

From the Director's Desk



NATIONAL METALLURGICAL LABORATORY
Jamshedpur - 831 007, India

Dear colleagues,

It is my honour to convene the 1st meeting of this reconstituted Research Council (RC). On my behalf and on behalf of my colleagues at National Metallurgical Laboratory (NML), it is also my pleasure and privilege to welcome all the esteemed members to this 58th meeting of NML's RC. Since I too assumed office only in March 2010, this is a new beginning for most of us; a new beginning for the Council to steer one of the oldest metallurgical institutions in the country. I feel overawed occupying this chair of this great institution which has such an illustrious heritage and legacy and occupies such a unique position in the country's R&D hierarchy. This RC meeting is also significant since it is the first meeting during the Diamond Jubilee year of the Laboratory. I can't but resist quoting Pt Jawaharlal Nehru when he inaugurated NML on the 26th of November 1950 "I think of the combination of this laboratory with the steel works in this city, of the marriage of science with industry for the progress of both...". Sixty years hence, these words are as relevant as it were then, in fact more so now because of the greater need to be internationally relevant. It is my pledge to remain committed to NML's pursuit of marrying science with industry for the progress of both. It is no coincidence that we have Shri H.M. Nerurkar, Managing Director, TATA Steel as the new Chairman of our RC. He not only represents India's oldest and largest steel works but also an industrial group which has far reaching vision for the Science and Technology in this country and has contributed significantly towards founding and shaping of NML. We look to the Research Council to provide us the guidance and strength to fulfil our mandate. I will be failing in my duties if we do not record our appreciation and gratitude to the previous Research Council under the chairmanship of Dr. Baldev Raj and Prof. S.P. Mehrotra as the Director of the Laboratory. They enabled NML to transgress the boundaries of metallurgy to a position of scientific leadership among the engineering laboratories of CSIR. I also wish to personally thank Dr Sukomal Ghosh, Director-in-charge during the interim period of close to ten months, for his wonderful job in managing the laboratory. However, amidst all this euphoria, there was a deep moment of sadness for the NML family as well as the metallurgical and materials fraternity of India; the untimely demise on January 10, 2010 of our past director Prof. Patcha Ramachandra Rao, one of the most innovative contemporary materials scientists in India and an ardent well wisher of NML. With a profound sense of grief, we at NML pay homage to this outstanding leader, who sowed the seeds of scientific curiosity into every one of us at NML.

This Research Council meeting is being held after almost a year and a half and therefore there is a lot of catching up to do. I will try to provide you an overview of the progress that we have made in several fronts over the past one and half years and report on where we stand today. I would also take this opportunity to outline our vision, goals, targets and roadmap for the next six years and beyond. My colleagues will then make detailed presentations on their respective divisions and roadmaps to achieve the target vision and goals. They will also elaborate on the core research areas of NML, our current major projects in each of these



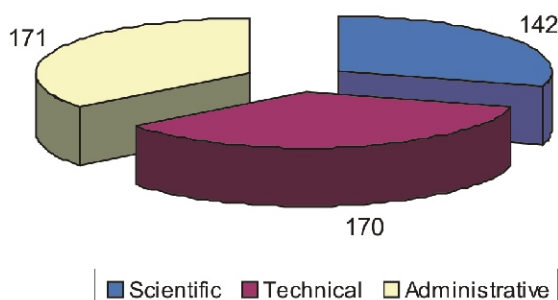


areas, our infrastructural strength and detailed roadmap for the future. Since many of the Research Council members are new, in this first RC meeting we will restrict ourselves to providing a flavour of our current activities and vision for the future. No detailed individual project presentations will be made except for the Supra Institutional Project on Advanced Steels which has to be mandatorily reviewed in every RC. However, for the benefit of RC members, the progress made on all the individual projects is included in the compilation which is already circulated to the RC members.

A Profile of NML

Before I present the progress made by NML, it would be appropriate to give a brief outline of NML including its centre at Chennai, specifically for the benefit of the new RC members. NML has a total permanent manpower of 483 personnel comprising of 142 scientists, 171 technical staff and 170 administrative staff. We are working towards a scientific to technical to administrative manpower ratio of 1:0.5:1 in the distant future. The total CSIR budget outlay for NML in the last financial year was about 33.48 crores, the salaries accounting for about 75% of the budget. The other project grants made by CSIR for the network and supra institutional projects are not included within this.

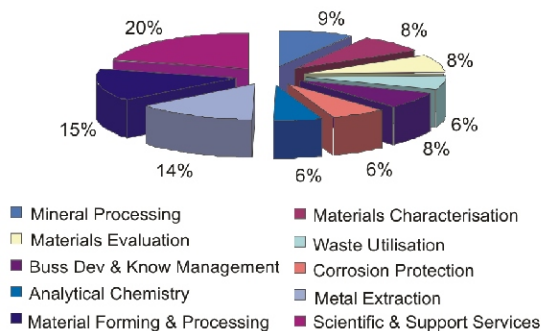
HUMAN RESOURCE as on 31.03.2010



BUDGET



RESEARCH GROUPS

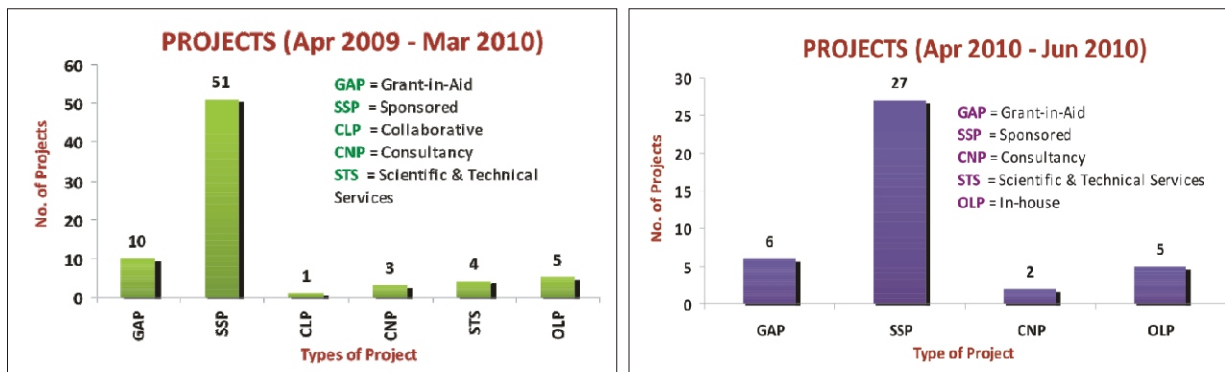


| A. Recurring | | Rs. in Lakhs |
|----------------------------|--|--------------|
| Salaries | | 2535 |
| Contingencies | | 267 |
| Human Resource Development | | 8 |
| Maintenance | | 134 |
| Chemical & Consumables | | 42 |
| Total Recurring (A) | | 2986 |
| B. Capital | | Rs. in Lakhs |
| Works & Services | | 130 |
| Apparatus & Equipment | | 114 |
| Office Equipment | | 5 |
| Furniture & Fittings | | 3 |
| Library Books | | 110 |
| Total Capital (B) | | 362 |
| Grand Total (A+B) | | 3348 |



Projects Pursued

NML pursued a wide range of projects during this period which included multi-laboratory networked projects, the supra-institutional project on steel funded by CSIR, a large number of industry sponsored projects and also a significant number of innovative research projects funded by the grant-in-aid bodies.



I would like to make a special mention of the CSIR networked projects that we have been pursuing in the 11th plan. In one of the flagship projects titled "*Technology for assessment and refurbishment of engineering materials and components*", NML is investigating engineering materials with emphasis on damage accumulation during service and with the aim of developing strategies for health monitoring, life assessment and rejuvenation of critical engineering components. It has joined hands with other sister laboratories such as CGCRI Kolkata, CMERI Durgapur, IMMT Bhubaneswar, NAL Bangalore, NPL New Delhi and SERC Chennai in this mission.

Another major network project where NML is playing the nodal role is "*Nanostructured Advanced Materials*" involving inter-related research on biomaterials, ceramics, composites and hard coatings, magnetic materials and structural materials. NML is collaborating with NAL, Bangalore, NCL Pune, IMMT Bhubaneswar, CGCRI Kolkata, CMERI Durgapur, CEERI Pilani and AMPRI Bhopal in executing various modules under the project. During periodic reviews, the project has received valuable inputs from the monitoring committee of this project under the chairmanship of Prof. K.L. Chopra. The scope and deliverables under the project are now fine tuned in terms of process/product/knowledge generation.

The other network projects in which NML is partnering other labs are : *Development of processes for Iron ore resources of India, Development of cost effective mine water reclamation technology for providing safe drinking water, Development of speciality inorganic materials for diverse application, Development of advanced light weight metallic materials for engineering applications, Nanomaterials and nanodevices for application in health and diseases, Engineering of structure against natural and other disasters, Zero emission research initiative, Advancement in metrology and Use of natural occurring minerals for providing safe drinking water at domestic level in the state of Jharkhand.*

Project Outcomes

We had set ourselves specific goals, science and technology targets and deliverables in each of these projects. It is gratifying to mention that in most of the projects, the promised



deliverables and targets were achieved within the time deadline and received a favourable review. The projects undertaken have resulted in technology development and transfer or development of new materials or development of new evaluation protocols or economic savings to the industry or new scientific insights. Some of the significant project outcomes in the last year are:

- the installation and commissioning of 150 tonnes/day sillimanite beneficiation plant at Indian Rare Earths at Chavara,
- development of commercial flotation reagents for iron ore in collaboration with M/s Somu Organics,
- development of complete technology packages in collaboration with MECON for iron ore beneficiation plants at Gua and Bolani,
- development of complete technology packages in collaboration with MECON for a four million iron ore pelletization plants at Gua,
- Baryte beneficiation plant at Mangampet, Cuddapah, Andhra Pradesh,
- reduction in galvanizing losses of Zn in several galvanizing industries,
- transfer of technology for a portable Automatic Ball-indentation system,
- transfer of technology for the recovery of Pb from Zn leach residue,
- development of new NDE protocols for damage assessment,
- development of rejuvenation protocols for Ni-base super-alloys (Udimet 520),
- development of magnetic sensor and sensor devices
- development of steel foams
- carrying out site trials of the Real Time Process Simulator developed by NML in the blast furnaces of Bokaro Steel plant

Major programs on *recycling of electronic waste, processing of ocean nodules, direct reduction iron making processes, smelting of ferroalloys, electro-thermal extraction of Na, coal mine-water reclamation, processing of light metal alloys, failure analysis, creep property evaluation and fatigue & fracture behaviour database for a wide range of materials, rapid solidification processing of magnetic alloys, biomimetic materials, corrosion evaluation and mitigation, industrial waste processing and standard reference materials* are continuing.

MoU's / Agreements Signed

Over the past year and a half, we have signed twelve MoUs for scientific collaboration and research projects, including four with international bodies. These are :

- i) Recovery of Pb and Sn from the liberated resin of PCBs swelled by organic - KIGAM, Korea
- ii) Fatigue ratcheting behaviour of SA 333 Carbon Steel and 304LN stainless steel under multi-axial, non-proportional loading - BARC, Mumbai
- iii) Fatigue and fracture behaviour of dissimilar metal weld - BARC, Mumbai
- iv) Studies on low temperature sensitization and low temperature thermal embrittlement of narrow gap weld joints of austenitic stainless steel - BARC, Mumbai
- v) Selective reduction of Cu Ni and Co from aqueous solutions through hydrothermal route for production of metal powders - KIGAM, Korea



- vi) Global engineering and project management support for commercial implementation of column flotation technology developed at NML - Mc Nally Bharat Engineering Co. Ltd.
- vii) Consultancy services for the establishment of a Metallurgical Laboratory for Failure Analysis and Corrosion Assessment - Caribbean Industrial Research Institute (CARIRI), Trinidad & Tobago
- viii) Information Disclosure Agreement - i2india IPR Pvt. Ltd. Bangalore
- ix) Numerical modelling of erosion in hydro-turbine components through Computational Fluid Dynamics (CFD) - Central Power Research Institute, Bangalore
- x) Evaluation of physical properties and creep characterization for Kaveri Engine Modules Phase-I - GTRE, Bangalore
- xi) Recovery of gold from slag - Emerald Jewel Industries India Ltd. Coimbatore
- xii) Development of process flow sheet for Atasu underground mine - Kazakhstan, Orken LLP, Kazakhstan

International Collaboration

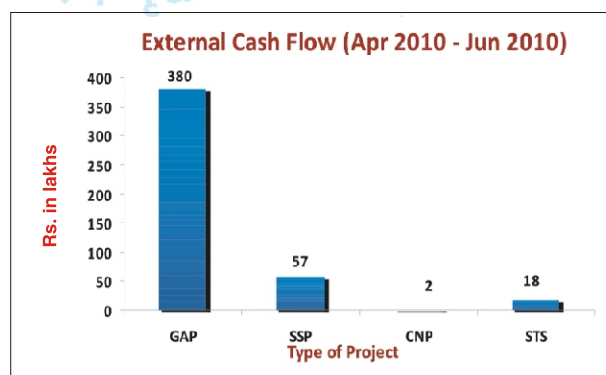
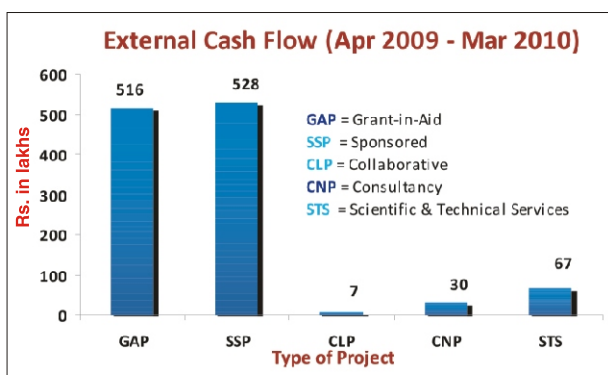
In addition to the several international collaborations established with KIGAM, Caribbean Industrial Research Institute, Orken LLP Kazakhstan etc as listed above, the level of international exposure and exchange of our staff has also grown several-fold. During the last year and half, about fifty seven of our scientists and technical staff went on foreign deputations on invitation or prestigious fellowships or for consultancy or international conferences or project exchange visits or equipment training. I hope that this international exposure will not only broaden their research perspective but will also be very useful for the future R&D activities of NML.

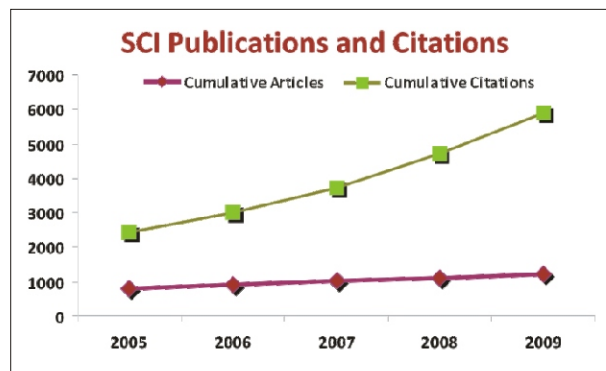
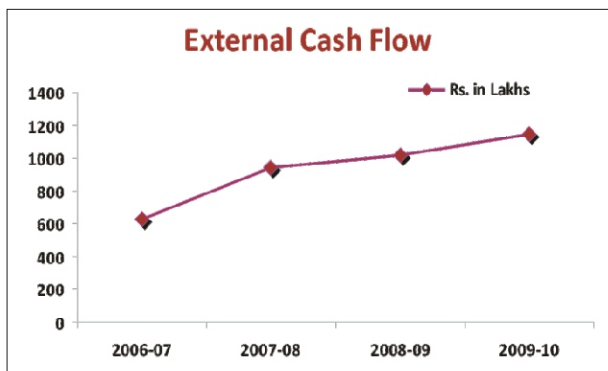
Infrastructure Established

NML can today claim to have among the best infrastructure in the world for characterisation and processing of minerals, metals and materials under a single roof. To add to the existing infrastructure, a number of new equipment were procured, installed and commissioned. I will not elaborate on this for want of time. These are listed in the RC-report handed over to you.

Performance Parameters

In terms of the CSIR performance parameters, NML has excelled all previous records. NML recorded its highest ever external cash flow of close to Rs 11.5 crores and the highest ever number of SCI publications last year. I take pride in complimenting team NML for raising the bar and setting new benchmarks of performance.





Over the past several years, NML has continued to be in the national limelight with respect to national awards and prestigious fellowships. This year has also seen several from NML receive various national awards :

- Metallurgist of the Year award for 2009 - S. Tarafder
- Young Engineer Award, Indian Institution of Engineers - Arpan Das
- Khare Best Paper Award (Coal Preparation) - A. Das, A. Vidyadhar and S.K. Dey
- Khare Best Paper Award (Beneficiation) - R. Singh, R.K. Rath, D.S. Rao, K.K. Sahu and K.K. Bhattacharya
- Mishra Best Paper Award (Bio-Hydro-Electro-Processing) - S.K. Sahu, B.D. Pandey and Vinay Kumar
- IIME Best Paper Award (Beneficiation) - Biswajit Sarkar, Avimanyu Das and S.P. Mehrotra
- Best Poster Award - S. Garai at the International Symposium on Current Status and Opportunities in Aromatic and Medicinal Plants
- Fellow of Indian National Academy of Engineers - S. Srikanth

In addition, several of my colleagues received some of the internal awards constituted for excellence in research. These are :

- Nijhawan Award (For the Best Technical Paper published in 2008) - Raghubir Singh, S. Ghoshchowdhury and Indranil Chatteraj
- Altekhar Award (For the Best Technology of 2008) - Amitava Mitra, K.K. Paul, A.K. Mallik, A.K. Panda, Arvind Kumar
- Award of Excellence in In-house Research (For in-house projects completed in 2007)
 - 1st Best Project Award - Sanjay Kumar, Rakesh Kumar, A. Bandopadhyay, Swapan Kr. Das, B. Ravikumar, B.K. Mitra and S.P. Mehrotra
 - 2nd Best Project Award - B. Sarkar, Avimanyu Das, K.K. Bhattacharya and S. Chandrasekhar

Some of the prestigious national fellowships were received from NML. These include:

- Raman Research Fellowship - S. Sivaprasad, B. Ravi Kumar
- BOYSCAST Fellowship - A.K. Mohanty, Arpan Das, D. Mandal, Arpita Ghosh
- Indo-US Fellowship - Mainak Ghosh





- DAAD Fellowship - S. Chakravarty
- INSA Fellowship - Ansu J. Kailath
- India Distinguished Visiting Fellowship - Mamta Sharma

The awards and prizes received by NML staff were not restricted to R&D category. Some of my colleagues from NML received prizes in lecture competitions quiz and essay competitions :

- Lecture competition (1st Prize) - R.K. Sahu at the Founder's Day Celebration of Indian Ceramic Society
- Lecture competition (3rd Prize) - Md. Murtuja Husain at the Founder's Day Celebration of Indian Ceramic Society
- Dara P Antia Memorial Quiz - Sanjay Agarwal and Pankhuri Sinha won 2nd Prize.
- Vigilance Awareness Week Essay Competition 2009 - R.K. Singh Roushan won first prize

NML has a history of excelling in sports. The last year saw several of our staff members win important local sports tournaments :

- Sojitz Golf Tournament 2010 - Pravesh Kumar won the tournament
- Jamshedpur Challenge Golf Tournament 2010 - winner Pravesh Kumar
- Second Inter Corporate Sector Table Tennis Tournament - R. Raju, D. Murmu, K.P. Krishnan and K.S. Trivedi won Runners-up Trophy.
- Timken Golf Tournament 2009 - Pravesh Kumar won the first prize.
- SSBM Tournament (Indoor Finals) - Md. Nayeem Ansari and Md. Salim Ansari won Runners-up prize in Carrom.

My heartfelt congratulations to all of them.

Distinguished Visitors

We had several eminent personalities from India and abroad visiting NML during this period and delivering lectures. Prominent among them were:

- Padmashri Saoli Mitra, Kolkata
- Dr. Roger A Brooks, Addenbrooke's Hospital, University of Cambridge, UK
- Dr. B.V.R. Tata, IGCAR Kalpakkam
- Prof. Abdul-Majeed Azad, Chemical Engineering, The University of Toledo, USA
- Prof. K.A. Natarajan, Indian Institute of Science, Bangalore
- Dr. Juergen Mattusch, Analytical Chemistry Division, Helmholtz Centre for Environmental Research, Leipzig, Germany
- Dr. M.T. Shyamsunder, Inspection Systems, John F Welch Technology Centre Pvt. Ltd., GE, Bangalore
- Prof. P. Ramachandra Rao, Raja Ramanna Fellow (DAE), ARCI Hyderabad
- Prof. Ing. Ivo Dlouhy, Brittle Fracture Group, Institute of Physics of Materials, Academy of Science of Czech Republic
- Dunstan Barnes, Department of Materials Science and Metallurgy, Cambridge University, UK



- Dr. K.H. Park, Korea Institute of Geoscience & Mineral Resources, South Korea
- Prof. Jae-chun Lee, Korea Institute of Geoscience & Mineral Resources, South Korea
- Dr. A.K. Gangopadhyay, Dept. of Physics, Washington University, St. Louis, USA
- Dr. D. Bhattacharya, Product Research, Arcelor Mittal Global R&D, Chicago, USA
- Dr. T. Ramasami, Department of Science & Technology, Govt. of India, New Delhi
- Mr. Thomas M. Fesich, MPA, Universitat Stuttgart, Germany
- Dr. Konstantin Mavrodiev Petrov, Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, Sofia
- Prof. H.S. Ray, Former Director, RRL, Bhubaneswar

Human Resources

A large number of people have joined NML since the last RC meeting. I take this opportunity to wish them a very successful professional life at NML.

Dr. Jay Chakraborty, Scientist Gr. IV(4), P.P. Bhattacharya, Scientist Gr. IV(2), Mrs. N. Vasumathi, U.K. Das, Scientists Gr. IV(1), A.K. Upadhyay, Gr. III(3), Tipu Kumar, S.K. Pradhan, Gr. III(2), M. Samanta, Pankaj Kumar, Shailendra Kumar Gr. III(1), Ajay Puri, Ms. Purnima Sinha, D.K. Sumbrui, Gr. II(2), Abhishek Kr. Singh, Ranbindranath Behra, J.N. Ramanlal, B.R. Tigga, Jyoti Kumar, M.K. Behra, Rakesh Kumar, M.K. Toppo, D.R. Mahato, A.K. Toppo, Saroj Kumar, Gr. II(1), A. Bagchi, S.O. (F&A), R.N. Kumbhakar, Daftry, D.A. Srivastava, Asst. (S&P)

Twenty-one of my colleagues, fellow employees, retired in the past year and half. They are Dr. S. Chaudhuri [Sct.IV(6)], Dr. A.K. Bhattamishra, Sri S.K. Malaviya, [Sct. IV(4)], Sri Lal Maharaj [Gr.III(7)], Sri A.K. Acharjee, Sri A.R. Pan, Sri Rajeshwar Prasad [Gr.II(4)], Sri Ramanand Prasad [Gr.II(3)], Sri Avtar Singh, Sri S.N. Prasad, Sri T.S. Das, Sri S.D. Thakur, Sri Madan Singh [Gr.I(4)], Dr. I.A. Quadri [S.O. (F&A)], Sri A. Gopalakrishnan (P.S), Sri B.B. Choudhury (Sr.Stenographer), Sri Arbind Patra [Asstt.(S&P) Gr.I], Ms. Sulekha Sengupta [Asstt.(G) Gr.I], Smt. Rukmani, Sri Rohina (Safaiwala), Sri A.K. Bose (Watchman)

I wish them all a Very Happy & Healthy Retired Life.

Conferences and Training Programmes

The following training programmes/workshops/seminars were organised at NML:

- NML Change Leaders Workshop, April 12-23, 2010
- Training Programme on NDT for Indian Air Force, March 8-12, 2010
- National Seminar on Electronic Waste, January 21-22, 2010
- Workshop on Metallurgy for Engineers, December 14-16, 2009
- Training programme on NDT for Air Force, September 8, 2009
- Orientation programme for new recruits (Gr.(IV) & Gr. (III) levels), April 28, 2009
- Training programme on NDT for Air Force, March 23, 2009

In addition, NML was entrusted the responsibility to organise a special session on 'Mechanochemistry and Mechanical Alloying' during 4th Asian Particulate Technology Symposium (APT2009), September 14-16, 2009, New Delhi.

Societal and Extra Curricular Activities

In addition to the delivery of public goods and private goods, NML also has a knowledge dissemination and societal mandate which includes organization of conferences/symposia, development of human resources in the country, creating awareness on energy and



environment, protecting traditional knowledge, creating scientific and technology awareness in the country, creating vigilance awareness, promotion of Rajbhasha and so on. In this pursuit, NML organized several training programmes, functions, awareness campaigns etc as listed below:

- Tree Plantation Programme, June 7, 2010
- Technology Day Celebration, May 11, 2010
- ISO Audit at NML, May 6-10, 2010
- World Earth Day Celebration, April 22, 2010
- Inauguration of Pilot Plant for mine water reclamation, January 13, 2010
- NML Foundation Day, November 26, 2009
- Vigilance Awareness Week at NML, November 3-6, 2009
- CSIR Programme for Youth Leadership in Science (CPYLS), October 13-14, 2009
- CSIR Foundation Day Celebration, September 26, 2009
- CSIR-Innovation day Celebration, September 8, 2009

At NML, it is never 'All work and No play". CSIR allows time for sports and extra-curricular activities. We had sports events and quiz conducted as part of the Foundation Day Celebrations of NML.

Our Vision and Goals for the Future

As NML steps into the next decade, it is time to introspect its relevance and impact in the context of the changing times, its financial viability and sustainability, the nation's aspirations and its standing in the international arena today. Public funding in non-strategic areas has to be exercised with caution - I personally believe that public funded S&T projects has to be in partnership with the industries, else it would remain divorced from the user. I have a dream, vision and direction for NML which I believe is the way forward and I have a roadmap to achieve them. I presented this to the Director General and the Search Committee during my selection process and sought their agreement and endorsement. Since I assumed this office of Directorship, I have also discussed these vision, goals and directions extensively with all my colleagues and we are in the process of evolving a shared vision and a roadmap.

My dream for NML is that by 2022 we become a self sustained technology centre in the areas of minerals, metals and materials science. This dream is based on the solid foundations of NML's heritage, its manpower and infrastructural strength, its position in the fraternity of international materials laboratories and the goodwill of the people of India for NML to succeed. I do not expect to be here till 2022 to realize my dream. However, I hope to be here until 2016 to give shape to my dream and in this pursuit, we have set ourselves the following goals:

- Meet 50 % of NML's total budget from industrial sponsorship
- Achieve 80% direct utilization of man-power and major equipments
- Develop and commercialize five technologies that will have a lasting impact
- Realize 5% of operational budget from IP licensing and royalties
- Move towards a paperless NML
- Deliver on one national mission project
- Create leadership chain for tomorrow



These are difficult targets and can be made possible only if we have defined a clear roadmap to achieve each of these goals. To achieve even partial financial self-sustenance, we have to leverage our full collective strength in terms of our credibility; our manpower strength, our infrastructural strength, our knowledge domain, our successful technologies, our intellectual properties and the strength of our industrial linkages. Our proposed roadmap for this purpose is:

- 25 % of target budget to be realized from leasing of equipment and facilities to industries (Sign annual contract with all major clients).
- 50% of target budget from high end scientific services through contract research
- 20% from technology development partnerships with private partners
- 5% from IP licensing and technology transfer royalties

To meet the target of 80% man and machine utilization, our proposed roadmap would be :

- Introduction of e-timing system
- Utilization of tele/video conferencing for most meetings and reviews to minimize unproductive time
- Put in place online project and equipment management systems
- Introduction of internal accounting for equipment utilization
- Annual leasing of equipment time to industries and institutes
- Outsourcing of complete equipment maintenance and, if possible, its running
- Outsourcing of pilot scale operation and maintenance
- Creation of local manpower agencies with skilled manpower to assist in execution of projects

The path to the development and commercialization of technologies would be a lot tougher because of the need to compete with international benchmarks. However, we propose to set the ball rolling through the following initiatives:

- Part of research to exclusively focus on technology development - technology development projects to have domestic relevance and extensive industry interactions
- Technology development in partnership with industry
- Prepare concise technology information document (name of product/process and detailed technical specifications vis-a-vis international benchmarks, current market, scale of development, capital investment, return on investment, performance guarantee assurance) to be updated and put on website
- Interaction with not only major industries but SME's, Banks, Venture Capitalists on commercialization of potential NML technologies
- High rewards (commensurate with value) to staff on technology transfer

On the intellectual property front, the thrusts would be on converting all forms of knowledge to resources and associate the industries in the development and exploitation of intellectual property :

- High priority on selling of knowledge generated within and outside NML - *knowledge to wealth initiative*
- Thrust on patent/software licensing rather than only filing - *patents/software licensed to be the performance index*





- Joint ownership of patents with industry - *patent filing and maintenance costs to be sought from industry*
- High rewards (based on licensed value) for *patents licensed*

Today's corporate world as well as several government offices has moved towards a *paperless culture*. It is essential that NML immediately implement a paperless office environment. We have proposed the following initiatives in this regard:

- Online access to all relevant links
- Biometric system for access and for time accounting
- Online human resource management system
- Installation of automated security surveillance systems
- Online equipment management systems - Online booking of equipment hours with charge/project numbers
- Online submission and approval of all applications/forms, requests, notes, purchase indents, stores/library request etc.
- Online project management system - online tracking of all project status, progress, man-hours consumed, expenditure status etc.
- Online purchase and inventory systems
- Online accounting systems and processes
- Conduct online trainings and develop online training modules

CSIR has already acted upon several of these through the CSIR IT Transformation Initiatives. We consider leadership development to be the single most important parameter that would determine the realization of our goals. In this regard, I propose to move in the direction of delegation of authority. The cornerstones of my policies will be:

- To move from a director centric culture. We propose to have multiple levels of leadership with authority delegated. The Director's job would be to mainly direct
- Retain divisional hierarchy only for administrative purpose - activity/project based hierarchy to dominate
- Recruitment of potential leaders
- Every major activity to have a young second rung leadership identified and nurtured for takeover
- High emphasis on mentoring and nurturing of human resources
- Grooming through leadership development programs

In *summary*, we plan to shift from:

- limited private funding to limited public funding
- building infrastructural assets to knowledge bases
- knowledge generation to knowledge utilization
- sourcing everything inward to outsourcing non-core activities
- manpower intensive to knowledge intensive
- curiosity driven science to science for the benefit of industry/society





- research for publication to publications from research
- pilot plants to piloting the plants
- investing on equipments to investing on people
- national needs to international opportunities
- providing jobs within to creating jobs outside
- individual to team assessments
- firefighting to systemic solutions

We are striving to change; to keep up with the changing times; change to bring in more focus, more relevance, a more professional work culture, accountability, transparency and more impact; change ultimately to meet the aspirations and expectations of the stakeholders and the people - a change that is consistent with continuity. I request the RC chairman and members to advise us and provide suggestions on the directions and mandate that we have set forth. It would require not only all my colleagues at NML to put their heart and soul in striving to achieve these goals but also the support and patronage of all the Research Council members in this pursuit.

It is a matter of great pride for all of us that NML is celebrating its "Diamond Jubilee Year" from 26th November 2009 to 26th November, 2010. During this year of celebration, we are organizing a number of events including a few Diamond Jubilee Lectures. The first lecture in the series was delivered by Prof. Gautam Mukerjee, Visiting Faculty, XLRI on "*Relevance of India in the World Today - The R&D Advantage*" on the National Technology Day on May 11, 2010. The other dignitaries who will be delivering these special lectures are: Dr. Baldev Raj, Director, IGCAR, Kalpakkam; Prof. S. N. Upadhyay, Director, Academic Staff College, BHU, Varanasi and Dr. Mano Manoharan, General Manager, GE Research, Bangalore. In addition, the MPT-2010 International Seminar on "*Mineral Processing Technology*" will also be organized and hosted jointly by NML and TATA Steel as part of the "*Diamond Jubilee Celebrations*".

NML is also planning to host a special programme on November 26, 2010 evening with a "Laser Show" depicting the history, achievements, people and recognitions received by NML over the last six decades in which our Hon. Minister of Science & Technology, Govt. of India and Director General, CSIR have been invited. A film on NML as well as a "Special Souvenir" is also being planned.

Before concluding, I wish to recall the words of Sir J.R.D. Tata after one of his visits to NML in Jan 1963 "As usual, a visit to NML leaves one with a sense of purposeful and constructive achievement". I hope that the Chairman and the Members of the RC will go back with a similar feeling. In concluding, I also thank all my scientist colleagues, technical staff members, all my colleagues and staff members of various sections of administration for their continuous support and cooperation.



20 July 2010

S. Srikanth

(S. Srikanth)
DIRECTOR