Challenges and Criticisms of ISO 14001 Certification of Two Asbestos Mines

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ABSTRACT: The adverse health effects of asbestos are undisputable and well documented in mining environmental literature. The worldwide environmental anti-asbestos campaign begun in the late-1980s is premised on this fact. Consequently, major asbestos consumers like Japan, United States and most of Europe will completely ban the use of asbestos by 2005. Most asbestos mines have responded to this challenge by maintaining, reducing or ceasing production thus, portraying the industry as a sunset industry.

Anticipating closure, African Associated Mines (AA Mines) took a bold step to develop and implement an ISO 14001 Environmental Management System (EMS) to minimise environmental liability at closure through improved environmental performance. The EMS was certified in February 2004 and apart from initial intentions, it enabled AA Mines to establish new asbestos markets in the Far East. This paper examines the challenges and criticisms of the certification process of AA Mines.

1 INTRODUCTION

African Associated Mines (AA Mines) is the sole producer of chrysotile asbestos fibre in Zimbabwe. The company is one of the single largest mining employer and foreign currency earner in the country, employing close to 6,000 employees (about 10% of the total formal mining labour force in the country). AA Mines produces a total of about 145,000 t/year of chrysotile asbestos fibre from its two subsidiary mines, Shabanie and Gaths. Shabanie mine is located in Zvishavane about 180 km south-east of Bulawayo, the country's second largest city and Gaths Mine is located in Mashava a further 60 km to the east of Zvishavane (Figure 1). The two mines are both underground mining operations utilising sub-level and block caving methods for ore extraction from Archean schist rock formations. The ore from underground is sent for processing at the milling plants where the fibre is extracted from the rock by crushing and selective vacuum aspiration. The fibre is then cleaned and blended into various grades as per customer specifications and then packaged for shipment. In February of 2004 the two mines were certified to the international ISO 14001 standard. The certification was achieved amid several challenges and criticisms.

2 CHALLENGES AND CRITICISMS

The first challenge was that the certification was sought at the height of a strong world environmental anti-asbestos campaign begun in the late-1980s for asbestos-related respiratory and cancer diseases. Accordingly, major asbestos consumers like Japan, United States and most of Europe will completely ban the use of asbestos by 2005. Admittedly, the adverse health effects of asbestos associated with its uncontrolled production and use are undisputable and well documented in mining environmental literature (Asbestos International Association, 1990; Bignon, Peto and Saracci eds., 1989; Dement, 2001; Virta, 2002; World Health Organisation, 1986 and World Health Organisation, 1989). The campaign has been quite strong forcing most producers to maintain, reduce or cease production resulting in an overall declining world production (Figure 2). As can be seen from Figure 2, world annual asbestos fibre production declined from 4 million tonnes in

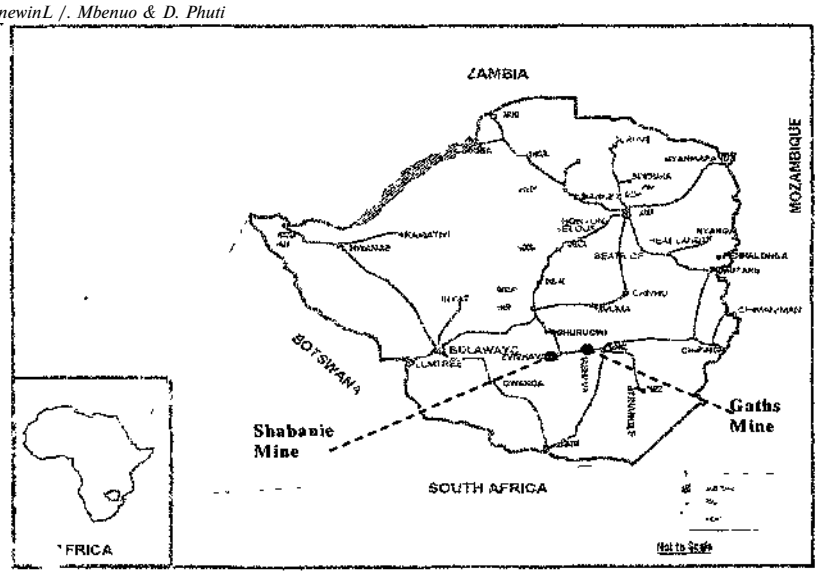


Figure 1. Map showing location of Shabanie and Gaths mines.

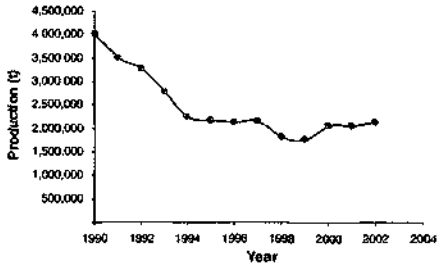


Figure 2. World Asbestos Production from Î 990
(Djt j Source'BıckıngllümaiKÍ Virt a, 2004)

1990 to stabilise around 2 million tonnes from the year 2000.

Secondly, there was no local mine to draw experience from since the mines were among the first mines in the country to pioneer the ISO 14001 route. There was also the general perception that mines were not very environmentally conscious as evidenced by the numerous media reports on mine accidents and disasters.

AA Mines also faced the criticism that they had chosen the ISO 14001 route because they wanted to improve the marketing of their product not that they genuinely wanted to improve their environmental performance. Thus, by implementing ISO 14001 Environmental Management System (EMS), the mines needed to prove that their environmental performance had indeed improved.

The certification was also achieved at a time when the ISO 14001 standard has been receiving widespread criticism that it is not a panacea for environmental problems. The paradigm shift away from the perception of ISO 14001 as an effective environmental management tool has resulted in serious debate between two schools of thought. In one school are the advocates of ISO 14001, who argue that it is a product of international consensus and a comprehensive tool that provides industry with a way of controlling environmental impacts (Krut and Gleckman, 1998). The proponents also strongly argue that ISO 14001 provides access to global markets and is likely to become a condition for doing business globally. In the opposing school are the critics who argue that ISO 14001 on its own is an inadequate tool to solve environmental impacts of industry (Krut and Gleckman, 1998). Firstly, they argue that it limits public involvement since the public cannot set targets or monitor industry's performance. The targets are set by the industry themselves and are what they are judged against. Also ISO 14001 is voluntary, thus companies are not obliged to disclose environmental performance results making it difficult to know their environmental performance (McCreary, 1996). Another argument is that ISO 14001 alone cannot be used to distinguish between a good and a desultory

environmental performer, thus companies with "weak" environmental policies who could be seriously polluting the environment could easily get ceıtıfied

One technique for investigating the envuonmental impact of a particular product is its full Life Cycle Analysis and Management (LCA) LCA uses a systems approach to investigate the inputs and outputs during each stage of a product's production, use and disposal Critics of ISO 14001 have argued that LCA should be the basis for assessing environmental performance rather than site-based polices and audits chaiactenstic of the ISO 14001 EMS In response to these criticisms some countries such as Denmark and Sweden, have adopted an "ISO 14001 Plus" appioach, requmng companies to fulfil the ISO requirements plus additional demands specific to their product

Given the foregoing arguments, the rest of this paper examines how the challenges and criticisms of ISO 14001 certification have been addressed by AA Mines The discussion analyses and reviews the coie elements of ISO 14001 EMS and the AA Mines expei ıences ıelatıng to each element The five core elements of the ISO 14001 standard are

- An environmental policy,
- An assessment of environmental aspects, legal and voluntary obligations,
- A management system,
- A series of periodic audits and ıeports to top management and
- A public declaration that ISO 14001 has been implemented

3 ENVIRONMENTAL POLICY

An envuonmental policy statement is the only public document that the ISO 14001 standard requnes a certified oiganisation to produce The mam role of the policy statement is that it is the basis for the design, implementation, monitoring and continual improvement at a ceıtıfied facility In order to guard against the criticism of producing a "weak" environmental policy, AA Mines undertook a comprehensive "initial review" to establish the environmental status of the organisation After benchmarking the status against regulatory, industry and company voluntary standaids, a policy statement was pioduced that outlined the company's commitment to pıeventıon of pollution with emphasis on

- Aır-boıne asbestos fibre and lock dust,
- Air, watei and land pollution,
- Noise and vibration levels,
- Dumps ıehabılıtatıon and management,
- Accident and incident prevention,
- Identifying and eliminating any possible environmental and health risks and
- Conservation of resources

4 ENVIRONMENTAL ASPECTS, LEGAL AND OTHER OBLIGATIONS

The ISO 14001 standard requnes an oiganisation to conduct performance assessment In setting objectives and taigets, an organisation should "establish and maintain procedures to identify environmental aspects of its activities, products or services that it can control and over which it can be expected to have an influence " (SAZ, 1996) In addition, an oiganisation should establish and maintain a proceduie to identify and have access to legal and othei requirements to which it subscribes (SAZ, I996) Twenty legal and other relevant instruments were identified by AA Mines (Table 1)

Table 1 List of legal and othei relevant instruments

1 Mines and Minerals Act (Chapter 21 05) (1996)	11 The Pneumoconiosis Act (Chapter 15 08) (1996)
2 Mme (Management and Satety) Regulations (1990)	12 Envuonmental Management Bill (2000)
3 Explosives Act (Chapter 10 05) (1996)	13 Public Health Act (Chaptei 15 09) (1996)
4 Natural Resouices Act (Chapter 20 13) (1996)	14 Explosives Regulations (1989)
5 Hazardous Substance and Articles Act (1996)	15 ILO Convention 162
6 Foiest Act (Chapter 12 05) (1996)	16 Uiban Councils Act
7 Water Act (Chapter 20 24) (1996)	17 Labour Relations Act
8 Atmosphere Pollution Prevention Act 20 03 (1996)	18 Road Traffic Act
9 Parks and Wildlife Act (Chapter 20 14) (1996)	19 ZINWA Act
10 National Museums and Monuments Act (1996)	20 Workman s Compensation Act

The initial review and benchmarking process established that the most significant environmental aspects were, in order of priority

- Air-borne asbestos fibre,
- Air-borne rock dust,
- Fumes fiom explosives blasting,
- Noise from machinery and equipment,
- Vibration from machinery and equipment,
- Exhaust fumes from mobile equipment,
- Oil spillage fiom mobile equipment,
- Waste rock and fines and
- Heat from virgin rock and mobile equipment

Although legal compliance was already being achieved m most of the significant aspects, EMS targets were set to operate well below the compliance limits Accordingly, opeiatıonal procedures were developed to ensure compliance with EMS targets Relevant operational control and monitoring programmes were then developed to ascertain the adequacy of these procedures in meeting the required EMS targets As will be seen later, if a procedure was failing to give required ıesults, it was reviewed and amended so that it improved the conti ol of the significant aspect concerned Air borne asbestos fibıe and rock dust look top priority on the significant aspects register since they are directly the causes of the adverse health effects of asbestos It is for this reason that although die performance on other significant aspects were controlled and monıtoıed, only the performance in controlling these two will be reported here In addition only the two major departments, mining and milling, that liberate fibre and dust into the air will be reported on The legal limits set out in the Mine Management and Safety Regulations of 1990, for air-borne asbestos fibıe and rock dust, aie 2 fibres per millilitre per 4-houi period and lOmg pel m^3 pei 4-hour period, respectively Since the mines weie alieady achieving fibre and dust counts below these legal limits, it was agreed that the sampling locations and number of peisonal samplers would be maintained The air borne fibre EMS target was then set as the percentage of samples with fibre counts greater than 0 5 fibres pei millilitre per 4-hour period being less than 5% of total samples, within three years and thereafter to 0% For ıock dust counts, the percentage of samples with dust counts gieatei than 8mg per m^3 pei 4 hour peııod were to be withm 5% of the total samples, again within thiee years The ISO 14001 piogramme had been started at the end ot June 2001 (ı e Quarter 3, 2001) and the compilation ol the proceduies was completed m Quarter 4 of 2001 Implementation of* the procedures began m Quarter 1 of 2002 and ran * for 2 years befoie ceitification (ı e Quarter 1 of 2004) The results of the implementation are shown in Figures 3 6 Figure 6 is typical example where a procedure had to be amended to improve the control of dust m the milling plant at Gaths mine The results show that, although there were variations from Quarter to Quarter, the geneial trend was a gradual decline in the percentage of samples above the set target It can also be seen that before project implementation the variations were moie erratic compared to the period duıing implementation and after certification, indicating the impact of action pıogrammes Sımılaı tıends were established foi othei significant factors, other than fibre and dust It can be concluded therefore, that AA Mines' environmental policy led to improved environmental performance in key target areas, hence the gi anting of the certification

5 MANAGEMENT SYSTEM

The established environmental management system checks if an oıganısatıon is in line with its stated environmental policy Thiough clear Unes of authonty and ıesponsıbılıty, an EMS follows pioject cycle phases of planning, implementation, monitoring, corrective action, îeview and continual improvement At AA Mines, an ISO 14001 team comprising of carefully selected departmental representatives headed by a management representative, the Technical Services Manager, was mandated to drive the programme semi-autonomously at departmental level so that chances of carrying over the existing status quo were minimised The departmental heads also had to commit Üıemselves to complying with the ISO 14001 programmes specific to their sections It was also realised at the onset that the paıtıcıpatıon, and moie importantly, acceptance and ownership, at grass loots level weie essential for a successful ISO 14001 project Thus, the mine launched a 'Come on-Boaid' programme to educate employees on the importance of then participation and ownership ot the ISO 14001 project This approach was quite effective in getting the EMS through various the project phases The associated documentation generated by the EMS at AA Mines included the following

Environmental Health and Safety (EHS) Policy,
EHS Policy Manual,
Legal Aspects Register,
Significant Aspects Registei,

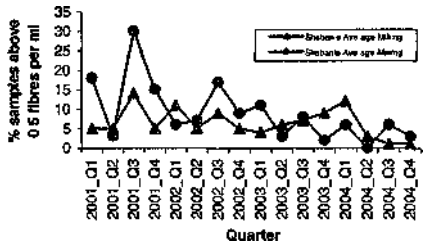


Figure 3 Fibre Count Trend for Shabame

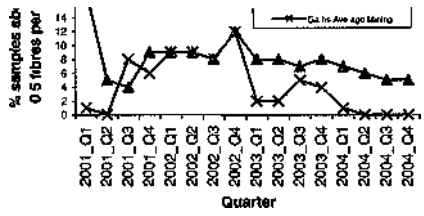
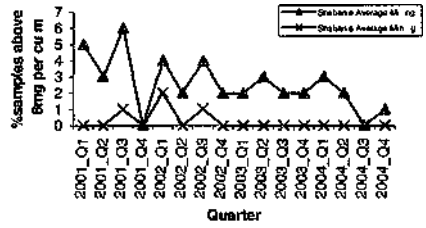
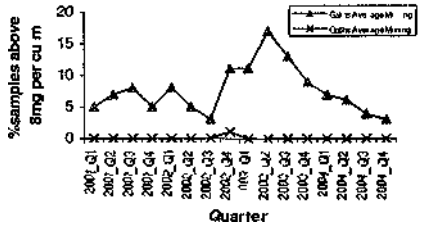


Figure 4 Fibre Count Trend for Gafhs Mine





Figurée Dust Count Trend for Gaths Mine

- Proceduies Manual,
- Work Institutions Manual and
- Records

6 PERIODIC INTERNAL AUDITS

Internal audits are undertaken to veufy if the EMS is conforming to action plans and policy Results of audits are reported to top management In addition to internal audits, an organisation seeking certification will have to be audited by an accredited external third party Clitics argue tliat ISO 14001 is based on internal and external audits, whose ıesult is piesented to senior management It is not clear if information discovered during an audit shows illegal activities or major pollution can be disclosed to the public or ıegulatory authorities as the consequences could be heavy lawsuits and lengthy litigations (McCreary, 1996) The standard does not state if regulatory authorities can demand access to audit results

In the case ot AA Mines, all the four internal audits undertaken prior to certification did not reveal majoi non regulatory compliance In addition, the fust SAZ third party audit only picked up minor non-conformances which were rectified during the three months befoie the final certification audit in Febıuaıyof2004

7 PUBLIC DECLARATION

The ISO 14001 standard requires that the environmental policy should be communicated and made available to the public AA Mines met this requirement by publishing the policy it was implementing m the local media and soliciting inputs into the progiamme It also communicated later through the same local media that it had attained ISO 14001 certification

8 OTHER ISO **14001** BENEFITS

Over and above improving the mines' production environment, part of the EMS entailed the development of a good mine closure plan The closure plan included projects that could ıesult m former asbestos dumps being cleaied away for use as raw material tor the production of other environmentally safe products These projects, still in their embiyomc stages are the recovery of magnesium from dumps, conversion of the dump matenal to pioduce low temperature Chiome-Mag foundry bricks and the ıecoveıy of nickel from the dumps These projects were the results of an ISO 14001 driven mind set change from traditionally viewing piocess waste as "waste" to viewing the same waste as possible raw material foi other processes that can be developed

9 CONCLUSION

AA Mines developed and implemented an ISO 14001 EMS in anticipation of closure so that environmental liability at closure would be minimal However, after certification, the mine was faced with a pleasant surprise as closure was no longer imminent since the piocess had led to the establishment of new markets. In addition, environmental performance improved AA Mines are likely to continue improving their environmental performance so that they do not lose the certification in subsequent surveillance audits This project was a huge task the mines undertook against a backdrop of serious challenges and criticisms These included criticisms on the inadequacy of ISO 14001 as an effective environmental management tool, absence of previously certified local mines, the strong worldwide anti-asbestos environmental campaign, and general perception of mines as serious envuonmental polluters and hazards to human safety

The AA Mines case has demonstrated that by attaining ISO 14001 certification, an organisation can improve its environmental performance and get better access to global markets The AA Mines case also indicated that by implementing ISO 14001, a positive mmd-set change can occur on the perception of process waste by employees

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