August 2013

INTERNATIONAL CYANIDE MANAGEMENT CODE PRODUCTION RE-CERTIFICATION AUDIT

Anhui Anqing Shuguang Chemical Co Ltd Production Facility Summary Audit Report

Submitted to:
International Cyanide Management Institute (ICMI)
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Washington DC 20005
UNITED STATES OF AMERICA

REPORT

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Distribution:

International Cyanide Management Institute
Anhui Anqing Shuguang Chemical Co Ltd

Golder Associates

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1.0 SUMMARY AUDIT REPORT FOR CYANIDE PRODUCTION OPERATIONS

Name of Cyanide Production Facility:	Anhui Anqing Shuguang Chemical Co Ltd
Name of Facility Owner:	Anhui Anqing Shuguang Chemical Co Ltd
Name of Facility Operator:	Anhui Anqing Shuguang Chemical Co Ltd
Name of Responsible Manager:	Mr Li Derong
Address:	Anhui Anqing Shuguang Chemical Co Ltd 47 Jingbei Road Anqing
State/Province:	Anhui Province
Country:	Peoples Republic of China

2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

2.1 Anhui Anqing Shuguang Chemical Company Limited

Shuguang (founded in April 1994) is a large enterprise manufacturing high-purity solid sodium cyanide in the People's Republic of China. Shuguang has a production capacity of 50,000 tonnes per annum, and services both domestic Chinese and export markets in South America and Asia. Shuguang's "Qingyi" branded industrial sodium cyanide accounts for approximately 30% of the cyanide product sold in the domestic market, and almost 90% of China's exports of sodium cyanide. This is largely attributed by Shuguang to the claimed high quality of their product.

Shuguang makes consistent statement of its commitment to stable and safe production of cyanide, and no safety or environmental incidents of significance have been reported. The company has been awarded credits as "National Advanced Chemical Enterprise of Protecting Environment" and "National Example Enterprise of Occupational Health".

2.2 The Production Facility

The Production Facility is located adjacent to the acrylonitrile unit of the Anqing Branch of China Petroleum and Chemical Corporation (AQPCC).

AQPCC manufactures hydrocyanic acid as a by-product of its process for the manufacture of acrylonitrile. Hydrocyanic acid is delivered to Shuguang by pipeline to manufacture high-purity solid sodium cyanide.

Shuguang also purchases 40% liquid sodium cyanide from Anqing New Shuguang Fine Chemical Co Ltd. This material is transported to Shuguang by road tanker for use in manufacturing solid sodium cyanide. The sodium cyanide produced by Anqing New Shuguang Fine Chemical Co Ltd is supplied to a range of customers for uses relating to galvanization, pesticides, pharmaceuticals, dying as well as supporting Shuguang in its business supplying gold mining markets. The sodium cyanide supplied to Shuguang is therefore not produced by Anqing New Shuguang Fine Chemical Co Ltd primarily for use in gold mining and is not subject to the requirements of the Cyanide Code.

The key processes involved in the production are:

- Reaction – liquid hydrocyanic acid with purity higher than 99.5% supplied by the adjacent acrylonitrile facility is reacted with 48% sodium hydroxide to form sodium cyanide solution.

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- Evaporation and Crystallization - saturated sodium cyanide solution is pumped into a vacuum evaporator to remove the water, and the concentrate is fed to the crystallizer.
- Solid Liquid Separator - wet crystals are generated by continuous solid-liquid separation of the concentrated crystal pulp.
- Drying – the sodium cyanide crystal is heated transiently in the dryer to evaporate the residual water, and crystals are dried into dry powder.
- Moulding - Dry sodium cyanide powder is moulded into “pillows” of flakes.
- Packaging - sodium cyanide is delivered into the tablet tank through oscillatory conveyor and then is weighed in the weighing and packing machine. After filling, weighing and covering, qualified products tested by random sampling will be attached with a certificate and stamped with the work number, and then put in storage. Solid sodium cyanide and potassium cyanide products are packed within steel drums or wooden barrels with an inner liner of high-density polyethylene.

Key changes to the facility and its operations since the previous ICMIC audit in 2009 comprise:

- Construction of a new cyanide storage warehouse.
- Construction of a new warehouse for storing of cyanide packaging materials.
- Construction of new cooling towers for the cyanide plant.
- Construction of a new sodium hydroxide storage tank farm, comprising 2 existing 330 m^3 storage tanks (relocated from an existing tank farm to the new tank farm) and 6 new 500 m^3 bulk aboveground storage tanks in a new bunded tank farm. The site previously had 3 sodium hydroxide storage tanks, three of capacity of 330 m^3. One of these tanks has been converted to storage of sodium cyanide. The other two tanks have been relocated to the new sodium hydroxide tank farm.
- Reconfiguration of the storage of sodium cyanide. Three years ago the storage comprised two 75 m^3 and two 32 m^3 storage tanks in a single tank farm. Now the storage comprises the two 75 m^3 storage tanks relocated to the former water recycling area and one of the former 330 m^3 NaOH storage tanks. The two former 32 m^3 storage tanks have been removed.
- Installation of a third hydrocyanic acid/sodium hydroxide reactor unit of similar design and capacity to the two existing reactors.
- The underground transfer pipe for the treated wastewater from the WWTP was replaced with an aboveground section of pipe.

There have not been any significant changes to the evaporation, crystallisation, centrifuge, dryer, pressing or packaging operations in the last 3 years.

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3.0 SUMMARY AUDIT REPORT

3.1 Auditor's Findings

Anhui Anqing Shuguang Chemical Co Ltd is:

☒ **in full compliance with**

☐ in substantial compliance with

☐ not in compliance with

The International Cyanide Management Code

This operation has not experienced compliance problems during the previous three-year audit cycle.

Audit Company:	Golder Associates
Audit Team Leader:	Tom Carmichael, Lead Auditor
Email:	tomcarmichael@golder.com

Name and Signatures of Auditors

Name, Position	Signature
Tom Carmichael, ICMI Pre-certified Lead Auditor and Production Technical Specialist	
Russell Beazley, Auditor	

3.2 Dates of Audit

The Re-Certification Production Audit was undertaken over six person days between 25 and 27 March 2013.

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Transportation Operations and using standard and accepted practices for health, safety and environmental audits.

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3.3 Principle 1 – Operations

Design, Construct and Operated Cyanide Production Facilities to Prevent Release of Cyanide

Operations Practice 1.1: **Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures**

☒ **in full compliance with**

The operation is ☐ in substantial compliance with **Operations Practice 1.1**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 1.1 requiring an operation design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

Quality assurance and quality control practices were applied to the initial plant construction in 1995, to the major expansion completed in 2007 and to the modifications undertaken since 2009.

The construction works undertaken have adopted established standards for materials of construction using materials such as HDPE-lined mild carbon steel and stainless steels (grades 304 and 316) recognised for their compatibility with cyanide. Shuguang has also made appropriate investigations to support its use of such materials as epoxy and neoprene rubber.

Whilst the plant is operated by a significant workforce, it is also extensively instrumented with indicators, alarms and interlocks connected to a centrally-located distributed control system to help manage processing risks including releases and exposures. The chemical reactors are instrumented for early identification of conditions that could lead to cyanide releases and there is an emergency shutdown system to stop the reaction if a hydrogen cyanide release is detected.

Electric power supply is duplicated so that a backup supply can be activated if the primary power feeder fails.

Level indicators and alarms are installed on tanks to manage the risk of overfilling.

Cyanide is managed on concrete surfaces to ensure that cyanide spills or cyanide-contaminated water generated when responding to a hydrogen cyanide release cannot seep into the ground. Cyanide storage secondary containments are sized to contain at least 110% of the volume of the largest tanks and the concrete structures are lined with epoxy liners to ensure impermeability is maintained.

The risks of releases from cyanide process pipelines are managed by a combination of measures including fixed HCN detectors, valve guards, use of appropriate construction materials and preventive maintenance.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Operations Practice 1.2**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 1.2 requiring that develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

The Production Facility has an extensive system of procedures, instructions and checklists (including signs to reinforce operating requirements) which support the management of the integrity of processing equipment and its operation in a manner planned to avoid cyanide releases and exposures. The procedures deal comprehensively with both normal and abnormal operating requirements.

The Production Facility applies effective procedures to control the modification of physical plant and operating instructions. The evaluation of proposed modifications takes account of the potential impacts on the environment, health and safety and has been applied to the modifications undertaken since production began in 1996.

An annual plan of preventive maintenance activities is prepared for each year, establishing intervals to be adopted for inspections, protective activities and calibrations of instruments monitoring such parameters as hydrogen cyanide concentrations, pressures, flows and levels.

The process plant is extensively instrumented to support the activities of its large workforce. Some instruments display locally whilst others are monitored and interpreted in the central control room.

Under normal circumstances there is no discharge of cyanide-contaminated water to the environment, with on-line monitoring of cyanide concentrations in effluent and stormwater discharges being used to initiate corrective actions when criteria are exceeded.

Procedures are in place to ensure the avoidance of cyanide-contaminated waste and to treat cyanide-contaminated waste where this is generated (e.g. used packaging, used personal protective equipment). The Production Facility employs a licensed facility and accredited technology to decontaminate its solid wastes. The cyanide warehouse is designed to provide good ventilation (using both mechanical and natural ventilation) whilst also protecting the packaged product from moisture through the use of wooden pallets and to ensure drums are kept elevated. Humidity is monitored using hygrometers.

The site is subject to high integrity security arrangements by means of effective fence and numerous security cameras. Procedures are in place to ensure cyanide is packaged as required by the political jurisdictions through which the load will pass. Packages are routinely labelled in Chinese, English and Russian.

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with **Operations Practice 1.3**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 1.3 requiring it to inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

Inspections of the integrity of tanks, pumps, pipes, valves and bunds are undertaken as part of the operation's preventive maintenance program. The frequencies of preventive maintenance activities are reviewed annually.

Inspections for leaks and housekeeping are undertaken as part of operational monitoring of the plant, which includes two-hourly inspections in each department by multidiscipline teams of at least five people.

Operational monitoring is also undertaken using the extensive instrumentation. The plant displayed a high standard of housekeeping during the audit.

Records are maintained of the various inspections, with inspections recorded on hardcopy checklists, and corrective actions (repairs) are recorded in the Maintenance Records. These documents are retained in hardcopies and managed by the relevant departments.

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3.4 Principle 2 – Worker Safety

Protect Workers' Health and Safety from Exposure to Cyanide

Practice 2.1: **Develop and implement procedures to protect plant personnel from exposure to cyanide.**

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Worker Safety Practice 2.1**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 2.1 requiring an operation develop and implement procedures to protect plant personnel from exposure to cyanide.

The site has developed formal procedures to minimise worker exposure during normal plant operations, non-routine or emergency operations and during maintenance. Shuguang has a *Safety Production Procedure*, which outlines general safety precautions for normal operations and maintenance activities. Procedures are available for specific operating and maintenance tasks. Emergency response documentation details the safety precautions to be undertaken during non-routine and emergency situations.

The facility has a procedure to review proposed process and operational changes and modifications for their potential impacts on worker health and safety, and to incorporate the necessary worker protection measures. The procedure applies to all plant modifications to ensure that they are implemented in a manner which does not present a hazard to safety, health, the environment or physical security. For all the potential modifications, likely risks and appropriate control measures must be identified to manage the health, safety and environment impacts. Modification proposals are reviewed by a suitably qualified person from the EHS, Production and Equipment and Maintenance departments. Of the sample change applications viewed, the EHS Manager had participated in the risk assessment process and the changes were all signed off by the General Manager.

The managers of the Production Facility solicit and consider worker input in developing and evaluating health and safety procedures. The employees are involved in the hazard identification and risk control measures through specific meetings, Team Meetings and suggestions from employees. Employees can make suggestions regarding process or procedural changes to their supervisors or management via the Employee Suggestion Box.

The facility uses fixed and portable monitoring devices to confirm that controls are adequate to limit worker exposure to hydrogen cyanide gas and sodium, calcium or potassium cyanide dust to 4.7 ppm (5 mg/m^3) or less, as cyanide. Each type of monitor is set to alarm at 4.7 ppm (5 mg/ m^3). In addition to gas monitoring, Shuguang undertake daily, weekly, fortnightly and monthly manual cyanide dust monitoring at a number of locations throughout the facility.

Hydrogen cyanide monitoring equipment is maintained, tested and calibrated in a manner consistent with the directions of the manufacturer, and records are retained for at least one year. Both fixed and portable HCN monitoring equipment is calibrated on a six monthly basis.

The Facility has identified areas and activities where workers may be exposed to HCN gas or sodium cyanide dust at more than 4.7 ppm (5 mg/m^3) or less, as cyanide, and requires the use of personal protective equipment as necessary in these areas when these activities are being performed. Signs displayed, and Standard Operating Procedures set out requirements for the use of defined PPE specific to the distinct areas listed above.

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The Production Facility has provisions for a buddy system, or workers can otherwise notify or communicate with other personnel for assistance, help or aid where deemed necessary. The *Production Design Management and Emergency Response* procedure clearly specifies that all the operations must be conducted by at least two operators, and generally by four operators. In the event of any emergency, the operator can report to the manager or doctors using a mobile phone or through fixed radios located throughout the facility.

The Production Facility assesses the health of employees to determine their fitness to perform their specified tasks. The *Occupational Health Monitoring Regulation* clearly specifies the health requirements for each job, ranging from the chemical operators, maintenance operator, manager, laboratory technician, laundry workers, and drivers. Prior to commencing employment, pre-health assessment is conducted.

The Production Facility has a clothing change procedure for employees, contractors and visitors to areas with the potential for cyanide contamination of clothing. The procedures clearly state that required personal protective equipment must be fitted before entry to the relevant work areas.

There are warning signs advising workers that cyanide is present and that, if necessary, suitable PPE must be worn. Warning signs are located extensively around the Production Facility. At locations where exposure to harmful concentrations of cyanide is possible, there are warning signs about the potential injury and PPE requirements.

Personnel are prohibited from smoking, eating and drinking, and having open flames in areas where there is the potential for cyanide contamination. Procedures and signs clearly state the prohibitions of smoking, eating, drinking and open flames in the designated production areas.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Worker Safety Practice 2.2**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 2.2 requiring an operation develop and implement plans and procedures for rapid and effective response to cyanide exposure.

The facility has developed specific written emergency response procedures to respond to cyanide exposures. The procedural documents identify self-rescue, rescue by an operation partner, and rescue by First Aid Station as possible scenarios in the event of the cyanide exposures such as skin exposure and eyes exposure. An *Emergency Response Knowledge Question and Answer Card* is distributed to each employee.

There are also warning signs containing emergency response procedures in the plant.

Showers, low-pressure eye wash stations and non-acidic fire extinguishers are located strategically throughout the facility and they are maintained and inspected on a regular basis. Non-acidic fire extinguishers are inspected on a weekly basis for presence and a monthly basis for pressure checks.

The facility has water, oxygen, resuscitator, antidote and a means of communication readily available for use in the plant.

Fixed radios and telephones are installed to as a means of communication or notification in the event of emergency.

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The Production Facility inspects its first aid equipment to assure that it is available when needed. First aid and emergency response equipment is stored and tested in accordance with the manufacturers' specifications, and replaced on a schedule that assures they will be effective when used. Eye washes and showers are inspected twice every week and other emergency aid equipment (such as antidotes) is inspected at appropriate intervals.

Antidotes are stored under temperature conditions per manufacturer's specifications.

MSDS and first aid procedures on cyanide safety are in the language of the workforce (Chinese) and are available to workers in the areas where cyanide is handled. All procedures including the MSDS are located in the First Aid Station and EHS Department.

Storage tanks, process tanks, containers and piping containing cyanide is identified to alert workers of their contents.

The facility has a decontamination procedure for employees, contractors and visitors leaving areas with the potential for skin exposure to cyanide. All visitors and facility workers receive induction training detailing information about the danger of cyanide, risks at the plant and safety information in general, including cyanide exposure procedures and decontamination requirements.

The facility has on-site capability (including doctors and nurses) to provide first aid and medical assistance to workers exposed to cyanide.

The facility has developed procedures to transport exposed workers to locally qualified, off-site medical facilities. All cyanide exposure will be treated by site medical staff in the first instance. Should the injuries be too severe to successfully treat on-site, patients can be transferred to the Anqing Shi Hua Hospital via ambulance, which is a 3.0 km journey.

The Facility has alerted local hospitals of the potential need to treat patients for cyanide exposure, and the operation is confident that the medical facility has adequate, qualified staff, equipment and expertise to respond to cyanide exposures.

Mock emergency drills are conducted annually to test response procedures for various exposure scenarios, and lessons learned from the drills are incorporated into response planning.

Procedures are in place to investigate and evaluate cyanide exposure incidents to determine if the Facility's programs and procedures, to protect worker health and safety and to respond to cyanide exposures, are adequate or need to be revised. Shuguang reports that it has never had an incident or injury leading to a cyanide exposure.

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3.5 Principle 3 – Monitoring

Ensure that Process Controls are Protective of the Environment.

Monitoring Practice 3.1: **Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.**

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Monitoring Practice 3.1**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 3.1 requiring an operation conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

There is no direct discharge to surface water under normal operating conditions, nor is there any indirect discharge of contaminated groundwater to surface water. No groundwater contamination has been identified at the site to date. Water discharges ultimately destined for disposal to the Yangtze River are monitored as they cross the boundary of the Production Facility, allowing responsibility for any issues to be clearly differentiated from those that could originate from the adjoining site that also handles hydrogen cyanide.

Atmospheric emissions are limited by controls including a cyclone dust removal, water and alkaline scrubbers, and local exhaust ventilation. A network of on-line HCN meters is located at key locations through the Facility for monitoring purposes.

Groundwater monitoring is conducted twice monthly on two bores located upstream and downstream of the manufacturing area within the site and on-line monitors provide continual monitoring of emissions to air and water to ensure there is no delay in detecting abnormal conditions.

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3.6 Principle 4 – Training

Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner

Practice 4.1: **Train employees to operate the plant in a manner that minimizes the potential for cyanide exposures and releases.**

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Training Practice 4.1**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 4.1 requiring an operation train employees to operate the plant in a manner that minimises the potential for cyanide exposures and releases.

The facility trains workers to understand the hazards of cyanide and refresher training is periodically conducted.

The site has a programme for the induction of new employees, which includes the following levels of targeted training:

- Company level safety training
- Department level safety training
- Shift level safety training
- Job skill training (as required for job roles); and
- Annual refresher training.

The facility trains workers in the use of PPE and when and where this equipment is required, via orientation training, annual refresher training and signage throughout the plant.

The facility trains workers to perform their normal production tasks with minimum risk to worker health and safety and in a manner that prevents unplanned cyanide releases. The *Employee Training Plan* outlines the various positions within Shuguang and the required training that must be given. Both the Department and Team safety training and the job skill training cover health and safety issues in normal operations, including those associated with nominated positions/tasks.

The training elements necessary for each job are identified in training materials. The *Employee Training Plan* outlines the elements for each training session required to be given per position. The relevant procedures are used to provide the training detail/material.

Training is provided by appropriately qualified personnel. Shuguang as 41 trainers spread across a number of disciplines. These trainers are required to be on both the technical competence and their communication skills. Technical competence is demonstrated through external licencing for Health, Safety and Environment trainers, through internal licencing following completion of an examination for technical trainers. Communication skills are signed-off following satisfactory completion of an interview with the Shuguang Vice General Manager.

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Employees are trained and their competency is evaluated prior to being allowed to work with cyanide. There is a progressive approach to developing competency. Competency is considered to be achieved when the trainee has passed all the required examinations (written or informal test/demonstration) within the training period for each module of competency.

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	**Training Practice 4.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 4.2 requiring the operation train employees to respond to cyanide exposures and releases requiring an operation train employees to respond to cyanide exposures and releases.

The facility trains workers in the procedures to be followed if a cyanide release is discovered and to respond to worker exposure to cyanide. Routine drills are used to test and improve their response skills.

Upon employment, employees receive Company, Department and Team level training on health, safety, environment, technical and emergency response aspects associated with Shuguang's operations and the role of the employee.

Additionally, annual refresher training is given on hazards and safety considerations at the facility. This is mapped out each year in the *Employee Training Plan* and includes monthly training sessions. Topics include those associated with emergency response.

The *Emergency Response Knowledge Question and Answer Card* is provided to workers as an aide memoire, documenting the key points covered in training.

Emergency drills are evaluated from a training aspect to determine if personnel have the knowledge and skills required for effective response. Training procedures are revised if deficiencies are identified. During the recertification period, Shuguang has conducted two mock emergency drills (June 2011 and June 2012). The purpose of the drills was to test the procedures, equipment, and first aid capacity of the facility. No corrective actions were identified from these drills. However, according to the EHS Manager, if there is any deficiency identified, such as in the effectiveness of the procedures or their observed implementation, a corresponding corrective plan and measures will be drawn up to support the continual improvement of the response planning. Implementation of corrective action measures are verified by the respective supervisors.

Training records are retained throughout an individual's employment documenting the training they have received, including the names of the employee and the trainer, the date of training, the topics covered, and examination and job observation records demonstrating the employee's understanding of the training materials.

A selection of training records was reviewed for production and maintenance personnel at Shuguang. These records indicated that the appropriate Company, Department and Team level orientation training was being conducted as well as the scheduled annual training. Interviews with the employees that these records correspond to support this assertion.

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3.7 Principle 5 – Emergency Response

Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities.

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

☒ **in full compliance with**

The operation is
☐ in substantial compliance with **Emergency Response Practice 5.1**
☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 5.1 requiring the operation prepare detailed emergency response plans for potential cyanide releases.

The site has developed written documents that constitute an Emergency Response Plan to address potential releases of cyanide that may occur on-site or may otherwise require response. These documents contain procedural information specifying actions to be conducted, decisions to be made and details of persons responsible to make decisions and undertake the actions.

A detailed *Emergency Incident Management Plan* has been developed, which identifies seventeen types of emergencies, of which nine are related to cyanide release.

The Emergency Response Plan documents describe specific response actions considered appropriate for the identified potential emergency situations (such as decisions to evacuate employees and communities) and use of cyanide antidotes. Generic responses for isolating releases at source are covered in overarching emergency response documentation, whilst specific scenarios are covered in detail for responses emergency releases (including control and containment). Emergencies would be investigated as incidents to determine the underlying causes and corrective actions required to prevent recurrence.

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

☒ **in full compliance with**

The operation is
☐ in substantial compliance with **Emergency Response Practice 5.2**
☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 5.2 requiring an operation involve site personnel and stakeholders in the planning process.

Shuguang has involved its workforce and external stakeholders in the emergency response planning process. The workforce has the opportunity to participate in the planning process through annual training in emergency response. External stakeholders involved have included Wu Li Village, the neighbouring facility of the Anqing Petrochemical Company, Fire Protection Service, Safety Protection Bureau, Environment Protection Bureau and Anqing Shi Hua Hospital.

Each external stakeholder has been provided with a copy of the emergency response documentation and have acknowledged their awareness of these documents formally.

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Shuguang has entered an agreement with the neighbouring community, Wu Li Village regarding the communication and response actions to be taken if evacuation is ever required.

An agreement has been established with the Anqing Shi Hua Hospital to cover the support it will provide to Shuguang's on-site health professionals in the event of acute poisoning.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Emergency Response Practice 5.3**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 5.3 requiring the operation designate appropriate personnel and commit necessary equipment and resources for emergency response.

The emergency response documentation designates the General Manager as primary and the Vice General Manager as alternate emergency response commander in chief with explicit authority to commit the resources necessary to implement the emergency response documentation.

The emergency response documentation identifies the Emergency Response Teams and the training required to put the emergency response documentation into effect.

The emergency response documentation includes call-out procedures and contact information for the command team members and clearly specifies the duties for all emergency response trained members (consistent with the roles assigned to them on a departmental basis).

A list of emergency response equipment is included with the emergency response documentation. A procedure is in place to inspect emergency response equipment and assure its availability as required in the emergency response documentation. Inspection records were sighted by the Auditor.

The outside responders who may be directly involved in responding to an emergency have formally acknowledged their awareness of the emergency response documentation. Members of regulatory bodies and a neighbouring company were involved in mock drills in 2011 and 2012.

Shuguang considers that Anqing Yicheng Hospital does not need to be involved in drills.

Shuguang conducted a cyanide spills emergency response drills. The records of the drill indicate that the local Fire Protection Authority, Environment Protection Bureau, Worker Safety Authority and representatives of the local village were involved in the most recent drill in April 2013.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Emergency Response Practice 5.5**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 5.4 requiring an operation develop procedures for internal and external emergency notification and reporting.

The emergency response documentation contains clear flow charts describing the call out procedures and contact information for management, internal responders, outside responders and medical facilities.

Based on a review of potential releases from the Production Facility and the distances involved, Wu Li Village has been identified as the only residential community potentially affected by an emergency. Procedures and contact information for notifying Wu Li Village are clearly described in the Plan. A neighbouring chemical manufacturing facility has also been identified as potentially affected by an emergency.

The emergency response documentation notes that specific government agencies and designated media contacts are to be notified if the impact of an emergency extends outside the facility.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Emergency Response Practice 5.2**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 5.5 requiring an operation incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The emergency response documentation does describe specific, appropriate remediation measures, such as recovery or neutralisation of solutions or solids, decontamination of soils or other contaminated media and management and/or disposal of spill clean-up debris. This includes for both soil and groundwater contamination. Alternate drinking water supply is regarded as not applicable to the Shuguang site given that the drinking water supply is municipal water, and that the nearest surface water is approximately 3.0 km from the site. The drinking water source is the Yangtze River, which is about 11 km southeast of the Site.

The emergency response documentation prohibits the use of chemicals such as sodium hypochlorite, ferrous sulfate and hydrogen peroxide to treat cyanide released into surface water. In any case, the release of cyanide into surface water is not considered a credible scenario.

The emergency response documentation addresses arrangements for environmental monitoring of soil and groundwater to identify the extent and effects of any release, including sampling methodologies, parameters for analysis and reference criteria.

Anhui Anqing Shuguang Chemical Co Ltd		30 August 2013
Name of Facility	Signature of Lead Auditor	Date

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Emergency Response Practice 5.6**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Standard of Practice 5.6 requiring an operation periodically evaluate response procedures and capabilities and revise them as needed.

The emergency response documentation is required to be evaluated at least annually and updated if any deficiencies are identified during drills or the actual implementation of the emergency response documentation. Evidence of annual review was provided to the Auditor.

Two drills involving cyanide exposures and releases during the recertification audit and involved internal and external stakeholders.

Anhui Anqing Shuguang Chemical Co Ltd		30 August 2013
Name of Facility	Signature of Lead Auditor	Date

Report Signature Page

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