

INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Cyanide Production Summary Audit Report (Repackaging & Storage)

***Vehrad Transport & Haulage
Tema, Ghana***

11th –13th July 2012

***For The
International Cyanide Management Code***

Name of Operation: Vehrad Transport & Haulage
Name of Operation Owner: Vehrad Transport & Haulage
Name of Operation Operator: Vehrad Transport & Haulage
Name of Responsible Manager: Mr Ghassan Hussein
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Location detail and description of operation

The repackaging plant, operated by Vehrad Transport and Haulage, is located at Plot 16/17, Heavy Industrial Area, Tema, Ghana, and has been established to provide a sparging service to ICMI certified cyanide consignors and the mines in West Africa that wish to receive sparged cyanide briquettes, rather than cyanide packaged in sea containers, containing cyanide briquettes packaged in Polypropylene bags, in wooden boxes.

The repackaging plant consists of a two hopper, sparging facility, supported by a warehouse, where the boxed and bagged cyanide briquettes are stored, prior to being sparged. Consignors deliver their sea containers to the site where they are de-stuffed of cyanide boxes. These boxes are stored in the warehouse, whilst they await repackaging into sparge tanks, then they are transported to the mines by Vehrad Transport and Haulage. Each consignor's cyanide boxes are stored separately in the warehouse.

The cyanide briquettes are repackaged from cyanide boxes into sparge tanks. These sparge tanks are delivered by the ICMC certified transporter, Vehrad Transport and Haulage, to mine sites in West Africa.

Waste cyanide packaging (wooden boxes, plastics and polypropylene bags) are stored in the warehouse and transported to a Ghana Environmental Protection Agency-approved, ICMI certified, incinerator facility and disposed of.

Auditor's Finding

This operation is

- X 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
& Production Auditor

E-mail: arend@eagleenv.co.za

Date of Audit: 11th – 13th July 2012

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.

Vehrad Transport & Haulage




12/2/2013

Name of Facility

Signature of Lead Auditor

Date

Vehrad Transport & Haulage



Signature Lead Auditor
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12th February 2013

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.

X in full compliance with

The operation is in substantial compliance with Production Practice 1.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The design for the repackaging plant was checked for ICMI compliance by a metallurgical engineer, in consultation with a tank design and construction company and Plan Wheel Consulting Engineers. Design drawings covering the site plan, fence wall & details, ground plan, roof framing plan, roof plan, sections and details, elevations, foundation plan and details, ground floor plan and detail, columns, and roof beam framing plan were reviewed.

Also reviewed was the design pack which included a bulk bag reprocessing conceptual flow diagram; a warehouse process flow diagram; a unit process diagram; a bulk bag reprocessing process flow diagram; a fork lift transport of bulk bags schematic; the iso-tainer transport process flow diagram; and the incinerator process flow diagram. The on-site warehouse was modified to accommodate cyanide storage by the installation of ventilation fans, the sealing of floors, and the installation of a ramp, linked to the bunding and containment requirements.

A Quality Assurance/Quality Control Program was used during construction and a “fit for purpose” quality assurance certificate was issued by the Consulting Engineer. The materials of construction were mild steel and the construction engineer was aware that the equipment was to be used in conjunction with sodium cyanide.

The Facility has two independent sensors to detect overfilling of the sparge tank. A sensor detects the height of the briquettes in the tank and this is supported by visual indication using a video camera. The video camera has a screen at operator level attached to one of the pillars. A manual electrical vibrator is used to spread the pyramid briquette stack below the hatch to ensure an even level of briquettes.

The offloading yard, adjoining the entrance to the repackaging facility, is fully concreted and slopes gently to the entrance of the repackaging facility. At the base of the slope is a collector trench which runs to the main site containment sump.



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

X in full compliance with

The operation is in substantial compliance with **Production Practice 1.2**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Twenty four operating procedures have been developed for the repackaging plant and storage warehouse. The procedures cover pre-, post and basic operation, the cyanide repackaging plant and warehouse management, guidelines for vital components, inspections, a manual of authority, decontamination of equipment, the buddy system, a change management procedure and a process flow diagram.

The procedures also include relevant pre-work inspections and appropriate PPE and abnormal situations such as overfilling, power outages, blockages, damage to bags and broken or damaged handles, residues in bag and hopper and dealing with other abnormal and emergency situations.

The Repackaging Facility has a Planned Maintenance System (PMS) in place for inspections, maintenance of equipment and history of maintenance of equipment. The plant is not fully operational so no full checklist history is available. However, the repackaging facility will be subject to six monthly maintenance checks. These will commence once the repackaging plant is fully operational. A Cyanide Repackaging Plant and Warehouse Storage Management procedure is in place to minimise cyanide gas generation. A separate plant inspection procedure and checklist includes specific details on equipment, pre-operational and operational activities. The storage warehouse inspection regime for the roof and ventilation equipment and condition of the concrete floor is also covered by a written procedure.

The site has 4 portable Pac 7000 HCN monitors and a portable 3M EVM gas and particulate monitor. The EVM monitor was calibrated on 11 May 2012 and calibration is recommended by the manufacturer annually. The Pac 7000s are new and yet to be calibrated but will be calibrated annually according to manufacturer's recommendations.

Under normal operating conditions, the repackaging facility process is a dry process. However, washings from the containment area (decontamination water and floor washings) will be cleaned up and disposed of using an evaporation tank. In the case of the Storage Warehouse, small, dry spillages will be dealt with according to the Cyanide Repackaging Plant and Warehouse Storage Management procedure. Should there be large quantities, these will be disposed of via the mines in terms of the Emergency Response, Deployment Plan And Guide.

With respect to hydrogen cyanide gas management, in the repackaging facility, no cyanide is stored in the repackaging facility building but the building has been specifically modified to encourage adequate ventilation and air circulation. In the storage

warehouse, large scale extractor fans are installed to ensure adequate air circulation in the building. Both the repackaging facility and the storage warehouse have procedures and physical facilities to prevent moisture from affecting the solid cyanide during storage and processing. The storage warehouse is always locked and monitored by security guards and customs officers as it is a bonded customs warehouse. The repackaging facility is an area within walls, within the main site and access is controlled by a security guard with no persons permitted in the facility without authorisation and appropriate PPE. A Change Management Plan is in place and was used to consider the changed cyanide risk of introducing a sparging facility and the additional storage of cyanide. It will also be used to address any future changes.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 1.3**
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

In the repackaging facility, inspections for the sparge tanks have been developed. No pipes or valves are involved in the process but inspection routines are in place for the hoppers and related bag and box handling facilities in the repackaging plant. The storage warehouse is inspected in terms of the Plant Inspection Procedure and Checklist. The two facilities are inspected daily, before operations commence and after completion. Inspection documentation identifies all items to be observed, date of the inspection, the name of the inspector, and any observed deficiencies and corrective actions are documented and records retained.

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.

X in full compliance with

The operation is in substantial compliance with **Production Practice 2.1**
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Twenty four procedures have been developed for the Repackaging and Storage Warehouse. These include consideration of PPE, pre-work and post operation checks, heat stress, normal and abnormal conditions, the buddy system, Training Plan, pre-, post-

and basic operations, and a manual of authority. All routine, non-routine and emergency scenarios and their responses are covered by effective procedures and work instructions. A Change Management Plan is in place and was used to consider the changed cyanide risk of introducing a sparging facility and additional storage of cyanide. It will also be used to address any future changes.

An Assurance/Quality Control Program was used during construction and a “fit for purpose” quality assurance certificate was issued by the Consulting Engineer. The materials of construction were mild steel and the construction engineer was aware that the equipment was to be used in conjunction with sodium cyanide.

The Facility has two independent sensors to detect overfilling of the sparge tank. A sensor detects the height of the briquettes in the tank and this is supported by visual indication using a video camera. The video camera has a screen at operator level attached to one of the pillars. A manual electrical vibrator is used to spread the pyramid briquette stack below the hatch to ensure an even level of briquettes.

The site has 4 portable Pac 7000 HCN monitors and a portable 3M EVM gas and particulate monitor. The EVM monitor was calibrated on 11 May 2012 and calibration is recommended by the manufacturer annually. The Pac 7000s are new and yet to be calibrated but will be calibrated annually according to manufacturer’s recommendations. Initial Hot Spot Surveying for HCN gas and particulates using ICMI limits during sparging operations has not detected recordable levels. Hot Spot surveys will continue to be undertaken as the number of sparging exercises increases. The company nurse operates a wellness program and the staff are given medical examinations and screening annually.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 2.2**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Facility has its own Emergency Response procedure to respond to cyanide exposures. A safety shower (with reserve water cistern supply in case of water supply failure) is located in the yard outside the building. Fire extinguishers are located strategically in the yard and building (repackaging area and warehouse). An eye wash bottle is located in the first aid kit. A potable water supply is readily available. Oxygen is available in the emergency shed outside the warehouse and repackaging facility, via an “oxygen concentrator” (Perfecto2 Invacare) and an Oxy-viva oxygen bottle. Emergency communication is via the man down alarm and cell phones. Antidote is stored in a fridge for transport with the patient to Tema General hospital. Cyanide first aid equipment is inspected monthly. Cyanide antidote is stored in a fridge according to manufacturer’s specifications. The company nurse manages a schedule for replacement of the antidote from a UK supplier. Inspections are undertaken according to requirements of the ER

Equipment Inspection List. English is the working language of the site and MSDSs are included in the Emergency Response Plan and procedures, a copy of which is located in the Emergency Shed. Operators go through the shower and decontaminate their PPE. Visitors and contractors are not permitted in the area during repackaging. A trained nurse and 5 trained cyanide first-aiders are also available on site. Representatives of local hospitals and clinics have participated in training and briefing seminars. The latest seminar conducted in April 2012 for stakeholders included site staff, neighbours, police, Ghana EPA, Tema hospital, and the Ghana Ports and Harbour authority. Mock emergency drills are conducted and evaluation forms from 5 observers were sighted. Consolidated discussion after the drills indicated no changes to procedures were needed. Additional drills will be conducted later as repackaging operations are increased. The same company investigation procedure as used for transportation incidents, will be used as necessary for incidents in the repackaging facility and storage warehouse.

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.

X in full compliance with

The operation is in substantial compliance with **Production Practice 3.1**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

No water used in the facility escapes from containment and it is in such small quantities that it cannot affect surface or ground water. Wash water drains to storage tanks and containers which use an evaporation disposal method. There is no direct discharge to surface water and all discharge goes to an effluent and hydrocarbon, three compartment, linked, containment sump which is emptied whenever one compartment is full. Monitoring will continue to be undertaken once the repackaging plant is fully operational. The sparging facility has extraction fans with filtration equipment. The hopper is also designed with flexible rubber flaps to ensure any dust is kept within the hopper and facility.

A portable gas and particulate monitor is available to check levels under normal, abnormal and emergency conditions. Background and baseline water and air monitoring have been undertaken during the current commissioning operations for the plant. Monitoring will take place quarterly during rainy season and dry season.

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.

X in full compliance with

The operation is in substantial compliance with **Production Practice 4.1**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Workers for the repackaging facility and warehouse have been trained in cyanide awareness and hazards. PPE training is included in Cyanide Awareness Training. Training for the process and procedures was conducted on an “on the job” basis and PTOs (Planned Task Observations) were conducted to check conformance when test runs with sand and stone were undertaken, in addition to the first 5 ton commissioning runs. The facility is newly established and training is based upon the twenty four operating procedures. Additional training was provided by appropriately qualified external trainers.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 4.2**

 not in compliance with

 not subject to

Summarize the basis for this Finding/Deficiencies Identified:

Training was given to all operators on the Repackaging Plant Emergency Response Plan which covers both cyanide releases and worker exposures. A mock drill was conducted to check response and additional drills will be conducted later as operations are increased. Training records are kept in the form of individual “Passports to Operate” (kept on site, not with employees) as well as training course attendance lists. All records are kept permanently.

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.

X in full compliance with

The operation is in substantial compliance with **Production Practice 5.1**
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Emergency Response Plan Deployment and Guide and ER Flow Diagram covers the repackaging plant and storage warehouse. The scenarios considered in the Plan include:- roof collapse and impact of rain on stored cyanide; release during loading whilst repackaging; releases during fires and explosions; and evacuation plans. The limited nature of operations means that the scenarios are limited. The Plan includes assessment, mitigation and investigation to prevent future releases.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 5.2**
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The latest seminar conducted in April 2012 for stakeholders included site staff, neighbours, police, Ghana EPA, Tema hospital, and the Ghana Ports and Harbour authority. The seminars (which include detailed descriptions of the Sparging facility along with diagrams and process flow charts, Cyanide Awareness and Cyanide First Aid Training, and the Cyanide Emergency Response Plan) and discussion will be undertaken on a periodic basis, approximately every two years.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 5.3**
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Plan designates primary and alternate emergency response coordinators with explicit authority to commit the resources necessary to implement the Plan. All repackaging operators are trained as emergency response team members and their training is included in the Training Matrix and the Training Plan. Duties and responsibilities and a list of emergency response equipment is also included in the Plan.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 5.4**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Plan includes procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities for any emergency.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 5.5**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Plan describes specific, appropriate remediation measures, such as disposal and neutralization of solutions and solids, decontamination of soils and other contaminated media and management and disposal of spill clean-up debris. The Plan prohibits the use of chemicals such as sodium hypochlorite, ferrous sulfate and hydrogen peroxide to treat cyanide that has been released into surface water but this is unlikely as there is no surface water likely to be affected.

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

X in full compliance with

The operation is in substantial compliance with **Production Practice 5.6**

 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Plan includes provisions for reviewing and evaluating its adequacy on an annual basis or after any actual event or after lessons learned during a mock drill.

