

**A PRESENTATION ON
SAFETY IN COAL MINES**

for

3rd US-India Working Group Meeting on Coal

by

COAL INDIA LIMITED

4th April, 2006
New Delhi

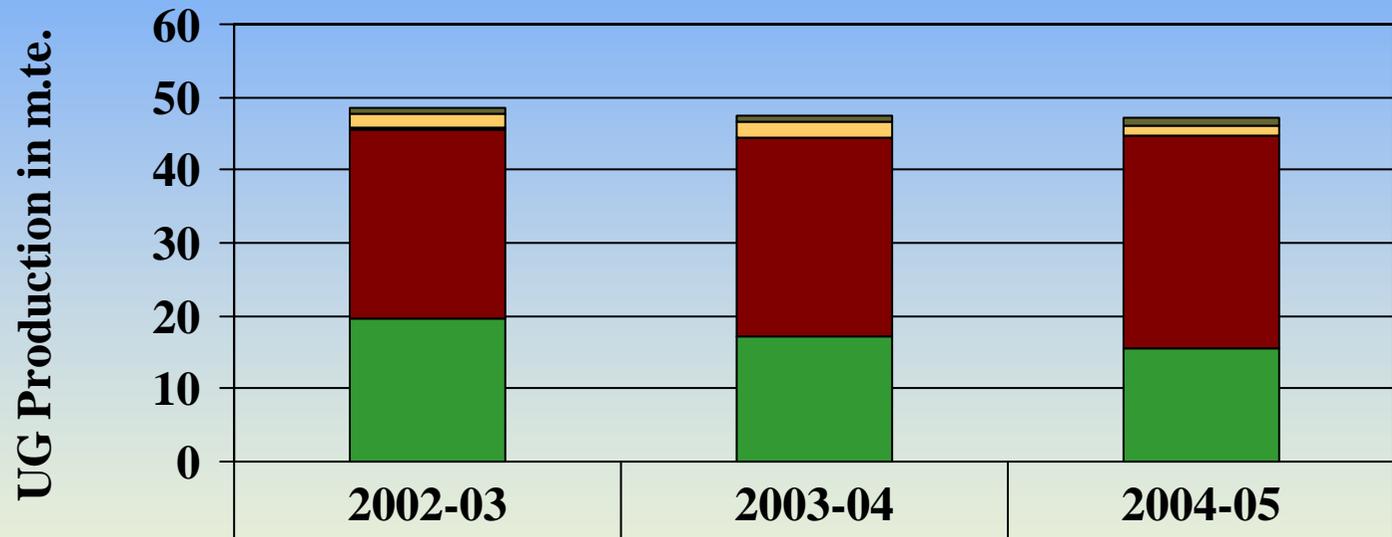
BREIF FACTS REGARDING ROLE OF COAL INDIA LTD. IN THE INDIAN COAL MINING SCENARIO

- **Coal India Limited is the single largest coal producing company in the world.**
- **Coal India Limited is the second largest corporate body in the world.**
- **CIL produces 85 % of India's total coal production.**
- **Operations are spread over 8 States (Chhattisgarh, Jharkhand, MP, Orissa, West Bengal, Maharashtra, UP & Assam)**
- **Operates through 8 subsidiary companies.**
- **Operates 467 mines (296 underground mines, 142 Opencast mines, 29 mixed mines)**
- **Employs nearly 455 thousand persons.**

BACK-GROUND INFORMATION REGARDING COAL MINING IN CIL

- Traditional underground coal mining in India is by Bord & Pillar method with blasting-off-the-solid & coal evacuation by manual loading into mine cars hauled by rope haulages.
- Since its formation CIL has moved towards Opencast (OC) Mining. Presently 85 % of CIL's production comes from OC, mostly by Shovel Dumper combination. Coal transport is by tippers. Draglines are also used in some mines. One mine deploys in-pit crusher & conveyor. Surface Miners are presently being used in a number of mines.
- In Underground (UG) Mining CIL has largely mechanised loading through SDLs / LHDs. CIL has 5 PSLW faces & 2 Continuous Miners with Shuttle Cars & Universal Drilling Machines.

TECHNOLOGY-WISE UG PRODUCTION IN CIL IN LAST 3 YRS



	2002-03	2003-04	2004-05
■ Other Methods	0.65	0.93	0.91
■ Mech.LW	1.95	2.05	1.36
■ Conv.LW	0.2	0.14	0.15
■ Mech.B&P	26.08	27.14	28.98
■ Conventional B&P	19.53	17.18	15.65

SAFETY IN OPERATIONS IN COAL INDIA LIMITED

Two of the major objectives of Nationalisation of coal mines in India in the early 70s were

- Enhancement of safety in coal mine & conservation of coal property.
- Kick start India's drive towards energy sufficiency.

To this end CIL accords the first priority to safety in operations as embodied in its mission.

FRAMEWORK FOR SAFETY IN COAL MINES IN CIL

- Safety in coal mines in India are regulated by
 - The Mines Act, 1952 & the rules/Regulations/ byelaws framed thereunder.
 - The Indian Electricity Act, 1910 & Rules thereunder.
 - The Indian Explosives Act, 1984 & Rules framed thereunder.
- Environmental aspects are governed by
 - The Environmental (Protection) Act 1986 & Rules framed thereunder
- The Directorate General of Mines Safety, under the Ministry of Labour, administers the provisions of the Mines Act.

SAFETY POLICY OF COAL INDIA LTD

- Plan operations & systems to eliminate / reduce mining hazards
- Implement statutes
- To improve working conditions by technology up gradation
- Dedicated provision of material & money for safety
- Deploy safety personnel wholly for safety
- Implement worker participation in safety management
- Draw & implement Safety Plans
- Establish Internal Safety Organisation
- Multi-level monitoring of safety
- Senior Management to inculcate safety awareness & practice it in their functioning
- Training & retraining to promote safety oriented skills
- Strive to improve the living conditions & health of employees

WORKMEN'S PARTICIPATORY BODIES MONITORING SAFETY IN CIL

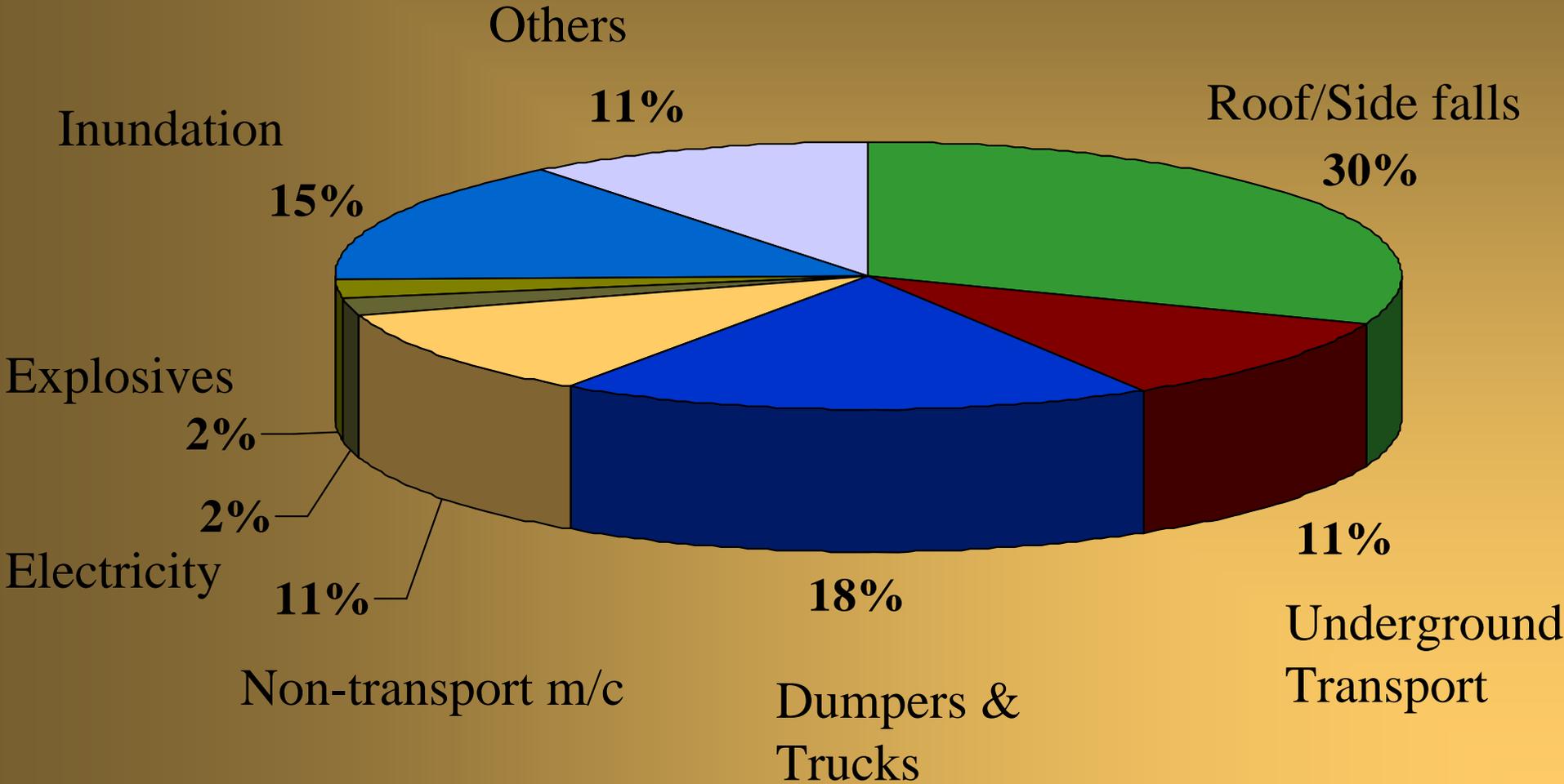
- WORKMEN'S INSPECTORS
- MINE LEVEL SAFETY COMMITTEES meeting monthly
- AREA (Group of Mines) LEVEL BIPARTITE/TRIPARTITE COMMITTEES – meeting bi-annually.
- SUBSIDIARY COMPANY LEVEL TRIPARTITE COMMITTEES – meeting bi-annually.
- THE COAL INDIA SAFETY BOARD meeting bi-annually.
- THE STANDING COMMITTEE ON SAFETY IN COAL MINES CHAIRED BY HON'BLE MINISTER FOR COAL meeting bi-annually..

SAFETY PERFORMANCE OF CIL IN 2005 COMPARED TO THE YEAR OF ITS INCEPTION, 1975

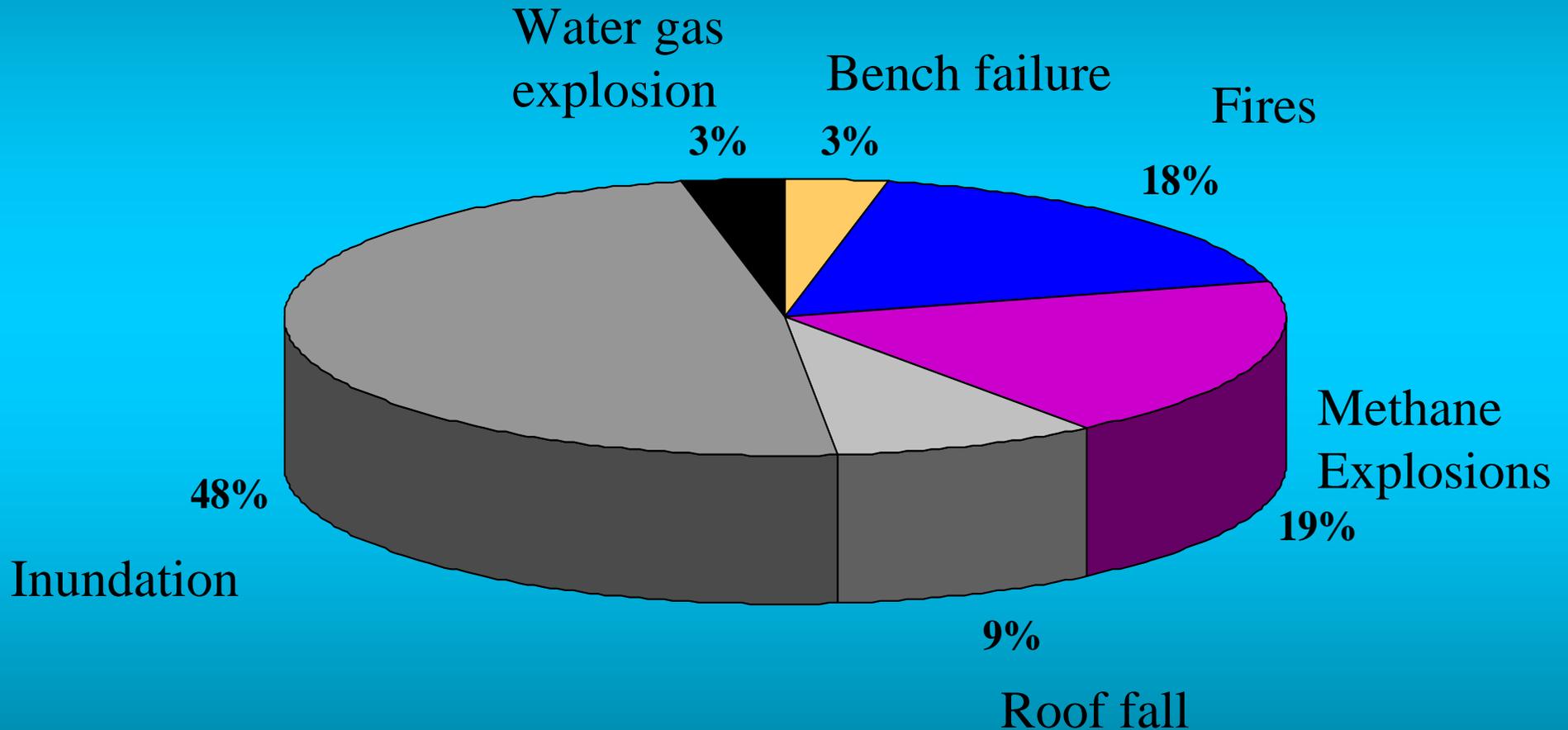
PARAMETER	1975	2005
FATAL ACCIDENTS	177	73
FATALITIES	233	94
SERIOUS ACCIDENTS	1456	354
SERIOUS INJURIES	1515	364
FATALITY RATE / M.TE. OF PRODUCTION	2.62	0.28
FATALITY RATE / 3,00,000 MANSHIFTS	0.52	0.27
SERIOUS INJURY RATE / M.TE.	17.03	1.08
SERIOUS INJURY RATE / 3,00,000 MANSHIFTS	3.41	1.06

Figures for 2005 are subject to reconciliation with DGMS

CAUSE-WISE BREAK-UP OF FATALITIES IN CIL IN 2005

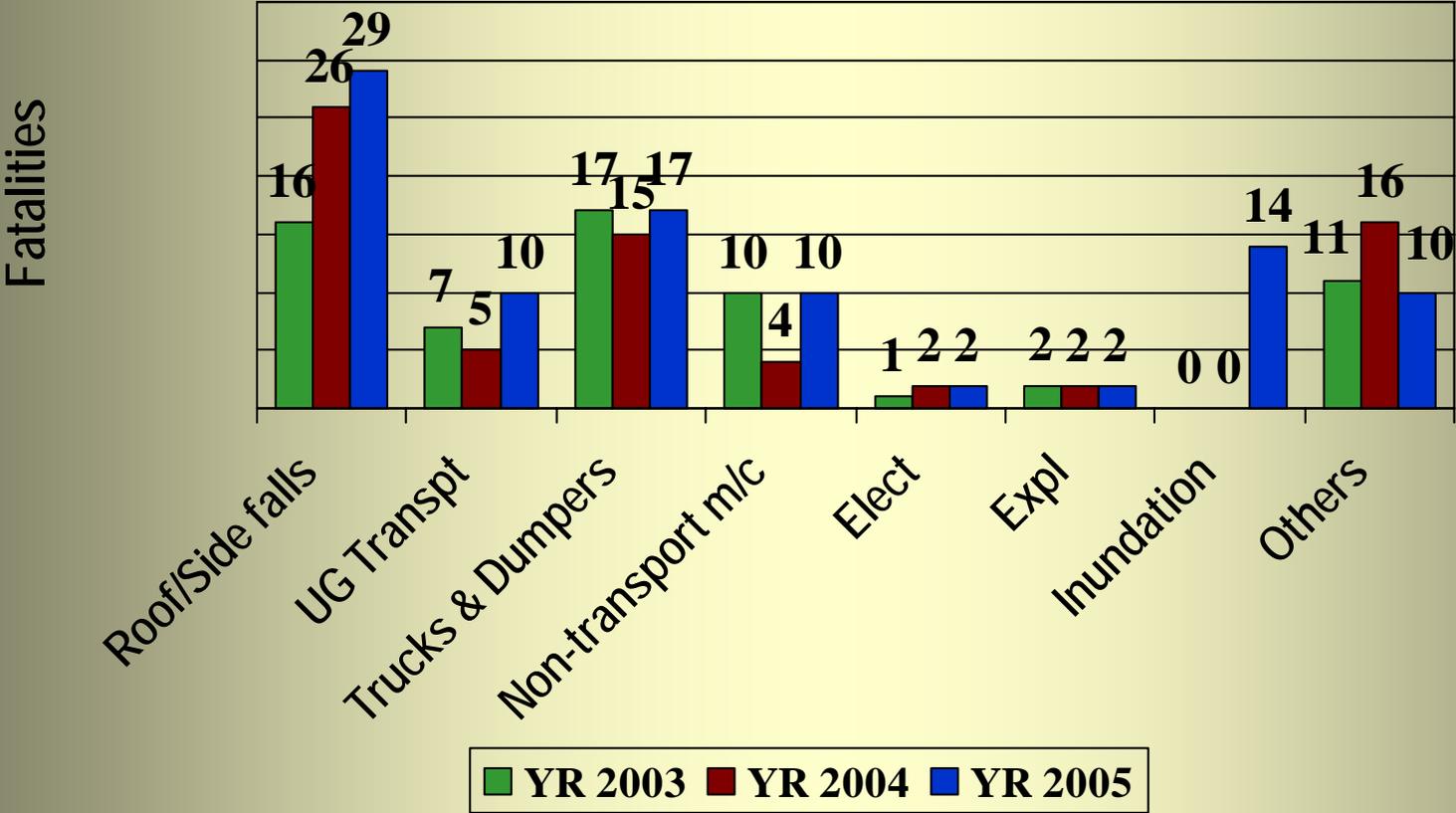


CAUSE-WISE FATALITIES IN DISASTERS* IN CIL



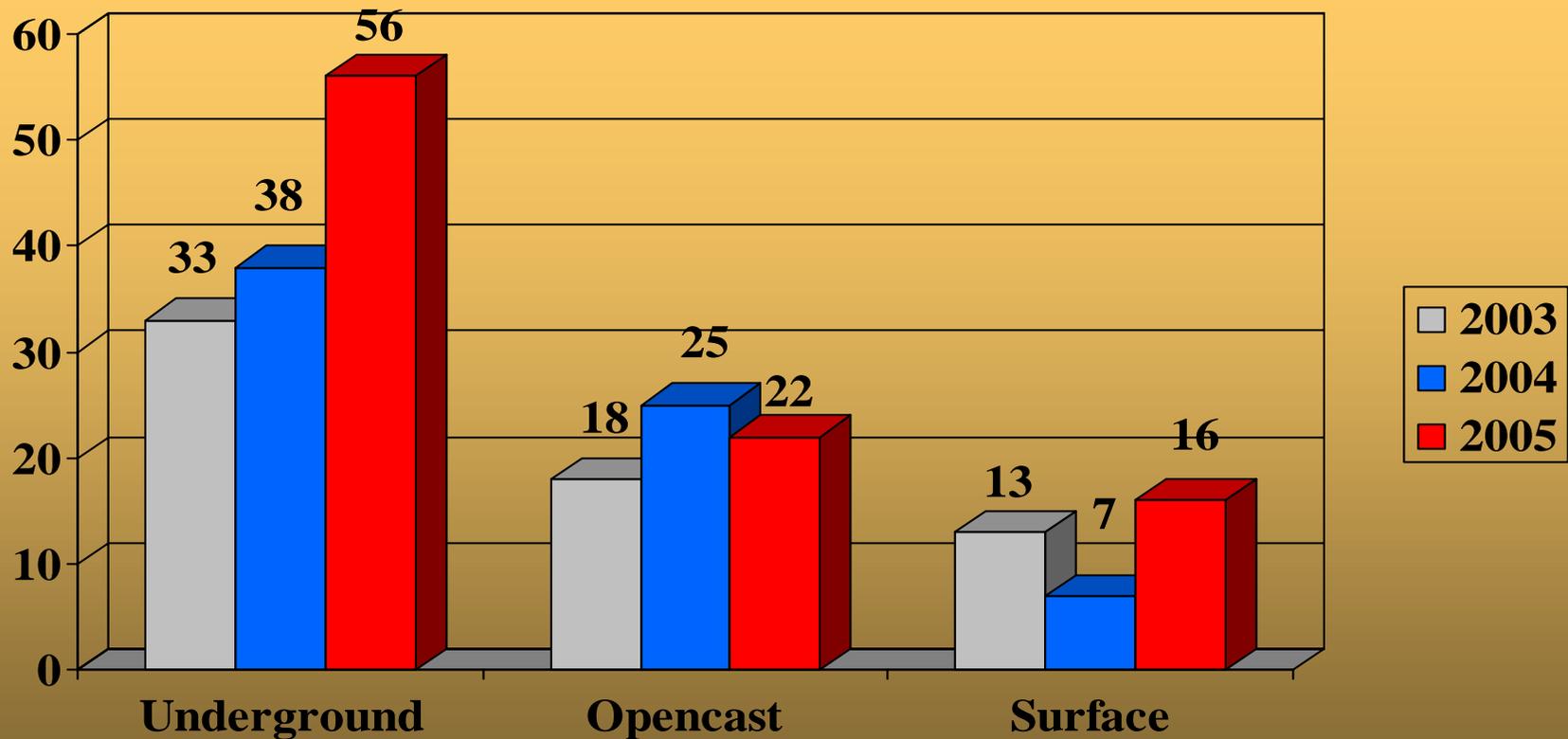
* Fatal accidents resulting in 10 or more fatalities

CAUSE-WISE FATALITIES IN CIL 3 YEARS



Figures for 2004 & 2005 are subject to reconciliation with DGMS

PLACE-WISE BREAK-UP OF FATALITIES IN CIL IN LAST 3 YRS



Figures for 2004 & 2005 are subject to reconciliation with DGMS

PLACE-WISE RATES OF FATALITIES IN CIL IN LAST 3 YRS

YEAR	FATALITY RATE/M.T.E			FATALITY RATE/ 300,000 Manshifts		
	UG	OC	Overall	UG	OC	Overall
2003	0.87	0.09	0.21	0.18	0.17	0.18
2004	0.83	0.10	0.22	0.17	0.25	0.20
2005	1.09	0.10	0.23	0.23	0.22	0.23

Figures for 2004 & 2005 are subject to reconciliation with DGMS

MAJOR AREAS OF CONCERN IN SAFETY IN CIL

- Instrumentation for early warning of impending failure of strata (roof/ sides).
 - Load cells, convergence recorders are used in PSLW faces.
 - One mine where poor strata condition was a bottleneck has been turned around with the help of RMT, UK with modified support design with resin bolting & strata monitoring by Remote Reading Telltales, Sonic Extensometers, Strain Gauge Bolts, Remote Reading Rib Extensometers, Vibrating Wire Stress Meters.
- Technology for detection of hidden slips / cracks in underground mines. National Institute of Rock Mechanics, Kolar is engaged in R&D in this direction.

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MAJOR AREAS OF CONCERN IN SAFETY IN COAL INDIA LIMITED

- Identification & delineation of unapproachable waterlogged old workings of doubtful location. CIL is has commissioned R&D in this direction through Ground Penetrating Radar, Electrical Resistivity Survey, Seismic Methods.
- Early detection of mine fires & fire fighting systems for mines. CIL has installed computerised Environmental Tele-monitoring Systems in 13 mines & more such systems would follow.

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MAJOR AREAS OF CONCERN IN SAFETY IN CIL

- Stabilisation of ground surface disturbed by past mining at shallow depths.
- Controlling extensive fires in numerous coal seams in Jharia Coalfields.
- Exchange of information regarding overall safety systems for mines – opencast & underground.
- Exchange of information regarding Mine Rescue Organisation & Systems.

THANK YOU

Prepared by
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