

ful implementation of the tasks assigned to NACC require the establishment of a network of surveillance centres distributed throughout the country, staffed with properly trained epidemiologists,

microbiologists and molecular biologists who unfortunately are in very short supply. In any case it is good that at least the need for such a task force has been realized.

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NEWS

New research board for Navy-oriented ocean sciences

The Defence Research and Development Organization (DRDO) has set up a Naval Research Board, effective September 1996. Modelled after the Aeronautics Research & Development Board (AR&DB), the Naval Research Board (NRB) has been set up to strengthen and deepen the knowledge base applicable to the Indian Navy. The NRB has several new features and flexibilities in concept, funding philosophy and operational latitude, elaborated in the Concept Paper, Charter and Executive and Financial Powers of the NRB. Says the 'Concept Paper' in extract:

'If India is to build up the required sea-denial/sea-control capability foreseeable up to 2010-2015 then it will call for appropriate provisioning of a Navy of approximately twice the present size with new weapon systems, surveillance and EW capabilities in all three dimensions. But doing so by import will present insurmountable difficulties; for: *what is developed abroad will not suit our new requirements; what is suitable will be denied; what is not denied will be un-affordable.* This is the already recognizable triple-trap that the Navy will enter in the early years of 2000+.'

Basic philosophy articulating the NRB

The Naval Research Board (NRB) will focus on the generation or enhancement of the applicable knowledge base leading to the exploitation of the sea for military purposes. 'It is important to recognize that the basic philosophy articulating the NRB is the enhancement and expansion of the applicable knowledge base. It is not the definition or

achievement of a future naval operational requirement. The aim is increasing our understanding of a topic area. The NRB's projects will be imagination-driven - not requirements driven.

'The NRB will invite research proposals that focus on substantial phenomena or observations that are not understood, and, that lack of understanding is a serious obstacle to scientific or technological progress.' Elaborating:

- The search is for bright people with novel and/or imaginative approaches. 'If you had all the resources you need to do what you want to do, what would you be doing that you are not doing now.' The unit of funding is the experienced leader-researcher and his small team ~ typically one post-doctoral researcher and two or three doctoral/masters students.
- The criterion for funding is the novelty of approach and the likelihood of high-quality research being performed by the fundee, and his team.
- The likelihood of possible future application is NOT a criterion for making a choice between alternative/competing proposals.
- The primary expected end result of the research is a small group of qualified people whose expertise resulting from the research can be drawn upon to build an exploitable area of technology in the subject/topic area, and;
- The secondary expected end-result of the research is a body of

knowledge which establishes (or rationally abandons) a potential application of a new, or inadequately understood, scientific principle.

'The knowledge base generated by the NRB through the above philosophy will be embodied in high-quality technical manpower and in the new techniques and design-tools developed through NRB-funding.'

Functions, powers and budget of NRB

- Support basic research that will generate new knowledge potentially useful to the Navy and to train young minds and hands to generate, use and apply that knowledge creatively to the purposes of the Navy.
- Set the principles and practices governing the relationship of DRDO with the academic world; 'think tanks', and non-profit research institutions in India and abroad as well as research strengths in the laboratories of the other agencies like CSIR.
- Consider, and approve, by peer-evaluation, research proposals submitted to the NRB. This evaluation will be accomplished through specialist panels.
- Set up research panels; set funding patterns and funding methodologies for the research panels of the NRB and approve their respective spending proposals for the year.

- Approve research programmes that overlap, or are not covered by, any research panel.
- Decide on specific research programmes or individual projects whose estimate of expenditure spread over the duration of the programme/project exceeds Rs. 20 lakhs, or involves expenditure on major civil works.

The guidelines define 'major' civil works as works 'which create permanent roofed area on land, or any structures in the sea'.

Collaterally, the NRB will fund the development of any specially-designed sensors, instrumentation, data acquisition and display systems necessary for carrying out the research funded by NRB. The techniques and tools of advanced simulation, and mathematical modelling will be brought to bear upon, and tailored to suit, the research programmes funded by the Board.

- ◆ NRB will also evolve methods to improve cooperation between Indian marine scientists so as to widen and deepen the benefits accruing from national projects through the exchange of expertise and knowledge and better use of facilities.
- ◆ However, NRB will exclude funding of the development of major systems like research sea craft and research submersibles (but will include funding of their use for the purposes of research funded by the NRB).

Of particular note in the 'Concept paper' is the new, innovative NRB programme on training and mobility of researchers, which reads:

'This programme aims to promote, through the training and mobility of researchers, an increase in the quality of human resources available to DRDO and to NRB-funded research programmes as also the enhanced use for these programmes of national ocean-related S&T facilities. The purpose of this programme of the NRB is to stimulate imagination and creativity by

encouraging scientists to generate such research proposals to NRB as act as vehicles to serve the objectives below:

- ◆ to allow researchers to travel throughout India encouraging mobility between research-disciplines, between academic institutions, research institutes and R&D divisions of ocean-related industry;
- ◆ to help researchers to use existing large-scale ocean-related research, development, test and evaluation facilities and survey vessels;
- ◆ to improve the scientific and technological cohesion of the Ocean Research Community and increase the general level of scientific excellence in that community;
- ◆ to promote, through networks, the training of young researchers and trans-agency cooperation of scientists on research projects funded by the NRB.

It should be noted that the above are *objectives* of an NRB programme – not merely means.'

NRB programme on the dissemination and exploitation of research results

This NRB programme has as its objective the dissemination and exploitation of the results from scientific research funded by NRB so as to:

- ◆ ensure wide dissemination of research results;
- ◆ catalyse the exploitable areas of research results into innovations.

P. V. Indiresan, former Director, IIT, Chennai and currently Research Professor, Centre for Policy Research, Delhi, has been appointed as the first Chairperson of the NRB.

To fulfil its Charter, the NRB has been clothed with extensive executive

and financial powers. Thus, the NRB has been empowered to rapidly identify and deploy on projects/programmes of the NRB 'high-calibre scientific and technical persons, predominantly young, identified both from within the country and abroad, provided they are not persons superannuated from the service of the Government of India or from enterprises. To this end, the NRB is empowered to offer fellowships and adjunct positions flexibly structured so as to maximize the interactions between academia, scientific laboratories or establishments, particularly those of DRDO, as also enterprises in the public and private sectors. These fellowships and adjunct positions may carry emoluments (personal to the individual holding the fellowship or position) not exceeding the maximum salary, and allowances & perquisites, of a head of a scientific agency of the Govt of India.'

Organize and support 'training and hands-on participation, for specified periods, in R&D activities in relevant areas in universities, R&D institutions in India and abroad and companies devoted to R&D'.

Support and fund, 'facility design and construction, including structures in the sea and the hiring of premises and sea-craft within the limits of the relevant budget provisions'.

The budget for the NRB is expected to rise from the Rs 1.5 crores available for the second half of the financial year 1996-97, up to about Rs 5 crores per year in a few years.

DRDO sources point out, however, that: 'Money *per se* is unlikely to be a constraint. What is most worrying is the flight of young talent away from research careers in science and engineering. The NRB guidelines permit, in principle, even a 28 year old to receive a handsome fellowship of Rs 15,000 a month (plus accommodation) which figure will go up if and after the Pay Commission proposals are accepted by Government. The moot question is whether we can retain such a person in our national S&T system, even if not in DRDO, after his NRB fellowship terminates.'