



Workshop
on
Initiative
for
Construction Safety Awareness
-A Report-

21-22 March, 2015

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Acknowledgement

With a sense of satisfaction, I express my sincere thanks for the support provided by Indian Institute of Technology Delhi and Delhi Chapter of National Safety Council in organizing this workshop on Initiative for Construction Safety Awareness at IIT Delhi.

I would like to thank all the speakers for sparing their valuable time and sharing their viewpoints and experience with us in the workshop and also promising to work with us in our future endeavors. I also take this opportunity to express my sincere thanks to all the participants of the workshop and offer an apology for any inconvenience during the event.

The event could not have been a success that it was but for the cooperation and active participation of colleagues such as Prof. Brian Kleiner, Dr. Daniel Hindman and Dr. Thomas Mills from Virginia Tech, USA and Dr. Kumar Neeraj Jha (IIT Delhi), and, Mr. A.K. Tripathi (Consultant). Thanks also to Mr. Prabhat Narayan (SGS (P) Ltd.), Ms. Archana Purohit (GMR group), and Mr. Dilip Patel (IIT Delhi), who made the organization look easy with their effort in planning the event.

I would like to recognize the efforts of the IITK team which included Ms. Anshita Agrawal, Mr. Brijesh Kumar, Ms. Khushboo Gupta and Mrs. Nidhi Verma. I also acknowledge the hard work of student volunteers Mr. Chetan Chauhan, IITK and Mr. Krupen, IITD, who worked with the organizing team during the event.

And finally, thanks to Dr. Ralph Hall for his support throughout the ongoing collaborative research project under the Obama Singh 21st Century Knowledge Initiative being supported by the UGC. Partial financial support for the event also came from this project, and is gratefully acknowledged. The credit of making the ICONSA workshop successful goes to one and the all who have been associated with this task.

Sudhir Misra

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1. About the workshop

With India poised to make a significant investment of resources in the creation and maintenance of infrastructure, there is an urgent need to ensure that this investment does not come at the expense of worker health and safety. This workshop brought together national and international stakeholders – contractors, owners, regulators, and academic institutions – to explore different aspects of construction safety and identify strategic opportunities to advance awareness and research on this critical issue.

The workshop on Initiative for Construction Safety Awareness (ICONSA) was held on 21st & 22nd March 2015 at IIT Delhi. The event was organized jointly by the Department of Civil Engineering, Indian Institute of Technology Kanpur and Myers-Lawson School of Construction-Center for Innovation in Construction Safety, Virginia Tech, USA, as one of the activities under the ongoing collaborative project on ‘Creating an International Program for Sustainable Infrastructure Development’ under the Obama Singh 21st Century Knowledge Initiative. The event was also supported by the Delhi Chapter of the National Safety Council of India and Department of Civil Engineering, Indian Institute of Technology Delhi. The workshop focused on various aspects of construction safety studies.

The ICONSA Workshop provided a platform to the diverse group of professionals and facilitated a discussion on the latest state of practice with regards to the formulation and compliance of appropriate standards and legal frameworks. This report provides a short summary of ICONSA workshop. It has been prepared for circulation to participants but is also intended as a resource for those interested in the workshop content but who were unable to attend. Announcement for the workshop is included in Annexure 1.

2. Objective

- To create awareness of critical construction safety issues
- To deliberate on possible safety legal frameworks that are applicable to India
- To discuss academic initiatives and programmes in construction safety
- To try to chalk out a ‘way forward’ to sustain professional activity in the area

3. Participants and Invited Presentations

The invited presentations consisted of distinguished professionals from different parts of the world having expertise in the field of education and industry. 13 speakers shared their knowledge and experience in the field of construction safety and related fields in the workshop (List of speakers is enclosed in Annexure 3).

25 participants representing over 10 organizations, including CRRI, DMRC, L&T, NBCC, NICMAR to name a few from different parts of country attended the workshop (The list of participants is attached in Annexure 4).

4. Programme

The two day workshop included presentations of experts from different fields. The schedule of the workshop is included in the Annexure 2.

5. Summary of ICONSA Day 1 and 2

Day 1 - 21st March 2015

At the outset Prof. Sudhir Misra, IIT Kanpur made formal welcome address and spoke about the need and objective of the work shop. He explained the need and status of construction safety awareness in India.

The Chief Guest for the event Mr. Jose Kurian's address mainly focused on welfare of construction labours. In India 90-95% construction labours are migrated labours; this results in non-unionization and lack of awareness of various facilities and provisions for construction workers. He related human maturity level with accidents at construction sites. The construction companies should not see safety as an investment and mentioned construction managers must be responsible for site accidents. He emphasized the need of framework for construction safety which includes legal, administration, technical, education, training, certification and research. He illustrated various process and areas for safety at workplaces along with health and safety management requirements. Mr. Kurian concluded with a list of available Indian standards for safety and health requirements.

Dr. Daniel Hindman, VT, USA, gave an introductory speech about Centre for Innovation in Construction Safety, Health and Well-being (IC-SAFE) and its mission. The IC-SAFE's mission is to improve construction worker safety, health, and well-being by connecting and integrating industry, education, and research. The Center established a practice-to-research-to-practice life-cycle for research such that pragmatic and measurable results do not trade-off against productivity or profitability.

Mr. M Kamarajan, L&T Construction spoke on "Holistic Approach to Construction Safety" and focused on two points (1) Responsibility (Who's Baby) and (2) ILO & National statistics. He emphasized that approach to safety starts with technology, and standards followed by the HSE management system can result in improved culture. He pointed out that important elements necessary to achieve safety excellence are conditional and behavioral. He revealed that in present scenario, as such, no International standards are available for safety performance, health and management system for the construction industry.

Mr. Saurabh Prakash, an engineer turned lawyer gave a broad view of the applicable legislative provisions relating to health, safety and welfare of construction workers. He explained the various sections of the building and construction workers act (BOCW) 1996 and Factors act 1948.

In a related presentation, Mr. Ashok Tripathi, Consultant, presented various regulatory provisions and compliance mechanism with special focus on legal aspects in building and other construction activities. Special emphasis was given for registration of construction labours and various benefits available, etc.

Mr. Anil Dhawan, GMR Group, shared his experiences of the time when he worked with Bechtel talking about raising the level of safety provisions in the construction industry. Brief on safety management was given, including Leadership, Design, Risk Management, Employee Competency, Responsibility and Accountability, Implementation and Monitoring.

Dr. Kumar Neeraj Jha, IIT Delhi, presented some case studies of construction accidents in India with special emphasis on safety of temporary structures. He illustrated that temporary structures do not deserve temporary treatment. In building construction 60% failure is due to form work collapse,

shoring collapse, inadequate shoring and lateral bracing, 8% due to premature removal of shore and 18% failure are due to faulty material. He concluded with a few recommendations for temporary structures such as scaffolding materials, access arrangement and Formwork design & drawings.

Dr. Daniel Hindman, VT, USA presented the role of fall in occupational injuries. In construction industry 36.9% fatal injuries are due to fall from height. Various fall protection systems were described, including guard rail systems, safety net system and personal fall arrest system. Special attention was given on personal fall arrest system (safety belts) used in the construction industry along with its design requirements and various components.

Dr. Thomas Mills presented various USA regulatory provisions and compliance mechanisms in construction health and safety. The presentation theme included Occupational Safety & Health Administration (OSHA), Employer Responsibility, Regulations, Challenges, Incident Reporting and Safe Reasoning. The concluding remarks of Prof. Mills considered safety as a profit center and makes win-win for Construction Company and workers.

Ms. Swati Meherishi, Senior Editor, Springer, discussed about possible Journal on Construction safety. Her presentation was in four parts. Part I briefed about springer publications and its market stand. Part II briefed about the current status of construction safety journal. It revealed as such, no journal is in market dedicated to construction safety. Part III briefed about proposed journal to meet the needs of both industry and academia in the construction safety domain which includes scope, composition, frequency, size, quality control and possible collaborations. Part IV briefed about plan of actions with possible deadlines.

In the last presentation of the day, Prof. Sudhir Misra outlined a map to meet the workshop objectives. This included creating awareness towards construction safety issues, academic initiatives and programs, initiatives for research proposals, work with BIS to design relevant codes, preparation and publication of various manuals & monographs, sharing of industry wide practices, etc. It was proposed to carryout various Phase I activities such as organizing workshops, carrying out few projects, dissemination/sharing of information. At a later stage, the creation of a center for construction safety studies could be foreseen.

Day 2 – 22nd March 2015

After Prof. Sudhir Misra briefly summarized the proceedings of the first day, Mr. Devendra Gill, DMRC Ltd gave a presentation on “Managing safety in construction works in urban settings – Challenges and mitigations”. This was mainly focused on various construction safety measures in practice at Delhi Metro construction sites and challenges faced. Various contract obligations, SHE targets, safety method statements/ work procedures, DMRC safety principles / manuals were briefly described.

Mr. Deepak Prinjha, IFFCO Tokyo Ltd briefed about importance of insurance in construction safety at construction projects. Details of interested parties in insurance, insurance covers available, risk associated in projects, things not covered, extensions, misconceptions, suggestions are briefed in this presentation. He also clearly mentioned that insurance in the construction sector was relatively new and a lot of work needs to be done at various levels to streamline the operation.

Mr. Sandeep Jain and Shailendra Kumar, Flour Daniel Pvt Ltd briefed various safety principles followed in EPC executions of projects which includes measurement of safety, safety metrics,

reporting, objectives, hazards, human natures, HSE organization, need of safety during design stage, implementation, program execution, systems followed, etc.

Mr. Ram Monohar Vikas, IRMA explained the current status of construction workers and their ability to learn at site. He emphasized on applicable legislative provisions relating to health, safety and welfare of construction workers. Also shared few personal experiences related to safety at construction sites.

Mr. Prabhat Narayan, GMR group briefed the cost of an accident at construction sites stating various on field illustrations and concluded that accident cost is much more than prevention cost.

Dr. Daniel Hindman, VT, USA, briefed the hoisting issues giving various statistics of US construction accidents and systems followed. He discussed the challenges faced in construction sites in special environments.

Dr. Thomas Mills, VT, USA, presented a report based upon vulnerable workers focusing on Latino's working within the residential construction sector including the insights, lessons and considerations

Towards the end of the workshop, the floor was thrown open to all participants who spoke briefly about their experiences and expectations from the initiative. Given below are some of the points that emerged from the discussion:

- Identification of safety budget using existing documents.
- Importance of educating construction workers on their rights.
- To create awareness of BOCW Act among workers and industry.
- Sharing of knowledge between participants.
- To continue this platform for future developments.
- To make industry participation for these initiatives.
- To identify few projects in the area of construction safety.

6. Moving Forward

The workshop concluded by identifying the following actionable items:

- Formation of a group for Construction Safety Professionals with members comprising of both academia and industry.
- Creation of smaller 'working groups' with a focused agenda. Two themes which could be taken to begin with could be (a) Education in Construction Safety, and,
(b) Legal Framework in Construction Safety
- Creating a repository for sharing accident data and related information
- Consider the possibility of launching a Journal for Construction Safety for dissemination of information and promote interdisciplinary research in the area
- Consider the creating of an office/secretariat for three years in project mode at IIT Kanpur with Prof Sudhir Misra as the Principal Investigator. This project should be jointly funded by all stakeholders.
- Effort should be made to hold a similar event in other parts of the country to increase awareness towards the subject, and also to serve as an occasion to monitor the progress on the points mentioned here, and better define the future course of action.

Prof. Misra delivered vote of thanks and concluded the workshop formally.



INITIATIVE FOR CONSTRUCTION SAFETY AWARENESS

- A workshop by IIT Kanpur & Virginia Tech on March 21 and 22, 2015 -



Background

With India poised to make a significant investment of resources in the creation and maintenance of infrastructure, there is an urgent need to ensure that this investment does not come at the expense of worker health and safety. This **Workshop on Initiative for Construction Safety Awareness (ICONSA-15)** will bring together national and international stakeholders – contractors, owners, regulators, and academic institutions – to explore different aspects of construction safety and identify strategic opportunities to advance awareness and research on this critical issue. The participation of this broad stakeholder group will ensure a discussion on the latest state of practice with regards to the formulation and compliance of appropriate standards and legal frameworks.

ICONSA-15 is being organized by the Department of Civil Engineering, Indian Institute of Technology Kanpur and Myers-Lawson School of Construction-Center for Innovation in Construction Safety, Virginia Tech, USA, on March 21 and 22, 2015, and will focus on various aspects of construction safety studies. The event is also being supported by the Delhi Chapter of the National Safety Council of India and Indian Institute of Technology Delhi. IIT Kanpur and Virginia Tech are currently working together on an International Project under the Obama Singh 21st Century Knowledge Initiative on ‘Creating an International Program for Sustainable Infrastructure

Objectives

- To create awareness of critical construction safety issues
- To deliberate on possible safety legal frameworks that are applicable to India
- To discuss academic initiatives and programmes in construction safety
- To try to chalk out a ‘way forward’ to sustain professional activity in the area

Registration

Participants can register at <http://www.iitk.ac.in/infocell/announce/iconsa/registration.html>. Due to space constraints an early registration is encouraged. Limited spot registration may be possible on 21st March morning.

Category	On-line registration	Spot registration
Faculty from colleges	INR 4000	INR 5000
Professionals from Industry	INR 5000	INR 7000

CONTACT	
Prof Sudhir Misra Department of Civil Engineering, Indian Institute of Technology Kanpur, Kanpur- 208016, INDIA	Prof Brian M Kleiner Myers-Lawson School of Construction, Center for Innovation in Construction Safety, Virginia Tech, USA
Email: sud@iitk.ac.in Tel: +91-512 679 7346	

Venue
Department of Management Studies, Indian Institute of Technology Delhi, New Delhi -110016



INITIATIVE FOR CONSTRUCTION SAFETY AWARENESS

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SCHEDULE

Day 1: March 21, 2015

Time	Session
9:30-10:00 a.m.	Registration
10:00-11:00 a.m.	About the Workshop
11:00-11:30 a.m.	Break
11:30-12:30 p.m.	Some Case Studies
12:30-1:30 p.m.	Regulatory Mechanism in Construction Safety
1:30-2:30 p.m.	Lunch
2:30-3:30 p.m.	Compliance and Documentation Mechanisms for Regulations
3:30-4:00 p.m.	Break
4:00- 5:00 p.m.	Comprehensive Approach to Safety
7:30-9:00 p.m.	Dinner

Day 2: March 22, 2015

Time	Session
10:00-11:00 a.m.	Construction Safety: The Workers' Perspective
11:00-11:30 a.m.	Break
11:30-12:30 p.m.	Construction Safety in Special Environment
12:30:1:30 p.m.	Education & Research Relating to Construction Safety
1:30-2:30 p.m.	Lunch
2:30-3:30 p.m.	Break Out Sessions <ul style="list-style-type: none"> • Regulatory framework in India • Compliance issues at sites • Education in construction safety • Special considerations in India
3:30-4:00 p.m.	Report from Break Out Sessions
4:00-5:00 p.m.	Concluding Remarks and Panel Discussion on “way forward”



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SCHEDULE

March 21, 2015

Time	Session	Title of Presentation	Speaker
9:30-10:00 a.m.	Registration	-	-
10:00-11:10 a.m.	Inaugural Session	Welcome	Sudhir Misra, IIT Kanpur
		Workshop Background, Need, Future Possibilities and OSI Partnership	Daniel Hindman, VT, USA / Sudhir Misra, IIT Kanpur
		Address by Chief Guest	Jose Kurian, CPWD
		Vote of Thanks	Kumar Neeraj Jha, IIT Delhi
11:10-11:30 a.m.	Break		
11:30-1:00 p.m.	Comprehensive Construction Safety	Some Case Studies of Construction Accidents in India	Kumar Neeraj Jha, IIT Delhi
		Saved by the Belt when Falling from Grace	Daniel Hindman, VT, USA
		Holistic Approach to Construction Safety	M Kamarajan, L&T Constructions
		Safety Raising the Bar	Anil Dhawan, GMR Group
1:00-2:30 p.m.	Lunch		
2:30-3:45 p.m.	Regulatory Provisions and Compliance Mechanisms	A Broad View of the Applicable Legislative Provisions Relating to Health, Safety and Welfare	Saurabh Prakash, Advocate
		Legal Aspects in Building and Other Construction Activities	Ashok Tripathi, Consultant
		Fines, Crimes, & Fatalities; Meet the Judge, Jury, and Executioner	Thomas Mills, VT, USA
3:45-4:00 pm	Break		
4:00-5:00 p.m.	Way Forward - I	Finding and Funding Safety Research	Daniel Hindman, VT, USA
		Draft Road Map	Sudhir Misra, IIT Kanpur
7:30-9:00 p.m.	Dinner		



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SCHEDULE

March 22, 2015

Time	Session	Title of Presentation	Speaker
10:00-11:15 a.m.	Construction Safety in Special Environment	Summary from Day 1	Kumar Neeraj Jha, IIT Delhi
		Managing Safety in Construction Works in Urban Setting:- Challenges and Mitigation	Devendra Gill, DMRC Ltd.
		Hoisting Issues, Marine Construction	Daniel Hindman, VT, USA
		Holistic Approach to Safe EPC Execution of Projects	Arun Kumar Jain, Fluor Daniel Pvt. Ltd.
11:15-11:30 a.m.	Break		
11:30-1:00 p.m.	Construction Safety: The Workers' Perspective	Insurance - an Important partner in Construction Safety	Deepak Prinjha, IFFCO-Tokio GIC Ltd.
		Cost of an Accident at Construction Project	Prabhat Narayan, SGS (P) Ltd.
		A Broad View of the Applicable Legislative Provisions Relating to Health, Safety and Welfare	Ram Manohar Vikas, IRMA
		Everybody's Different But We All Bleed Red: It's in our culture	Thomas Mills, VT, USA
1:00-2:30 p.m.	Lunch		
2:30-3:30 p.m.	Break Out Sessions	Regulatory Framework in India	Ashok Tripathi, Consultant
		Compliance Issues at Sites	Prabhat Narayan, SGS (P) Ltd.
		Education in Construction Safety	Kumar Neeraj Jha, IIT Delhi
		Special Considerations in India	Ram Manohar Vikas, IRMA
3:30-5:00 p.m.	Concluding Session	Report from Break Out Sessions	
		Panel Discussion on "way forward"	
		Concluding Remarks	
5:00-5:30 p.m.	High Tea		

Details of Speakers

No.	Name	Organization
1	M. Kamarajan	Larson & Toubro Constructions
2	Anil Dhawan	GMR Group-DIAL
3	Devendra Gill	Delhi Metro Rail Corporation
4	A. K.Tripathi	Consultant
5	Ram Manohar Vikas	Institute of Rural Management Anand
6	Prabhat Narayan	SGS (P) Ltd., DIAL ATC Project
7	Thomas Mills	Virginia Tech
8	Daniel P. Hindman	Virginia Tech
9	Kumar Neeraj Jha	Indian Institute of Technology Delhi
10	Saurabh Prakash	Advocate
11	Sandeep Jain	Fluor Daniel Pvt. Ltd.
12	Shailendra Kumar	Fluor Daniel Pvt. Ltd.
12	Deepak Prinjha	IFFCO-Tokio GIC Ltd.

Details of Participants

S. No.	Name	Affiliation / Organisation
1	Pankaj Kumar	Sr. Manager, ISGEC
2	Anurag Bansod	Safety Officer, Sunil Hitech Engineers Ltd.
3	Gopal Das	Safety Officer, Sunil Hitech Engineers Ltd.
4	Kuldeep Seth	Deputy General Manager, National Buildings Construction Corporation Ltd
5	Keita Nakasu	JICA Expert, MoRTH, JICA India Office
6	Amit Shriwas	Assistant Professor, National Institute of Construction Management and Research
7	Pawar Amol D	Assistant Professor, National Institute of Construction Management and Research
8	R.Murugraj	Assistant Engineer, ISGEC Heavy Engg Ltd
9	Deependra Kumar Gupta	Dy. Manager, ISGEC Heavy Engg Ltd
10	Shri Kishan Gupta	Planning Engineer, ISGEC Heavy Engg Ltd
11	Siril Shiyam Baldana	Assistant Manager, ISGEC Heavy Engg Ltd
12	Yoji Kawai	Representative, NEXCO East
13	Rabindra Nath Das	Chief SHE Manager Siemens Ltd
14	Ashok Kumar Yadav	Chief SHE Manager Siemens Ltd
15	Dinesh Sharma	Chief Project Manager Siemens Ltd
16	Rajeev Garg	S.E.Indian Institute of Technology Kanpur
17	Ashutosh Arun	Scientist Central Road Research Institute
18	Kushal Roychowdhury	Chief SHE Manager ITD - ITD Cem JV, Delhi Metro Rail Project
19	Halith Ahamed	Asst Mgr/Safety DMRC
20	P. Sivasubramanium	Junior Engineer (Civil)DMRC
21	Atul Grover	Partner Bombay Paints Sales
22	Deepak Advani	Partner S.T. Advani Co.
23	Vijay Kumar Sharma	Chief Inspector of Factories (Delhi)NCT of Delhi
24	Pravindra Kumar	Construction Manager L&T
25	Dharmendra Singh	Sr. Manager SHE L&T

Details of Organizing Team

S.No.	Name	Organization
1	Sudhir Misra	Professor, Indian Institute of Technology Kanpur
2	Nidhi Verma	Employee, Indian Institute of Technology Kanpur
3	Khushboo Gupta	Research Associate, Indian Institute of Technology Kanpur
4	Anshita Agrawal	Student, Indian Institute of Technology Kanpur
5	Dilip Patel	Student, Indian Institute of Technology Delhi
6	Mohit Dwivedi	Employee, Indian Institute of Technology Kanpur
7	Chetan Chauhan	Student, Indian Institute of Technology Kanpur
8	Krupen	Student, Indian Institute of Technology Delhi
9	Brijesh Kumar	Project Associate, Indian Institute of Technology Kanpur
10	Archana Purohit	GMR Group
11	Praveen Kumar	Employee, Indian Institute of Technology Kanpur
12	Dheeraj Yadav	Employee, Indian Institute of Technology Kanpur