

Achieving excellence in safety is integral to Xstrata's success. Our aim is to operate an injury, illness and fatality-free business and we believe that all work-related incidents, illnesses and injuries are preventable.

safety



## Our approach

Achieving excellence in safety is integral to Xstrata's success. Our aim is to operate an injury, illness and fatality-free business and we believe that all work-related incidents, illnesses and injuries are preventable. We work to eliminate incidents in the workplace by identifying, assessing and, where reasonably practical, eliminating or otherwise controlling hazards. We do this through effective safety leadership at all levels. Our management standards, safety systems, engineering standards and behavioural programmes ensure our employees and contractors take the right decisions to remain safe as they carry out their work.

Xstrata has made significant improvements in safety performance at its sites since acquisition, through implementing baseline, critical and issue-based risk assessments and action plans, job hazard analyses, planned task and behavioural observations and planned inspections. In addition, we have redeployed safety professionals back to the operations and away from corporate offices to ensure greater ownership of safety performance, dedicated safety resources and enhanced safety leadership at our operations.

## Our performance

All Xstrata operations have comprehensive safety management systems, which are fully aligned to the international Occupational Health and Safety (OH&S) management standards OHSAS 18001 and AS/NZS 4801.

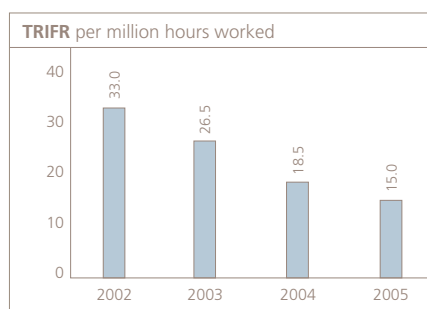
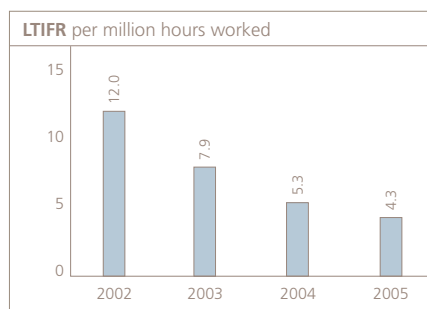
The HSEC Assurance audits showed our OH&S management performance across the regions was good in Europe, Australia and South America and satisfactory in South Africa. OH&S management systems achieved a satisfactory score in Europe and Australia but were weaker in South America and South Africa where extra resources have been allocated to rapidly improve these systems.

While third party certification is not a corporate requirement, Xstrata's Lydenburg chrome smelter is externally certified to OHSAS 18001 and the Rustenburg, Wonderkop, Lydenburg and Boshhoek chrome smelters, San Juan de Nieva zinc smelter and the Rhovan vanadium plant are targeting third party certification over the next two years. Management systems at six sites are certified to ISO 9001 –

Rustenburg, Wonderkop, Boshhoek, Nordenham, Northfleet lead refinery and the Townsville copper refinery. A document mapping the requirements of OHSAS 18001 and AS/NZS 4801 to Xstrata's HSEC Management Standards is available from our website.

### Fatalities

Xstrata did not achieve its goal of being a zero fatality business in 2005. Tragically, nine people (three employees and six contractors) lost their lives in seven workplace incidents, compared with six fatalities in 2004. The majority of these incidents occurred in southern Africa, with one incident in Peru and one in Spain. The primary causes of fatalities were falls of ground and incidents involving mobile equipment and plant.



Each fatal incident is fully investigated and reported to the Executive Committee and Board, remedial actions are undertaken and safety systems improved.

Over the last 18 months our two commodity businesses operating in southern Africa have been implementing specific, intensive fatality prevention programmes. These programmes and an analysis of factors contributing to critical and fatal incidents are discussed in more detail on page 57.

## Injury frequency rate performance

Xstrata measures total recordable injuries, which includes all injuries except first aid cases, per million hours worked. This measure includes the impact of significant injuries on employees who may be able to

perform alternative duties, but not their normal function, and who would not be captured by indicators based on lost time injuries alone. Recordable injuries were adopted by the Occupational Safety and Health Administration (OSHA) of the USA and the Minerals Council of Australia because they provide a more accurate measure of the number of people being injured. First aid injuries are recorded and investigated at the site level but are not part of the recordable injuries statistics. The lost time injury frequency rate is also reported to provide a basis for comparison with our industry peers.

Xstrata achieved substantial improvements in injury frequency rates in 2005. Overall, the total recordable frequency rate (TRIFR) decreased by 19% and the lost time injury frequency rate (LTIFR) was 18% lower than in 2004.

Xstrata Copper was the major contributor to this achievement with a 47% reduction in the TRIFR from 2004. While both divisions of Xstrata Copper contributed to this significant improvement, Minera Alumbraera contributed 61% of this total improvement. Key to this success has been the continued leadership development programme and the maturity of their behavioural safety programme focused on completing quality workplace safety observations.

At our South African operations, comprehensive manager and supervisor training programmes, active workforce participation in safety initiatives together with behavioural based safety programmes, as part of the intensive safety effort over the past 18 months, led to improved injury frequency rates at Xstrata Alloys and Xstrata Coal South Africa, where the TRIFR was reduced by 32% and 23% respectively.

Xstrata Coal's NSW operations achieved a 31% reduction in the LTIFR compared with 2004 and a 7% reduction in the total recordable injury frequency rate.

Injury frequency at Xstrata Coal's Queensland operations remained at the same level as 2004. In 2006 the NSW operations are focussing on the prevention of manual handling injuries, particularly in underground operations. Since the

Summary of fatal incidents	
March 2005	Xstrata Copper Las Bambas exploration site, Peru One employee sustained fatal injuries from falling down a shaft in old mine workings on the exploration lease while sheltering from a storm.
April 2005	Xstrata Coal Witcons underground mine, South Africa One employee was hit by a shuttle car underground after entering a work area.
May 2005	Xstrata Alloys Maloma underground anthracite mine, Swaziland Three contractors lost their lives through a fall of ground during routine work.
June 2005	Xstrata Alloys Kroondal chrome mine, South Africa One contractor sustained fatal injuries when caught in the conveyor of a crushing/screening plant.
July 2005	Xstrata Coal Spitzkop coal mine, South Africa One employee was crushed when a forklift overturned.
August 2005	Xstrata Alloys Kroondal chrome mine, South Africa One contractor sustained fatal injuries through a fall of ground.
November 2005	Xstrata Zinc Hinojedo roasting plant, Spain One contractor sustained fatal injuries from a falling pipe during demolition works.

Total recordable injury frequency rate			
	2005	2004	% improvement
Alloys	11.5	16.8	31.6
Coal	16.4	16.4	–
Copper	12.9	24.1	46.5
Zinc	24.5	25.6	4.3
<b>Group total</b>	<b>15.0</b>	<b>18.5</b>	<b>18.7</b>

formation of our Queensland coal division, as part of the acquisition of MIM, the focus has been on achieving legislative compliance and programmes to prevent catastrophic events, (see 2004 case study on preventing frictional ignition). Initiatives to reduce more common, less severe injuries in 2006 include the introduction of a behavioural based safety programme targeted at micro-behaviours, a safety leadership workshop for all senior managers and executives and numerous site based initiatives.

Xstrata Zinc achieved a good result in reducing lost time injury frequency rates by 25%, although the lost time and total recordable injury frequency rates in this business remain higher than the Group average and efforts are continuing to bring their performance in line with Xstrata's other businesses.

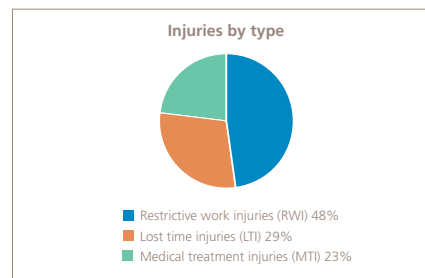
Xstrata's TRIFR and LTIFR performance continue to be equivalent to or better than the Minerals Council of Australia (MCA) industry averages for these measures.

### Recognition for safety

During the year Ravensworth coal operations in Australia won the People's Choice category in the 2005 New South Wales Minerals Council's Safety Innovation Awards (see case study on page 65).

### Safety fines and prosecutions

In 2005, Xstrata incurred no safety fines or prosecutions.



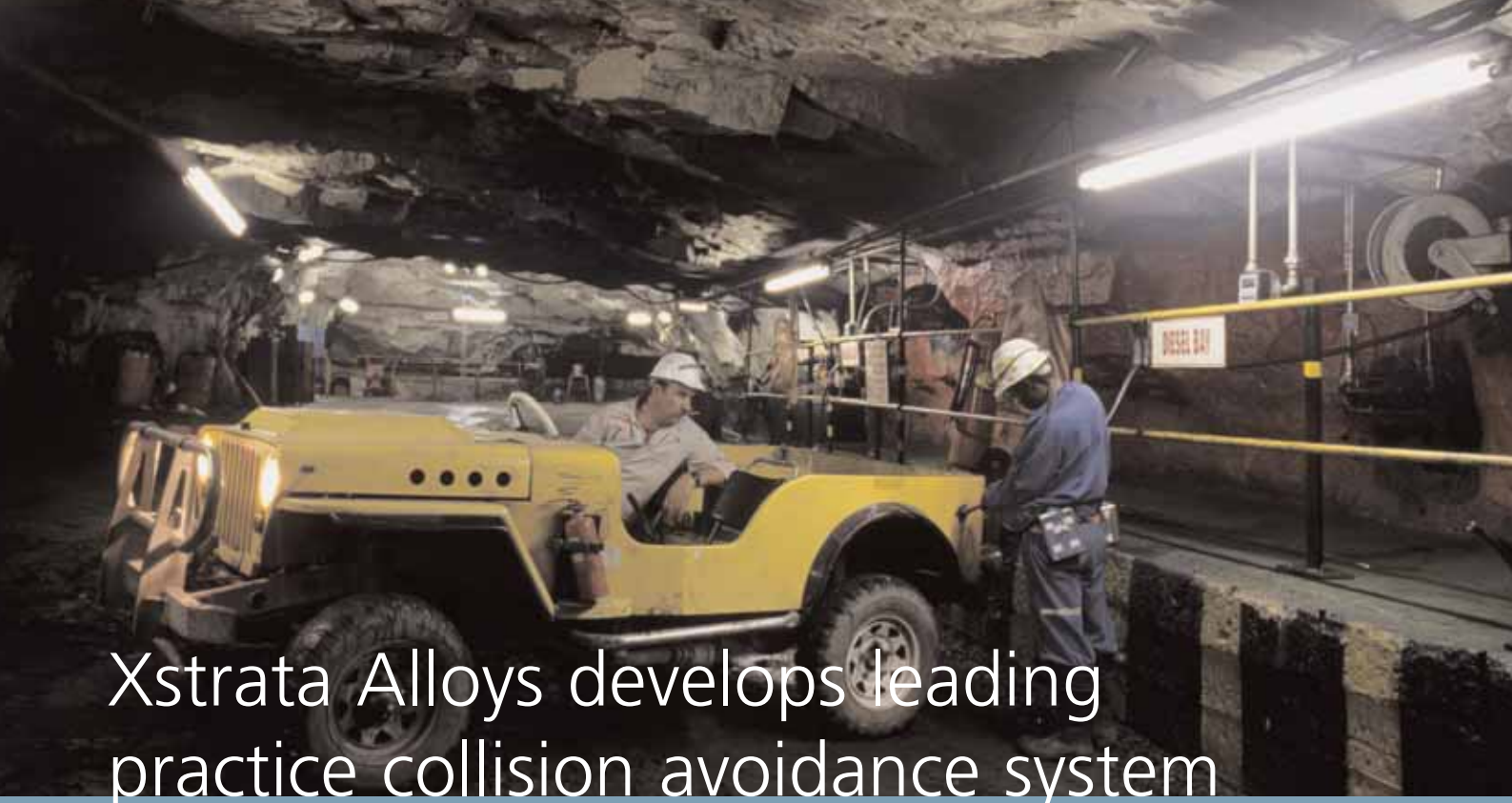
## Key challenges

Xstrata's key safety challenge is the elimination of fatalities and critical incidents, with a particular focus on our South African businesses (Xstrata Alloys and Xstrata Coal South Africa), where the majority of fatalities and a higher proportion of high potential risk incidents (including serious 'near miss' incidents) has occurred.

### Fatality and critical incidents prevention programmes

We remain committed to our belief that the goal of zero fatalities is achievable in our business. We recognise that low injury frequency rates alone are not an indicator of how major hazards are being managed and we have developed a very strong 'near-miss' reporting culture across our operations since 2002, to provide leading indicators of our performance in managing critical risks. Xstrata's HSEC Management Standards include a specific standard focussed on catastrophic hazards, which recognises the particular challenge these incidents represent. This standard is intended to ensure the Group has the culture, processes and structures to identify and manage high potential safety hazards over the life of our operations. Every operation was audited against this standard through the HSEC Assurance Programme in 2005 and the overall Group performance was above the 'satisfactory' level. Performance against this standard was better in Europe, South America and Australia than in South Africa.

The intensive fatality prevention programmes being implemented at these operations, combined with the improved cross-learning between our high performing operations and our South African businesses that the HSEC Assurance Programme has facilitated, is expected to improve performance and audit scores substantially for the region.



# Xstrata Alloys develops leading practice collision avoidance system

Xstrata Alloys and Becker Electronics have developed leading practice technology for safely managing the interaction of vehicles and pedestrians in underground mines, with total investment of ZAR6.4 million.

This technology was developed in response to the identification of interaction between vehicles and employees underground as one of the principal causes of critical incidents at Xstrata Alloys operations. The findings from high potential risk incidents and the investigation into a fatal incident involving a load haul dump (LHD) operator in October 2004 were used to determine the requirements for a technology to manage this risk. The primary purpose of the technology is to improve the visibility of equipment and employees underground and ensure early detection and warning for vehicle operators and pedestrians using the same area. This is achieved through the transmission of radio signals between vehicles and individuals' headgear, which causes head lamps to flash and give audible alarms when vehicles are in proximity or approaching.

A small technical team comprising Xstrata and Becker personnel was established to adapt a prototype being used in Indonesian open cut mines to the harsher underground environment and to test whether the chrome seams would affect the radio signal. Xstrata Alloys specified

the product application and Becker developed the software and hardware.

Two initial trials of the technology confirmed the principle behind the technology would work, but did not meet performance requirements for robustness or performance in an underground environment. On the third attempt, new technology from Becker – the CAS300 vehicle transmitting unit – was adopted and was found to address the issues encountered in previous trials. An industrial antenna was installed to the vehicle/equipment transmitting unit and the unit was made waterproof to cope with high pressure cleaning. The new system was fitted to 125 vehicles and 1600 personnel avoidance system (PAS) receiver tags were distributed to employees across five chrome operations.

Roy Murley, Xstrata Alloys Mining Division Engineering Manager said that, 16 months later, the system was working well despite some minor vibration issues and had been well accepted by pedestrians and operators.

"This system has demonstrably improved safety. The interaction between vehicle and pedestrian has been made more obvious and people are definitely changing their behaviour. In the past, the guys would walk beside a machine. Now, when they receive a PAS warning, they stand aside

and wait for the vehicle to go past before continuing on," he said.

To further extend the application of the people and vehicle detection system, Xstrata Alloys has introduced a lamp room control system. Every employee who goes underground has a designated cap lamp, rescue pack and monitoring equipment stored in the lamp room on the surface of the mine. As part of the new system, an electronic reader has been installed in every lamp room.

As an employee passes the reader before going through the turnstile, a warning sounds and a message is displayed on an electronic billboard if the cap lamp is not fully charged, equipment like methanometers are not correctly calibrated or the employee is not carrying the correct equipment. In phase two of this project, the system will be interlocked with the turnstile preventing the employee from going underground until the problem identified by the reader has been rectified.

"If the lamps are not fully charged, they emit a dim light which makes it difficult for operators to see pedestrians," he said.

"My observation is that there are now very few incidences of faulty lamps underground and that this new culture is starting to be embedded."

An analysis of fatal and high potential incidents at Xstrata's operations since 2002 shows:

- there are three principal causes of critical incidents:
  - falls of ground;
  - mobile equipment; and
  - interaction of people and plant/machinery
- 92% of fatalities since Xstrata's listing in 2002 have occurred in southern Africa with approximately two-thirds occurring in underground mining operations;
- safety leadership is essential to managing major hazards and, particularly at the supervisor level in South Africa, needs to be enhanced;
- the majority of incidents have occurred due to a combination of inadequate hazard awareness and at-risk behaviour. Safety strategies, annual plans and targeted initiatives are addressing these issues, including improved supervisor skills and behavioural-based safety programmes at all operations to eliminate at-risk behaviour; and
- the reporting and analysis of high potential risk incidents, including 'near misses' provide an invaluable source of learning. Improved levels of high potential risk incident reporting often correspond to fewer critical incidents.

In 2004 we undertook a comprehensive analysis of our South African operations to understand why fatal incidents occur more frequently in this region – a factor common to all producers operating in southern Africa. Our analysis found that in this region, hazard awareness and identification skills were less well developed and employees and contractors had a less risk-averse attitude than in other regions. In addition, employees were accustomed to an instructional management style and did not always challenge supervisors or middle managers on safety issues. Supervisors in particular were identified as requiring enhanced safety leadership skills and best practices were not always shared at divisional level across other sites in the commodity business or between businesses. Finally, cultural differences and the very wide range of languages spoken by employees may have impacted on the effectiveness of training programmes.

From the final quarter of 2004 and during 2005, intensive fatality prevention programmes were developed and implemented at all South African operations to tackle the key causes of fatal incidents and to address the challenges our analysis identified. Following fatal incidents in 2005, a thorough assessment of Xstrata's fatality prevention programmes was conducted together with external experts, to determine whether our programmes were addressing the correct key risks to the greatest extent possible. This analysis confirmed that our overall fatality prevention programme in South Africa is correct and is beginning to show significant improvements in behaviour and leadership. However, the programme seeks to change attitudes and eliminate at-risk behaviour and, as such, requires a long-term approach and ongoing commitment. Xstrata's Board is monitoring progress carefully and both our South African businesses, Xstrata Alloys and Xstrata Coal SA, are required to provide the Board HSEC Committee with six-monthly progress reports on their fatality prevention programmes.

While a large number of initiatives are underway across our commodity businesses to achieve continuous and sustainable improvements in safety performance, this chapter focuses on the key elements of our initiatives to tackle fatalities and critical incidents, as the primary safety challenge we face. In response to the key risks identified above, our fatality, critical incident and injury prevention programmes concentrate on the following:

- high potential risk incident ('near miss') reporting;
- behavioural safety programmes;
- leadership and training programmes and performance criteria;
- contractor management; and
- improved safety management systems and safe working procedures to manage key risks such as interaction between people and vehicles or mobile equipment (see case study on page 58) and roof falls.

Franz Mazivhe 'sounds' the roof to check for roof fall hazards at Kroondal mine



<b>Definitions</b>
<b>Critical HSE Incident (CI)</b>
<p>1. Injury or damage to assets or loss of operations</p> <p>An event, which has caused:</p> <ul style="list-style-type: none"> <li>■ single or multiple fatalities; or</li> <li>■ life threatening injury to a person(s), i.e. injuries that require immediate, aggressive action by site, ambulance and medical staff, such as urgent or emergency surgery, admittance to an intensive care or high dependency facility; or</li> <li>■ damage to assets or property, or loss of operations, to a value greater than \$0.5 million.</li> </ul>
<p>2. Environment</p> <ul style="list-style-type: none"> <li>■ Category 4 or Category 5 environmental incidents (see glossary).</li> </ul>
<p>3. Media attention</p> <ul style="list-style-type: none"> <li>■ Public exposure of a serious, negative consequence.</li> </ul>
<b>High potential risk incident (HPRI)</b>
<p>An event, or 'near miss', which could have:</p> <ul style="list-style-type: none"> <li>■ killed, or permanently disabled, a person(s); or</li> <li>■ caused life threatening injury to a person(s); or</li> <li>■ caused damage to assets or loss of operations to the value of greater than \$0.5 million; or</li> <li>■ caused a Category 4 or Category 5 environmental incident.</li> </ul>

### High potential risk incidents ('near miss') reporting

Since 2002, Xstrata's operations have focused on recording, reporting and investigating high potential 'near miss' incidents, as an important leading indicator of safety performance and a critical learning tool to avoid fatalities. High potential risk incident reporting has steadily increased across Xstrata's businesses during this time period, indicating improvements in hazard identification and often corresponding to improved safety performance. In 2005, 226 high potential risk incidents were reported across Xstrata's operations, compared to 168 in 2004. Regular reviews of high potential risk incident reporting are undertaken to ensure all employees and contractors continue to improve awareness of 'near misses'.

All critical and high potential risk incidents are reported monthly to the Xstrata Executive Committee and quarterly to the Board and are investigated by a team of senior operations and safety personnel to determine their underlying causes and to develop preventive action plans. The investigations into high potential risk incidents form an integral part of safety training, hazard identification and management and are a valuable source of improvements to safety plans and systems.

### Behaviour based safety programmes

Addressing the behavioural issues that contribute to safety incidents is one of Xstrata's major safety challenges. Behaviour based safety programmes require a collaborative, problem-solving approach by managers and employees to identify appropriate and inappropriate behaviours, which are then incorporated in behaviour inventories and used by personnel to monitor peer behaviours in a participative setting. Targets are set against inventories and progress against records of observations is monitored and shared.

Behaviour based safety programmes are in place or are being implemented at every Xstrata operation globally, with a particularly intensive effort in South Africa in 2005 and 2006. These programmes have been developed in consultation with employees and internationally recognised safe behaviour experts.

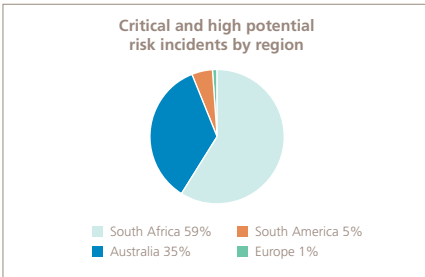
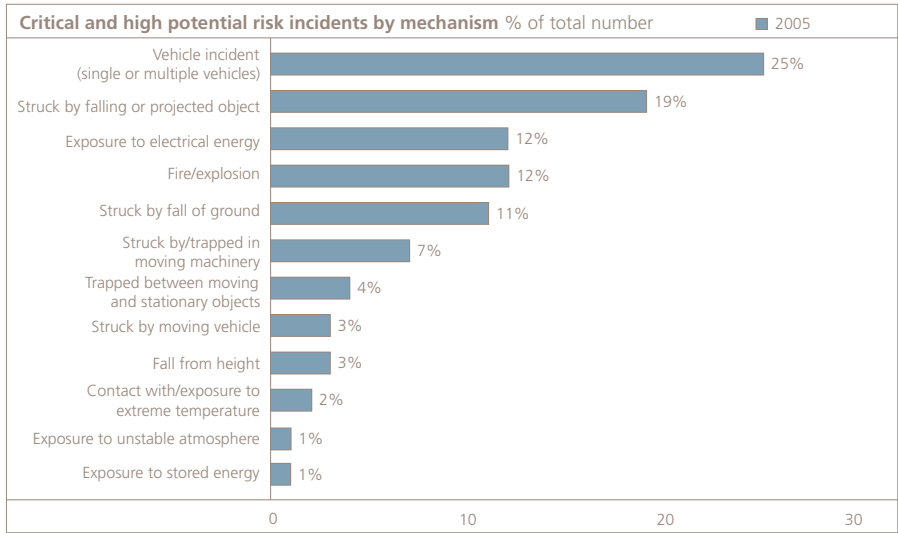
The majority of South African employees have been trained in the methodology of behavioural safety and the observation of unsafe or at-risk behaviour. Programmes specify safe and at-risk behaviour; and techniques include task observations; training for management, observers and employees in safety self-management; goal setting; and positive reinforcement through an incentive scratch card system that provides immediate monetary rewards for demonstrated safe behaviour. Observations are recorded and necessary corrective actions implemented. The introduction of the behaviour-based safety programmes and other initiatives have not only improved the management of major hazards but have also resulted in a substantial improvement in injury performance across the South African sites. For example, Tavistock Colliery improved the frequency of lost time injuries from 0.6 per million hours worked in 2004 to 0 in 2005 and the TRIFR from 3.8 in 2004 to 0.5 in 2005.

### Enhanced safety leadership in South Africa

Xstrata Coal's General Manager Health and Safety was seconded to South Africa in 2005 to facilitate the development of a five-year HSEC strategy and accompanying safety plans, and to transfer best practice safety skills from our high-performing Australian mines.

Xstrata Alloys established a Sustainable Development Department in 2005, led by a member of the senior management team and supported by external consultants. The Department's primary aims are to ensure an integrated approach to health, safety, environment and community programmes across Xstrata Alloys through an overall sustainable development strategy and balanced scorecard, and to drive their fatality prevention programme.

Remuneration at both South African businesses has been reviewed and reweighted to ensure the emphasis is on rewarding safety management and safe behaviour by the business at every level. At Xstrata Alloys, HSEC performance now represents at least 60%



of all management bonuses. Clear evaluation criteria have been set and performance is linked back to the balanced scorecard. At Xstrata Coal, 80% of supervisors' performance bonus and between 40% and 50% of lower level employees' total performance bonus is now dependent on safety criteria. For senior management, the overall safety performance of the business unit determines 40% of the bonus amount.

### Supervisor training

Xstrata Coal identified hazard awareness, incident investigation, supervision and safety coaching skills as key areas for improvement amongst employees, contractors and supervisors and as a priority in addressing fatalities in South Africa.

In response, Xstrata Coal South Africa, in collaboration with independent experts, created a comprehensive off-site 28 day training programme, designed to improve supervisory skills particularly in the area of safety management (see case study on pages 62-63). This training programme has been described as an example of global best practice by an independent safety professional who reviewed Xstrata Coal South Africa's fatality prevention programme in July 2005. All Xstrata Coal South Africa supervisors completed this training programme in 2005 and all newly appointed supervisors are required to complete the course. All managers completed a safety management course to complement the supervisor training and impart the specific knowledge and skills managers require.

Xstrata Alloys has been closely involved with the development and roll-out of Xstrata Coal's supervisor training programme and this business unit is adopting a similar model in 2006, learning from Xstrata Coal's experience. All Xstrata Alloys supervisors will be trained in four modules – self empowerment through emotional intelligence; resource management; people and team management; and managing discipline in the workplace. Following training, a continuous evaluation programme will be implemented to ensure skills transfer and an ongoing focus on improved safety leadership and coaching. All managers are being trained in incident investigation and are participating in further HSEC management training.

Unsafe acts contribute to the majority of injuries at Xstrata Zinc operations. To address this, we initiated a campaign in 2005 focussed on safe behaviour training awareness and motivation that includes supervisors and will continue into 2006. Hazard assessments for all materials and activities will be completed during 2006 at all Xstrata Zinc operations and will be complemented with the improvement of incident investigation activities, including root cause analysis, to determine the fundamental reasons of injuries and their prevention.

Technician completes safety walk around of vehicle at Ernest Henry mine





The introduction of a best practice supervisor leadership training programme across Xstrata Coal's South African operations in 2005 is helping to improve safety performance and raise the status of supervisors among the workforce.

In the past, Xstrata Coal South Africa did not have a formal performance and succession management system in place for the measurement, selection and succession planning of supervisors. Supervisors were the 'best employees' selected from our miners, artisans or plant operators. This practice resulted in a number of supervisors not having received formal training in supervision and people management, and less well developed skills in hazard identification, risk perception and behavioural change. Addressing the role of the supervisor was identified as a critical intervention.

Xstrata Coal South Africa Operations Director John Gardner said a revolutionary programme was needed to address the training and skills issue as well as re-empowering the supervisor role, which had suffered from lack of credibility.

"There were no structured training programmes available for supervisors in the industry – the South African Mining Qualifications Authority is still in the process of establishing a standard based qualification, and the 'off-the-shelf' courses were too academic and not applicable to the role of mining supervisors," he said.

"This meant we had to develop our own training programme; one that was practical, job related and competency based. Our 28-day course encompasses the principles of self learning, group dynamics and the Kolb and Fry learning cycle which includes conceptual, experimental, concrete and reflective learning.

"The understanding and practical application of knowledge and skills forms the core of the assessment process. Participants are led through a path of self discovery by the facilitators, while innovative and practical exercises, role plays, video/photo equipment and learning techniques are applied to master and embed new knowledge, skills and understanding. The programme is divided into eight modules which cover legal duties, technical knowledge, safety leadership, resource management, people management, safety training and coaching."



## Safety leadership training programme

A baseline examination was held prior to training to establish existing levels of knowledge of the legal, HSEC and other requirements of their specific jobs. By the end of the training programme all participants achieved 100% in this examination, a significant increase from average scores of around 40% before training and testimony to the effectiveness of this comprehensive course. Back on the job, performance is audited monthly by compliance managers.

At the end of the course, the supervisors had obtained:

- greater knowledge and understanding of the fundamentals of safety, health and environment;
- improved knowledge and understanding of the learning material, principles and techniques;
- improved ability to apply and transfer their knowledge, skills and competencies to their teams;
- a change in attitude and commitment towards safety and safety management;
- a learning file for reference, ongoing training revision and inserting memory joggers (short process descriptions); and
- general and specific standards for their specific areas of responsibility.

Feedback from the training was that, despite initial reservations, supervisors found the planned task observations, emotional intelligence, and people and resources management modules particularly helpful.

The programme is already producing results. There have been measurable improvements in HSEC performance, production, industrial relations and good housekeeping at all sites since the trained supervisors have returned to work. These supervisors score between 85% and 100% on the monthly compliance audits compared to scores of around 50% for supervisors who have not yet participated.

### Engaging and consultative management approach

Employee participation in identifying hazards and managing safety risks is imperative to our success in achieving zero injuries or fatalities at our operations. Health and safety information and reporting structures were revised during the year and new structures adopted across our businesses to facilitate greater employee participation, including improved communications in a range of languages and using a wide range of teaching methods to overcome lower levels of literacy.

In north Queensland and South America, Xstrata Copper and Xstrata Zinc have implemented the Positive Attitude Safety System (PASS), which encourages peer review and open discussion of observed deficiencies and desired behaviours. PASS is a dynamic safety process that assists line management to encourage, support and reinforce safe behaviours, activities and attitudes. This creates a positive safety environment, which supports employees' safety habits and encourages employees to bring forward their ideas on safety improvements.

### Hazard assessments and incident investigation training

Hazard assessments form an important part of managing risk and safety at our operations. Comprehensive risk assessments are completed for identified major hazards at each site and codes of practice, standards and procedures are revised and updated in response. Hazard awareness training is undertaken using awareness mock-ups.

Incident investigations have revealed that we need a more practical tool which our employees and contractors can use to minimise risk in the workplace, particularly in South Africa. A number of initiatives are being developed to address this, including a series of 'Golden Rules' developed for each hazard at Xstrata Alloys and the '12 Cardinal Safety Rules' developed at Xstrata Coal South Africa, in consultation with employees. In addition the Visible Veld (field) Leadership Programme is being used. This programme involves mine managers calling together work teams to stop work and identify safety hazards. Photographs are taken of the hazards, the work team identifies a solution and the mine managers ensure the solutions are implemented. The team is also advised when the safety issue has been rectified. At Xstrata Alloys, an interactive simulated training programme is used to teach hazard identification and corrective actions.

In 2005, our South African operations implemented ICAM – the incident, cause, analysis method of incident investigation – to investigate all lost time, restricted work and high potential risk incidents. ICAM is a recognised investigation and data analysis method used by a number of companies around the world to enable quick and easy identification of the root causes of an incident. ICAM aims to prevent recurrence and to advance safety by examining why incidents happen. Our training programme is encompassing all heads of department, managers, and operating managers, who are trained in lead or basic investigation techniques.

George Fisher Mine: Morning Crew attending a communication meeting



### Contractor management

Improved contractor management has been identified as a key focus area for our businesses to achieve our aim of a fatality-free business. Our HSEC Standard: Contractors, Suppliers and Partners requires the systematic selection, engagement and management of contractors, suppliers and partners who provide Xstrata with products and/or services. Systems are required for monitoring contractor performance and regular audits are undertaken to ensure compliance to Xstrata's Standards, with financial penalties for non-compliance or dismissal.

Overall our Group performance against this standard fell slightly short of the satisfactory target with all regions performing above this level except for South Africa. The South African HSEC improvement programmes are also addressing this deficiency, in particular through the supervisor training programme and their contractor management systems.

# Ravensworth Operations solve industry dragline safety hazard

The removal of dragline rope socket wedges can now be carried out safely thanks to the ingenuity of a maintenance team from the Ravensworth Operations in New South Wales.

Dragline ropes are changed regularly. Until recently, this process presented a safety hazard, as three workers were required to repeatedly pull a heavy steel boomer back high enough to generate enough force to knock socket wedges out. Maintenance Manager John Green set his team the task of tackling this issue, a common problem for the open cut coal mining industry.

Maintenance team coordinator Paul Scott, boilermaker Mark Parkes, rigger Ron Shuttleworth, fitter David Shearer and dayshift electrician David Pickles considered a range of options, including replacing complete sockets and wedges, using a Kobota excavator

with a hydraulic hammer attachment, and using a portable hydraulic press.

The preferred option was to develop a trigger release mechanism for the boomer that enabled one operator to control the release from the safety of an area adjacent to the mobile crane cab. As a result, all personnel are removed from the area of risk.

"Many complicated methods had been considered and trialled but this simple solution has proven to be the most successful by far," Paul Scott said.

David Pickles said his experience as a glider pilot and pilot trainer gave him the idea to utilise the glider tow release mechanism to safely release the boomer.

"I was thrilled to see it operate and prove to be so successful. It was also great to be able to contribute to the improvement of the safety of my workmates," he said.

Modifying the existing boomer has a number of advantages including preventing metal from splintering on impact, enabling the boomer to be adjusted to variable angles and force, and allowing the tightest wedges to be removed at a single stroke.

This initiative won the People's Choice Award in recognition of its importance for open cut mining at the 2005 New South Wales Minerals Council's Safety Innovation Awards. John Green said the boomer could be easily applied across other open cut operations to prevent injuries.

"This is a simple, cost-effective solution that came about by positive input from personnel in the field. They knew there were hazards involved in this process and were determined to find a solution," he said.

Mark Parkes said the boomer had operational as well as safety benefits, allowing the maintenance team to complete the job more quickly.

"We can now crop the ropes in no more than two-thirds of the time it used to take us. The previous risks have been eliminated," he said.



Contractor management has been identified by Xstrata Zinc as its primary area of focus for safety improvements, together with behavioural safety programmes. In response to the fatality of a contractor at a zinc operation in Spain in 2005, a Contractor Safety Supervisor has been appointed specifically to oversee major externally contracted work and ensure compliance against Xstrata's safety standards and procedures at Xstrata Zinc operations in Spain. The frequency of safety inspections has been increased and increased financial penalties are being imposed for non-compliance. Along with current safety plans, each contractor will define specific preventative actions and safety targets, which are assessed quarterly.

### Improved safety management systems and safe working procedures

As previously identified, the key risks associated with Xstrata's operations are interaction between people and mobile equipment and roof falls underground.

Xstrata Alloys identified collisions between people and mobile equipment underground as its most pressing safety risk and set about developing new technology, fitted to each employee and contractor's safety helmet to alert people underground and operators of mobile equipment to their proximity to one another. See case study on page 58.

Underground mining expertise from Xstrata Coal's Australian operations was employed at some South African underground operations to assist in identifying improvements to management systems and safe working procedures and to prevent falls of ground.

In November 2005, Xstrata Alloys conducted an intensive one-week evaluation of mining and ground control practices in collaboration with recognised industry experts such as Professor Jim Galvin, Consultant Mining and Rock Engineer (Australia); Professor Neilon van der Merwe (University of Pretoria); Dr Mike Roberts (MiningTek CSIR); and Tony Jagger, Consultant Geologist and Rock Engineer (South Africa). Xstrata Alloys is implementing a number of leading practice initiatives arising from this review. These include the compilation of structural geological plans that map all dominant geological features, to enable better mine planning and avoidance of roof fall incidents.

Noise monitoring equipment at Minera Alumbrera's truck workshop

