Orión Productos Industriales, S.A. de C. V.

Cyanide Code Audit

Summary Audit Report

Project No. 0427701

January 2018
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1. **GENERAL SUMMARY**

1.1. **INFORMATION ON THE AUDITED OPERATION**

Name of Cyanide Transportation Facility: Orion Productos Industriales, S.A. de C.V.
Name of Facility Owner: Orion Productos Industriales, S.A. de C.V.
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Location detail and description of operation:

Orion Productos Industriales, S.A. de C.V. (hereinafter called Orion) is a distributor of sodium cyanide in solid state (briquettes) in Mexico. Currently, Orion supplies several mines in Mexico.

Orion operations involve the reception of solid cyanide in the ICAVE terminal at the Veracruz port. Cyanide received at the ICAVE terminal is unloaded using the terminal cranes which place the container on a platform hauled by a truck operated by ICAVE that can circulate only within the port terminal. Cyanide is then transported by Orion to their cyanide storage facility located at Tizayuca, Hidalgo State, México, and later shipped to the client. Orion performs transport operations with their own vehicles.

Orion acquired cyanide from Orica’s Yarwun facility until late 2015; Orica maintained their certification as producer (initial certification in 2006) and that of their Australia and Latin-America Supply Chains (from their facility and including ocean transport from Australia’s ports) during the period they were Orion’s supplier. Once the stock acquired from Orica was exhausted, Orion signed an acquisition contract with Hebei Chengxin Co., Ltd (Hebei) in April 2017; Hebei production facility has been certified as Cyanide Manufacturer since October 2012. In August 2017, Hebei certified its ocean supply chain.

This audit comprises the cyanide reception operations in the ICAVE terminal, transportation from the Veracruz port to the Orion’s cyanide distribution center, warehousing operations of the Distribution Center and cyanide transport operations to Mexican mines.

The distribution center operations include storage of 1,000kg- double-bag-lined wooden boxes as received inside the containers coming from the port; each container has 20 wooden boxes or 50 and 85 kg capacity metal containers that are unloaded in the distribution center facility. Forklifts transport these boxes and containers to the storage area, and load them onto the vehicles that are later dispatched to clients.

Orion Productos Industriales, S.A. de C.V. 31 January 2018
Name of Facility Signature of Lead Auditor Date
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OVERALL 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 transportation 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: ERM Mexico, S. A. de C. V.
Audit Team Leader: Juan Carlos Rangel Lopez  E-mail: juancarlos.rangel@erm.com

Names and Signatures of Other Auditors:

Metztli Katsurada    Oswaldo Diaz

Date(s) of Audit: October 10, 2017

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 Transportation Operations and using standard and accepted practices for health, safety and environmental audits.
2. **ORION AS DISTRIBUTION CENTER**
   
   This operation is
   
   √ in full compliance  
   □ in substantial compliance  
   □ not in compliance

   with the International Cyanide Management Code

2.1. **OPERATIONS PRACTICE 1. DESIGN, CONSTRUCT AND OPERATE CYANIDE PRODUCTION FACILITIES TO PREVENT RELEASE OF CYANIDE**

2.1.1 **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  
   □ in substantial compliance with Transport Practice 1.1  
   □ not in compliance with

   **Summarize the basis for this Finding/Deficiencies Identified:**

   Cyanide is stored inside Orion’s solid chemicals warehouse and records are maintained about of the construction plans, structural calculations, compatibility of construction materials, and concrete quality certificate of the storage facility. Orion’s storage facility was designed and constructed by a qualified architect. According to the observations made during the audit process, no expansions or modifications to the original structure have been performed since its construction.

   Orion holds the quality control and quality assurance documents for the storage facility which is constructed with concrete floor, concrete block walls, and metal sheet roof. Cyanide is handled within the manufacturer containers, wooden boxes of 1,000 kg and 1,135 kg and metal containers of 50 and 85 kg capacity. A power outage or equipment failure would not result in a cyanide release. Concrete walls of the storage facility would prevent that cyanide from spreading outside of the storage facility in case of cyanide release.
2.2.2 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

- [x] in full compliance with
- [ ] in substantial compliance with Transport Practice 1.2
- [ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Orion has developed and implemented the procedure No.PGAM-RI22-06 (last updated on 8 June 2017), which describes the unloading, loading, and management of cyanide containers. Relevant personnel were interviewed during the audit and they were aware of the procedure requirements.

In addition, Orion’s procedure No. PGMT-RI22-03 (last updated on 20 June 2016) requires conducting a compatibility analysis of hazardous materials contained in vehicles prior to authorizing maintenance activities in order to avoid unsafe conditions.

Orion has developed an Emergency Procedure to respond to Cyanide Emergencies in the Storage Facility, which covers the relevant scenarios for their operations (e.g. spills and exposure).

Orion’s Management of Change Procedure (PGDG-RI11-01, last updated on 26 July 2017) establishes the steps to identify and evaluate hazards associated with new projects or changes required in the Orion’s facility as well as controls to avoid or minimize identified hazards. New projects or changes are analyzed by a multidisciplinary team. Analysis results are registered in form No. FRDG-RI11-03; according to information reviewed, no changes in Orion’s operations have taken place.

Cyanide containers are handled using forklifts. All forklifts are owned by Orion and the maintenance is provided through the forklifts manufacturer. Preventive maintenance is provided every 200 hours. Orion has a daily checklist where the forklift operation hours are recorded. Additionally, forklifts are inspected by the operator at the beginning of the work shift. The inspection is recorded using a checklist of 22 questions. When a deviation is detected, it is reported immediately and response actions are implemented; deviations are closed within 24 hours, if the deviation is classified as critic, then the work is stopped.

Orion has a procedure for the disposal of empty cyanide containers (PGAM-RI24-01, last updated on 22 October 2016). According to this procedure, Orion contracts authorized hazardous waste haulers to dispose of cyanide related wastes (i.e. plastic kegs, bags and wooden boxes).

Cyanide is received in plastic bags within a wooden box and 50 and 85 kg metal containers which are stored in a roofed area where the height of the walls allows for the storage facility to have adequate ventilation and secure and access is allowed only to authorize personnel. This
packaging is compliant with international hazardous materials transport regulations; which are consistent with the respective Mexican regulations. Site personnel inspects storage area and when damaged packaging materials are identified these are replaced on site. Damaged packaging materials are handled as hazardous waste as described in Production Practice 1.2.7.
2.2.3 Production Practice 1.3: Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

The operation is

√ in full compliance  
☐ in substantial compliance Practice 1.3  
☐ not in compliance

Summarize the basis for this Finding/Deficiencies Identified:

Orion stores cyanide in solid state within a warehouse; there are no tanks, pipes, pumps or valves holding cyanide solutions in Orion facility. The warehouse floor and walls work as secondary containment. The warehouse is inspected on a daily basis (non-recorded) and on a monthly basis (recorded in the FRAM-R122-01 inspection form).

Orion has also implemented the loading, discharge, manipulation and distribution of sodium cyanide containers procedure (hereinafter loading procedure, PGAM-R122-06, last updated on 08 June 2017). According to this procedure, truck loading is conducted in concordance with the Official Mexican Standard NOM-012-SCT-2-2008 to prevent vehicle overloading.

2.2. WORK SAFETY: PROTECT WORKER’S HEALTH AND SAFETY FROM EXPOSURE TO CYANIDE

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

The operation is

√ in full compliance  
☐ in substantial compliance with Practice 2.1  
☐ not in compliance

Summarize the basis for this Finding/Deficiencies Identified:

Orion has developed the procedure PGAM-R122-06 that includes the required practices for reception, storage requirements, loading and unloading activities, and personal protective equipment, which was confirmed through interviews with relevant personnel.

Since the facility is dedicated only to storage activities, non-routine and emergency operations correspond only to those included in the emergency response plan. Furthermore maintenance is related only to forklifts, which is performed at Orion’s facility by an external contractor.

Orion has implemented a Management of Change procedure that includes instructions to identify and evaluate hazards associated with new projects or changes in Orion’s facility. According to reviewed information, no significant changes at Orion’s facility or in Orion’s operations have been implemented.
Orion verbally collects feedback on complaints and suggestions through daily 5-minute meetings. Additionally, Orion has a Health and Safety Committee (HS Committee), where representatives from the employees participate. The HS Committee performs monthly inspections at the facility and present suggestions to improve procedures, and to correct unsafe conditions. Employees are encouraged to submit their complaints and suggestions to the HS Committee.

Orion has three portable cyanide detectors to monitor cyanide air concentrations while loading and unloading cyanide containers, plus one more for emergency response incidents. In addition the cyanide storage facility has a fixed cyanide detector that operates permanently. The detectors are calibrated to trigger the alarm at 4.7 ppm.

Detectors are calibrated and a calibration certificate is issued by the manufacturer. The mobile detectors were replaced in June 2017 and the fixed detector in October 2017. Additionally, the Site has implemented the procedure PGCO-RI16-04, for calibration of cyanide gas detectors (last updated on 31 July 2017). The procedure establishes that the fixed detector must be calibrated upon acquisition and after one year, subsequent calibrations must be conducted every six months. For portable detectors, the procedure establishes that the detectors must be calibrated upon acquisition and after six months, subsequent calibrations must be conducted every three months.

No areas or activities where workers may be exposed to hydrogen cyanide gas and sodium, calcium or potassium cyanide dust at more than 4.7 parts per million (5 mg/m³) have been identified. Nevertheless, a class A suit is maintained at the facility to be used in case a cyanide container is damaged or a cyanide release has to be controlled. If alarms are triggered, the actions to take include evacuating the area evacuation until the arrival of the emergency brigades as stated in the Emergency Response Plan.

Mobile phones and telephones are used to communicate among relevant personnel related to the cyanide operations. Signs advising workers that cyanide is present and suitable personal protective equipment must be worn are posted at the cyanide storage area in addition to signs prohibiting personnel from smoking, eating and drinking, and having open flames in areas where there is the potential for cyanide contamination. Disposable suits are used as part of the PPE required at the cyanide storage area.

Pre-employment medical tests are required prior to hiring new personnel and periodically while working at Orion. Health and safety assessment includes: general physical exam, blood studies and drugs test. Relevant documentation was reviewed during the audit related to this point.

2.2.2 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
Summarize the basis for this Finding/Deficiencies Identified:

Orion has implemented a General Emergency Procedure in Transportation of Sodium Cyanide procedure (PGSG-RI27-03, last updated on 6 February 2017). This procedure includes steps to respond to cyanide related emergencies inside and outside of Orion’s facilities, which address spills, fires and intoxication due to cyanide exposure.

The site has low pressure eye wash stations and dry chemical powder extinguishers available in the cyanide storage facility which According to the interviewed personnel, are inspected on a monthly basis. Emergency showers are located at the facility; their functionality was tested during the audit.

To treat any exposed employee, the facility has an oxygen tank and antidote kit, which according to the procedure PGSG-RI23-01 and the inspection records reviewed, is inspected on a monthly basis. The antidote kits are kept in refrigeration at the temperature range recommended by the manufacturer. The facility has an oxygen tank with a valved mouthpiece and antidote kit to treat any exposed employee. No resuscitators were available and none are considered required due to the availability of the oxygen tank. The employees have mobile phones for internal communication and the facility has telephone services. In addition Orion has identified the nearest hospital that would treat exposed employees, if required. This hospital has signed a contract with Orion for the treatment of patients exposed to cyanide and has received training and a cyano-kit from Orion. An emergency response brigade trained in first aid and is familiar with cyanide intoxication symptoms on site.

Written communications with external responders were available for review, including the local hospital. Orion has a contract with Santa Julia’s maternal child hospital signed on 29 March 2017, for the attention of employees in case of poisoning with cyanide, with validity of one year. The facility conducted a mock emergency drill in April 2017 regarding a worker exposure in accordance with its drill program. Records of the mock emergency drill and its analysis are kept on site.

The Spanish MSDS (Material Safety Data Sheets) was available in the cyanide storage area. Only the first aid brigade is authorized to treat an exposed employee.

The cyanide storage area and each individual box and container are identified regarding the presence of cyanide; there are no tanks, pipes or other vessels and only authorized personnel are allowed to enter in the area. Wearing a disposable Tyvek suit is mandatory to enter the area.

Orion has the Procedure PGSG-RI33-01 incident investigation. This procedure indicates that such incident investigation must be backed up by a report.
2.3. **MONITORING: ENSURE THAT PROCESS CONTROLS ARE PROTECTIVE OF THE ENVIRONMENT.**

2.3.1 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
- □ in substantial compliance with Production Practice 3.1
- □ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion is a storage facility; their operations do not generate air emission or wastewater containing cyanide under normal conditions. Waste generated by an emergency would be handled as hazardous waste. This section is not applicable to the facility.

2.4. **TRAINING: TRAIN WORKERS AND EMERGENCY RESPONSE PERSONNEL TO MANAGE CYANIDE IN A SAFE AND ENVIRONMENTALLY PROTECTIVE MANNER.**

2.4.1 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
- □ in substantial compliance with Production Practice 4.1
- □ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion has implemented a training procedure (PGQS-RI15-01 last updated on 28 July 2017), which establishes a training program for all personnel, including personnel related to cyanide management. New hire employees have to attend the General Training Framework FRQS-RI15-01 prior to beginning activities on site. The framework includes the following topics:

1. Safe sodium cyanide handling
2. Selection, use and maintenance of PPE
3. Emergency Response to Sodium Cyanide
4. Sodium Cyanide Intoxication First Aid
5. HCN portable detector use
6. Fire prevention (use of fire extinguishers)
7. Sodium Cyanide packing procedure
8. Warehousing procedure:

Refresher training is provided by Orion to all their employees on a two-yearly basis.

Orion has two internal trainers, authorized by the Federal Labor Agency, that provide training to Orion’s employees. Authorization granted by the Federal Labor Agency guarantees that...
internal trainers are qualified to provide training regarding hazardous materials management.

The two-yearly training program (including use of personal protective equipment) is attended by all personnel and the hazard identification is attended to all cyanide operators. Training is provided by the Orion’s internal trainers and the EHS department respectively. The EHS department keeps all training records registered and filed.

All training sessions included in the annual training program have been designed as a result of a Hazard Identification and Risk Assessment to address risks associated with the activities of each job at the distribution center.

New hire employees must demonstrate their experience in hazardous materials management before they are contracted by Orion. In addition, a new hire induction training program must be completed by new hire employees prior to the beginning of their activities in the company. New hire induction training program include 14 training sessions with a total of 28 hours of training as established by the General Training Framework.

The effectiveness of cyanide related training is tested using a written test. Based on the tests results (70% minimum record to pass), Orion determines if employees must be retrained in the short term. Depending on the training topic, a practical exam (e.g. a practical demonstration on loading/unloading procedures) may also be requested by the trainers. Test results are kept by the human resources department.

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

The operation is

✓ in full compliance with
☐ in substantial compliance with Production Practice 4.2
☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Orion has an emergency procedure for the different scenarios that could result in an emergency such as cyanide release. All employees are trained in this procedure by the EHS department upon hiring of new employees and once every two years. Orion’s drill program indicates that a cyanide release drill should be conducted annually.

The latest cyanide release emergency drill was performed in April 2017. Besides their emergency response brigade, the administrative and operative personnel of the facility as well as personnel from the Santa Julia Hospital participated during the emergency drill. Orion keeps records of the mock drill performed which were reviewed during audit. According to the interviewed Orion representatives, the mock drill reports are used to define the contents of the emergency response refresher training.

ERL reviewed training records to confirm the implementation of the training program described above. These records included the names of the employee, trainer, date of training
and topics covered as well as the written exams. Three employees were interviewed and answered correctly to all of the questions asked regarding cyanide management in their work area.

2.5. **EMERGENCY RESPONSE: PROTECT COMMUNITIES AND THE ENVIRONMENT THROUGH THE DEVELOPMENT OF EMERGENCY RESPONSE STRATEGIES AND CAPABILITIES**

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

The operation is

- [ ] in full compliance with
- [ ] in substantial compliance with Production Practice 5.1
- [x] not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion has developed an Emergency Procedure PGSG-RI27-03 (last updated on 6 February 2017), to respond to Cyanide Emergencies in the Storage Facility and its transportation (herein after the Emergency Procedure). It is a 40-page document that covers all the operations in the distribution center. It includes a section describing the sodium cyanide characteristics, emergency assessment and levels and scenario-specific instructions. Additionally, Orion has a Civil Protection Plan, last updated on 1 June 2017 that includes emergency organization, communications protocol, emergency drills, and emergency response procedures in case of fire and other general scenarios.

The Civil Protection Plan includes instructions to evacuate the facility. The facility is located at an industrial park, and is a member of the Mutual Aid Industrial Committee (GAMITH, Grupo de Ayuda Mutua de la Zona Industrial de Tizayuca); through which they would notify other facilities in case their evacuation is required. However, given the nature of the cyanide related operations at the site, it is not expected that evacuation from neighboring areas would be required as a result of a cyanide incident.

Orion has implemented the procedure No. PGSG-RI23-01 (last updated on 22 March 2017) that establishes the use of cyanokit in case of intoxication with cyanide and includes scenarios related to releases from wooden boxes and drums.

Orion has an accident investigation procedure that requires identifying the root cause of the accident and establishing preventive and corrective actions to prevent accident repetition. This would help to prevent future releases. As previously noted, the Emergency Procedure also establishes steps to follow and mitigation measures for different emergency scenarios (including cyanide releases).

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

The operation is

- [ ] in full compliance with
The site Emergency Response Plan and safety procedures were prepared by site personnel.

Local emergency response agencies such as the State Civil Protection Agency, Fire Department, GAMITH and Santa Julia hospital have been informed of their responsibilities in case of emergency. Additionally, personnel of the Santa Julia Hospital received training from Orion on hazardous materials management, specifically sodium cyanide on 1 April 2017. During the latest Civil Protection visit, conducted on 17 March 2017, Orion and the Civil Protection Agency agreed to conduct training related to cyanide management.

The nearest residential area is located approximately 3 km away from the facility.

This Civil Protection Plan is revised and submitted on an annual basis to the Municipal Civil Protection and Firefighters Agency; which visited the facility and validated the Plan in March 2017.

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

The operation is

- [ ] in full compliance with
- [ ] in substantial compliance with Production Practice 5.3
- [ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Civil Protection Plan includes the name of the different members of the emergency committee and brigades (including evacuation, first aid and firefighting) and details their roles and responsibilities.

Orion has a brigade integrated by specialized internal responders for emergency events with hazardous materials, including cyanide releases. Internal responders are trained annually; the latest training was performed on 26 September 2017. Both the Emergency Procedure and the Civil Protection Plan identify the responsibilities for the different emergency response team members.

Orion has implemented a monthly inspection checklist to confirm emergency response equipment availability and conditions; the presence of the equipment was reviewed during the audit. The Civil Protection Plan and the Emergency Response Procedure establish three levels of emergency response. However, the Job Safety Analysis establishes that the consequences of the incidents will be small and there is no need for external responders in a cyanide related event.
2.5.4 Production Practice 5.4: Develop procedures for internal and external emergency notification and reporting

The operation is

√ in full compliance with
□ in substantial compliance with Production Practice 5.4
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Civil Protection Plan and the Response Procedure include instructions to notify the authorities as required. The cyaniokit use procedure includes instructions on how to notify medical facilities.

The Plan does not consider the evacuation of communities to be necessary; however, instructions for communication with the authorities and external responders are included.
2.5.5 Production Practice 5.5: Incorporate into response plans and remediation measures monitoring levels that account for the additional hazards of using cyanide treatment chemicals

The operation is

✓ in full compliance with
□ in substantial compliance with Production Practice 5.5
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The cyanide storage area has concrete floor; therefore, in case of spill or release, no soil or water remediation measures would be required added to the fact that there are no water bodies within a 1 km from the facility. Monitoring would be limited to air and it will be done with two portable and one fixed cyanide detectors.

2.5.6 Production Practice 5.6: Periodically evaluate response procedures and capabilities and revise then as needed

The operation is

✓ in full compliance with
□ in substantial compliance with Production Practice 5.6
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

According to the emergency response procedure developed by Orion, it is reviewed on a two-yearly basis, and after emergency drills, if necessary. According to the response procedure, it was last updated in February 2017. Their annual emergency drills program includes cyanide spills with the latest drill performed in April 2017 involving a cyanide spill inside the cyanide storage facility causing a toxic cloud and one exposed worker.
3. **ORION AS TRANSPORTATION COMPANY**

3.1. **TRANSPORT: TRANSPORT CYANIDE IN A MANNER THAT MINIMIZES THE POTENTIAL FOR ACCIDENTS AND RELEASES**

3.1.1 Transport Practice 1.1: Select cyanide transport routes to minimize the potential for accidents and releases.

The operation is

- √ in full compliance with
- □ in substantial compliance with Transport Practice 1.1
- □ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion has the written procedure PGTC-R108-01 (dated 26 July 2017) to select and assess cyanide transport routes. As part of the procedure, Orion uses the online-service provided by Mexico’s Communications and Transport Agency (SCT, Secretaría de Comunicaciones y Transportes) to select routes to transport cyanide. The service provides the highways authorized for the transport of hazardous materials. A route description is prepared by Orion based on the SCT system and Orion’s GPS system. Orion personnel verify, on field, the information stated in the route description and identify blackout areas.

Information obtained on field is included in the Orion’s GPS system and routes description. Routes description is provided to trucks operators before every shipment.

Orion’s procedure considers the following items during the routes selection among others:

- Road description including photographs,
- Populated areas,
- Pitch and grade,
- Prevalence and proximity of water bodies, flood areas, and fog,
- Infrastructure,
- Landslide areas,
- Speed limits,
- Accident statistics,
- Areas in constant maintenance,
- Hospitals,
- Schools,
- Unsafe areas

Orion’s procedure PGTC-R108-01 establishes that routes are reevaluated at least every 24 months. However, a route risk reevaluation could be performed before when trucks’ operators notify about any change in the routes.
Orion uses a risk assessment methodology named “Fine” to evaluate risks of selected cyanide transport routes. This methodology considers three factors: consequences, exposure and probability of occurrence for each risk identified. Measures to control risks identified and risky areas photographs are included in routes assessment developed by Orion. Risk assessment results are shared with truck operators.

Orion’s risk assessment form to evaluate routes includes measures taken to address risk identified and since convoys are prohibited in Mexico, Orion is not considering the use of escorts for cyanide transportation and also they will not subcontract any of the cyanide handling or transport.

Orion is member of the SETIQ (which provides telephone orientation for chemical emergency response during ground transport) and identifies the brigades from other members with response capabilities in the vicinity of the incident to support the response while Orion’s brigade arrives. Orion has notified SETIQ about the routes used to transport cyanide. As part their activities, SETIQ shares this information with local authorities.

### 3.1.2 Transport Practice 1.2: Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.

The operation is:

- [x] in full compliance with
- [ ] in substantial compliance with Transport Practice 1.2
- [ ] not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion has a procedure for the selection and recruitment of new hire drivers. As part of the mentioned procedure, the candidates have to fulfill the following requirements to be hired:

- To pass a HAZMAT management knowledge exam,
- To hold the driver license granted by the Federal Transport Agency,
- To have eight years of experience transporting HAZMAT,
- To pass three psychometric and psychological tests, and
- To pass a 225-point driving test

Driver license granted by the Federal Transport Agency authorizes the drivers to transport hazardous materials, including cyanide. To obtain the mentioned license, federal regulation requires that the drivers of hazardous materials transport fulfill the following requirements:

- a. Two years of experience transporting hazardous waste and hazardous materials;
- b. Training course provided by the Federal Transport Agency; regarding hazardous waste and hazardous materials transportation; and,
- c. Physical and psychological surveys.
Once hired, the new drivers must attend a theoretical and practical introductory training (14 hours) that includes, among others, the following topics:

- Principles of transport safety,
- Transport of hazardous materials,
- Firefighting extinguishers use,
- Classification and identification of hazardous materials,
- Selection, use and maintenance of personal protective equipment,
- Defensive driving,
- Basic safety procedures, and
- Use of the transport emergency guide

From July 2016 to September 2017, Orion’s personnel involved in cyanide management received cyanide safety management training that includes the following topics:

- Sodium cyanide characteristics description,
- Material Safety Data Sheet information,
- PPE required,
- Safety management procedures,
- First aids,
- Risks identification, and
- Safety measures in case of fire or spill.

Orion has a two-yearly training program that is mandatory to all trucks operators and administrative personnel. Orion’s training program is taught by two internal trainers that are registered with the Federal Labor Agency.

### 3.1.3 Transport Practice 1.3: Ensure that transport equipment is suitable for the cyanide shipment.

The operation is

- [✓] in full compliance with
- [ ] in substantial compliance with Transport Practice 1.3
- [ ] not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

As previous mentioned Orion receives the loaded ocean container in the Veracruz port which is attached to a truck and transported to Orion’s cyanide storage area in Tizayuca, Hidalgo, México. Loads are verified by Orion in the port, through the custom import permit, before the container is attached to the truck.
For every shipment, Orion uses the table of authorized weights and dimensions organized by type of vehicle, included in the Mexican Official Standard NOM-012-SCT2-2008, to verify that transport vehicles are not overloaded.

In addition, Orion’s maintenance department verifies that vehicles mechanical conditions are suitable for the load weight that will transport.

According to the interviewed personnel a detailed inspection is performed to each truck every trip. Additionally, a daily inspection is performed and recorded in the driver’s logbook. This inspection includes: brakes, steering system, lights, and tires, among others.

Maximum loads are verified by Orion in ICAVE, through the custom import permit, before the container is attached to the truck. In addition, for each load, Orion determines the type of truck that will be used based on the purchase order and the table of authorized weights and dimensions by organized type of vehicle, included in the Mexican Official Standard NOM-012-SCT2-2008.

The maximum weight of the container received in ICAVE is 24 tons. Orion has a full trailer which has a capacity of 40 ton (2x20 ton). This full is used to pick the cyanide shipment in ICAVE.

3.1.4 Transport Practice 1.4: Develop and implement a safety program for transport of cyanide.

The operation is

✓ in full compliance with

☐ in substantial compliance with Transport Practice 1.3

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Orion has the procedure PGAM-RI22-06 “Unloading, loading and management of Cyanide” which describes the safety measures that Orion’s employees have to adopt to ensure the integrity of the cyanide containers during unloading, loading and transportation activities.

The transport modality from the port to the Orion’s facility consists of transporting an oceanic container which is locked and tagged at the production facility. The lock and tag are removed at the Orion’s cyanide storage facility by Orion’s personnel.

Before the cyanide containers are loaded to trucks for their transport from the Orion’s facility to the mines, they are wrapped. Wooden boxes and containers are secured once loading is concluded. To protect the door block and brace are applied at the Orion’s storage facility.

Orion has implemented a procedure for inspections prior to shipment. Inspections by truck are recorded in the driver’s logbook. Visual Inspection includes physical and mechanical conditions of the trucks (i.e. brakes, steering system, lights, and tires, among others). The visual inspection also requires verifying that the placards are posted on the truck. Trucks
drivers and Orion’s Call Center personnel verify that placards are properly posted in accordance with MSDS, prior to each shipment.

The Orion’s preventive maintenance program procedure (PGMT-RI22-01, dated 30 May 2016), includes three types of maintenances: A) every 25,000 - 30,000 km; B) every 100,000 to 120,000 km; and, C) every 750,000 – 1,000,000 km.

Maintenance programs include: oil and filters change, lights, tires, brakes, lubrication, fluids levels, cleaning, tire inspection, engine inspection and, suspension system inspection, among others.

Orion has an intranet named Infosfera, where mileage of each truck is registered by the Call Center personnel after every shipment. Maintenance personnel monitor the mileage report and notify the Call Center personnel when a truck has to receive preventive maintenance. Call Center personnel notify the truck’s operator who has to prepare a maintenance order and bring his vehicle to the maintenance workshop located at the Orion facility. If required, Orion has an agreement with an external contractor to provide preventive and corrective maintenance to vehicles that are away from the workshop.

Orion has a trucks spare parts warehouse that is available 24 hours/ 365 days in case maintenance personnel require spares to provide preventive or corrective maintenance.

If corrective maintenance is required during road transportation, Orion owns vehicles that transport technicians and spare parts to the area where the trucks are located.

Orion keeps records of the corrective and preventive maintenance activities performed on each truck.

Orion’s procedure PCGT RI22-07 (dated 18 April 2017) establishes that the maximum journey is 5 hours driving per 0.5 hour of rest if cyanide is transported. Maximum journey per day is 14 hours in service (including driving and on hold time). Orion workload decreased in early 2016. When they resume operations in late 2016, the original policy on operation hours (9 hours of driving per day) was exceeded in several shipments. Orion identified this deviation in April 2017; the procedure was updated to reflect the time that may be spent on hold at the port. Additionally, when a shipment is from the port directly to a mine site, two drivers are assigned to the service to ensure compliance with the policy and timely delivery.

Call Center personnel maintain permanent monitoring of the reports issued by the National Weather Service (SMN, Servicio Meteorológico Nacional), SCT and national and local news agencies to determinate if any road shipment must be suspended due to severe weather or civil unrest.

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1 Orion’s Call Center is the area in charge to monitor vehicles during transportation, maintain constant communication with drivers and verify the vehicles compliance with Orion’s transportation requirements, among others.
Call Center personnel notify the drivers on route by mobile phone and GPRS system if they have to suspend cyanide transportation as well as when there are favorable conditions to restart transportation. Besides, available alternative routes are also notified by the Call Center personnel.

In case of civil unrest, the conflict area is identified in the Orion’s GPS system, so trucks operators and the Call Center personnel can verify the truck’s proximity to the conflict zone.

Orion has implemented an alcohol and drugs prevention program. Potential new employees are tested prior to their hiring. Additionally, alcohol and drugs tests are performed twice per year. Furthermore, an alcoholmeter is used randomly in case of drunken state. Orion keeps drug analysis results during at least three months. Additionally, Orion keeps a file of each driver for as long as the driver works for Orion.

3.1.5 Transport Practice 1.5: Follow international standards for transportation of cyanide by sea and air.

The operation is

- [✓] in full compliance with
- [□] in substantial compliance with Transport Practice 1.5
- [□] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

As described in Section 1, the scope of this audit was from the moment the ship delivers the cyanide at the Mexican port and its ground transport to the distribution center and mines in Mexico; therefore, this practice does not apply.

3.1.6 Transport Practice 1.6: Track cyanide shipments to prevent losses during transport.

The operation is

- [✓] in full compliance with
- [□] in substantial compliance with Transport Practice 1.6
- [□] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All the trucks are equipped with GPS and GPRS systems that are monitored in real time from the Orion facility by the Call Center personnel. In addition, drivers have mobile phones.

GPS is monitored constantly updating location every 5 minutes; errors can be identified immediately at the control panel. Drivers are responsible for reviewing the functionality of the cellular phones. GPS and GPRS devices are inspected prior to shipments.
Blackout areas have been identified by Orion. Blackout areas have been included in the Orion’s GPS systems. Orion has a procedure for transit through blackout areas that includes the following activities:

- The driver calls the Call Center prior to entering the blackout area and informs them about the estimated time to cross the area.
- GPS alerts Call center when a vehicle is close to a blackout area.
- Call Center notifies the drivers before they enter a blackout area.

Orion has implemented a GPS system to monitor the progress of the trucks 24/7. Orion’s Call Center is the area in charge of identifying any delays or deviations and issue internal notifications to alert the customer. Customer is alerted through the shipments area.

Orion has implemented controls to prevent loss of cyanide during shipment. Orion maintains a cyanide inventory. Each time a cyanide shipment arrives at the Orion’s storage area, the following information is included in the Orion’s inventory: purchase number order, date of entry to the Orion’s cyanide storage facility, type of container (boxes or containers) and, shipment weight. Every box or container is assigned a batch number. Then, for each shipment that Orion transports to mines, the following information is captured in their inventory: client’s name, amount of cyanide transported, delivery date, order number and remaining amount in stock.

Orion also keeps the transport document (documento de embarque) required by the Mexican regulations. Transport document includes information of the truck, the net load, and the consignee. Trucks are tagged to prevent loses during the transport operations. Finally, the GPS system will notify Orion if unauthorized stops take place or unauthorized routes are used by drivers.

The availability of the transport document and safety data sheet is verified prior to the trucks departure and Orion tracks cyanide shipments to prevent losses during transport.

3.2.  INTERIM STORAGE: DESIGN, CONSTRUCT AND OPERATE CYANIDE TRANS-SHIPPING DEPOTS AND INTERIM STORAGE SITES TO PREVENT RELEASES AND EXPOSURES.

3.2.1  Transport Practice 2.1: Store cyanide in a manner that minimizes the potential for accidental releases.

The operation is

√ in full compliance with
□ in substantial compliance with Transport Practice 2.1
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Orion does not operate interim storage facilities therefore this Practice does not apply.
3.3. **EMERGENCY RESPONSE: PROTECT COMMUNITIES AND THE ENVIRONMENT THROUGH THE DEVELOPMENT OF EMERGENCY RESPONSE STRATEGIES AND CAPABILITIES**

3.3.1 **Transport Practice 3.1: Prepare detailed emergency response plans for potential cyanide releases.**

The operation is

- ✓ in full compliance with
- □ in substantial compliance with Transport Practice 3.1
- □ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion has implemented a General Emergency Procedure during Cyanide Transport (PGTC-RI22-07, last updated February 2017, hereinafter Emergency Procedure). It is a 40-page document. This procedure establishes the roles description for the emergency brigades, the notification chain, the phone directory for external emergency response services and the manufacturers (Annex 9); and the cyanide safety data sheet. The Emergency Procedure includes instructions to respond to thirteen different scenarios for ground transport of cyanide in solid state. The scenarios include spill on asphalted ground, on non-asphalted ground, on water body, spill during raining events, and on wet ground. The procedure indicates that the consequences could be greater in events involving dry boxes versus ocean containers.

Emergency procedure includes a detailed description of the roles of outside responders including SETIQ, police, civil protection and fire department.

3.3.2 **Transport Practice 3.2: Designate appropriate response personnel and commit necessary resources for emergency response.**

The operation is

- ✓ in full compliance with
- □ in substantial compliance with Transport Practice 3.2
- □ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Orion has trained personnel to respond in case of emergency with HAZMAT. Training records of the members of the emergency response brigades were reviewed during audit. The Emergency Procedure establishes the responsibilities for the members of the response team (communication brigade, decontamination brigade, logistics manager, traffic controller, and other internal roles during the emergency).

Orion has defined the following as the minimum required emergency response equipment that must be available at their main base and two support bases.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level A suits</td>
<td>1</td>
</tr>
</tbody>
</table>

Orion Productos Industriales, S.A. de C.V.
Name of Facility

Signature of Lead Auditor

Date: 31 January 2018
The Emergency Procedure establishes that the drivers carry their personal protection equipment and that they are to call the base in case of emergency. Orion has three bases (the main and two support bases) where they store the emergency response equipment.
The availability of this equipment was confirmed at the main base during the audit. Orion has also has an online inventory system where the availability of the emergency response equipment is controlled by the central base and updated by the bases personnel. Emergency response equipment is inspected on a monthly basis. Additionally, the online inventory system identifies materials that require replacement.

3.3.3 **Transport Practice 3.3: Develop procedures for internal and external emergency notification and reporting.**

The operation is

- [ ] in full compliance with
- [ ] in substantial compliance with Transport Practice 3.3
- [ ] not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

The Emergency Procedure includes the instructions for initial communication and the responsibility for the communications brigade to identify additional resources and agencies that have to be contacted. There is directory of internal personnel and external responders.

The Emergency Procedure, which includes the internal and external notification and reporting instructions, states that it has to be reviewed entirely at least on a two-yearly basis.

3.3.5 **Transport Practice 3.4: Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.**

The operation is

- [ ] in full compliance with
- [ ] in substantial compliance with Transport Practice 3.4
- [ ] not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

The Emergency Procedure includes instructions to collect solids (e.g. cyanide debris, soil, etc.) and neutralization solutions (e.g. using absorbing materials) and to dispose of them as hazardous waste.

Orion’s emergency procedure establishes that no chemicals can be used to neutralize cyanide that has been releases into surface water.

3.3.5 **Transport Practice 3.5: Periodically evaluate response procedures and capabilities and revise them as needed.**

The operation is

- [ ] in full compliance with
- [ ] in substantial compliance with Transport Practice 3.5

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Name of Facility Signature of Lead Auditor     Date
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Summarize the basis for this Finding/Deficiencies Identified:

As previously noted, the Emergency Procedure establishes that it must be reviewed on a two-yearly basis. It also considers updates after mock drills, if necessary. Mock drills are performed on an annual basis and latest emergency drill was performed in April 2017 and consisted in the release of cyanide forming a toxic cloud with one exposed person.
4. **PORT DUE DILIGENCE - ICAVE TERMINAL**

Orion receives sodium cyanide at the ICAVE terminal at the Veracruz port. Cyanide is owned by the consigner until it is received by Orion at the Veracruz port. The ship is unloaded using the terminal cranes which place the container in a platform hauled by a truck owned and maintained by ICAVE that can circulate only within the port terminal. As chain of custody, ICAVE receives the ocean container number and Orion’s data.

Hazardous substances are handled by ICAVE in accordance with the International Maritime Dangerous Goods Code (IMDG Code). IMDG code includes an incompatibility matrix that is used by ICAVE operators to determine the area where ocean containers can be stored. The maximum stacking height is of five containers. In case the container does not have the four placards with the UN number, the terminal can place labels in the containers. There is a computer system to control the movement and location of the container while it is located in the terminal.

According to the interviewed personnel all personnel have been instructed to not open the containers.

Once the ocean container is temporarily stored at the port and released by the customs authority, ICAVE authorizes an Orion’s truck to pick up the ocean container. Ocean container is placed in the Orion’s truck using a crane operated by ICAVE. Cyanide is transported by Orion to its cyanide storage facility located at Tizayuca, Hidalgo, Mexico.

ICAVE terminal is certified in the following standards:

- ISO 14001 standard for environmental managements systems;
- ISO 9001 standard for Quality management;
- Clean Industry (certifies compliance with Mexican environmental regulations);
- Partners in Protection (PIP); and
- Customs-Trade Partnership Against Terrorism (C-TPAT) standards.

ICAVE personnel have received an introductory training to handle hazardous materials. ICAVE has an annual training program that must be attended by their personnel. Training is provided by a third party company. In addition, ICAVE is enrolled in PROCADIST, a distance education program controlled by the Federal Labor Agency.

Training provided by ICAVE includes among others, the following topics:

- ICAVE operations
- Occupational health and safety
- Safety regulation
- HAZMAT course (four hours, for new hired personnel (the last training took place on 12 April 2017) on and two hours refresher course every year, performed by a third party, the latest course dated on 17 February 2017)
- PIP code
- First aids
- Defensive driving
- Operation of forklifts, loading and unloading equipment
- PPE use
- IMDG code

The cranes used in the dock have a maximum load capacity from 40 to 60 tons, the patio cranes have a load capacity of 40.6 tons. In addition ICAVE has small trucks (tracto plana) that operate only within the port terminal; this type of trucks can haul a container of up to from 35 to 60 tons. Equipment is inspected prior start each shift using an equipment specific checklist. Records are kept by the Equipment Control department. If issues are identified during inspection, the equipment is not used.

According to ICAVE’s container loading/unloading procedure, most operations are related to a single container, only the dock crane has the capacity to manage two containers simultaneously. All other equipment can manage one container at the time.

The preventive maintenance program is based on failures relevance (impact to operations, cost, safety, and environment). Safety and the frequency of the failures are the highest weight. Preventive maintenance program was implemented in 2013. The relevance was assigned by a committee formed by the leadership of different departments. The frequency for the maintenance operations is defined based on operation hours. The frequency of the maintenance routines has been uploaded in software which generates automatic work orders. The cranes have odometer (for operation hours) which is updated weekly to the software and then the work orders are generated automatically and the maintenance operations are coordinated with the operations personnel. Compliance with the work orders are also recorded in the software.

Preventive and corrective maintenance records are held for four months in paper for small equipment such as reach stacker, small trucks, among others. Cranes preventive and corrective maintenance records are stored in a digital system since 2007. Training records are kept for one year.

Small trucks operators can work double shifts only when both shifts are with daylight time. Crane operators cannot work double shifts. Dock crane operators can only work six continuous hours.

ICAVE has an internal safety regulation that includes an alcohol and drugs policy, they implement random drugs test (urine test) and alcohol in breath during holiday season, or when there is an accident (e.g. collision), according to the medical personnel they keep records; however, records were not available for review as they are regarded as confidential information. This policy was established in 2012 and includes the removal of the employee if the test results positive. This policy and the random test are applicable to contractors and truck operators.
When the wind speeds exceed 38 miles per hour, the terminal completely stops operations. Some operations are suspended at lower wind speeds (35 miles per hour).

ICAVE has an emergency response plan last updated on 20 April 2017, it is a 118 pages document, it has a track changes for updates and reviews; which are performed at least once a year. They have an internal brigade for hazardous materials that consists of (53) trained members. There are two areas with secondary containment where leaking container are placed. The emergency response plan requires having the MSDS of the materials available and use the UN Emergency Response Guidance to attend the emergency and has emergency response kits for acids and alkaline substances. Also, ICAVE has an electronic management system named ESIGA, in which every ICAVE procedure is available for revision by the workers.

Orion provided training to ICAVE personnel on cyanide handling and emergency response on April 2017. Based on the observed emergency response capabilities, maintenance and training programs implemented by ICAVE, it is concluded that no additional actions are required from Orion. However, a training course focused just in cyanide features for the ICAVE’s internal brigade for hazardous materials is scheduled for May 2017; this course will be provided by Orion personnel.