

SUMMARY AUDIT REPORT

for the March 2013
International Cyanide Management Code Transportation Recertification Audit



Prepared for:

Chukotka Mining and Geological Company
Kinross Gold Corporation/ Kupol Project

Submitted to:

International Cyanide Management Institute
1200 "G" Street NW, Suite 800
Washington, D.C. 20005

FINAL

September 17, 2013



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SUMMARY AUDIT REPORT

Name of Transporter Operator: Chukotka Mining and Geological Company (CMGC) Transportation Group

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Location detail and description of operation:

The Chukotka Mining and Geological Company (CMGC) Transportation Group is a wholly owned subsidiary of CMGC. CMGC Transportation Group is devoted to the transportation of materials from the Port of Pevek (Chukotka Autonomous Region, Russia) to the Kupol gold mining operation some 400 km due south.. The cyanide is shipped and stored in standard 20-foot steel intermodal shipping containers. Within each shipping container the solid cyanide is packaged in 1,000 kg 'bag-in-box' intermediate bulk containers (IBC).

Cyanide is delivered to the region via ship into the Port of Pevek once per year, typically in the fall. The containers are transported via CMGC Transportation Group truck convoys from the Port of Pevek to CMGC's interim storage facility at Km 21 along a route that is determined by the local authorities. The shipping containers are then stored at a dedicated compound until conditions are cold enough for an ice road to support heavy transportation vehicles that truck the containers to the mine site approximately 390 km south. The route is shown on Figure 1.

Ground transportation from the Km 21 interim storage facility to the Kupol mine is conducted by truck in the winter, usually between February and April, when conditions are cold enough for the ice road to support heavy transportation vehicles. The cyanide

is transported in convoys that have emergency response personnel and equipment, security personnel, spare parts and equipment, and a maintenance team. The ice road is 390 km long and normally takes between 10-12 hours to traverse. On arrival at the Kupol cyanide storage compound, the Kupol mining operation takes custody of the material.

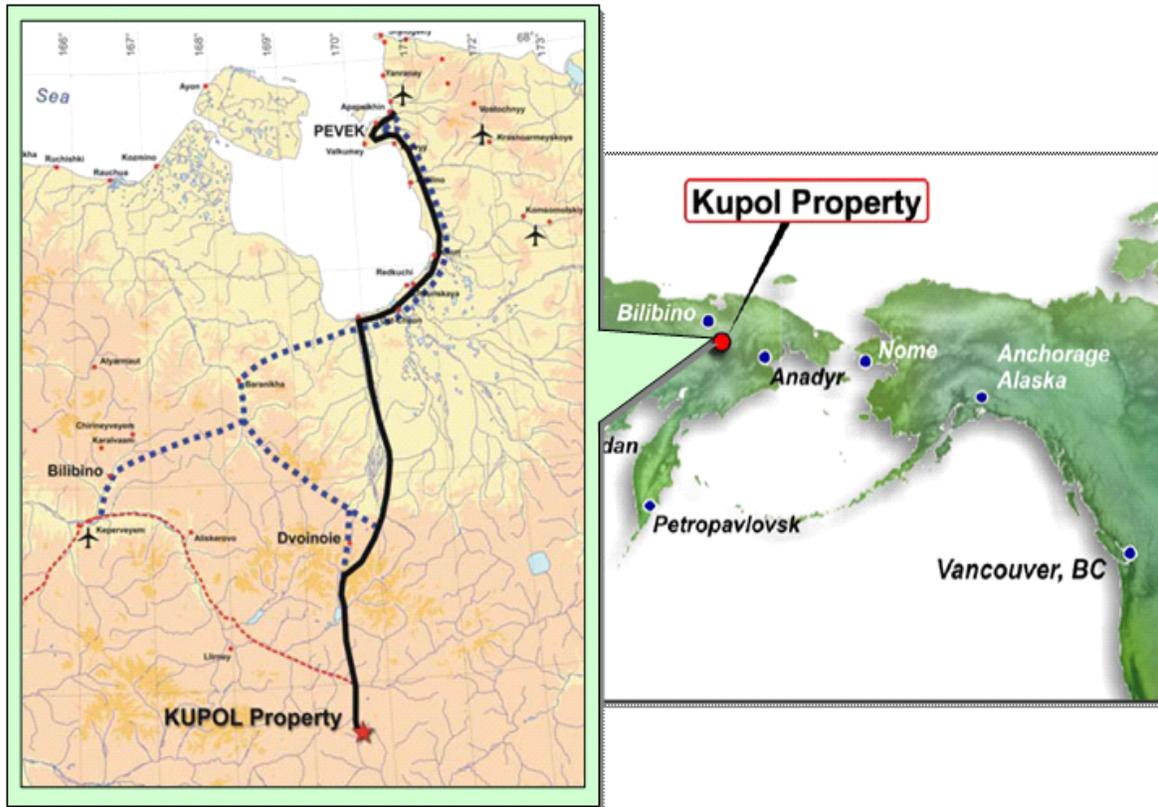


Figure 1 – CMGC Transportation Group – Pevek to Kupol Cyanide Transportation Route¹

¹ Source: Kupol Mine, Russian Federation, NI 43-101 Technical Report (Henderson, May 2011).

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Auditors' Finding

The operation is: ■ in full compliance
 in substantial compliance
 not in compliance

with the *International Cyanide Management Code*.

CMGC Transportation Group has not experienced any cyanide incidents or compliance issues since the previous audit.

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Names and Signatures of Other Auditors

Ivan Senchenya



Date(s) of Audit: March 1 – March 8, 2013

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 Transportation Verification Protocol* using standard and accepted practices for health, safety and environmental audits.

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1. TRANSPORT: Transport cyanide in a manner that minimizes the potential for accidents and releases.

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

The operation is

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

Summarize the basis for this Findings/Deficiencies Identified:

The routes upon which the cyanide is transported are established by the company's Chief Engineer in coordination with local governmental authorities (Traffic Inspectorate of Chukotka). There is limited choice regarding the exact routes driven. There is a summer road (transportation from the Port of Pevek to the Km 21 storage facility) and a winter road (transportation from the Km 21 storage facility to the Kupol gold mining operation), each of which is permitted by the Traffic Inspectorate. The town of Pevek representatives are included in considerations for the summer road. There are no other towns, settlements or other populated areas other than company's 'rotational field camps' along the winter road. The maximum allowable grade for the transportation of the cyanide is an 8% grade.

Risk assessments are undertaken for the summer and winter roads. The risk mitigation measures noted in the risk assessments include the requirements that cyanide be transported in convoys with security guards, emergency and maintenance equipment and personnel; convoy speed be limited to 30 kilometers per hour; and regular ice thickness monitoring of the ice roads be performed. Cyanide is therefore shipped in convoys. Each convoy has a Convoy Leader, several escort vehicles, maintenance trucks, and emergency response vehicle. Each convoy includes a militia escort. Drivers are switched out at a mid-way point to ensure that they are not overly fatigued. CMGC's documents and procedures describe the responsibilities, roles and procedures relating to the safe handling, safe temporary storage and safe transport of cyanide.

The routes undergo a re-evaluation and re-permitting process by the government authorities (Traffic Inspectorate of Chukotka) prior to the beginning of each seasonal transport campaign; although since 2013 the governmental authority no longer requires a permit for transportation on the winter road because the winter road is fully owned by CMGC. Route conditions are monitored during the transport. Drivers are in constant contact with other drivers and base operations via radio. Changing road conditions and

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weather situations that would require additional or different safeguards are reported to the road maintenance crew.

Input from governmental agencies, and other stakeholders are considered during the route permitting phase. Sign-offs on the permit for transportation from port of Pevek to the storage area 21 Km show that a number of different stakeholders, including those from the city of Pevek, are included in the permitting process. The government manages the communication of emergency response information to local medical facilities and external responders (Traffic Inspectorate and the national health and safety agency “Rostekhnadzor” (RTN)) are part of the cyanide importing approval process. The trucking operation has their own trained emergency responders and it can also contact Kupol mine emergency resources, if necessary. Due to the remote nature of the region (there are no communities along winter road), CMGC Transportation Group and the Kupol mine site will respond to all emergency response steps that may be required on the winter road.

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

- in full compliance with Transport Practice 1.2
- in substantial compliance
- not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

CGMC Transportation Group only uses trained, qualified and licensed drivers and Terex container handler operators. Cyanide transport drivers must have the appropriate class of drivers licence for the type of vehicle driven and an “ADR Certificate” confirming the hazardous materials classes that the driver is permitted to transport. The company checks the validity of driver licenses and certificates and retains a record of each prior to each summer and winter shipment. These records were available on file for each of the cyanide shipments in the past three years. The container handler operators have several years of experience operating heavy vehicles including excavators, dozers and/or forklift loaders prior to becoming a Terex “reach stacker” operator. The truck drivers are generally independent contractors that are hired seasonally to drive the company trucks. Many of the drivers return each season.

Employees and contract drivers involved with cyanide storage, handling and transportation at Km 21 annually receive training in fire protection; storage, treatment and transportation of sodium cyanide; and the regulation on transportation of hazardous cargos by motor vehicle in the Russian Federation. The training is conducted within approximately one month of the summer and winter cyanide convoys. The training

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program is approved by “Rostekhnadzor” (RTN) and takes 3 days to complete. Trainees are examined by a commission approved by the agency and must pass the test before being permitted to drive for CGMC. Refresher training (an approximately 1.5 hour long briefing) is also conducted just prior to departure of a convoy. This briefing includes loading and unloading, convoy protocol, state of the roads, speed restrictions, communication, emergency response and documentation drivers are required to carry.

Although many of the personnel used by this seasonal operation are technically contracted personnel (e.g., drivers), the management of all transport activities and personnel is done directly by CMGC Transportation Group management and follow Company procedures.

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

The operation is in full compliance with Transport Practice 1.3
 in substantial compliance
 not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

Cyanide is transported on recent-model Ural-Iveco truck/trailers that are leased to CGMC Transportation Group. The technical passports (specification documents) show these vehicles have a load capacity of 38,000 kg, which is more than adequate for transporting individual cyanide shipping containers that have gross weights of between about 23,800 kg and 24,200 kg. Based on manufacturer’s specifications, the Terex “reach stacker” container handler has a 45,000 kg lift capacity. The Terex reach stacker is equipped with a load moment indicator to ensure loads handled do not exceed the crane capacity for a given lift configuration.

CGMC Transportation Group has a regular inspection and preventive maintenance program in place to ensure the equipment remains in good operating condition and continues to be able to safely carry the loads specified. Vehicles are maintained at the garage located at Km 21; they are checked prior to each departure of a cyanide convoy and checked and serviced on return to Km 21. The preventative maintenance program is tracked using a J.D. Edwards software system. Only parts supplied or recommended by the vehicle manufacturer are permitted to be used. A daily operation check is also performed on the Terex reach stacker. In addition, a mechanical inspection is completed prior to any handling of cyanide containers. Records of vehicle inspections covering the last three years were viewed and are retained at the Km 21 maintenance shop.

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Overloading of trucks is prevented by limiting the load per truck to one shipping container. This is standard practice to prevent the overloading and possible vehicle break-down when going over rough terrain. The Terex is equipped with a load moment indicator that can be monitored by the driver to ensure loads handled do not exceed the crane capacity for a given lift configuration.

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

The operation is

- in full compliance with Transport Practice 1.4
- in substantial compliance
- not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

Cyanide is received as solid briquettes packed in nylon “supersacks” and polyethylene-lined 1,000 kg plywood Intermediate Bulk Containers (IBCs), which are transported in sealed 20 foot shipping containers; twenty IBCs per container. The containers are not opened until custody of the containers is transferred to the Kupol mine operation at the Kupol mine site. The seal integrity, number on each container, and container condition is checked on receipt at the Port of Pevek, on receipt at the interim storage at Km 21, and at the start and end of the trip between the Km 21 interim storage facility and the Kupol mine. The containers are secured to the trailer bed using clamping mechanisms that are part of the trailer itself. The integrity of the clamping mechanism and the attachment point on the container is checked during a pre-trip inspection prior to the departure of the cyanide convoy. There are specific locations on the trailer that will accept the container, thereby eliminating the possibility of an unbalanced load.

Drivers conduct pre-departure vehicle safety checks that include confirmation that cyanide placards are displayed on all four sides of the transport vehicles. Placards are posted on each side of the cyanide containers and the front and rear of each truck and trailer.

A safety program is in place for cyanide transport that includes, electrical and mechanical inspections of trucks prior to convoy departure; medical examinations of drivers, including an alcohol breathalyzer test, heart monitoring and a blood pressure test prior to convoy departure and at Dvoynoye camp; limiting driver’s on-duty work day to 12 hours and swapping drivers at the pre-designated mid-route road camp at Dvoynoye (approximately 5 to 6 hours’ drive from Km 21) to reduce fatigue; monitoring weather and road conditions and adjusting the convoy schedule accordingly; and monitoring ice thickness at river crossing. Records of this safety program are available for the past three years and include vehicle maintenance records, driver “Travel Sheets” or shipping papers (which provide a record of driver and vehicle, pre-departure vehicle

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check, driver medical check, driver changeover at Dvoynoye, travel times, and other information); clinic medical surveillance log books; and ice thickness inspection records.

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

The operation is

- in full compliance with Transport Practice 1.5
- in substantial compliance
- not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

Shipments are not transported by sea or by air in this part of the supply chain. Section 1.5 requirements are therefore not considered to be within the scope of this report.

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

The operation is

- in full compliance with Transport Practice 1.6
- in substantial compliance
- not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

Radios are installed in all transport and support vehicles used in cyanide convoys. There are no radio blackout spots along either the summer route or winter route. The cyanide convoy leader also travels with a satellite telephone. An emergency response team and equipment travel with each cyanide convoy in the event of a transportation emergency. The convoy can communicate with management and emergency responders at both Km 21 and the Kupol Operations in case of emergency. If additional assistance or heavy lifting equipment is required, this would be mobilized either from Pevek or Kupol, depending on the location of the incident and the type of support required. The convoys (summer and winter) are escorted by traffic police. These personnel also use satellite phones in order to maintain communications in case of an emergency.

The radios installed in all the vehicles are in regular use and are part of the preventive maintenance program to ensure that they remain in good mechanical condition. Additionally, the convoy leader carries a satellite phone on all convoys. All communication equipment is checked for functionality prior to the departure of the cyanide convoy.

Each vehicle in the cyanide convoy is also equipped with a global positioning system (GPS). The operation of the GPS is confirmed as part of the drivers pre-departure

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vehicle safety check. The location and speed of all trucks in the convoy are monitored at approximately two hour intervals through a computerized GPS tracking system ("CyberFleet"). Additionally, the progress of the transport is monitored by the militia escorts and by CMGC management via radio and phone communications. The GPS is used to ensure trucks do not get separated and also to check that speed restrictions are being followed.

CMGC tracks the cyanide shipping containers from the point they are unloaded from the ship at Pevek on to CGMC Transportation Group trucks, to delivery to the Kupol mine. The container number and seal is checked against the Bill of Lading when unloaded from the ship at Pevek, on delivery at the Km 21 cyanide storage compound; on leaving the storage compound on route to Kupol; and on delivery to the Kupol mine cyanide storage compound. At the start of a convoy to Kupol, the dispatch office logs the container numbers, truck and trailer numbers, and associated driver identification information. This information is included in the documentation required to be carried by the drivers during transport.

Government regulations require that drivers carrying hazardous materials have an "Accident Card" (Material Safety Data Sheet) with them at all times during transport of the cargo. The bill of lading documentation indicates the amount of cyanide being transported. This package of information remains with the driver at all times and is transferred to the ensuing driver at the mid-way driver switching point along the winter road (i.e., Dvoynoye camp) at the time of the truck and cargo hand-over.

2. INTERIM STORAGE: Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.

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

The operation is

- in full compliance with Transport Practice 2.1
- in substantial compliance
- not in compliance

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

The Km 21 interim storage facility is a secure open air container storage facility used for holding imported shipping containers of materials and products destined for CGMC's mining operations until the winter road is open and these containers can be transported to their destination. Solid cyanide, still in the original sealed shipping containers unloaded from the ship at Pevek, is stored in a separate, secure, cyanide storage compound at the facility, located away from other container storage. Signs are clearly

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posted on the entrance gates to the compound warning that toxic chemicals are stored and that trespassing, open flames, smoking, eating, and drinking are prohibited. There is also signage posted that displaying the personal protective equipment required in the compound. "UN 1689" and CHIP "Hazardous to Environment" placards are clearly posted on each cyanide shipping container.

The Km 21 interim storage facility is manned by security guards. Within this secure area cyanide is stored in a dedicated compound with additional security provisions. The compound is located near a security guard office and is visible from the office window. There are also security cameras that provide good coverage of the compound. The compound is flood lit and bounded by a 2 m high barbed wire fence with gates at each end that are locked and sealed to prevent unauthorized access. A security guard conducts a perimeter inspection of the compound several times a shift. Entrance to the compound is strictly limited and a permit, signed by the heads of the warehouse and security, is required before access is permitted. Security also completes entries in the Security Logbook at the beginning and end of each shift and maintains records of the number of containers entering or leaving the compound, changes of locks and seals on the gates, and the names of all persons entering the compound.

Cyanide is stored in sealed shipping containers that are stored away from other materials in a dedicated, secure and locked storage compound. The compound is underlain with an impermeable liner and in the unlikely event that a cyanide release occurred from a container, any granular material or water flow would be directed toward and contained in one of two drainage sumps located at the perimeter of the compound. CMGC implemented Quality Assurance and Quality Control (QA/QC) programs during construction of the cyanide storage compound and containment system. No modifications to the facilities have occurred subsequent to the original construction, which was approved and certified by the RTN. CMGC maintains a copy of the "Commissioning Act", dated 27 April 2007, certifying that the facility was constructed to the approved design. The shipping containers are not opened at Km 21 and as the containers are stored in the open, build-up of hydrogen cyanide gas is not a concern.

During the short summer period when snow melt may occur, any potentially impacted run-off would be contained and captured by the sumps. Run-off collected in the sumps is tested for potential cyanide. The results of analysis on samples collected on 3 June 2010 and 30 August 2012 showed cyanide concentrations to be less than 0.05 mg/l. In 2011 no sample was collected as the sumps were dry. After analysis the water pumped from the sumps was directed to the sewage treatment plant.

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

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

The operation is

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

Summarize the basis for this Findings/Deficiencies Identified:

CMGC Transportation Company has two documented emergency response plans (ERPs) for cyanide transportation, one for the winter road and another combined plan for the summer road and the Km 21 interim storage facility. Both documents are approved annually by municipal department of the Ministry of Emergency in Pevek (Chaun municipality). The ERPs appear to be appropriate for the organization. Each plan includes a number of scenarios outlining the potential incident types on the summer road, the winter road, and the storage facility. The Company only transports cyanide via truck and only solid sodium cyanide (in steel intermodal shipping containers as previously described) is transported. All scenarios considered in the ERPs are related to potential truck accidents or accidents in the storage area. Summary information regarding the general characteristics of sodium cyanide is contained within each of the two ERPs. Detailed information regarding the chemical and physical form of cyanide is also contained on an "accident card" (MSDS) that is kept in the truck at all times with the shipping paperwork.

The ERPs consider the conditions of both the summer road and winter road. The scenarios described also consider the proximity of the route to water bodies (in the summer plan) and the presence of snow and ice, as well as quality and stability of winter ice road. The cyanide packaging type and the transportation equipment used are also considered in the plans. A description of response actions required during four different potential emergency scenarios for summer and winter road transportation are included in the plans.

The storage facility is an open-air secure compound surrounded by a steel post and barbed wire fence. The cyanide containers are stored on a gravel topped multilayer engineered containment pad. There are no specific structural or operational considerations regarding the storage area that needed to be explicitly made in the ERP for Km 21.

In addition to CMGC Transportation Group one internal response team that accompanies the convoy, each convoy is also escorted by traffic police. The role of the police in notifying any necessary external responders or community personnel is described in the ERPs. Although CMGC Transportation Group is considered to be

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

The operation is **■ in full compliance with Transport Practice 3.3**
in substantial compliance
not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

The ERPs detail the responsibilities for external notifications and list the contact phone numbers for key agencies. The transport of cyanide is somewhat unique in this operation because the shipper is CMGC and the receiver is the Kupol Mine operation. CMGC and the Kupol operation both monitor the radio channels for any problems during the convoy. The convoys are escorted by police who would notify external responders for additional assistance, if necessary. The notification of regulatory agencies would also be coordinated by the police escort if an emergency was to occur during a convoy.

Systems are in place to ensure that the internal and external emergency notification and reporting procedures are kept current. The ERPs are reviewed annually within two months respectively, of the cyanide shipment to Pevek and the first winter cyanide convoy. All information in the plans is checked for accuracy and continued suitability. The review includes analysis and update of internal and external emergency notification and reporting procedures. Both documents are approved annually by municipal department of Ministry of Emergency in Pevek (Chaun municipality).

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 Transport Practice 3.4**
in substantial compliance
not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

The ERPs include the steps to be taken to clean-up and remediate in the event of a spill. The plans address the decontamination of solids and include a list of materials and equipment available in the storage area and to be carried on the emergency response vehicle for cyanide convoys. CMGC Transportation Group is aware of the hazards of using decontamination chemicals in surface waters. The ERPs clearly forbid the use of use sodium hypochlorite, ferrous sulfate, and hydrogen peroxide to treat cyanide if it has been spilled into surface waters.

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

- in full compliance with Transport Practice 3.5

The operation is
in substantial compliance
not in compliance

Summarize the basis for this Findings/Deficiencies Identified:

There are clear procedures for periodic reviewing and evaluating the adequacy of the plans and ensuring that they are fully implemented. The ERPs are reviewed annually within two months, respectively, of the arrival of the cyanide shipment at Pevek and the first cyanide winter convoy. All information in the plans is checked for accuracy and continued suitability. Both documents are approved annually by municipal department of Ministry of Emergency in Pevek (Chaun municipality).

Mock emergency drills have been conducted annually prior to the first cyanide convoy over the winter road and again prior to the transport of the cyanide over the summer road. These include table top and practical emergency response drills. The drills have simulated an overturned cyanide container during transport including response to a cyanide release.

Although records were reviewed that documented the planned drill scenario and emergency response actions actually taken during the drill, no record was being maintained of the drill debriefing, any recommendations for emergency response improvements, and completion of any recommended actions. However, based on discussion such activities and actions were being completed. Subsequent to the audit CMGC revised their mock drill instruction plan and reporting format to include requirements to record the debriefing, and to document the corrective action plan and sign-off procedure for addressing any corrective actions identified during a drill. In addition to the annual reviews previously noted, the ERPs are also reviewed after an incident or mock drill and updated as needed.

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