



Challenges Before DRDO

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DRDO is celebrating its Golden Jubilee this year. While this is time for celebration, it's also the time for introspection and reflection. This is being done to some extent in the functions and seminars arranged by the organisation. But one wonders whether the real issues are being addressed, like how can DRDO play a more vital role in the development of science and technology for the country and how can DRDO fulfill the expectations of its stake-holders in a more effective way.

These two points are related and should be recognised as such by policy makers.

Directed basic research is critical for developing cutting-edge technologies and systems. Perception of analysts is that the nature of work done has changed in the DRDO system over the years to the detriment of research activities. Attention earlier given to research has deviated as reflected in the low number of technical papers published in important journals from majority of Labs. Priority given to system integration work, non-availability of highly qualified research personnel in DRDO Labs, lack of leadership to lead younger teams on a long term basis to achieve given objectives, lack of challenging tasks and lack of motivation among young scientists, have led to for gradual decline in research activities in DRDO.

During first two decades DRDO confined itself to small projects involving marginal improvements to existing equipments and development of substitutes. During these two decades the expenditure of DRDO increased at the rate of Rs.5 crores per year. After this period, the organisation has undertaken design and development of major systems of direct interest to the

services and this was reflected in the steep increase in funding from Rs.90 crores per year in 1983 to about Rs.1,000 crores in 1993.

At this time, as a policy measure with renewed emphasis on achieving self-sufficiency in design and development of defence weapon systems and taking on challenging tasks, funding for DRDO from 1993 onwards increased at a steady rate. The financial allocation for DRDO in 2007-2008 stood at Rs.6,000 crores amounting to 6 per cent of defence budget. For a long time, till beginning of nineties it used to be 3 per cent or less of defence budget. Thus, from the allocation point of view, in percentage terms, DRDO has gained as compared to other demands for grants of defence budget. It has helped in well equipping its laboratories with needed facilities.

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What about its achievements? From an overall point of view, DRDO's

achievement has been a mixture of "successes" and "failures", with failures drawing more attention than successes. Whether it is laboratories or technology development programmes, the performance has been of variable quantity which makes its clients skeptical about its claims in specific areas.

In this context, the intrinsic strength of DRDO for undertaking research in advanced areas of science and carrying out development work, calls for re-assessment. The most crucial requirement in this regard is the availability of dedicated and highly motivated scientists in adequate number. Unfortunately, not adequate attention have been given to development of Human Resources (HR) in DRDO, which are crucial for the success of any R&D organization.

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in its DRDS cadre spread over 51 Labs. The important point, however, is that the scientific manpower is dominated by first degree holders. Ph.Ds in science subjects are 7% and Ph.Ds in engineering subjects are only 3% of scientific manpower, which is particularly worrying. With M.Tech and M.Es accounting for 29%, really qualified scientific manpower is less than 40% of DRDO scientists. B.Sc, B.Tech, Diploma-holders, M.Sc, MA and medical degree holders account for 60% of scientific manpower who cannot be treated as research trained. A survey indicates that 43% of the DRDO Labs have less than 2% of their scientists possessing Ph.D. degrees in their respective core disciplines. A survey also indicates that the urge for acquiring higher qualification is fast decaying in DRDO. This is the most unsatisfactory situation for a research and development organisation mandated to develop frontier technologies.

The age profile of scientists is also not encouraging. In 50% of Labs the average age of scientists in all grades is above 37 years which is much higher than is desirable.

An Audit Report on HR issues of DRDO drew attention to the high rate of attrition among its young scientists. The reasons identified for it were more worrisome than the static of attrition: lack of professional challenge, better career opportunities elsewhere, location disadvantages, and need for furtherance of professional qualifications. In other words, poor motivation is a major problem. It was also observed that young scientists get disenchanted soon after joining the Labs. One of its basic reasons for it is that component of systematic research is too low in their technical activities and the technical goals set for entry level scientists are not challenging.

In this context, the present recruitment process in DRDO also needs a critical look. The recruitment process is handled through a centralized Recruitment and Assessment Centre (RAC). The disturbing feature is the undue time delay between request by the Labs and the recruitee joining for duty. This proves a deterrent to talented young scientists to seriously consider a career in DRDO. This makes it necessary to think about decentralised recruitment procedure, with Director of Labs being empowered to induct talented candidates in the quickest possible time, so that DRDO projects do not get delayed. The training programme of the new inductees

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need to be revamped. There is also the basic challenge of offering extensive advanced training and

research opportunities to DRDO scientists in the country and abroad, which is now sorely lacking. It would be beneficial to give serious attention to emulating at least in principle, Department of Atomic Energy (DAE) and Department of Space (DoS) for creating such institutions and facilities, in order to create a pool of trained scientific and technical manpower for DRDO. There is no reason why the DRDO schemes should not be at par with those of DAE and DoS. This calls for leadership responsibilities to be shouldered by comparably younger scientists than is the case today, as also organisational changes which focus attention on individual Labs as centre of excellence.

Then there is Defence Research and Technical Development Cadre (DRTC), with a total strength of more than 12000 personnel, representing 40% of total manpower of DRDO, which provides technical assistance in research and development activities. It makes important contributions in achieving organisational goals. A survey indicates that only a small percentage of DRTC cadre is below the age of 40 years, which is not a healthy sign. Among the DRTC staff, however, there are quite a few persons holding Ph. D and M.E degrees While on one side there are not adequate number of Ph.Ds and M.Es in scientific cadre, the qualified persons in the technical cadre in spite of several years of experience, are unable to get promoted to scientific cadre, because of promotion rules and vacancy position, leading to resentment in this important cadre.

We have mentioned about high rate of attrition among young scientists in DRDO because of lack of challenging tasks being assigned to them early in their career as also because of better career opportunities elsewhere. How can this be rectified? To find an answer, we have to look at the overall scenario as to what extent challenges are being placed for indigenous R&D by the present policies.

Around 50% of DRDO resources get spent on the development of Strategic Complex and Security-sensitive Systems. Here the achievement of DRDO is indeed commendable, particularly as import option was non-existent. A view is often expressed that DRDO should confine its R&D activities to these systems only, leaving the rest of R&D for other players.

So long import options are regarded as viable options for getting advanced weapon systems from abroad, irrespective of their costs and other drawbacks, one can follow this route. This can only restrict the

scope of indigenous R&D, making it less and less challenging and increase the country's dependence on technology from abroad through 'transfer of technology route' which may not be the best available and that too with denial of crucial technologies.

On the other hand, Standing Committee of the Parliament, keeping in view the goal of self-sufficiency in design and development of weapon systems, has recommended increase in fund allocation for DRDO in percentage terms of the defence budget. Obviously, this would not be in consonance with the view regarding reduction in the scope of DRDO activities by confining its activities only to strategic systems.

The nature of war that can take place in future has changed from those visualised in the cold-war era. The concept of deterrence has taken a beating with the emergence of non-state actors who can be used by the elements of the government for achieving their objectives in a cost-effective manner. So also has changed the concept of what is strategic system and what is not. In the era of RMA, advent of network centric warfare and challenges of low-intensity conflict it is difficult to determine now, what is strategic and what is tactical weapon system. The same forces which are transforming the economy and society are tending to transform war as well. Many of the heavy and complex weapon systems highly regarded in the past for their military value are becoming less and less relevant in the context of new challenges. It is the circumstances and the environment in which war is conducted that will determine what is strategic and what is not. It is the strategy which will determine what is relevant technology.

What is however evident is that need for innovative skill is much more now than ever before. The motivated and dedicated scientists, technical personnel and system thinkers in the country, have to play crucial role in coming forward with innovative technological solutions to wide range of challenges that would be faced by the armed forces in future. And these solutions should come fast. These would call for very close association of the scientists of DRDO with strategic and system thinkers in the Service Headquarters. It would be difficult to arrive at innovative solutions by involving outsiders, who would be motivated by commercial interests and may not have the same grasp of military and security related challenges facing the country as a DRDO scientist would have.

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The government has over years spent large amount of funds for creation of necessary infrastructure for carrying on advanced research. A pool of around 7,000 scientists is a great asset for any country, more so in India, where science stream is no more attracting very talented students. We have not only to nurture and develop this asset by enhancing its quality, but also exploit it by placing before it challenging tasks in the quest for achieving self-sufficiency in design and development of equipment and systems. This cannot be achieved by depending on imports of complete systems and the route of transfer of technology as an adjunct to import.

If the procurement policy puts more reliance on "Buy" categories and "Buy and Make" categories, to the relative neglect of "Make" categories, (leaving this to the manufacturing sector, both public and private) the challenges before the DRDO scientists would go down leading to an unexciting and unattractive career, which cannot be counterbalanced by change in recruitment and promotion policy. This will only lead to further attrition among the younger scientists, with the talented moving

out first and lower of capability of DRDO for facing future challenges increasing the dependence on imports. This is already happening. The "10 year Plan for Self-Reliance in Defence Systems" which was formulated in 1993 which envisaged a coordinated thrust for self-reliance in defence systems lies in shambles and nobody talks about it. The 10 year plan wanted to raise the self-reliance index from its 1992-93 estimation of 0.3 to a possible 0.7 by the year 2005. This implied that the import content of the defence procurement would be brought down to 30% or less in next 10 years, an obviously impossible goal of a flawed plan which increased complacency without competence. The current indications, however, suggest that contrary to expectations the self-reliance index has fallen below 30% at present and the import content is more than 70%.

Solution to HR problems to a great extent is dependent on the mandate given to DRDO. The mandate should be a challenging one which is also dictated by strategic considerations. From the national interest and strategic point of view, government has to take a stand through a well-articulated policy decision that apart from so called 'Strategic Systems', DRDO should focus on the development of :

(a) Critical technologies denied to India;

(b) Technologies embedded in systems made available in the peace time but which could be denied during times of conflict;

(c) Technologies that are imported at prohibitive cost; and

(d) Innovative technological solutions to emerging security- related problems.

Above mandate cannot be fulfilled without adopting enlightened HR policies:

The basic challenge before DRDO is to attract, retain and motivate outstanding scientists to contribute effectively to the design and development of security related systems. For this, the brand image of DRDO, which is wilting because of inability to deliver the prototype of the systems in time and within the projected costs because of intrinsic weaknesses in terms of qualified manpower as indicated above, as also the criticisms which are freely aired by its customers and stakeholders, must undergo a substantial change. If young meritorious scientists are to choose DRDO as a career then technical challenges offered by

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the DRDO projects in its very well endowed Labs should be widely publicised to brighten the image of DRDO in the mind of the public. But these should be real challenges backed up by procurement policy with its accent on self-reliance with

well established milestones to be achieved in the next ten years, which should be monitored periodically, by a high level policy making body.

As far as DRDO is concerned, we have to go beyond customer- producer relation and recognise it as a national asset which has been painstakingly developed by substantial investments over years. Proper use must be made of this asset by the nation by reposing faith in it and by placing challenging tasks before it. All the stake-holders should recognise this point and take active part in decision making at various levels for design and development of advanced systems. DRDO has to actively seek for it and create suitable environment and institutions for it .Only then can DRDO thrive.

Let the Golden Jubilee year for DRDO also be its take-off year.



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