

HEALTH AND SAFETY AT A FERTILIZER COMPANY IN PAKISTAN A CASE STUDY OF ENGRO CHEMICAL

BY SABINA APPELT¹

Human rights issues addressed

- Occupational health and safety

Human rights management practices discussed

- Strategy
- Processes and procedures
- Training

Abstract

This case study focuses on the efforts undertaken by Engro, a chemical manufacturing and marketing corporation, to improve occupational health and safety standards in their core business practice. The rights to health and the enjoyment of just and favorable conditions of work - including safe and healthy working conditions - are recognized by international human rights treaties. Thus, efforts to implement these rights directly contribute to the advancement of Global Compact Principle 1: businesses should support and respect the protection of internationally proclaimed human rights. This case study examines the implementation of new health and safety standards (the so-called DuPont Best Practices) aimed at improving the health and safety of Engro's employees. Particular focus will be on the implementation of the new standards into the day-to-day behavior of employees.

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1. Company Profile

Engro Chemical Pakistan Limited (Engro) is based in Pakistan and primarily focuses on the manufacturing and marketing of fertilizer. Its urea fertilizer manufacturing site is situated in Daharki in the province of Sindh. Engro was established when Exxon (Esso until 1978) divested its business in 1991. The employees of Exxon Chemical Pakistan Limited decided to buy out Exxon's share and renamed it Engro, which stands for "Energy for Growth." At the time of writing, Engro is expanding its production capacity of urea through the creation of a new plant in Daharki which will be the world's biggest single train ammonia-urea complex upon completion. The company expects to reach a capacity of around 2.3 MMET Urea per annum by mid-2010. Engro has 130 management employees and 350 non-management staff at the plant in Daharki. These numbers are expected to increase to 195 management and 555 non-management before new projects commissioning at the enlarged plant. In addition, Engro employs 72 contractors and around 5000 contract employees on a daily basis. The latter number will decrease to around 1000 – 1200 as the plant extension nears completion.

The commitment to health and safety is an explicit part of the core values stated in Engro's corporate responsibility report.² A corporate health, safety and environment (HSE) committee has been in place since 2004. This committee has been headed by the company president, Asad Umar, as the DuPont assessment suggested that a commitment to safety, health and environment would have to come from the very top of the company. There is also a section dedicated to the safety of the manufacturing site, headed by a safety unit manager and staffed with a senior safety engineer, a process safety engineer, a safety supervisor and a safety technician. These five people are exclusively employed to improve Engro's safety and report to the health, safety and environment manager. Safe Operating Committees at the divisional level entrench commitment to these values throughout the hierarchy of Engro (see Appendix 1 for further information on safety organization). Since 2004, Engro has won awards by the National Forum for Environment and Health on an annual basis.³

Engro has been a participant of the Global Compact since June 2006 and thus committed itself under Principle 1 to support and respect the protection of internationally proclaimed human rights. The rights to health and the enjoyment of just and favorable conditions of work are part of these rights as they are recognized in a number of international human rights treaties⁴. The right to work explicitly includes, among other things, the right to safe and healthy working conditions, and so Engro's efforts to improve the health and safety standards at their plant are fully in line with a commitment to support and respect internationally proclaimed human rights.

2. Improving Health and Safety – From Initial Audit to Implementation

In 2000, Engro decided to update its health and safety standards. The standards in place at Engro at the time dated from the 1980s. They had been adopted by Exxon after the disaster at the Union Carbide pesticide plant in the Indian city of Bhopal. The disaster was later found to have been caused by substandard safety procedures. Even after Engro became independent in 1991, until 1998, Exxon experts were called in every two years to audit Engro's health and safety procedures in line with Exxon standards.

² http://www.engro.com/about_engro/core_values/index.php. In this report Engro also affirms its commitment to environmental protection which will not be focus of this case study however.

³ NFEH 1st award 30 June 2004; NFEH 2nd award 30 June 2005; NFEH 3rd award 25 July 2006; NFEH 4th award 4 July 2007; NFEH 5th award 2 July 2008; NFEH 6th award 9 July 2009. For further information on the National Forum for Environment and Health see www.nfeh.org.

⁴ See, for instance, *Universal Declaration of Human Rights* Articles 23 and 25(1), *International Covenant on Economic, Social and Cultural Rights* Articles 7 (b) and 12.

The decision in 2000 to bring Engro's health and safety standards up to international standards was motivated by the perception that both existing standards at the company and laws and regulations in Pakistan were inadequate to prevent injuries or ensure employee health and safety at the Engro plant. In particular, existing standards as well as local laws were identified as lacking the behavioral aspect on safety. As the company believes that it will take decades until local laws and regulations will match international best practices, the decision was taken to go beyond local laws and consult international sources.

The main hazards employees are exposed to at Engro are the risks of large-scale ammonia gas or chlorine gas release, as well as fires and explosions caused by hydrogen handling at the ammonia plant. The main type of injuries workers experienced were cuts and bruises, as well as, to a lesser degree, fractures and burns. It was hoped that these injuries could be reduced through the implementation of internationally recognized best practices. In the same year, then president of the company Zafar Ahmad Khan decided to have the existing safety standards examined by the company DuPont. A first audit was carried out by DuPont in which the company practices were benchmarked with DuPont's best practices.

(a) Initial Findings

The first report noted that particular problems were in the area of **behavior** safety (relating to the day-to-day behavior of employees), as Engro's existing safety standards mainly focused on **process** safety (i.e. technology and equipment related aspects of safety). Both behavior and process safety were found to be at the lower end of DuPont's best practices. This initial report has been described by Engro management as an "eye opener." In the following months, the safety professionals (those individuals in charge of safety inside the company) presented the findings to the top management in order to achieve approval to align Engro with the health and safety standards developed by DuPont. Approval of the management was given in 2003 and an audit conducted to establish the baseline.

(b) Changing Processes – Incident Analysis and Leading Indicators

Incident analysis has been an important part of improving process safety (i.e. technology and equipment related aspects of safety). Initially, safety incidents are declared and classified according to severity. For severe incidents, team investigations are carried out. The investigation protocol then covers the identification of the primary or root cause of the incident and analyses which PSRM (Process Safety Risk Management) element was violated. In order to avoid recurrence of the incident, specific recommendations are generated, and the quality of the incident report is assessed by the Incident Reports Review Committee (IRRC). This Committee is headed by the departmental managers, and the review takes place on a quarter-yearly basis. Twice a year, a detailed incident analysis is carried out by the safety section and discussed in Safe Operations Committee meetings headed by the general manager of the plant. The general manager then reports back to the Vice-President of the company.

Another important concept introduced by DuPont was the concept of "leading indicators" – rather than just generating recommendations and reports after the occurrence of accidents ("lagging indicators"), it is considered crucial for an effective safety strategy to also pro-actively identify risks and develop solutions to minimize risks before accidents happen. In other words, a forward, rather than a backward-looking way to develop safety leading indicators is recommended.

In the process of identifying leading indicators, Engro management, among others, benefited from reading the Baker panel report written to investigate the safety culture and management systems at BP North America in the aftermath of the Texas City Refinery explosion on 23 March 2005. The Baker panel

report was released on 16 January 2007, and the principal finding was that BP management had not sufficiently distinguished between occupational (behavioral) safety and process safety. Engro management found this report very helpful in developing their leading indicators in particular in the area of process safety.

(c) Changing Behavior – Towards Greater Independence and Responsibility

The main challenge in implementing the new standards has concerned the training of employees as the day-to-day behavior of employees has had to be altered fundamentally in some areas. One main aspect has been the introduction of self-audit: DuPont introduced the idea that individual workers should be encouraged to consciously carry out audits of the safety of their own work on a day-to-day basis. Self-audit is based on the idea that in order to effectively improve safety, workers have to be encouraged to take greater responsibility for their own behavior. In general, DuPont behavioral standards aim to achieve independence and ultimately interdependence of workers. In other words, the aim is to first achieve that workers do not have to be monitored continuously to ensure safety procedures are followed (independence). The next stage will then be to encourage workers not only to take responsibility for their own actions, but also to watch out for and help co-workers as needed (interdependence). The underlying rationale of the DuPont model is that it will lead to increased efficiency of safety standards if workers are not only prevented from doing the wrong thing, but actively seek to do the right thing and thus positively contribute to safety.

(d) Setting Objectives

To motivate employees to take such increased responsibility, safety objectives or goals are set for each employee, from management to non-management. These objectives vary depending on the position of the employee inside the company. So for instance, managers are given a target injury rate to achieve in their division, whilst individual workers are asked to develop action plans how to achieve this target. On an annual basis, a review of the objectives takes place, and the HSE performance of each employee is included in their annual appraisal. Safety performance is thus a factor taken into account when promotions (or dismissals) are decided upon. The annual appraisals of non-management employees are based on reports by their supervising managers.

There are also reward and recognition programs which are based upon HSE performance. Employees may, for instance, be awarded certificates or receive material safety rewards like watches. In addition, “emergency squad awards” have recently been introduced (currently in the range of 2500-3000 rupees).

(e) Training

In order to train employees in improved process and behavior safety, DuPont experts carry out classroom teaching for those employees considered as critical mass (i.e. managers, unit managers, section heads) who have the role of imparting the training down the line. Classroom trainings are also organized for newcomers (as soon as a sizeable number of newcomers has accumulated). Furthermore, Engro runs a program for the safety training of employees, the most important component of which is the so-called “D-level committee” (i.e. a committee at shop floor level) which meets once a week for two hours (including contractors and day workers). In each session, discussions on mandatory safety topics and any HSE related issues are held.

There is a complete program on the safety management of contractors, and the Process Safety and Risk Management ratings as well as the Personnel Safety and Management ratings specifically include the safety of contractors (see Appendices 5 and 6). As for other employees, the contracts of contractors

include reward and penalty clauses and the rating of contractors encompasses their safety performance. So Engro is committed to having contractor safety on a par with its company safety, and workers and contractors of all levels of the company belong to D-level safety committees and thus play a part in site safety.

Per year, approximately 18,000 man-hours are invested in such training. The HSE committee headed by the company president Asad Umar meets each quarter to develop HSE strategies and set targets for future performance. All managers and line organization personnel have to do two management safety audits per month in which they visit the plant, meet workers and establish contact with them to discuss unsafe behavior and situations at the shop floor level. These internal audits are not announced beforehand and are based on training done by DuPont. In addition to these safety audits, company executives also sporadically carry out safety visits.

(f) External Monitoring

Apart from the DuPont external audits, which take place every two years, various other forms of external safety monitoring take place in addition to Engro's internal monitoring. On an annual basis, the Government of Pakistan Ministry of Industries and Production checks the safety of the boilers. Twice a year (lasting for around two to three days each time), the site is assessed for compliance with ISO-9000, ISO-14001, OSHAS-18000 and SA-8000 standards by auditors from SGS Pakistan. The insurance auditor of Marsh International examines the plant with regard to stringent safety criteria once every three years. In 2009, the British Safety Council was also asked to audit the environment management system against a 5-star audit program.⁵

3. Analyses

The reason Engro decided to align their systems with the DuPont management system was that this particular system is known among petrochemical companies as the “gold standard” and was perceived as the most efficient system available in order to reduce injury. As DuPont generally expects a transition period of four to five years to be necessary for behavioral patterns of employees to be changed effectively, no conclusive numbers are available yet to testify to a reduction in injury numbers. However, serious injury rates in 2007 and 2008 were lower than in 2005 and 2006 (see Appendix 3) – they were reduced from fourteen injuries in 2005 and seventeen injuries in 2006 (including LWI) to seven injuries in 2007 and four injuries in 2008 (including LWI). The fact that the number of first aid injuries went up during that period is considered as a positive development as it means that injuries are captured at a first aid stage. Compliance with behavioral management safety audits increased from 57% in early 2006 to between 98-100% in 2008/2009 (see Appendix 2). Behavioral safety audit compliance went up from 53% in 2006 to 95% in 2009 (see Appendix 4). DuPont audits have also found a general improvement in all areas (e.g. management commitment, safety policy, supportive safety personnel, line organization, progressive motivation) since 2003. The overall average of performance according to DuPont ratings has risen from 1.4 (out of 5) in 2003 to 3.1 (out of 5) in 2008 (see Appendix 6). Process safety and risk management ratings have gone up from an average of 2.0 in 2003 to an average of ~3.9 (4.0 being “excellent”) in 2009 (see Appendix 5).

Engro management has further reported a visible change in the factory climate and reported that employees seem to generally take health and safety more seriously than before 2003. Engro has affirmed

⁵ For more information see <http://www.britsafe.org/audit/index.aspx>

its commitment to further train employees and monitor changes and hopes to be able to report improved numbers in the coming years.

4. Lessons Learned and Challenges Ahead

The implementation of improved working conditions has not had any adverse financial effects – on the contrary, Engro has continued to increase profits and achieve growth for stakeholders (see Appendix 7). Presently, Engro does not have any data available on the exact financial benefits of increased safety; however, Engro management has affirmed their conviction that the cost of accident is very high and that increased safety pays off not only for employees but for the company as a whole. Engro is planning to do further work to quantify these benefits in the future.

The main lesson learned throughout the alignment with the new standards has been that a positive approach to safety which engages workers and teaches them to take responsibility for their actions is more effective than mere “policing” of employee behavior. Engro management have said that they experienced the first audits by an external company as “eye opening” and found them to give valuable new perspectives on problem areas. Both managerial and non-managerial staff have reported that the introduction of improved safety standards has not only had a positive impact on their job, but that they have shared the learning benefits with their spouses and families. The emphasis on safety finds expression in the following slogans which were submitted by employees as part of a slogan competition organized by Engro in 2009. This slogan competition takes place on an annual basis and encourages employees to submit slogans on issues related to safety and the environment. Even though it was established before the introduction of DuPont best practices, it has since gained in importance and prominence in the company.

An important lesson has been that behavior has to be changed over the medium and long run, as entrenched unsafe behavior will not be eradicated over night. However, it is believed that through education and training, a thorough change in the work culture – such as to increase individual responsibility – can be achieved and will be sustainable in the long run. Engro further commits itself to continuously re-assess performance and plans to raise standards over time.

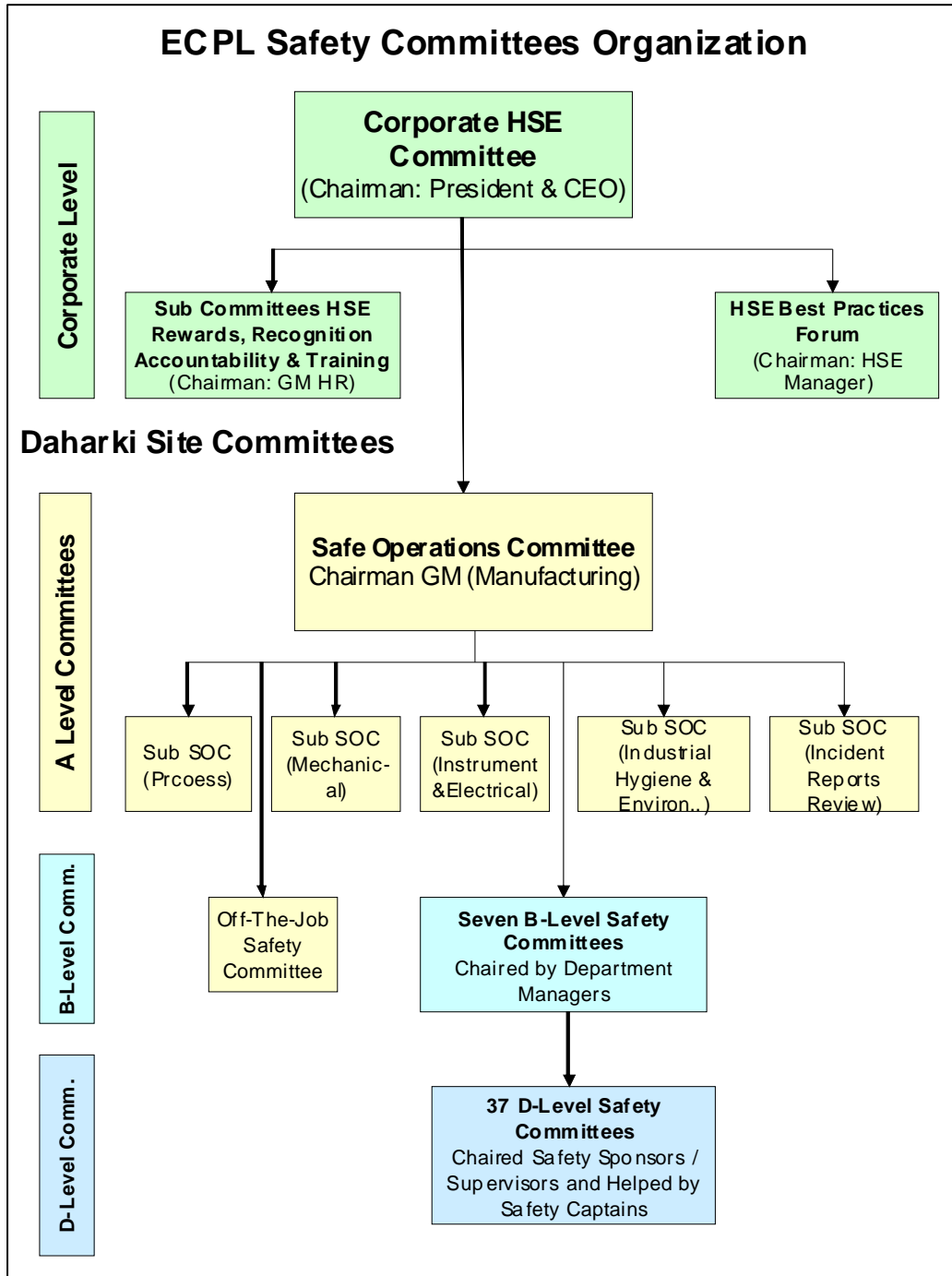
The immediate challenges ahead perceived by Engro are that the safety department should play less and less of a role in monitoring as the line organization should take more of a lead. This will be necessary to move to the next stage as described above, the stage of “interdependence” where employees take up responsibility not only for their own behavior but also for others around them. The culture of responsibility has to “trickle down” and employees need to further internalize the new standards. In order to do this, Engro plans to continue weekly classroom teaching, as well as to monitor developments of standards globally to continually keep up to date with improvements. Employees feel that networking

<p><i>Safety is our life line</i> <i>Keep incident free 2009</i> by Haq Nawaz Chandio</p> <p><i>Adopt the safe way</i> <i>Any time any day</i> by Shahid Javed</p> <p><i>No injury is our goal</i> <i>Let's strive as a whole</i> by Muhammad Arshad Aziz</p> <p><i>If it is plant or market, safety</i> <i>to be given first priority</i> by Nasrullah Burero (translated from Urdu)</p> <p><i>Let's share the safe habits</i> by Ghulam Nabi (translated from Urdu)</p>
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and benchmarking with the best practices across the world is the most efficient way to continuously improve safety, and there is a strong conviction that it will be possible to completely prevent all injuries in the future.

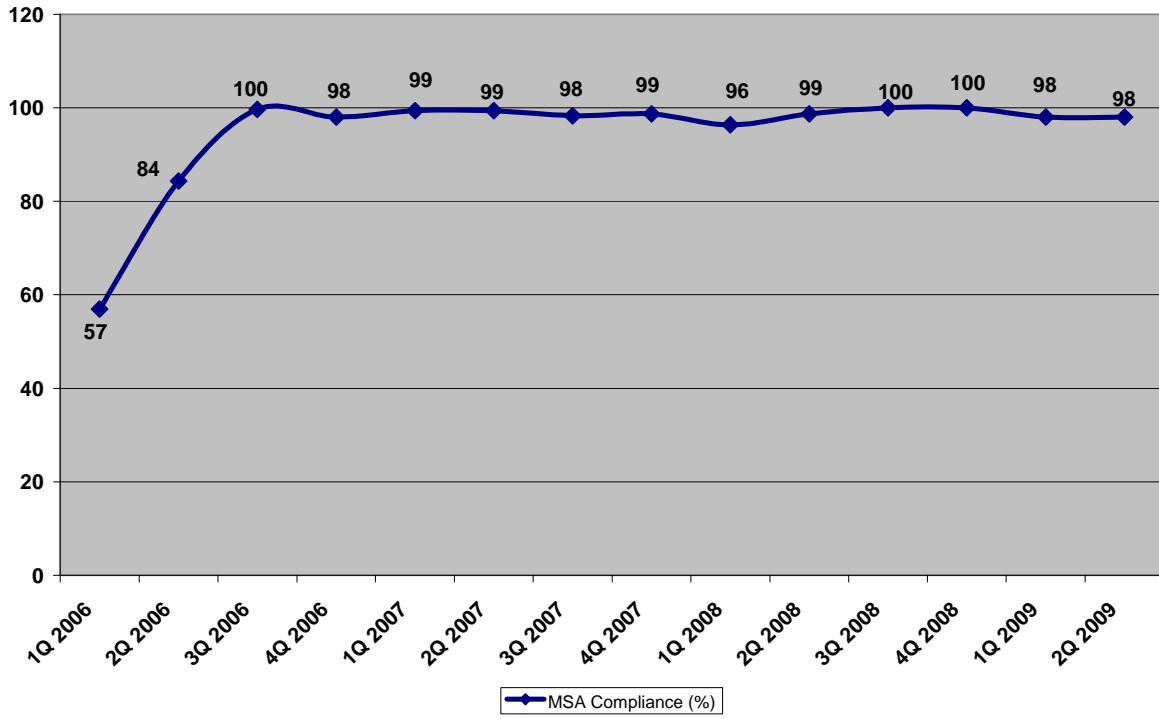
Engro considers the changes undertaken at its plant as replicable by other companies. A recommendation to other companies planning to improve their health and safety procedures would be to undertake plant visits to other companies which are already operating at higher standards as this may help managers to better understand new processes more quickly. This may reduce the period it takes to implement new standards.

Appendix 1: Safety Committees Organization



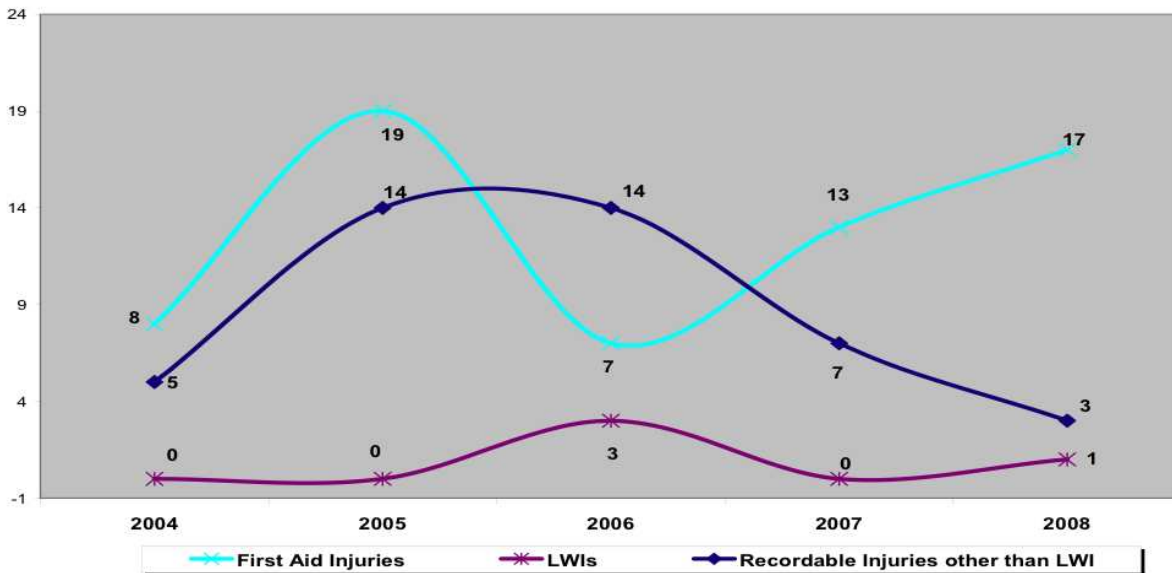
Appendix 2: MSA compliance from 2006~2009

Compliance with Behavioral Management Safety Audits Schedule - 2006 ~ 2009



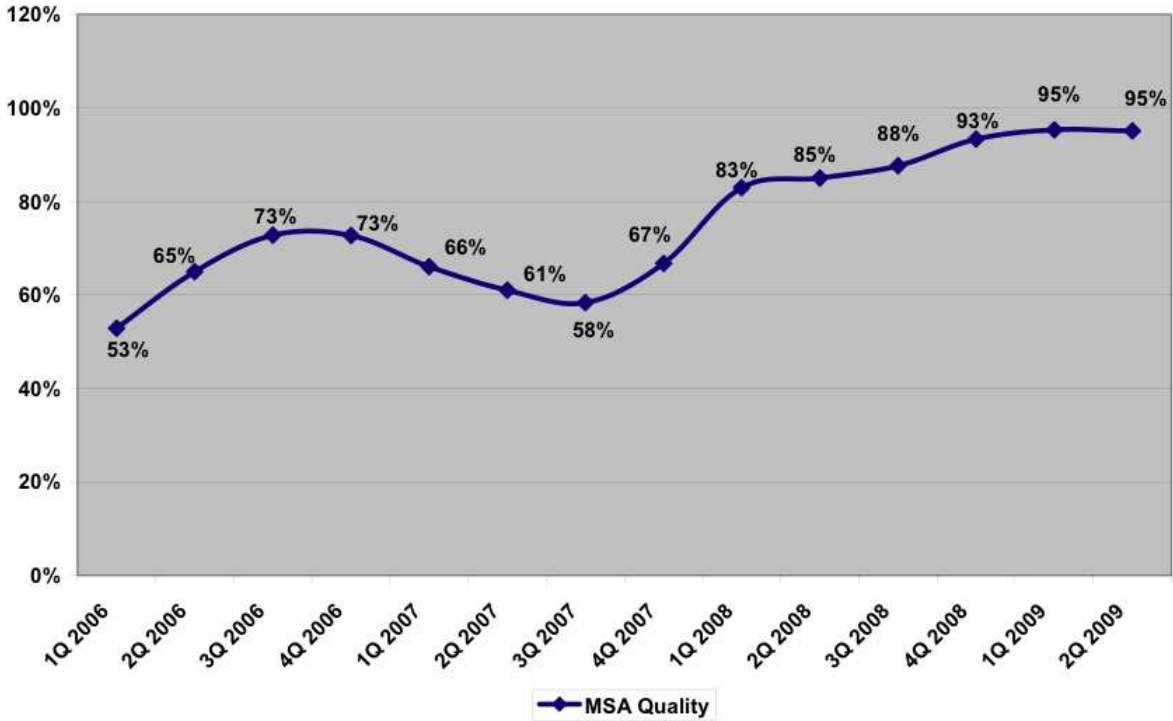
Appendix 3: Injuries Trend 2004 – 2008

Injuries Trend 2004 till 2008



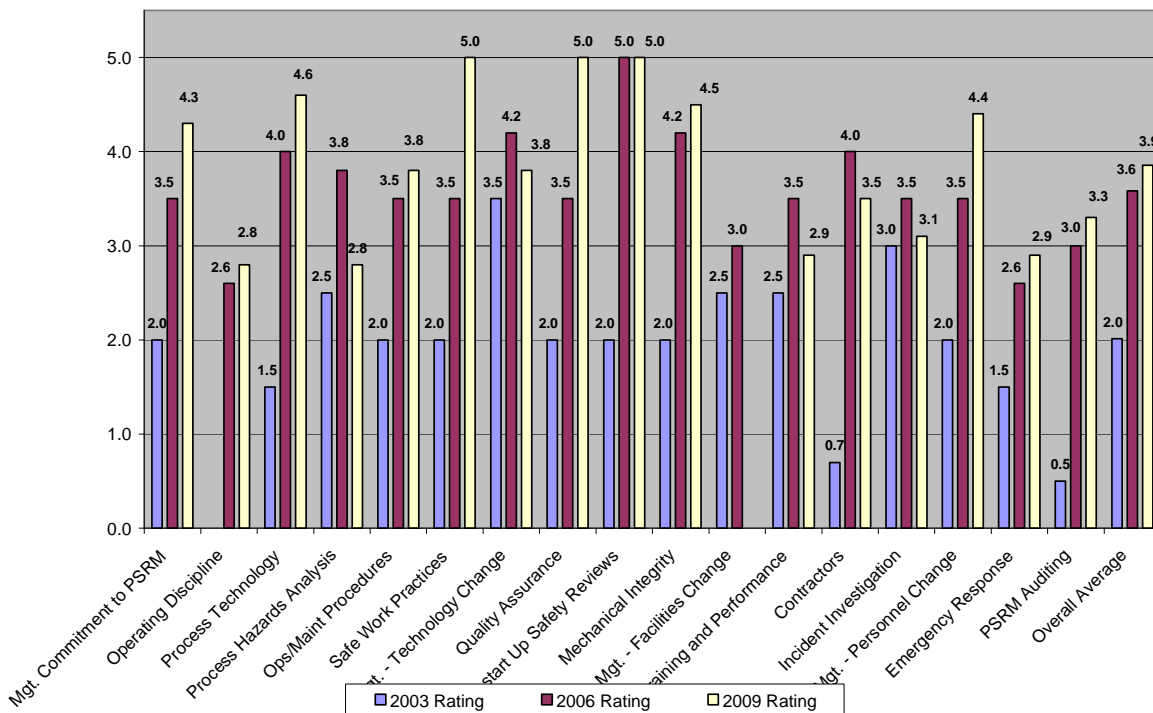
Appendix 4: Behavioral Safety Audits 2006 – 2009

Behavioral Safety Audits Quality - 2006 ~ 2009



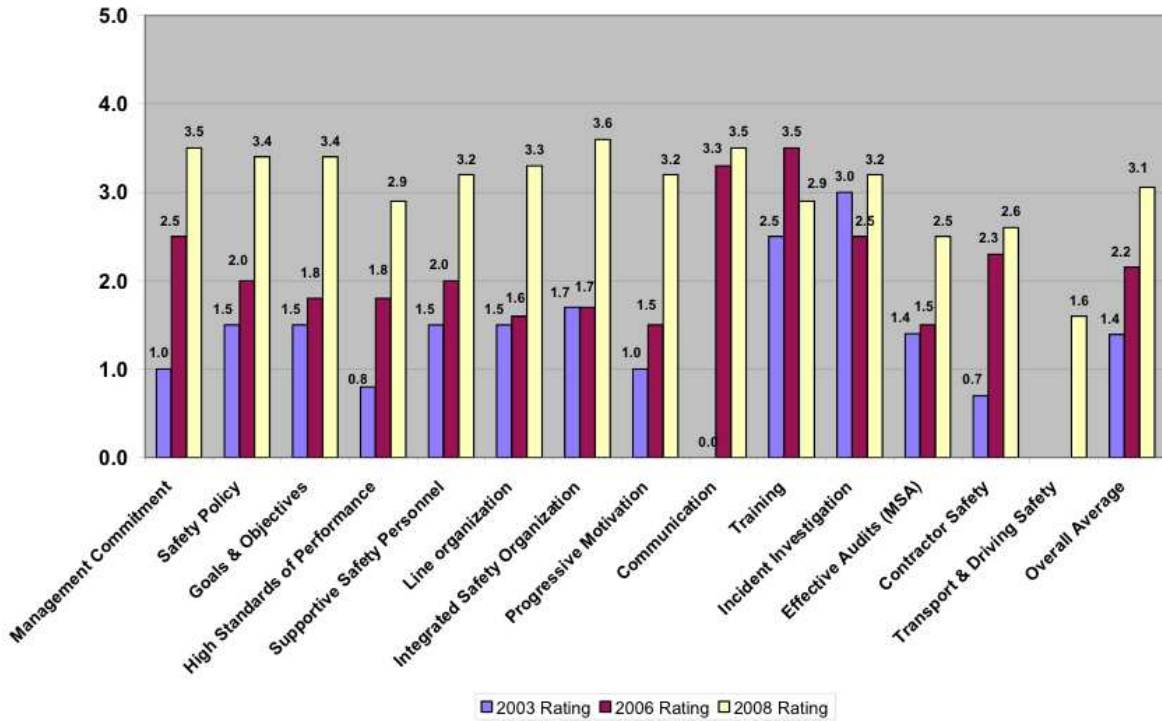
Appendix 5: Process safety & Risk management ratings

PSRM Rating by DuPont - 2003 - 2006 - 2009

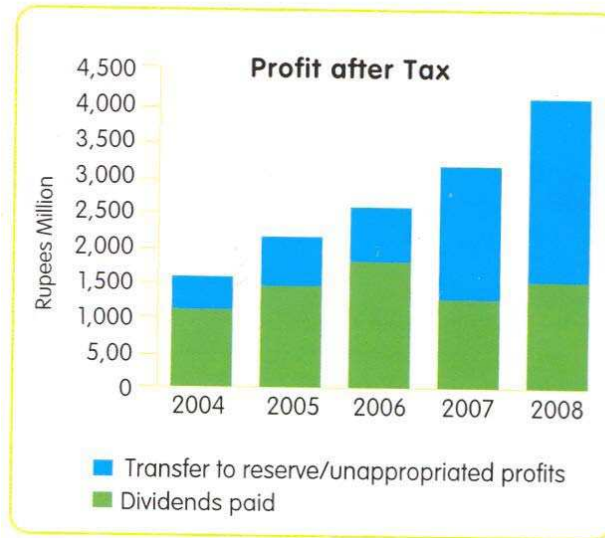


Appendix 6: Personnel Safety Management Ratings 2003 – 2008

PSM Rating by DuPont - 2003 - 2006 -2008



Appendix 7: Profit after tax



PROFIT AFTER TAX (US\$ Million)				
2004	2005	2006	2007	2008
20	29	32	40	54