UTM OPENCOURSEWARE

CONSTRUCTION SAFETY

INTRODUCTION TO CONSTRUCTION SAFETY

SBC 3363

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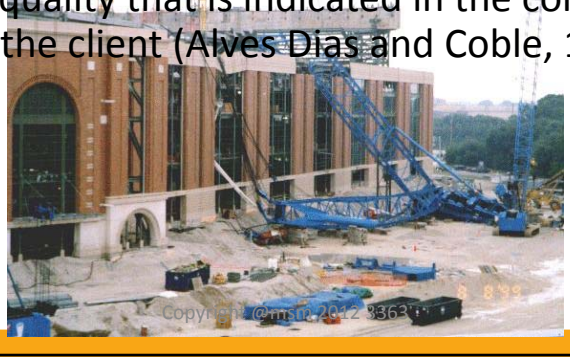
Accident, Safety and Culture

- Nowadays, quality and safety are two main issues in construction industry. ISO 9000 has been promoted in construction industry to ensure the quality of construction work done by a contractor.
- Apart from quality, a safe working environment is very necessary to put aside the current industry pictures of high risks in construction works. Construction safety is a standard of quality that is indicated in the contract and required by the client (Alves Dias and Coble, 1996).



Accident, Safety and Culture

- Revolution and changes in safety system management has become as a mandate in practicing safety action that can be managed interminable (Low and Sua, 2000).
- The worldwide construction industry is still practicing work process by labour intensive where based on wet trades. This factor contributes to the low quality of work due to the workers are lack of expertise and training and also exposed to the accident easily (CIDB, 2004).

ANGGOTA bomba mengeluarkan mayat daripada saluran paip pembetungan di Taman Jati, Jeram, Kuala Selangor, kelmarin. – Gambar oleh Abdullah Mansen

BH 8/08/03

Dua mati tertimbus ketika kerja pembetungan

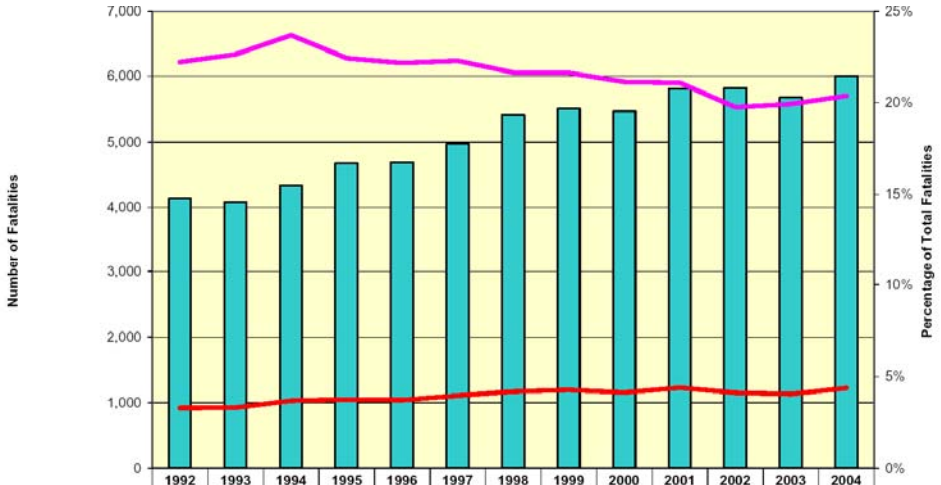
KUALA SELANGOR, Ahad – Dua lelaki mati tertimbus ketika melakukan kerja pembetungan di Baru 5 1/2, Taman Jati, Jeram di sini, petang semalam.

Tee Kok Wah, 46, dari Pasir Penampang di sini, dan seorang warga Indonesia, Jaman Jojok, 45, tertimbus apabila tanah yang digali runtuh menimpa mereka ketika melakukan kerja itu bersama tiga pekerja lain kira-kira jam 4.30 petang.

Ketua Polis Daerah, Superintendan Mohd Adzmir Nazri, berkata Tee dan Jaman mati di tempat kejadian dan mayat mereka dibawa ke Hospital Tanjung Karang untuk bedah siasat.

Beliau berkata, mereka mengalami kecederaan teruk di kepala dan polis tidak mengesyaki sebarang unsur jenayah.

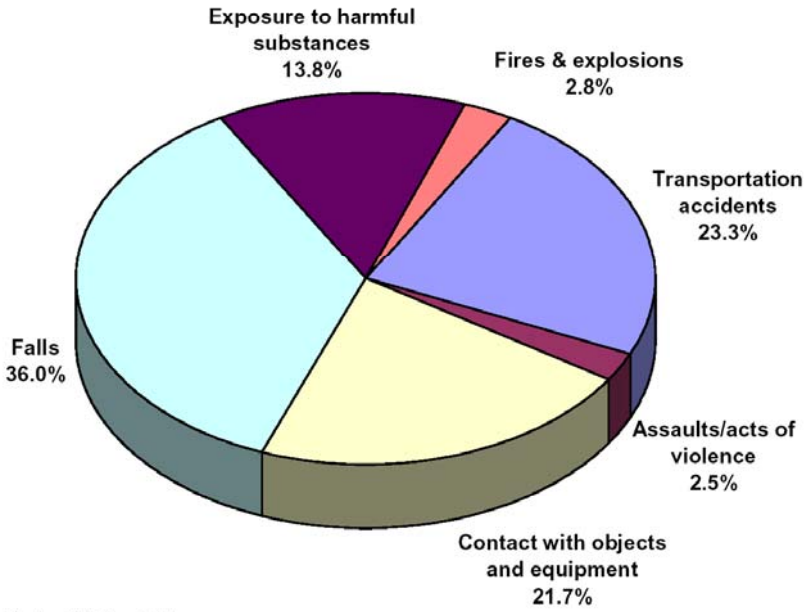
Fatality Trend Over Time (1992 – 2004)



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Construction as % of Total	14.8%	14.6%	15.5%	16.7%	16.8%	17.7%	19.3%	19.7%	19.5%	20.8%	20.8%	20.3%	21.5%
Fatalities, Construction	919	924	1,027	1,048	1,039	1,107	1,171	1,190	1,154	1,225	1,149	1,131	1,224
Fatalities, Total	6,217	6,331	6,632	6,275	6,202	6,238	6,055	6,054	5,915	5,900	5,524	5,575	5,703

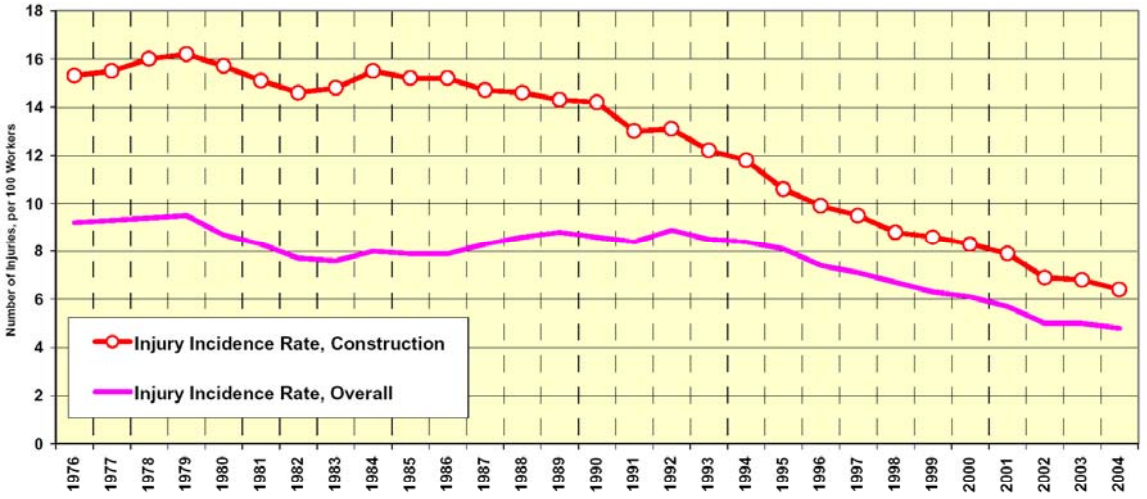
Source: U.S. Bureau of Labor Statistics, 1992 - 2004

Breakdown of Construction Fatalities in 2004



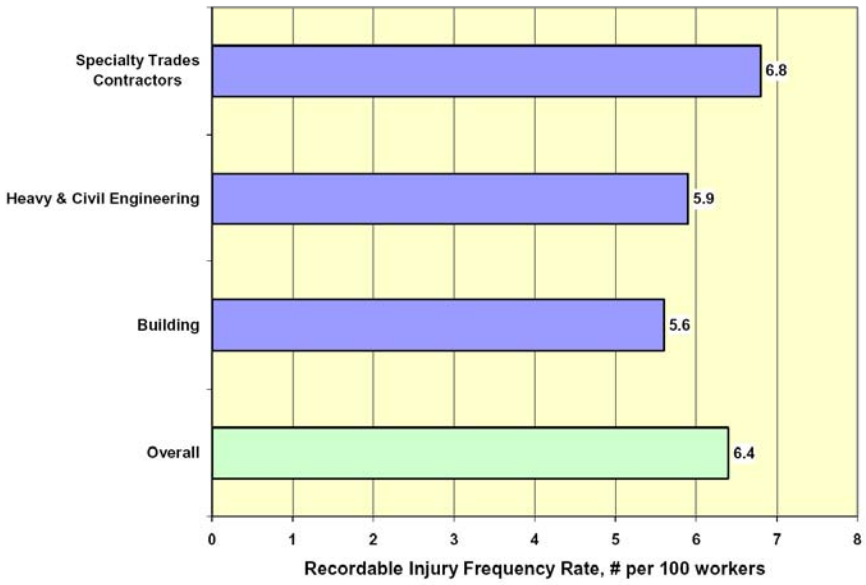
Source: U.S. Bureau of Labor Statistics, 2004

Injury Trend Over Time (1976 – 2004)



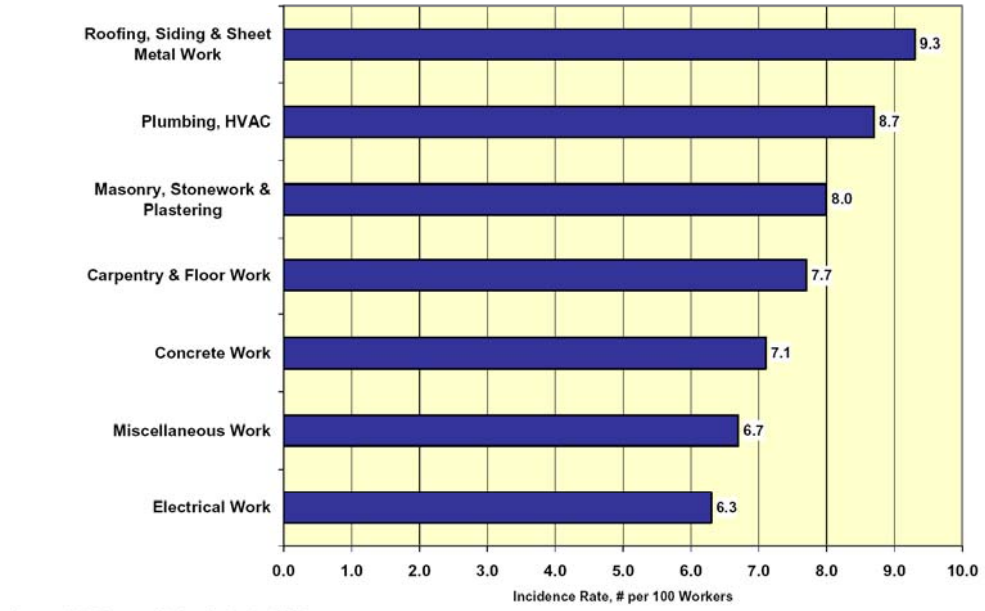
Source: U.S. Bureau of Labor Statistics, 1976 - 2004

Non-Fatal Injury Incidence Rate by Construction Type



Source: U.S. Bureau of Labor Statistics, 2004

Non-Fatal Injury Incidence Rate by Trade Contractor



Source: U.S. Bureau of Labor Statistics, 2002

Number of Industrial Accidents by Industries 1994-2002

Sector	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agriculture,Forestry & Fishing	27,268	21,954	14,250	24,390	13,880	12,753	11,893	12,424	9456
Mining & Quarring	1,406	1,017	967	763	771	756	626	573	545
Manufacturing	68,281	63,733	56,332	37,829	38,718	40,730	41,331	35,642	33,523
Electricity,Gas and Water	588	548	725	372	3,583	592	537	499	516
Construction	4,536	4,634	5,401	3,648	1,232	4747	4873	4593	5015
Commerce	9,173	10,200	13,058	9,248	13,015	14,685	15,452	13,774	13,685
Transport	4,437	4,840	5,093	3,276	4,077	4,462	4,778	4,382	4,439
Financial Institution and Insurance	592	681	516	367	719	627	687	602	567
Other Services	2,897	3,475	5,342	3,731	5,315	5,987	6,581	5,950	5,924
Civil Service	5,821	5,303	6,727	4,523	5,620	6,726	8,248	7,487	8,140
Activities not adequately defined	507	846	7	902	1,459	9	0	0	0
Total	125506	117231	108418	89049	88389	92074	95006	85926	81810

Sumber : Pertubuhan Keselamatan Sosial (PERKESO), 2009

Accident by industries 2004-2008

PERUSAHAAN/TAHUN	JUMLAH KEMALANGAN YANG DILAPOR				
	2004	2005	2006	2007	2008
Pertanian, Perhutanan, Pemburuan dan Perikanan	7,875	5,923	5,604	2,631	3,467
Perlombongan dan Kuari	772	615	541	328	541
Pembuatan	31,372	28,454	27,066	19,228	27,066
Bekalan Elektrik, Gas dan Air	501	469	515	493	515
Pembinaan	5,086	4,973	4,500	3,931	524
Perdagangan	13,194	12,220	11,783	12,298	9,741
Hotel dan Restoran	29	53	39	13,248	1,601
Aktiviti Hartanah, Penyewaan dan Perniagaan	157	174	159		4,405
Pengangkutan, Penyimpanan dan Perhubungan	4,194	3,676	3,653	3,639	3,305
Pentadbiran dan Pertahanan Awam, Keselamatan Sosial Wajib	16	19	25		3,912
Pengantaraan Kewangan	5,903	5,157	5,386	542	718
Aktiviti Perkhidmatan Komuniti, Sosial dan Persendirian Lain	8,524	8,869	8,469		272
Kesihatan dan Kerja Sosial	1	0	2		849
Pendidikan	0	1	2		239
Isi Rumah Persendirian dan Pekerja Bergaji	0	3	5		3,551
Organisasi dan Badan di luar Wilayah	1	3	4		155
Aktiviti yang tidak dapat ditakrifkan sepenuhnya	0	8	8	9	6
JUMLAH	**83,513**	**81,003**	**77,742**	**70,690**	**68,008**

Issue And Problem in Safety Culture

- Jones (1997) stated that safety is part of important aspects which should be given an attention and guidance to improve the stated safety management to stronger safety culture. Some can be used like the method to improve safety management, plant and equipment, and workers involvement. Safety culture in construction community can be very low.
- Looking at that weakness in these characteristic and human attitudes, it can be concluded that to protect from accidents need changing of paradigm in the characteristic and human attitudes. Previous reactive and bad attitudes be a norm, should be changed to positive and proactive culture (Mohd Saidin *et al.* 2006b).

Current Situation

"Too often safety is neglected. There must be cultural and behavioural change."

Royal Commission into the Building and Construction Industry, Final Report, Reform-Occupational Health and Safety, Volume 6, 2003

Current Situation

- Most construction companies have robust and third party accredited OHS management systems in place
- Incidents often occur because the system was not:
  - Followed;
  - Implemented, and/or
  - Didn't address the situation which resulted in the incident
- Safety culture differentiates safe from unsafe construction sites
- Company leaders and line management determine the culture

Early Recognition Of Occupational Diseases

- In 1473 a German physician, Ellenborg, published the first known pamphlets on occupational disease from gold miners.
- In 1556 the German scholar, Agricola, described the diseases of miners.
- In 1713 Ramazzini, who is regarded as the father of occupational medicine, suggested that in diagnosis doctors should ask patients about their occupations.

Emergence Of Industrial Accident - 1

- Industrial accidents arose out of the Factory System during the Industrial Revolution in Britain in 18th Century (1700s).
- Women and children worked as heavy labourers under unsafe and unhealthy workplaces.

Emergence Of Industrial Safety Legislation

- In 1833 English Factory Acts was the first effective industrial safety law.
- It provide compensation for accidents rather than to control their causes.
- Insurance companies inspected work places and suggested prevention methods
- Problem:
  - **Safety became Injury and insurance oriented**

Emergence Of Safety Management - 1

- Role of Herbert W. Heinrich (1930's),
  - Developed Domino Theory and promoted control of workers behaviour.
- Problem;
  - **Focused on worker behaviour and not management**
  - **Caused people to think that safety is about policing worker**

Emergence Of Safety Management - 2

- Frank Bird (1970) developed Loss Control Theory.
- Suggested that underlying cause of accidents are lack of management controls and poor management decisions.
- Problem:
  - Not so popular: blames management (responsibility and control).

Emergence Of Safety Management - 3

- In 80's Behavioural Based Safety (BBS) was introduced;
- Based on Heinrich's findings.
- Work by recognizing safe work habits and offering rewards and punishment.
- Problem:
  - Focuses on workers and not on hazard or management
  - Reward and punishment system have flaws

Emergence Of Safety Management System - 1

- Current development of Occupational Safety And Health management system was driven by two parallel forces:
  A. Self-regulatory legislation in the United Kingdom (1974),
  B. Quality management movement

A-Self Regulation Legislation - 1

- Lord Robens, Chairman of a Royal Safety Commission Report noted that:
  - There was too many OSH legislation,
  - Was fragmented,
  - Limited in coverage (specific hazards & workplace),
  - Out of date and difficult to update,
  - Inflexible (prescriptive),
  - People thought that safety was what government inspectors enforced.

A-Self Regulation Legislation - 2

- Lord Robens recommended
  - Self regulation
- Report resulted in the Health and Safety of Workers At Work Act in the UK in 1974
- Similar legislation was enacted in Australia in 1984
- Enacted in Malaysia in 1994 after the 1992 Bright Sparkler accident in Sungai Buloh

A-Self Regulation Legislation - 3

- Features of "Robens style" legislation:
  - General duties of care by:
    - Employer, employee, manufacturer, designer, supplier
    - Duty of employer to make the workplace safe
  - Consultation with employees through Safety Committees
  - Safety Officer as advisor and coordinator
  - Improvement and prohibition notices

A-Self Regulation Legislation - 4

Legislation follow major accidents and reinforce need for management system

ACCIDENT	**REGULATION/PROGRAMME**
Flixborough (1974),	CIMAH regulation
Bhopal (1984)	"Responsible Care" / Process safety
Piper Alpha (1988)	Risk Assessment / Management system

Quality Management Approach to Occupational Safety and Health Management – 1

- There are similar issues in safety management as in quality management
- Example:
  - Productivity
  - Worker involvement
  - Proactive approach
  - Scientific approach
  - Customer and human rights

Quality Management Approach to Occupational Safety and Health Management – 2

- Management system standards:
  - ISO 9000 QMS was proven successful and ISO 14000 EMS was introduced in 1996
  - UK published BS 8800 and Australia AS8401 OSH management systems in 1996
  - International and auditable OHSAS 18001 OSH Management System published in 1999
  - ILO approved an OSH management system for governments to adopt during 2000

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THANK YOU