow on support of the Air System/ Airborne Store. When multiple agencies are involved, the respective roles and responsibilities may be defined in an agreement/ MoU among the agencies involved. Where there is no ambiguity or when used in a generic sense, the term Main Contractor is used throughout this document.

### **Technical Airworthiness Authorities (TAA)**

CEMILAC and DGAQA, the organizations dealing with Technical Airworthiness of the Air Systems/Airborne Stores are jointly called TAA.

### **Test Adequacy Review Board (TARB)**

TARB is a board constituted by the Main Contractor to review the adequacy of ground testing of systems/subsystem as part of design validation. The board will be chaired by a domain expert and will have system experts, CEMILAC, DGAQA as members. Flight testing agency of User Services may also be co-opted wherever required.

## **2. Test Adequacy Review Board**

### **2.1 Need for TARB**

In accordance with DDPMAS Ver 1.0, during development, TARB may be constituted by the Main Contractor to review the adequacy of ground testing of systems/subsystem as part of design validation. TARB may be constituted under the following conditions:

- (a) The main contractor feels the need for the independent review of the test cases & procedures
- (b) CEMILAC/RCMAs mandates the TARB to be constituted to independently review the adequacy of the test methodology, test cases & procedures. CEMILAC/RCMA may include the requirements upfront in the ACP document or recommend it to be constituted during the course of the product certification.

The needs of TARB as mentioned in IMTAR-21 is given in Annexure – 1.

### **2.2 Constitution of TARB**

As per DDPMAS, the test adequacy review board will be chaired by a domain expert and will have system experts. Technical Airworthiness Authorities (TAA) viz CEMILAC, DGAQA are also members of the TARB. Flight testing agency of User Services may also be co-opted wherever required. Based on various regulations/sections of IMTAR – 21 the typical constituent members of TARB are:

- (i) Domain Expert : Chairperson
- (ii) System Experts
- (iii) Domain Experts
- (iv) Flight Testing Agencies
- (v) Airsystem (Platform) Development Organization Rep
- (vi) Service Headquarters
- (vii) Representative from CEMILAC/RCMAs
- (viii) Representative of DGAQA
- (ix) Software IV&V Members
- (x) D&D Teams from Main Contractor / D&D Agency
- (xi) Member Secretary : From Main contractor

### **2.2.1 Selection of Chairperson & Experts**

The chairperson on the TARB should be an expert in the domain and shall have extensive experience in the area. It would be preferable that the chairperson is not from the same organization / division what is developing the system/store. The same considerations may be exercised for domain / system experts. The chairperson of the TARB may co-opt additional members as felt necessary. The TARB chairperson may also constitute sub-committees / working teams if required.

The honorarium, if planned, for the chairperson & experts shall be borne by the Main Contractor in accordance with their internal practices.

### **2.2.2 TARB – Terms of Reference**

The TARB constitution letter shall include the precise scope, activities and the list of documents/data to be reviewed by TARB. The Terms of Reference shall be include the tentative period/PDC for the TARB to complete its activities.

Ratification of TARB constitution by CE, CEMILAC

In case the TARB is constituted based on recommendation by CEMILAC and/or inclusion in ACP document, the committee may be put-up to Chief Executive (A) for ratification. For such a TARB, CEMILAC would provide a unique number (E.g. CEMILAC/TARB/NNNN/YYYY) which can be obtained from O/o Director (Technical Coordination & Public Interface).

## **2.3 Conduct of TARB Meetings**

### **2.3.1 Inputs to TAR Board**

Before convening the TARB, the member main contractor shall baseline the TRTM, Test Plans/Test Procedures (eg. FTP, SOFT, QTP, TTS, ATP, ITP, GAT, Flight Test Schedules etc) and the Test Rigs / Test Facilities specifications. All necessary documents like System Specifications, Technical Specifications, ICDs, Environmental Maps, standards, etc. Such documents may incorporate all the comments and recommendations of prior reviews like PDR/CDR etc.



### **2.3.2 Convening of TARB Meetings**

The member secretary shall convene the TARB meetings. The meeting notice with necessary brief papers and documents/data shall be forwarded to the TARB committee members atleast 15 working days before the date of the meeting. The member secretary shall circulate the draft MoM of every TARB meeting within 48 hours. Finalized MoM of each meeting may be released within one week for the conduct of the TARB.

### **2.4 Conclusion of TARB**

On completion of all the activities with satisfaction of the Chairperson, the TARB member secretary shall perform the following:

- (a) Incorporate all the recommendations into the TRTM, Test Plans / Procedures and Test Rigs/Facilities.
- (b) Prepare a TARB Proceeding document that includes all the activities conducted during the TARB and the recommendations. All the action items shall have PDCs and responsibilities clearly brought out.
- (c) Forward the TARB proceeding to Chief Executive (Airworthiness), CEMILAC for information.

### **2.5 TARB recommendation and follow up**

All the recommendations by TARB may be completed in a time-bound manner. If required the same TARB may be reconvened to study the test results and their deviations.

The overall inputs & outputs of TARB process is illustrated in Figure – 1.

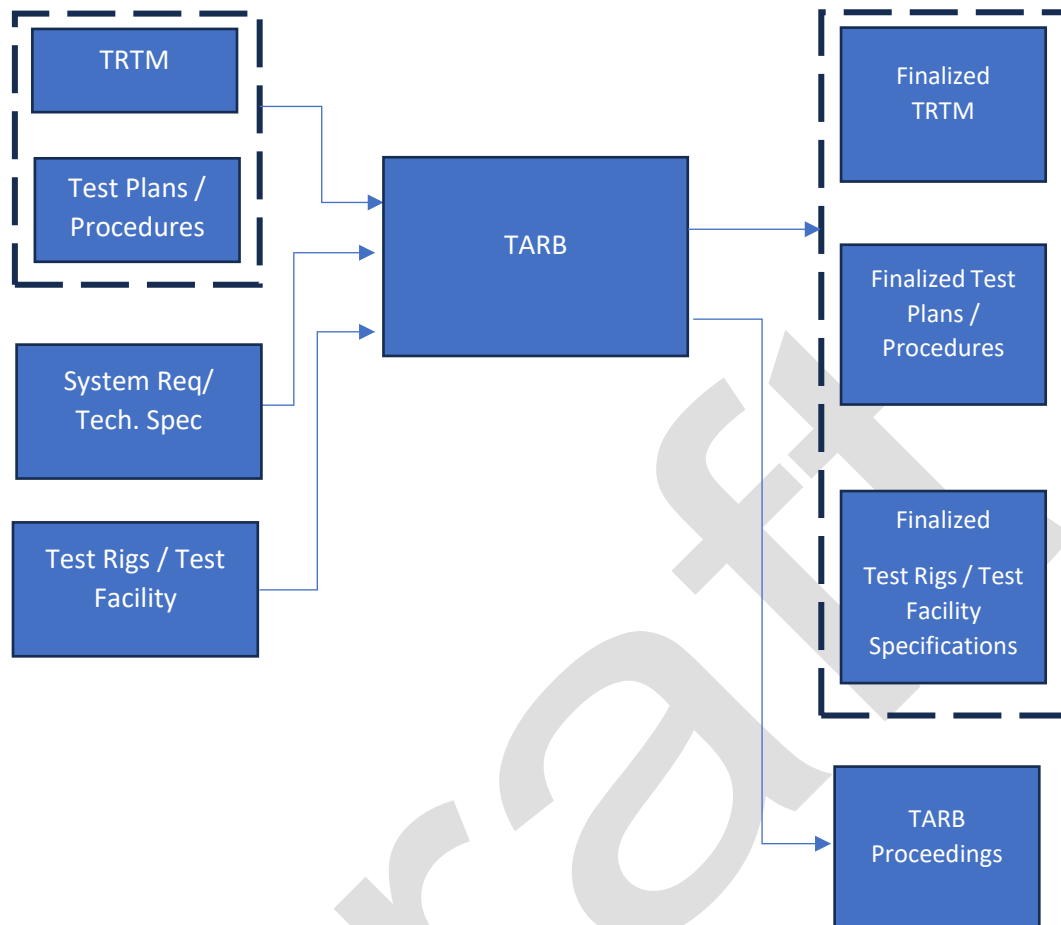


Figure 1 : Inputs and Outputs of TARB

### **3. Review, Promulgation and Feedback**

#### **3.1 Review**

This document was prepared by CEMILAC and reviewed internally by subject matter experts.

#### **3.2 Promulgation**

This document is a part of manuals of Technical Airworthiness Framework released by CEMILAC. The document would be available in CEMILAC's official website after release.

#### **3.3 Feedback**

Any feedback on the document may please be forwarded to the undersigned:

The Director (TC & PI)  
CEMILAC, D R&D Organization,  
Ministry of Defense,  
Bengaluru, Karnataka, India  
PIN Code – 560 037  
Email : [gd.tcs@cemilac.drdo.in](mailto:gd.tcs@cemilac.drdo.in)

#### 4. Annexure – 1: References of TARB in IMTAR-121

Sl. No	IMTAR-21 Reference	Description
1)	3.0 Responsibilities of CEMILAC	Participate in Test Adequacy Review Board (TARB) and ensure test adequacy.
2)	21.B3.16 & 21.B3.D.6	<p>Prior to submission of test plan documents to CEMILAC for approval, the Main Contractor shall constitute the Test Adequacy Review Boards (TARBs), wherever needed, with the involvement of domain experts to review the readiness of the test article and the adequacy of the testing proposed.</p> <p>a. The test methodology and philosophy, adequacy of the testing proposed and also the readiness of the test article shall be reviewed by Test Adequacy Review Board(TARB) before commencement of the ground testing.</p> <p>b. TARB shall be constituted by the Main Contractor with the involvement of domain experts. CEMILAC and DGAQA shall be part of the TARB committee.</p> <p>c. The test plan agreed by TARB shall be reviewed and approved by CEMILAC</p> <p>d. Testing methodology and philosophy w.r.t test article shall be reviewed which includes QA aspects of hardware/components fabricated, Test rig details, instrumentation details, boundary condition imposed on the test article, etc.</p> <p>e. The subsystem undergoing testing shall be of production standard w.r.t. processes, make, SOP etc..</p>
3)	21.C1.B	j. A Test Adequacy Review Board (TARB) shall be constituted to check for the completeness of the test requirement.
4)	21.C6.1.13	Test Adequacy Review Board (TARB) shall be formed by the Main Contractor for adequacy check with members consisting of System experts, domain experts, Software design & development team members, IV&V member, CEMILAC member and other relevant stake holders.
5)	21.C6.2.5 CEH Evaluation and Tests	c. Test Adequacy Review Board (TARB) shall review the test plan and test methodologies at system integration level for adequacy. IV & V shall participate in the testing as per the recommendations of TARB.