



आरोग्य खनिक

AAROGYA KHANIK

NIMH NEWSLETTER

VOLUME 1, ISSUE 1, JULY 2010

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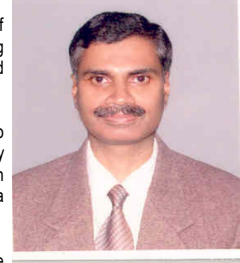
Message from Chairman, NIMH

The rapid development of the Indian economy over past few years has also increased the requirement of various minerals in the country. The National Mineral Policy, 2008 has emphasized not only on increasing productivity and output of various minerals but also the sustainable development of mineral industry and protection of workers and environment from the adverse effect of mining.

National Institute of Miners' Health with the mandate for promotion of occupational health of miners and to provide Technical Support Services to the mining and mineral processing industry has an important role to play in the sustainable development of mineral industry. The Institute also needs to disseminate information on various health issues and create awareness among employers, employees and other stakeholders. "Aarogya Khanik" can play an important role in this regard.

It gives me great pleasure in introducing the inaugural issue of "Aarogya Khanik" which is an attempt of the Institute to disseminate information on issues relating to miners' health among all stakeholders.

With best wishes,



S. Vijay Kumar
(S. Vijay Kumar)

Secretary to the Government of India &
Chairman, National Institute of Miners' Health

We welcome Shri S Vijay Kumar, IAS, who has taken over as Secretary to the Government of India, Ministry of Mines and Chairman of National Institute of Miners' Health. We look forward to his constant guidance and support in development of National Institute of Miners' Health and in our endeavor of achieving our Mission "Indian Mining & Mineral Industry sans Occupational Diseases" and Vision "Safe Mines and Healthy Miners" -NIMH Parivar

Message from the Director

Health of miners has always been concern of administrators and employers because of the exposure to health hazards and risk of developing occupational diseases. With the rich heritage of experience and expertise in miners' health, NIMH set up in 1990 with the mandate to address the issues relating to health of miners in Metalliferous Mines, is providing technical support services to mines and conducting applied research addressing specific issues relating to health of miners since then.

In this issue of "AAROGYA KHANIK", we provide information on biomarkers on occupational diseases, health status review of miners in Rajasthan and review of respirable dust sampler CIP-10. The review of the instrument is an unbiased scientific review based on experience of our scientists in the field. We hope you will find this Newsletter useful. Your suggestions and comments will help us in improving contents of the "AAROGYA KHANIK".

With best wishes,



Dr. P. K. Sishodiya

Dr. P. K. Sishodiya

Secretary, Ministry of Mine Visits NIMH



Mrs. Santha Sheela Nair, IAS, Secretary to the Government of India, Ministry of Mines accompanied by Shri C S Gundewar, Controller General, Indian Bureau of Mines and Shri N K Dutta, Deputy Director General, Geographical Survey of India, Nagpur, visited National Institute of Miners' Health on 17th February 2010. During her visit, she interacted with the officers and staff of the Institute. On this occasion, Dr. P K Sishodiya, Director, NIMH, welcomed her and gave a brief presentation on the activities, future plans and inputs required for development of the Institute. Mrs. Nair also visited Occupational Hygiene, Occupational Medicine, Biochemistry and Analytical Laboratory of the Institute.

During her visit, she also interacted with the M.Sc. students of Biotechnology from Kamala Nehru College, Nagpur, engaged in their dissertation and research projects in the Institute and suggested that NIMH should request various mining companies to sponsor project work of the students so that they can serve as future resources for the mining industries. Mrs.

Nair wished that the Institute would provide a new direction to the research in occupational and environmental health issues of miners.

OUR VISION

“Safe Mines
and Healthy
Miners”

Biomarkers and Occupational Diseases

The term “Biomarker” is used for any measurement reflecting an interaction between a biological system and environmental agent. Biomarkers can be objectively measured and evaluated as an indicator of normal biological processes, pathogenic processes, or pharmacologic response to a therapeutic intervention. Sixth Meeting of the IPCS Programme Advisory Committee (1989) recommended the term “Biomarkers” in the assessment of human health risks from occupational exposures. Biomarkers have been found to be helpful in early detection in many diseases e.g. Acetylcholine Esterase (Ach) for neurotoxicity, Serum Glutamate Pyruvate Transaminase (SGPT) and Bilirubin for liver function, etc There is also evidence that level of some of the biomarkers such as Glutathione (GSH), Superoxide Dismutase (SOD), Angiotensin Converting Enzyme and Neopterin, correlate with degree of exposure to occupational and environmental hazards and may be helpful in early detection of occupational diseases. Recent studies suggested that serum and urinary Neopterin levels are higher among silica exposed workers and workers having coal workers pneumoconiosis. Similarly, Clara cell Protein-16, Tumor Necrosis Factor- α , Interleukin-8 etc. measurements have been proposed as biomarkers of exposure to crystalline silica and coal mine dust. Biomarkers play an important role in target identification, validation and elucidation of mechanism of action. NIMH scientists have undertaken a project on Biomarkers detection in dust exposed miners which is under progress.

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Health Status Evaluation of Miners in Rajasthan

National Institute of Miners' Health carried out a health status evaluation study among the miners of Rajasthan. A total of 2540 miners engaged in various sub-occupations were studied from March to August 2005. The health status of each mine worker was evaluated by recording a detailed history and questionnaire modified from the standardized British Medical Research Council version, followed by medical examination, Chest X-ray, Pulmonary function test, Audiometry, Electro cardiogram, Random blood sugar, Urine Analysis and Vision screening test. Data collected was analyzed. It was observed that out of total 2540 mines workers, 5.75 % had changes suggesting of silicosis, or silico-Tuberculosis. It was further observed that restrictive impairment was more common (14.4 %) as compared to obstructive impairment (1.02%) and combined impairment (1.92%). 13% mine workers were having Noise Induced hearing Loss \geq 6%. Urine analysis showed Glycosuria present in 2.79% and Proteinuria in 6.89%. Vision test suggested that 10.16% workers as having refractive error. 8.62% workers were having Hypertension and 2.16% workers having Diabetes. Body mass Index showed 12.8% underweight and 26.5% miners being overweight of which Class I obesity was observed among 4.1% of the miners.

Review of Instrument: Dust Sampler, CIP 10



Manufactured by ARELCO, France, the CIP 10 is a personal dust sampler worn on the workers chest for the assessment of airborne particulate matter in mines, industry and environment.

Shaped like a long compact block with a cylindrical selector and rotating cup for collecting airborne dust particles in its upper part and a flat box enclosing the operating components in the lower part, the box's shape makes it easy to wear/carry without posing a hindrance to the safety of the worker during sampling activities. The CIP10 is fundamentally based on the rotating cup principle. The instrument collects dust on a Poly Urethane Foam (PUF) cup that is mounted on a motor shaft that rotates at non variable high speeds (so as to give a constant flow rate of 10 L/min) inside an enclosure that has an axial air inlet and a tangential air outlet. The rotation of the cassette therefore form generates air flow by a centrifugal-fan like effect and assures capture of aerosol fractions previously selected by the selector placed upstream of the system. The speed can however also be adjusted using an internal potentiometer and tachometer in case the flow rate needs to be altered.

CIP10 uses a 45 grade (45 pores per linear inch) PUF foam for aerosol fraction/dust collection. Selective filtration at different levels of the instrument body for respirable, thoracic, invaluable and total dust can also be done by placing a size selector at the entry of the rotating cup. During the course of sampling, the CIP 10 assembly is switch on/off by briefly passing a special magnet at the specific area marked on the cover/case of the instrument.

After sampling, the exposed foam is kept in its specific case for transportation to the laboratory. The dust on this foam filter is then analyzed in the lab as per the specific need.

Advantages:

Small and compact with modular architecture, the rugged manufacture of CIP10 ensures that it does not require any specific maintenance other than periodic cleaning after sampling, and recharging of the batteries. The instrument is being intrinsically safe in the mines and has been approved by DGMS for use in the mines throughout India for dust sampling activities. The CIP10 corresponds fairly well to the conventional CEN-ISO-ACGIH criteria for sampling the inhalable health related aerosol fraction.

Disadvantages:

The maintenances and repair of CIP10 is expensive and after sale service is not up to the mark. Magnetic on/off switch frequently runs out of operation and is difficult to replace. Samples collected are cumbersome to process for determination of free crystalline (Quartz) silica by FTIR method. The instrument is not suitable for collecting sample for determine crystalline silica by FTIR where silica % is very high i.e. > 30%.

R & D projects

Ongoing S & T project

S. No.	Name of the Project	Sponsoring Agency	Remarks
1.	Development of protocol for evaluation of vibration hazard potential of mining equipment.	Ministry of Mines S& T Division, GOI	In Progress
2.	Systematic study of potential bio markers of occupational diseases in miners	Ministry of Mines S& T Division, GOI	In Progress

Short term Research Project: (M. Sc Biotechnology)

S.No	Name of the Project	Students Name	Remarks
1.	Studies on Protein Biomarkers in Municipal Solid Waste workers.	Pravin Soni	Completed
2.	Investigation on Protein biomarker development for assessment of pulmonary disorder in coal dust exposed workers .	Kanchan Muley	Completed
3.	Investigation on appearance of protein prototype in gin mill worker by SDS-PAGE.	Sneha Pakhale	Completed
4.	Exploration of biomarker for prediction and early detection of Aluminium exposed workers.	Sonal Hariharno	Completed
5.	Approaches towards identification of signature protein in the painters.	Sonali Pilliwar	Completed
6.	Evaluation of protein biomarker in traffic police.	Sweta Dudhalkar	Completed

Clientele Projects Completed

Sr. No.	Name of the Projects	Participating Scientists	Month/Year
1.	Investigations into the vibration Characteristics of Mining Equipment, Jaiprakash Associates Limited, Rewa. (M.P.)	Shri B.B.Mandal	July 2009
2.	Airborne respirable dust survey, Noise Monitoring and Vibration studies at Panchpatmali Bauxite mines of National Aluminium Company Ltd.	Shri. Debasis Chattarjee	Dec 2009
3.	Vibration studies of HEMM in bauxite mine of HINDALCO, Kolhapur	Shri Debasis Chattarjee	June 2010

Our distinguish visitors and their valuable comments

Date	Name of visitor	Affiliation with designation	Visitors Comments
16.01.2010	Sandeep Kumar Nayak	Joint secretary to Government of India Ministry of Mines, Shastri Bhawan, New Delhi	Impressed with the amount of work that NIMH wants to undertaken in its plan activity
28.01.2010	Paul Harrison	Director, SIMTARS Department of Economic Development and Innovation Queensland 4300 Australia	Very Impressive establishment
28.01.2010	Stewart Bell	Commissioner of Mines Safety & Health Executive Director, Safety and Health Division Queensland 4300 Australia	Excellent Facility
28.01.2010	Rahul Guha	Deputy Director General of Mines Safety Directorate General of Mine Safety, Western Zone, Nagpur.	Excellent Facility
08.02.2010	Dr. Pournima Kulkarni	Occupational Health Consultant 66, Bhangre Vihar, Trimurti Nagar, Nagpur-22	Facilities are excellent and can be utilized for underprivileged
17.02.2010	Santha Sheela Nair	Secretary to the Govt. of India, Ministry of Mines, Shastri Bhawan, New Delhi	—
04.05.2010	Ingrid Christensen	Senior Specialist, Occupational Safety & Health, International Labour Organization, South East Asia Region, New Delhi	—
04.05.2010	K.J. Singh	Chairman-cum -Managing Director Manganese Ore India Ltd.	—
20.05.2010	Dr. S. K. Wadhawan	Director (Technical) Ministry of Mines, Shastri Bhawan, New Delhi	Most Fascinating! State of art equipments and modern facilities to match with conductive work culture for optimum productivity and health of experts as well.
26.05.2010	Vijay Vyas	Grindwell Norton Limited, Buttibori, Nagpur	—

Joint Secretary, Ministry of Mine, Inaugurates Biochemistry Laboratory



Shri. Sandeep Kumar Nayak, IAS, Joint Secretary, to Government of India, Ministry of Mine visited NIMH on 16th January, 2010. During his visit, he inaugurated Biochemistry laboratory which is a new setup in institute. Dr. Shubhangi Pingle explained the role of Biochemistry laboratory in early

detection of occupational and environmental diseases in miners. Joint secretary took keen interest in understanding the function of different instruments in the laboratory. He was impressed with the amount of work that NIMH wants to undertake in its plan activity.

Executive Director and Director, SIMTARS Visit NIMH

Mr. Stewart Bell, Executive Director and Mr. Paul Harrison, Director, SIMTARS Australia, visited NIMH on 28th January 2010. During their visit, they interacted with officer, staff and students. and visited occupational medicine, occupational Hygiene and Biochemistry departments. They wished NIMH to initiate work in new direction which will be helpful in ensuring safe mines and healthy miners. They also expressed willingness to collaborate with NIMH on various project.



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Hazard Monitoring in Mines vis a vis Recommendations of 10th Safety Conference



The institute organized two days workshop on "Hazard Monitoring in Mines Vis-à-vis Recommendations of 10th Safety Conference" during the period May 4th & 5th 2010 at NIMH, Nagpur. Seventeen delegates participated in this workshop from WCL, MOIL and MECL. During the workshop, the participants were exposed to rigorous classroom sessions, demonstration and practical training on various instruments from

Occupational Medicine, Hygiene and Biochemistry laboratory of the institute. The participants, expressed the views that the workshop, was beneficial for enforcing safety and health in mines and requested to organize more trainings and workshop programme for safety managers. Certificate were given to the participants after successful completion of workshop.

Senior Occupational Safety & Health Specialist, ILO Visits NIMH

Ms. Ingrid Christensen, Senior Occupational Safety & Health Specialist, ILO

Sub-regional Office for South Asia, was the Guest of Honour for the workshop on "Hazard monitoring in mines vis-à-vis Recommendations of 10th Safety Conference" organized by the Institute on 4th & 5th May 2010 as a part of the celebration for "World Occupational Safety and Health Day", and delivered address on ILO Conventions relating to OSH in mining industries during the inaugural session.

During her presentation, she reviewed ILO Conventions relating to occupational safety and health in mining industry. She also discussed the provisions of Convention 155, Recommendation 164 on Occupational Health Services and Convention 187 of 2006 on Promotional Framework for Occupational Safety and Health and emphasized the need for developing national system and national programme on occupational safety and health. Ms. Christensen also visited various laboratories at the Institute and observed facilities available in the Institute and interacted with the participants attending the workshop.



OUR MISSION

"Indian Mining & Mineral Industries sans Occupational Diseases"

Forthcoming Events:

1. 2010 Federal Occupational Health Conference August 4-6, 2010 Sacramento, California.
2. Ergonomics and Human Factors: Strategic Solution of Workplace safety and Health September 13-16, 2010 Boston, MA. .
3. The 8th International Symposium on Biological Monitoring in Occupational and Environmental Health (ISBM 2010) September 6-8, 2010 Hanasaari, Espoo, Finland.
4. 2nd International conference on climate change and Sustainable Management of natural Resources, December 5-7, 2010 Gwalior, Madhya Pradesh (India).
5. International conferences on Environmental Science and Technology. 6 December 2010 Istanbul, Turkey.
6. 61th National conference of Indian association of Occupational Health. 9th-12th Feb 2011 Badodhara, Gujrat (India).
7. 34th International Conference of Safety in Mines Research Institute (ICSMRI) 7th -10th December 2011 Kharagpur (India).

Editor

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National Institute of Miners' Health
JNARDDC Campus, Wadi, Nagpur-440023 (M.S.) India
Website: www.nimh.gov.in
Email id: aarogykhanik@gmail.com