THIRD PACIFIC ECONOMIC COOPERATION COUNCIL
MINERALS NETWORK MEETING

THE AUSTRALIA / INDIA MINE SAFETY TRAINING PROJECT

(An Australian Government Aid-Funded Project)
India & Australia

July 1997 – December 2001
E L Garner – Project Director

The Australia – India Mine Safety Training Project aimed to:

- Provide exposure to Australian mine safety practices and technology

- Develop:
  - codes of practice and legislative standards
  - occupational health and safety standards and procedures
  - mine safety information systems

Anticipated mutual benefits included:

- For India, exposure to recent Australian industry safety practices and technology
- Opportunities to adapt Australian experience and practice
- Enhanced trade opportunities for Australian suppliers of new mining technology

Project objectives included:

- Industry Familiarisation
- Training
- Development of Safety Standards and Systems
- Project Management

Project training areas included:

- Longwall Face Support
- Equipment Testing Standards and Approval Procedures
- Underground Coal Mine Roadway Support and Pillar Extraction
- New Technology in Hard Rock Mining
- Open Cast Mining
- Occupational Health and Safety
- Mine Safety Management Systems
- Environmental Management

Initial objectives comprised:

- Establishment of Training Programs
- Review of Existing Safety Standards and Systems
- Development of New Safety Standards and Systems

Implementation – Model Mine Program

- Mine safety management systems were developed by mine operating staff with external assistance
- Internationally accepted risk assessment processes were introduced at mines employing different extraction technologies and different operating conditions

The model mine program was undertaken at:

- An open cast lignite mine
- An underground zinc (ore) mine
- An underground bord and pillar coal mine
- An underground longwall coalmine

The mines were a mix of state owned enterprises and private sector mines

Model mines implemented newly developed mine safety management systems, and followed a sequential process of hazard identification, risk ranking and determination of hazard controls and responsibilities:

- Step 1: Identify **MECHANISMS** by which hazard can occur
- Step 2: Ranking of likely **RISK**
- Step 3: Identify **CONTROLS** (existing and possible new) for reducing **RISK**
- Step 4: Identify **PROCEDURES** for implementing and maintaining controls
- Step 5: Identify **RESPONSIBILITIES**

Identified Hazards

Safety Definitions:

- **Hazard:** A source of potential harm or a situation with the potential to cause loss
- **Principal Hazards:** A hazard with the potential to result in multiple fatalities
- **Risk:** The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood

Values and Risk Ratings established for:

- Consequence
- Exposure of Workers
- Probability of the Occurrence Happening

(For details refer to Tables 1, 2 & 3 in paper)

Common principles of hazard identification and management include:

- Management commitment and leadership
- An OH&S framework across the workplace
- Connection by all personnel to the OH&S system
- Safe work practices matching regulatory requirements
- Preparedness to handle emergency events
- Accident investigation and situation correction
- Record keeping
- Continuous improvement and openness to audit

The processes by which these are achieved comprise:

- Regular OH&S meetings involving mine-wide representation
- Regular reviews of work activities and equipment design and operation
- Improvements to reduce OH&S impacts in high risk area or activities
- Action management
- Audit work

Case Study - Jhanjra Colliery

An initial risk assessment workshop identified as high risk hazards:

- Strata Control
- Mine Environment -Ventilation and Spontaneous Combustion

To assist with development of mine safety Management plans, the Jhanjra Mine was provided the newly developed DGMS Guideline for Development of Safety Management Plans

Simulated Emergency Response exercises at two mines tested emergency planning

- Shortly ahead of the simulated exercise, the first selected (Bagdigi) mine was flooded, with miners 'holing through' into the flooded working of an adjacent abandoned mine, with a number of miners losing their lives in the resulting inundation

- The second exercise was conducted at CIL's Western Coalfields Silewara Colliery in July 2001

‘Guidelines for the Conduct of Emergency Procedures Exercises’ of the Queensland (Australia) Emergency Exercise Management Committee propose that exercises:

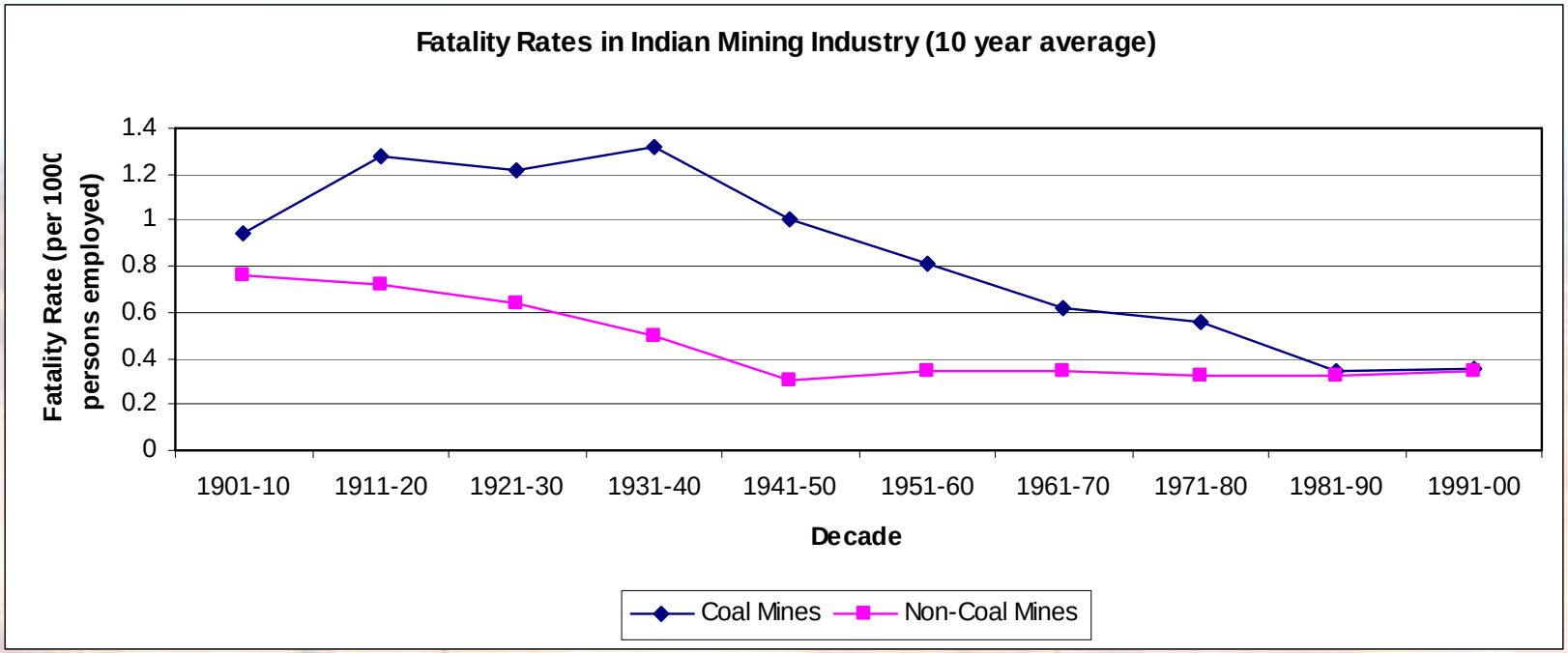
- Be systematic and require direct reference to the risks at the mine
- Be consistent with the concept of mutual assistance and include external agencies such as mines rescue stations, police, media and senior company officials
- Recognise that exercises should not necessarily be held on day shift
- Have an audit and evaluation process
- Be subject to risk assessment principles to ensure the exercises do not introduce new safety risks to persons at the mine

The simulation exercise demonstrated:

- All miners performed admirably in difficult conditions
- The type of rescue equipment available meant that in a real fire situation no one would have escaped
- The establishment of a refuge station underground equipped with a water supply and fail-safe communications with the surface would save lives
- Rope guidelines installed from the working faces to the refuge chamber would enable the miners to reach a safe haven
- The fire fighting equipment and procedures were inadequate for the type of fire
- Regular exercises and scenario planning precursors to the exercises should be carried out

Lessons applicable to all mines:

- Review the adequacy of (underground) fire fighting
- Regularly test all aspects of the mine emergency system
- Conduct simulated emergency response exercises
- Examine the adequacy of self-rescue equipment for the individual mine equipment
- Ensure mine to surface communications are appropriate
- Establish independently ventilated refuge chambers



Ten Yearly Average for Fatality Rates in the Indian Mining Industry
(Ministry of Labour – Standard Note 01.01.95, Government of India)

Fatality Rate per million tonnes of coal mined

Year	India	Czech Rep.*	Japan	W.Germany	U.K.	U.S.A.	Australia
1990	0.78	0.58	0.24	0.26	0.15	0.06	0.04
1991	0.60	0.33	0.12	0.32	0.14	0.06	0.09
1992	0.73	0.24	0.39	0.45	0.05	0.05	0.04
1993	0.70	0.15 *	0.28	0.22	N.A.	0.05	0.03
1994	0.90	0.12 *	0.14	0.29	N.A.	0.04	0.02
1995	0.77	0.26 *	0.32	0.26	N.A.	0.05	0.02
1996	0.48	0.15 *	0.00	0.25	N.A.	0.04	0.04
1997	0.52	0.23 *	0.47	0.19	N.A.	0.03	0.02
1998	0.47	0.13 *	N.A.	N.A.	N.A.	N.A.	N.A.

Number of Accidents in Indian Mines 1995 to 2005

Year		Non-Coal				Coal		
		Fatal	Serious	Total		Fatal	Serious	Total
1995	*	58	250	308		137	757	894
1996	*	63	235	298		131	677	808
1997	*	68	246	314		143	677	820
1998	*	54	234	288		131	522	653
1999	*	60	174	234		132	376	508
2000					x	80	447	603
2001	-	72			x	96	529	685
2002	+	17	205	222	x	62	482	544
2003	+	25	168	193	x	60	439	499
2004	+	15	143	158	X	66	402	468
2005 (ytd)						21	76	97

Source:
- * DGMS – Standard Note 01.01.2000 and DGMS communications
- \- DGMS – Website, 26.08.05
- \+ DGMS – Communication, 01.09.05
- x CIL – Website, 26.08.05

Special Report

URS Corporation and Austin Ausino Unite to Build China Market

URS Corporation is pleased to announce that Austin Ausino Engineering has agreed to become part of URS. We welcome the employees of Austin Ausino to URS, and believe the benefits of combining our two companies' resources are considerable. With 18 years of business experience in China, Austin Ausino offers design, project management and construction management expertise, which are highly complementary to URS' existing capabilities in China.