
SUMMARY AUDIT REPORT

Name of Cyanide Production Facility Business : Chemicals Business - Mining Reagents Business

Name of Facility Owner : Sasol Polymers a division of Sasol Chemical Industries Limited

Name of Facility Operator : EHJ Fourie

Name of Responsible Manager : JB Armstrong

Address : Midland Site, Bergius Street, Sasolburg, 1947

State/Province : Free State

Country : South Africa

Telephone : +27 16 920 3309

Fax : +27 11 522 3649

E-Mail : koos.fourie@sasol.com

Location detail and description of operation:

Sasol Polymers is a division within Sasol Chemicals Industries Ltd and consists of number of Business Units of which the Chemicals Business is one. The Mining Reagents Business is a department within the Chemicals Business.

The Mining Reagents Business is a production facility consisting of two operating plants, namely Cyanide 1 & Cyanide 2, located in the North West corner of the Sasol Polymers Midland Site. The facility specializes in the manufacture of liquid sodium cyanide solution for use in the South African gold mining industry. The production of the final product is accomplished by converting ammonia and natural gas to hydrogen cyanide gas in Shawiningan Reactors then absorbing it in caustic soda to form sodium cyanide. The main raw materials, ammonia, natural gas and caustic soda, are sourced from within Sasol business units.

Sasol Infrachem is a division within Sasol Chemicals Industries and is responsible for the provision of plant utilities (instrument air, process water, etc) and specialised services to the various business units on the Midlands site. The Mining Reagents Business has services level agreements with various sections of Sasol Infrachem for the provision of the following services:

- Emergency Services (security, fire station, HAZCHEM, medical centre etc.)
- Environmental Services
- Water and Waste
- Sillog (Sasol Transportation)
- AIA Inspection Services
- Occupational Health and Safety

Auditor's Finding

This operation is

- ☐ in full compliance
☒ in substantial compliance *(see below)
☐ not in compliance

with the International Cyanide Management Code.

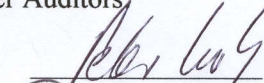
- * For cyanide production operations seeking Code certification, the Corrective Action Plan to bring an operation in substantial compliance into full compliance must be enclosed with this Summary Audit Report. The plan must be fully implemented within one year of the date of this audit.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst E-mail: arend@eagleenv.co.za

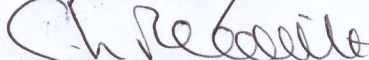
Names and Signatures of Other Auditors:

Peter Lotz



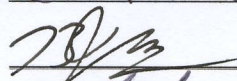
16.02.2007

Cathy Reichardt



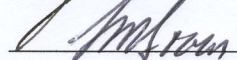
16.02.2007

Jurie Vorster



15/02/07

Lynton Brown



18/02/07

Name of Auditor

Signature of Auditor

Date

Date(s) of Audit: 20 – 24th November 2006

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Production Operations and using standard and accepted practices for health, safety and environmental audits.

Cyanide Plants 1 & 2

Name of Facility

Signature of Lead Auditor

CERTIFIED A TRUE COPY
OF THE ORIGINAL

19/2/07

Date

Cyanide Plants 1 & 2

Signature of Lead Auditor

9th February 2007

Page 2 of 7

JUDD ROBERT REID
COMMISSIONER OF OATHS
PRACTISING ATTORNEY, RSA
28 OLD MAIN ROAD, HILLCREST
KWAZULU NATAL

1. OPERATIONS: Design, construct and operate cyanide production facilities to prevent release of cyanide.

Production Practice 1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

The operation is ☒ in full compliance with Production Practice 1.1
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Limited information was available for quality control and quality assurance programmes used during the construction of the plants. However, a number of inspections by competent persons and civil and mechanical engineers, using risk-based methods and maintenance analysis found the structure, foundations, piping and control systems, "fit for purpose." Available plans and specifications show a recognition of cyanide usage and include sound containment strategies and materials compatible for use in cyanide production.

Production Practice 1.2: Develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

The operation is ☒ in full compliance with Production Practice 1.2
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The facility has a well established set of procedures, work instructions, and plans augmented by effective checklists, which are used by a seasoned and experienced workforce. The plans and procedures make provision for normal and abnormal conditions and two change management mechanisms ensure that operational changes and appropriately managed and accommodated.

Production Practice 1.3: Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

The operation is ☒ in full compliance with Production Practice 1.3
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The facility uses the SAP (computerized) system to control inspection, monitoring, and maintenance of production facilities. Inspections are triggered both by statutory requirements and a combination of equipment supplier recommendations and a history of observations which have prompted modification and improvement. Inspections are linked to a jobcard system to ensure effective response and follow-up of actions.

2. WORKER SAFETY: Protect workers' health and safety from exposure to cyanide.

Production Practice 2.1: Develop and implement procedures to protect plant personnel from exposure to cyanide.

The operation is ☒ in full compliance with Production Practice 2.1
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Routine activities are covered by effective procedures and work instructions which link to the facility's baseline risk assessment and issue-based risk assessments. Non-routine activities such as vessel entry are covered by issue-based risk assessments and a formalized permit to work system. Clear PPE requirements are indicated for routine and non-routine activities and these are reviewed regularly by management and workforce.

Production Practice 2.2: Develop and implement plans and procedures for rapid and effective response to cyanide exposure.

The operation is ☒ in full compliance with Production Practice 2.2
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Facility has its own Plant Emergency Action Plan (PEAP) with associated cyanide response procedures and work instructions. Emergency response, first aid, evacuation and hospitalisation plans are in place and are exercised regularly. A Medical Centre adjoins the facility and ambulance/fire responses are minutes away in the main chemical complex, of which the facility is a part.

3. MONITORING: Ensure that process controls are protective of the environment.

Production Practice 3.1: Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

The operation is ☐ in full compliance with Production Practice 3.1
 ☒ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Whilst environmental monitoring was undertaken, there were concerns regarding data quality and management which required review and revision to ensure formalized structure to the data collection and its use. Systems changes and revisions have taken place but iterations of data reporting cycles are needed to create confidence in the revised systems and protocols. (See Corrective Action Plan)

4. TRAINING: Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.

Production Practice 4.1: Train employees to operate the plant in a manner that minimizes the potential for cyanide exposures and releases.

The operation is ☒ in full compliance with Production Practice 4.1
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The facility has a sound training structure which combines formal classroom training, field checks and mentoring. The effectiveness of annual induction and refresher training was tested through staff interviews and found to be good. A formally qualified trainer (with 20 years service in chemical production) has developed very effective, practical training modules which benchmark well against best industry standards.

Production Practice 4.2: Train employees to respond to cyanide exposures and releases.

The operation is ☒ in full compliance with Production Practice 4.2
 ☐ in substantial compliance with
 ☐ not in compliance with
 ☐ not subject to

Summarize the basis for this Finding/Deficiencies Identified:

All employees are trained in emergency response procedures on site and records were checked to confirm training and refresher training was undertaken. Interviews with workers confirmed good understanding of procedures and responses. Drills are conducted regularly and the trainer is fully involved in observing drills and evaluating response effectiveness. Training and re-training undertaken using the "spare shift" system.

5. EMERGENCY RESPONSE: Protect communities and the environment through the development of emergency response strategies and capabilities.

Production Practice 5.1: Prepare detailed emergency response plans for potential cyanide releases.

The operation is ☒ in full compliance with Production Practice 5.1
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The emergency response plan was reviewed and found to be appropriately detailed. Response appropriately related to the facility's baseline risk assessment and Major Hazard Installation Risk Assessment. Roles and responsibilities were adequately documented and scenarios identified.

Production Practice 5.2: Involve site personnel and stakeholders in the planning process.

The operation is	<input type="checkbox"/> in full compliance with	Production Practice 5.2
	<input checked="" type="checkbox"/> in substantial compliance with	
	<input type="checkbox"/> not in compliance with	

Summarize the basis for this Finding/Deficiencies Identified:

Facility personnel are adequately involved in the emergency response planning process through the Health and Safety Committee, mock drills and post mortems thereof. Community involvement is via the Complex's liaison structures. However, sample interviews with three prominent community representatives suggested a possible poor understanding of the facility's cyanide production and transport. (See Corrective Action Plan)

Production Practice 5.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.

The operation is	<input checked="" type="checkbox"/> in full compliance with	Production Practice 5.3
	<input type="checkbox"/> in substantial compliance with	
	<input type="checkbox"/> not in compliance with	

Summarize the basis for this Finding/Deficiencies Identified:

Primarily responders and their back ups are clearly identified in the emergency response plan and call outs and contact details are readily available. Emergency equipment inventories were checked and noted to reflect actual availability. Outside responders (i.e. the Complex's medical and fire teams) were found to be readily available and a random drill test showed availability and speed of response.

Production Practice 5.4: Develop procedures for internal and external emergency notification and reporting.

The operation is	<input checked="" type="checkbox"/> in full compliance with	Production Practice 5.4
	<input type="checkbox"/> in substantial compliance with	
	<input type="checkbox"/> not in compliance with	

Summarize the basis for this Finding/Deficiencies Identified:

The Complex's weekly updated, detailed Hazmat emergency contact list includes all facility contact details and facility and complex procedures indicate who needs to be notified, in case of different emergencies.

Production Practice 5.5: Incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The operation is ☒ in full compliance with Production Practice 5.5
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Specific procedures have been developed to deal with remediation and these are integrated with the Complex's wider emergency response mechanisms.

Production Practice 5.6: Periodically evaluate response procedures and capabilities and revise them as needed.

The operation is ☒ in full compliance with Production Practice 5.6
 ☐ in substantial compliance with
 ☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Mock drills are conducted quarterly and are all followed by focused post mortems to evaluate performance and check for areas of improvement. In addition the response procedure requires formal review annually in terms of document control and ISO systems requirements. Mock drill feedback documentation was reviewed and recommendations for change were found to be followed through (rescue chairs).