

# Procedures for Project Formulation and Management (PPFM) in DRDO

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# **Procedures for Project Formulation and Management (PPFM 2016)**

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## Foreword

It has been just little more than a year that PPFM was last updated in May 2014. DRDO has rapidly changed since then necessitating the requirement of PPFM 2016 to capture and present fresh and detailed guidelines for project sanction, execution and closure in the Organisation. Experiences and inputs from Cluster DGs and Financial Advisors on project life cycle post Rama Rao Committee (RRC) implementation has also been brought in.

PPFM 2016 encompasses the timeframe from pre-project activity to the post-induction life cycle support. PPFM has been used by the projects since its first release in January 2006. The updated PPFM 2014 which was brought in to cater to RRC implementation while being effective as a high level guide of project execution, had a few redundancies, complex inter-linkages and could not incorporate the changeover from DATE to PEARL and initial lessons learnt in handling projects post RRC implementation.

Project management has improved markedly over historical benchmark with a wholehearted implementation of PPFM 2014. The projects are being executed as per plan and with a healthy budget performance. The review meetings are now on schedule with focus on techno-managerial issues facing R&D. The general tenets of project management as brought out in PPFM 2014 are not being changed in this document. However PPFM 2016 is being brought out to lay greater emphasis on pre-project activity and risk management, introduction of *Mission Mode (User trials)* as a new category of project, linking procurement plan with project sanction, in-depth costing guidelines, stringent review mechanism and suggesting a way forward after completion of the project.

With seven different technology clusters in place, PPFM 2016 creates a common and standardized management framework to plan, sanction, review and accomplish projects and manage schedules, variations and performance. The focus is on high alignment to Defence Services requirement, high level of preparedness for future weapon systems and low overruns.

In a 'Make in India' environment with focus on simplified processes, it is believed that PPFM 2016 would demonstrate further improvement in progressing the technology roadmap of DRDO and foster valuable guidelines to enable systemic success in executing projects and programmes of DRDO.

Dr S Christopher  
Secretary, Department of Defence R&D &  
Director General, DRDO

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# 1. INTRODUCTION

Defence Research and Development Organisation (DRDO), the R&D arm of the Ministry of Defence (MoD) is mandated to develop products and systems for the three wings of the Armed Forces. Setup in 1958 with about 10 establishments, DRDO has today evolved into a conglomerate of 46 laboratories, 4 human resource (HR) institutions, 3 certification agencies and one deemed university. The 46 labs are divided into seven clusters, based on their technology areas viz. Aeronautics (Aero), Armaments & Combat Engineering (ACE), Electronics And Communication Systems (ECS), Life Sciences (LS), Microelectronics & Devices and Computational Systems (MED & CoS), Missiles and Strategic Systems (MSS) and Naval Systems and Materials (NS & M). Their main activity lies in the design and development of cutting edge technologies and systems and they carry out this task by undertaking projects and programmes with a defined scope and with prescribed time and cost parameters.

Over the years a number of systems and technologies have been generated by DRDO. They include main battle tanks, combat aircraft, unmanned aerial vehicles, airborne early warning and control (AEW&C) system, surveillance systems, weapons such as missiles, torpedoes and sensors like radars, sonars, electro-optic instruments, laser systems and many more. At the end of year 2015, DRDO has a portfolio of about Rs 1.9 lakh Cr worth of production orders. Most of these have been accrued over the last 15 years and this number is steadily increasing.

## 1.1 CATEGORY OF PROJECTS

DRDO projects are categorized as follows:

**Mission Mode (MM)** projects: These are taken up based on Users requirements with stringent time lines and normally involve more than one lab with Users having a major say in steering the project. This kind of project normally depends on technologies that are proven or readily accessible either within DRDO/India or from abroad at short notice.

**Technology Demonstration (TD)** projects: These are normally initiated by DRDO as feeder technologies for future or imminent MM projects. These are funded and monitored by DRDO with little or limited User inputs. The purpose is to develop, test and

demonstrate a particular technology. Modules of this may be developed by industry and design/analysis packages by academia.

**Science & Technology (S&T)** projects: These are normally of basic research/applied research type taken up by labs with alignment to future technology needs. This kind of project is normally taken up with academia involvement and includes a quantum of analysis and simulation modules.

**Infrastructure & Facilities (IF)** projects: Projects which are typically advanced test and qualification facilities, which are not direct procurement cases are created through IF projects. For the development of state-of-the-art technologies, such facilities have to be created ahead or at the pace of the developments. It is essentially a capital investment which plays a major role in validating the technology/system generated/developed.

**Product Support (PS)**: Projects in this category are aimed at up gradation of existing systems in production or maintenance/technical support of the system for a limited period.

**Mission Mode (User Trials) (MM-UT)**: The scope of this newly launched sixth category of projects will cover conduct of User trials including DRDO support during the trials. The projects which will be taken under this category are those which have been completed in MM and the highest monitoring committee in its last review has recommended taking of the user trials project. The project proposal will be formulated with identified work share between User, Production Agency and DRDO.

## **1.2 DEFINITIONS**

Programme	<ul style="list-style-type: none"><li>• Development of System/Platform with multiple sub-systems each of which <b>is essential</b> for overall system.</li><li>• Category: MM/TD/S&amp;T</li><li>• Cost: &gt; Rs 500 Cr</li><li>• May be multi-lab effort with sub projects <b>in same</b> category given by nodal lab</li></ul>
Project	<ul style="list-style-type: none"><li>• Development of System/Product/Process/Technology/Infrastructure/Product Support</li><li>• Cost: &gt; Rs 2 Cr</li><li>• May include sub-projects to other labs <b>in same</b> category only</li></ul>



### 1.3 TYPE OF PROJECTS

Mission Mode (MM)	<ul style="list-style-type: none"> <li>• Development of System/Product and its demonstration in simulated/intended environment</li> <li>• Normally PDC &lt; 5 years</li> <li>• Must have specific no. of User deliverables as Output</li> <li>• Users QR/Funds/Commitment of orders required</li> <li>• *Peer review &amp; PEARL analysis is mandatory</li> </ul>
Technology Demonstration (TD)	<ul style="list-style-type: none"> <li>• Demonstration of Technology/Product</li> <li>• Output will be specific prototype (H/W or S/W)</li> <li>• *Peer review &amp; PEARL analysis is mandatory</li> </ul>
Science & Technology (S&T)	<ul style="list-style-type: none"> <li>• Development of Technology/Process</li> <li>• Output will be Study Report/Lab model/Prototype</li> <li>• *Peer review &amp; PEARL analysis is mandatory</li> </ul>
Infrastructure & Facilities (IF)	<ul style="list-style-type: none"> <li>• Development of Test/Manufacturing Infrastructure</li> <li>• Must be related to specific capability/technology</li> <li>• Not applicable for standard utility constructions</li> <li>• #Peer review &amp; PEARL analysis is desirable</li> </ul>
Product Support (PS)	<ul style="list-style-type: none"> <li>• Must be for a system in production/been produced</li> <li>• Requirement from Users/Production Agency (PA) is preferable</li> <li>• Upgrade proposed in the system or sub-system should be less than 50% of the cost of the original project</li> <li>• Can be also undertaken for technical support/maintenance of the system in production</li> </ul>
Mission Mode (User Trials) (MM-UT)	<ul style="list-style-type: none"> <li>• Must be for a system which has been completed in MM. Highest monitoring committee in its last review has recommended taking of such project</li> <li>• Proposal will be formulated with identified work share between User, Production Agency &amp; DRDO</li> <li>• Peer review &amp; PEARL analysis is not required</li> </ul>

\*All projects costing > Rs 5 Cr should have peer review and PEARL analysis

# Approval from Competent Financial Authority (CFA) is required if waiver of peer review and PEARL analysis, is sought

### 1.4 PROCEDURES FOR PROJECT FORMULATION & MANAGEMENT (PPFM)

In 2006, due to the vast spectrum of projects being undertaken, DRDO brought out structured guidelines on procedures to be adopted for Project Formulation and Management. This was released as Procedures for Project Formulation and Management (PPFM 2006) and covered the broad areas of sanction, execution and closure. In 2014, subsequent to the Rama Rao Committee (RRC) implementation and major organizational restructuring, a revised edition was released which provided clarity on types of projects

and programmes, detailed guidelines on project sanction process, execution and monitoring.

In 2015, based on major change in delegation of financial powers and Govt. directives to simplify processes and streamline internal functioning, the need was felt to revise the document and bring in greater clarity and focus on prioritized selection of projects, enhanced pre-project activity, deeper understanding of project costing, simplification of processing through multiple channels, detailed guidelines for project closure etc. Accordingly, PPFM 2016 has been prepared based on the above factors and after detailed deliberations between lab scientists and concerned HQ Directorates. Some of the major changes brought forth in this document are:

- ***Selection of projects:*** Based on an attributes scale consisting of parameters - alignment with Lab vision/mission/objective, core competence of Lab, need/benefits expected, alignment with Long Term Integrated Perspective Plan (LTIPP)/ Long Term Technology Perspective Plan (LTTPP), availability of resources etc.
- ***Enhanced pre project groundwork:*** Completion of feasibility study, concept design, analysis of technology/module readiness level (MRL), formulation of procurement plan and risk management plan- before processing for sanction.
- ***Costing:*** Through detailed guidelines of parameters to be looked into for every head of expenditure proposed.
- ***Introduction of a new category of Project “Mission Mode (User Trials)”:*** This is being introduced based on the fact that a number of MM projects are extended only due to protracted trials which are season/location based and hence the true development time can never be projected.
- Greater clarity on types of milestone reviews like Preliminary Design Review (PDR), Detailed Design Review (DDR) and Critical Design Review (CDR).
- Detailed guidelines on project closure.
- ***Way Forward after Closure of Project:*** A section has been included on Way Forward for the projects which are completed. Process has been indicated for the lab to undertake next generation/category of projects. On completion of MM projects, User may be asked to come out with production order to be placed on identified production agencies.
- Approval process for short closure, repeated extension of Probable Date of Completion (PDC).

The manual is broadly grouped under various heads viz.

I Project selection and pre-project groundwork which covers

- Concept design, readiness analysis and review
- Cost estimation
- Procurement plan
- Risk management plan

II Project sanction process which covers

- Examination of proposal
- Submission and routing with timelines
- Issue of sanction letter

III Project execution which covers

- Preparation of project execution plan
- Review mechanisms
- Guidelines on design, manufacturing, testing

IV Project Closure including

- PDC/Cost extension and
- Administrative and technical closure
- Way forward

Detailed guidelines, formats and check lists have been included to both standardize and ease the work of labs for project execution.

## 2. PRE-PROJECT ACTIVITY

Every lab planning to take up a new project should carry out a certain quantum of preliminary work prior to formulating the detailed proposal. Sufficient groundwork before sanction is perhaps the single most important factor in a successful project. The pre-project groundwork which precedes project sanction is an important determinant of adherence of timelines. Complete awareness about the project related critical technologies and detailed procurement plan at key technical and financial decision points is preferred before the sanction of the project. It must be appreciated that greater the depth of ground work and pre-project activity, greater is the chance of completing the project within defined time and cost.

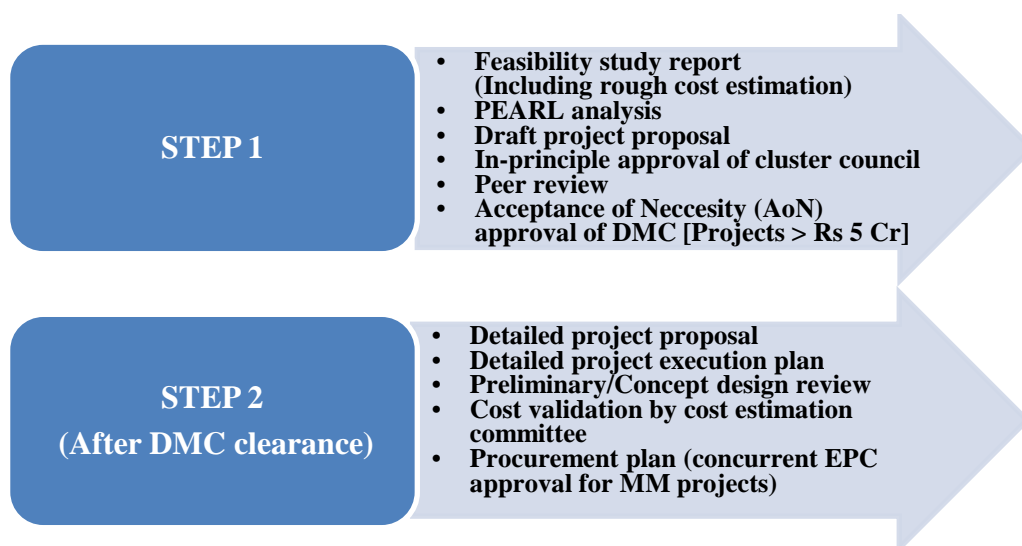
Following are the steps in this regard

### 1. Annual selection of projects

The exercise of selection of new projects should be done annually, the dates for which will be announced from DRDO HQ. During the selection, all new projects being proposed by the lab will be graded on a comparative basis on a figure of merit based on selective attributes. The attribute scale will consist of parameters viz. alignment with Lab vision/mission/objective, core competence of Lab, alignment with LTIPP/LTTPP, S&T merit/potential for Transfer of Technology (ToT) or production, and need for additional HR. Points must be allotted for each attribute. The overall score will be a figure of merit for the project being proposed. This attribute table will be prepared by Director (PM) of cluster Director General (DG) and reviewed and approved by DG. Guidelines are given in Appendix A. The final selection of new projects by concerned DG will be done taking into account existing workload of ongoing projects vis-à-vis available HR. **Exceptions to this annual exercise will be only through urgent written requirements forwarded by the Services.**

### 2. Sanction of projects

Projects selected through this annual selection process will then be taken up for processing. Sanction will now be a two-step process as depicted in the figure:



The two step sanction process for projects will be:

- a) The first step would be Acceptance of Necessity (AoN) by DRDO Management Council (DMC) after:
  - Formulation of feasibility study report which will include rough cost estimate
  - Project Evaluation Assessment and Readiness Level (PEARL) analysis
  - The in-principle approval of cluster council
  - Peer review.
- b) After DMC Clearance, the case should be processed for final sanction. The case file should include:
  - Detailed project proposal (with work breakdown structure, risk mitigation plan)
  - Project execution plan and PDR document
  - Lab Director may appoint committee for project cost estimation after peer review and the cost estimate should be validated by the cost estimation committee
  - Formulation of procurement plan; Equipment Procurement Committee (EPC) approval along with project sanction is mandatory for procurements in MM projects.

The details of each step are given below:

## **2.1 FEASIBILITY STUDY REPORT**

Detailed Feasibility Report (DFR) should precede sanction of Defence R&D projects to enable approval of projects which can be successfully accomplished within the estimated cost and time and thus promote self-reliance in critical Defence technology. The purposes of feasibility report are:

- To realistically assess the probability of success of the project taking into account the internal and environmental factors;
- To identify the critical elements contributing to the low success probability and to facilitate initiation of necessary project work to soften the criticality;
- To carry out adequate pre-project work including design, design review and simulation to enable commencement of hardware realization soon after the project is sanctioned;
- To utilize past technological data and managerial experience for gainful exploitation in the execution of the present project;
- To assess completed/ongoing related development in other labs of DRDO; and
- To assess the contribution and support required from external agencies, not directly under the control of DRDO and prepare suitable interaction and communication system to ensure their synergistic contribution during all phases of the project, i.e. design, developmental trials, productionisation and induction.

The feasibility study should examine the following aspects: need of the project, goal of the project, pre-feasibility study work (literature survey and work already undertaken), preliminary design and analysis, realisation plan, testing plan, technical risk analysis, resource assessment, techno-managerial constraints, cost-benefit analysis etc. These are indicative and not exhaustive and labs may augment the same based on the specific needs of the project. Some of these are discussed below.

### **2.1.1 Need of the Project:**

Briefly discuss the importance of taking the project and whether this is being initiated to fulfill User requirements/DRDO's technology roadmap.

### **2.1.2 Goal of the Project**

For focusing the attention on the project, it is necessary to define the technological goal which is sought to be achieved through the present project. Invariably, it should include:

- Unique objectives
- Quantitatively measurable outputs
- Acceptable performance zones
- Abnormal factors which may lead to under performance
- Goals which should be normally derived through:
  - Detailed analysis and evaluation of User requirement wherever applicable, and
  - Study of technological options and their evaluation leading to final selection.

While defining the goal, it will be useful to indicate its linkage with previous projects and the incremental scientific effort needed to achieve the designated goal.

### **2.1.3 Linkage of Project Goal with Thrust Area, Current Five Year Plan (FYP) and Long Term Technology Perspective Plan (LTTPP)**

Relationship of the project goal to the thrust area of the laboratory is required to be clearly brought out. In case, part of the goal is within the thrust area of the lab and the rest cover the activities of other labs, collaborative mechanism with other labs should be clearly indicated. The list of agencies including external agencies collaborating in the project, the extent of contribution and their willingness to participate may also be indicated. Any past collaborative experience, if applicable, may be indicated. Relationship of the present project with the DRDO's FYP/LTTPP should be clearly stated. Reason of variation, if any, may be given.

### **2.1.4 Literature Survey**

In all high-tech areas, it is necessary to bring out the relationship between the project goal and the state-of-the-art technological accomplishment in the global scenario. From a survey and analysis of national S&T achievement, the state-of-the-art accomplished at the national level may also be brought out. This study should include the work which is currently in progress in different institutions in the country with probable dates and the expected results. It will also be appropriate to bring out the infrastructure required such as design tools, test and evaluation equipments, sub-systems and materials which may form as vital inputs to the project. The work initiated for self-reliance in these areas by

different agencies, may also be indicated. The bottlenecks and difficulties experienced by other agencies in carrying out similar development work due to any embargo or import restrictions, if known, may also be mentioned.

### **2.1.5 Details of Work Already Undertaken**

To enable proper appreciation of strengths and limitations of the lab, it may be useful to provide a reference of all the work which has been done by the lab having a direct bearing to the present project. This may cover the following details: title of the project; designated goals; goals achieved; deviation in accomplishments; causes of deviations; factors which contributed to the successful completion of the project within the cost and time; the building blocks of previous projects which are directly proposed to be used in the present project; details of the granted and applied patents; number of research and review papers published; names of scientists associated with these projects and their availability for the present project; and broad specifications of facilities and infrastructure created for the earlier projects and their utilization for this project.

### **2.1.6 Preliminary Design and Analysis**

Success or failure of the project primarily rests on robustness of design. To enable successful completion of the project, it is essential to pay highest attention to this aspect by trying to examine what all can go wrong in the design. Before embarking upon a design, an analysis should be made on the various design approaches, which will enable the project team to achieve the goal. It is useful to carry out preliminary design through all the known approaches. Once the design is completed, it can be verified through modeling and simulation studies. The simulation should not only cover the detailed testing of the system design but should also seek to carry out sensitivity analysis of variations in system parameters. Criterion for selecting a design approach among several competing candidates may include availability of extra margin, ratio of special non-standard parts and components to standard parts, components ease of fabrication, cost per unit during quantity production, safety/production management cost, relative energy consumption, reliability and relative ease of maintenance. Alternative chosen may be stated with reasons highlighting the critical elements. The causes of the criticality, criticality solutions and confidence level may also be stated. While carrying out the design, emphasis should be to use as far as possible proven blocks developed in the past.



The robustness or otherwise of these elements should be clearly indicated. Reports of these building blocks may be provided as reference documents for the detailed feasibility report.

The emphasis during this stage of DFR would be to conceptualize the problem and carry out detailed software analysis involving mathematical modeling and simulation, thereby generating a number of solution sets. Such detailed analysis alone will enable selection of the optimal solution. Efforts should be made to utilize assets generated during earlier R&D activities.

#### **2.1.7 Confidence Level in Accomplishing the Project through Chosen Design Approach**

For a comprehensive appreciation of the project complexity, it would be necessary to provide an assessment of confidence in accomplishing the said goal with qualifying assumptions. The confidence level both for optimistic specification and pessimistic specification may also be given. The confidence level assessment may also be furnished for activities to be executed by the external collaborators together with Lab's critical evaluation of the estimates. The requirement of additional know-how, expertise, consultancy and infrastructural facilities, which is likely to improve the confidence level should also be indicated.

#### **2.1.8 Realisation Plan**

Based on the design approach selected, a macro level realisation plan both for hardware and software should be formulated. Facilities for manufacture/realization should be assessed so as to avoid duplication. Estimation of time and cost for realization should be presented.

#### **2.1.9 Testing Plan**

Based on the project objectives, a first level of testing plan should be evolved. This will bring out the assessment of existing facilities and need for creation of new setup. Estimation of time and cost for testing should be presented.

### **2.1.10 Analysis of Technical Risks**

Detailed Risk Management Plan should be a part of the DFR which will also be included in the final project proposal. The components of a Risk Management Plan are detailed below:-

- a) Identify risk involved
- b) For each risk, estimate the probability of occurrence and its impact on time performance and cost schedules
- c) Categorize the risk in order of high impact/high probability, high impact/low probability, low impact/high probability or low impact/low probability
- d) For each risk, starting from top priority, outline a possible strategy to overcome the impact of occurrence-concentrating on top two quadrants.

The Risk Management Plan should be a top-down approach right from activity/task breakdown. The risk management plan together with the Product Breakdown Structure (PBS)/Work Breakdown Structure (WBS) should be a critical part of a DFR and should be reviewed and vetted by the peer review committee in detail. It should also be presented as part of PDR, CDR and project reviews at every stage.

### **2.1.11 Human Resource Assessment**

As a prelude to the assessment of the resources required for the project, WBS from design to the final accomplishment of the goal is to be generated and minimum set of work packages required to be completed for accomplishing the project goal should be identified. Optimal HR deployment plan is to be prepared for each work package.

### **2.1.12 Techno-managerial Constraints**

In spite of the best efforts to provide adequate resource for progressing the project at an acceptable pace, it may so happen that the resource provided is lower than the required minimum. The effect of such input constraint on the rate of progress of the project for different input rates may be worked out and given in a tabular form. At times other constraints, such as import embargo, foreign exchange (FE) crunch, lack of expertise may also arise. Contingency plans may, therefore be formulated and included in the DFR. Components/materials may be imported in the development phase of the project to achieve faster results in progressing the design. The thrust and plans required for

generating self-reliance in respect of such components and materials at the productionisation phase with their cost and resource implication may also be analyzed and reported. Due to unforeseen reasons, certain agency may not be able to fulfill the level of support which they assured at the planning stage of the project. Method to overcome such bottlenecks may be indicated as a part of the contingency plan. Identification of such activities in the DFR will lead to proper appreciation of project problems.

### **2.1.13 Cost Benefit Analysis**

Often question arises, whether it is economical to import a few pieces of equipments to meet the urgent Service requirement, even though competence is available for developing and fielding the equipment. In the case of purchase of the equipment, the costs involved are the procurement price and maintenance-cost during its life cycle. Again this cost, the benefit is quick availability of the equipment to meet immediate needs. This, however, does not guarantee uninterrupted supply for meeting the future needs. In addition, it makes the nation dependent upon foreign supplier for supply of spares which is not consistent with the security needs.

On the other hand, the cost of supply of equipment through indigenous development will include the development and technology transfer costs. Inclusion of these two elements of cost may lead to apparently non-competitive per unit cost. However, the advantages gained through the development process are typically:

- Self-reliance in new technology,
- Short reaction time for up-gradation,
- Assurance of uninterrupted supply of spares and expertise for maintenance,
- Design and fabrication of the equipment to meet all specifications which may not be possible in case of import
- Revenue generation through expected ToT fees and royalty

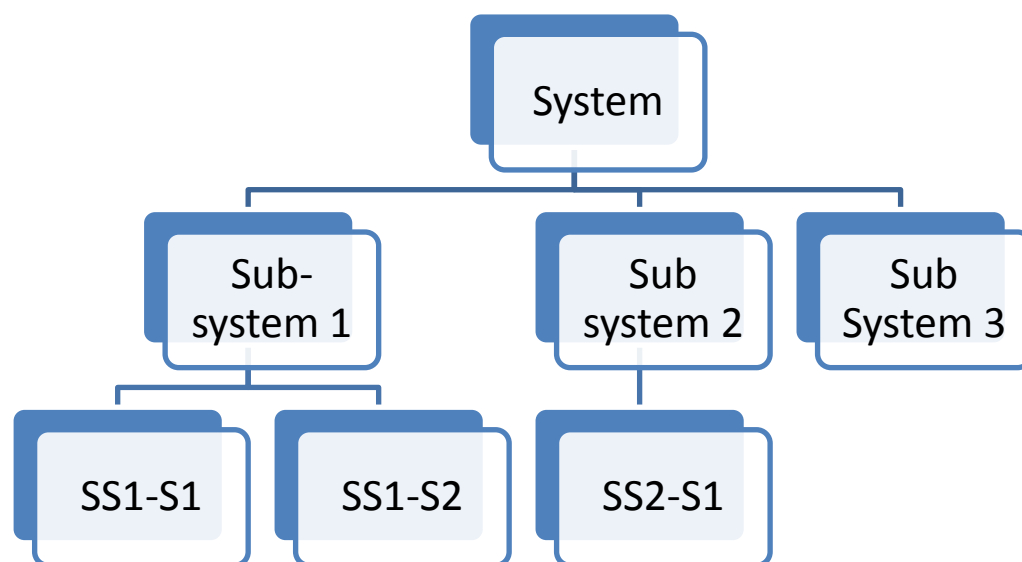
Every project proposal should necessarily include cost-benefit analysis. The cost-benefit analysis of the proposed system/technology should be supported with a comparative study in terms of technology, cost, development period/date of initiation, collaborations, User base and expected production quantity for contemporary products worldwide.

## 2.2 PROJECT EVALUATION & ASSESSMENT OF READINESS LEVEL (PEARL)

The next step after detailed feasibility report is the PEARL analysis. PEARL is the tool for self assessment of the current technology readiness status by the project team as well as a decision tool for the sanctioning authority. It is also intended to be a planning tool as the starting point of PEARL analysis is the work-breakdown/product-breakdown tree which will provide a clear picture of the quantum of development activity required to achieve project completion.

The model brings in transparency and relatively more objectivity into the technology/module readiness levels and most importantly, places the responsibility on the Project Director, to make an honest evaluation of the current technological status of the proposed project/programme. The new model also lays emphasis on the need to support stated readiness levels through detailed documentation. The summary of PEARL is brought out to understand the procedure/methodology adopted by this tool.

The WBS should be prepared as per illustration given:-



**PRODUCT TREE**

During PEARL analysis, the project should be broken down in terms of modules/sub-systems, the readiness level of each module will be assessed thereafter and the Project Readiness Index (PRI) will be arrived at. The progress of PRI will be estimated on an

annual basis with project execution. Validation of readiness level/PRI should be by an independent committee viz. Technology Council of the lab. Members of Technology Council should be a part of the Peer Review Committee (PRC) who will brief on the PRI awarded and its appropriate PDC requirement. The PRC will be the final authority for acceptance of PRI and required timeline.

Summary of PEARL analysis is given below:

### **2.2.1 Objective of PEARL**

- To assess difficulty/ease of development
- To make realistic assessment of time for development
- To provide expected levels of sub-system readiness level during execution and at completion of project
- All indices to be backed by proof documents.

### **2.2.2 Steps to be followed:**

- Draw system-subsystem/module block diagram
- Identify the Module Readiness Level (MRL) of each sub-system using MRL table at Section 2.2.3, giving requisite proof documents
- Go to sub-subsystem level if MRL is  $< 5$  for that particular module or not easily verifiable
- Evolve Project Readiness Index (PRI) as lowest value of all subsystem MRLs  
i.e.  $PRI = \min \text{ of MRL of sub systems}$
- Draw the anticipated roadmap of MRL and PRI with project timeline.

### **2.2.3 Module Readiness Level (MRL)**

MRL levels are derived from the scale 1 to 10 based on stages of the proposed project/programme. This is applicable for subsystems, modules, algorithms, processes etc.

**Table: Description of Module Readiness Level (MRL)**

<b>MRL Level</b>	<b>Definition</b>
<b>1</b>	Ab-initio research to start
<b>2</b>	Basic technologies assessed and reported
<b>3</b>	Concept design document formulated and vetted by expert committee
<b>4</b>	Similar module made earlier and proved at bread board/Lab level
<b>5</b>	Similar module made earlier and proved at actual environment
<b>6</b>	Required module manufactured as prototype with preliminary test in lab/test rig
<b>7</b>	Required module proved as prototype in test bed and qualified
<b>8</b>	Required module integrated in system and proved in test bed
<b>9</b>	Required module integrated and proved in actual environment
<b>10</b>	Module in production/Commercial-of-the-Shelf (COTS)

#### **2.2.4 Project Readiness Index (PRI)**

This is a single index that represents the readiness level of whole project/programme at any stage. This is taken as minimum value of MRL of the various sub-systems. The PRI levels arrived after PEARL analysis may be used to decide the categories of the projects are mentioned below:

- PRI between 1-4 should be S&T category
- PRI between 3-7 should be TD category
- PRI between 5-9 should be MM category

The overlap in the TD category is meant to address the bulk of DRDO projects which start at design concept stage and go up to the stage of being proved in a test bed. These are however indicative categorization and the project team can always present justification for any change in the suggested grading which needs to be accepted by competent authority.

The details are provided in the PEARL reference manual (also available on DP&C, DRDO HQ, DRONA portal)

***Note: PEARL analysis is mandatory for all projects costing more than Rs 5 Cr barring IF, PS and MM-UT category of projects. In a rare case, if waiver is sought for MM,***

*TD and S&T category of projects, approval from competent authority shall be taken and appended with proposal.*

## 2.3 DRAFT PROJECT PROPOSAL

After preparation of DFR and PEARL analysis, a draft proposal should be formulated and this must cover in detail the following aspects:

- Final specification/Scope of Work (SoW) indicating essential and desirable features as directed by Users(for MM)/ by Lab (for TD/S&T)

*In case of MM Projects, specifications (essential and desirable) must be discussed with User which will culminate into Qualitative Requirements (QRs). User may also be requested to finalize the QRs as early as possible and handover the same to concerned lab before processing project proposal for consideration of competent authority.*

- Required resources (size of team of scientists/technical staff, infrastructure available etc).

*Lab Director may identify scientist/technical staff from existing strength of Lab and constitute a team which will work in proposed project/programme. Infrastructure requirements may also be looked into in advance.*

- PDC of the project

*PDC must be realistic within which envisaged objectives could be achieved.*

- Competence level/preliminary work done- from DFR

*Project Director must take stock of technological competence available with the lab and preliminary work done earlier by the lab.*

- Preliminary PEARL analysis report (including assumptions made).

*Labs should carry out PEARL analysis (if applicable) and get it vetted by Technology Council. PEARL certificate should be appended at the time of final submission of the project proposal.*

- Project execution plan.

*Project plan should specify major milestones of the project including Project Evaluation and Review Technique (PERT) chart and detailed WBS as indicated in Table:*

Activity Plan/WBS/MS Project Chart w.r.t. Product Tree

Sub system		Activity	Timeline (months)
SS1-S1	S1	Detailed design& analysis	T0+3
		Realisation	
		Testing	
---	S2	Design	T0+3
---		Realisation	
		Testing	
SS2	--	---	--
--			
SS3			
--			
Assembly/Integration			
Testing			

- Critical factors/technology involved.

*Critical factors/technology involved in execution of project must be described sufficiently and measures suggested to minimize the criticality if possible.*

- Risk Management Plan (To be elaborated from DFR)

*Project risks are to be identified and remedial steps to mitigate the risk factor should be clearly brought out for undertaking high, medium and low risk projects/programmes. A risk management document, which will identify risks, and possible strategies to manage the risks may be prepared and attached. Inputs of the risk management plan may be drawn from the detailed feasibility report.*

The Project Director is responsible for:

- Scheduling and performing risk assessment and developing strategies to manage those risks for each phase of the project as identified within the project plan.
- Providing a risk review within status reports to the steering committee, which will specify any changes to the risks identified during each phase of the project and the strategies adopted to manage them.



An indicative tabulation for risk identification and mitigation plan along with guidelines for preparing the table is given in Appendix B.

- Resource Plan

*HR availability is a critical factor which needs to be addressed properly to execute any project/programme successfully. To assess the availability of diversified team members in terms of percentage should be brought out (in the format given in Form 2) to help the Project Director to know exact contribution likely to be made by an individual in each work package proposed under the project.*

#### Skills and Resources

The project resource requirements for entire period or specific phases may be indicated:

- Project Director
- Design team
- Manufacturing and testing team
- Procurement in-charge
- Independent Quality Officer and/or Quality Review Consultant
- Representatives of the User

The following aspects need to be addressed:

- The impact of resources being off-line on projects
- How these resources will be released to the project

- Training Needs

Details of the training requirements may be brought out based upon the required skills and resources listed above. It may also be brought out that how the training is to be provided and conducted.

- Management Plan

*The requirement of additional decision making authority (technological, financial and administrative) should be indicated with reasons. Special review*

*and monitoring techniques for timely accomplishment of project goals within the prescribed cost may be indicated for different phases of the project.*

- Plan of action for prototype development

*Lab should bring out a product tree including WBS at the time of finalization of plan of action for prototype development. Identify development partners (DPs), if required and take them into loop right from beginning of project execution.*

- Production agencies proposed.

*Identify possible production agencies at the stage of formulation of project proposal, if needed under the proposed project/programme (for MM projects).*

- Cost of the project

*Fund requirement of the project needs to be drawn in sufficient detail. Basis of costing of major store/items may be given (example: basis may be previous orders cost plus inflation, budgetary quotes, similar purchase information from other academic institutions/R&D organisations, other sources etc). Detailed guidelines are given in Chapter 3.*

- Infrastructure Development

*If applicable, approximate estimate of building/infrastructure items costing more than Rs 25 lakh needs to be vetted/given by DCW&E/CCE(R&Ds).*

- Costs benefit analysis/spin-off benefits.

*Spin-off benefits of project/programme should be quantifiable and have direct bearing on national exchequer or social impact/benefit to the Services or common man.*

Most of the above will be drawn from DFR. Hence, DFR is the most critical part of proposal documentation.

## **2.4 APPROVAL OF CLUSTER COUNCIL**

All project proposals will be presented to cluster council for according '*in-principle*' approval to take up the new project by labs/estts. Cluster council will discuss the new project proposal, development strategy and suggest work share among cluster labs, if applicable. Projects approved by cluster council will then go the next stage of peer review.

## **2.5 PROJECT PEER REVIEW**

All DRDO projects costing more than Rs 5 Cr will have peer review by an expert committee for their viability. The purpose of the peer review is to tap the relevant expertise available outside the laboratory proposing the project within DRDO and elsewhere in the country. As far as possible views of the beneficiary or the main stakeholder, in the outcome of the project should also be incorporated prior to final formulation of the project. The competent authority constitutes a committee known as Peer Review Committee (PRC). The committee examines the availability of expertise and adequacy of core competence available in the laboratory proposing the project, proposed time, approximate cost, other resources, approach, methodology, etc. The project peer review should be conducted after *in-principle* clearance of cluster council.

For PS, IF and MM-UT category of projects, peer review is not mandatory. However if project cost is > Rs 5 Cr the peer review is desirable. In case waiver is sought for IF, PS and MM-UT category of projects approval from Competent Authority will be taken and appended with the proposal.

Guidelines for conduct of Peer Review are at Appendix C.

## **2.6 APPROVAL OF DRDO MANAGEMENT COUNCIL (DMC)**

All project proposals costing more than Rs 5 Cr will be presented to DMC for AoN to take up the new project by labs/estts. DMC approval is required only in case of new project proposals and not for PDC extension, re-allocation of funds, cost enhancement/revision etc.

Projects approved by cluster council and whose peer review has been completed will be put up to DMC for AoN.

**Cluster Council clearance and recommendation of cluster DG for DMC presentation:** Dir (PM) of the cluster will prepare two to three page summary of proposed project and forward the same to Director, Planning & Coordination (DP&C), DRDO HQ. Date of cluster council clearance and recommendation of DG to present the proposal in DMC should find mention in summary report forwarded to DP&C. DP&C, will fix the time slot for DMC presentation, the summary of project proposals with details mentioned below should reach DP&C at least two weeks in advance of expected date of presentation in DMC.

**Format of Project Summary to be Presented at DMC**

- Title of the project
- Cost: Rs in Cr (IC + FE = Total)
- Scope/Objectives of the project:  
*Scope of the project should be clearly defined in quantifiable and measurable terms*
- Deliverables/Output:  
*Likely deliverables/output be mentioned after thorough discussion/consultation with User*
- Security classification of project  
*(Top Secret/Secret/Confidential/Restricted/NIL)*
- PEARL (MRI) of various sub-systems and proposed development strategy for each
- Participating labs with work share:  
*Summary of work share, Project Director intends to assign participating labs be brought out in tabular form with funds and time required for the same*
- Brief of earlier work done:  
*Similar work undertaken in the past by the project team having direct bearing to the present project may be brought out briefly*
- Technology challenges/issues foreseen:  
*Technology challenges (grey areas) likely to be crop up during execution of project be highlighted sufficiently and possible way out to overcome the same*
- Cost breakdown
- Realistic Gantt chart with projected milestones.

The presentation should follow the format of Project attributes indicated above.

**Note:**

- (i) DMC presentation will be scheduled at the earliest after receiving the summary of project report from the Director (PM) of the cluster.*
- (ii) Lab/Project Director may be required to make a formal presentation to DMC on scheduled date. DP&C, DRDO HQ will intimate the date of DMC presentation in advance.*
- (iii) Presentation will be preceded by summary by DP&C of ongoing commitments of the Lab.*
- (iv) Minutes of DMC (recommendations/directions shall be forwarded to Lab Director and cluster DG*
- (v) DMC minutes should be placed in case file while forwarding the project proposal for sanction by CFA. DMC minutes should be referred in noting sheet of case file and must be addressed adequately.*
- (vi) Director (PM) of the cluster will ensure the compliance of DMC directives before forwarding the case to CFA for sanction.*

## **2.7 DETAILED PROJECT PROPOSAL**

Based on DMC directives and PRC recommendations, the detailed project proposal should be formulated. After DMC approval, a Project Director (PD), Deputy Project Director (DPD) and basic core team should be identified by the Lab Director. This team may include Services rep (for MM projects) with defined responsibility for trials and acceptance. The teams will work out the detailed project proposal, carry out PDR, work out procurement plan based on WBS and risk matrix. Concurrently a cost estimation committee should be setup by Director to carry out detailed costing. An indicative constitution of cost estimation committee will include members from finance, project group and technology council/technical expert. PD/DPD will be responsible for the sanction, execution and final closure of the project.

### **Detailed Project Execution Plan**

The aim of project execution plan (PEP) is to ensure achievement of the designated technological goals of the project within a pre-determined cost and time frame. Plan must be robust and flexible enough to absorb even enforceable problems and bottlenecks. With

this aim in view, the lab should prepare a detailed project execution plan drawing the details from draft project proposal. Guidelines for preparing detailed project execution plan (PEP) for projects are at Appendix D.

## **2.8 PRELIMINARY/CONCEPT DESIGN REVIEW**

Prior to forwarding the case for project sanction PDR should be carried out when **extensive in-house design work** is involved in the development of a system under the project.

The PDR shall be a formal technical review of the basic design approach for the product. It shall be held after the technical specification, the software design document, the software test plan, hardware test plan are available, but prior to the start of detailed design. The PDR may be collectively done for an item as a system or individually for different sub-systems and assemblies, spread over several events. The over-all technical programme risks associated with each sub-system or assembly shall also be reviewed on a technical, cost and schedule basis. For major projects, the PDR should include system requirement review as well as review of the concept design of the project. For software, a technical understanding shall be reached on the validity and degree of completeness of the software design document. The following articles will be included in the review wherever applicable:

1. Preliminary design synthesis of the hardware development specification for the item being reviewed.
2. Trade-off studies and design studies results.
3. Functional flow, requirements allocation data, and schematic diagrams.
4. Equipment design specification and configuration drawings.
5. Broad environment control and thermal design aspects.
6. Broad electro-magnetic compatibility of the preliminary design.
7. Broad power distribution and grounding design aspects.
8. Safety engineering considerations.
9. Security considerations.
10. Survivability/vulnerability considerations.
11. Preliminary lists of materials/components and processes.
12. Pertinent reliability/maintainability/availability data.

13. Preliminary weight data.
14. Interface requirements.
15. Development schedule.
16. Producibility and manufacturing considerations (e.g., materials, tooling, test equipment, processes, facilities, skills and inspection techniques). Identify single source, sole source, and diminishing source.
17. Value engineering considerations.
18. Standardization considerations.
19. Description and characteristics of commercially available assemblies and sub-stations including any optional capabilities such as special features, interface units, special instructions, controls, formats etc. (include limitations of commercially available equipment such as failure to meet human engineering, safety, and maintainability requirements of the specification and identify deficiencies.
20. Preparation of PDR document.

The PDR report must be reviewed and accepted by a committee chaired by a technical expert in the relevant area and with members having design experience.

## **2.9 PROCUREMENT PLAN**

An important part of project execution is the procurement plan, delays in which can effectively hamper project timelines. A measure of the progress of a project is reflected in the percentage of expenditure accrued at any given time. Expenditure is mainly due to contracts and procurement. An overall procurement plan should be prepared, detailing all products, components to be procured with their estimated timelines, cost and source of supply. If adequately prepared, approvals for major procurements can be taken upfront with the project sanction. This will go a long way in cutting down delays. Special focus must be given to long lead items and critical items with limited/constrained source of supply. A separate team/officer accountable to the project should be identified to deal with all procurement action on a war footing.

The Procurement Plan may be shown in the format shown:

No.	Name of the item/Service	Brief description/ Purpose	Sources of supply	Mode of tendering	Expected cost/ Source	Expected Date of Tendering/ Placing of SO	Expected Date of Delivery

EPC approval along with project sanction is mandatory for major procurements in MM projects and EPC approval should be a part of the main sanction file. Detailed justification for mode of tendering together with budgetary estimates, source of supply and full justification for the procurement of products/Service should be enclosed in project sanction file. However, for other categories of projects, the file for EPC approval may move in parallel with the project sanction file.

Project proposals which do not seek concurrent EPC approval for major stores (not applicable for MM projects) must give detailed justification for the same. **Provision for floating Expression of Interest (EOI)** before project approval is permitted. Provision for carrying out vendor identification/development partner should be done through feasibility studies from Lab build-up funds during this period.

Guidelines as in PM 2006 and its amendments/revisions should be followed for procurement.

## **2.10 COST VALIDATION BY COST ESTIMATION COMMITTEE**

Project costing is one of the important elements of a project proposal. It forms the basis of deriving the CFA for sanctioning the project. While making a project proposal and costing it, the following should be analyzed

- Components of cost under various heads
- Cost under Capital head vs. Revenue head
- Percentage of FE component
- The deliverables/output being produced in the project
- How the items planned for procurement has been costed
- The detailed project costing guideline is discussed in Chapter 3.



### 3. PROJECT COST ESTIMATION GUIDELINES

1. The crux of the Project cost is reflected in the cost break up under the Major & Minor Heads with the IC/FE and Capital/Revenue heads. The method of project costing is dependent on various factors :
  - Type/category of project being proposed
  - Scope of the project
  - Method of execution of the project, which in turn is derived from the type of project.
  - No. of deliverables/outcomes/by-products of the project and their type i.e. prototype, engineered, qualification tests (QT), deployable by User etc.
    - MM and PS projects, with deliverables to the User/Services, prima facie would be Revenue heavy, as bulk of the expenditure would be towards deliverables to the User and not asset creation or deliverables to DRDO.
    - TD and S&T projects would have a large percentage of Capital depending on the scope.
    - IF projects would be primarily Capital based with only contingencies, etc. falling under Revenue as they would be resulting in creation of IF & assets for DRDO.
2. Ideally, the scope of the Project/Objectives and deliverables should be translated into modules/systems/activities, associated test equipment, software, works, etc. and each further break down to its sub-system/component levied, which should be costed.
3. Assumptions on which the costing is based should also be defined e.g.
  - Rate of inflation and FE rates of which year considered
  - Percentage of escalation on the above per year taken into account
  - Basis of calculation of numbers/spares of modules/systems/sub-systems taken for costing

- Specifications frozen or accepted by the appropriate authority, peer-reviewed
  - Methodology of implementing the project as accepted/proposed
4. Cost estimation should be supported by a clear statement of items/services to be procured, quantities/scope of the same and basis for estimating the cost of those items/services. The said basis could be last purchase price, existing rate contract, budgetary quotes etc. In the case of major equipment and high value stores the justification for procuring them and not opting for hiring or outsourcing as a services, should be clearly brought out. The general principle of costing used for product costing should apply to the costing of the project too. Every estimated cost should have a basis/a supporting data in the form of one of the following:
- (i) Previous purchase price/supply order (SO)/purchase order (PO) either from the same Lab/cluster/DRDO/any other Govt. agency normalized to the present day estimated cost by including a 2-3% escalation per year, or including foreign exchange rate variation (FERV) at an actual in case of import content.
  - (ii) And/or internal cost estimation based on experience. Especially in case of sub-systems for which components/Line Replacable Units (LRUs) are known to the Project/Lab internal estimation is particularly relevant in cases of customization, development of hardware and software.
    - (a) If a previous cost is available (old PO for same or similar) and modification is required, then percentage of work to be done should be indicated to give idea of proportionate additional cost over the non-recurring engineering (NRE) cost of the referral order.
    - (b) If new development is required, then Bill of Material (BOM) + Development/NRE Cost break-up. That is assessed LRUs/components with approximate numbers and cost + estimated work (skilled members + unskilled members with prevailing man hour rates taken for cost estimation).
  - (iii) Completely new tasks/jobs can be supported with budgetary quote (BQ)/or expert inputs.
5. Ideally, every project proposal should be accompanied by a financial document which consists of supporting documents used for estimation i.e. previous

POs/SOs, internal estimations, POs from sister organizations, BQs etc. indexed as per the module wise/activity wise/sub-system wise matrix.

6. In certain cases where estimation of quantity may not be practically feasible such as under Minor Heads 105 and 800, a bench mark percentage of project cost/revenue expenditure could be considered.

A head wise summary of possible basis for cost estimation is tabulated:

**MAJOR HEAD 2080-REVENUE**

<b>Minor Head</b>		
105-Transportation	Movement of Personnel	Not admissible under projects as the power to authorize moves remains only with Lab Director (build-up funds), unless it is Cabinet Committee on Security (CCS) projects wherein special powers are accorded to monitoring boards.
	Movement of Stores	The likely stations between which stores are likely to be moved, estimated no. of trips between them and therefore the estimated amount during the periodicity of the project.
110	Stores	This will identify the different types of Revenue procurements which will need to be done to achieve the objective of the project and should be supported with the module/activity wise matrix with sub-systems/components/software/hardware/test equipment/sub-projects/CARS-CAPSI/Hiring of Transport/Trial expenditure/Contingencies etc.
	Equipment/stores	<ul style="list-style-type: none"> <li>• List of stores/equipment with quantity;</li> <li>• LLP, market survey, budgetary estimates.</li> </ul>
	Contract for Acquiring Research Services (CARS)	<ul style="list-style-type: none"> <li>• Nature of research services;</li> <li>• Institutions identified;</li> <li>• Past cost data or budgetary estimates;</li> <li>• Internal assessment.</li> </ul>
	Contract for Acquisition of Professional Services (CAPSI)	<ul style="list-style-type: none"> <li>• Nature of research services;</li> <li>• Cost as per standard rates.</li> </ul>
	Consultancy Contracts	<ul style="list-style-type: none"> <li>• Nature of research services;</li> <li>• Institutions identified;</li> <li>• Past cost data or budgetary estimates;</li> <li>• Internal assessment.</li> </ul>

	Sub-Projects	List of sub-projects and head wise details of cost estimation by the lab concerned with supporting documents.
	Job work/Contracts	<ul style="list-style-type: none"> <li>• Nature &amp; scope of work;</li> <li>• Past cost data or budgetary estimates;</li> <li>• Internal assessment.</li> </ul>
	Hiring of Transport, FOL, for Project Vehicles	A benchmark percentage could be established.
	Hiring of Technical Services	<ul style="list-style-type: none"> <li>• Nature &amp; scope of work;</li> <li>• Past cost data or budgetary estimates;</li> <li>• Internal assessment.</li> </ul>
	Contingency & Miscellaneous	A maximum limit in terms of percentage project cost/revenue cost. Any proposal for higher then the bench mark would require specific justification.
111-Works		<p>The head covers any Minor works for customizing existing facilities or minor modifications etc, duly supported with AEs from the MES if non-technical and CCE R&amp;D if technical. The costing should be based on:</p> <ul style="list-style-type: none"> <li>• Nature &amp; scope of work;</li> <li>• Rough indicative cost from MES/CCE (R&amp;D)</li> </ul>

**MAJOR HEAD 4076-CAPITAL**

052 – (i) Plant & Machinery (ii) Project related Vehicles		<p>Costing of any major equipment, test jigs, which are categorized as Capital and will result in asset creation for the Organisation, <b>including vehicles</b>. It is done on the basis of:</p> <ul style="list-style-type: none"> <li>• List of machines and equipment;</li> <li>• LLP, budgetary estimates.</li> </ul>
111-Works		<p>Any Major Works which are essential for achieving the project objectives duly supported with estimates from the MES/CCE R&amp;D. The costing should be based on:</p> <ul style="list-style-type: none"> <li>• Nature &amp; scope of work;</li> <li>• Rough indicative cost from MES/CCE (R&amp;D)</li> </ul>

The point of time at which the costing should be done is very crucial. The Lab Director shall appoint a committee at the very outset and ensure that a broad scope is officially made available to them, especially after peer review and AoN by DMC wherein the scope and methodology of project implementation are discussed. Often changes in the scope and method also emerge after the PDR and if there is a drastic change, it may necessitate a re-look at the costing.

## 4. PROJECT SANCTION

Once all pre-project activity including preliminary/concept design review and preparation of procurement plan is completed, the project sanction process shall be initiated. **The integrated proposal should move within maximum of 4 months of AoN by DMC for formal approval.**

The final project proposal incorporating all recommendations of the PRC/DMC must be consolidated following the format/guidelines laid down in Form 1.

Once a project file is initiated it will be tracked for delays as per Timeline chart provided in Form 3. The time control sheet for file movement in the specified format should be pasted in the inner left side of the file.

### 4.1 SUBMISSION OF PROJECT PROPOSAL

On completion of all stipulated pre-project activity, the case should be processed for final sanction. The case file should include:

- Project security classification (Top Secret/Secret/Confidential/Restricted/NIL)
- Feasibility report with PEARL
- PRC recommendations
- Detailed project proposal (with WBS, risk mitigation plan, execution plan)
- PDR document
- Project cost estimation document duly validated by the cost estimation committee
- Procurement plan

The project proposal should be drafted in the prescribed proforma (refer Form 1), adhering the following guidelines:

- All items of *Part-I & Part-II* including the enclosures should be indexed in the 'Contents' list with respective page numbers.
- A-4 size paper should be used in the 'Portrait' orientation.
- Proposal may be prepared in running text for better readability.
- Optimum security classification should be given. Care may be taken to ensure that the document is not over classified.

*The following may be considered for project classification:-*

- (i) Projects taken under the EC/PC route will be classified as 'Top Secret'.*
  - (ii) CCS projects will be classified as 'Secret'.*
  - (iii) Classification for all other projects as confidential/restricted/NIL will be decided by the Lab during project formulation/sanction with the approval of CFA.*
- Title/name of the project should be appropriate and meaningful. It should not be very long.
  - *Part-I, Item 6:* Details may be given only for applicable budget heads under *Revenue* and *Capital* account heads.
  - *Part-II, Item 1:* Brief technical appreciation is required for decision making by management. Emphasis should focus on the technological aspects of the project (generally, it should not exceed few pages). Details described in the feasibility report, need not be *repeated*, rather they should be referred/linked).
  - All costs may be given in Cr.
  - All time periods including PDC should be given in months.

The proposal has to be submitted for sanction to the competent authority through respective DG's Office and give title and recommend code name of project/programme, if required.

#### **4.1.1 SUB-PROJECTS**

Sub-projects can be allotted by the nodal lab to DRDO sister labs/estts. only for the specific module/sub-system of the overall system under development. Sub-projects cannot be allotted by the nodal lab to other Govt. organisations viz. Department of Atomic Energy (DAE), Indian Space Research Organisation (ISRO), Bhabha Atomic Research Centre (BARC), Department of Science & Technology (DST) etc. Instead work package with identified scope of work, timelines and cost can be awarded for which proposal will be sought from the Govt. funded agency. No tendering is required for the award of work packages. However, the proposal for the work package must be a part of the project proposal and sanction of the same can be taken with project sanction.

Sub-projects can only be given out of funds from a main project. Labs who wish to have independent development tasks to be taken up by sister labs may give their request in writing, based on which a proposal will be formulated and a project undertaken by Lab

with approval of its concerned CFA. A satisfactory report of completion will be taken from user Lab prior to closure.

Given below are guidelines for undertaking sub-projects.

- Sub-project shall always be the part of main project likely to be undertaken by nodal Lab. However CFA will have freedom to award additional sub-projects at a later date. It is recommended that adequate ground work should have been attempted in pre-project phase to finalise sub-projects partners a priori.
- **Sub-projects will follow the same route as any other project.** Proposal of sub-project/Work Package shall be prepared by the intended organisation/Lab, which has been identified by nodal Lab to undertake this, following the guidelines of PPFM in summarised form. Lab will take approval of its cluster council and DG before forwarding the proposal to nodal Lab.
- Fund for the sub-project will be released directly to the participating lab(s)/other Govt. organisation by Directorate of Budget, Finance & Accounts (DBF&A) on the recommendation of the Director of the nodal Lab.
- Serial numbering of sub-project will start from a series 01 to 999 which will be given immediately after the serial number of the main project separated by a hyphen.
- PDC & cost of the sub project/Work Package should always be less than the PDC/cost of the main project. Category of the project should also be same as main project.
- The competent authority for PDC extension, cost enhancement and re-allocation of funds pertaining to sub project would be the nodal Lab Director, who has been entrusted the responsibility to execute the main project.
- Monitoring of the sub-project/Work Package will be done by the monitoring committees constituted for the main project. However, in addition to this, Director of participating lab can monitor it as per his convenience.
- Progress report of sub-project/Work Package along with details of expenditure shall be submitted at regular interval as decided by project/programme Director/Lab Director of nodal Lab.
- At the time of final completion of the sub-project/Work Package, the Project/Programme Director will submit a closure report to nodal Lab.

- The lab closing the sub-project will ensure that all steps/stages as laid down in the PPFM document for closure of projects are followed.
- Statement of expenditure duly vetted by CFA of Lab/organisation executing the sub-project/Work Package should also be annexed along with closure report.
- However financial authority of nodal Lab can conduct further vetting of statement of expenditure and seek clarification from the participating Lab/organisation, before final settlement, if required.
- Technical Closure Report must be submitted **within three months** of the expiry of sub project/Work Package PDC.
- Nodal Lab will issue closure letter of sub project/Work Package irrespective of the closure of main project.

**Note: Sanction of GoI is required to enter into MoU with industries/institutions for undertaking design and development of a defined task.**

## 4.2 SCHEME FOR ALLOTMENT OF PROJECT NUMBER & SUB-PROJECT NUMBER

The project number has to be in the form of “**XX/YY-ZZ/ABC-123**”. Here, **XX** defines the category of the project, **YY-ZZ** financial year of the sanction of project and **ABC** is the abbreviated initials of the name of the lab to which the project is sanctioned (as mentioned in Annexure 1)

<b>XX Category</b>		<b>YY-ZZ Financial Year of Sanction</b>
MM	MM (SL) – MM Project : Army MM (SN) – MM Project : Navy MM (SA) – MM Project : Air Force MM (SS) – MM Project : Inter Services MM (SM) – MM Project : Medical Services MM – DRDO/other than above	Only the last two digits of the financial year need to be given
TD	Technology Demonstration	
S&T	Science & Technology	
IF	Infrastructure & Facilities	
PS	Product Support (Support, Improvement & Productionisation)	
MM-UT	Mission Mode (User Trials)	



<b>ABC – Lab</b> (Generally, the first three letters of the abbreviated name of the laboratory/establishment - as mentioned in Annexure 1)	<b>123 – Digit</b> (S. No. of the project to be obtained from the lab)
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Illustrative example of assigning Project/Programme Number for nodal Lab

TD/13-14 /ARD-215	This reflects a TD category of project sanctioned to Armament Research & Development Establishment (ARDE) in the financial year 2013-14 and S. No. of the project sanctioned to the lab is 215
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In case of multi-lab project the participating Labs executing sub-projects will be assigned separate project numbers as per the scheme mentioned.

Illustrative example of assigning project number for the participating Labs

TD/13-14 /ARD-215.01 (TBR-25)	<ul style="list-style-type: none"> <li>➤ This reflects a TD category of project sanctioned to ARDE in the financial year 2013-14 and S. No. of the project sanctioned to the nodal Lab is 215</li> <li>➤ First sub-project given to TBRL (.01) which is 25<sup>th</sup> running project of the participating lab.</li> </ul>
TD/13-14 /ARD-215.02 (HEM-36)	<ul style="list-style-type: none"> <li>➤ This reflects a TD category of project sanctioned to ARDE in the financial year 2013-14 and S. No. of the project sanctioned to the nodal Lab is 215</li> <li>➤ Second sub-project given to HEMRL (.02) which is the 36<sup>th</sup> running project of the participating lab.</li> </ul>

### **4.3 PROCESSING OF PROJECT PROPOSALS FOR PROJECT SANCTION/PDC EXTENSION/RE-ALLOCATION OF FUNDS AND COST REVISION**

1. The lab initiating the project proposal will ensure that all steps/stages as laid down in the PPFM document are completed and the Checklist 1 is attached with the proposal, before processing the same for sanction of the designated CFA (Lab Director/Cluster DG/ Secretary DD R&D / RM / FM / CCS).
2. Project proposal which are less than Rs 5 Cr (Lab Directors' powers) will be checked by an officer designated by the Lab Director and routed for financial vetting before approval by Director. Sanction letter will be issued by the designated officer.

3. All project proposals which are within DGs powers will be checked by Dir (PM) of cluster DG and routed through IFA (R&D) for financial vetting before approval by cluster DG. Sanction letter will be issued by the Dir (PM) of cluster.
4. Project proposals beyond DGs powers will be initiated by the nodal Lab and forward to the office of cluster DG for further processing. Project proposals will not be initiated by the office of Cluster DGs.
5. Project proposals which are beyond the powers of Cluster DGs will be forwarded (along with completed **Checklist 1** and recommendations of the DGs) to DP&C, DRDO HQ for further processing i.e. for obtaining approvals and financial sanction of the CFA. DP&C will arrange issue of sanction letter (complete with Project Number and Unique Sanction Code of the designated CFA). Project proposal file and other documents will be sent back to cluster DGs office/Lab, thereafter.
6. Office of cluster DGs will maintain 'Lab-wise Master Control Register' for their records regarding Project Number. The standardized code for allocation of project number and format of project sanction letter will be as indicated in the previous section.
7. All project sanction letters must also have a **"Unique Sanction Code"**, the details of which have already been circulated separately by DBF&A (Maintenance of a control register containing details of Unique Sanction Code for each financial sanction issued by any CFA, will henceforth be mandatory). Project sanction letter will be considered incomplete/invalid, if Project Number and Unique Sanction Code, both are not mentioned in the letter.
8. Copies of all project sanction letters and closure letters, issued by various competent authorities, must be endorsed to DP&C, DRDO HQ.
9. Copies of all project sanction letters for projects, costing over Rs 2 Cr, must also be endorsed to DBF&A, for allocation of **"Unit Code"**, to facilitate allocation of project funds and booking of expenditure.
10. There will be no separate fund allocation for activities/tasks costing up to Rs 2 Cr and the same will be catered for by the Labs under **"Build Up"**.
11. PDC extension for projects/programmes within DGs power can be approved by CFA. If quantum of PDC extension is >50% of the original PDC or >2 extensions, the case file should be put up for approval of next higher CFA/Secretary DD R&D, whichever is lower. The Corrigendum will be processed for issue by office of

approving CFA and should necessarily be forwarded to DP&C and DBF&A for records.

12. All cost enhancement sanctions, issued by designated CFA, will also have fresh **“Unique Sanction Code”**. Unique Sanction Code is not required for those sanctions which entail only PDC extension without cost revision.

#### 4.4 FINANCIAL POWERS FOR PROJECT/PROGRAMME SANCTION & ROUTING OF FILES

Multiple financial vetting: For cases where CFA is Secretary DD R&D and beyond, the proposal will be vetted by IFA, who will flag issues of concern and forward the same to DG. Office of DG will provide clarifications on the issues raised by IFA and forward the file for processing at DRDO HQ. This will avoid repeated return of file to IFA.

Competent Financial Authority	Extent of Financial Powers Delegated	Concurrence Level	Proposed Routing of Files
Directors of Labs/Estts	Up to Rs 10 lakhs	Without consultation of Finance	As per prevailing policy
	Above Rs 10 lakhs and up to Rs 5 Cr	IFA	Project Director→ IFA→ Lab/Estt. Director for Sanction→ Officer designated by lab Director to sign Sanction letter
CC R&D/ cluster DG	Above Rs 5 Cr and up to Rs 50 Cr	IFA	Lab Dir→ Dir (PM) of cluster DG→ IFA→ DG for sanction→ Dir (PM) of cluster DG for issue of Sanction letter
Secretary Defence (R&D)	Above Rs 50 Cr and up to Rs 75 Cr	JS & Addl. FA	Lab Dir→ Dir (PM) of cluster DG→ IFA→ DG→ DP&C→ DBF&A→ CCR&D (R&M)→ Addl. FA(R&D)→ Secy DD R&D for sanction→ DP&C for processing of Govt. Sanction letter→ US (R&D) for issue of Sanction letter
Raksha Mantri	Above Rs 75 Cr and up to Rs 500 Cr	FA(DS)/ Secretary Defence(Fin)	Lab Dir→ Dir (PM) of cluster DG→ IFA→ DG→ DP&C→ DBF&A→ CCR&D (R&M)→ Addl. FA(R&D)→ Secy DD R&D→ Secy Def (Fin)→ Raksha Mantri for Sanction→ DP&C for processing of Govt. Sanction letter→ US (R&D) for issue of Sanction letter
Finance Minister	Above Rs 500 Cr and up to Rs 1000 Cr		Lab Dir→ Dir (PM) of cluster DG→ IFA→ DG→ DP&C→ DBF&A→ CCR&D (R&M)→ Addl. FA(R&D)→ Secy DD R&D→ Secy Def (Fin)→ Raksha Mantri→ Finance Minister for Sanction→ DP&C for processing of Govt. Sanction letter→ US (R&D) for issue of Sanction letter
Cabinet Committee on Security (CCS)	Beyond Rs 1000 Cr		Lab Dir→ Dir (PM) of cluster DG→ IFA→ DG→ DP&C→ DBF&A→ CCR&D (R&M)→ Addl. FA (R&D)→ Secy DD R&D→ Secy Def (Fin)→ Raksha Mantri→ Finance Minister→ CCS for Sanction→ DP&C for processing of Govt. Sanction letter→ US (R&D) for issue of Sanction letter

*Note: Financial Powers for Project/Programme sanction and routing of files have been framed as per DBF&A Letter No. DRDO/DBFA/FA/83226/M/01/2031/D(R&D) &*

*MoD ID No. 14(23)/2003/IFDP II dated 30 July 2010 and its corrigendum's. The table will be modified in conjunction with changes made to the above letters from time to time.*

#### 4.5 EXAMINATION OF PROJECT PROPOSAL: ROLE & TIMELINES

Before sanctioning any DRDO project by the Competent Authority, it has to be examined at various levels. Routing of project proposal for sanction is shown above. The following time schedules & roles may strictly be adhered to, for sanctioning of the project as shown in Figure:

	Role	Max. Time
<b>Project Director</b>	Formulation of integrated project proposal with detailed costing and procurement plan	Within 4 months of AON
<b>Lab Director</b>	First level of approval	1 week
<b>Director (PM) of cluster DG</b>	Scrutiny of proposal for check list of documents	1 week
<b>IFA (R&amp;D)</b>	Financial vetting & DGL vetting	2 weeks
<b>Cluster DG</b>	Recommendation of project proposal	1 week
<b>DP&amp;C</b>	Check for PPFM/DMC compliance	3 days
<b>DBF&amp;A</b>	Ensure financial guidelines, vet DGL	3 days
<b>DMM</b>	EPC clearance	3 days
<b>CC R&amp;D (R&amp;M)</b>	Overall scrutiny	3 days
<b>Addl. FA (R&amp;D)</b>	Financial vetting & DGL vetting	2 weeks
<b>Secretary, Defence R&amp;D</b>	Sanction & approval	2 weeks
<b>Approximate time for Sanction</b>	10-12 weeks (upto Secretary Defence R&D)	

#### 4.6 SUBMISSION OF PROJECTS TO CCS FOR SANCTION

For CCS projects, specific format has to be followed as specified by Cabinet Secretariat whose guidelines are available on website [www.cabsec.nic.in](http://www.cabsec.nic.in) and web portal of DP&C on DRONA. Specimen format of the main note is given as Form 4.

#### 4.7 ISSUE OF PROJECT SANCTION LETTER

The CFA sanctions the project on file, after which a Govt. sanction letter is issued by authorized person (generally a Deputy Secretary or Under Secretary) of DD R&D, mentioning title, project number (USC), PDC, cost with break-ups of main budget heads,

monitoring and management mechanism. The Govt. letter issued without **Unique Sanction Code** will be treated as null and void.

Unless or otherwise mentioned in the Govt. letter the date of issue of the Govt. letter is considered as date of commencement of the project. Please refer format of sanction letter at Form 5.

*Note: All CCS project sanctions/amendments must be routed through DP&C, DRDO HQ who will co-ordinate with DS/US (MoD) for release of Govt. Sanction Letter.*

## 5. PROJECT EXECUTION

Execution of the project should be governed by detailed execution plan to take care of both macro level planning and micro level detailing. The Project Execution Plan (PEP) is the operational document for the project. The PEP is the roadmap of the project and it is the responsibility of the Project Director to formulate and follow it meticulously. It enables its effective day-to-day (operational) management and control.

Following are the suggested steps in project execution.

1. Drafting of detailed Scope of Work (SoW): Detailed scope of work is to be extracted from macro level SoW and defined objectives.
2. WBS is to be created. The overall task to be broken down into sub-systems and each sub-system to be split up into various phases viz. design, configuration finalization, analysis & review, realisation, test & evaluation and trials. These activities are to be placed in timeline map which should remain as the baseline document for all reviews. Revised time charts can be generated for future reviews but must always draw comparison with the baseline chart.
3. Identified Project Director should draw up a project management plan consisting of:
  - a. **Creation of cross functional team:** Once a project is sanctioned, a cross functional team consisting of experts in design, manufacturing, testing should be identified. A member of the Lab Quality Assurance (QA) team and Lab Material Management/Store team should be identified with responsibility for speedy completion of related tasks.
  - b. **Risk Management plan:** Identification of critical paths/risk areas and strategy to overcome risk.
  - c. **Resource Plan:** Detailed resource plan outlining availability and utilization of funds, HR, equipment and infrastructure.
  - d. **Procurement Plan:** List of items to be procured, when which item is to be initiated looking at overall project requirements.

- e. **Quality Plan:** This must be done in coordination with identified Quality, Reliability and Safety (QR&S) personnel and should detail out the quality requirements at each phase of design, manufacturing & testing.
- f. **Realisation/Manufacturing Plan:** This must be done in coordination with team identified to oversee the product realisation and should take special care of long lead schedules.
- g. **Test & Evaluation Plan:** To be prepared in coordination with testing group and will include identification/ establishment of test facilities and test schedules/acceptance criteria.

All the above plans must be presented at the first Project Monitoring & Review Committee (PMRC)/ Executive Board (EB) review meeting.

- 4. In addition to preparation of the above plans, the Project Director also has additional responsibilities such as :
  - a. **Reporting status:** It is advisable that annual execution plans be prepared and executed based on the reflected milestones of the project. The annual plan must be broken down into sub activities/micro plan for each sub-systems. An online Results Framework Document (RFD) module for Project tracking is available on DRONA. Project Directors' must provide a monthly status update of the micro plan by 5<sup>th</sup> of each month. In addition as and when sought quarterly reports must be forwarded to HQ.
  - b. **Coordinating reviews:** Keeping tabs on periodic reviews viz. PMRC, EB & Apex Boards/ generation of minutes and action taken reports.
  - c. **Configuration Management:** Should have overall control and oversight of configuration changes and cross effects.
  - d. **Change Management:** Changes in planned configuration to be discussed, approvals obtained, disseminated and documented as per guidelines.
  - e. **Documentation & record keeping.**
  - f. **Process for approval for Cost/PDC extension/closure**

Guidelines for preparing detailed project execution plan (PEP) for projects are at Appendix D.

### Consultancy and Development Contract

DRDO projects can outsource a specific quantum/module of development activity to academia/industry which has established credentials/potential expertise in the relevant area. The type of activity could be design consultancy, analysis report, development/realization of a module (Build to specification-BTS) etc. The following broad guidelines for placement of such contracts are given below:

- Quantum/SoW is to be detailed out including all relevant information such as what will be provided by DRDO in terms of free issue materials (FIM), HR, infrastructure etc. QA requirements, delivery schedules and acceptance criteria must be a mandatory part of the SoW of the work package.
- Identification of competent partner to carry out required work will be through one of the following:
  - EOI/Advertisement on website if no known source is available
  - LT/ST/PAC mode of tendering - as applicable if source is known and conditions laid down in PM are satisfied.

*Note: The process of placing the development contract/design consultancy/feasibility study package on the relevant agency will follow all the guidelines of PM 2006 as amended from time to time.*

## 5.1 MILESTONE REVIEWS

Project execution benefits greatly through technical reviews.

The definition, scope and the appropriate time to do various types of milestone reviews are as detailed below:

- **Preliminary Design Review (PDR):** Should be done before sanction of the project with focus on design methodology/approach and realisation process.
- **Detailed Design Review (DDR):** Should be done after the sanction with focus is on sub-systems level detailed design. Acceptance of DDR committee report should be the milestone gateway for manufacturing clearance of first prototype.
- **Critical Design Review (CDR):** Should be carried out based on the feedback of initial test rig trials of the first prototype. System is cleared for manufacturing in numbers and full fledged testing after CDR approval.



**Competent authority for constitution of PDR/CDR Committee:**

PDR is mandatory for MM and TD projects. The competent authority for constitution of PDR committee is as under:

Up to Rs 5 Cr	Lab Director in consultation with Director (PM) of cluster DG
Rs 5 Cr and above, but less than Rs 75 Cr	Cluster DG
Rs 75 Cr and above	DG DRDO/Secretary Defence R&D (after ensuring compliance to composition of Committee as per PPFM guidelines)

**Constitution of PDR/CDR Committee:**

PDR should be constituted as under:-

- 1) Chairman (eminent technology expert preferably from outside DRDO).
- 2) Two external experts (eminent personalities in specific area from academic institutions).
- 3) Two DRDO technical experts (from SAM-C, TCG, HPO, FTM or from any DRDO lab).
- 4) Project Directors of sub-projects of participating labs.
- 5) Project Director will be the Member Secretary of the committee.

*Note: Chairman can co-opt/ invite any eminent person to participate in review process*

**5.2 CRITICAL DESIGN REVIEW (CDR)**

CDR shall be conducted for each item when detailed design is essentially complete, prototype realized and subjected to basic test. For complex/large systems CDR may be conducted on an incremental basis, that is, progressive reviews are conducted for different sub-systems and software, instead of a single CDR. The purpose of this review will be to:

1. Determine that the detailed design of each item under review satisfies the performance and engineering requirements of the design specification.
2. Establish the detailed design compatibility among the item (sub-system, assembly, equipment) under review and other items of the system, facilities, computer software and personnel.
3. Assess risk areas (on a technical, cost and schedule basis) for each item of the system.
4. Assess producibility of each item of system hardware.

5. Review software detail design document, interface design document and engineering drawings to see that they satisfy the requirement established by design specification.

The following items shall be included in the review:

1. Adequacy of the detailed design reflected in the draft design specification.
2. Detailed engineering drawings including schematic diagrams.
3. Adequacy of the detailed design in the following areas: electrical design, mechanical design, environmental control and thermal aspects, electro-magnetic compatibility, power generation and grounding, electrical and mechanical interface compatibility, mass properties, reliability/maintainability/availability data, system safety engineering, security engineering, survivability/vulnerability, producibility and manufacturing, transportability, packaging and handling, human engineering and biomedical requirements, standardization, design vs. logistics trade-offs.
4. Interface control drawings.
5. Review of preliminary test data.
6. Design analysis.
7. Initial manufacturing readiness (for example, manufacturing engineering, tooling demonstrations, development and proofing of new materials, processes, methods, tooling, test equipment, procedures, reduction of manufacturing risks to acceptable levels).
8. Detail design information on all bought out items to be provided with the system.
9. Verify corrosion prevention/control considerations to ensure materials have been chosen that will be compatible with operating environment.
10. Findings/status of quality assurance program.
11. Software detailed design, data base design and interface design document(s). In case where the CDR is conducted in increments, complete documents to support that increment shall be available.
12. Schedules for remaining milestones.
13. Support equipment provisioning problems.

*Note: CDR is typically carried out after initial tests on the first prototype and test data is available for fine tuning design/ manufacturing*

### **5.3 TEST AND EVALUATION**

Test and Evaluation is a continuous process during the development, production and induction of a system in the service. Tests are conducted to prove the design, to see that each assembly and sub assembly is able to perform its intended function to test for reliability growth, and on the system as a whole to see that developmental efforts have succeeded, and finally operational tests or User trials for acceptance for induction into Service.

In certain complex programmes, it may be desirable to form a Test Article Review Board (TARB) to clear test plan, test procedure, test set-up, acceptance criteria and other related issues.

### **5.4 DEVELOPMENTAL TEST AND EVALUATION (DT&E)**

A system undergoes several tests and evaluations during its various development phases and these can be summarized as:

1. Feasibility Study Phase Tests
2. Initial Development Phase Tests
3. Final Development Tests (including Acceptance Test & Qualification Test)
4. User Assisted Technical Trials (UATT)
5. User Trials (UT)/User Evaluation Trials (UET)

Various tests and measurements are required to be carried out in the above mentioned first three phases. When a system has been successfully developed, User require to evaluate the same against the QRs. User trial readiness review and User trials is to be progressed as given below.

### **5.5 USER TRIAL READINESS REVIEW**

After completion of development and DT&E, a review shall be carried out to ascertain whether the system developed is ready for User trials. An independent team shall be constituted for this review and acceptance of the developed system for User trials. For major systems, Secretary, Defence R&D may constitute this team.

The Readiness Review and Acceptance Team (RRAT) shall be multi-disciplinary and multi-laboratory. It shall review the results of development test carried out so far and

the documents such as design specification, technical, operating manual and user handbook to ascertain that the system's performance and reliability to meet all parameters of QR issued by the Users. The developing laboratory must provide reliability data and log book to this team to ascertain reliability figures given by the laboratory. Logbook is meant for recording deviations/defects or other observation. After acceptance of the system by the User, similar log book should also be given to user to record occurrence of defects, repair activity and down time etc. during operating life of equipment.

## **5.6 TRIAL DIRECTIVES**

After the technical work on equipment development project is over, in-house and technical trials have been conducted along with the User and the trial results have been found satisfactory, then following steps are necessary:

1. When the system is ready for the User trials, the User generally nominates a trial unit and a trial directive is issued. The trial directive describes in detail, the test, the test sequence and the procedures to be followed in User trials. This may include the acceptable performance limits and the bottom line requirements. The trial environment vis-à-vis actual operational environment may also be mentioned, if applicable.
2. The trial directive also includes a trial questionnaire, which tries to ascertain whether the characteristics of the system developed (system specifications) are likely to meet qualitative requirement in respect of all parameters specified therein.
3. DRDO and User should sign trial directives. The issues like number of samples, firms, trials, experiments & qualification test and number of stations, period of trials environment & evaluation must be defined.
4. In the case of an equipment development project, in the first phase of technical trials, adequate number of trials should be conducted by the joint team of developer & User. The number of trials will depend on the complexity of the equipment. After the successful completion of trials, the project may be treated as closed and completion report of the project be submitted for the project closure.
5. If more number of trials are to take place under various operating conditions like terrain, climatic conditions, altitude etc., then a new project should be taken for such trials. Memorandum of Understanding (MoU) be signed among the Users and the developer which should cover the issues like number of trials, number of

samples, firing trials, environmental & quality testing, number of stations, period of trials and evaluation must be defined in the MoU. When the technical trials are in progress with the user, the ToT action should be initiated along with the identification of the production agency. Both should process concurrently.

The trial directive should, therefore, be examined critically and any requirement which is unreasonable or beyond the design parameters should be negotiated, before commencement of User trials. The trial directive should also be analysed to categorize the parameters into '**requirements which must be met/essential**' and '**requirements which are desirable**'. It should be kept in mind that no compromise is likely to be made on the requirements of first category. **DRDO labs must obtain copy of Trial Directive before commencement of the trials. The Project Director and the User should jointly sign it.**

As far as possible, the comparative User trials with a foreign item should be avoided. If it is to be carried out the performance limits should be specified by the User in QRs and trial directive so that the User trials are objective and performance is not judged, subjectively with reference to one time, random performance of another item.

## **5.7 USER TRIALS**

User trials are conducted to evaluate a system's operational qualities with regard to effectiveness, suitability, reliability, maintainability, availability and supportability, and to identify any operational and logistics support deficiencies.

User trials focus on two specific areas: (1) operational effectiveness (2) operational suitability. Both operational effectiveness and operational suitability go hand in hand and are virtually inseparable, as elements within one are readily inclusive in either test area.

**Operational effectiveness** is determined by how well a system performs its mission when used by service personnel in the planned operational environment relative to organisation, doctrine, tactics, survivability, vulnerability, and electronic, nuclear or non-nuclear threats.

**Operational suitability** is determined by the degree to which a system can be placed satisfactorily in the field, with consideration given to availability, compatibility, transportability, interoperability, reliability, wartime usage rates, maintainability, safety,

human factors, manpower and logistics supportability, documentation and training requirements.

User trial is conducted under conditions, which are as operationally realistic as possible and must be representative of both combat stress and peacetime operating conditions, foreseen throughout the system life cycle.

Through User trials the test team measures the system against operational threshold ('essential') or what Army calls the 'bottom line requirements' and objectives ('desirable') outlined in the QRs and trial directives issued by the Service HQ.

As much as is practical, User trial team should comprise personnel with same type of skills and qualifications as those who will operate maintain and support the system when deployed. This assures credibility of User trial results and findings.

*Note: It has been observed time and again that User-driven projects are not being formally closed within the PDC of the project for want of conclusive output from operational test and evaluation (User trials). Many a times reasons for delay are unavailability of platforms, last minute changes in specifications, need of more number of trials under various operative conditions etc. Given the circumstances, Competent Authority may decide whether or not to include the operational test and evaluation trials (User trials) under the scope of the project. Alternatively, User trials can be taken up as a separate project with defined scope/timelines with user participation.*

## **6. PROJECT MONITORING AND REVIEW**

All DRDO projects should be monitored by a multi level monitoring and review mechanism. The number of levels will depend on the value and category of the projects. Given in the following paragraphs are guidelines for the review mechanisms which should be strictly followed.

Various high level committees, including R&D Panels, Steering Committees, Advisory Committees and Boards, carry out reviews of DRDO projects. The Vice Chief of Army Staff (VCOAS) reviews the Staff projects for Army, twice a year. For all major programmes/projects, there are multi-tier 'Programme Management Boards (PMBs)', having representation from the Services, DRDO laboratories and in some cases from academic institutions and other national research laboratories. These PMBs periodically monitor and review the programmes and give mid-course corrective directions.

The MM projects/programmes are to be executed in close interaction/association with User Services. Involving Users in pre-project requirements/pre-project activity, project progress reviews help into cutting short the delays and to know their views in advance including GSQRs and also to keep continuous visibility of the projects.

All DRDO projects should have an integrated review and monitoring mechanism approved by the competent authority at the time of sanctioning the project. Review report will be submitted to the Director (PM) of cluster DG and copies to all concerned at DRDO HQ.

### **6.1 AGENDA OF MONITORING COMMITTEE MEETINGS**

#### **PMRC**

- Action points of previous review: Highlighting points for resolution.
- Detailed Schematic/Product Tree (indicating Bought out/BTP/BTS) with current status.
- Reviewing technical progress of project as per original Gantt/PERT chart clearly indicating any change from reference base line (milestones linked financial outlay & timelines) prepared and approved at the time of sanction of the project.
- PEARL Table: Current status.
- Discussion on unresolved technical issues and their proposed solutions.

- Recommending alternate approach, whenever necessary.
- Deliberation on key issues including new issues brought up for approval.
- Review of procurement issues vis-à-vis expenditure debited, commitment made, pipeline cases as on date.
- Recommending enhancement of funds, PDC extension and closure of projects.

### **EXECUTIVE BOARD**

- Action points of previous review: Highlighting points for resolution.
- Detailed Schematic/Product Tree (indicating Bought out/BTP/BTS) indicating status of each module.
- Reviewing technical progress of project as per original Gantt/PERT chart clearly indicating any change from reference base line (milestones linked financial outlay & timelines) prepared and approved at the time of sanction of the project.
- PEARL Table: Current status.
- Discussion on unresolved technical issues by PMRC and related managerial issues with their proposed solutions.
- Recommend/ratify alternate approach, whenever necessary.
- Deliberation on key issues including new issues brought up for approval.
- Review of overall expenditure status. Resolution/deliberations on cases related to industry/manufacturing partners.
- Ratification of recommendation made by PMRC to enhance project cost, re-allocation of funds and PDC extension.

### **APEX BOARD**

- Deliberation on key management issues which have cropped up during execution of projects/programmes and solutions thereof.
- Discussion on unresolved techno-managerial issues by EB with their proposed solutions including issues related to users, production agencies.
- An overall review of the project/programme w.r.t. technical milestones envisaged vis-à-vis achieved under the project.



- Ratification of recommendation made by Programme Management Board (PMB), Project Management Board (PJMB), Executive Board (EB) in respect of project/programmes cost enhancement, re-allocation of funds and PDC extension.

*Note: The actual approvals for cost, PDC revision will be obtained on file by moving the case file through Director (PM) of cluster DG.*

## 6.2 MANAGEMENT AND MONITORING OF PROJECT

	Projects cost (≥ Rs 1000 Cr)	Projects cost (≥ Rs 500 Cr - Rs 1000 Cr)	Projects cost (≥ Rs 5 Cr - Rs 500 Cr)	Projects cost (≤ Rs 5 Cr)
Apex Board	Chairman: Secretary, Defence (R&D)		-	-
	Members <ul style="list-style-type: none"><li>Secretary Expenditure/Nominated Rep (for project cost ≥ Rs 1000 Cr)</li><li>Secretary Defence (Fin)/ Finance Advisor (Defence Services)</li><li>VCOAS/VCNS/VCAS/ Chief of Integrated Defence Staff (CIDS) or their nominated Rep</li><li>Cluster DG</li><li>DG’s of participating labs</li><li>Addl. FA (R&amp;D)</li><li>CC R&amp;D (R&amp;M)</li><li>Directors of participating labs</li><li>Any other members</li><li>Chairman may co-opt/nominate other members as and when necessary.</li></ul>			
	Standing Committee for Apex Board:			
	Members <ul style="list-style-type: none"><li>Secretary Defence (Fin)/Finance Advisor (Defence Services)</li><li>Cluster DG</li><li>Addl. FA (R&amp;D)</li><li>CC R&amp;D (R&amp;M)</li><li>Any other members</li><li>Chairman may co-opt/nominate other members as and when necessary.</li></ul>			
	Member Secretary: Director (Nodal Lab)			
	Periodicity of review: At least once a year			
Programme Management Board (PMB)/	Chairman: Concerned DG (Cluster)			-
Executive Board (EB)	Members <ul style="list-style-type: none"><li>Director (Nodal Lab)</li><li>Directors of participating labs</li><li>Subject experts from R&amp;D Centers/Industry/Academia and other DRDO Labs (at least from two different groups; for projects ≤ Rs 500 Cr)</li><li>Addl. FA (R&amp;D) (for projects costing ≥ Rs 75 Cr)</li><li>IFA(R&amp;D)</li><li>Project Director (Participating Lab)</li></ul>			-

	<ul style="list-style-type: none"><li>• Director P&amp;C, DRDO HQ (to be replaced by Dir (PM) of cluster DG for projects cost <math>\leq</math> Rs 25 Cr</li><li>• DISB, DBF&amp;A (if required)</li><li>• User Rep (if applicable/required)</li><li>• Rep of Inspection/QA Agency (if required)</li><li>• Any other members</li><li>• Chairman may co-opt/nominate other members as and when necessary.</li></ul> <p><b>Standing Committee for PMB:</b></p> <p><b>Members</b></p> <ul style="list-style-type: none"><li>• Director (Nodal Lab)</li><li>• Programme/Project Director</li><li>• Addl. FA (R&amp;D)/ IFA (R&amp;D) - as per requirement</li><li>• Any other members</li><li>• Chairman may co-opt/nominate other members as and when necessary.</li></ul>	
	<p><b>Member Secretary:</b> Programme/Project Director</p>	
	<p><b>Periodicity of review:</b> At least once in six months</p>	
<p><b>Project Management Board (PJMB)/</b></p> <p><b>Project Monitoring &amp; Review Committee (PMRC)</b></p>	<p><b>Chairman:</b> Director (Nodal Lab)</p> <p><b>Members</b></p> <ul style="list-style-type: none"><li>• Director (PM) of cluster DG (for all projects except <math>\leq</math> Rs 5 Cr).</li><li>• Subject experts from R&amp;D Centers/Academia and other DRDO Labs (at least from two different groups)</li><li>• Senior expert scientist</li><li>• DFA/Dy. IFA/Jt. IFA/Director (Fin)</li><li>• Reps of participating labs.</li><li>• Lab Head Planning</li><li>• User Rep (if required)</li><li>• Rep of Inspection/QA Agency (if required)</li><li>• Any other members</li><li>• Chairman may co-opt/nominate other members as and when necessary.</li></ul> <p><b>Standing Committee for PJMB:</b></p> <ul style="list-style-type: none"><li>• Project Director</li><li>• DFA/Dy. IFA/Jt. IFA/Director (Fin)</li><li>• Senior expert scientist</li><li>• Any other members</li><li>• Chairman may co-opt/nominate other members as and when necessary.</li></ul>	
	<p><b>Member Secretary:</b> Programme/Project Director</p>	
	<p><b>Periodicity of review:</b> Once in three months</p>	

### 6.3 SUGGESTED COMPOSITION OF REVIEW COMMITTEES FOR DIFFERENT CATEGORIES

<b>Peer Review (All projects costing &gt;Rs 5 Cr will be peer reviewed)</b>					
Category	MM	TD	S&T	IF	PS
Chairperson	Outside Expert (Preferably)	Outside Expert (Preferably)	Outside Expert(Preferably)	Outside Expert(Preferably)	Outside Expert(Preferably)
Academia	Two	Two	Two	-----	----
User	Yes	NM	-----	----	Yes
DRDO expert	SAM-C/HPO/ Other Lab experts	SAM-C/HPO/ Other Lab experts	SAM-C/HPO/ Other Lab experts	NM	NM
DP&C/Dir PM	Yes	Yes	Yes	---	-----
Member Secy	PD	PD	PD	PD	PD
<b>PMRC</b>					
Category	MM/MM-UT	TD	S&T	IF	PS
Chairperson	Lab Director	Lab Director	Lab Director	Lab Director	Lab Director
Academia	Yes (two)	Yes (two)	Yes (two)	NM	-----
User	Yes	NM	-----	NM	Yes
QA Rep	Yes	Yes	NM	Yes	Yes
Participating Labs	Lab PD	Lab PD	Lab PD	Lab PD	Lab PD
Lab Head Planning	Yes	Yes	Yes	Yes	Yes
DRDO expert	SAM-C/HPO/ Other Lab experts	SAM-C/HPO/ Other Lab experts	SAM-C/HPO/ Other Lab experts	Other Lab experts	Other Lab experts
IFA (R&D)	DFA	DFA	DFA	DFA	DFA
Member Secy	PD	PD	PD	PD	PD
<b>EB</b>					
Category	MM/MM-UT	TD	S&T	IF	PS
Chairperson	DG	DG	DG	DG	DG
Academia	NM	NM	Yes	----	-----
User	Yes	NM	-----	-----	Yes
QA	Yes	NM	NM	NM	Yes
DRDO expert	SAM-C/HPO/ Lab experts	SAM-C/HPO/ Lab experts	SAM-C/HPO/ Lab experts	Lab experts	Lab experts
DP&C	Yes	Yes	Yes	Yes	-----
DISB, DBF&A	Yes	NM	NM	NM	NM
IFA (R&D)	Yes	Yes	Yes	Yes	-----
Participating Labs	Lab Dir/PDs	Lab Dir/PDs	Lab Dir/PDs	Lab Dir/PDs	Lab Dir/PDs
Member Secy	NodalLabDir/PD	Nodal Lab Dir/PD	Nodal Lab Dir/PD	Nodal Lab Dir/PD	Nodal Lab Dir/PD
<b>Apex Board</b>					
Category	MM/MM-UT	TD	S&T	IF	PS
Chairperson	Secy DD R&D	Secy DD R&D	Secy DD R&D		
User	Yes	NM	-----		
QA	Yes	Yes	Yes		
Participating Lab Directors	Yes	Yes	Yes		
DRDO expert	NM	NM	NM		
CCR&D(R&M)	Yes	Yes	YES		
Finance	Addl. FA/IFA	Addl. FA/IFA	Addl. FA/IFA		
Others	Cluster DG	Cluster DG	Cluster DG		
Member Secy	Nodal Lab Dir	Nodal Lab Dir	Nodal Lab Dir		

NM-Not Mandatory (lab may invite as per need)

## **7. PROCEDURE FOR DEPOSIT WORKS (DW)/ LIMITED SERIES PRODUCTION ORDERS (LSP)**

With a view to monitor expenditure and ensure that the linkages between financial outlays and technical output is well formulated not just for DRDO funded projects but also for Deposit works (DW)/ Limited Series Production (LSP) orders, it has been decided to streamline the procedure for funding of DW/LSP orders entrusted to DRDO laboratories by Service HQ/other agencies. This procedure shall be applicable for payments from Revenue as well as Capital heads.

### **7.1 DEPOSIT WORKS (DW)**

**Purpose:** DW Projects are taken up by DRDO labs to meet the following objectives:

- Provide design consultancy service
- Development of prototypes for technology demonstration to agencies other than Services
- Manufacture of limited number of prototypes for a developed system in the absence of ToT to a production agency - for agencies other than Services
- Provide testing and support for testing.

**Funding:** By agencies other than DRDO (not Services)

**Competent authority for sanction/closure:** The competent authority for sanction/closure of DW will be the same as in case of financial powers vested with the CFAs for new project sanction/closure.

#### **Steps for undertaking Deposit Work**

1. DRDO can accept DW from outside agencies like ADA, ISRO, BARC, DPSUs, PSUs, private industry etc. The agency farming out the DW will send the requirement directly to Lab/office of cluster DG if the lab is known, else to DP&C, DRDO HQ.

2. DP&C will forward the requirement to the concerned cluster DG. Cluster DG will scrutinize the requirement and may assign the job to the concerned Lab. Lab will prepare the proposal outlining estimated cost (under various heads and cash outgo plan- duly vetted by Finance), PDC, terms and conditions etc. and submit it back to the office of cluster DG who will review the necessity. The proposal will, thereafter, be submitted to the concerned agency after the approval of cluster DG.
3. On the grant of DW by the Agency, a DW code will be assigned by the office of cluster DG to the Lab for all future reporting to higher authorities. A copy of the sanction will be uploaded in the Sanctions Data Base on DRONA/forwarded to DP&C for record.
4. The concerned CDA of the Lab will open a DW account to operate the funds.
5. The agency will transfer the funds to the CDA in the DW account as per the mutually agreed terms.
6. The DW will be executed by the Lab as per the policies and procedures for project execution in vogue in DRDO. Cluster DG shall monitor the progress of the DW.
7. Lab shall ensure submission of financial statement of accounts under DW, duly vetted by respective CDA (R&D), to the concerned agency after completion of the job and payments. A copy of the same shall invariably be endorsed to the office of cluster DG.
8. Lab shall also submit a technical completion report to all concerned highlighting the work done as against stated objectives and achievements (e.g. patents, publications etc.), if any, after obtaining the approval of cluster DG. A copy of the report shall also be endorsed to DP&C.
9. All work undertaken and done will remain under the ambit of audit (internal as well as statutory) by the concerned agencies.

The procedure as prescribed above will be followed for all DW entrusted to DRDO, which shall be sanctioned henceforth for execution by DRDO establishments. There will be no change in procedure at present for existing 'ongoing' projects, where substantial funds have already been transferred by Service HQ/other agencies to DRDO. These will continue to follow the existing practices till further instructions are issued for reviewing specific projects on case-to-case basis.

## **7.2 LSP OF DEVELOPED PRODUCTS**

(in absence of ToT to a production agency)

As opposed to an R&D project which is essentially an in-house activity financed by DRDO budget, LSP is funded by concerned User Service HQ, is time bound (typically 24-36 months) and entails contractual obligations having time and cost implications. It may necessitate co-opting industry partners and ToT to such entities. Therefore, it is essential that all concerned fully understand the nuances of LSP activity and participate vigorously to ensure timely execution. This being a 'fast track' activity, procedure outlined for such activities should be adopted. However, care has to be taken to ensure that all activities are undertaken as per approved procedures and existing guidelines. All procurements shall be processed as per PM 2006, as amended from time to time. Standing TPCs would be constituted for expeditious processing of procurement cases.

**Competent authority for approval:** The competent authority for approval of LSP will be the same as in case of financial powers vested with the CFAs for new project approval/sanction.

### **Objectives of LSP:**

- (i) To meet specific and small requirements of Services.
- (ii) To incorporate General Staff (GS) and trial observations.
- (iii) To establish production agency.
- (iv) To generate documents and drawings for AHSP & ToT.
- (v) To transfer AHSP and ToT

### **Procedure:**

- The requirement is received from Services. Based on this requirement, Lab prepares a project proposal outlining time required, scope of deliverables and estimated cost under various heads. Cost estimate of the activity will be arrived at by a committee consisting of the Lab Director and a concerned project officer, representative of DI<sup>2</sup>TM and Finance. During negotiations with User agency, representative of DI<sup>2</sup>TM and Finance will be involved.

- The proposal is then routed to DI<sup>2</sup>TM, DRDO HQ for second level of scrutiny and processed for approval (through proper channel) of Secretary DD R&D through Addl. FA.
- Subject to approval, the file is forwarded by DI<sup>2</sup>TM to User for concurrence.
- Services HQ will issue appropriate financial sanction after obtaining approval of their CFA. The sanction will indicate total cost of the project, time frame, head of account to which the expenditure is to be booked and authorize PCDA (R&D)/CDA (R&D) to book the expenditure directly to the relevant heads of accounts of the concerned Service. The booking of expenditure will be restricted to budget allocations for the project during the respective financial year. While issuing the sanction fund availability for the first financial year will be indicated in the sanction order. Lab Director is authorized to use these funds for LSP execution.
- A copy of the approval letter should be **uploaded in the Sanctions Data Base** on DRONA and forwarded to DP&C for record.
- Execution of LSP order is initiated following DRDO procedure for project execution and procurement. Quarterly and annual expenditure statements should be forwarded through DI<sup>2</sup>TM to the User.
- DI<sup>2</sup>TM, DRDO HQ will project total fund requirements for the projects being executed by DRDO laboratories at the time of preparation of Budget Estimates (BE)/ Revised Estimates (RE) each year, to the concerned Services HQ for necessary allocations. Services HQ will ensure that adequate funds are allocated for each of these projects and allocation letters are sent to DRDO HQ, concerned laboratories and PCDA (R&D)/ CDA (R&D) in the beginning of the financial year.
- As soon as the project is completed by DRDO labs they should intimate total expenditure duly vetted by respective IFA (R&D)/ PCDA (R&D)/ CDA (R&D) to DRDO HQ and concerned Service HQ. A closure report incorporating statement of audited accounts and a summary of achievements against agreed milestones must be forwarded to DI<sup>2</sup>TM, DRDO HQ and Service HQ. A copy of the same should be sent to DP&C for record.
- Any revisions of time/cost will follow the same process as for LSP sanction.

***For detailed guidelines please refer to ToT guidelines in DI<sup>2</sup>TM portal of DRONA.***



## 8. PDC EXTENSION, RE-ALLOCATION OF FUNDS & COST ENHANCEMENT

PDC for projects should be fixed on a realistic basis in consultation with the sponsoring agency and taking into account all relevant factors.

Whenever, a need arises to extend the PDC, a statement of case giving details of work completed and pending together with full justification for not adhering to PDC and suggesting a revised PDC duly recommended by highest monitoring body should be forwarded to Competent Authority at least **three months prior to expiry of PDC** in the format given at Form 6.

PDC extension for projects/programmes within DGs power can be approved by CFA. If quantum of PDC extension is >50% of the original PDC or >2 extensions, the case file should be put up for approval to next higher CFA/Secretary DD R&D, whichever is lower. The Corrigendum will be processed by office of approving CFA.

Similarly cases pertaining to cost enhancement and re-allocation of funds between major heads/sub-heads, duly recommended by the highest monitoring body, should be put up for approval of competent authority at least three months before expiry of the current PDC.

Re-allocation of funds & cost enhancement proposals should be submitted as per Form 7.

## 9. PROJECT/PROGRAMME CLOSURE

Most of the DRDO projects are in response to a technology requirement or a User need and a key stage in concluding the project is to confirm that the project has, in fact, met the stated objectives. This step requires a mixture of process and communication, addressing the following questions:

1. Have all agreed outputs/deliverables been achieved?
2. Were they of the agreed quality?
3. Are there any resulting obligations on the provider, such as post development support?
4. Are processes for handling intellectual property established and agreed, including for any future revenue?
5. Is there a clear communication channel for follow-up contact between the user and the lab/estt? This is particularly important if a dedicated project team had been established to run the project?

A sanctioned DRDO project may be closed under the following conditions:

- **Cancelled Project:** The project has been approved and project no. allotted; but where the work on the project has not commenced and no expenditure has been incurred. Such projects can be cancelled through initiating a case of closure by concerned lab/estt.
- **Short Closed Project:** Where the work on a project has already commenced and certain amount of expenditure has been incurred but for certain reasons (to be specified) it is decided to short close the project.
- **Stage Closed Project:** Pre-mature closure of project is where considerable effort and funds have been spent yet no concrete results have been achieved. It is desirable that no project should be dropped/stage closed as it attracts audit objections. Stage closing of a project is only resorted into extra-ordinary circumstances. For dropping/premature closing a project, statement of case has to be prepared in the format given at Form 8 and submitted to the competent authority.
- **Closed Projects:** Completion of the project with the specified objectives accomplished

### **Factors Causing Delays in Submission of Closure Reports**

- Some labs/estts have been raising Small Work Order Demand (SWOD) orders on Ordnance Factories (OFs) for getting some arms and ammunition related work required for firing trials, etc. There are two problems which are experienced on SWOD orders:
  - Delay of several years in receiving statement of accounts.
  - Inflated bills to original expenditure about which labs have no information or control.

Labs/estts. are advised to constantly pursue the matter with OFs to avoid delays in obtaining statement of accounts and final settlement of the bills.

- Some labs are creating facilities for User Services under projects and they continue their maintenance under the same projects, which is not correct. Such projects should be closed immediately after expiry of PDC. In case continuance of work is essential/unavoidable separate project/build-up can be undertaken with a defined PDC. Later on, User should be requested to maintain the facility at its own cost.

## **9.1 STEPS INVOLVED IN CLOSURE OF PROJECT/PROGRAMME**

### **Project Evaluation for Closure**

Once the last task is completed the project has to be evaluated; measuring outcome achieved. The project has to be analyzed to find out reasons for positive and negative deviations.

### **Recommendation of Highest Monitoring Body**

Once Project Director is satisfied that all objectives envisaged under project/programme have been met and deliverables/output as brought out in Govt. Sanction letter are ready, a meeting of the highest monitoring committee (as brought out in Govt. letter), should be organized to recommend the formal closure of the project. Project Director will make a formal presentation to the review committee on the project's achievements, milestones, tests conducted and overall objectives achieved vs. those envisaged in the proposal and will seek formal closure of the project. The PEARL analysis will also be presented which had been reviewed by Verifying Authority (Technology Council). Accordingly, the review committee will recommend closure. Minutes of this meeting must be appended with the proposal of closure of project.

### **Technical Closure Report**

A detailed technical report should be formulated highlighting technical achievements, further scope of undertaking future work and limitations post project activities, project

documentation, post project responsibilities, The PEARL certificate issued by Verifying Authority shall be the part of Technical Closure Report. This is an in-house document and not meant for audit. Technical Closure as per Appendix E is necessary for all projects/programmes. It should have essentially the following details/documents.

- Complete project history
- Details of objectives envisaged vis-à-vis achieved/shortfall
- Achievements of the project
- Detail justification/reasons for shortfalls
- Design document
- Manufacturing process sheets (if applicable)
- Test results
- Lessons learnt
- Proposed utilization of developed technology in immediate future projects
- Suggestions for Way Forward

The Technical Closure Report should be prepared by Project Director, authenticated by Lab Director and vetted by cluster DG. Two copies of this report should be prepared of which one should be retained with the lab and the other should be maintained at DG office for reference. A soft copy of technical closure should be given to DP&C, DRDO HQ for archival.

After completion of the above report, the case will be processed for administrative closure.

#### **Way Forward after Closure**

For the MM Projects which have completed User trials the Lab should move a file to Services HQ through DRDO HQ with a note indicating readiness for induction/production as a follow-up. The file should be routed through concerned DG and CC R&D (PC & SI). The note should request production order giving details of achievements, specifications, recommended production agency, unit cost and list of recommended spares. CC R&D (PC & SI) should forward the case in consultation with Secretary DD R&D to the concerned User agency for production order.

For TD Projects, file should be moved to Services HQ through the above indicated channel for finalization of QRs based on the output of the TD project to enable taking a MM project as a follow-up. A technologically advanced product may also be planned to be taken up in a TD mode as a successor to the completed TD projects. Intimation about the completed TD project should also be sent to the identified labs wherein it can be used

as a sub-system/module for ongoing/future MM projects. The product information should also be uploaded on DRONA.

In case of S&T projects, the User labs should be identified. A brochure about the research may be created or a product should be made from the research outcome. The information should also be uploaded on DRONA. Based on the inputs, the lab or any other appropriate lab may take a TD project. The next level/next generation of the S&T project may also be undertaken.

### **Administrative Closure**

Statement of Case (SoC) for administrative closure of the project should be forwarded to the competent authority **within six months** of the expiry of PDC, as given at Form 9.

Project Director will obtain a certificate (which shall be appended with the Administrative Closure Report) from the Material Management/Store section of the lab/estt. regarding completion of all payments i.e. no outstanding commitments, no live supply orders or contracts, not even pertaining to warranty which sometimes extends beyond the project PDC.

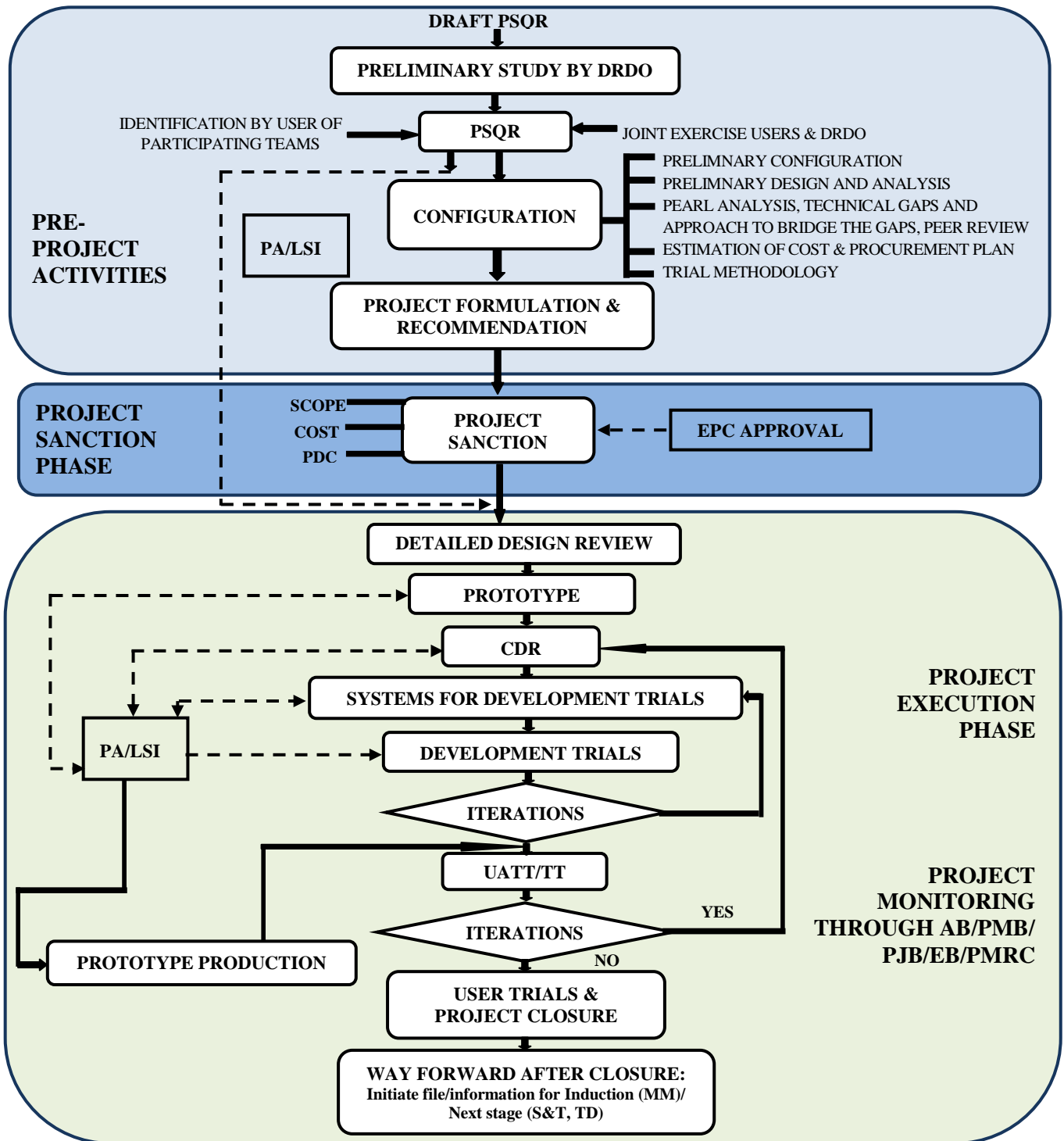
No expenditure should be committed in the project after expiry of the PDC. The items/stores must be received in the Lab before the expiry date of PDC. However, payment of committed stores can be released beyond PDC within the same financial year. This closure report serves the purpose of audit authorities. It should have essentially the following details/documents.

- Project attributes
- Brief summary of technical achievements (objectives envisaged vis-à-vis achieved)
- Certificate from the Material Management/Store section for no outstanding commitments of any kind against project
- Statement of expenditure vetted by concerned CDA (R&D)/LAO

The specimen format for closure sanction letter is in Form 10.

## **9.2 COMPETENT AUTHORITY FOR CLOSURE OF PROJECT/PROGRAMME**

In case where a project has been finally completed with the specified objectives achieved, the project will be closed with the approval of the competent financial authority (CFA). In the remaining cases i.e., **where a project is cancelled, short closed, stage closed, the authority competent to sanction permanent closure of the project will be Secretary DD R&D or concerned CFA, whichever is higher.** A summary of the overall process of project flow is given in the figure:



**Note:** The above is specific to MM projects. Necessary exceptions in certain processes will occur for TD and S&T projects (e.g. QRs, production).

## 10. TRANSFER OF TECHNOLOGY (ToT)

Post development of any system, product, and technology by any DRDO lab the Transfer of Technology (ToT) is carried out to industry/industries by DRDO for manufacturing and supply to the market. ToT fees and royalty fees are applicable to all industries except OFB. The ToT comes under 2 major classifications:

- (i) **Category A or CAT “A”:** These are essentially military technologies and the ToT is carried out with license restricted for supply to Indian Armed Forces.
- (ii) **Category B or CAT “B”:** These are spin-off or dual use technologies for which ToT is done to industry/industries based on market analysis and on “what the market can bear” basis.

*The procedure adopted to carry out ToT, including detailed guidelines are available in the DI<sup>2</sup>TM portal of DRONA.*

# **GUIDELINES**



## APPENDIX A

## ATTRIBUTE TABLE

During the annual selection process, all new projects being proposed by the lab will be graded by the cluster DG office on a comparative basis with a figure of merit based on specified attributes. The attributes will consist of parameters viz. alignment with Lab's mandate, core competence of Lab, alignment with DRDO's LTTPP/FYP, S&T merit or potential for ToT/Production and need for additional HR. These will be viewed against current work load of the lab to arrive at a decision on selection.

Given below is a sample table of attributes (to be filled by Director (PM) of cluster DG)

1	2	3	4	5		6	7
Project Name	Alignment with Lab's Mandate/ Mission  (0-5)	Core Competence of Lab  (0-5)	Alignment with DRDO's LTTPP/FYP  (0-5)	Project Output*		Need for additional HR  (0 to -5)	Total Score  (Sum of Col 1-6)
				S&T merit (for TD/S&T projects)  (1-5)  1: low impact  5: high impact/ high use	Potential for transition to next category/ToT  (for TD/MM projects)  (1-5)		
Project 1	3	3	5	-	5	-2	14
Project 2	5	5	3	5	-	0	18

**Alignment with Lab's Mandate:** The scoring for the same will be done on a scale of 0 to 5 wherein 0 will be assigned if the project does not match the lab's mandate, 3 if there is an indirect link and 5 if it is directly related to labs mandate.

**Core Competence of Lab:** This may be graded as:

0: Never Done

3: Few modules developed at lower specification

5: All modules developed at lower specification

**Alignment with DRDO's LTTP/FYP:** This may be marked as:

0: NIL alignment

3: Indirect

5: Direct

**Project output:** It is to be noted that projects will be graded w.r.t either S&T merit or potential for ToT/Production

**Need for additional HR:** This will have to be obtained from table below and with inputs from lab and may be graded based as follows:

0: NIL required

-3: Five additional scientists required

-5: Twenty or more additional scientists required

The total score is then worked out as summation of each row and a ranking of this figure of merit for different projects should be done. This should then be viewed as against the current workload of the lab derived from sample table.

**Sample Table of ongoing workload (To be filled by Lab)**

S. No.	Title of Project	Cost (in Rs Cr) Current	PDC Current	No. of scientists required to complete pending tasks in the Project	% Work Pending D: 80% R: 50% T: 10%	Remarks
1	Project 1	1540	Aug/16	200	50	
2	Project 2	102	Dec/16	10	10	
3	Project 3	21	Feb/16	10	10	
	Total	1663		220	770+10+2	

*Overall % of Work Pending =  $782/1663 = 47\%$*

*Total Strength of Lab (DRDS): 780*

It is suggested that with greater than overall 50% pending work on ongoing projects will imply that not more than two new projects can be undertaken in the year. Final decision is left to the judgment of the cluster DG depending on perception of lab capability and available HR and need for taking up required development projects.

**RISK ANALYSIS/ RISK MANAGEMENT PLAN**

Risk analysis is an important aspect which needs consideration during the entire project life cycle beginning from the preparation of a feasibility study report wherein the Lab needs to identify technical risks involved in a project as well as chalk out a plan to mitigate them in due course. Risk Management Plan involves the following steps:

1. Identify the risk- to be drawn from the Product Tree/ WBS
2. Assess the probability of occurrence and its impact on time, cost and performance
3. Prioritize risks- in terms of Impact/Probability
4. Plan and implement the mitigation strategy
5. Track and monitor the risks throughout project cycle through a risk register.

**Risk Identification:** There are numerous strategies/tools through which risks can be identified viz. documentation reviews, SWOT analysis, brainstorming among experts, Delphi techniques, assumption analysis and cause-and effect & influence diagrams, Monte Carlo simulations etc.

**Probability of Occurrence:** This is assessed generally based on qualitative judgment and can be graded on a numeric scale. The impact factor can be worked out based on impact on project cost, time & performance degradation. Details/examples are provided in the table below.

**Prioritization of Risks:** Risks are then prioritized based on probability and impact and mitigation strategies are worked out accordingly.

**Mitigation Strategy** for each level

Priority 1: Hi Probability/Hi Impact (Hi P/Hi I) – critical;

hence mitigation strategies to be worked out to control

Priority 2: Hi Impact/Low Probability (Hi I/Low P) – important;

mitigation strategy should try to share the risk with development partner

Priority 3: Hi Probability/Low Impact (Hi P/Low I) – Accept and mitigate;

work out strategy to control risk

Priority 4: Low Probability/Low Impact (Low P/Low I) – can be ignored

**Track & Monitor:** All risks which have been identified should be compiled in a document in which mitigation strategies should be detailed. Risk owners should be assigned specially for Priority I risks and the status should be monitored at every review meeting.

The risk management plan thus becomes a part of Detailed Project Proposal wherein the Lab needs to provide an indicative tabulation for 'risk identification and mitigation'. An illustrative example is shown below: The risk in a project can be classified as low (0.2), medium (0.5) and high (0.8) based on the probability of occurrence. What impact this will make to the overall progress of the project with respect to time, cost and performance can then be subsequently calculated. The risk score can then be subsequently be assigned to each risk based on both the probability and impact.

No.	Sub-System	Risk Description	Probability of occurrence L/M/H (0 to 1)	Impact on			Overall Impact (Average of Impact %age)	Risk No. P X I	Mitigation Strategy
				Time Months 0.2,0.5,0.8	Cost Rs 0.2,0.5,0.8	Performance % 0.2,0.5,0.8			
1	Propulsion system	Material defect	0.6	0.30 (33% time over-run)	0.20 (20% cost over-shoot)	0.25 (25% performance lost)	0.25	0.6X0.25 = 0.15	
2	SS2								

*Note:* 12 months is 33% of project PDC of 36 months, similarly 20 Cr is 20% of project cost of Rs 100 Cr and range reduction of 25% indicates that range will be reduced accordingly (For values of P or I >0.5, mitigation strategy should be detailed).

After assigning a risk score, a risk response strategy can be made as shown below:

- Avoid- Remove root cause, eliminate from project
- Transfer/Share- Make third party responsible
- Control- Use contingency plans/parallel paths, workarounds etc
- Accept- Some risks can only be accepted as the price of mitigation may be too high. Such risks should be identified at start, documented for clarity and contingency reserves utilized.

Finally, it is important that a proper monitoring and control process may be established to evaluate the effectiveness of the risk processes viz. risk assessment, risk audits, technical

performance measurement and status meetings which may become a part in the discussion of monitoring body.

## **CONDUCT OF PEER REVIEW**

Peer Review Committee (PRC) is expected to look into the feasibility of the project by taking into consideration the design aspect, realisation methodology, projected timelines, realisability/achievability and validation of MRLs and PRIs (PEARL analysis).

1. The Chairman of the PRC must be an eminent person (preferably from outside DRDO) having expertise in the area of the project. He may either be from a premier research organization, academic institution or from industry. In exceptional cases, if from within DRDO, he should be from a different laboratory working in the similar area. However, the decision must be based on the capabilities and experience of the individual. It is desirable that the chairman should have experience of managing/coordinating/directing projects of similar costs and technological complexities.
2. The PRC must have a mix of members from within and outside DRDO and members should be eminent personalities from R&D institutions, academic institutions and industry. Members can also be co-opted in the PRC at the Chairman's discretion. The expert should not be nominated from the groups/industry, which is likely to be contracted for CARS or development contract in the same project.
3. A representative from the User agency may also be a member of the PRC, if it is a specific User driven project.
4. Representatives from proposed Development Partners (DP) in the development effort can be represented, in the Committee if desired (in attendance and not as a member of the committee) to give decisions about the scope, costs and time schedules proposed to be assigned to them.
5. Representatives from DP&C, DRDO HQ would be nominated as a member for PRC. Director SAM-C/FTM/HPO/DRDO experts and Integrated Finance (R&D) would be nominated on need basis in the PRC. PEARL analysis and its review by the PRC would be an important aspect of recommendations of the Committee.
6. While processing the case for approval of PRC for all systems development projects (TD/MM), the concerned Project Director will send a copy of draft project

proposal, feasibility study report and PEARL analysis of the proposed project proposal duly vetted by Technology Council. Recommendations made by Technology Council regarding MRL/PRI values should be deliberated in detail in the Peer Review Committee.

7. For S&T projects, Chairman PRC with help of the experts should also evaluate technical competence of the Lab to meet the objectives and check the viability of methodology selected for design/manufacturing.
8. If the purpose of the S&T project is to generate new knowledge in the area of the core activity of the laboratory, then the PRC should clearly bring out whether creation of such knowledge will result in an incremental increase or a quantum leap in the contemporary understanding in national and global context.
9. If the S&T project is for developing a product/process or technology, then potential Users must be identified. Estimated commercial or strategic impact in most optimistic scenario should be brought out by the PRC.
10. The relevant deliberations of the PRC will be minuted and issued after due approval of the Chairman.
11. In addition to the minutes, the main recommendation of the PRC signed by the Chairman should be appended to the project proposal

### **Planning of Peer Review**

The following steps are to be taken by the laboratories/establishments:

1. The laboratory to prepare a 'Detailed Feasibility Report (DFR)'. This document must be deliberated in PRC.
2. An executive summary of the DFR be prepared.
3. Following documents be forwarded to the Director (PM) of cluster DG along with recommended composition of the PRC:
  - Project Proposal.
  - DFR
  - Executive Summary.
  - PEARL analysis report duly vetted by Technology Council.

Director (PM) of cluster DG may take the following steps on receipt of proposal from the laboratories/establishments.

1. To examine DFR, project proposal, executive summary. Director (PM) of cluster DG, need to satisfy himself that all documents mentioned earlier to the format and required details are enclosed with the proposal.
2. Director (PM) of cluster DG to initiate file for approval of constitution of the PRC to the competent authority. The file need to be routed through respective cluster DGs, as may be the requirement. The tentative date for the PRC meeting to be indicated.
3. Project Director in consultation with the Director (PM) of cluster DG to schedule the meeting after approval, and send the relevant documents along with a copy of *Roles of Constituents of PRC*. It is very essential for the Chairman and outside members to go through their roles and functions and recommend the project accordingly.
4. Project Director to prepare the minutes. The minutes need to be necessarily vetted by the following before acceptance by Chairman :
  - Director (PM) of cluster DG or his rep at concerned DG office.
  - Representatives of participating labs in the project before the Chairman's acceptance.
  - All members of PRC.
5. To initiate the file for approval of CFA through route defined in respective sections.

### **Constitution of PRC**

The PRC should be constituted as under:-

- i. Chairman (Eminent person preferably from outside DRDO).
- ii. Two external experts (eminent personalities in the specific area from academic institutions).
- iii. Two DRDO experts (preferably from other labs/HPO/FTM/SAM-C).
- iv. DP&C, DRDO HQ (for projects costing more than Rs 25 Cr) or Director (PM) of cluster DG (for projects costing less than Rs 25 Cr).
- v. Technology Council Members to defend the MRL/PRI values assigned to the projects
- vi. Project/Programme Director (Member Secretary).
- vii. Additionally- User rep and QRS rep could be invited (on need basis) especially for MM projects.



- viii. Representatives of participating labs (if applicable).

### **Competent Authority for Constitution of PRC**

No formal peer review is required for project costing less than Rs 5 Cr, however it is desirable. For higher value (> Rs 5 Cr) projects, the following Competent Authorities would approve constitution of the PRC:

Upto Rs 5 Cr	Lab Director in consultation with Director (PM) of cluster DG
Rs 5 Cr and above, but less than Rs 75 Cr	Cluster DG
Rs 75 Cr and above	DG DRDO/Secretary Defence R&D

For PS, IF and MM-UT category of projects, peer review is not mandatory. However if project cost is > Rs 5 Cr the peer review is desirable. In case waiver is sought for IF, PS and MM-UT category of projects, approval from competent authority shall be taken and appended with the proposal.

### **Agenda of PRC**

The agenda of the PRC is to deliberate on the following aspects and give their recommendations:

1. Aim/scope/goals of the project vis-a-vis charter of the laboratory.
2. Sufficiency/level of pre-project activities
3. **Design Aspect:**
  - a) Available design alternatives.
  - b) Selection of a suitable design option.
  - c) Reasons for adopting a specific approach.
  - d) Analysis of requirement vs. design
4. **Realization methodology:** Identification of optimum method of product realisation.
5. **Risk Factors/Grey Areas:** Risk factors and grey areas threatening successful execution of the project/programme and their mitigation strategy.
6. **Time Plan:** PDC of the project should be realistic and achievable.
7. **Category of the Project/Programme:** Under which category proposed project should be undertaken be deliberated and recommended.
8. **Realisability/Achievability** of major milestones linking financial outlay and timelines of the project as per schedule indicated in the PERT/Critical Path

Method (CPM) charts (given in *Part II*, S. No. 1 of Statement of Case for sanction of project, Form 1).

9. **QA Plan:** Quality assurance (QA) plan should be deliberated with nominated QA member of the Lab and should cover all aspects viz. design, manufacturing and testing.
10. **Testing Plan:** Testing Plan of Lab model or prototype should be deliberated together with acceptance criteria.
11. **Cost Estimation:** Rough order of cost estimates may be provided based on budgetary quote/e-mail quotes etc to assess the approximate cost of the project. However, final cost of the project should be finalized as per the recommendation of Project Cost Estimation Committee having finance as one of the member.
12. **PEARL level:** MRL/PRI indices at the beginning of undertaking the project (at sub-system level and overall project level) and expected increase in these indices at the time of closure of the project should be discussed in detail and final values arrived shall be documented.
13. Preliminary identification of industry and development partners.
14. Available infrastructure for system/sub-system realization.

### **Documents for PRC**

An executive summary document of the DFR should be prepared and circulated along with the project proposal **at least two weeks in advance** to all participants. This should also include details on 'what is expected from the PRC'. The Director (PM) of cluster DG will ensure that the guideline has been adhered to. The following documents are to be given to all the members of the PRC:

- DFR
- Executive Summary
- Draft Project Proposal
- PEARL analysis report duly vetted by Technology Council

### **Recommendations of the PRC**

The PRC's specific recommendations on the topics brought out in PRC agenda need to be recorded for consideration/implementation, and should be a part of the final project

proposal. Articulated recommendations (minutes) of the PRC duly approved by the Chairman should be appended with the project proposal.

### **Role of Constituents of PRC**

#### **Chairman**

1. Examination of the documents submitted to the PRC and to call for additional information, if required.
2. To ensure that design, realization and testing aspects are adequately addressed in the documents.
3. To certify MRL levels and PRI value of proposed project while discussing PEARL analysis report.
4. To examine the necessity to co-opt additional members.
5. If necessary, can order another meeting of the Committee in order to resolve/address matters, which remained unresolved due to any reason.
6. To ensure that the recommendations of the PRC are unambiguous and recorded as decided by the Committee.
7. To approve the minutes of the meeting of PRC after ensuring that the important comments of all the members have been incorporated.
8. To ensure that the peer review is conducted as per the document made available to the PRC and all issues highlighted in the Executive summary ('what is expected from the PRC?') be addressed.
9. Any other issue not discussed but considered necessary by the Chairman in the interest of the project can be addressed and documented.

#### **External Technical Experts**

1. To go through the documents, made available to them and to ensure that issues highlighted in the Executive Summary are addressed.
2. To closely examine the system configuration, technologies and sub-technologies and the import options, if any.
3. To ensure that wherever necessary, alternative technologies have been examined and given due consideration.
4. To look for the technological gaps/grey-areas and to examine how these are proposed to be overcome and to suggest alternate/suitable approaches for the

same. To also check that resources projected are adequate to meet the aim/scope of the project.

5. Any other issue not discussed but considered necessary by the Chairman in the interest of the project can be addressed and documented.

#### **Director (PM) of cluster DG**

1. To assist laboratory, DG and DRDO HQ in finalizing constitution of the PRC.
2. To ensure that the Chairman and all the members receive the necessary documents (Project Proposal, DFR, Executive Summary, PEARL analysis report duly vetted by Technology Council including details of 'what is expected from the PRC' etc.) at least two weeks in advance.
3. To also ensure that comments from the experts are solicited, and forwarded to the Chairman of PRC at least 7 days prior to the date of PRC meeting.
4. To ensure that comments from the work centers are obtained and documented regarding the sub-projects identified and resources allocated.
5. To ensure that draft minutes incorporating important comments of the members are approved by the Chairman and issued at the earliest. (It is recommended that the minutes be issued within two weeks of the conduct of the review).
6. To ensure that guidelines issued by DRDO HQ for conduct of peer reviews and PEARL analysis are followed in letter and spirit.
7. Any other issue not discussed but considered necessary by the Chairman in the interest of the project can be addressed and documented.

#### **Director Planning & Coordination/Representative**

1. To ensure that the project undertaken is as per core competence of laboratory and there is no duplication of work.
2. To suggest allocation of work share to other labs for specific modules of technical expertise.
3. To ensure that comments from the work centers are documented regarding the work share identified and resources allocated.
4. To ensure that guidelines issued by DRDO HQ for conduct of peer reviews and PEARL analysis are followed in the right spirit.
5. To ensure that all necessary details are provided in the draft project proposal.

**Project Director**

1. To prepare the entire documents, following the PPFM guidelines, including Executive Summary.

**Representative of SAM-C/FTM/HPO/DRDO Expert**

1. To assess PEARL analysis of the proposal. Offer comments on technological gaps, grey areas, critical technologies and strategy to mitigate the same.
2. To provide inputs about the User service perceptions/perspective plans which may have direct impact on the project activity proposed and about the appropriateness of the project vis-à-vis the technology trends elsewhere.
3. To apprise the PRC about the availability of required development expertise and infrastructure for development/production partners for targeted system/sub-systems.
4. Comment upon scope of the work allocated to Project team member's vis-à-vis the availability of resources. Confirmation about the adequacy of resources and approval of their establishment to undertake the allocated activities for completion within the stipulated time
5. To suggest essential enhancements of resources to meet the targets/scope of work allocated to them.

**User Representative**

1. To clarify issues relating to GSQR/ASQR/NSQR/JSQR, etc. (wherever applicable).
2. To provide necessary inputs in absence of any formal QRs.
3. To give details on operational scenario and testing methodology expected.
4. To give details, if required, about the existing systems in use with them and elsewhere in the world and other details about the operation, maintenance and use of the product.
5. Views regarding scope and time estimates etc.
6. User commitments by way of total requirements of (indigenously developed) systems, part funding, etc as approved by the competent authority in their respective establishment.

## **PROJECT EXECUTION PLAN**

### **Part – I**

#### **1.0 Introduction**

Project Execution Plan (PEP) is the operational document for the project. It is owned, maintained and summarized by the Project Director and project team to support the delivery of the agreed project outputs. Depending on the size and complexity of the project, the need for multiple PEPs for the Project may arise.

The PEP is the road of the project and it is the responsibility of the Project Director. It enables its effective day-to-day (operational) management and control.

*Following are the steps to be followed in Project Execution Plan:*

a) Detail project outputs

Describe specifically the project's outputs, which have been envisaged at the start of the project. The detailed scope of work needs to be brought out in detail.

b) Create a WBS

The overall task to be broken down into sub-systems and each sub-system to be split up into various phases viz. design, configuration finalization, analysis & review, manufacturing, test & evaluation and trials. These activities are to be placed in timeline map and critical activities to be identified.

c) The Project Director has the responsibility to draw up a project management plan consisting of:

1. Creation of cross functional team for design, manufacturing, QA, T&E- all overseen by the Project Director.
2. Risk Management plan- assessment of risk & strategy to overcome risk
3. Resource Plan- Availability of resources- HR, funds & infrastructure
4. Procurement Plan
5. Quality Plan
6. Development plan- to address areas of design, manufacturing, software formulation, integration, test & evaluation

d) Responsibilities/roles and functions of cross functional teams are given below

1. Project Director

- i. Draw up all above plans in coordination with respective groups and get the plans approved by concerned official
- ii. Status Reporting
- iii. Coordinating reviews
- iv. Process for approval extension/closure
- v. Configuration Management- should have overall control & oversight of configuration changes and cross effects
- vi. Change Management- Changes in planned configuration to be documented as per guidelines
- vii. Documentation & record keeping.

2. Design & Analysis Team

- I. Design approach- for overall system design requirements to be studied and overall configuration to be finalised
- II. Sub-system wise:
  - a. Configuration finalization/detailed specifications generation
  - b. Analysis, simulation/modelling to be carried out
  - c. PDR/DDR of each sub-system to be coordinated
- III. Integrated System DDR to be coordinated/completed
- IV. Review for Design completion- Milestone I**
- V. Preparation of Test schedules (ATP/QT) with QA, T&E, Users group

3. Manufacturing of Hardware Team

- I. Freezing of manufacturing drawings, process plans for overall/sub-system
- II. Raw material sourcing
- III. QA Inspection plan
- IV. Review for manufacturing readiness- Milestone II**
- V. Tendering & executing
- VI. Inspection & acceptance

4. Software

Guidelines of Software Development Life Cycle (SDLC), are appended at **Part II**. However the detailed guidelines are under formulation by Dr. Karunakar Committee and will be disseminated when approved.

5. QA/ Inspection/IV&V

- I. Design vetting
- II. Vetting of manufacturing drawings
- III. Vetting of inspection plan
- IV. Inspection of hardware
- V. **Clearance for integration & testing- Milestone III**

6. Test & Evaluation

- I. Finalisation of test requirements with design/QA
- II. Generation of QRs for test facility, if required
- III. Augmentation/establishment of test facilities
- IV. Inspection/clearance of test facility with QA
- V. Conduct test as per ATP (Acceptance Test Procedure)
- VI. Generation of test reports
- VII. CDR followed by realisation of prototypes in required nos.

Note: Marked in Green are gateway milestones which should serve as clearance to proceed to next phase.

**Details are in subsequent paragraphs**

## **2.0 Management Plan**

### ***Management***

This section may be covered by a reference to the Project's governance structure, i.e. management roles, functions and responsibilities that are defined in the plan. The Project Director is responsible to the sponsor for the delivery of the agreed project outputs.



***Sub-project Management***

Define the operational management of the sub-projects if many sub-projects given to sister DRDO labs.

***Reference Groups***

Detail any specific reference groups (i.e. function, objectives, membership etc.) that are required.

***Consultants***

Detail any consultancies (i.e. function, time frame, objectives, management, reporting etc.) that are required.

***Working Parties***

Detail any specific working parties (i.e. function, responsibilities, time frame, objectives, membership etc.) that are required.

## **2.1 Quality Plan**

***Methodologies and Standards***

Describe the methodologies and standards that will be followed and for what purpose namely:

- Quality Management
- Output Development
- Project Management
- Define any variations to standards.

Describe what will happen if a new version of a methodology or standard is released before the project is complete. How changes to the methodologies and standards will be initiated and implemented, and what will happen to superseded standards and procedures.

***Inspection, Measuring and Test Equipment***

Describe if any special tools, techniques, inspection, measuring and test equipment, which needs to be acquired or developed for verifying the project outputs, or the process of developing those outputs. How will the equipment be verified/calibrated?

***Outputs to be developed***

All outputs and components of outputs shall be managed.

### ***Project Evaluation***

The measurement of the success of a project provides valuable input into the continuous improvement for the following phases of a project, or for the subsequent projects. This evaluation forms an important part of the project's Quality Plan. Improvements may be identified in the areas of the planning process, the development process, the summarizing process, or to the project management processes in general.

## **2.2 Vendor Search & Evaluation Plan**

DRDO has the following mechanisms for identifying development partners

1. **Study of DRDO-Industry Database:** A database of industry partners from every segment viz. large, medium, small and micro-industries has been compiled by DI<sup>2</sup>TM and is available in their online portal. This database gives contact details together with area of expertise, products developed and DRDO labs that have interacted with the industry. This can be accessed for the first cut idea of identifying possible partners.
2. **Interaction at Seminars/Aero Show/Defence Exhibitions/Industry Meet:** Various labs/clusters and Directorates organize exhibitions, seminars etc. in which participation of industries is invited. Confederation of Indian Industries (CII) organizes industry meets at various industrial hubs in the country. The industries present their capabilities and provide demonstrations of products developed- which can be assessed for possible utilization.
3. **Cluster Meets:** DRDO is organizing cluster meetings of labs, discipline wise. These meetings are chaired by cluster DGs. This occasion can also be utilized by labs for displaying products and sharing future work plans with industry partners.
4. **Expression of Interest:** When possible partners are not easily identifiable, an expression of interest (EoI) can be raised in the open domain. The EoI must detail the exact technical requirements and pre qualification criteria which forms the minimum threshold for industry partners to qualify. Based on the response and assessment thereof, detailed SRS/specifications can be formulated. Guidelines in PM 2006 and DI<sup>2</sup>TM guidelines on methodology for selection of PA/DP can be studied for further details.

### **2.3 Development plan:**

Describe the process to be undertaken in the design and development of the project's outputs, as defined in the Quality Plan. Consider the approach for this section, either by describing the design and development activities for each output, or summarizing the minimum activities required.

#### ***Design and Development Activities***

Describe the process that will be used to design, develop/manufacture, review, accept, distribute and change outputs. Will all outputs delivered by the project follow the same process? Describe by exceptions.

Example documentation products include functional requirements specification, design specifications, test specifications, User documentation, maintenance documentation and training material. Other outputs may include developed software/systems.

#### ***Design Methodology***

Describe the design methodology that activities will conform or give reference to, if not already addressed in the Quality Plan. Design and development activities to be performed are to be listed in the project plan.

#### ***Design Input***

Describe any design input that will be used. Ensure input is reviewed for applicability before commencing any design or development. Be aware that the development of an output may be input into the design of another output. Design validation through alternate sources like wind tunnel testing, modeling & simulation exercises is an essential tool to pin point in advance any design weaknesses.

#### ***Design Output***

Describe any specific design output requirements e.g. an iterative process will occur to produce a sequence of design specifications.

#### ***Inspection and Review***

Describe the responsibilities and processes required. Following to be included:

- Reviewing outputs, ensuring conformance to methodologies and standards.

- Review/inspect for content and completeness.
- Process for identification defects, deficiencies, related issues, etc.
- Formulate the Acceptance Test Plan (ATP).
- Documentation requirements.

### ***Approval and Acceptance***

Describe the responsibilities and processes required. Following to be included:

- Approval of output, and acceptance- What should be the acceptance band for measured outputs
- Documentation requirements.

### ***Authorization and Distribution***

- Describe the responsibilities and processes required. Following to be included:
- Authorisation (of output release) and distribution of output.
- Output management and maintenance requirements post-acceptance.
- Documentation requirements.

### ***Updating and Changing***

Describe the responsibilities and processes required. Following to be included:

- Updating the output (e.g. future releases following project milestones).
- Changing the output (e.g. user change in functional requirements).
- Requesting change and method of re-release.
- Documentation requirements.

## **2.4 Configuration Management**

Configuration management is a term often applied to change control procedures (e.g. change requests, problem reporting, issues management etc.) undertaken at the project/implementation team level to control change and reduce its impact on the overall project.

### ***Change Control***

The Project Director in accordance with methodology/process shall use change control. This process provides the means for:

- Facilitating the introduction of specific project change;
- Allowing the impact of the change to be assessed;
- Providing a method of summarizing change; and
- Providing an audit trail of change.

***Approval of changes is by the Monitoring Committee***

Describe the process that will be used to raise, record, review and resolve change requests.

## **2.5 Problem Reporting and Resolution**

### ***Issues***

When issues arise, which must be resolved between the users and the Project Director then the issue shall be advised in writing between the Project Director and the Users. The recipient of the issue shall be responsible for ensuring it is resolved. On receipt of the issue, recipient should intimate the Project Director the time frame in which it is likely to be resolved and communicate the resolution in writing to the initiator.

### ***Non-availability of Resources***

If any agreed resource is not made available as scheduled in the project plan and, in the opinion of the Project Director, the project cannot proceed the schedule shall be revised. The Project Director should negotiate any adjustments for the time lost with all the affected parties.

### ***Provision of Facilities and Equipment***

Describe facilities are required by the project team (e.g. accommodation, office support, equipment etc.) and any specific maintenance requirements. Document the project's environment baseline.

Problem reporting is used to record a problem that has been identified in a project. Describe the process that will be used to raise, record, and review and resolve problem reports.

### ***Issues Management***

It is anticipated that the Project Director and team will solve most of the issues raised within the development phase. However, issues arising, which must be resolved between

the users and the Project Director, are referred to the project sponsor for resolution. Describe the process that will be used to raise, record, review and resolve issues.

### ***Confidentiality***

All project members, agents, contractors and sub-contractors shall respect the confidentiality of each other's business and technology and shall not reveal any information concerning the other party without the written permission of the other party. All agreements and contracts entered into require inclusion of a confidentiality clause.

## **2.6 Testing Plan**

This should be prepared keeping in view design specifications and operational requirements.

### ***Output Review and Acceptance***

Describe the process that will be used for the review and acceptance of each output and documentation product, including who is responsible for scheduling the reviews, who will be involved, what will be generated for each accepted output or documentation product.

### ***Test Plan (Project Outputs)***

All testing shall show the version of the output being tested, the version of the test specifications being used and, for acceptance testing, the version of the design specification being tested against.

### ***Unit Testing***

List the individual sub systems subjected for testing individually along with testing stages and tests to be carried out.

### ***System and Integration Testing/Technical Trials***

**Approach:** System and integration testing shall be performed using the system test specifications and each test specification shall be annotated with the results of the test. Where the output fails to pass testing a problem report shall be raised. Incident reports

may be used to identify individual failures for later consolidation under a single problem report.

**Review:** When the tests have been successfully completed the results of testing shall be reviewed generally as defined in the development plan.

***Acceptance Testing/User Trials***

This is done when development work is over and User evaluates the deliverable for its operational effectiveness operational suitability. User trials to be conducted are enumerated.

**Approach:** The User shall nominate a team to apply the acceptance test specifications to the system. Describe processes, resourcing and responsibility for developing and approving the acceptance-testing plan. The nominated acceptance test specifications shall be applied to the nominated version of the system to test that the system conforms to the nominated version of the design specification. Each test specification shall be annotated with the result of the test. Where the output fails to pass testing then a problem report shall be raised. Incident reports may be used to identify individual failures for later consolidation under a single problem report for evaluation of reliability data or meantime between failures (MTBF.)

**Review:** When the tests have been successfully completed the results of testing shall be reviewed generally as defined in the development plan.

### **3.0 Documentation & Record Keeping**

Determine what records will be generated by the project team and retained by the Project Director, and where they will be retained. The following is a list of the non-exhaustive records that will necessarily be generated. The project monitoring/steering committee may add to the list to facilitate the ultimate objective of the project.

- Project Management Records
  - Project Proposal
  - Feasibility Report
  - Project Execution Strategy
  - Environment Baseline
  - PEP.
- Incident problem/accident Report Register /Logbook

- Change Request Register
- Open Issue Register
- Output Distribution List
- Managed Output Identification
- Quality Assurance records and reliability data.

### ***Records Required by the User***

Which of the records created within the project, if any, does the User require access to? How and when will they access them? How long will they retain them and for what purpose? The Project Sponsor and Steering Committee will be provided with copies of any records the user request access to.

## **4.0 Appendices**

The following documents and forms should be attached to the PEP as appendices to enhance or meet specific project requirements.

- Templates that become working documents in their own right, as they will be updated and managed during the life of the project (e.g. project plan); or
- Additional information provided to support the summary content within the Project Execution Plan (e.g. project development methodology).

## **Part – II**

### **SOFTWARE DEVELOPMENT LIFE CYCLE GUIDELINES (SDLC)**

1. During planning stage of the software project, a framework is to be identified that describes the activities to be performed at each stage of software development project. The frame work could be water fall, V shaped model, structured evolutionary prototyping, rapid application model (RAD), incremental, spiral, agile (like extreme programming, feature driven, dynamic systems development method (DSDM), adaptive etc.) or any other tailored SDLC model.
2. Technical and managerial reviews required in a specified SDLC should be identified during planning activity and they should be conducted at identified phases and monitored.



3. Documents to be prepared during respective phases should be listed for any software project.
4. Documentation standards and templates to be followed during software development should be specified for a software project.
5. Application development, testing & deployment setup should be identified for all software projects.
6. Configuration management plan & source code traceability plan should be specified.
7. Applicable CASE tools, databases, configuration management tools, bugs management tools, development IDEs to be used for the software project should be specified and arrangements should be used made for their usage.
8. Training on all the above may be arranged for all the above identified technologies and tools to respective identified stake holders.
9. QA plan & requirement of QA agency should be specified for any software project.
10. Independent V & V requirement and code inspection can be brought out based on the assessment of criticality of the software by project management and technical review committee.

**Note:** Detailed guidelines are under formulation by Dr. Karunakar Committee and will be disseminated when approved.

## PREPARATION OF TECHNICAL CLOSURE REPORT

### **Executive Summary**

#### ***Background***

Briefly describe the background and scope of the project.

#### ***Reason for Closing the Project***

State the reason why this project is being closed. This usually is because the outputs have been delivered, the closing date has been reached and/or the budget has been expended. A project may be closed for other reasons, for example a change in policy or agency priorities, a loss of funding or a deadline date reached. Output of the project and achievements should be included.

#### ***Summary of Recommendations***

List the recommendations that appear in this report. One of the recommendations should be for the project steering committee/highest monitoring body to agree that the project can be deemed closed. The project has fulfilled all of the requirements as documented in the relevant project plan, or the steering committee is satisfied that all outstanding items have been satisfactorily addressed or there is some other reason to close the project. The committee should also recommend the way forward.

### **Closure Activities**

Various activities are required in closing the project.

#### ***Project Staff***

Describe what steps are being taken to manage the movement of project staff from the project to other roles, including the timing of their move, the capture of their project knowledge and handover of that knowledge to the labs/estts.

#### ***Issues Management***

Identify any outstanding issues and who will continue to progress the issues.

#### ***Risk Management***

Identify any risks which will transfer to an operational area and who has responsibility for monitoring them.

***Financial Management***

Identify any outstanding financial issues, and how they will be handled.

***Asset Management***

Describe any assets which were acquired for the project, and who will take ownership of them upon completion of the project.

***Records Management***

Identify what arrangements have been put in place for the storage, security and backup of hard copy and soft copy (electronic) records and project documents.  
Identify who is responsible for these activities.

***Post Project Responsibilities***

List any matters that are outstanding, what actions are required to address them and who is responsible. This should include things that are outstanding or have not been formally agreed prior to this stage such as outcomes yet to be achieved, outputs not yet delivered, maintenance of the outputs or other operational matters such as meeting future training requirements.

***Recommendations***

Recommendations include such things as the transfer of responsibility for the outcomes to the user, how outstanding outputs and issues should be addressed, any recommendations for the continued operation by the users.

**Highlights and Innovations**

Describe the highlights of the project and any innovations used or developed by the project.

**Project Performance**

Summarize the actual performance of the project against the planned performance. All projects vary to some extent from the original plan, these variations should be identified and the reasons for the variance described.

***Performance against Objectives (Deliverables/Output)***

Describe the actual performance of the project in relation to the achievement of the planned project objectives.

***Performance against Outcomes (Infrastructure & Competence Building)***

Describe the actual performance of the project in relation to the achievement of targeted outcomes. Were all planned targeted outcomes achieved, to what degree? Some outcomes may not be achieved at this point in time. In this case details should be given as to when the outcomes are anticipated to be achieved and who is responsible for their ongoing measurement and reporting of progress towards their achievement.

***Performance against Outputs***

Describe the actual performance of the project in relation to the delivery of the outputs. Were all planned outputs delivered, to what degree? Were they all accepted? Did the quality of the outputs meet expectations?)

***Performance against Schedule***

Describe the actual performance of the project against the project schedule.

***Performance against Budget***

Describe the actual performance of the project against the project budget.

***Recommendations***

List the recommendations that arise from this section of the Report including future work which needs to be taken up.

**Potential Applications**

Describe potential other applications of the product developed under the project.

**Lessons Learnt**

Describe technology up-gradation details (achievements) including expertise developed in sub-domains. Mention original MRL level calculated at the time of sanction of the project as well as the level of MRL reached at the time of closure of the project with suitable justification.

***What worked Well?***

Describe the technology development process, details including project management and quality management processes that were perceived to be appropriate and/or effective for the project, as reflected by the Users and the project records/documentation.

***What could be Improved?***

Describe the technology development process, project management and quality management processes that were perceived to be inappropriate and/or ineffective for the project, as reflected by the users and the project records/documentation.

***Recommendations***

List the recommendations that arise from this project.

**Way Forward**

It may be listed what are the plans for further use of the prototypes/technologies developed in the project. In case, of product development plans for Mk-II, User acceptance or any other related future roadmap for the product may be mentioned.

**Appendices**

Appendices can be attached to provide any relevant supporting information, such as:

- A copy of the signed declaration of acceptance by the relevant users for each of the deliverables
- A copy of minutes of highest monitoring body recommending the technical closure of the project

**Distribution List**

Report(s) to be submitted to the following:

- Director (PM) of cluster DG
- Peer/participating laboratories.
- DP&C, DRDO HQ

# **FORMS & FORMATS**

## STATEMENT OF CASE FOR SANCTION OF PROJECT

Name of laboratory/establishment: \_\_\_\_\_

Title of the Project: \_\_\_\_\_

**Category**

(Please tick in appropriate box)

- ☐ Mission Mode (MM)  
☐ Technology Demonstration (TD)  
☐ Science & Technology (S&T)  
☐ Infrastructure & Facilities (IF)  
☐ Product Support (PS)  
☐ Mission Mode (User Trials) (MM-UT)

Security classification of project

- ☐ Top Secret  
☐ Secret  
☐ Confidential  
☐ Restricted  
☐ NIL

GSQR/NSR/ASR No.:

(for MM Projects)

Cost (Rs. in Cr):

\_\_\_\_\_ Total (FE)

Duration (in months):

Is it a FYP Plan/LTTPP Project?

Yes / No

If yes, please give Reference

(please quote Page No., Table No.,  
S.No. of FYP Document)

If No, please give Justification

for undertaking the project

Is Detailed Feasibility Study Report enclosed?

Yes / No

Recommendation of Cluster Council/DMC?

(please attach the minutes)

Yes / No

Is PEARL Analysis Report enclosed?

(In case of IF, PS and MM-UT category, if waiver is  
sought, approval from CA is required)

Yes / No

Is Project Execution Plan attached?

Yes / No

( ) *Prototype*  
( ) *Limited Series Production*  
( ) *Technology*  
( ) *Assembly or sub-assembly*  
( ) *Process*  
( ) *Others*

## Part-I (Macro Details)

## Part-II (Micro Details)

## Part –I



5. **Please specify the User(s)** (Army/Air Force/Navy/  
(Please attach the GSQR/NSR/ASR Inter-services/DRDO)  
for MM Projects)
6. **Breakup of Cost (Rs. in Cr)**

(a) **Major Head-2080, Revenue** (Cost has to be kept minimum)

Minor Head	Major Head 2080 - Revenue Heads of Expenditure	Total RE (FE)
105	Transportation (Movement of Stores)	
110	Stores	
	Equipment/Stores	
	CARS	
	CAPSI	
	Consultancy Contracts	
	Sub-projects	
	Job Work/Contracts	
	Hiring of Transport, FOL for Project Vehicles	
	Hiring of Technical Services	
	Contingency & Miscellaneous	
111	Works	
<b>TOTAL (REVENUE)</b>		

**Note:** No funds should be put under Minor Head 003 (Training) and 105 (Movement of Personnel) as it is given centrally to the lab.

(b) **Major Head 4076, Capital**

(Equipment/stores/sub-assembly forming part of major deliverable system, having life of 7 years or more)

Minor Head	Major Head 4076 - Capital Heads of Expenditure	Total RE (FE)
052	Plant & Machinery	
	Project related Vehicles	
111	Works	
<b>TOTAL (CAPITAL)</b>		

<b>GRAND TOTAL (REVENUE &amp; CAPITAL)</b>	
--	--

**Note:**

- (i) *Details of the equipment, machinery and store costing more than Rs50 lakh or 10% of project cost- whichever is less to be provided as Annexure, giving cost, FE (if any), and the month/year of procurement during implementation of the project.*
- (ii) *EPC approval along with project sanction is mandatory in MM projects and part of the main sanction file. For other categories of projects, the file for EPC approval may move in parallel with the project sanction file.*

*(iii) Project sanction file will not move for vehicle sanction to DHRD. This will be processed separately only after project approval is accorded.*

7. **Additional requirement of mechanical transport vehicles specific to the project, for equipment/developed systems and stores (with justifications):**

---



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8. **Proposed year-wise financial commitments/cash out flow (Rs in Cr):**

Year	IC	FE	Total
-	-	-	-
-	-	-	-

9. **Proposed project deliverables:**

- (a) No of prototypes for testing \_\_\_\_\_  
 (b) No of (type approved/qualified) deliverables \_\_\_\_\_

10. **Any other information:** \_\_\_\_\_

---

11. **List of enclosures:**

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_

## **Part – II**

1. **Brief technical appreciation** (This should include objective, scope, relevance of the project to the charter of the Lab/Estt. and Mission in maximum 1 or 2 pages only).

- ❖ Justification (need) for undertaking the project/programme along with the recommendation of the cluster council/DMC (please attach minutes).
- ❖ Competence level/preliminary work done to acquire the same.
- ❖ Brief of PEARL analysis. Initial MRL indices at the time of undertaking the project and likely MRL levels at the time of closure of the project as accepted by Peer Review Committee.
- ❖ Peer Review recommendations (please enclose the approved copy of minutes of the peer review committee meeting).
- ❖ PERT/Gantt Charts.
- ❖ Major milestones (not > 6) linking financial outlay and timelines.
- ❖ Critical factors/technology involved.
- ❖ High development risk areas and remedial actions proposed.
- ❖ Plan of action for prototype development/execution plan.
- ❖ Realisation Plan
- ❖ Testing Plan
- ❖ Development Partners.

- ❖ Production agencies proposed.
- ❖ Costs benefit analysis/spin-off benefits.
- ❖ Project management and monitoring structure proposed.

2. If the project is to be executed by multiple laboratories, please outline the agreed work-packages between the various labs/estts.

S. No.	Nature of Work	Lab/Estt.	Cost (Rs in Cr)	PDC (in months)	Remarks

3. **List of major additional facilities (capital) required for the project**  
(Please highlight status of similar facilities existing with the laboratory as well as other DRDO labs/estts and why they cannot be utilized)

1. \_\_\_\_\_  
2. \_\_\_\_\_

4. **Major training requirements**

S. No.	Discipline/ area for training	Agency contacted	No of Personnel proposed to be trained	Duration	Cost	Remarks

*Note: Correspondence made with the agencies contacted for imparting the training and their willingness for the same should be enclosed.*

5. **Details of Sub-Projects/ Work Packages (Separate Tables)**

S.No.	Title of Sub-Project	Objectives & Scope of Work	*DRDO Lab/ Estt.	Cost (Rs in Cr)	PDC (in months)

*\*Sub-Projects can be given to DRDO labs only. However, work packages can be given to other Govt. agencies like DAE, DoS, Council of Scientific and Industrial Research (CSIR), ISRO etc. Proposals of Sub-Projects/Work Packages duly signed by competent authority should be submitted along with the main proposal.*

6. **Details of CARS**

S.No.	Name of Institute/ Agency	Area where R&D is required	Cost	PDC	Confidence level of the agency	Remarks

*Note: Correspondence made with academic institutes contacted for undertaking the research activity and their willingness for the same should be enclosed*

**7. Details of Consultancy requirements**

S.No.	Discipline/ area	Agency	Cost	Confidence level of the agency	Remarks

*Note: Correspondence made with the agency contacted for offering consultancy and their willingness for the same should be enclosed.*

**8. Details of additional manpower requirements**

S.No.	Designation/ Rank	Discipline	Number(s)	Period/Duration	Remarks

*Note: Additional manpower requirement should be in consonance with the manpower roadmap submitted to DHRD. Demand for additional manpower will accrue negative score and will lead towards less chances of project sanction.*

**9. Details of additional building space requirement**

- (Funds for construction of building should be booked under Major Head-4076(Capital)/Sub Head-111(Works)
- (AE's should be obtained from concerned CCE/DCW&E and appended with the proposal)

**10. Any other information** (Important for the project but not covered above).

---

**11. Comments of Project Director with signature and date**

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**12. Following details need to be certified by Lab Director**

- (i) **Manpower of Lab: DRDS - DRTC -**  
(ii) **Details of the ongoing Projects/Programmes of the lab in hand:**

S. No.	Title of Project	Project No.	Cost (in Cr) Original/Current	Date of Sanction	PDC Original/Current	Name of Project Director	Status of completion (Design/Realisation/Testing Stage)

**Recommendations of Lab Director with signature/date.**

*Note: Lab Director will give his recommendations on the proposal submitted by Project Director. He will also certify that manpower requirement for the proposed project/programme will be allocated from existing lab strength. Availability of building space, if required, for housing the new equipments likely to be purchased under the project will be made available from the existing building space. In case additional manpower/building space is needed, the details may be given as per S.No. 8 & 9.*

**13. Attribute Table as filled by Director (PM) of cluster DG during Annual Selection of Projects**

1	2	3	4	5		6	7
Project Name	Alignment with Lab's Mandate/ Mission  (0-5)	Core Competence of Lab  (0-5)	Alignment with DRDO's LTTPP  (0-5)	Project Output*		Need for additional HR  (0 to -5)	Total Score  (Sum of Col 1-6)
				S&T merit (for TD/S&T projects) (1-5)  1: low impact 5: high impact/ high use	Potential for transition to next category/ ToT (for TD/MM projects) (1-5)		

**14. Recommendations of concerned Cluster DG with signature and date.**

*Note: Cluster DG will offer his comments/recommendations taking a holistic view on necessity, availability of technology/expertise, manpower, resource availability and overall possibility of successful execution of the project/programme within project timelines.*

## Form 2

### INDICATIVE HUMAN RESOURCE DEPLOYMENT

#### Human Resource Deployment

S. No	Name of the Scientist	Designation	Discipline	% Availability	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	WP10	WP11	WP12	WP13	WP14	WP15
1	A	Sc 'G'	Mechanical	90	20	40							20					10	
2	B	Sc 'G'	Electronics	50		15						20						15	
3	C	Sc 'F'	Mechanical	100	30	30				20								20	
4	D	Sc 'F'	Electrical	70		10							40			20			
5	E	Sc 'F'	Mechanical	70		20					30				10			10	

## Form 3

## TIMELINE CHART

	Round 1		Round 2		Round 3	
	Date (In)	Date (Out)	Date (In)	Date (Out)	Date (In)	Date (Out)
<b>Project Director</b>						
<b>Lab Director</b>						
<b>Director (PM) of cluster DG</b>						
<b>IFA (R&amp;D)</b>						
<b>Cluster DG</b>						
<b>DP&amp;C</b>						
<b>DBF&amp;A</b>						
<b>DMM</b>						
<b>CC R&amp;D (R&amp;M)</b>						
<b>Addl. FA (R&amp;D)</b>						
<b>Secretary, Defence R&amp;D</b>						
<b>FADS</b>						
<b>Raksha Mantri</b>						
<b>US (R&amp;D)</b>						

**Form 4**

**CCS FORMAT**

**Annexure 1**

**SPECIMEN FORMAT OF THE MAIN NOTE**

SECRET

Copy No. \_\_\_\_\_

No. \_\_\_\_\_  
MINISTRY OF \_\_\_\_\_  
DEPARTMENT OF \_\_\_\_\_

New Delhi, the (date of the note)

NOTE FOR THE CABINET

OR

NOTE FOR THE CABINET COMMITTEE ON \_\_\_\_\_

OR

NOTE FOR THE EMPOWERED GROUP OF MINISTERS/ GROUP OF MINISTERS  
ON \_\_\_\_\_

Subject: \_\_\_\_\_

\*\*\*\*\*

**1. INTRODUCTION**

A snapshot of the proposal in 3 or 4 sentences.

**2. BACKGROUND**

A brief background of the proposal to understand its genesis. This would include consideration of the matter earlier by Cabinet/ Cabinet Committees/ EGom/GoM or Commissions/High level Committees etc. if relevant and other pertinent details.

**3. PROPOSAL**

The proposal may be stated with clarity and precision so that there is no ambiguity in what the Ministry/Department aims to achieve by implementing the proposal. The time-lines for completion of different stages of the projects/scheme/plan etc, where relevant, need to be clearly spelt out.

**4. JUSTIFICATION**

Rationale of the proposal may be brought out in this part of the note.



**5. INTER-MINISTERIAL CONSULTATIONS**

Details of all inter-ministerial consultations and their views/comments as elaborated in the consolidated instructions should be brought out in this section. This should also give details of the appraisal of the proposal by any appraisals bodies or financial institutions.

**6. FINANCIAL IMPLICATIONS**

The financial implications of the proposal may be worked out as accurately as possible and should be detailed in this section. Further, the manner in which the expenditure is proposed to be borne may also be clearly indicated.

**7. APPROVAL PARAGRAPH**

The approval paragraph is the most crucial paragraph containing the proposal on which consideration and approval of the Cabinet/Cabinet Committee is solicited. It should be a self contained paragraph and drafted with clarity and precision leaving no scope for ambiguity or differing interpretations.

**8. STATEMENT OF IMPLEMENTATION SCHEDULE (APPENDIX-I)**

As per prescribed format and conforming to the approval paragraph.

**9. STATEMENT OF EQUITY, INNOVATION AND PUBLIC ACCOUNTABILITY (APPENDIX-II)**

As per prescribed format. Brief details of how the proposal will sub serve the three criteria to be included in the main body of the note.

**10. STATEMENT ON MAJOR MILESTONES AND CORRESPONDING TARGET DATES (APPENDIX-III)**

In the format prescribed for the purpose. (This is required only for infrastructure Project related proposals)

**11. APPROVAL OF THE MINISTER-IN CHARGE**

The last paragraph should indicate about the approval of the Minister-in-charge to the proposal(s) contained in the note.

Signature\_\_\_\_\_

Name\_\_\_\_\_

Designation\_\_\_\_\_

(Joint Secretary or higher in the  
Sponsoring Ministry/Department)

Telephone No.\_\_\_\_\_

**Note: The above format is indicative and the exact headings may vary.**

**SECRET**

No. -----

Ministry of -----

Department of -----

**STATEMENT OF IMPLEMENTATION SCHEDULE**

Subject: \_\_\_\_\_

\*\*\*\*

Gist of decision requited	Project benefits/results	Time-frame and manner of implementation/reporting Cabinet Secretariat. to

Signature\_\_\_\_\_

Name\_\_\_\_\_

Designation\_\_\_\_\_

(Joint Secretary or higher in the  
Sponsoring Ministry/Department)

Telephone No.\_\_\_\_\_

SECRET

No. -----

Ministry of -----

Department of -----

**STATEMENT OF EQUITY, INNOVATION AND PUBLIC ACCOUNTABILITY**

Subject: \_\_\_\_\_

\*\*\*\*

S. No.	The required goal	How does the proposal advance this goal?
1.	Equity or Inclusiveness	
2.	Innovation	
3.	Public Accountability	

Signature \_\_\_\_\_  
 Name \_\_\_\_\_  
 Designation \_\_\_\_\_  
 (Joint Secretary or higher in the  
 Sponsoring Ministry/Department)  
 Telephone No. \_\_\_\_\_

**SECRET**

No. -----

Ministry of -----

Department of -----

**STATEMENT ON MAJOR MILESTONES AND TARGET DATES**

Subject: \_\_\_\_\_

\*\*\*\*

<b>S. No.</b>	<b>Major milestones</b>	<b>Time frame for completion/target date</b>
<b>1.</b>		
<b>2.</b>		
<b>3.</b>		

Signature\_\_\_\_\_

Name\_\_\_\_\_

Designation\_\_\_\_\_

(Joint Secretary or higher in the  
Sponsoring Ministry/Department)

Telephone No.\_\_\_\_\_

**SPECIMEN FORMAT FOR THE PRESS BRIEF**

Ministry name

Date of decision

Subject of the Note for the Cabinet/Cabinet committees

1. Decision
2. Point-wise details
3. Background
4. Implementation strategy and targets
5. Major impact
6. Expenditure involved
7. No. of beneficiaries
8. States/districts covered
9. Details and progress of scheme if already running

## SPECIMEN FOR PROJECT SANCTION LETTER

NO. (To be allotted by designated competent authority)  
Government of India,  
Ministry of Defence,  
Defence Research & Development Organisation  
Lab Name & Place/HQ, New Delhi (As the case may be)  
Date.....

To  
**The Director/Cluster DG/DG DRDO**  
(Lab/Estt.)

I am directed to convey the sanction of the **Director/CC(R&D)/DG(Cluster)/Secretary Defence R&D** (as the case may be) for undertaking the following Project in accordance with the powers delegated vide letter no DRDO/DBFA/83226/M/01/2031/ D(R&D) dated 30<sup>th</sup> July 2010 as per the following details.

1. Title of the project : \_\_\_\_\_
2. Nodal Lab : \_\_\_\_\_
3. Other Participating Labs, if any : i) \_\_\_\_\_  
ii) \_\_\_\_\_
4. Project No. : (i) For Nodal Lab: \_\_\_\_\_  
(ii) For Participating Lab 1: \_\_\_\_\_  
(iii) For Participating Lab 2: \_\_\_\_\_
5. Plan/Non-Plan Project : \_\_\_\_\_
6. Security classification of project : \_\_\_\_\_
7. Total estimated cost : \_\_\_\_\_ Cr (FE: \_\_\_\_\_ Cr)  
(Rupees in words)  
**Break-up of Share in case of Jointly Funded Projects**
8. Start Date (DD: MM: YYYY) : \_\_\_\_\_
9. PDC (Months & Date) : \_\_\_\_\_
10. Objectives : (i) \_\_\_\_\_  
(ii) \_\_\_\_\_  
(iii) \_\_\_\_\_

11. Deliverables/Output : \_\_\_\_\_

12. Details of Funds (Lab-wise)

**Break-up of Estimated Funds**

Minor Head	Major Head 2080 -Revenue	Nodal Lab	Participating Lab, if any	Total
	Heads of Expenditure	RE (FE)	RE (FE)	RE (FE)
105	Transportation (Movement of Stores)			
110	Stores			
	Equipment/Stores			
	CARS			
	CAPSI			
	Consultancy Contracts			
	Sub-projects			
	Job Work/Contracts			
	Hiring of Transport, FOL for Project Vehicles			
	Hiring of Technical Services			
	Contingency & Miscellaneous			
111	Works			
<b>TOTAL (REVENUE)</b>				
	<b>Major Head 4076- Capital</b>			
052	Plant & Machinery			
	Project related Vehicles			
111	Works			
<b>TOTAL (CAPITAL)</b>				
<b>GRAND TOTAL(REVENUE &amp; CAPITAL)</b>				

13. Add para **If Required/Applicable** ----- If EPC approval is required along with project sanction, additional information viz. name of equipment(s), estimated cost, probable source of supply, mode of tendering, wherever applicable may be submitted along with the proposal.

14. Add para **If Required/Applicable** ----- Director (s) of Nodal and participating (if applicable) Lab(s) are authorized to allot sub-projects to other Defence R&D Labs/Estts for development/ manufacture of subsystems/sub-assemblies required for the project within the sanctioned funds under specific budge heads and likely date of completion.

15. **If Required/ Applicable** ----- Directors of Nodal Lab and participating Labs (if applicable) are also authorized to place supply orders for development, consultancy, or research contracts with other Govt./public/private sector organizations, academic institutions etc. restricting it within the total sanctioned funds (within the budget sanctioned under the relevant heads subject to financial powers authorized vide Government of India, Min of Defence letter no DRDO/DBFA/83226/M/01/2031/ D(R&D) dated 30<sup>th</sup> July 2010 (if applicable and required) .

16. Procurement of stores will be made in accordance with the rules and procedures for procurement of Equipment/Stores and services within the available powers and in terms of DRDO “Purchase Management- 2006” manual issued vide Government of India, Ministry of Defence letter No. DMM/PP/0000205/M/868/D(R&D) dated 22<sup>nd</sup> March 2006” as amended from time to time.

17. Director (Nodal Lab) is authorized to change the FE element as given in the GoI letter which can be converted to IC, subject to the overall sanctioned cost of the project not being exceeded.

18. **Add: -** Para on Debit of Expenditure /Flow of funds in case of Joint Projects with Services/PSUs and Other agencies.

19. If Required/Applicable: Project vehicles, if any, furnish details

20. The project monitoring committee structures as applicable may be brought out as Annexure to this Govt. Letter.

21. An indicative PERT/Gantt Chart with major milestones may be brought out as Annexure to this Govt. Letter for monitoring purpose only

22. Para on Special Powers (as applicable) & other specific issues, if any: Should be approved on file.

23. Developmental trials shall be held in the Lab(s) or in the field; all others through separate sanction of independent project with participation of users.

24. Expenditure will be debited to the relevant Minor Heads, under Major Head 2080 “Revenue” and Major Head 4076 “Capital” (**as the case may be**), of Defence Services Estimates, Research & Development.

25. Unique Sanction Code (USC) : \_\_\_\_\_  
(Please refer guidelines issued vide letter no- DBFA/FA/83301/M/01 dated 31st Mar 2014, available on DRONA portal of DBFA, DRDO HQ)

26. This issues with the concurrence of IFA (R&D) or JS & Addl. FA (R&D) (**as the case may be**) vide their I.D No.\_\_\_\_ dated \_\_\_\_.

Yours faithfully  
Authorised Signatory)

*Note: The circulation of the sanction letter of the project will be as per the table given below:*



CFA	Copy to	Ink Signed Copy to
Mandatory Circulation	<ul style="list-style-type: none"><li>• DGADS/PDA(AF)/PDA(Navy) as per case</li><li>• Director PM of cluster DG</li><li>• DBF&amp;A, DMM, DP&amp;C</li><li>• DFA (Lab)</li><li>• User (Services), if any</li></ul>	<ul style="list-style-type: none"><li>• PCDA (R&amp;D), RK Puram</li><li>• CDA/JCDA/Dy CDA</li><li>• Labs Holding sub-projects</li><li>• CDA (Services) – for jointly funded projects</li></ul>
Director	LAO & Concerned Test Audit Office	Cluster DG
Cluster DG	<ul style="list-style-type: none"><li>• IFA (Cluster)</li><li>• CCR&amp;D (R&amp;M)</li><li>• AT-IX – C Section Controller General of Defence Accounts (CGDA)</li><li>• DCW&amp;E – if prov for Rev/Cap (Works)</li></ul>	Concerned Lab
Secretary	<ul style="list-style-type: none"><li>• All as for Cluster DG</li><li>• JS &amp; Addl FA (R&amp;D)</li></ul>	<ul style="list-style-type: none"><li>• Cluster DG</li><li>• Concerned Lab</li></ul>

## STATEMENT OF CASE FOR PDC EXTENSION

## Part – I

1. Title of the Project : \_\_\_\_\_
2. Project/ProgrammeNo. : \_\_\_\_\_
3. Name of Lab : \_\_\_\_\_
4. Sponsoring Agency : \_\_\_\_\_
5. Sanction Cost (in Cr) : IC\_\_\_\_\_ (FE\_\_\_\_\_)
6. Date of Sanction : \_\_\_\_\_
7. Amount spent so far (in Cr) : Spent - IC\_\_\_\_\_ (FE\_\_\_\_\_)  
: Committed- IC\_\_\_\_\_ (FE\_\_\_\_\_)  
: In Pipeline - IC\_\_\_\_\_ (FE\_\_\_\_\_)
8. PDC Original : (i) (DD:MM:YYYY) & Months \_\_\_\_\_  
(subsequent, if any) : (ii) (DD:MM:YYYY) & Months \_\_\_\_\_
9. Revised PDC proposed with : (i) (DD:MM:YYYY) & Months \_\_\_\_\_  
financial or any other implications : (ii) (DD:MM:YYYY) & Months \_\_\_\_\_
10. Whether approval of Fund Sought/ : \_\_\_\_\_  
obtained for revision of PDC
11. Details of Additional funds required : \_\_\_\_\_
12. Minutes of the Monitoring Committee  
Meetings held so far and recommendations  
of the highest monitoring committee  
for PDC extension of the project : \_\_\_\_\_
13. Defendable reasons (point wise) why  
ThePDC could not be adhered : \_\_\_\_\_
14. Work done so far with  
milestones achieved : \_\_\_\_\_
15. Work to be carried out with revised  
milestones for the extended period  
of PDC : \_\_\_\_\_

16. Revised PERT/Gantt Chart attached : \_\_\_\_\_
17. **New Monitoring mechanism proposed : \_\_\_\_\_  
to avoid further PDC slippage**
18. Check list for submission of case for  
PDC Extension duly signed by competent  
authority (enclosed / not enclosed) : \_\_\_\_\_

**Approved / Not Approved**

**(Laboratory Director)**

**(Competent Authority)**

**Part – II**  
**(Specimen Format for PDC Extension Govt. Letter)**

No. \_\_\_\_\_/\_\_\_\_/D(R&D)  
Government of India  
Ministry of Defence  
Deptt.ofDefence Res &Dev  
DRDO HQ,  
**Date** \_\_\_\_ **Month, Year**

To,  
The Director General Research & Development,  
Defence Research & Development Organisation,  
Min. of Defence,  
DRDO HQ, New Delhi – 110 011

**Subject: PDC extension of Project (Name) \_\_\_\_\_(No)\_\_\_\_\_**

I am directed to convey the sanction of the Director/CC(R&D)/DG (Cluster)/Secretary DR&D (*as the case may be*) for PDC extension of Project (Name) \_\_\_\_\_(No)\_\_\_\_\_ vide Govt. sanction letter no. \_\_\_\_\_ dated \_\_\_\_\_ as amended vide corrigendum no. \_\_\_\_\_ dated \_\_\_\_\_, from \_\_\_\_\_ months (DD/MM/YYYY) to \_\_\_\_\_ months (DD/MM/YYYY) .

2. All other entries remain same.
3. Unique sanction code: \_\_\_\_\_
4. This issues with the concurrence of Ministry of Defence (Finance / R&D) vide their Dy. No. \_\_\_\_\_/MoD(Fin)/R&D) dated \_\_\_\_\_.

Yours faithfully,

()   
Under Secretary to the Govt. of India

**Ink Signed Copy to :**

DG (Cluster)  
Director Lab – 02 copies  
Director P&C - 02 copies  
CGDA, New Delhi  
PCDA (R&D), New Delhi  
CDA (R&D), Concerned  
File copy

**Copy to**

The Director of Audit, Defence Services, New Delhi  
Addl FA & JS  
IFA (R&D), Concerned  
Director, DMM  
Director, DBF&A  
Director, CW&E

*Note: PDC Extension letter shall be signed by authorized signatory of CFA.*

## STATEMENT OF CASE FOR RE-ALLOCATION OF FUNDS AND PROJECT COST ENHANCEMENT

### Part – I

1. Name of Lab : \_\_\_\_\_
2. Project/Programme No : \_\_\_\_\_
3. Title of the Project : \_\_\_\_\_
4. Sponsoring Agency : \_\_\_\_\_
5. Sanction Cost (in Cr) : IC\_\_\_\_\_ (FE\_\_\_\_\_)
6. Date of Initiation : \_\_\_\_\_
7. Amount spent so far (in Cr) : Spent - IC\_\_\_\_\_ (FE\_\_\_\_\_)  
: Committed - IC\_\_\_\_\_ (FE\_\_\_\_\_)  
: In Pipeline - IC\_\_\_\_\_ (FE\_\_\_\_\_)
8. PDC original given and Subsequent, if any : (i) (DD:MM:YYYY)& Months \_\_\_\_\_  
: (ii) (DD:MM:YYYY)& Months \_\_\_\_\_
9. Work done so far with milestones achieved : \_\_\_\_\_
10. Re-allocation of funds
  - i) Details of head-wise funds to be re-allocated
  - ii) Reasons/Justification for re-allocation of funds  
(Point-wise justifiable and defensible reasons may be highlighted)
  - iii) Recommendations of highest monitoring committee for re-allocation of funds
  - iv) Details of project monitoring committees meetings planned as per the Govt. letter vis-a-vis held along with their respective minutes
  - v) Remedial steps undertaken to avoid further re-allocation in future
11. Cost enhancement
  - i) Proposed Project cost (Cr)
  - ii) Head-wise details of enhanced / proposed project cost (Cr)
  - iii) Reasons/justification for cost enhancement  
(Point-wise justifiable and defensible reasons may be highlighted)
  - iv) Recommendations of highest monitoring committee for cost enhancement  
(please append the minutes)
  - v) Supporting documents (budgetary quotes, e-mail quotes etc) for cost enhancement

- vi) Details of project monitoring committees meetings planned vis-à-vis held as per the Govt. letter (please append the minutes)
  - vii) Remedial steps undertaken to avoid further cost enhancement in future
12. General Assessment of Status (health) of Project  
(views of the project leader/project Director may be brought out)
13. General Assessment of Status (health) of Project  
(views of the project leader/project Director may be brought out)
14. Check list for submission of case for  
Re-allocation of funds / Cost Enhancement  
Duly signed by competent Authority  
(enclosed / not enclosed) : \_\_\_\_\_

**Approved / Not Approved**

**(Laboratory Director)**

**(Competent Authority)**

*Note: In case of re-allocation of funds of the project/programme, case files need not be routed through DP&C.*

**Part – II**  
**(Specimen Format for Cost Enhancement Govt. Letter)**

No. \_\_\_\_\_/\_\_\_\_/D (R&D)  
Government of India  
Ministry of Defence  
Deptt.ofDefence Res &Dev  
DRDO HQ,  
**Date   \_\_ Month, Year**

To,

The Director General Research & Development,  
Defence Research & Development Organisation,  
Min. of Defence,  
DRDO HQ, New Delhi – 110 011

**Subject: Cost Enhancement of Project Project (Name) \_\_\_\_\_(No)\_\_\_\_\_**

I am directed to convey the sanction of the Director/CC(R&D)/DG (Cluster)/Secretary DR&D (*as the case may be*) for Cost enhancement of Project (Name) \_\_\_\_\_(No)\_\_\_\_\_ vide Govt. sanction letter no \_\_\_\_\_ dated \_\_\_\_\_ as amended vide corrigendum no. \_\_\_\_\_ dated \_\_\_\_\_, from Rs. \_\_\_\_\_ (FE \_\_ Cr) to Rs. \_\_\_\_\_ Cr (FE \_\_\_\_\_) as per following details:

Minor Head	Major Head 2080 -Revenue	Nodal Lab	Participating Lab, if any	Total
	Heads of Expenditure	RE (FE)	RE (FE)	RE (FE)
105	Transportation (Movement of Stores)			
110	Stores			
	Equipment/Stores			
	CARS			
	CAPSI			
	Consultancy Contracts			
	Sub-projects			
	Job Work/Contracts			
	Hiring of Transport, FOL for Project Vehicles			
	Hiring of Technical Services			
	Contingency & Miscellaneous			
111	Works			
<b>TOTAL (REVENUE)</b>				
	<b>Major Head 4076- Capital</b>			
052	Plant & Machinery			
	Project related Vehicles			
111	Works			
<b>TOTAL (CAPITAL)</b>				
<b>GRAND TOTAL (REVENUE &amp; CAPITAL)</b>				



2. All other entries remain same.
3. Unique sanction code : \_\_\_\_\_
4. This issues with the concurrence of Ministry of Defence (Finance / R&D) vide their Dy. No. \_\_\_\_\_/MoD(Fin)/R&D) dated \_\_\_\_\_.

Yours faithfully,

()   
Under Secretary to the Govt. of India

**Ink Signed Copy to :**

DG (Cluster)  
Director Lab – 02 copies  
Director P&C - 02 copies  
CGDA, New Delhi  
PCDA (R&D), New Delhi  
CDA/JCDA (R&D), Concerned  
File copy

**Copy to**

The Director of Audit, Defence Services, New Delhi  
Addl FA & JS  
IFA (R&D), Concerned  
Director, DMM  
Director, DBF&A  
Director, CW&E

***Note: Cost enhancement Govt. letter shall be signed by authorized signatory of CFA.***

**STATEMENT OF CASE FOR CANCELLATION/  
SHORT CLOSURE/STAGE CLOSURE OF  
PROJECTS/PROGRAMMES**

1. Name of Lab/Estt : \_\_\_\_\_
2. Title of the Project/Programme : \_\_\_\_\_
3. Project/ProgrammeNo. : \_\_\_\_\_
4. Category of Project : \_\_\_\_\_
5. Sponsoring Agency and QR No. : \_\_\_\_\_
6. Date of Sanction : \_\_\_\_\_
7. PDC original given and Subsequent, if any : (i) (DD:MM:YYYY)& Months \_\_\_\_\_  
: (ii) (DD:MM:YYYY)& Months \_\_\_\_\_
8. Sanctioned Cost (Cr) : IC \_\_\_\_\_ (FE \_\_\_\_\_)
9. Statement of Accounts : Expenditure incurred Rs: IC \_\_\_\_\_ (FE \_\_\_\_\_)  
(duly vetted by local finance/CDA R&D)
10. Present Status : \_\_\_\_\_  
(give details of the work done  
so far and the stage to which project  
has been progressed)
11. Detailed reasons/considerations for : \_\_\_\_\_  
Cancellation/Short Closure/Stage  
Closure of the Projects/programmes
12. Minutes of the Monitoring Committee  
Meetings held so far and recommendations  
of the highest monitoring committee for  
cancellation, stage closure & short closure  
of the project/programme: \_\_\_\_\_
13. Lessons Learnt : \_\_\_\_\_

**(Accounts Officer)**

**(Project Director)**

**(Recommendation of Lab Director)**

**(Approved / Not Approved)**

**(Competent Authority)**

***Note:***

- 1. Statement of expenditure should be vetted by local audit officer/CDA (R&D) and a certificate of this effect may be obtained with signature mentioning name clearly and office seal.***
- 2. Competent authority for cancellation, short closure and stage closure of the projects/ programmes is Secretary Defence R&D or concerned CFA whichever is higher***

**ADMINISTRATIVE PROJECT/PROGRAMME CLOSURE FORMAT****Part – I**

1. Name of the Lab : \_\_\_\_\_
2. Title of the Project/Programme : \_\_\_\_\_
3. Cost in Rs (Cr) / FE (original & revised) : \_\_\_\_\_

Cost Rs (Cr)	Original	Revised
IC		
FE		
Total		

4. Category of the Project (MM/TD/S&T/IF/PS/MM-UT) : \_\_\_\_\_
5. Date of Sanction : \_\_\_\_\_
6. PDC of the Project (months& date) : \_\_\_\_\_

Original	Revised	No of Revisions

7. Expenditure : IC\_\_\_\_\_ (FE\_\_\_\_)
8. Aim & Objectives : \_\_\_\_\_
9. No of Prototype (type approved/qualified) deliverables as brought out in Govt. Letter : \_\_\_\_\_
10. Achievements (based on aim & objectives) \_\_\_\_\_  
(fill up the proforma given at part-II of this Form)
11. Recommendation of highest Management & Monitoring Committee Meeting for Administrative Closure of the Project (enclose minutes of the meeting)  
\_\_\_\_\_

## 12. List of sub-projects

Sl. No	Sub Projects, Name & No.	Agency	Cost	Status	Achievement

## 13. List of CARS

Sl. No	CARS Name & No.	Agency	Cost	Status	Achievement

## 14. Consultancies

Sl. No	Aim	Agency	Amount	Date

15. Details of Facilities Generated (as proposed in the programme)  
\_\_\_\_\_

## 16. Trial Results (In brief) - Attach copies of final trial reports issued by users)

**Statement of Accounts (Expenditure)**

17. It is certified that the project “\_\_\_\_\_” No. \_\_\_\_\_  
has incurred the expenditure of Rs. \_\_\_\_\_ including F.E. \_\_\_\_\_  
against the sanctioned cost of Rs. \_\_\_\_\_ including F.E. \_\_\_\_\_.  
All the stores/equipment undertaken in the project has been accounted for.

---

(Accounts Officer)

Certify that all objectives set for the project have been met (if not, please justify for not achieving the set targets)

\_\_\_\_\_

(Project Director)

**Audit Authorities**  
**(Local Audit Officer / CDA R&D)**  
**(Signature with name and office seal)**

\_\_\_\_\_

**Recommendation of the Lab Director**  
\_\_\_\_\_

Approved / Not Approved

**(Competent Authority)**

***Note:***

- (i) Statement of expenditure certificate duly vetted by audit authorities (Local Audit Officer/CDA (R&D) must be appended with the proposal***
- (ii) Distribution of Administrative/Technical Project Closure Report will be as under:-***
  - a) Participating Labs***
  - b) Concerned CCR&D (if applicable)***
  - c) Director PM, O/o cluster DG***

**Part – II**

**SUMMARY OF TARGETS/OBJECTIVES ENVISAGED AND  
ACHIEVED IN THE PROJECT/PROGRAMME**

<u>1</u> S. No.	<u>2</u> Name of the Project	<u>3</u> PDC (months)	<u>4</u> Cost (Cr)	<u>5</u> Expenditure (Cr)	<u>6</u> Targets as Envisaged	<u>7</u> Targets as Achieved	<u>8</u> Justification
					Targets Technology/ Deliverables/ Products/ Learning Knowledge as envisaged in the project proposal	Targets Technology/ Deliverables /Products/ Learning Knowledge etc. as achieved against each objective	

Place: \_\_\_\_\_

Signature of Project/Programme  
Director/Leader with Office Seal:

Date: \_\_\_\_\_

\_\_\_\_\_

**Recommended  
Lab Director**

**Approved / Not Approved**

**(DG Cluster)**

## Form 10

## SPECIMEN FOR PROJECT CLOSURE LETTER

No. \_\_\_\_\_/\_\_\_\_/D(R&D)  
 Government of India  
 Ministry of Defence  
 Deptt. of Defence Res & Dev  
 DRDO HQ,  
 New Delhi- 110011

Date \_\_\_\_ Month, Year

To,

The Director General Research & Development,  
 Defence Research & Development Organisation,  
 Min. of Defence,  
 DRDO HQ, New Delhi – 110 011

**Subject: Closure of Project “Project (Name) \_\_\_\_\_” (Project No)**

I am directed to convey the sanction of Director/CC(R&D)/DG (Cluster)/Secretary DR&D(*as the case may be*) for Closure of Project “**Name of Project**”(Project No. \_\_\_\_), sanctioned to (Lab Name) vide Govt. of India, Ministry of Defence letter no. (*Original sanction*) letter no. \_\_\_\_/\_\_\_\_/D(R&D) dated \_\_\_\_ Month Year, as amended vide corrigendum (*if any*) no. \_\_\_\_/\_\_\_\_/D(R&D) dated \_\_\_\_ Month Year, with effect from Month, Year.

2. The expenditure incurred on the said project is Rs. \_\_\_\_ Cr (Rupees \_\_\_\_ including FE Rs. \_\_\_\_ Cr (Rupees \_\_\_\_ against the sanctioned cost of Rs. \_\_\_\_ Cr (Rupees \_\_\_\_ including FE Rs. \_\_\_\_ Cr (Rupees \_\_\_\_).

3. Unique Sanction Code (USC): \_\_\_\_\_

4. This issues with the concurrence of Ministry of Defence (Finance / R&D) vide their Dy. No.\_\_\_\_/Dir/Fin/R&D dated \_\_\_\_Month, Year.

Yours faithfully,

( )

Under Secretary to the Govt. of India

**Ink Signed Copy to :**

DG (Cluster)  
 Director Lab – 02 copies  
 Director P&C - 02 copies  
 CGDA, New Delhi



PCDA (R&D), New Delhi  
CDA (R&D), Concerned

**Copy to**

Director of Audit, Defence Services, Delhi  
Addl FA & JS  
IFA (R&D), Concerned  
Director, DBF&A  
Director, DMM  
Director, CW&E

*Note: Closure letter shall be signed by authorized signatory of CFA.*

# CHECKLIST

**CHECKLIST 1**

**New Project Sanction**

**This check-list should be placed on the file on top of Detailed Project Proposal**

- 1 Project estimated cost is vetted by cost estimation committee/local finance authorities?  
(Yes/No)
- 2 User commitment for MM projects  
(Yes/No)
- 3 i) Minutes of the Peer Review Committee Meeting  
(Yes/No)  
*Recommendation of PRC on PEARL analysis (Initial MRL indices at the time of undertaking the project and likely MRL levels at the time of closure of the project)*  
*In case PRC has not been conducted details of approval of waiver of PRC.*  
ii) Whether the recommendations of Peer Review Committee have been implemented and proposal has been modified accordingly?  
(Yes/No)  
iii) Recommendation of the Cluster Council / DMC to undertake the project (please append the minutes)  
(Yes/No)
- 4 Detailed Feasibility Report with two pages Executive Summary  
(Yes/No)
- 5 Monitoring mechanism as per laid down guidelines of PPFM  
(Yes/No)
- 6 Major Milestones linking financial outlay and timelines (not more than six)  
(Yes/No)
- 7 PERT/GANTT charts  
(Yes/No)
- 8 Micro activity chart linked with defined timelines for six monthly intervals  
(Yes/No)
- 9 Manpower, Building space and Vehicle requirement if any  
(Yes/No)
- 10 Details of CARS, CAPSI, Consultancy, Sub-Projects, Training etc if proposed  
(Yes/No)

- |    |   |          |
|----|---|----------|
| 11 | Details of sub-projects indicating scope, cost and PDC enclosed                             | (Yes/No) |
| 12 | Procurement plan<br>(Necessary documents for EPC approval enclosed)                         | (Yes/No) |
| 13 | Risk Identification and mitigation plan   | (Yes/No) |
| 14 | Time Line Chart prepared  | (Yes/No) |
| 15 | Comments of Lab Director on ongoing project commitments                                     | (Yes/No) |
| 16 | SoC for sanction of project ( <b>Form 1</b> ), Para 14, flagged for signature of cluster DG | (Yes/No) |

**(Signature of Director PM of Cluster DG)**

**CHECKLIST 2**

**PDC Extension of the Project/Programme**

- |   |   |          |
|---|---|----------|
| 1 | Expenditure Details enclosed  | (Yes/No) |
| 2 | Reasons for not adhering to PDC enclosed  | (Yes/No) |
| 3 | List of activities to be carried out with revised milestones for the extended period of PDC enclosed                                    | (Yes/No) |
| 4 | Revised PERT/Gantt Chart for extended period of PDC enclosed  | (Yes/No) |
| 5 | Recommendations of highest monitoring committee for extension of PDC enclosed   | (Yes/No) |
| 6 | Details of project monitoring committees meetings planned as per the Govt. letter vis-a-vis held with their respective minutes enclosed | (Yes/No) |
| 7 | Remedial steps undertaken to avoid further PDC extension is enclosed  | (Yes/No) |
| 8 | General Assessment of Status (health) of Project enclosed   | (Yes/No) |

It is certified that points raised in check list has been taken into consideration and necessary information / papers have been placed in file.

**(Signature of Director PM, O/o Cluster DG)**

**CHECKLIST 3**

**Re-allocation of Funds & Project Cost Enhancement**

- 1 Expenditure Details - IC\_\_\_\_\_ (FE\_\_\_\_) enclosed (Yes/No)
- 2 **Re-allocation**
  - (i) Details of re-allocation of funds enclosed (Yes/No)
  - (ii) Reasons (Justification) for re-allocation of funds enclosed (Yes/No)
  - (iii) Recommendations of highest monitoring committee for re-allocation of funds enclosed (Yes/No)
  - (iv) Details of project monitoring committees meetings held (Yes/No)
- 3 **Cost enhancement**
  - i) Details of cost enhancement enclosed (Yes/No)
  - ii) Reasons for cost enhancement enclosed (Yes/No)
  - iii) Recommendations of highest monitoring committee for cost enhancement enclosed (Yes/No)
  - iv) Supporting documents (budgetary quotes, e-mail quotes etc) for cost enhancement enclosed (Yes/No)
  - v) Details of project monitoring committees' meetings held (Yes/No)
- 4 General Assessment of Status (health) of Project enclosed (Yes/No)

It is certified that points raised in check list has been taken into consideration and necessary information / papers have been placed in file.

**(Signature of Director PM, O/o Cluster DG)**

# **ANNEXURE**

## Lab Abbreviation for Project Allocation

ADA	Aeronautical Development Agency
ADE	Aeronautical Development Establishment
ADR	Aerial Delivery Research and Development Establishment
ANU	Advanced Numerical Research and Analysis Group
ARD	Armament Research & Development Establishment
ASL	Advanced Systems Laboratory
CAB	Centre for Air Borne System
CAIR	Centre for Artificial Intelligence & Robotics
CFE	Centre for Fire, Explosive and Environment Safety
CHE	Center for High Energy Systems and Sciences
CVR	Combat Vehicles Research & Development Establishment
DAR	Defence Avionics Research Establishment
DEA	Defence Electronics Application Laboratory
DEB	Defence Bioengineering and Electro-medical Laboratory
DFR	Defence Food Research Laboratory
DIB	Defence Institute of Bio-Energy Research
DIH	Defence Institute of High Altitude Research
DIPA	Defence Institute of Physiology & Allied Science
DIPR	Defence Institute of Psychological Research
DLJ	Defence Laboratory Jodhpur
DLR	Defence Electronics Research Laboratory
DMR	Defence Material Research Laboratory
DMSR	Defence Materials Research & Development Establishment
DRD	Defence Research & Development Establishment
DRDL	Defence Research & Development Laboratory
DRL	Defence Research Laboratory
DTR	Defence Terrain Research Laboratory



GTR	Gas Turbine Research Establishment
HEM	High Energy Materials Research Laboratory
INM	Institute of Nuclear Medicine & Allied Sciences
IRD	Instruments Research & Development Establishment
ITR	Integrated Test Range
JCB	Joint Cipher Bureau
LAS	Laser Science & Technology Centre
LRD	Electronics & Radar Development Establishment
MTR	Microwave Tube Research & Development Centre
NMR	Naval Materials Research Laboratory
NPL	Naval Physical Oceanographic Laboratory
NST	Naval Science & Technological Laboratory
PXE	Proof & Experimental Establishment
RDE	Research & Development Establishment
RCI	Research Centre Imarat
SAG	Scientific Analysis Group
SAS	Snow & Avalanche Study Establishment
SPL	Solid State Physics Laboratory
TBR	Terminal Ballistics Research Laboratory
VRD	Vehicles Research and Development Establishment

## Annexure II

## DRDO Labs (under Technology Clusters/Heads)

Naval Systems & Materials		Aeronautical Systems		Armaments and Combat Engineering Systems	Missiles & Strategic Systems	Electronics & Comn. Systems	Life Sciences	MED & Computational Systems	
NPOL	DMRL	GTRE	CABS	VRDE	DRDL	DEAL	DEBEL	ANURAG	CAIR
NSTL	DLJ	ADE		R&D EE	RCI	DLRL	DIPAS	SSPL	SAG*
NMRL	DMSRDE	ADRDE		SASE	ITR	LRDE	DIPR	MTRDC	JCB*
		CEMILAC*		DTRL	TBRL	IRDE	INMAS	SITAR Society [STAR-C (DARE®)& GAETEC (SSPL®)]	
				PXE	ASL	LASTEC	DRL		
*Regulatory & Certification functions with Corporate Hqrs. @ Functional coordination centre				ARDE		DARE	DIBER		
				CVRDE		CHESS	DFRL		
				HEMRL CFEES*			DIHAR DRDE		

## Certification Agencies:

- CEMILAC
- CFEES
- SAG

## HR Institutes:

- CEPTAM
- DESIDOC
- ITM
- RAC

## Deemed University:

- DIAT

**Abbreviations**

ACE	Armaments & Combat Engineering
AE	Approximate estimate
AEW&C	Air-borne early warning and control
AHSP	Authorised Holder of Sealed Particulars
ARDE	Armament Research & Development Establishment
ASR	Air Staff Requirement
ATP	Acceptance Test Procedure
BARC	Bhabha Atomic Research Centre
BE	Budget Estimate
BFA	Budget, Finance & Accounts
BTS	Build to specification
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CARS	Contract for Acquiring Research Services
CCR&D	Chief Controller Research & Development
CCR&M	Chief Controller Resource & Management
CCS	Cabinet Committee on Security
CDA	Controller of Defence Accounts
CDR	Critical Design Review
CEO	Chief Executive Officer
CFA	Competent Financial Authority
CGDA	Controller General of Defence Accounts
CI	Capability Index
CIDS	Chief of Integrated Defence Staff
CIDSS	Command Information & Decision Support System
CII	Confederation of Indian Industries
CP	Central Purchase
CPM	Critical Path Method
CSIR	Council of Scientific and Industrial Research
DAE	Department of Atomic Energy
DBFA	Directorate of Budget, Finance and Accounts
DDR	Detailed Design Review
DFR	Detailed Feasibility Report
DG	Director General
DHRD	Directorate of Human Resource Development
DIITM	Directorate of industry interface & Technology Management
DMC	DRDO Management Council
DoS	Date of Sanction
DP	Development Partner
DP&C	Directorate of Planning & Coordination
DPR	Detailed Project Report
DPSU	Defence Public Sector Undertaking
DD R&D	Department of Defence (Research & Development)
DRDO	Defence Research & Development Organisation

DRDS	Defence Research Development Service
DRONA	DRDO Rapid Online Network Access
DRTC	Defence Research Technical Cadre
DS	Distinguished Scientist
DSDM	Dynamic Systems Development Method
DST	Department of Science & Technology
DT&E	Developmental Test & Evaluation
DW	Deposit Works
EB	Executive Board
ECS	Electronics & Communication Systems
EOI	Expression of Interest
FADS	Finance Advisor Defence Services
FE	Foreign Exchange
FIMS	Free issue materials
FM	Finance Minister
FTM	Futuristic Technology Management
GS	General Staff
GSQR	General Staff Qualitative Requirement
HEMRL	High Energy Materials Research Laboratory
HQ	Head Quarters
HR	Human Resource
IC	International Cooperation
IDC	Integrated Defence Council
IDS	Integrated Defence Staff
IF	Infrastructure Facility
ISRO	Indian Space Research Organisation
JSQR	Joint Staff Qualitative Requirement
LATOT	License Agreement for Transfer of Technology
LP	Local Purchase
LS	Life Sciences
LSP	Limited Series Production
LTIPP	Long Term Integrated Perspective Plan
LTTPP	Long Term Technology Perspective Plan
MED	
&CoS	Micro Electronics & Devices and Computational Systems
MM	Mission Mode
MOD	Ministry of Defence
MOU	Memorandum of Undertaking
MRL	Module Readiness Level
MS	Management Services
MSS	Missiles & Strategic Systems
MTBF	Mean Time between Failures
NS&M	Naval Systems & Materials
NSQR	Naval Staff Qualitative Requirements
NSR	Naval Staff Requirement
OF	Ordinance Factory
OFB	Ordinance Factories Board
P&A	Pay & Allowances
P&C	Planning & Coordination

PA	Production Agency
PAR	Project Appreciation Report
PBP	Project Business Plan
PBS	Product Breakdown Structure
PCDA	Principal Controller of Defence Accounts
PDC	Probable Date of Completion
PDR	Preliminary Design Review
PEARL	Project Evaluation Assessment and Readiness Level
PEP	Project Execution Plan
PERT	Project Evaluation and Review Technique
PJMB	Project Management Board
PM	Project Monitoring
PMB	Programme Management Board
PMRC	Project Monitoring and Review Committee
PPA	Pre Project Activity
PPFM	Procedures for Project Formulation and Management
PRC	Peer Review Committee
PRI	Project Readiness Index
PS	Product Support
PSU	Public Sector Undertaking
QA	Quality Assurance
QR	Qualitative Requirement
QR&S	Quality Reliability & Safety
R&D	Research & Development
R&M	Resource & Management
RE	Revised Estimate
RFP	Request for proposal
RM	RakshaMantri
RRAT	Readiness, Review and Acceptance Team
RRC	Rama Rao Committee
S&T	Science & Technology
SAG	Scientific Analysis Group
SAM-C	System Analysis & Modeling Centre
SDLC	Software Development Life Cycle
SITAR	Society for Integrated Technology Application & Research
SMP	Stakeholder Management Plan
SoE	Statement of expenditure
SoW	Scope of Work
SRI	System Realisability Index
ST	Science & Technology
SWOD	Small Work Order Demand
TARB	Test Article Review Board
TBRL	Terminal Ballistics Research Laboratory
TCG	Technical Core Group
TD	Technology Demonstration
TEC	Technical Evaluation Committee
ToT	Transfer of Technology
TPC	Tender Purchase Committee
UATT	User Assisted Technical Trials

USC	Unique Sanction Code
MM-UT	Mission Mode (User Trials)
V&V	Verification & Validation
VCAS	Vice Chief of Air Staff
VCNS	Vice Chief of Naval Staff
VCOAS	Vice Chief of Army Staff
WBS	Work Breakdown Structure

## **Acknowledgements**

The revised Procedure for Project Formulation and Management 2016 (PPFM 2016) has been finalised after several deliberations and discussions.

Project Directors of various labs have provided in-depth comments which have been a valuable input in the formulation of PPFM 2016. Valuable suggestions from the office of cluster DGs and Director, Budget Finance & Accounts (DBF&A) have been received, which have been incorporated under the guidance of CCR&D (R&M).

We acknowledge with thanks, the advice and inputs from our financial advisors: Sh. RG Viswanathan, Addl. FA (RV) & JS; Ms. K Inderjeet Kumar, IFA Bangalore; Sh. Suchindra Misra, IFA Pune and Ms. Vandana Kumar, IFA Delhi.

The team from DP&C comprising of Dr. Rajio Singh, Scientist F, Sh. Sumit Goswami, Scientist F, Dr. Abhishek Yadav, Scientist D and Sh. Lalit Mohan, Scientist C have worked with dedication to ensure methodological compilation of the relevant guidelines.

The efforts from the team of DESIDOC towards publication of this document are acknowledged with thanks.

**Nabanita R Krishnan**  
Director  
Dte of Planning & Coordination

Directorate of Planning and Coordination  
Defence Research & Development Organisation  
DRDO Bhawan, Rajaji Marg  
New Delhi-110011

Designed, Edited & Printed by  
**DESIDOC**