



May 2011

## INTERNATIONAL CYANIDE MANAGEMENT CODE CYANIDE

# Orica Australia Limited East Africa Supply Chain Certification Audit, Summary Audit Report

**Submitted to:**

International Cyanide Management Institute (ICMI)  
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REPORT



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**Distribution:**

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## 1.0 INTRODUCTION

### 1.1 Operational Information

**Name of Transportation Facility:** Orica East Africa Supply Chain  
**Name of Facility Owner:** Not Applicable  
**Name of Facility Operator:** Orica Australia Ltd  
**Name of Responsible Manager:** Dave Ellison, SH&E Distribution Risk Manager  
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Gladstone, 4680  
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**Country:** Australia  
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### 1.2 Description of Operation

#### 1.2.1 Orica Australia Limited

Orica is an Australian-owned, publicly listed company with global operations. Orica is managed as discrete business units that produce a wide variety of products and services. The Mining Chemicals unit is based in Australia and exports products to Asia, Africa and the Americas, as well as supplying the local Australian industry. The unit's main product is sodium cyanide (cyanide), which is manufactured at Orica's Yarwun cyanide production facility (Yarwun Facility) in Queensland, Australia. Orica Mining Chemicals is the world's second largest producer of cyanide.

##### 1.2.1.1 Yarwun

Orica's Yarwun Facility, which is located at Yarwun, approximately eight kilometres (km) by road from Gladstone, Queensland, commenced operations in 1989 and is engaged in the manufacture of cyanide (both solid and liquid forms), ammonium nitrate, nitric acid, chlorine, sodium hydroxide, sodium hypochlorite, hydrochloric acid and expanded polystyrene balls.

Solid sodium cyanide is packaged in either sparge isocontainers, which have a maximum gross weight of 26 tonnes, or intermediate bulk containers (IBCs), which in turn are packed into a container. A maximum of 20 IBCs can be packed into a freight container with a maximum gross weight of 28 tonnes. Liquid cyanide is packaged into isotanks with a maximum gross weight of 26 tonnes.

Cyanide manufactured at the Yarwun Facility is used in gold mining operations within Australia, Asia, Africa, Papua New Guinea, New Zealand, Solomon Islands and South America.

Orica's Yarwun Facility was re-certified and being in full compliance with the Code on 17 March 2010.

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## **1.2.2 Marine Transportation**

Orica contracts all marine transportation of solid sodium cyanide within the East Africa Supply Chain to MSC.

### **1.2.2.1 Mediterranean Shipping Company**

The Mediterranean Shipping Company, headquartered in Geneva, Switzerland, is engaged in the worldwide transport of containers. As of September 2010, MSC operated 423 container vessels with the capacity to handle the equivalent capacity of 1 776 000, 20 foot containers.

Shipping destinations include ports in Africa, Asia, North America, the Middle East and Oceania. MSC Shipping is a carrier service providing international shipping of containers on a fleet of their container vessels. All of MSC's vessels are registered by the Lloyd's Register Group, which provides classification and certification of ships, and inspects and approves important components and accessories. This registration is a requirement of the Australian Customs Act.

## **1.2.3 Ports**

### **1.2.3.1 Port of Dar es Salaam, Tanzania**

The Port of Dar es Salaam is the Tanzania principal port with a rated capacity of 4.1 million (dwt) dry cargo and 6.0 million (dwt) bulk liquid cargo. The Port has a total quay length of about 2000 metres with eleven deep-water berths. Dar es Salaam port handles about 95% of the Tanzania international trade. The port serves the landlocked countries of Malawi, Zambia, Democratic Republic of Congo, Burundi, Rwanda and Uganda. The port is strategically placed to serve as a convenient freight linkage not only to and from East and Central Africa countries but also to middle and Far East, Europe, Australia and America.

The Tanzania Ports Authority owns and operates the Port of Dar es Salaam and several other ports in Tanzania, including all of the country's lake ports. The Tanzania Ports Authority was created in 2005 to coordinate the country's system of harbours, provide harbor facilities and services, construct new harbours, operate and maintain navigational aids, provide warehouse services for cargo, to act as carriers of goods or passengers, and to provide facilities and amenities for port users.

The Port of Dar es Salaam contains two kilometres of quays with 11 deep-water berths. The Port of Dar es Salaam is strategically positioned to move goods not only within East and Central Africa but between Africa and Europe, Australia, the Americas, and the Far East.

Tanzania International Container Terminal Services Ltd (TICTS) manages the container handling activities at berths 8, 9, 10 and 11 and the Inland Container Depots at Kurasini and Ubungu.

Orica uses MSC to transport its shipments to the Port of Dar es Salaam in Tanzania.

The Port of Dar es Salaam Harbour Master oversees all port operations. This includes:

- management of port protocols for vessel docking
- entry to port by Port Pilots
- vessel approaches
- shipping activities to port activities changeover.

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Stevedoring operations include:

- Handling of full/empty containers on and off vessels, container storage areas for general cargo, port security, etc.
- Management programs for container placement and movement including identification of hazardous cargoes.

### **1.2.3.2 Port of Mombasa, Kenya**

The Port of Mombasa is utilised for transit through to only one end user destination, North Mara, due to its location within Tanzania. The Port of Mombasa is a key port in East Africa for access to other land-locked countries in the region. The Port of Mombasa is controlled by the Kenya Maritime Authority (KMA) which was established with the mandate to regulate, coordinate and oversee maritime affairs in Kenya.

Orica uses MSC to transport its shipments to the Mombasa, Kenya.

The Port of Mombasa Harbour Master oversees all port operations. This includes:

- management of port protocols for vessel docking
- entry to port by Port Pilots
- vessel approaches
- shipping activities to port activities changeover.

Stevedoring operations include:

- Handling of full/empty containers on and off vessels, container storage areas for general cargo, port security, etc.
- Management programs for container placement and movement including identification of hazardous cargoes.

### **1.2.4 Road Transportation**

Orica Contracts all road transportation within the East Africa Supply Chain to Freight Forwarders Tanzania (FFT) and Freight Forwarders Kenya (FFK) where deliveries are effected on behalf of Orica Mining Chemicals.

Road transportation from the ports of Dar es Salaam and Mombasa are effected by end user arranged transportation.

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**1.2.4.1 Freight Forwarders Tanzania**

Freight Forwarders Tanzania is a freight forwarding transportation organisation within Dar es Salaam and other areas of Tanzania.

Freight Forwarders Tanzania views itself as a market leader in the Clearing and Forwarding Industry in East Africa and the company's Vision Statement notes that FFT is to maintain its reputation for excellence by providing superior logistics services in a professional and competitive manner. FFT's sister company, FFK is closely linked with FFT.

FFT provides the following services:

- Clearing and Forwarding.
- Maritime and Port Operations Management.
- Handling and Warehousing.
- Transport and Delivery.

At the time of the audit, FFT transported Orica's solid sodium cyanide to:

- Tulawaka Gold Mine in Tanzania.
- Buzwagi Gold Mine in Tanzania.
- Bulyanhulu Gold Mine in Tanzania.
- Geita Gold Mine in Tanzania.

FFT was certified as being fully compliant with the Code on 22 May 2008.

**1.2.4.2 Freight Forwarders Kenya**

Freight Forwarders Kenya was incorporated in 1973 following the amalgamation of three prominent Clearing and Forwarding Agents, namely Kenya General Agency Ltd, Reynolds and Co. Ltd and Wafco Ltd.

FFK is a member of the Kenya International Clearing, Forwarding and Warehousing Association and was a founder member of the Association's predecessor, the Kenya Clearing, Forwarding and Warehousing Association.

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With 30 years of experience, FFK has developed a network of subsidiaries and agents enabling the organisation to offer a range of clearing, forwarding and logistics services:

- customs clearance
- marine services
- warehousing
- transportation
- procurement services
- communications.

At the time of the audit, FFK transported Orica's solid sodium cyanide to:

- North Mara Gold Mine in Tanzania.

FFK was certified as being fully compliant with the Code on 27 May 2008.

### 1.3 Transit Storage

Storage in transit does occur at Ports identified in Section 1.2.3 while formalities such as customs clearance, quarantine checks and carrier releases are performed. Once formalities are complete, the cyanide containers are collected by the respective road transporters. At no stage along the East Africa Supply Chain is cyanide removed from the trucks or containers prior to unloading at customer mine sites.

Depending on weather, cargo types and other operational matters, shipping lines may trans-ship their cargo from one vessel to another. This involves unloading the cargo at a terminal facility, temporary set down and loading onto another vessel for the continuation of the delivery. Such trans-shipping does occur with Orica's solid sodium cyanide. Orica has no control over when and where this happens, but through its due diligence assessments has satisfied itself that the shipping line used (MSC) undertakes the shipping of its product in accordance with the International Dangerous Goods Code (IMO DG Code) and in a professional manner. This extends to the selection of terminals for trans-shipping.

Trans-shipping ports used include:

- MSC
  - Port of Singapore
  - Port of Durban.

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**1.4 Auditors Findings and Attestation**

in full compliance with  
 in substantial compliance with  
 not in compliance with

**Orica East Africa Supply Chain is:** **The International Cyanide Management Code**

**Audit Company:** Golder Associates  
**Audit Team Leader:** Edward Clerk, CEnvP (112), RABQSA (020778)  
**Email:** eclerk@golder.com.au

**1.5 Name and Signatures of Other Auditors:**

Name	Position	Signature	Date
Edward Clerk	Lead Auditor and Technical Specialist		13 April 2011
Susan Regan	Trainee Auditor		13 April 2011

**1.6 Dates of Audit**

The Orica East Africa Supply Chain Certification Audit was undertaken on 6 April 2011 based on the following due diligence reports:

- Due diligence review MSC. The due diligence was undertaken by Orica on 4 September 2010
- Due diligence review Dar es Salaam Port, Kenya. The due diligence was undertaken by Orica in 17 August 2010
- Due diligence review Mombasa Port, Kenya. The due diligence was undertaken by Orica in 19 August 2010

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.

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2.0 CONSIGNOR SUMMARY

2.1 Principle 1 – Transport

Transport Cyanide in a manner that minimises the potential for accidents and releases.

2.1.1 Transport Practice 1.1

Select cyanide transport routes to minimise the potential for accidents and releases.

in full compliance with

The operation is

in substantial compliance with

Transport Practice 1.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 1.1 requiring the transport of cyanide in a manner that minimises the potential for accidents and releases.

Orica

Orica has developed procedures to guide the selection of transport routes to minimise the potential for accidents and releases, or the potential impacts of accidents and releases.

Routes are selected by Orica’s SH&E Distribution Risk Manager in consultation with Orica’s transport contractors and customers. The evaluation and selection of the route(s) is undertaken through a risk assessment process conducted in accordance with Australian Standard AS 4360: 2004 Risk Management. Risk assessments are undertaken for all route alternatives selected for assessment. Additionally, route risk assessments are also undertaken for product loading and departure, product storage, and product unloading and delivery. Mitigation measures used to reduce risks to acceptable levels were detailed in the risk assessment documentation for the specific routes.

Orica has implemented a procedure to periodically re-evaluate routes used for cyanide deliveries. The SH&E Distribution Risk Manager advised that the re-evaluation of routes used for cyanide deliveries is undertaken by Orica staff approximately every 18 to 24 months.

SOP TMP 02 Transport Routes – Route Conditions and Transportation Agency Feedback procedure was developed by Orica to ensure that relevant feedback from transportation agencies relating to routes utilised for the movement of cyanide is provided to Orica for assessment and follow up on actions, as appropriate. This procedure is referred to in the Sodium Cyanide Transport Management Plan.

Orica has documented the measures taken to address risks identified with the selected routes and developed procedures to evaluate the risks of selected cyanide transport routes and take the measures necessary to manage these risks. Mitigation measures are then detailed in the risk assessment documentation of the transport contractor.

Orica, in conjunction with its road transport contractor, seeks input from stakeholders and applicable governmental agencies as necessary in the selection of routes and development of risk management measures.

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Where routes present special safety or security concerns, Orica ensures the transport contractor uses convoys, escorts or other additional safety or security measures to address the concern. East Africa is assessed by Orica as having a risk rating of Level II and all containers are transported under escorted convoy conditions. Security measures implemented by Orica for transportation of cyanide within the East Africa Supply Chain include the use of locked and sealed containers, and constant monitoring and reporting of the progress of the convoy by the transport contractors.

Orica, through its transport contractor, has advised external responders, medical facilities and communities as necessary of their roles during an emergency response.

Orica's *Sodium Cyanide Transport Management Plan* notes that emergency response responsibility will extend only to aspects of supply to which Orica is contractually responsible, however, Orica will work with all customers and assist where possible in maintaining an emergency response plan and provide specialist advice in the event of any emergency. The *Sodium Cyanide Transport Management Plan* also notes that agents, distributors and transport companies shall have an appropriate emergency response plan for handling any sodium cyanide incident that falls within their contractual responsibility. The emergency response plan shall address the entire delivery route.

Orica's *Sodium Cyanide Transport Management Plan* states that agents, distributors, transport companies and other parties contracted to Orica shall be responsible for implementing the *International Cyanide Management Code* and contracts between Orica Mining Chemicals and these parties shall incorporate the obligations of each party in meeting the Code's requirements.

Where subcontractors are utilised by contracted carriers, the Orica *Sodium Cyanide Transport Management Plan* notes that no subcontractors are to be engaged by any prime contractor without the prior approval of Orica and an appropriate assessment of the proposed subcontractor's capabilities having been performed. The assessment of transportation agencies is via the Orica *Mining Chemicals – Carrier Assessment Questionnaire (SOP TMP 16)*, which enables a self assessment and external assessment. The assessment sheet includes two parts. Part 1 details a protocol covering the following:

- Company Profile.
- Safety, Health and Environment (SH&E).
- Fleet Operations.
- Depot Operations.
- Compliance, Examination and Maintenance of Road Transport Equipment.
- Internal Safety Audits, Workplace Observations and Assessments.

Part 2 of the questionnaire contains vehicle and driver safety checklists for the transport of dangerous goods.

A scoring system is included in this assessment process with minimum standards detailed. Orica conduct Carrier Assessments using this process at a minimum of every two years.

In addition to *SOP TMP 16*, it is also a mandatory requirement that the prime contractor have an appropriate *Subcontractor Management Plan* in place which includes regular assessment of subcontractors utilised.

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Orica contracts all road transport within the East Africa Supply Chain to FFT and FFK. A Transport Contract is maintained with FFT and FFK and is signed off by the appropriate management representative.

**Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

**Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

**MSC**

Orica takes into consideration the shipping services available to service the intended target area. Orica only operates in export markets that are serviced by major international shipping companies with the ability to offer scheduled container services from the Port of Brisbane to the destination country or continent. Orica uses MSC for its international shipping to East Africa due to its selection of services available from the Port of Brisbane.

Orica does not have control of the routes taken by the shipping lines contracted to transport sodium cyanide. In selecting a route, shipping lines must take into account factors such as tides, currents, winds, storms and load compatibilities. To account for this variability, Orica has undertaken due diligence reviews of MSC to ensure that the shipments are in accordance with the IMO DG Code.

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2.1.2 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 [ ] not in compliance with Transport Practice 1.2

Summarise the basis for this Finding/Deficiencies Identified:

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 1.2 requiring personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.

Orica

Orica does not employ transport drivers or directly operate transport vehicles in its East Africa Supply Chain; this is undertaken by its contractors FFT and FFK. Despite this, Orica does ensure its transport contractors and subcontractors use only trained, qualified and licensed operators to operate its transport vehicles.

Orica's Sodium Cyanide Transport Management Plan states that agents, distributors, transport companies and other parties contracted to Orica shall be responsible for implementing the Code and contracts between Orica Mining Chemicals and these parties shall incorporate the obligations of each party in meeting the Code's requirements.

Section 21 to 23 of Orica's Sodium Cyanide Transport Management Plan clearly describes the minimum training standards expected by Orica in the transportation of cyanide. The document also notes that where subcontractors are utilised by prime contracted agencies, the prime contractor is to have an appropriate procedure to ensure that all relevant subcontractor personnel meet the specified training requirements.

Freight Forwarders Tanzania

FFT was certified as being fully compliant with the Code on 22 May 2008.

Freight Forwarders Kenya

FFK was certified as being fully compliant with the Code on 27 May 2008.

2.1.3 Transport Practice 1.3

Ensure that transport equipment is suitable for the cyanide shipment.

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

Summarise the basis for this Finding/Deficiencies Identified:

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[Handwritten Signature]

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The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 1.3 requiring that transport equipment is suitable for the cyanide shipment.

**Orica**

Orica does not directly operate transport vehicles in its East Africa Supply Chain; this is undertaken by its FFT and FFK.

Orica does ensure that contractors only uses equipment designed and maintained to operate within the loads it will be handling. Orica has developed procedures to verify the adequacy of the equipment for the load it must bear; to prevent overloading of the transport vehicle being used for handling; and, ensures its subcontractors meet elements 1 through 3 of Transport Practice 1.3.

Orica has developed a *Transport of Sodium Cyanide – Carrier Safety Program (SOP TMP 05)* that details the minimum safety requirements and programmes that Orica requires its prime contractor and associated subcontractors to implement.

**Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

**Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

**2.1.4 Transport Practice 1.4**

**Develop and implement a safety program for transport of cyanide.**

in full compliance with

**The operation is**

in substantial compliance with

**Transport Practice 1.4**

not in compliance with

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

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 1.4 requiring the operation develop and implement a safety program for transport of cyanide.

**Orica**

Orica does not directly operate transport vehicles in its East Africa Supply Chain; this is undertaken by FFT and FFK. Despite this, Orica does ensure its transport contractors and subcontractor implement a safety program for the transport of cyanide that ensures that cyanide is transported in a manner that maintains the integrity of the producer’s packaging.

The Orica Australia Supply Chain Audit (certified as compliant with the Code on 5 October 2010) addresses items such as cyanide packaging, labelling, container loading and security. The East Africa Supply Chain is a continuation of the Australia Supply Chain and containers are not opened until they arrive at the final destination.

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Orica does ensure its transport contractors and subcontractor use placards and signage to identify the shipment as cyanide, as required by local regulations and international standards.

Orica ensures that its transport contractors and subcontractors implement safety programmes for cyanide transport. Section 32 of Orica's *Sodium Cyanide Transport Management Plan* states that agents, distributors and transportation agencies have a responsibility to ensure that a safe workplace is provided for its personnel and that of the contractors utilised. The plan notes that this includes:

- Fatigue management is considered in all transportation activities
- Loads are secured in the appropriate and safest manner
- Procedures are in place by which transportation can be suspended or modified if conditions such as severe weather or civil unrest are encountered
- A drug abuse prevention programme (including over the counter medication) is in place
- Vehicle inspections are effected prior to each shipment
- A preventative maintenance programme is in place
- Carrier Safety Programs should be consistent with the requirements of *SOP TMP 05 (Transport of Sodium Cyanide – Carrier Safety Program procedure)*

**Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

**Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

**2.1.5 Transport Practice 1.5**

**Follow international standards for transportation of cyanide by sea and air.**

**in full compliance with**

**The operation is**                       in substantial compliance with                      **Transport Practice 1.5**

not in compliance with

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

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 1.5 requiring the operation follow international standards for transportation of cyanide by sea and air.

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**Orica**

Orica does transport consignments of cyanide by sea within the scope of this audit. As identified during the Orica Australia Supply Chain certification audit, all containers (i.e. freight containers of IBCs, sparge isocontainers or liquid isocontainers) are placarded at the Yarwun Facility in accordance with the requirements of the IMDG Code with UN numbers, the Class 6 dangerous goods class label and the environmentally hazardous substance label. This level of placarding is consistent with the requirements of the ADG Code.

A container intended for sea transport has documentation prepared in accordance with the IMDG code, which is faxed to the shipping agent. The normal road documentation prepared in accordance with the ADG Code accompanies the load on its road/rail voyage to the Port of Brisbane.

Orica does not transport consignments of cyanide by air within the scope of this audit.

Section 37 of Orica's *Sodium Cyanide Transport Management Plan* notes that no sodium cyanide manufactured by Orica Mining Chemicals or manufactured by third parties on behalf of Orica Mining Chemicals will be permitted to be transported by air without express written permission of Orica.

**Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

**Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

**MSC**

Due diligence of MSC conducted by Orica indicated that the shipping companies transported cyanide in compliance with the Dangerous Goods Code of the International Maritime Organisation. The due diligence specifically referenced provisions of the Dangerous Goods Code that are required to be addressed under this question.

**Port of Mombasa and Dar es Salaam**

Due diligences of the Ports were conducted by Orica in 2010. The due diligences indicated that the ports were in compliance with the Dangerous Goods Code of the International Maritime Organisation. The due diligences specifically referenced provisions of the Dangerous Goods Code that are required to be addressed under this question.

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**2.1.6 Transport Practice 1.6**

**Track cyanide shipments to prevent losses during transport.**

in full compliance with

**The operation is**

in substantial compliance with

**Transport Practice 1.6**

not in compliance with

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

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 1.6 requiring the tracking of cyanide shipments to prevent losses during transport.

**Orica**

Orica does not employ transport drivers or directly operate transport vehicles; this is undertaken by its contractors FFT and FFK. Despite this, Orica does ensure its transport contractor vehicles have means to communicate with the transport company, the mining operation, the cyanide producer or distributor and/or emergency responders.

Orica's *Transportation of Cyanide – Tracking of Shipments (SOP TMP 10)* procedure requires Orica and its contracted transportation agencies to maintain a vehicle tracking system that shall provide:

- Duress notification by the driver
- Visibility to external users to current location of vehicles carrying product
- Download capability relating to each vehicle and each individual trip
- Geo-fencing, if practicable

Orica does ensure contractor communication equipment (GPS, mobile phone, radio, pager, etc) is periodically tested to ensure it functions properly.

Orica does ensure its communication blackout areas along transport routes have been identified and ensure special procedures are implemented for the blackout areas. Orica's *Remote Area Communications* procedure details the requirements for communication when transporting cyanide in areas that are recognised as a communications risk.

Orica does ensure its transport contractor implements systems or procedures to track the progress of cyanide shipments. Orica's *Transportation of Cyanide – Tracking of Shipments* procedure requires Orica and its contracted transportation agencies to maintain a vehicle tracking system.

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Orica does implement inventory controls and/or chain of custody documentation to prevent loss of cyanide during shipment. Section 43 of Orica's *Sodium Cyanide Transport Management Plan* requires:

- All packaging to be secured in such a manner so as to prevent ready access to the product contained within, or as a minimum, provide the capability to readily identify that packaging has been tampered with
- In the event that vehicles are required to be left unattended, the requirements of *SOP TMP 07* are to be applied.
- As an integral facet of security during transport, tracking methodologies should be employed. *SOP TMP 10* refers to these methodologies.

Orica does ensure that its transport contractors carry records indicating the amount of cyanide in transit and *Material Safety Data Sheets* are available during transport.

Orica has developed a procedure to ensure its subcontractors meet elements 1 through 6 of Transport Practice 1.6. Where subcontractors are utilised by contracted carriers, the Orica *Sodium Cyanide Transport Management Plan* notes no subcontractors are to be engaged by any prime contractor without the prior approval of Orica and an appropriate assessment of the proposed subcontractor's capabilities having been performed. The assessment of transportation agencies is via the Orica *Mining Chemicals – Carrier Assessment Questionnaire (SOP TMP 16)*, which enables a self assessment and external assessment. The assessment sheet is very detailed and includes two parts.

### Freight Forwarders Tanzania

FFT was certified as being fully compliant with the Code on 22 May 2008.

### Freight Forwarders Kenya

FFK was certified as being fully compliant with the Code on 27 May 2008.

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2.2 Principle 2 – Interim Storage

Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent release and exposures.

2.2.1 Transport Practice 2.1

Store cyanide in a manner that minimises the potential for accidental releases.

The operation is [X] in full compliance with [ ] in substantial compliance with [ ] not in compliance with Transport Practice 2.1

Summarise the basis for this Finding/Deficiencies Identified:

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 2.1 requiring transporters design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent release and exposures.

Orica

Storage in transit does occur at the following Ports while formalities such as customs clearance and carrier releases are performed:

- Port of Mombasa, Kenya
Port of Dar es Salaam, Tanzania

Storage in transit also occurs at the transshipping port of Singapore and Durban.

Depending on weather, cargo types and other operational matters, shipping lines may tranship their cargo from one vessel to another. This involves unloading the cargo at a terminal facility, temporary set down and loading onto another vessel for the continuation of the delivery. Such trans-shipping does occur with Orica's sodium cyanide. Orica has no control over when and where this happens, but through its due diligence investigations has satisfied itself that MSC undertake the shipping of the product in accordance with the International Maritime Dangerous Goods Code (IMO DG Code) and in a professional manner. This extends to the selection of terminals for trans-shipping.

Port of Mombasa and Dar es Salaam

Due diligences of the Ports were conducted by Orica in 2010.

The due diligences assessed interim storage requirements at these facilities and Orica ascertained that the ports are operating in a safe and responsible manner and is suitable for the transit of sodium cyanide.

Freight Forwarders Tanzania

FFT was certified as being fully compliant with the Code on 22 May 2008.

Freight Forwarders Kenya

FFK was certified as being fully compliant with the Code on 27 May 2008.

Orica East Africa Supply Chain

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### 2.3 Principle 3 – Emergency Response

Protect communities and the environment through the development of emergency response strategies and capabilities.

#### 2.3.1 Transport Practice 3.1

Prepare detailed Emergency Response Plans for potential cyanide releases.

in full compliance with

The operation is

in substantial compliance with

Transport Practice 3.1

not in compliance with

#### Summarise the basis for this Finding/Deficiencies Identified:

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 3.1 requiring the operation prepare detailed Emergency Response Plans for potential cyanide releases.

#### Orica

Orica has developed detailed emergency response document (*Emergency Response Guide Sodium Cyanide*) to provide emergency response guidance for specific mine site, storage facilities and transport incidents involving spillage of Orica product.

The transport companies involved in the shipment of cyanide are required to have plans that cover spill response outside of the Yarwun gate to the end user. Orica provides assistance and support in this role through the *Emergency Response Guide Sodium Cyanide*, 24 hour call centre and product specialists based at the Yarwun Facility.

The *Emergency Response Guide Sodium Cyanide* is appropriate for the selected transportation route or interim storage facility within the supply chain. The objective of the *Emergency Response Guide Sodium Cyanide* is to provide information in a suitable format, which can be used to minimise the adverse effects of a cyanide emergency on people, property and the environment. It is applicable to the management of an emergency involving Orica-supplied sodium cyanide solid or liquid product. It is considered applicable for product spillages at any location along the product supply chain from the Yarwun Facility gate to the mine site end user.

The emergency documentation is appropriate for the transportation routes selected by the transport contractors. The *Emergency Response Guide Sodium Cyanide* is relevant to road transportation within the East Africa Supply Chain.

The *Emergency Response Guide Sodium Cyanide* is applicable to the management of an emergency involving Orica-supplied sodium cyanide solid or liquid product. It is considered applicable for product spillages at any location along the product supply chain. Although the plan does not specifically consider all aspects of the transport infrastructure, the emergency response approach outlined in the *Emergency Response Guide Sodium Cyanide* is flexible enough to accommodate variations in transportation infrastructure.

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The *Emergency Response Guide Sodium Cyanide* does consider the design of the transport vehicle and method of packaging of the product. The guide contains procedures for different types of transport containers, freight containers with IBCs and isocontainers.

Section 3.0 of the guide provides response to the following scenarios:

- 3.1 Dry Sodium Cyanide Spill – Inside Building/Storage Facility
- 3.2 Dry Sodium Cyanide Spill – Outside Building/Storage Facility
- 3.3 Dry Sodium Cyanide Spill – Inside a Shipping Container
- 3.4 Shipping Container Decontamination
- 3.5 Handling Wet Sodium Cyanide
- 3.6 Sodium Cyanide Spill to Waterway
- 3.7 Response to a Fire in the Vicinity of Stored Cyanide
- 3.8 Roll-Over of Shipping Container

The *Emergency Response Guide Sodium Cyanide* does include descriptions of response actions for anticipated emergency situations.

The critical component of the emergency response process is the dedicated Orica ERS based in Melbourne. The *Emergency Response Guide Sodium Cyanide* requires Orica ERS to be contacted in the event of an emergency involving cyanide. Orica ERS operates 24 hours a day, seven days a week providing telephone advice and assistance to the public, emergency services and others on incidents relating to the transport, storage and use of chemical products and raw materials in emergency situations.

Appendix 6 (Orica Response to a Report of a Cyanide Incident) of the *Emergency Response Guide Sodium Cyanide* details the initial actions to be undertaken, including the interactions with emergency service providers such as police and fire brigade, determining if the leak is cyanide and preventing the spread of contamination. All emergency responders identified along specific routes, during the route assessment process, are issued with Orica's *Emergency Response Guide*.

### **Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

### **Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

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2.3.2 Transport Practice 3.2

Designate appropriate response personnel and commit necessary resources for emergency response.

in full compliance with

The operation is

in substantial compliance with

Transport Practice 3.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 3.2 requiring the operation designate appropriate response personnel and commit necessary resources for emergency response.

Orica

Orica does not directly operate transport vehicles or storage facilities along its East Africa Supply Chain.

Orica provides emergency response training of appropriate personnel. Orica retains technical and advisor roles in an emergency and can provide physical resources and personnel to assist emergency services in the response to an incident involving cyanide. To maintain this capacity, Senior Orica ERS personnel or their delegates conduct training of new Orica ERS coordinators, with input from other Orica ERS coordinators and other Orica personnel as required. Initial coordinator training is conducted in accordance with training schedules, with each competency/component in the training program only being signed off by the trainer and trainee once the content is covered thoroughly and adequately to the satisfaction of both parties. For most sections of the training, written or verbal tests or exercises are conducted to ensure that the trainee has the required level of understanding. Independent of the training programme, all new Orica ERS coordinators complete a recognised first aid certificate course (Senior Workplace First Aid), driver awareness course, and internal auditor certification, as soon as practicable after joining the Orica ERS. There is an intensive two week training programme for a new ERS coordinators and cyanide is one of the topics covered under the Industrial Chemicals component of the course.

Orica has developed and provided initial and periodic refresher training covering cyanide awareness and emergency response to its transport contractors.

The Emergency Response Guide Sodium Cyanide clearly identifies the key Orica roles and responsibilities in the event of an off-site emergency. Appendix 6 of the guide provides description of the each role. Orica has clearly delineated its role and the responsibilities of the subcontractor during an emergency response.

The Emergency Response Guide Sodium Cyanide does not detail emergency response equipment that may be required during an emergency. Appendix 15 of the Orica Emergency Response Guide Sodium Cyanide provides guidance on the level of PPE outline by the US EPA but does not specify what should be provided during transport. Section 3.8 of the guide lists the PPE to be provided in the event of a roll-over of a shipping container. The Guide is intended to be used by contractors and provides a point of reference for Orica's contractors to develop and align their emergency management plans.

Orica has developed procedures to inspect emergency response equipment and assure its availability when required. Orica has implemented processes to check that contractors transporting the material have

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necessary equipment including during transport. Section 2.3 PPE and Section 2.5 Emergency Response of the SF-016 questionnaire addresses PPE selection, maintenance and supply and emergency response procedures and capabilities

Orica’s *Sodium Cyanide Transport Management Plan* states that agents, distributors, transport companies and other parties contracted to Orica shall be responsible for implementing the *International Cyanide Management Code* and contracts between Orica Mining Chemicals and these parties shall incorporate the obligations of each party in meeting the Code’s requirements.

Where subcontractors are utilised by contracted carriers, the Orica *Sodium Cyanide Transport Management Plan* notes no subcontractors are to be engaged by any prime contractor without the prior approval of Orica and an appropriate assessment of the proposed subcontractor’s capabilities having been performed. The assessment of transportation agencies is via the Orica *Mining Chemicals – Carrier Assessment Questionnaire (SOP TMP 16)*, which enables a self assessment and external assessment. The assessment sheet is very detailed and includes two parts.

**Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

**Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

**2.3.3 Transport Practice 3.3**

**Develop procedures for internal and external emergency notification and reporting.**

in full compliance with

The operation is

in substantial compliance with

**Transport Practice 3.3**

not in compliance with

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

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 3.3 requiring the operating develop procedures for internal and external emergency notification and reporting.

**Orica**

There are procedures and contact information for notifying the shipper, the receiver/consignee, regulatory agencies, outside response providers, medical facilities and potentially affected communities of an emergency. The *Yarwun Site Emergency Plan* and the *Emergency Response Guide Sodium Cyanide* includes procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities of the emergency, as appropriate. Receivers/consignees are advised via the Customer Service Centre.

There are provisions to ensure that internal and external emergency notification and reporting procedures are kept current. Orica has a *Model Procedure (MP-SG-020C-Emergency Plans)* detailing the requirement for the development of an effective emergency response system at either a site or business level.

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**Freight Forwarders Tanzania**

FFT was certified as being fully compliant with the Code on 22 May 2008.

**Freight Forwarders Kenya**

FFK was certified as being fully compliant with the Code on 27 May 2008.

**2.3.4 Transport Practice 3.4**

**Develop procedures for remediation of releases that recognise the additional hazards of cyanide treatment.**

in full compliance with

The operation is

in substantial compliance with

**Transport Practice 3.4**

not in compliance with

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

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 3.4 requiring the operation develop procedures for remediation of releases that recognise the additional hazards of cyanide treatment.

**Orica**

The *Emergency Response Guide Sodium Cyanide* includes procedures for remediation, such as recovery or neutralisation of solutions or solids, decontamination of soils or other contaminated media and management of spill clean-up debris. Section 2.5 Decontamination of a Spill of Solid or Liquid Cyanide into Soil and Section 2.6 Use of Sodium Hypochlorite for Decontamination Purposes of the *Emergency Response Guide Sodium Cyanide* provide information on the hazards associated with the recovery and neutralisation.

These procedures include descriptions on decontamination of soils or other contaminated media. The procedures require the responder to notify the relevant parties listed in the Guide. For Australia, Orica ERS is listed as the prime contact and information concerning the management of spill clean-up debris is initiated through this service. In addition, Document *YYA129895043 Decontamination of Soil Contaminated with Cyanide Liquor* describes the decontamination process and sets out the use of colorimetric test kits to determine that cyanide concentrations are reduced below one part per million.

Document *YYA1292702 Decontamination of Equipment in Cyanide Service* describes the decontamination process for cyanide equipment, requiring that it be treated using hot condensate (> 50 °C) and dilute sodium hypochlorite.

The Orica *Emergency Response Guide Sodium Cyanide* provides the following warning in Section 3.6 (Sodium Cyanide Spill in a Waterway) which prohibits the use of chemicals to treat cyanide that has been released into surface water:

*Orica Mining Chemicals subscribes to the recommendations of the International Cyanide Management Code in that no chemicals are to be added to a flowing waterway in the event of a cyanide spill as these may only exacerbate the situation with their own toxicity characteristics.*

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Freight Forwarders Tanzania

FFT was certified as being fully compliant with the Code on 22 May 2008.

Freight Forwarders Kenya

FFK was certified as being fully compliant with the Code on 27 May 2008.

2.3.5 Transport Practice 3.5

Periodically evaluate response procedures and capabilities and revise them as needed.

in full compliance with

The operation is

in substantial compliance with

Transport Practice 3.5

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Orica East Africa Supply Chain is in FULL COMPLIANCE with Transport Practice 3.5 requiring the operation periodically evaluate response procedures and capabilities and revise them as needed.

Orica

Orica does not directly operate transport vehicles or storage facilities along its East Africa Supply Chain.

There are provisions for periodically reviewing and evaluating the plan's adequacy and they are being implemented. Orica has a Model Procedure (MP-SG-020C-Emergency Plans) detailing the requirement for the development of an effective emergency response system at either a site or business level.

The Emergency Response Guide Sodium Cyanide is a controlled document that is subject to an annual review with the last review in December 2010.

Orica has adopted a consultative approach and work with their transport contractors to undertake exercises and review the emergency plans. The emergency response plan and guide are controlled documents under Orica's document management system and subject to periodic review.

There is a procedure to evaluate the Plan's performance after its implementation and revise it as needed. The procedure has been implemented. Orica's Model Procedure MP-SG-045B Corrective and Preventive Action documents the Orica global procedure for investigation of incidents. All incidents categorised as Category II or above are also reviewed by the division management team for additional leanings, cross business communication requirements and planning purposes.

Freight Forwarders Tanzania

FFT was certified as being fully compliant with the Code on 22 May 2008.

Freight Forwarders Kenya

FFK was certified as being fully compliant with the Code on 27 May 2008.

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### 3.0 SEA TRANSPORT SUMMARY

#### 3.1 Mediterranean Shipping Company Australia Pty Ltd

##### 3.1.1 Audit and Operational Information

MSC Shipping is a carrier service providing International shipping of containers on a fleet of their container vessels.

A due diligence of MSC shipping was conducted by Orica on 4 September 2010. The reviews were conducted by David Ellison, SH&E Distribution Risk Manager of Orica Australia Pty Ltd. David Ellison meets the ICMI requirements for a Transport Expert.

##### 3.1.2 Scope and Summary of Due Diligence Investigation

The purpose of the due diligence was to ensure Orica shipping of sodium cyanide is conducted in accordance with the International Maritime Dangerous Goods Code (IMO DG Code). The following items were addressed within the Orica due diligence:

- Compliance with ICMC:
  - Transport Practice 1.1
  - Transport Practice 1.5 (1.5.1)
  - Transport Practice 1.6
- Australian Shipping Regulatory Framework:
  - Australian Maritime Safety Authority (AMSA)
  - Cargoes
  - Port State Control
  - Power of Inspection and Detention
- Australian Department of Defence.
- Conclusion

The due diligence review concluded:

*Orica through its dealings with MSC Shipping has found them to be a highly professional shipping organisation. MSC Shipping is one of the few carriers with the ability to provide Orica with a worldwide coverage.*

*The ongoing review as a service provider and this due diligence review has found no issues of concern in regards to MSC Shipping's management and the shipping of solid sodium cyanide product. The review is not a final acceptance of MSC Shipping for future work and as with all service providers to Orica, Orica will continue to review and monitor their performance.*

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*Any changes in state, national or international regulations, standards or laws can result in a total review of the international shipping requirements.*

The due diligence also noted that:

*Orica is not able to conduct inspections and checks on shipping vessels readily due to port safety and security issues. The Australian Government through the Australian Maritime Safety Authority (AMSA) and State Government through the Port State Control (PSC) do however inspect and monitor cargo vessels that frequent Australian ports. These inspections ensure vessels are seaworthy, do not pose a pollution risk, provide healthy and safe work environments and comply with relevant international regulations. These inspections are not only carried out at Australian ports but internationally and set the operating standards for the international shipping companies.*

This due diligence report was reviewed by the audit team's transport technical auditor, Edward Clerk, who found that the operations of MSC Shipping had been comprehensively evaluated through Orica's due diligence process.

### 3.2 Port of Dar es Salaam

#### 3.2.1 Audit and Operational Information

The Port of Dar es Salaam, Tanzania, is Tanzania's main port.

Orica conducted a due diligence review of the Port of Dar es Salaam on 17 August 2010.

#### 3.2.2 Scope and Summary of Due Diligence Investigation

The purpose of the due diligence was to ensure Orica shipping of sodium cyanide is conducted in accordance with the International Maritime Dangerous Goods Code (IMO DG Code). The following items were addressed within the Orica due diligence:

- Compliance with ICMC
  - Transport Practice 1.1
  - Transport Practice 1.5 (1.5.1)
  - Transport Practice 1.6
  - Transport Practice 2.1
- Summary of Port Operations
- Arrivals
- Stevedoring
- Dangerous Goods Logistics centre
- Port information
- Conclusion

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The due diligence review found no issues of concern in regards to the management of solid sodium cyanide product.

The due diligence review determined that:

*The port is operating in a safe and responsible manner and is suitable for the transit of sodium cyanide. This suitability is added to by the presence and close working relationship between the port and Orica's contracted carrier, Dar es Salaam, with respect to sodium cyanide.*

The due diligence review was undertaken by the audit team's transport technical expert, Edward Clerk, who found the Orica due diligence report to be a comprehensive evaluation of the Port of Dar es Salaam.

### 3.3 Port of Mombasa

#### 3.3.1 Audit and Operational Information

The Port of Mombasa is utilised for transit through to only one end user destination, North Mara, due to its location within Tanzania. The Port of Mombasa is a key port in East Africa for access to other land-locked countries in the region.

Orica uses MSC to transport its shipments to the Mombasa, Kenya.

Orica conducted a due diligence review of the Port of Mombasa on 19 August 2010.

#### 3.3.2 Scope and Summary of Due Diligence Investigation

The purpose of the due diligence was to ensure Orica shipping of sodium cyanide is conducted in accordance with the International Maritime Dangerous Goods Code (IMO DG Code). The following items were addressed within the Orica due diligence:

- Compliance with ICMC
  - Transport Practice 1.1
  - Transport Practice 1.5 (1.5.1)
  - Transport Practice 1.6
  - Transport Practice 2.1
- Summary of Port Operations
- Arrivals
- Stevedoring
- Dangerous Goods Logistics centre
- Port information
- Conclusion

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The due diligence review determined that:

*The port is operating in a safe and responsible manner and is suitable for the transit of sodium cyanide. This suitability is added to by the presence and close working relationship between the port and Orica's contracted carrier, Dar es Salaam, with respect to sodium cyanide.*

### **3.4 Auditor Review of Due Diligence**

Orica has concluded from the due diligence assessments that no major issues of concern were identified with respect to the transportation of sodium cyanide throughout the domestic supply chain by the shipping operators, road transportation operators and port utilised. Based on a review of the due diligence reports, the auditor accepts this conclusion.

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## Report Signature Page

**GOLDER ASSOCIATES PTY LTD**

A handwritten signature in black ink, appearing to read 'L. Clerk'.

Ed Clerk  
Associate and Environment Group Manager

ECW/arp

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# **APPENDIX A**

## **Limitations**



## LIMITATIONS

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