

# NML news



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## DR. A. P. MITRA, DIRECTOR-GENERAL, CSIR, VISITS MARINE CORROSION RESEARCH STATION, DIGHA

Dr. A. P. Mitra, Director-General, CSIR visited the Marine Corrosion Research Station (MCRS), Digha on 27th June, 1987. He reviewed the programmes undertaken at MCRS and discussed with the Director and other scientists of the laboratory, the scope for reorienting the existing facilities and research activities at MCRS.



Dr. A. P. Mitra (centre) observing the experimental set-up at MCRS.

The Director-General suggested that two or three rooms of MCRS be provided with air-conditioning facilities to accommodate the vital instruments to protect them from corrosion damage due to saline atmosphere. He was of the opinion that the facilities at MCRS be made available to other institutions and laboratories both within and outside CSIR for conducting research. He further emphasized that a national programme which takes full advantage of the location of Digha be identified with collaboration from several laboratories and other institutions. Participating scientists from these institutions could come to Digha on a rotation basis and continue their research at MCRS.

## RESEARCH APPRAISAL AND PUBLICATIONS COMMITTEE (RAPC) MEETING

The second meeting of the RAPC was held on 26th May, 1987. Project leaders of most of the exploratory projects of the laboratory, presented the current status of their projects. Scrutiny of the current projects and new projects proposals were carried out and as a result, five new projects were approved.

A gist of exploratory projects completed/to be completed by June, 1987 is given below :

### 1) Aluminium alloy coating for steel

Two major metallic coatings for sheet steel have been used for the last 145 years. It has, however, been experienced that these coatings cannot function satisfactorily in industrial as well as marine atmospheres. Galvanised coating performs better in industrial atmosphere where as aluminium coating is effective in marine atmosphere. Moreover, aluminium coating does not galvanically protect steel in industrial and rural atmospheres. A new concept for the Al-Zn coating on sheet steels has emerged in USA. Exhaustive field exposure tests on Al-Zn alloy coating have ensured much improved corrosion resistance properties in both industrial and marine atmospheres. The NML has initiated R & D work on Al-Zn alloy coating and completed the project successfully. Composition and parameters for the production of Al-Zn alloy coating have been established. Since the coating combines some of the best properties of galvanised and aluminium coatings, it is of commercial importance as a new type of protective metallic coating for a wide range of steel products.

### 2) Development and scaling up of the production of Chromium-Manganese-Nitrogen-Carbon creep resistant steel for exhaust valve applications

Steels for diesel engines exhaust-valve application

have to be creep resistant at elevated temperature. NML has developed a process for the production of Cr-Mn-N-C creep resistant steel for this purpose. Trials have been successfully conducted at the R. D. S. O. Lucknow, with 100 Kg of this steel. Sponsoring of large scale trials by RDSO is under negotiation.

### 3) *Development of cadmium-free silver metal oxide*

Ag-Cd and Ag-CdO are two of the contact materials widely used on bench scale today in the electrical and electronics industries. However, it is well known that the cadmium possesses an appreciable degree of toxic and harmful effects on the human body. It has therefore, been felt necessary in the recent past to develop contact materials without cadmium and consequently the current exploratory project was taken up. A number of alloys were tried out, taken through various thermo-mechanical routes and finally internally oxidised. Broadly the observations are that zinc copper and tin in silver can substitute cadmium in the Ag-Cd and Ag-CdO alloys without sacrificing the desirable properties. The conductivity values as percentage IACS under the best combinations of processing parameters touch about 77 units with hardness of 75 VHN.

A number of techniques were adopted to identify the various oxides and another project is being launched to correlate electrical properties with the oxides present.

### 4) *Development of high ductility alloys Ultra High Carbon steel*

Ultra High Carbon (UHC) steel containing 1-2 pct. carbon has very limited applications owing to lack of any ductility. However, since 1975, these alloys have been revived, as it was found that they can be made superplastic at temperatures close to Al temperatures, provided the ferrite and cementite present are of sub-micron size. Exploratory experiment was taken up to find out a viable thermo-mechanical treatment which can be adopted industrially as an on-line process. A number of alloys were tried out and were taken through several thermomechanical treatment routes. Subsequently the alloys go through divorced eutectic deformation (DET) as well as divorced eutectic deformation with associated deformation (DETWAD). The results show at a temperature of about 800°C and at strain rate  $1.6 \times 10^{-3}$ , 650 percent elongation upto fracture. Even at room temperature, about 16 pct. elongation can be induced. One obtains an 'm' value of 0.5 and deformation stress of about 30 MPa at the higher temperature (800°C) for these materials. Optimisation of the processing parameters is underway to produce still better results.

### 5) *Conserving energy by room temp. sealing of anodic oxide coatings on Aluminium and its alloys*

The work on the above project has been completed and it has been concluded that it is technically feasible to seal anodized Aluminium and its alloys at room temp. from the newly developed baths containing nickel ions. The room temperature sealing is comparable to the one sealed in boiling water at 100°C. For developing countries like India, where the cost of sealing, could be high, it would be beneficial to adopt such energy saving processes.

## HONOURS AND AWARDS

We congratulate Dr. Inder Singh, Sri K.P. Mukherjee, and Dr. V. A. Altekar, Scientists, who have been nominated for the 'Corrosion Award' by the Electrochemical Society of India. The award has been given for their paper 'Rusting of Cold Rolled Sheet Coils during transit and storage : A Case Study'.

## TECHNICAL LECTURES

Mr. Avinash D. Kulkarni, Litex Electricals Pvt. Ltd., Pune. "Recovery of metal value from Lamp Industry Effluents" on 23rd June, 1987.

Dr. O. N. Mohanty delivered a lecture, 'Compacted graphite cast iron' at the Indian Institute of Technology, Kharagpur on 26th June, 1987.

Dr. R.N. Ghosh, presented a paper, 'Fracture mechanics based approach for characterisation of materials used in power plants', at the National Seminar on Steel for Power Sector, held at R & D Centre for Iron and Steel, Ranchi on 30th June, 1987. The paper was jointly written by Dr. R. N. Ghosh and Prof. S. Banerjee.

The following lectures were jointly organised by NML and Indian Institute of Metals, Jamshedpur Chapter :

Dr. R. K. Ray, IIT, Kanpur spoke on, 'Texture in Metals' on 3rd June, 1987.

Dr. Amitava Roy, Thapar Corporate R & D Centre, Patiala delivered a talk on, 'Grain boundary structure and properties' on 3rd July, 1987

The following lectures were organised jointly by NML and Indian Ceramic Society, Jamshedpur Chapter :

Mr. A. S. Prasad, Tata Iron and Steel Company Limited, spoke on, 'Laser and its applications in Iron & Steel Industries' on 8th June, 1987.

Mr. J. P. Blackburn and Mr. Heath Coate, Lafarge Refractories, France, delivered a talk on, 'Development and installation of low cement and ultra low cement castables for Iron & Steel Industry' on 30th June, 1987.

## **NEWLY FORMED COMMITTEES HELP STREAMLINE DECISION-MAKING**

Director, NML has delegated the authority for decision-making to thirteen newly formed committees as a step in the direction of speeding up administration. This has been a long felt need, particularly due to complexities of managing an institution of the size of NML. The roles, functions, constitution, as well as formats for agenda and reporting for each committee, have been defined. Each committee is managed by a chairperson, a convener, and members. Some of the members retire by rotation from each committee. A brief description of the function of the committees is included here.

### *1) Internal Committee (IC)*

In order to review the implementation of the laboratory's objectives, roles and programmes and to assist the Director in decision-making, this committee has been constituted.

### *2) Appointment Committee (AC)*

In order to help, organise and execute various facets of manpower planning, deployment and recruitment including cases for assessment, the Appointment Committee was constituted.

### *3) Construction & Maintenance Services Committee (CMSC)*

With a view to integrating and coordinating the activities connected with the construction and maintenance of the laboratory, large scale testing facilities as well as of housing complexes, this committee was constituted.

### *4) Counselling and Grievances Redressal Committee (CGRC)*

In order to provide for a just, speedy and effective redressal of grievances of employees, this committee was constituted.

### *5) Deputation & Manpower Development Committee (DMDC)*

This committee will scrutinise, screen and recommend nominations for deputation of staff to seminars, symposia, workshops, training courses, ex-

change programmes etc., within the country as well as abroad.

### *6) Delivery Committee (DC)*

This committee was constituted to effect the speedy delivery of materials being sold to the prospective purchasers.

### *7) Health Services Committee (HSC)*

This committee was constituted to oversee, direct and streamline the various activities pertaining to health services for both the laboratory and its residential complexes.

### *8) House Allotment Committee (HAC)*

The function of this committee is to coordinate, oversee and direct the activities concerning the allotment of NML's housing facilities.

### *9) Library, Information and Documentation Committee (LIDC)*

In order to coordinate, organise, oversee and direct the activities relating to the functioning of the library and documentation services, this committee was constituted.

### *10) Material Management Committee (MMC)*

In order to help, regulate, organise and execute multifarious activities connected with procurement, storage, inventory control and disposal of obsolete items, this committee was constituted.

### *11) Patents & Royalties Committee (PRC)*

In order to make recommendations on and to direct as required on all activities relating to patents and royalties this committee was constituted.

### *12) Research Appraisal & Publications Committee (RAPC)*

In order to organise, coordinate, oversee and direct various R&D activities of the Laboratory relating to the review and appraisal of research projects, colloquia and publications this committee was formed.

### *13) Safety and Liveries Committee (SLC)*

In order to make recommendations and to coordinate, oversee and direct as required on all activities concerning safety and providing liveries and safety garments for the use of NML employees this committee was constituted.

## PATENTS SEALED

1. Improved process for casting of aluminium or aluminium alloys to obtain fine grain refining thereof.

(Patent No. 157261, dated 19-11-1981, sealed on 20th February 1987)

2. Apparatus and method for the simultaneous production of hydrogen and carbon monoxide separately or as a gaseous mixture.

(Patent No. 157264, dated 13-8-1982, sealed on 20th February 1987)

## WE CONGRATULATE THEM ON THEIR PROMOTION. . .

Dr. C. S. Sivaramakrishnan, Dr. A. K. Nayak, Shri D. M. Chakraborty, and Shri Raghubir Singh as Scientist EII.

Dr. Venkates Rao, Dr. V.N. Choudhury, S/Shri Paras Nath, S. Prasad, Nirmalendu Ghosh and J. P. Srivastava as Scientist EI.

Dr. D.D.N. Singh, Dr. Sri Ram Singh, S/Shri Swatantra Prakash, S. Pramanik, R.R. Dash. S.K. Sinha, Diwakar Jha and Vinay Kumar as Scientist C.

S/Shri R. C. Arora, G. Basu as Scientist B, S/Shri T. K. Gangadharan, R. P. Saraswati, P. S. Virdhi, Onkar Singh, and R. K. Kunwar as Scientist B1.

Shri A. C. Basak as Senior Analyst.

S/Shri A. Hazra. S. Sarkar as Assistant Engineer.

## WE WISH THEM A HAPPY RETIRED LIFE . . . (Joining date in parenthesis)

S/Shri J. Guha, Scientist AI ( 22-4-1951 ); Amrik Singh, Civil Engineer ( 30-7-56 ); P. G. Krishnan, Fine Mechanic ( 4-8-1958 )

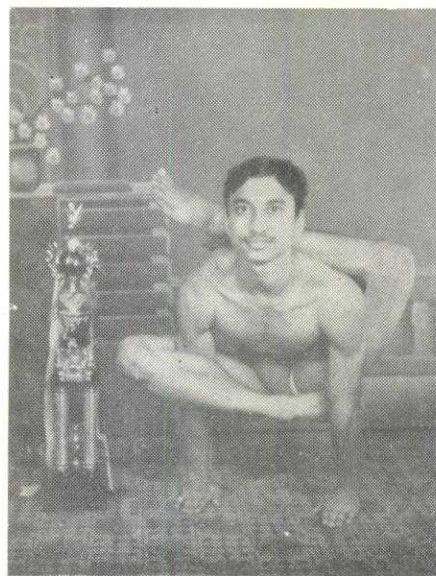
## WE WELCOME THEM AND WISH THEM A FRUITFUL STAY AT NML . . .

S/Shri V.P. Thomas, Civil Engineer 'B'; Alok Kumar

Arya, Pharmacist; Bhola Nath Mondal, Safaiwala; Girija Shankar Mishra, E. P. Rajiv Nambiar, Subrata Kumar Das as junior Research Fellows.

## SOCIO-CULTURAL & SPORTS FRONT

Shri Diptom Bose, son of Sri D. K. Bose participated in the 6th All India Yoga Competition organised by the Bishnu Charan Ghosh Memorial Committee at Calcutta from 20-23 June, 1987. We take this privilege to announce that Shri Bose bagged the Junior Title in this Competition, in which over 500 competitors took part from all over the country. Honourable State Health Minister, Govt. of West Bengal, Shri Prasanta Sur, distributed the prizes. Our warmest felicitations to Shri Diptom Bose on this remarkable achievement and we wish him still greater glory in days to come.



*Well done Master Diptom Bose.*

Our Bridge Team participated in the Master Pair Bridge Tournament organised by the Singhbhum District Bridge Association on 14th June 1987 at Keenan Stadium. Shri T. N. Swain and Shri S. K. Choudhury bagged the champion shield. S/Shri B.M. Singh and D. K. Goswamy were placed in third position.