



आरोग्य खनिक AAROGYA KHANIK

A NEWSLETTER OF NATIONAL INSTITUTE OF MINERS' HEALTH

VOLUME I, ISSUE 3, JAN 2011

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निदेशक की ओर से

पिछली तिमाही खनन क्षेत्र एवं खनिक स्वास्थ्य के संदर्भ में अत्यन्त महत्त्वपूर्ण रही। 13 अक्टूबर 2010 को चिली की San Jose Gold and Copper Mine में जमीन से 2059 फीट नीचे फंसे 33 मजदूरों को 69 दिनों के बाद जिन्दा सुरक्षित निकाला जा सका, जब की 17 दिनों तक उन लोगों की कोई खैर खबर नहीं थी। यह अपने आप में एक महत्त्वपूर्ण कार्य है। इस घटना से देश में 13 नवम्बर 1989 को रानीगंज कोयला क्षेत्र की महाबीर कोयला खदान में हुई दुर्घटना की याद ताजा हो जाती है, जब खनन इतिहास में पहली बार 64 खनिकों को 380 फीट जमीन के नीचे से 4 दिन बाद स्टील केपसूल की मदद से निकाल कर बचाया गया।

अक्टूबर, 2010 में एक ओर महत्त्वपूर्ण कदम MSHA USA द्वारा लिया गया, जिसमें 24 महीनों के अन्दर Coal Dust की Permissible limit को 2 mg/m³ से घटा कर 1 mg/m³ करने का प्रावधान किया गया। इसके पीछे कारण है कि NIOSH द्वारा प्रकाशित आकड़ों के मुताबिक अमरीका के कोयला खनिकों में Coal Worker Pneumoconiosis से पीड़ित लोगों में पिछले सालों में काफी वृद्धि हुयी है, और यह भी माना जा रहा है कि अब Coal Worker Pneumoconiosis पहले के मुकाबले कम उम्र में हो रही है एवं ज्यादा गम्भीर विकलांगता कर रही है। MSHA का यह भी मानना है कि Permissible limit कम करने एवं बेहतर Medical Surveillance से Coal Worker Pneumoconiosis से बचाव में मदद मिलेगी।

राष्ट्रीय खनिक स्वास्थ्य संस्थान खनन कम्पनियों को उत्कृष्ट सेवा प्रदान कर एवं अनुसंधान द्वारा खनिकों के स्वास्थ्य में बेहतरी के लिये कटिबद्ध है तथा इस दिशा में कार्य करता रहेगा। "आरोग्य खनिक" के माध्यम से हमारा प्रयास है कि खनन कम्पनियों एवं खनिकों को व्यावसायिक स्वास्थ्य संबंधित राष्ट्रीय एवं अंतर्राष्ट्रीय जानकारी प्राप्त कराये व जागरुक करें। मैं नव वर्ष की शुभकामनाएं देते हुये आशा करता हूँ कि आप सभी के सहयोग से हम इस प्रयास में सफल होंगे।



डॉ. पी. के. सिशोदिया

NIMH STALL AT ISC EXPO-2011 IN 98TH INDIAN SCIENCE CONGRESS 2011



National Institute of Miners' Health participated in Pride of India Exhibition in the 98th Indian National Science Congress from January 3-7, 2011 held at SRM University, Chennai. The five- day long congress was inaugurated by Prime Minister Dr. Manmohan Singh on January 3. The congress was attended by over 7,000 delegates from India and abroad, including six Nobel laureates and several eminent scientists from across the world.

The stall of National Institute of Miners' Health attracted a large number of visitors. NIMH newsletter "Arogya Khanik" was highly in demand throughout the exhibition. NIMH showcased the infrastructural facilities available for workplace monitoring, occupational health surveillance and various research projects undertaken by the institute. Students, researchers, government officials found this institute unique in its objectives and desired to interact with the institute in future. The Ministry of Mines (MoM) with its participating departments, viz., GSI, IBM, JNARDDC, NIRM, NIMH and NFTDC set up Exhibition stalls. The MOM pavilion was adjudged as the "Most Informative" and was honored with a certificate and trophy by the Chancellor of SRM Deemed University.

OUR VISION

“Safe Mines
and Healthy
Miners”

Review of Instruments:

Gravimetric Dust Sampler: GDS – NCB-MRE-113A



GDS -113A is a self powered intrinsically safe portable instrument used for gravimetric sampling of respirable airborne dust in mines. The instrument selects respirable dust according to British Medical Research Council/ Johannesburg criteria which excludes particles fall velocity greater or equal to that of 7.1 micrometer unit density sphere. It can operate for a full working shift un- attended. A rechargeable Ni-Cd 6.0 V battery drives a motor and a pump to draw 2.5 liters of dust laden air per minute through a horizontal four channel elutriator, which acts as size selector. The respirable dust is collected on a fibre glass filter medium of 55 mm diameter size. The concentration of dust is determined by weighing the filter and amount of air sampled during the shift and is expressed in mg/ M³ of air. GDS-113A is a DGMS approved dust sampler extensively being used for source monitoring studies as area. GDS-113A is considered the standard equipment for comparative study of different sampling instruments for respirable dust and deriving conversion factor. M/s Casella, Landon has discontinued manufacturing of the MRE-113A and therefore, there are difficulties in procuring spare parts including battery. The support service for the equipment is also not readily available in country.

Area Dust Sampler: High Volume Sampler

High Volume Sampler (HVS), is an area dust sampler and designed as per the specification of Central Board for the Prevention and Control of Water Pollution. It is used to collect the ambient dust containing Respirable Particulate Matter (RPM) and Suspended Particulate Matter (SPM) by keeping at 1.5 m height from the ground level and parallel to the ground to obtain representative sample on the site to assess the ambient environment. Additionally, it also has provision to collect samples of gaseous pollutants like SO₂, NO_x (Oxides of Nitrogen), CO, H₂S, F and Cl⁻ etc. by absorbing them in appropriate media through impinger as specified by the current National Ambient Air Quality Standards (NAAQS) on the basis of CPCB Notification dated 11-04-1994, S.O. 384(E), F. N. B-33014/4/90. After sampling the ambient air, dust particles are analyzed by **Gravimetric method** while absorbed gaseous pollutants are analyzed by **Spectrophotometric method**.



High Volume Sampler is works at flow rate in the range of 1.1 & 1.5 m³/min, the air is drawn through cyclone (additional assembly) and the dust particles are collecting on glass fiber filter paper with diameters of 0.1 to 100 μm (Stokes equivalent diameter). The mass concentration in μg/m³ in ambient air is computed by measuring the mass of SPM and RSPM collected and the volume of air sampled. The instrument is capable of adequately sampling the dust from the atmosphere having concentration of particulates as low as 1 μg/ m³. To obtained the average concentration of SPM, RSPM & gaseous pollutants, standard sampling period of 24 hrs. is recommended. Where concentration is high sample may be obtained in 6 to 8 hours. In case of cyclone assembly, fitted with the high volume sampler, only respirable (Stokes equivalent) particles having diameters less than 10 μm are collected on filter paper and rest of the particles (10 to 100 μm) can be collected on a removable pan of cyclone assembly.

Physical and chemical analysis of the collected dust can also be done after the effective sampling. The cumulative size of the collected particles can be determined by the Particle Size Analyzer/instrument and the organic and inorganic properties of the same can be determined by various standard chemical analytical techniques.

Field Audiometry:



Audiometry in field set ups like in mine, beneficiary plants etc are done during medical examinations of the workers as per recommendation of 10th conference for safety and in scientific projects carried out for epidemiological studies. Technical limitations in audiometry are how accurately we determine the frequency or the hearing level and the learning effect, i.e., the first ear tested sometimes appears worse than the second one since the individual becomes more proficient at detecting the threshold. Audiometric tests should be carried out in a sound-proof chamber however when done in mining environment it is difficult to eliminate external sounds, the Background noise from influencing the test. Other important consideration in audiometry is it is subjective and relies on the cooperation of the subject. If the subject is unable or unwilling to cooperate with the test then unrepresentative results will be obtained. Evaluation of the Audiogram is done by standard method and the hearing impairment is graded as per the recommendation of World health Organization. Ideally abnormal results of field audiometry should be confirmed with lab audiometry.

International Developments:

MSHA issues proposed rule on lowering miners' exposure to respirable coal dust

The proposed rule would lower the existing concentration limits for respirable coal mine dust from 2 milligrams of dust per cubic meter of air, or 2 mg/m³, to 1 mg/m³ over a 24-month phase-in period; require the use of the continuous personal dust monitor; provide for the use of a single, full-shift sample to determine compliance; address extended work shifts; and redefine normal production shifts. The limit for intake air at underground mines and for miners who show evidence of developing pneumoconiosis will be halved, as well, to 0.5 mg/m³ six months after the final rule's effective date. In addition, the proposed rule would require expanded medical surveillance. It will add spirometry testing, occupational history, and symptom assessment to the chest x-ray examination now required for underground coal miners and will extend medical surveillance to surface coal miners.

Based on recent data from NIOSH, cases of black lung are increasing among the nation's coal miners. Even younger miners are showing evidence of advanced and debilitating lung disease from excessive dust exposure. Over the past decade, more than 10,000 miners have died from black lung. The federal government has paid out more than \$44 billion in compensation for miners totally disabled by black lung since 1970.

<http://www.msha.gov/media/PRESS/2010/NR101014.pdf> [14th October, 2010]

2nd ILO / AIR Pneumo Training Workshop on use of ILO Classification of Pneumoconioses 2000



Dr. P K Sishodiya, Director NIMH attended the 2nd ILO / AIR Pneumo Training Workshop on use of ILO Classification of Pneumoconioses 2000 held at Central Chest Institute of Thailand, Bangkok from 20-22nd December, 2010 as resource person on behalf of AIR Pneumo project. The workshop was organized by AIR Pneumo Project, University of Fukui, Japan under chairmanship of Professor Yukinori Kusaka in collaboration with ILO. Dr. Igor Fedotov, Senior Occupational Safety and Health Specialist, ILO Geneva attended the workshop. The two and half days workshop provided refresher training to 21 occupational and chest physicians from Thailand and Vietnam in ILO International Classification of Radiographs of Pneumoconioses 2000 followed by examination for certification as AIR Pneumo Reader.

R & D projects

Ongoing S & T projects

Sr. 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	Field study conducted
2.	Systematic study of potential biomarkers of occupational diseases in miners.	Ministry of Mines S& T Division, GOI	Field study conducted

Ongoing Clientele Projects

Sr. No	Name of the Projects	Participating Scientists	Month/Year
1.	Health surveillance of RSMML employees Phase I (Completed)	Dr. S. Dhattrak , Dr .S Nandi, U. Dhumne, S. Ingole, S. Narwadiya, R. Tumane and P. Soni	Sept 2010
2.	Health surveillance of RSMML employees Phase II (Completed)	Dr. S. Dhattrak , Dr .S Nandi, U. Dhumne, S. Ingole, S. Narwadiya, R. Tumane and P. Soni	Nov 2010
3.	Health surveillance of RSMML employees Phase III (In progress)	Dr. S. Dhattrak , Dr .S Nandi, U. Dhumne, S. Ingole, S. Narwadiya, R. Tumane and P. Soni	Feb 2011
4.	Area and personal noise monitoring and Vibration Exposure in the use of mining equipments in Jilling and Langlota Iron-Ore mines of Essel Mining and Industries Ltd.	D. Chatterjee, N. Kulkarni and K. Sarkar	Dec 2010
5.	Noise monitoring studies at the Limestone mines of Rajshree Cements works Malkhed Road, Dist. Gulbarga, Karnataka.	G. S. Ravindra and J. Jaikumar	Dec 2010

Human Resource Development



Shri Debasis Chatterjee, Senior Research Officer and Head of the Department, Occupational Hygiene, went for training programme on “Creativity and Innovation Management in Research for middle and Senior Scientists”, sponsored by Department of Science and Technology, government of India at Administrative Staff College of India, Bella Vista, Hyderabad from 22nd November to 3rd December 2010. The two week training programme by ASCI faculty and external experts from different institutions highlighted the need for innovation and creativity in research by positive constructive approach of senior management and young scientist of different research institution.

Appointments / Promotions / Regularization during the year 2010-11:

Sr No.	Name	Promoted/ Appointment to
1.	Dr. Prashant Zade	Contract period extended by one year
2.	Mrs. Aruna A. Jawade	Junior Scientific Officer 1 st January 2011
3.	Ms. Rajani G. Tumane	Sr. Scientific Assistant 1 st January 2011
4.	Mr. Pravin N. Soni	Junior Research Fellow 13 th September 2010
5.	Mr. Krishnendu Sarkar	Junior Research Fellow 11 th November 2010

Our Distinguished visitors and their valuable comments:

Date	Name of visitor	Affiliation with designation	Visitors Comments
14.12.2010	श्री जय प्रकाश कर्दम	संयुक्त निदेशक राजभाषा खान मंत्रालय, शास्त्री भवन नई दिल्ली - 110 001	इस संस्थान के निदेशक डॉ. सिशोदिया तथा उनके सहकर्मियों से मिलकर पता चला कि खनिकों के स्वास्थ्य के प्रति वे कितने सजग एवं सक्रिय हैं। साथ ही हिंदी में अधिक से अधिक प्रयोग के प्रति भी उतने ही निष्ठावान हैं। मेरी बहुत बहुत शुभकामनाएं।

Forthcoming Events:

1. Lung Development and Repair. Hilton Santa Fe/ Historic Plaza, Santa Fe, New Mexico, USA, Feb 6th -11th, 2011.
2. Neurodegenerative Diseases: The Molecular and Cellular Basis for Neurodegeneration. Sagebrush Inn And Conference Center, Taos, New Mexico, USA, Feb. 21st-26th 2011.
3. 34th International Conference of Safety in Mines Research Institutes (34th ICSMRI) at Habitat World, India Habitat Centre, New Delhi, December 7th-10th, 2011.
4. International conference on Emerging trends preventive Occupational respiratory diseases at work places. New Delhi, Maula Azad Medical College. 22nd to 24th march 2011.
5. 61st National Conference of Indian Association of Occupational Health, Badodhara, Feb 16th -19th, 2011.

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“Indian Mining &
Mineral Industries
sans Occupational
Diseases”