# NAVAL AVIATION

# INDIGENISATION

## GUIDE BOOK

May 22

## FOREWORD

The Aviation arm of the Indian Navy (*IN*) operates and maintains about sixteen types of aircraft and their associated equipment. The *IN*'s aircraft inventory ranges from the vintage to the modern with a bulk of it from abroad. The need for self-reliance is obvious on any nation, and the Indigenisation efforts of the *IN*, embarked upon several decades ago, have yielded rich dividends. Several aircraft systems, Flight and Non-flight critical spares, aircraft tyres, batteries, minor consumables, Ground Support Equipment, etc. are now manufactured in the country by private Firms. A document called the 'Naval Aviation Indigenisation Roadmap 2022-2027' published by the *IN* (and available on its website) encapsulates the various items which are required to be indigenised. The two Naval Aircraft Yards at Kochi and Goa, along with the Naval Aircraft Servicing and Development Organisation (NASDO) at Goa and AAEHU Coimbatore, spearhead aviation's Indigenisation efforts. NAY (Goa) is responsible for Russian origin spares, NAY (Kochi) for Western Origin spares, Naval Aircraft Servicing and Development Organisation focuses on common equipment and AAEHU Coimbatore is tasked with exploring Indigenous repairs. These organisations are known as the 'In-house Indigenisation Committees (IICs)'.

Indian Firms who are keen on partnering with the Services for indigenous design, development and manufacture often find it difficult to understand the detailed procedures, policies and who or how to approach. This document therefore aims to serve as a concise 'Primer' and 'Guide' to answer these queries. Various sections of this book cover topics such as

Indigenisation Organisation in Naval Aviation, Indigenisation Process flow, Certification requirements, Make II procedure of Defence Procurement Procedure (DPP) and provide a comprehensive overview. Personnel seeking more detailed information on the subjects covered herein, are encouraged to read the other reference documents on those specific subjects, most of which are available in the open domain.

Overall, this document will assist indigenous Firms to participate in 'Make in India' and establishing a 'win-win' partnership with the Navy to promote self-reliance and indigenous capability.

**Jai Hind!**


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# CHAPTER - 1
# Indigenisation in IN Aviation - An Introduction

## Indigenisation in *IN* Aviation - An Introduction

Indian Navy is one of the largest in the world with an expanding Air Arm. Indian Navy operates over 16 different types of aircraft with wide variety of platforms and systems, ranging from legacy aircraft like Chetak to latest new generation Boeing P8I aircraft. There exists a mix of Russian, Western and a few indigenous platforms and systems with wide variety of inventory. The requirements of maintenance of new equipment, sustenance of legacy systems, development of new technologies, systems and subsystems and setting up of MRO facilities presents a huge Indigenisation potential for the Indian Private Industry. In context of naval aviation, ***Indigenisation is the process of achieving "self-reliance" utilising indigenous resources with an ultimate aim of developing substitutes so as to ensure that there is no dependence on suppliers from abroad.***

In Naval Aviation, activities towards indigenisation have been pursued for more than two and a half decades. **Defence Procurement Manual 09 Chapter 15** provides guidelines for the ***Design, Development and Fabrication Contracts*** along with the procedures followed by the Defence Authorities and departments for conclusion of contracts for design, indigenous development (including indigenisation activities) and fabrication of stores, equipment and spares required by the Defence Services.

### Decision for Indigenous Development.

IHQ MoD (Navy), Headquarters Naval Aviation (HQNA) and the In-house Indigenisation Committees (IIC) for Indigenisation of

air stores viz. NASDO Goa, AAEHU Coimbatore and the IICs at Kochi and Goa assess the economic viability of indigenous manufacture / repairs of a defence item in the civil sector in terms of volume, likelihood of future requirement and economies of scale, residual life of the equipment / item and the requirement over a long period (3-5 years).

**Partnership with Private Sector**.

The Indian private sector Industry today offers scope for their greater involvement in the Defence Sector and possesses the requisite skills and infrastructure for undertaking defence production and is willing to invest / share the cost of setting up of such infrastructure. The industry is therefore encouraged to make such investment by working out the minimum Order Quantity to maintain the financial viability of development within the desired time schedules. As regards to high technology complex systems, projects under this category are identified, to be undertaken by Raksha Udyog Ratnas (RURs) /Indian Industry / DPSUs / OFB / Consortia on a level playing field. Outsourcing of development of equipment / systems having high technology content is considered on the lines of parallel development for which the cost is shared with the vendors.

**Plan for Indigenisation**

***The Naval Aviation Indigenisation Roadmap 2022-27*** released in Mar 22 encapsulates the items under the ambit of the IICs, to be indigenised in the next five years. About 40 Flight Critical (FC) and 466 Non Flight Critical (NFC) spares have been identified covering all inventories. The document is available in

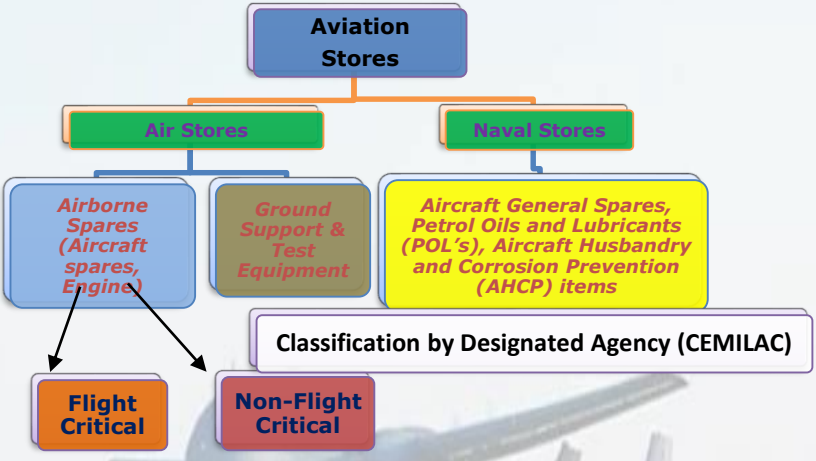
open domain and can also be accessed at Indian Navy website ***www.indiannavy.nic.in***

## CHAPTER-2
## An Overview of Airstores Indigenisation

## An Overview of Air stores Indigenisation

### Classification of Naval Aviation Stores

Stores for Naval Aviation purposes fall under two main categories viz Air Stores and Naval Stores. Air stores comprise of spare parts of aircraft, engines, aircraft associated systems ground support and test equipment all of which are used for aircraft servicing, maintenance and repair. Naval Stores consists of stores specifically used for aircraft use, such as Aircraft General Spares, Petrol Oils and Lubricants (POLs), Aircraft Husbandry and Corrosion Prevention (AHCP) items and other such stores used for servicing, maintenance and repair of naval aircraft. Air Stores directly affect the performance of an aircraft and are thus required to confirm to specific aeronautical standards as stipulated. Air stores are required to be supplied accompanied with a conformity certificate from the OEM/ supplier. *As part of the procurement procedure, air stores requiring inspection are to be inspected and certified by Naval/ Regional Aeronautical Quality Assurance Service (NAQAS / RAQAS)* so as to ensure the items supplied meet the stipulated conditions. Airborne stores are further classified as *'Flight Critical' / 'Non Flight Critical'* by designated agency CEMILAC undertaking classification considering all technical aspects relevant to applicability and usage of the item while undertaking categorization.




***Naval Aviation Stores Classification***

## Key Terms & Aspects related to Indigenisation

- ***Indigenisation*** Ingenious application of available In-country technology and resources in developing substitutes for imported equipment / items through reverse engineering by a reliable source of supply.

- ***Flight Critical (FC)*** Those items whose malfunction would jeopardize the airworthiness / safety of the aircraft and/or crew in flight are covered under Flight Critical. *Items fitted on engine, flight controls, fuel systems, flight instruments generally belong to this category*.

- ***Non Flight Critical (NFC)*** Those items whose malfunction would not jeopardize the airworthiness/ safety of the aircraft and/or crew in flight are covered under Non Flight Critical. *Aircraft General Spares and non-critical items pertaining to airborne stores, GSE items, tools, test equipment generally belong to this category.*

- ***Airworthiness*** Airworthiness is the continued capability of the aircraft/equipment to perform satisfactorily and fulfill mission requirements, throughout the specified life of the aircraft / equipment in the prevailing environments with acceptable levels of safety and reliability.

- ***DDPMAS (Procedure for Design, Development and Production of Military Airborne Stores)*** Document published by the CEMILAC under Ministry of Defence (DRDO) that lays down the requirements for design, development and production of airborne equipment and materials and aircraft general spare parts

- ***DDPIL (Procedure for Design, Development Production and Inspection of Electronic Equipment)*** Document published by published by the Ministry of Defence (Defence Production and Supplies) that contains certain provisions also provide guidelines for indigenisation of electronic items.

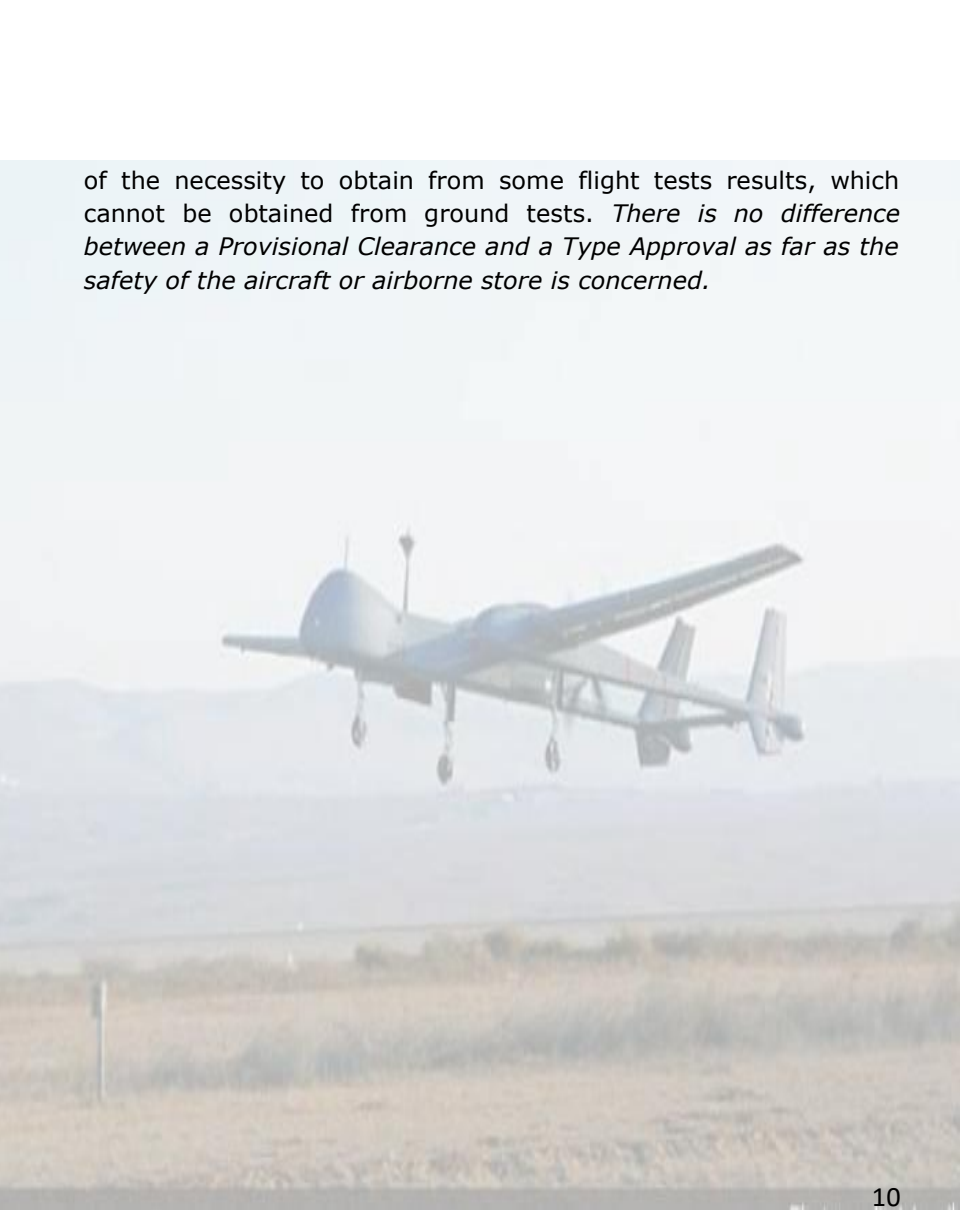
- ***Certification / Approval*** All airborne items need to be certified and approved for airworthiness before use on military aircraft. *The authority for approval, however, differs for different*

*items*. In general, where an item of raw material, Aircraft General Spares (AGS) parts, airborne equipment or component is manufactured to defined drawings, material specification and processes, and already has the approval by certifying authorities elsewhere, a fresh Type Approval may not be necessary. If the item cannot be produced exactly to the specification, the approval for airworthiness has to be obtained from Center for Military Airworthiness and Certification (CEMILAC). In cases where the items developed are *Non Flight Critical* and such spares are indigenised without deviations as per the indigenisation process, *approval/ certification is accorded by HQNA.* However in the case of *Flight Critical Items*, *approval by CEMILAC / RCMA (Regional Centre of Military Airworthiness) is essential*.

- ***Type Approval*** A certificate issued for flight/ mission critical items, by the Regional Director RCMA /Chief Executive, CEMILAC to the effect that the store under reference meets all design specifications and test requirements laid down by CEMILAC. The type approval is issued after the vendor submits a full Type Record with all relevant documents, to the satisfaction of CEMILAC.

- ***Provisional Clearance*** A Provisional clearance is issued by the approving authority (one of the RCMAs) for a limited period, pending issue of final approval. It is issued to the effect that the store under development meets all the laid down specifications and test requirements with the exceptions stated there in. It is issued because documentation is pending, or because some of the long life cycle tests (such as fatigue tests) are pending or because

of the necessity to obtain from some flight tests results, which cannot be obtained from ground tests. *There is no difference between a Provisional Clearance and a Type Approval as far as the safety of the aircraft or airborne store is concerned.*



# CHAPTER - 3
# IN Aviation Indigenisation Organisation

## *IN* Aviation Indigenisation Organisation

There are a number of agencies involved in Indigenisation process of Naval Aviation stores. A brief on role, tasks and organization of these agencies is discussed here.

### *Naval Agencies*

- ***Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD(N)}***

Directorate of Air Projects & Plans (DAPP) at IHQ MoD (N) is the nodal directorate responsible for coordinating all matters related to Indigenisation. The directorate formulates policy guidelines and roadmap for indigenisation with well-defined objectives and targets in consultation with HQNA and also represents IHQ MoD (Navy) on various committees dealing with research, development, cataloguing, Standardisation and indigenisation of Aircraft and Air Equipment.

- ***Headquarters Naval Aviation (HQNA)***

Headquarters Naval Aviation is the organisation for all policy decisions on Indigenisation of Air Stores in Naval Aviation in consonance with the policies and plans of IHQ MoD (Navy). In addition, HQNA promulgates Indigenisation Task for IICs considering various factors including recommendations received based on the existing inventories, demands by units, obsolescence issues, non-production or non-availability of aircraft spares, long

delay in import of spares and items required for introducing Naval Service Modifications

## ➢ *In-House Indigenisation Committee (IIC)*

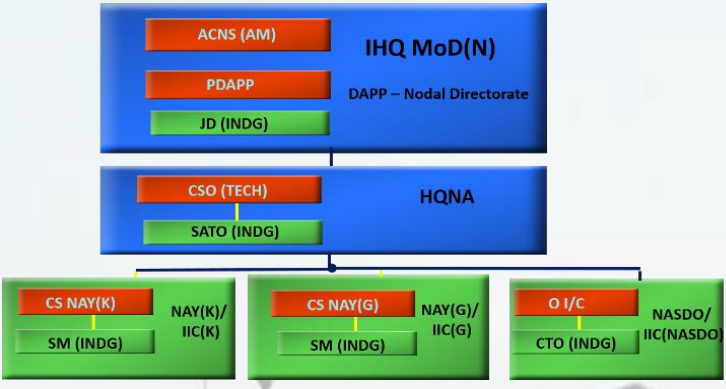
Three In-house Indigenisation Committees established at Naval Aircraft Servicing Development Organisation (NASDO), Goa and at Naval Aircraft Yards at Goa and Kochi are responsible for indigenisation activities as per the tasking of Headquarters Naval Aviation. The responsibilities of each organisation and the composition of the In-house Indigenisation Committee are as follows:-

- ✓ ***NASDO (Goa)*** NASDO (Goa) is responsible for indigenisation of all common use equipment.
- ✓ ***NAY (Goa)*** NAY (Goa) is responsible for indigenisation of aircraft specific spares and equipment including ground support equipment and specialist vehicles for all eastern origin aircraft viz. Kamov 28 and 31, IL-38SDand MiG 29K.
- ✓ ***NAY (Kochi)*** NAY (Kochi) is responsible for indigenisation of all aircraft specific spares and equipment including ground support equipment for western and indigenous origin aircraft viz. Dornier, P 8I, Seaking, Chetak, UH-3H, UAV, ALH & PTA.
- ✓ ***AAEHU*** IIC (AAEHU) is responsible for indigenous repairs and is to coordinate with DASE / IHQ and HQNA in identifying

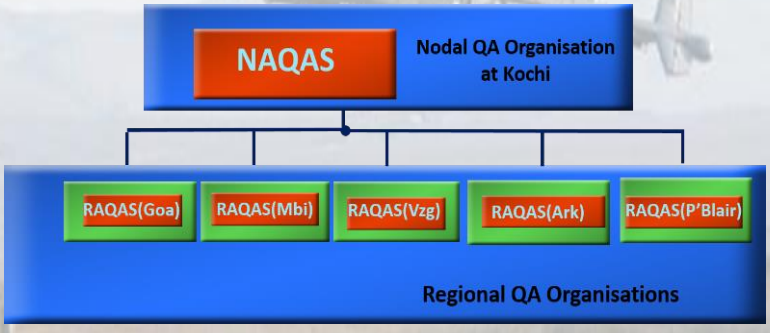
appropriate industry partners to undertake ROH of rotables. The In-house Indigenisation Committee will comprise of Officer In-charge AAEHU who will be supported by reps of NLC (Bengaluru), NLC (Kanpur), NLC (Nasik), NLC (Chandigarh), NLC (Barrackpore) & NLC (Hyderabad) who would be operating as 'Indigenous Repair Cells' in their respective zones of operation.

- ***Quality Assurance Agencies (NAQAS /RAQAS)***

Quality Assurance is a very important aspect of indigenisation so as to ensure that the item being developed meets the laid down specifications and is a true equivalent of the original item. Naval Quality Assurance organisations viz NAQAS at Kochi as the nodal agency and RAQAS at Goa, Mumbai, Arakkonam, Visakhapatnam and Port Blair closely associate themselves with the development activities so as to ensure quality products.




*Indigenisation Organization Chart*




*QA Organization Chart*

***Non Naval Agencies***

- ***Centre for Military Airworthiness and Certification (CEMILAC)***

The Chief Executive, CEMILAC is the Approving or Type Certifying Authority for all Flight Critical airborne stores. He is assisted by the various Regional Centers of Military Airworthiness (RCMAs), in fulfilling the above responsibilities. The role of Design authorities and Quality Assurance vary, depending on the type and complexity of item under development. The two regulatory authorities, playing a major role in indigenization of aviation stores are:-

- ✓ *Chief Executive, Centre for Military Airworthiness and Certification (CEMILAC)*
- ✓ *Director General Aviation Quality Assurance (DGAQA)*

- ***Approving Authority for Inspection and Quality Control DGAQA)***

The Inspection and quality control authority is responsible for the quality assurance during development activities and series production. The Director General of Aviation Quality Assurance (DGAQA), assisted by the Chief Resident Inspector (CRI) undertakes this function.

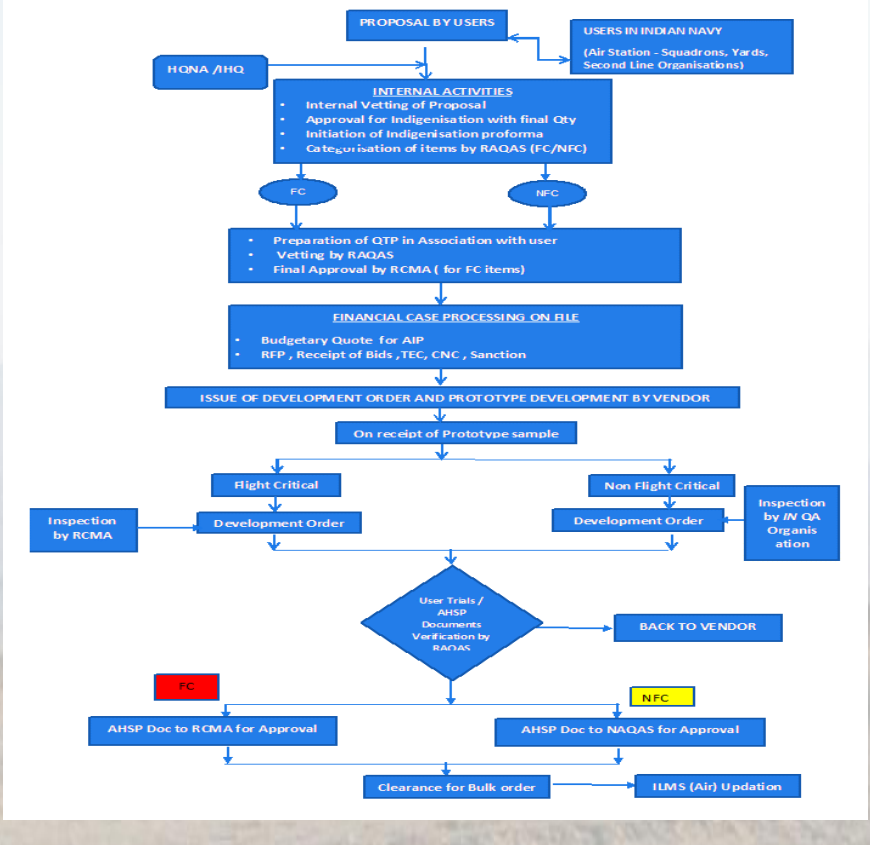
# CHAPTER - 4
## Indigenisation Process Flow

## Indigenisation Process Flow

The process of indigenisation involves the following:-

- ***Identification of items for indigenisation***
- ***Collection of Samples and their categorisation***
- ***Preparation and approval of drawings***
- ***Development of Prototype Sample and Approval of Trial / Test schedule***
- ***Fitment and Functional Testing of Prototype***
- ***Allotment of new Part Numbers***
- ***Type Approval***
- ***Sealing of particulars with Authority Holding Sealed Particulars (AHSP).***
- ***Updating of computerised inventory management system ILMS(Air)***

## Indigenisation Process Flowchart



## Selection of Items for Indigenisation / Development

The first and the foremost step in the process of indigenisation of air store in naval aviation would be to determine precisely what is required to be indigenised. This is broadly based on guiding factors such as *non-availability of the item from suppliers / vendors* and *high cost of supply*. Indigenisation tasks are prepared based on for each aircraft. In addition, considerations like obsolescence of items due non-production by the Original Equipment Manufacturer, imposition of sanctions on supply of military hardware, long lead time in procurement from abroad, exorbitant price tag on the items etc., may override priorities from time to time on a case to case basis.

*Each item included in the indigenisation task is evaluated to establish technical and economic feasibility of indigenisation*. The issues that are examined for technical feasibility are criticality of the item from flight safety aspect, complexity of the item from manufacturing angle, Indigenous availability of material required for manufacture and availability of technology required for manufacture. The issues that are examined for economic feasibility are economic viability in terms of quantities required, cost of imports, requirements being recurring/non-recurring, availability of stocks.

To progress with indigenisation, airborne stores is further categorised into the following three groups:-

✓ Equipment / Items for which technical specifications, manufacturing drawing, duly approved by approving authorities is available. *These items call for the provisions of Production Qualification Tests, to assess the manufacturing agencies' capability to produce the item.*

✓ Items for which technical specifications, manufacturing drawing duly approved by approving authorities is not available. *These items call for the provisions of Type Approval Tests, with the aim of proving the Design parameters, material specification, process etc. are suitable with an aim to progress with indigenisation.*

✓ Items for which technical specifications, manufacturing drawing would need to be evolved based on samples and on 'Reverse Engineering'. *The items under this category are subjected to limited type approval tests, since these are not flight critical items, and need not be as rigorous as on the Type Approval Tests.*

## Collection of Samples and their Categorisation

Based on the indigenisation task, serviceable samples of the items are forwarded to the respective Developing Agencies (IIC) for undertaking feasibility study. The IICs obtain duly completed Indigenisation Proforma with all technical details (design aiding data) from operational units which are subsequently forwarded to NAQAS / RAQAS for endorsing the categorization of the item. *The item is then categorized as flight critical / non-flight critical (FC / NFC) by NAQAS / RAQAS* and Proforma returned to the appropriate IIC for progressing indigenisation. A detailed technical study is then carried out by the IIC by collating *all available details of the samples like drawings, material specifications, design aiding*

*technical data, manufacturing process, tolerances, surface finish hardness, environmental requirements and logistics / financial* data such as cost, Provisional Officer's Valuation, minimum quantity requirements, anticipated requirements in future etc. Accordingly, a decision is arrived at by the IIC to take up indigenisation of the items either In-House or through outside vendors.

## Preparation and Approval of Drawings

It is essential to prepare precise drawings of the parts planned for indigenisation. The drawings of items were not available, are to be prepared using reverse engineering and by evaluating dimensions through micrometry of disassembled parts. The Quality Assurance agencies (NAQAS / RAQAS) associates in the preparation of drawings for providing details of micrometry and permissible tolerances on the dimensions. In case where use of standard tolerance charts is not feasible, these are decided on the basis of statistical measurements of a reasonable sized batch of items available in stock and by analysis of type of the fit indicated for the function for which the item is used. *However, the requirement to prepare drawings may be dispensed with, in cases where parts under development are mere substitutes by standard products like bearings, ICs, etc*. The developed drawings are to be approved by the following agencies before the development of the proto-types can commence:-

- ✓ NFC items developed In-House - Yard /Station QAC
- ✓ NFC items developed by vendors - NAQAS/ RAQAS

- ✓ FC items developed by vendors / Yards- Dir RCMA /Chief Resident Engineer / Chief Resident Inspector (CRE/ CRI)

## Development of Prototype Sample and Approval of Trial / Test Schedule

The prototype is to be manufactured / fabricated according to the approved drawings and specifications. In parallel, the qualification and acceptance test schedules for the prototype trials, acceptance and bulk production are also prepared by the developing agency. *The qualification test schedules for the prototype should include use of correct materials, dimensional checks, usage of correct procedures during manufacture and functional checks for mechanical items.* For rubber items, it would also include compatibility of medium with rubber compound. For electronic items, effect of environment is to be included. The acceptance test schedules for batch production, though not as elaborate as those for testing of proto types, must include all-important aspects. The test schedules are to be duly approved by the following agencies:-

- ✓ NFC items developed In-House - NAQAS / RAQAS
- ✓ NFC items developed by vendors - NAQAS/ RAQAS
- ✓ FC items developed by vendors / Yards- Dir RCMA /CRE/ CRI

## Fitment and Functional Testing of Prototype

The prototypes once developed, are to be subjected to fitment checks and tests as per the drawing and / or test schedule and if found

acceptable are functionally tested on aircraft / system/test benches / rigs. A representative of the appropriate inspection agency is to be associated in this exercise of functional testing.

*The functional test reports and fitment check report are to be part of documents put up for Type Approval / certification in the case of flight critical spares.*

## Allotment of new Part Numbers to Indigenised Air Stores

Once the fitment and functional tests are satisfactory, the item is accorded an indigenised part number while preparing the Type Approval Performa on completion of all basic development activities including specifications, drawings, tests and trials.

## Type Approval

The developing agency processes and forwards all relevant documentation from the beginning of indigenisation process including drawing material specifications, approved test schedules, prototype trial report etc to the type approving authority as indicated below for according type approval: -

- ✓ NFC items developed In-House - NAQAS / RAQAS
- ✓ NFC items developed by vendors - NAQAS/ RAQAS
- ✓ FC items developed by vendors / Yards- CEMILAC

## Sealing of particulars with AHSP

On obtaining type approval, all the technical documentation required for indigenisation / development are to be sealed and held with the AHSP for all items indigenised by the naval agencies. Alterations to the sealed particulars, if necessary, would require fresh approval of the Type Approving authority.

## Updating on computerized inventory management system ILMS (Air)

On completion of the indigenisation process and sealing of particulars, the AHSP reference, type approval reference and all other indigenisation details are to be updated on-line in the ILMS (Air) system through the indigenisation module by the respective IIC so as to have the item on the inventory and to enable the respective MO to initiate procurement.

# CHAPTER - 5
## Selection Of Vendors

## Selection of Vendors

### Identification of Vendors

Identification of appropriate vendors is a vital step. Initial efforts are made to utilize In-house facilities and capabilities. *If not available, the vendors who are registered with the naval indigenisation agencies viz NASDO (Goa) or IIC's at Kochi / Goa / AAEHU (Coimbatore) are approached*. In the event of suitable vendors not being available, *vendors registered by other organisations viz IAF BRDs, DGAQA / DGAQA / DRDO DPSUs etc* are also approached. Unregistered firms are considered taking into account their infrastructural facilities, capacity, technical competence and financial standing. Firms of national repute are considered based on self-certification, with the approval of competent authority.

### Development through Trade / Private Firms

The Yards approach trade only for items that are beyond their capability and / or capacity. Efforts are made to load high value and economically attractive items to trade so as to attract more vendors and generate wider vendor base. *While taking up indigenisation, the developing agencies evaluate and register the indigenous vendors in accordance with guidelines laid down in JSG-15 Joint Services Guide (Assessment and registration of vendors for Defence)*. A sample vendor registration form is placed at **Appendix 'D'**.

## Development of Source by Inviting Applications for Enlistment

The following procedure is followed towards development of sources for taking on indigenisation tasks:-

- Open advertisement is placed on the internet and advertised in leading newspapers every year, in respect of different products /components, for enlisting firms willing to participate in tenders issued by the Department / Organisation. The minimum number of products /components required to be submitted by the vendor for evaluation and likely demand for those components for the next two to three years is indicated in the advertisement.

- Interested firms may visit the factory/workshop/depot as indicated in the tender to see the product/ component required to be developed. Thereafter, the firms showing interest in developing the product / component are asked to submit the details of infrastructure available with them, as per the documents prescribed for vendor registration.

- The infrastructure details submitted by the firms are studied by a team of officers constituted to assess their manufacturing capability to verify their genuine potential for developing the product/ component.

- Firms found capable of developing the product/component are asked to submit the required number of samples (as advertised) of the identified product(s). On acceptance of samples, the firm will be eligible for participating in the tenders for the said component / product.

## Capacity Assessment

Capacity assessment / verification of firms which are not registered is to be undertaken by the agency processing the indigenisation so as to ensure that the firms identified are capable to develop prototype air stores or / and equipment and systems as required. Once a firm has successfully executed an order within +/-5% tolerance both in terms of quality and quantity, it is encouraged to get registered.

## Vendors Registration

Generally Request for Proposals (RFP) / Tender Enquiries are floated to as many vendors as possible and are also published on Indian Navy website. For this purpose of issuing RFPs, NASDO (Goa) and IICs have a list of known vendors for different categories of spares. This list contains both the existing / proven and prospective vendors for different categories of spares. The vendor base is continuously updated based upon interactions during various seminars followed by registrations. The firms whose registrations get approved are duly intimated.

# CHAPTER - 6
## Development Under 'Make' Category

## Development under 'Make' Category

This chapter intends to give a comprehensive overview of 'Make' category of DAP 2020 and to serve as an acquaint for the private industry on the opportunities therein. For details of procedures, private firms are encouraged to refer DAP -2020 available at ***www.mod.gov.in***

### Background

The "Make in India" initiative of the Government of India, aims to promote the manufacturing sector and increase the contribution of manufacturing output to 25% of GDP. Defence sector is prominent among the 25 sectors of industry covered under the "Make in India" initiative. The "Make" procedure seeks to address the multiple objectives of self-reliance, wider participation of Indian industry and provide impetus for MSME sector. Only Indian vendors including Association of Persons (AoP) are eligible for participation under "Make" program of acquisition. Successful development under this scheme would result in acquisition, from successful Development Agency/Agencies (DA/DAs), through the "Buy (Indian-IDDM)" category with indigenous design and development and a minimum of 50% IC, by inviting commercial bid and thereafter following the procedures detailed in Chapter II of DPP.

### "Make" Category Classification

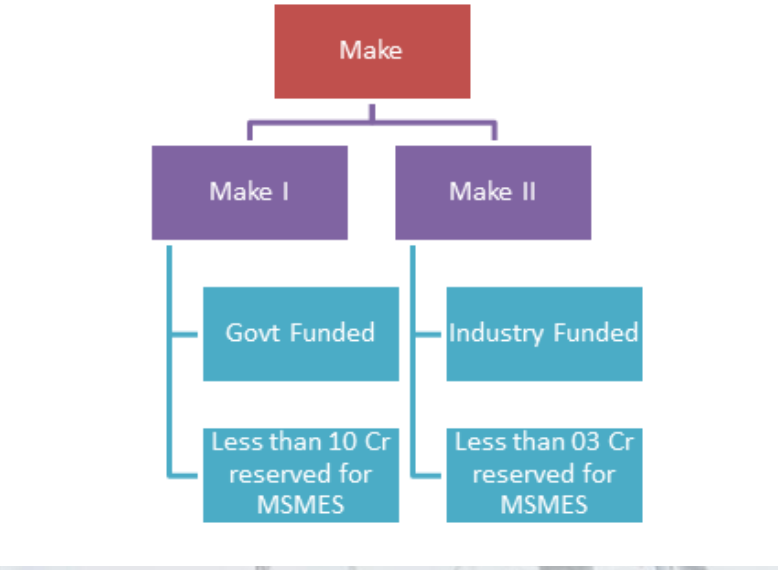
The "Make" category is divided into the following sub categories.

- ***Make-I (Government Funded)***

Projects under „Make-I“ sub-category will involve Government funding of 90%, released in a phased manner and based on the progress of the scheme, as per terms agreed between MoD and the vendor.

- ***Make-II (Industry Funded)***

Projects under Make-II category will involve prototype development of equipment/ platform/system or their upgrades or their systems/sub-assembly/assemblies/ components with a focus on import substitution, for which no Government funding will be provided for prototype development purposes.



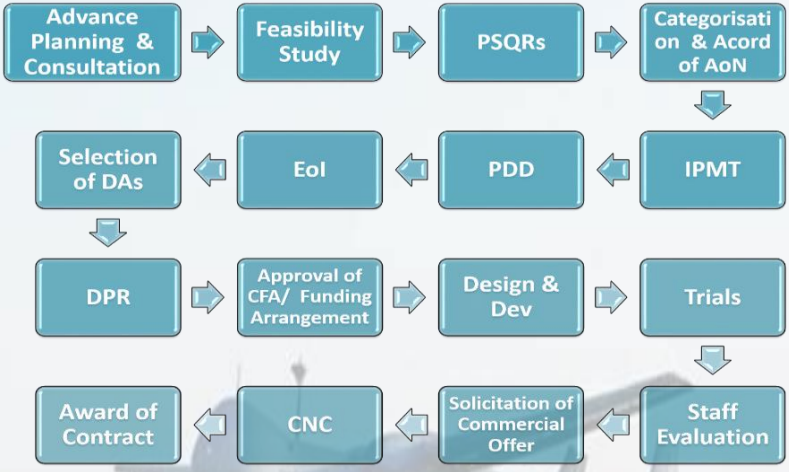

***Classification of "Make" Category***

**Development and Acquisition Process under "Make"Category**

The acquisition process under Make Category involves various following stages as illustrated below

- ***Advance Planning and Consultations***
- ***Feasibility Study***
- ***Preliminary Services Qualitative Requirements (PSQRs)***

- ***Categorisation and accord of Acceptance of Necessity (AoN) by the competent body***
- ***Constitution of Integrated Project Monitoring Team(IPMT)***
- ***Preparation of Project Definition Document (PDD)***
- ***Expression of Interest (EoI)***
- ***Selection of Development Agency (ies) (DAs)***
- ***Detailed Project Report (DPR)***
- ***Approval of CFA and Funding Arrangements***
- ***Design and Development of Prototype***
- ***User Trials by SHQ***
- ***Staff Evaluation***
- ***Solicitation of Commercial Offers***
- ***Commercial negotiations by Contract Negotiation Committee CNC)***
- ***Award of Contract***




***Development and Acquisition Process***

## *Key Aspects of "Make" Process Stages*

### Advance Planning & Consultation

- Identify Potential Projects based on LTIPP or otherwise
- Collegiate discussion with DRDO, DDP, Industries
- Forward list of potential 'Make' projects along with PSQRs to HQ IDS
- Categorization
- Annual Acquisition Plan (AAP) – Make (Ch I of DDP)

## Feasibility Study

**Feasibility Studies of Projects under AAP – 'Make'**

**Stakeholders: DRDO, HQ IDS, DDP, Finance**

**Feasibility Study will cover**

- Long term interest of Ministry of Defence
- Prelim Assessment of enabling tech, Industry Capability
- Estimated Time Period for Dev
- Suggested Sub Category
- Number of DAs to be selected
- Exit Criteria

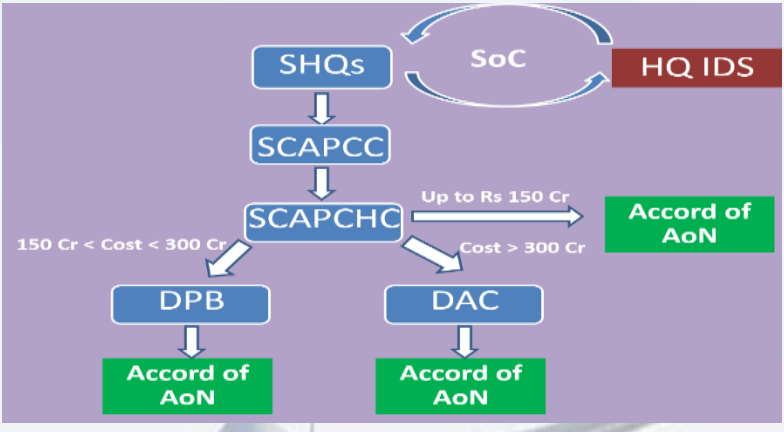
## Categorisation and accord of Acceptance of Necessity (AoN) by the competent body

**AoN Cost =Cost of prototype dev + Cost of Procurement**

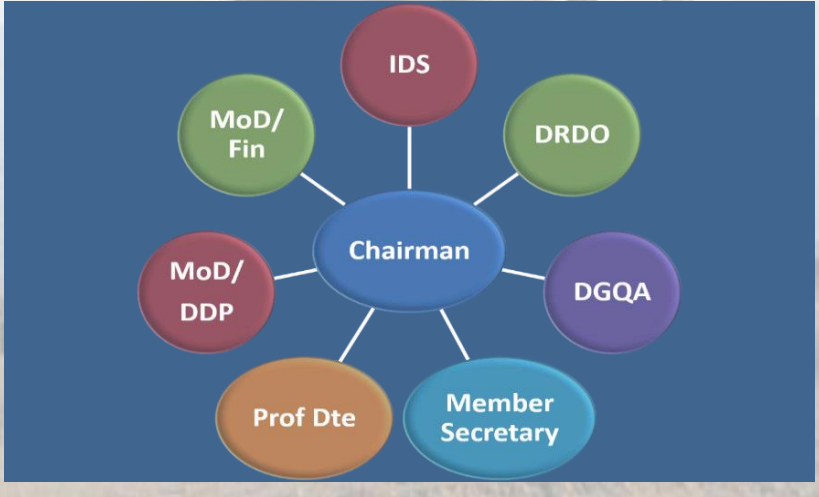
**Validity for AoN: One year**

**In case EoI not issued within 01 year, move case for revalidation of AoN with due justification**

**AON issued within one year by retracted later: EoI need to be re issued within 06 months of retraction**




## Constitution of Integrated Project Mo nitoring Team (IPMT)



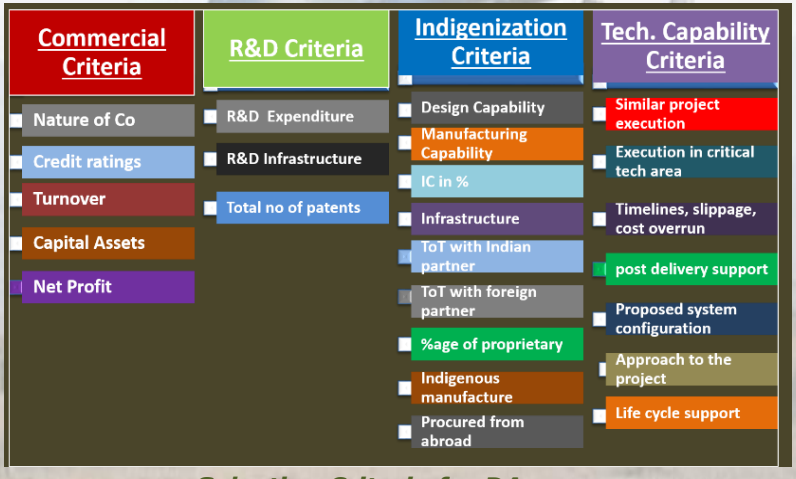
- DDP/ SHQ to constitute IPMT post accord of AoN
- Rep from SHQ, HQ IDS, DRDO, DDP, DGQA, Advisor(Cost), Mod(Fin)/IFA
- IMPT shall submit Six monthly progress report to DPB through PSO
- IMPT responsible for
  - PDD, Shortlisting of Companies/ issuing EoI, Assessment of EoI response, Evaluation of DPR, Prep of sanction order, obtaining CFA approval, monitoring project

## Preparation of Project Definition Document (PDD) and Expression of Interest (EoI)

- IPMT to prepare PDD & to be approved by PSO concerned
- PDD as guidelines for formulation of DPR
- IPMT to shortlist vendors for issue of EoI
- EoI to be approved by PSO concerned and to be issued to shortlisted vendors
- Evaluation assessment weightage criteria/ sub criteria to be detailed in EoI

## Selection of Development Agency (ies) (DAs)

- Assessment of EoI response based on approved criteria
- Selection to the extent possible based on self certification
- The selection list to be forwarded to DPB
- DAs to submit DPR including cost estimates
- DAs may collaborate under intimation to SHQ




*Selection Criteria for DAs*

## Approval of CFA and Funding Arrangements

| Description | CFA |
|---|---|
| Project Cost up to Rs 50 Cr | Secretary (DP) |
| Rs 50 Cr <Project Cost <=Rs 100 Cr | RM |
| Rs 100 Cr <Project Cost <=Rs 200 Cr | RM & FM |
| Rs 200 Cr <Project Cost | CCS |

- IPMT shall forward draft Project Sanction Order to DDP
- Sanction would be obtained by DDP
- Funds under "Make Procedure Prototype Dev "

## Funding of Make Projects

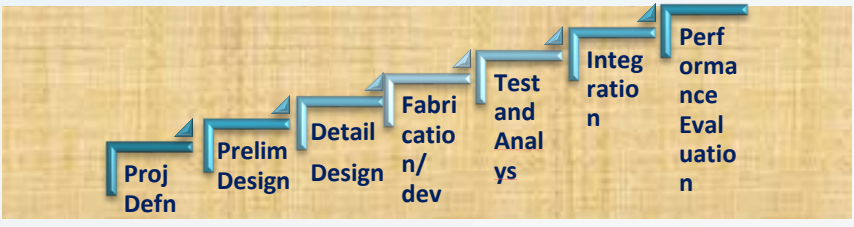
### *Make I*

- 90% by MoD + 10% by DA
- 20% of total prototype dev cost as Bank Guarantee
- If commercial RFP is not issued within 02 yrs, DA(s) will be entitled for balance 10%

### *Make II*

- No reimbursement of Dev Cost

## 'Make I' Step Up Process




## *Development and Development Process under "Make II" Sub- Category*

- **Advance Planning**.
  - AIP by Sec (DP)
  - No project would be retracted due to technology available with DRDO
- **AAP**. Make II < 150 Cr automatically included in AAP
- **Feasibility Studies**. Criteria, Nos of DAs
- **AoN**. Valid for six months only
- **IPMT/ Renamed as PFT**.
  - SHQs to constitute PFT prior fielding SoC
  - No members from DRDO, HQ IDS

- ✓ PDD. *Not required*
- ✓ Issue of EoI.
  - *On websites inviting Company(ies)*
  - *In addition issued to Companies who showed interest*
- ✓ DAs. *All shortlisted companies will be called DA.*
- ✓ Project Sanction Order.
  - *Sanction would be obtained by PFT from VCNS*
  - *PFT will issue sanction order with 'Nil' financial implication*

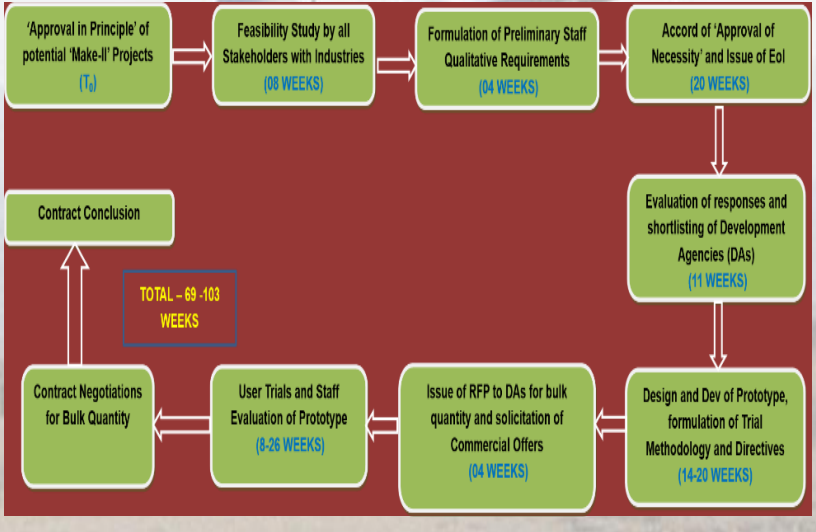
- **Time Overrun**
  - may be accorded by VCNS on recommendationof Head Make PMU
  - In case single vendor offered the prototype within stipulated timeline, not more than two extension will be accorded and case will be single vendor case (SVC)
- **IPRs**.
  - DA shall retain IPR
  - Govt shall have March-in rights
- **Timelines**.
  - timelines till placement of orders, reduced from 126 – 45.
  - timelines for Prototype Development and Evaluation 24-60 weeks

***Key Aspects of "Simplified Make II" Procedure***

- ***AIP by Sec (DP)***
- ***No project would be retracted due to technology available with DRDO***
- ***IPMT Renamed as Project Facilitation Team (PFT)***
- ***PFT to act as interface between SHQ and Industry***
- ***Conversion of PSQR to SQR prior commencement of trial***
- ***AoN valid for six months only***
- ***Feasibility Study including selection of Das***

- ***EoI issue on websites inviting Company(ies) and in addition issued to Companies who showed interest***
- ***At trial, no changes should be suggested which require re-design***
- ***Issue of commercial offer in consultation with SHQ***
- ***DA shall retain IPR***
- ***Govt shall have March-in rights***

## ***"Simplified Make II" Process Flow & Timelines***



**Appendix A**

## NAVAL TEST FACILITIES AVAILABLE FOR USE BY PRIVATE SECTOR

*This page lists the Laboratory Testing facilities that are available for use by private firms. For more information regarding guidelines, registration, procedure and terms & conditions please refer* ***https://www.indiannavy.nic.in/content/test-facilities-available-use-private-sector***

| Unit | Address & Contact Details | Facilities Available |
|---|---|---|
| Naval Aeronautical Quality Assurance Service | Controller Quality Assurance (Facility) NAQAS<br>Naval Base<br>Kochi -682004<br>Tel : 0484-2873658, 0484 - 2873652<br>Email :*nagas@navy.gov.in* | ✓ ***Calibration Facility - Electro Technical Calibration Facility***<br>✓ ***Mechanical Testing And Calibration Facility***<br>✓ ***Petroleum Testing And Analysis Laboratory*** |
| Naval Dockyard, Visakhapatnam | AGM(QA) / Manager (Lab)<br>Naval Dockyard<br>Visakhapatnam<br>Andhra Pradesh – 530014 | ✓ ***Material composition analysis of Ferrous metals and alloys***<br>✓ ***Material composition analysis of Non-*** |

Tel : 0891-2704738, 2816702
Email : ***encasdmit-navy@nic.in***

- ***Ferrous metals and alloys***
- ✓ ***Non Destructive Testing***
- ✓ ***Advanced Lub Oil Testing (Wear Elemental Analysis)***
- ✓ ***Mechanical Testing of Materials (Tensile, Shear, Spring and Hardness Test)***
- ✓ ***Static Load Deflection/ Compression testing of Shock and Vibration Mounts/ Dampers***

**Appendix B**

## PROFORMA
## VENDOR PRE-QUALIFICATION INFORMATION

(To be submitted by the vendor for initial assessment)

1. Name of the Firm :
2. Address (a) Registered Office :
   (b) Factory / works :
3. Year of establishment / incorporation :
4. Telephones / Tele fax / mobile / E-mail :
5. Details of items currently manufactured along with Specification details :
6. Details of defence item for which assessment desired and registration with NASDO is being sought

   (a) Involving Design & Development :
   (b) Production / Processing :
   (c) Any other type with details there of :
7. Category and range of plant and Machinery installed :
8. Capability in respect of:

   (a) Design and Development :
   (b) Manufacturing :
   (c) Quality control and testing :
9. Details and category of manpower employed :
   (Attach details on separate sheet)

| | | |
|---|---|---|
| 10. | Details of registration with any other Defence Establishment, Central Govt. establishment | : |
| 11. | Turn over during last three years | : |
| 12. | Any other relevant information e.g. Collaboration Quality Certificate, accreditation etc. | : |

(Attach copies of certificates)

Seal of the Firm
Place:
Date:

Signature
Name & Designation of Signatory

**Appendix C**

## CONTACT DETAILS OF NODAL OFFICERS AND *IN* OFFICES

*This page lists the details of nodal Officers dealing with matters related to Naval Aviation Indigenisation.*

| Unit/ Organisation | Rank, Name & Designation | Address & Contact Details |
|---|---|---|
| IHQMoD(N) / DAPP | Capt P Vinayagam PDAPP | Directorate of Air Projects & Plans<br>514, D Block, Defence Offices Complex, Africa Avenue<br>New Delhi - 110023<br>Tel : 011- 26771521<br>Email : ***dapp-navy@nic.in*** |
| IHQMoD(N) / DAPP | Cdr Abhijat Phand CDR (APP) | Directorate of Air Projects & Plans<br>512, D Block, Defence Offices Complex, Africa Avenue<br>New Delhi - 110023<br>Tel : 011- 26771546<br>Email : ***dapp-navy@nic.in*** |

| | | |
|---|---|---|
| HQNA | Cdr Prabhakar G<br>SATO<br>(Indigenisation) | Headquarters Naval Aviation<br>Vasco da Gama<br>Goa - 403802<br>Tel: 0832-2582108<br>Email : ***prabakar.gangadaram@nic.in*** |
| NAY(K) / IIC(K) | Cdr Sandeep G S<br>CM (D&D) | Naval Aircraft Yard (Kochi)<br>Naval Base<br>Kochi - 682004<br>Email : ***sncnayk-navy@nic.in*** |
| NAY(G) / IIC(G) | Cdr Marvin Jose<br>SM<br>(Indigenisation) | Naval Aircraft Yard<br>Dabolim, Goa – 403 801<br>Tel: 0832-2585704<br>Email : ***smiic-Goa@navy.gov.in*** |
| NASDO / IIC (NASDO) | Cdr R P Singh<br>CTO<br>(Indigenisation) | Naval Aircraft Servicing & Development Organisation<br>Dabolim, Goa – 403 801<br>Tel: 0832-2585095<br>Email : ***wncnasdogoa-navy@nic.in*** |

## Appendix D

# SOME SUCCESS STORIES

## NASDO (GOA): *ITEMS SUCCESSFULLY INDIGENISED*

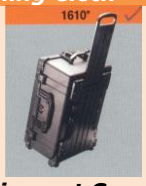
***Multi-Purpose Washing Rig.***


***Low Lint Wiper Tissue***


***Scratch proof Display Cleaning Cloth***

***Cable Tie & Tie Wrap***

***ACF-50 Type II***




***Equipment Carrying Case***


***Mobile Field Desk***


***Mobile Field Desk***

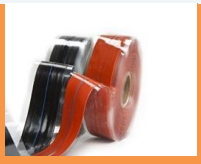

***Mobile Field Desk***

***UV Google***

***Latex Coated Safety Gloves***

***High Quality Ear Defender***

*Portable Lighting System*



*Self-Fusing Silicone aviation Tape*


*Air Publication Reader Tablet (APART)*


*Cordless Tool Kit – Frontline and Second/ Third Line*

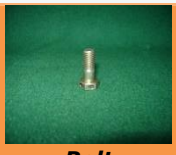
## ON GOING PROJECTS AT NASDO (GOA)

- *(I) Rodenator*
- *(II) Handocular (LED Rectangular Image Magnifier)*
- *(III) Low Lint Wipe Tissue*
- *(IV) Ultra Probe UP 15000 KIT*
- *(V) Steel Pallet*
- *(VI) Aircraft Fastener Pouches*
- *(VII) Tool Carry Bag*

## NAY (KOC) ITEMS SUCCESSFULLY INDIGENISED

***2 Step ladder CH0087NA-IKV***

***AIRCFART STORAGE BATTERY***



***Bolt LM307-30-IKV***

***Bolt***

***Boot S6140-65613-IKV***

***Bumper NLG-UAV, MCT1221131-003-IKV***

***Bumper NLG, MCT1222131-003***

***Carborator Gasket,MCT1233314 -001***

***Clip Disk, 5002510-IKV***

***Clip P, AS46783-15-IKV***

***Clip, BL4-IKV***

***Cockpit Display Unit-Sea king***

***Collective Actuator Amplifier***

***Adopter***

***Electronics PCB Assembly***

***Element Filter Main AN6236-2***

***Engine Mounting Bonded LM307-44-IKV***

***Engine Run up Guard***

***Exhaust Cover – P8I***

***Fastner, MO524000***

***Fluran Hose, S2S1000000-501-1 (AO9) IKV***

***Fluran Hose, S2S1000000-501-2 (AO9) IKV***

***Gasket 4430C159***

***Gasket 95244-27***

***Ground Speed Follow up***

***Grounding Braid 44020335-IKV***

***Yaw Actuator***

***$O_2$ Cart***

***PEC 256 K Dual Port store***

***PEC Service interface***

***APU ACCESS LADDER***

***Power Supply Unit***

***AIRCRAFT CONTROL SURFACE ACCESS PLATFORM***

***Roll Beeper***

***ELEVATOR STABILISER ACCESS PLATFORM***

***Roll Integrator and Summing***

***Seal Assy 205-236***

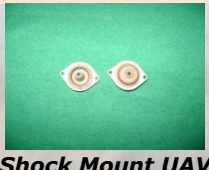
***Screw MS27039-1-13-IKV***

***Seal Channel S12604-236***

***Seal Channel S12604-236-IKV***

***SECTION 48 ACCESS PLATFORM***

***Seal 082109-99-IKV***



***Shock Mount UAV 106APDLQ-2***

***SME Box-Air Engineering***

***Stop S6120-62272-3-IKV***

***Strap Assy Bonding 341A65-5091-00 IKV***

***Strip Chaffing WD01-16-9144-IKV***

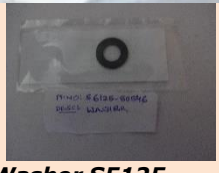
***A/C Tool Kit***

***Tool Kit***

***Transition Module***

***Tripod Jack***

***VDU – SKG***



***Washer S5125-50546***

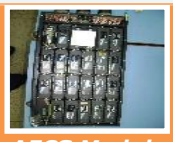
***Water Proof Floor Board***

***RADAR STORE***

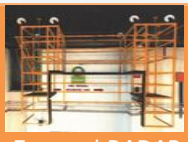
***Filter Assembley***

***Sea King RADAR PCBs Modules***

## ONGOING PROJECTS AT NAY (KOC)



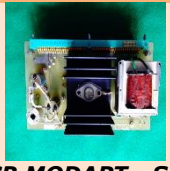
***AFCS Module***



*Forward RADAR Insp Platform*

*MIC TEL LEAD*

***PCB BATRAM - SKG***



***PCB MODAPT - SKG***

***Pitch Integrator Amplifier Module - SKG***

***Ignition Cable -***

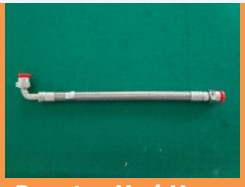
***Vertical Accelerometer***

***Linear Accelerometer***

***Mandatory Spares - SKG***

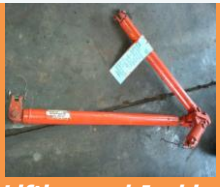
***Mian & Nose Wheel Tyre – P8i***

## NAY (GOA) ITEMS *SUCCESSFULLY INDIGENISED*



***Booster Hyd Hose***

***Fuel Tank Trolley***



***Lifting and Jacking Truss***

***Booster Hose MiG29K***

***Support for UNIT-1***

***Cowling Locks***

***Hydraulic Tyre Puller Mig29K***

***AC storage Battery MiG***

***Canopy Lifting Sling MiG 29K***

## ON GOING PROJECTS AT NAY (GOA)

***Stowage Cradle Trolley & Rail Arrangement for IAC-1***

***Equipment for Pressure Check Shock Strut***

***Multi-Functional Display***

***Canopy Seal***

***HUD Alignment Tool***

***PAZ-MK Fuel Hose***

***Engine Inserter and Remover***


***Small Sized Avionic Clock***

***Dummy BOM***

Manual Hand Op[illegible]

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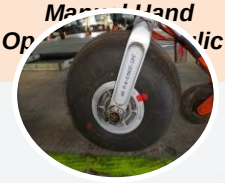

Nose Wheel Tyres

Brake Inner Tube

Brake Heat Pack

Airfield Towing and Steering Arm

Four Wheel Control Arm

Engine Elevating Line

Mooring Tension Brace

MFD Bonding Strip

MGB Stand

***MRH Stand***

***Deck Mooring Device***

***Towing Arm***

***Tyre Remover***

***Hydraulic Jack***

***Jacking Truss***

**Note:** *This document does not supersede any procedures laid down in any Government authorised and approved official document. The contents of this document are to be used as Guidelines only.*

"Indigenisation is the cornerstone of the path to self reliance"

Published by: Directorate of Air Projects and Plans