



February 2011

## INTERNATIONAL CYANIDE MANAGEMENT CODE CYANIDE

# Orica Australia Limited Asia Supply Chain Certification Audit, Summary Audit Report

**Submitted to:**

International Cyanide Management Institute (ICMI)  
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Washington, DC 20006  
UNITED STATES OF AMERICA

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REPORT

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**Distribution:**

- 1 Copy - ICMI (+1 electronic)
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## Table of Contents

<b>1.0 INTRODUCTION</b>	<b>1</b>
1.1 Operational Information	1
1.2 Description of Operation	1
1.2.1 Orica Australia Limited	1
1.2.2 Marine Transportation	1
1.2.2.1 Mediterranean Shipping Company	2
1.2.2.2 K-Line Shipping	2
1.2.3 Port of Laem Chabang	2
1.2.4 Road Transportation	3
1.2.4.1 Pioneer Ocean Freight	3
1.2.5 Transit Storage	3
1.3 Auditors Findings and Attestation	4
1.4 Name and Signatures of Other Auditors:	4
1.5 Dates of Audit	4
<b>2.0 CONSIGNOR SUMMARY</b>	<b>5</b>
2.1 Principle 1 – Transport	5
2.1.1 Transport Practice 1.1	5
2.1.2 Transport Practice 1.2	7
2.1.3 Transport Practice 1.3	8
2.1.4 Transport Practice 1.4	9
2.1.5 Transport Practice 1.5	10
2.1.6 Transport Practice 1.6	12
2.2 Principle 2 – Interim Storage	13
2.2.1 Transport Practice 2.1	13
2.3 Principle 3 – Emergency Response	14
2.3.1 Transport Practice 3.1	14
2.3.2 Transport Practice 3.2	15
2.3.3 Transport Practice 3.3	17
2.3.4 Transport Practice 3.4	17



2.3.5 Transport Practice 3.5..... 18

**3.0 SEA TRANSPORT SUMMARY ..... 19**

3.1 Mediterranean Shipping Company Australia Pty Ltd ..... 19

3.1.1 Audit and Operational Information ..... 19

3.1.2 Scope and Summary of Due Diligence Investigation ..... 19

3.1.3 K-Line Shipping ..... 20

3.1.4 Audit and Operational Information ..... 20

3.1.5 Scope and Summary of Due Diligence Investigation ..... 20

3.2 Port of Laem Chabang..... 21

3.2.1 Audit and Operational Information ..... 21

3.2.2 Scope and Summary of Due Diligence Investigation ..... 21

**APPENDICES**

**APPENDIX A**

Limitations



## 1.0 INTRODUCTION

### 1.1 Operational Information

**Name of Transportation Facility:** Orica Asia 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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PO Box 375  
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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. This unit's main product is sodium cyanide (cyanide), which is manufactured at Orica's Yarwun cyanide production facility (Yarwun Facility) in QLD, Australia. Orica Mining Chemicals is the world's second largest producer of cyanide.

Orica's Yarwun Facility, which is located at Yarwun approximately eight kilometres (km) by road from Gladstone, QLD, 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 cyanide is packaged in either sparge isocontainers, which have a maximum gross weight of 26 tonnes, or intermediate bulk containers (IBCs), which are in turn 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 isocontainers 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 and South America.

#### 1.2.2 Marine Transportation

The Orica Asia Supply Chain from the Port of Brisbane, QLD, to the various end point users covers the transportation of solid sodium cyanide by ship from the Port of Brisbane to the Port of Laem Chabang, Bangkok, Thailand, and then road transportation to end point users. The Orica Asia Supply Chain includes

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



- Marine transportation of solid cyanide from the Port of Brisbane, QLD, to the Port of Laem Chabang by MSC and K-Line.
- The Port of Laem Chabang
- Road transportation of solid cyanide (intermediate bulk containers (IBCs) within freight containers by Pioneer Ocean Freight from Port of Laem Chabang to end point users.

The Ocean Freight Supply Chain does not include:

- Transportation of Orica's sodium cyanide from its production facility to the Port of Brisbane.
- Receipt of sodium cyanide to customer mine sites.

### 1.2.2.1 Mediterranean Shipping Company

MSC, headquartered in Geneva, Switzerland, is engaged in worldwide container transport. As of September 2010, MSC operates 423 container vessels with the capacity to handle the equivalent capacity of 1,776,000 20 foot containers. MSC has set up dangerous goods cargo management centres that control the proper stowage of hazardous cargo worldwide through their Chem Link computer system headquartered in Antwerp. This hazardous cargo system is initiated when hazardous cargo is booked into the container booking MSC Link computer system.

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.

MSC has provided shipping services to AGR since AGR commenced the export of solid sodium cyanide in 2002. Shipping destinations include ports in Africa, Asia, North America, the Middle East and Oceania.

### 1.2.2.2 K-Line Shipping

K-Line Shipping (K-Line) is a carrier service providing international shipping of containers on a fleet of their container vessels, mainly in the SE Asia region. Containers containing solid sodium cyanide are placed and secured on their vessels at the loading port (Port of Brisbane) by the stevedoring company in accordance with the approved ship stowage plan ensuring appropriate separation between incompatible classes of dangerous goods and removed at the port of destination by the stevedoring company at that port. All vessels entering Australian ports are subject to possible AMSA (Australian Maritime Safety Authority) PSC (Port Safety Control) inspections to ensure that foreign ships visiting Australian ports are seaworthy, do not pose a pollution risk, provide healthy and safe work environments and comply with relevant international regulations.

### 1.2.3 Port of Laem Chabang

The Port of Laem Chabang, located in Bangkok, Thailand, is the main deep sea port of Thailand that offers universal services in order to exchange good worldwide. It consists of several minor ports and the Laem Chabang Port can handle extra large ships. The Port Authority of Thailand is responsible for the whole port while private sectors contract the operational function, which is called "Landload Port".

There are no alternative ports with the facilities to handle containers of Sodium Cyanide in Thailand.

The port of Laem Chabang currently handles approximately 3.5 million TEU's per annum which includes approximately 24,000 containers of Dangerous Goods.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



The stevedoring company Maersk Logistics operate under a long term lease agreement with the port authorities and manage the on shore (wharf) operations at Berth B1. This is the berth currently used by the Mediterranean Shipping Company to facilitate the unloading of their vessels.

**1.2.4 Road Transportation**

**1.2.4.1 Pioneer Ocean Freight**

Pioneer Ocean Freight forms the Thailand transportation arm of Pioneer Group Companies and has been established for 30 years. The company employs approximately 200 staff including 35 drivers, and has a dedicated fleet of 40 prime movers and trailers each capable of carrying up to 28 tonnes. Pioneer specialises in:

- Customs clearance
- International freight forwarding and multimodal transport
- Export documentation
- Packing, crating and unpacking, warehousing
- Inland transportation, container trucking
- Air transportation and air courier services

Pioneer Ocean Freight currently transports approximately 2,400 tonnes per annum of cyanide from the Port of Laem Chabang to the Chatree Gold mine site in Thailand and the Sepon Gold mine site in Laos.

Pioneer Ocean Freight contracts cyanide transportation to Nava Inland Transport (Nava) and Tong Transmission Company Limited (Tongtrans). Nava is contracted by Pioneer Ocean Freight to transport cyanide to destinations within Thailand (Chatree Gold Mine).

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

**1.2.5 Transit Storage**

Storage in transit does occur at the Port of Laem Chabang while formalities such as customs clearance and carrier releases are performed. Once formalities are complete, the cyanide containers are collected from the Port of Laem Chabang by Pioneer Ocean Freight. At no stage 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 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 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 the shipping lines used (MSC and K-Line) 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.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



Trans-shipping ports used include:

- MSC
  - Port of Singapore
- K-Line
  - Port of Singapore

### 1.3 Auditors Findings and Attestation

in full compliance with

AGR Ocean Freight Supply Chain is:

in substantial compliance with

not in compliance with

The International Cyanide Management Code

Audit Company: Golder Associates

Audit Team Leader: Edward Clerk, CEnvP (112), RABQSA (020778)

Email: eclerk@golder.com.au

### 1.4 Name and Signatures of Other Auditors:

Name	Position	Signature	Date
Edward Clerk	Lead Auditor and Technical Specialist		25 February 2011

### 1.5 Dates of Audit

The Orica Asia Supply Chain Certification Audit was undertaken on 25 January based on the following due diligence reports:

- Due diligence review of K-Line. The due diligence was undertaken by Orica in September 2010.
- Due diligence review MSC. The due diligence was undertaken by Orica in September 2010
- Due diligence review Laem Chabang Port, Thailand. The due diligence was undertaken by Orica in September 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.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



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.

## 2.0 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 Asia 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. 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.

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. South East Asia is

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



assessed 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 Asia Supply Chain include the use of locked and sealed containers, and constant monitoring and reporting of the progress of the convoy by Pioneer Ocean Freight.

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.

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.

Orica contracts all road transport within the Asia Supply Chain to Pioneer Ocean Freight. A Service Level Agreement is maintained with contractors and is signed off by the appropriate management representative. Included in the contract is the requirement for, amongst other regulatory requirements, compliance with the Code.

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. Part 1 details a protocol covering the following key areas:

- 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:

- Section A
  - Driver Details
- Section B (i)
  - Prime Mover details
- Section B (ii)

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



- Trailer Tanker details
- Section C
  - Checklist Information
  - Documentation
  - Emergency Response Information
  - Emergency Response Trailer
  - Vehicle Placarding
  - Segregation
  - Portable Safety Equipment
  - Emergency Response Equipment

**K-Line and MSC**

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 both MSC and K-Line to ensure that the shipments are in accordance with the IMO DG Code.

**Pioneer Ocean Freight**

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

**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.**

in full compliance with

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

not in compliance with

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

The Orica Asia 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 Asia Supply Chain; this is undertaken by its prime road contractor Pioneer. 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

<u>Orica Asia Supply Chain</u>	 _____ Signature of Lead Auditor	25 February 2011 Date
Name of Facility		



Orica Mining Chemicals and these parties shall incorporate the obligations of each party in meeting the Code's requirements.

Orica does ensure its transport contractors and subcontractor personnel operating cyanide handling equipment are being trained to perform their jobs in a manner that minimises the potential for cyanide releases and exposures.

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 above detailed training requirements.

**Pioneer Ocean Freight**

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

**2.1.3 Transport Practice 1.3**

**Ensure that transport equipment is suitable for the cyanide shipment.**

in full compliance with

**The operation is**

in substantial compliance with

**Transport Practice 1.3**

not in compliance with

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

The Orica Asia 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 Asia Supply Chain; this is undertaken by its prime road contractor Pioneer.

Orica does ensure that the prime contractor 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.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



**Pioneer Ocean Freight**

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

**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 Asia 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 Asia Supply Chain; this is undertaken by its prime road contractor Pioneer. 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, which was certified as compliant with the Code on 5 October 2010, addressed cyanide packaging, container loading and security. The Asia Supply Chain is a continuation of the Australia Supply Chain and containers are not opened until they arrive at the final destination.

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. The Orica Australia Supply Chain Audit addressed placards and other signage used to identify the shipment as cyanide, as required by local regulations or international standards. The Asia Supply Chain is a continuation of the Australia Supply Chain and containers are not opened nor have their signage augmented until they arrive at the final destination.

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

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



- Carrier Safety Programs should be consistent with the requirements of *SOP TMP 05 (Transport of Sodium Cyanide – Carrier Safety Program procedure)*

Orica has developed a procedure to ensure its subcontractors meet elements 1 through 3 of Transport Practice 1.4.

**Pioneer Ocean Freight**

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

**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 Asia 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.

**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 severe marine pollutant label (i.e. fish with St Andrews Cross). 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 either the Port of Brisbane or Port of Townsville.

Orica does not transport consignments of cyanide by air within the scope of this audit and this Transport Practice is therefore NOT APPLICABLE within the scope of this document.

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 Mining Chemicals.

**K-Line**

K-Line operations personnel on the K-Line vessels on arrival at the loading port provide the Master with copies of the Dangerous Goods manifest (including stowage plan) and Packing Certificates for each of the hazardous cargo units loaded at that port.

K-Line operations personnel provide copies of the Emergency Information together with the Dangerous Goods manifest (including stowage plan) and Packing Certificates for each hazardous cargo unit to be loaded at that port to the ship's Master.

Orica Asia Supply Chain

25 February 2011

Name of Facility

Signature of Lead Auditor

Date



K-Line operations comply with the requirements process as follows:

- (i) The MO 41 is the document referenced in the ICMI guidance notes.
- (ii) A copy of the MO 41 is provided to MK-Line for assigning the container reference numbers and sending the HAZCHEM bookings for finalisation. From the MO 41 the container reference number is the K-Line tracking and monitoring system now records the UN classification (UN 1689), Dangerous Goods Class (6) and that the product is a marine pollutant. This information then determines the placement and segregation of the container on the vessel and handling through trans-shipment ports, if applicable.
- (iii) All containers (stipulated by their reference number) must be finalised by the vessel loading cut-off time. This requires the MO 41 to be provided between 48 and 24 hours prior to cut-off.
- (iv) Sodium cyanide solid is designated a “red line” cargo at the Port of Brisbane and is only loaded to the vessel when called in.
- (v) K-Line operations are required to provide the Port of Brisbane a detailed list of all containers with dangerous goods that are loading onto a particular vessel.
- (vi) On plan approval it is passed onto the vessel operator (stevedore) for loading of the vessel.

**MSC**

MSC operations personnel on the MSC vessels on arrival at the loading port provide the Master with copies of the Dangerous Goods manifest (including stowage plan) and Packing Certificates for each of the hazardous cargo units loaded at that port.

MSC operations personnel provide copies of the Emergency Information together with the Dangerous Goods manifest (including stowage plan) and Packing Certificates for each hazardous cargo unit to be loaded at that port to the ship's Master.

MSC operations comply with the requirements process as follows:

- (i) The MO 41 is the document referenced in the ICMI guidance notes.
- (ii) A copy of the MO 41 is provided to MSC for assigning the container reference numbers and sending the HAZCHEM bookings for finalisation. From the MO 41 the container reference number is the MSC tracking and monitoring system now records the UN classification (UN 1689), Dangerous Goods Class (6) and that the product is a marine pollutant. This information then determines the placement and segregation of the container on the vessel and handling through trans-shipment ports, if applicable.
- (iii) All containers (stipulated by their reference number) must be finalised by the vessel loading cut-off time. This requires the MO 41 to be provided between 48 and 24 hours prior to cut-off.
- (iv) Sodium cyanide solid is designated a “red line” cargo at the Port of Brisbane and is only loaded to the vessel when called in.
- (v) MSC operations are required to provide the Port of Brisbane a detailed list of all containers with dangerous goods that are loading onto a particular vessel.
- (vi) On plan approval it is passed onto the vessel operator (stevedore) for loading of the vessel.

**Pioneer Ocean Freight**

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



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 Asia 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 Pioneer Ocean Freight. 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 not employ transport drivers or directly operate transport vehicles; this is undertaken by Pioneer Ocean Freight. Despite this, 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. As mentioned above, Orica's Transportation of Cyanide – Tracking of Shipments procedure requires Orica and its contracted transportation agencies to maintain a vehicle tracking system.

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

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



- 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 Pioneer carries 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.

**Pioneer Ocean Freight**

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

**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.**

in full compliance with

The operation is  in substantial compliance with **Transport Practice 2.1**

not in compliance with

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

The Orica Asia 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 Port of Laem Chabang and the MSC and K-Line transshipping port of Singapore. A due diligence of the Port of Laem Chabang conducted by Orica found that cyanide is stored in a manner that minimises the potential for accidental releases. The due diligence of the Port of Laem Chabang found no issues of concern in regards to The Port Authority of Thailand and its lease operators Maersk Logistics and JWD InfoLogistics Co Ltd's awareness and management of the handling and systems in place for the sodium cyanide product.

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 the shipping lines used (MSC and K-Line) undertake the shipping of the product in accordance with the *International Maritime Dangerous*

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



Goods Code (IMO DG Code) and in a professional manner. This extends to the selection of terminals for trans-shipping.

Pioneer Ocean Freight

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

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

Orica

The Orica Yarwun Facility has a Site Emergency Plan (YY167474000) and capabilities for the containment and combating of a cyanide spill during production, loading or temporary storage. Section 2.0 of the Yarwun Site Emergency Plan provides a detailed response to cyanide poisoning, fire in the Cyanide Warehouse and spills for both solid and liquid forms present on site. This plan has been developed to address emergency situations within the boundaries of the site.

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 Pioneer. The Emergency Response Guide Sodium Cyanide is relevant to road transportation within the Asia Supply Chain.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



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.

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*.

### Pioneer Ocean Freight

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

### 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

Orica Asia Supply Chain

25 February 2011

Name of Facility

Signature of Lead Auditor

Date



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

The Orica Asia 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 Asia 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 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*

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



Questionnaire (SOP TMP 16), which enables a self assessment and external assessment. The assessment sheet is very detailed and includes two parts.

Pioneer Ocean Freight

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

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 Asia 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.

Pioneer Ocean Freight

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

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 Asia 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 Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



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.

Pioneer Ocean Freight

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

2.3.5 Transport Practice 3.5

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

The operation is [X] in full compliance with [ ] in substantial compliance with [ ] not in compliance with Transport Practice 3.5

Summarise the basis for this Finding/Deficiencies Identified:

The Orica Asia 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 Asia 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.

Orica Asia Supply Chain Name of Facility Signature of Lead Auditor Date 25 February 2011



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. Orica has conducted mock emergency drills with Pioneer Ocean Freight.

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.

### Pioneer Ocean Freight

Pioneer Ocean Freight was certified in full compliance with the Code on February 9, 2011.

## 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 in September 2010.

#### 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 a-i)
  - 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.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



### ■ Conclusion

Orica concluded in the due diligence, that no issues of concern were noted in regards to MSC management and shipping of the sodium cyanide product. The due diligence also noted that the report is not a final acceptance of MSC for future work and as with all service providers to Orica; AGR will continue to review and monitor their performance. In particular, any changes in state, national or international regulations, standards or laws can result in a total review of the international shipping requirements.

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.

### 3.1.3 K-Line Shipping

#### 3.1.4 Audit and Operational Information

K-Line Shipping (K Line) is a carrier service providing international shipping of containers on a fleet of their container vessels, mainly in the SE Asia region.

A due diligence of K-Line shipping was conducted by Orica in September 2010.

#### 3.1.5 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 a-i)
  - 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

Orica concluded in the due diligence, that the due diligence found no issues of concern in regards to K-Line management and shipping of the sodium cyanide product. It was also noted that the due diligence was not a final acceptance of K-Line for future work and as with all service providers to Orica, Orica will continue to review and monitor their performance. In particular, any changes in state, national or international regulations, standards or laws can result in a total review of the international shipping requirements.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



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 K-Line Shipping.

### 3.2 Port of Laem Chabang

#### 3.2.1 Audit and Operational Information

The Port of Laem Chabang, Bangkok, Thailand, is the main deep sea port of Thailand that offers universal services in order to exchange goods worldwide.

A due diligence of Laem Chabang Port was conducted by Orica in September 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 a-i)
  - Transport Practice 1.6
  - Transport Practice 2.1 (2.1.1 – 2.1.2, 2.1.4 and 2.1.6)
- Summary of Port Operations
- Arrivals
- Stevedoring
- Dangerous Goods Logistics centre
- Port information
- Conclusion

Orica concluded in the due diligence, that the due diligence found no issues of concern in regards to Port of Laem Chabang's management of the sodium cyanide product. It was also noted that the due diligence was not a final acceptance of the Port of Laem Chabang for future work and as with all service providers to Orica, Orica will continue to review and monitor their performance. In particular, 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 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 Laem Chabang.

Orica Asia Supply Chain

Name of Facility

Signature of Lead Auditor

25 February 2011

Date



## Report Signature Page

**GOLDER ASSOCIATES PTY LTD**

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Associate and Environment Group Manager

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# APPENDIX A

## Limitations



## LIMITATIONS

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