EVOLUTION OF DRDO AND ITS LIBRARIES

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CHAPTER 3

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threat is strength and vigilance. The process of planning for such defence does involve a long term assessment of the threat perceptions, international relations, international economic trends, economic and political developments in neighbouring countries, global developments in the field of military science and technology vis-à-vis own potential. This background knowledge is essential for formulation of the defence policy.

The defence and national security planning is an activity which necessarily comprehends a timeframe of not merely a few years but a few decades. This is mainly because translation of defence technology into actual capability is a difficult process, involving long lead-time and gestation period, besides heavy expenses. Any country that does not keep pace with the explosive expansion of the frontiers of S&T runs the risk of being relegated to permanent obsolescence. Indian government has been consistently laying emphasis on the development of S&T as a major instrument for achieving national goals of self-reliance and socio-economic development. Over the years a strong S&T infrastructure base has been established in the country. This covers a chain of national laboratories, specialised centres, various research and development centres and academic institutions and training centres, which continuously provide expertise, technically trained manpower and technological support. Decision-making, be it for long-term planning or day-to-day functioning is increasingly dependent on instant availability of the required information. The national strength in defence is based on its capabilities in S&T. Relevant information on S&T as applicable to defence science plays a vital role in the field of Research and Development (R&D)
and formulation of policy matters and decisions in the defence scenario. In order to meet the defence objectives adequately, it is essential to continually develop new technologies / infrastructure on which our defence industry could be based cost-effectively.

3.2. EVOLUTION OF DRDO

The defence forces of a country - the men in uniform with combat responsibility, need the support of a substantial infrastructure both within the state sector and in the country at large. Such support is needed primarily in the material sphere to develop, produce, upgrade and maintain combat and support systems. Several national laboratories were set up soon after independence. Nuclear research was taken up as a thrust area. In 1948 Pundit Jawaharlal Nehru invited Professor P M S Blackett, a British Nobel laureate in Physics and the President of the Royal Society, to advise how a national base for defence production could be created. Blackett's view was that India should build up from the actual level of technological and industrial capabilities it possessed at the time. In July 1948, the first Scientific Advisor to the Defence Minister was appointed and a Defence Science Organisation (DSO) was set up a year later. The emergence of the DSO immediately after independence paved the way for the creation of numerous laboratories in the country to spearhead the R&D activity in the field of defence science and technology. The limited R&D contributions to the defence in the first decade of independence came from the Technical Development Establishment within the armed forces or with the Ordnance Factories. In 1958 these were merged with the DSO to form the Defence Research and Development Organisation. In
1967, a full-fledged Department of Defence Research and Development was created in the defence ministry, and the Scientific Advisor to the Defence Minister, was made the head of DRDO.

The DRDO operates through a network of laboratories engaged in research activities leading to design, development and induction of state-of-the-art weapons, materials and equipments required by the defence forces. There are also some field laboratories for the purpose of carrying out trials on equipments under the varying climatic conditions. A separate department of Defence Research and Development Organisation Head Quarters, responsible for formulation and execution of R&D plans and administration of laboratories was formed. Two agricultural research farms, and one animal husbandry farm are also functioning under this organisation.

The DRDO has registered significant achievements in its various R&D activities. The notable developmental successes of DRDO include the surface-to-surface missile - Prithvi, the state-of-the-art main battle tank - Arjun, flight stimulators for aircrafts, Pilotless Target Aircraft (PTA), balloon barrage system, parallel supercomputer Pace-plus, etc. The weapon and ammunition developed by the organisation and productionised by the production agencies include the Indian field gun, INSAS rifle 5.56 mm, charge line mine clearing for safe passage of vehicles in the battle field, illuminating ammunition for enhancing night-field fighting capability, cluster weapon system for fighter aircraft, new generation bombs for high-speed aircraft, naval mines and 105 mm
PSAPDS. Multi barrel rocket system Pinaka is already under trials by the army. In the area of electronics and instrumentation, amongst the significant developments are low-level tracking radar Indira - I, Indira - II, for army and air force, light-weight field artillery radar, battlefield surveillance radar, secondary surveillance radar, automatic electronic switch, avalanche victim detector, tidex, EW systems, night vision devices and secured telephones (Sectel). Some of the achievements in the area of engineering systems are bridge-layer tank Kartik, military bridging systems, various types of shelter, crash fire tenders, and rapid intervention vehicle. In the area of naval systems and materials, the organisation has developed an advanced ship sonar system, marine acoustic research ship - Sagardhwani, underwater anti-fouling paints, torpedoes, naval simulators and jackal steels. Submarine sonar and weapon control system - Panchendriya, is already undergoing harbour / sea trials. The indigenous Light Combat Aircraft (LCA) Tejas and the Remotely Piloted Vehicle Nishanth have successfully undergone flight trials.

India's Integrated Guided Missile Development Programme (IGMDP) comprises four missile systems: Prithvi -surface-to-surface tactical battlefield missile, Akash - medium-range surface-to-air missile, Trishul - short-range surface-to-air missile, and Nag - third-generation anti-tank missile. Trishul is getting ready for user trials. Akash and Nag are in advanced stages of development. This programme also includes the development of the intermediate-range ballistic missile - Agni.
The DRDO has also successfully developed 'convenience foods' for the armed forces placed at remote field areas. It is vigorously pursuing the goal of technological self-reliance in defence systems through a ten-year national self-reliance mission. State-of-the-art technology systems are also being channelled to make available bio-medical equipment at a much lesser cost.

3.3. DEFENCE INFORMATION SYSTEM

India, with its vast Science & Technology infrastructure, is regarded as a scientifically advanced country. The development of S&T in India owes to a series of policies enunciated by the parliament which emphasises the government's responsibility to foster, promote and sustain, by all appropriate means, the cultivation of science and scientific research in all its aspects - pure, applied and educational. The policy envisages a well-planned effort for promoting the growth of S&T personnel on a scale adequate enough to satisfy the nation's needs in areas of agriculture, education, industry and defence. There has been significant growth in the capabilities and achievements in high technology areas, like nuclear and space sciences, defence electronics, microelectronics, informatics / telematics, biotechnology, renewable energy sources, ocean sciences, etc. This progress attained must be sustained and improved upon. The continued sustenance and further acceleration of the momentum achieved so far depend on the availability of timely, accurate and precise information which is the raw material for any development.
It has been universally recognised that information is the key factor essential for making sound decisions and policies, from the lowest to the highest level. People are dependent on information in every sphere of activity. Georges Anderla\(^3\) defines information as a resource, "a resource as fundamental as energy or water, which affects all human activity and an indispensable, irreplaceable link between intellectual and material activities". Information has been described by Kemp \(^4\) as "the fifth need of man ranking after air, water, food and shelter". The role and significance of information cannot be emphasised further.

Ching-Chih-Chen\(^5\) defines information as "all knowledge, facts, data and imaginative works of mind which are communicated formally or informally in any format". Information is the raw material, by distilling, shaping and integrating which, knowledge emerges. It is because of the vital role played by information, its importance and involvement in the very structure, warp and weft of society, that today's society is christened as 'Information Society'. Society has undergone significant changes at various periods of human society. The agrarian society gave way to the industrial society and the post-industrial society in turn, has paved way to the emerging information society.

The Information Centres are the most vital social institutions for the dissemination of knowledge and information. Teaching, research, and scientific activities in all institutions are centred around the Information Centres. Each library or information centre forms part of a larger organisation whether it be a local authority, a large industrial organisation, an academic or government institution and lays stress on
different areas of specialisation with the aim to support the parent organisation. The government libraries came into existence in 1857, as a result of the formation of the Government Departments during the beginning of formal British rule. The Government of India with its headquarters in Calcutta organised a few departments on the pattern of the administrative structure in England, to deal with the problem of law and order, collection of revenue, regulations of commerce, etc. For the help and guidance of the officers working in these departments some statutes, reports, guide books, etc were also collected. As their number increased, the collection emerged in the form of a departmental library. Libraries at the national level were set up in various ministries and departments to serve the legislative, administrative and development functions of the government.

The MoD has a number of R&D laboratories, training institutions, design centres, production units, fabrication and maintenance workshops, etc for meeting the various technical / operational requirements of the armed forces and other agencies. These technical facilities come under three departments into which the work of the defence ministry is organised. They are

- The Department of Defence,
- The Department of Defence Research and Development Organisation, and
- The Department of Defence Production and Supplies.
Each of the above departments has huge information requirements for carrying out their functions / services effectively and there are good numbers of libraries / TICs in each of the department. There are about eighty-five such libraries / TICs spending annually more than two crores for the acquisition of scientific and technical literature. In earlier days, intelligence agencies had to grapple with the problem of acting on too little information. Whatever information was obtained came from attaches resident in foreign countries, from spies and from various other more or less reliable sources. Today the problem is just the reverse, viz. of handling a flood of detailed information obtained through networks that encompass the globe. It is a task demanding the use of data processing systems of immense capacity and speed, instant-retrieval systems, and many other devices, almost all electronic, that give information in great detail. Growth of knowledge and the resultant literature produced is practically limitless. Information scientists therefore must have some methods to keep track of this 'information world'. Modern technologies such as digital communication techniques using satellites and sophisticated computer systems have reduced the time gap required for the generation, processing, and dissemination of information and provide useful methodologies for decentralised collection of information and its retrieval. It is essential to make the maximum possible use of these modern technologies even for routine library tasks in the defence establishments. The sensitive area of defence relies on timely and reliable supply of information for its efficient functioning. An effective information system at national level is an indispensable infrastructure facility for defence R&D. Such an organisation should have ready access
to defence oriented scientific information from all over the world and have close liaison with defence R&D establishments. The Defence Scientific Information and Documentation Centre (DESIDOC) fulfils these requirements.

3.4. DESIDOC

DESIDOC, is the apex information agency of the DRDO. DESIDOC meets the information requirements of the defence R&D Headquarters as well as other institutions and organisations engaged in defence activities. DESIDOC has now attained the status of national information centre on defence science. The focal points of DRDO's information system are the libraries or TICS of the respective laboratories and the DESIDOC.

DESIDOC started functioning in 1958 and it was then known as Scientific Information Bureau (SIB). It was one of the divisions of the Defence Science Laboratory (DSL), a major laboratory of DRDO. As the activities of DRDO increased and expanded, the activities of SIB also correspondingly increased. In 1967, it was renamed as Defence Scientific Information and Documentation Centre with expanded charter of duties. The hierarchical position of DESIDOC in the MoD is appended below.
Fig. 3.1: Hierarchical position of DESIDOC in the Ministry of Defence

The MoD in the Government of India has three departments, each headed by a Secretary. Figure 3.1 displays the administrative structure of the MoD and the position of DESIDOC in the ministry. It does not show the hierarchy in terms of protocol.

DESIDOC, while concentrating its efforts to meet the S&T information requirements of DRDO in particular, and the Ministry of Defence in general, was also extending its services to other non-defence agencies or organisations on a reciprocal basis till 1992. Since January 1993, DESIDOC has opened its services to many individual agencies or
organisations against payment. Since the centre has a very rich information base in its library and has expertise, skills and capabilities in several areas of information processing and dissemination, the policy of DESIDOC is to endeavour to serve non-defence requests also, while concentrating its efforts to meet the DRDO demands.

DESIDOC is a pioneer among Indian libraries and has the status of National Information Centre for defence science. Sumati Sharma's study conducted in 1999 establishes DESIDOC as the best-equipped library in the country and having the largest collection of documents on defence S&T. As per the data available from DRONA (DRDO Rapid Online Network Access) DESIDOC as on 1/1/2002, has a membership of 1184. The DESIDOC library has a seating capacity for 150 users. The library has a collection of 72261 books. It subscribes to 573 journals and has 52237 bound volumes of journals. There are 101099 technical reports and 41 CD ROM databases. It has a huge collection of 198445 patents and 50800 standards and specifications. The centre has computerised the various library activities. The data on the holdings of the DSL are maintained in database form and an integrated database of the holdings of all the DRDO libraries is being organised. DESIDOC functions as a central agency of DRDO to collect scientific and technical information from various published and unpublished sources, process it in various usable forms and disseminate the same to DRDO laboratories and other agencies of MoD. Fig 3.2 displays the organizational structure of DESIDOC.
DESIDOC is also responsible for developing a database and information system in defence science and technology. It is also expected to carry out R&D work in information science relevant to defence needs. It coordinates the library and information activities of DRDO libraries.
DESIDOC provides the following major information services / package:

1. SDI Service: Selective Dissemination of Information is a personalized service to researchers and top managers in the areas of their interest.

2. Patent Information Alerts (Bi-monthly): Patents are considered an important source of information for R&D. This abstracting service covers various foreign and Indian patents.

3. Defence Reports Abstracts: Since technical reports are the best source of information to scientists, extracts of a large number of technical reports released by NASA, NTIS, RAND (USA) and DRIC (UK) are made available.

4. DESIDOC List is an indexing service and contains references of current published articles on topics of defence interest.

5. Literature searches are normally conducted on request.

6. Translation Services: An estimated 48% of science journals in the world are published in languages other than English, such as, Russian, German, French and Japanese. DESIDOC provides translation service to the scientists on demand through a team of well-qualified and experienced translators. It also maintains a translation bank of the unclassified translations done by its translators.

7. CCLIS: Current Content in Library and Information Science is a bimonthly service based on about forty-eight journals in the field of Library and Information Science.
3.5. CONCLUSION

Since the last five decades, DRDO has undergone a series of evolutionary transformation to encompass the vital ingredients required for its role as a national organisation for attaining self-reliance in defence technology through the network of its laboratories. The DRDO libraries / TICs attached to the laboratories are the information agencies for collection, processing and dissemination of scientific and technical information of interest to their parent laboratory.
REFERENCES


