

SUMMARY AUDIT REPORT

for the September 2016
International Cyanide Management Code Recertification Audit



Prepared for:

Anhui Anqing Shuguang Chemical Co., Ltd (AASCC)

Submitted to:

International Cyanide Management Institute
1400 I Street, NW, Suite 550
Washington, DC 20005, USA

FINAL

13 January 2017



Ramboll Environ Shanghai, Inc.
Suite 13-A New Hualian Mansion East Building
No.755 Huaihai Road (M) Shanghai 200020
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SUMMARY AUDIT REPORT

Name of Producer: Anhui Anqing Shuguang Chemical Co., Ltd

Name of Owner: Anhui Anqing Shuguang Chemical Co., Ltd

Name of Responsible Mr Changbin Chen, Senior Vice President

Address: No.47 Jingbei Road, Anqing City
Anhui Province

Telephone: +0556-5055689

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Location detail and description of operation:

Anhui Anqing Shuguang Chemical Company Co., Ltd (AASCC) located at No.47 Jingbei Road, Anqing City, Anhui Province, P.R. China, is responsible for solid cyanide manufacturing (i.e., sodium cyanide and potassium cyanide) from hydrocyanic acid. The company operates under a Dangerous Chemical Safe Production License issued by the Anhui Province Work Safety Bureau, and valid from May 4, 2014 to May 3, 2017.

AASCC is located adjacent to the acrylonitrile unit of the Anqing Branch of China Petroleum and Chemical Corporation (AQPC). As a by-product of acrylonitrile manufacturing, hydrocyanic acid is delivered to AASCC by pipelines for manufacture of solid sodium cyanide. AASCC also purchases additional 40% liquid sodium cyanide from Anqing New Shuguang Fine Chemical Co., Ltd.

The AASCC sodium cyanide manufacturing operations include:

- Reaction - liquid hydrocyanide acid (above 99.5% in purity) supplied by the adjacent acrylonitrile facility is reacted with 48% sodium hydroxide to form sodium cyanide solution;
- Evaporation and Crystallization - saturated sodium cyanide solution is pumped into a vacuum evaporator to remove 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 in the dryer to evaporate the residual water, and crystals are dried into dry powder;
- Moulding - Dry sodium cyanide powder is moulded into "pillows" or flakes;
- Packaging - sodium cyanide is delivered to the tablet tank through an oscillatory conveyor and then weighted in the weighing and packing machine. Products are

tested by random sampling and the qualified products are packed with steel drums or wooden boxes with inner polyethylene liners.

Based on the interview with the site personnel and site observation, there have been no significant changes since the previous ICMC audit in 2013.

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Auditors' Finding

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

The Anhui Anqing Shuguang Chemical Co., Ltd (AASCC) operation has not experienced any cyanide incidents, releases, or exposures, or any significant compliance ICMC compliance issues since the operation was previously certified in 2013.

Audit Company: **Ramboll Environ Shanghai, Inc.**
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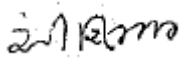
Audit Team Leader and Technical Auditor: Fengli Liu

e-mail: fliu008@163.com

Date(s) of Audit: 6 Sep 2016 and 8 Sep 2016

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 Finding 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 Cyanide Production Verification Protocol* and using standard and accepted practices for health, safety and environmental audits.

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SUMMARY AUDIT FINDINGS REPORT

1. Operations: Design, construct and operate cyanide production facilities to prevent release of cyanide.

Production 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 Production Practice 1.1**

The operation is

in substantial compliance with
not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

The Production Facility is in FULL COMPLIANCE with Production Practice 1.1 which requiring the design and construction of cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

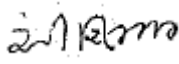
Quality control and quality assurance (QA/QC) programs have been implemented during construction of cyanide facilities and storage facilities, and the QA/QC records have been retained.

For any new construction of cyanide production and storage facilities, the construction representative from the vendor (including the supervision contractor) signed off after the completion of construction, and AASCC qualified engineers who have rich experiences in cyanide facilities also review and sign off to accept the handover of the assets.

Grade 304 stainless steel is used for cyanide production facilities and cyanide storage tanks. Grade SUS316L stainless steel is used for the HCN pipeline from AQPC and Grade 304 stainless steel is used for other pipelines at the facility. Carbon steel is used for compressed air storage tanks. High density polyethylene (HDPE), which is also compatible with cyanide, is used for the construction of sodium hypochlorite storage tank. The two wastewater storage tanks are constructed of mild carbon steel and are lined with polyethylene to prevent corrosion. The aboveground wastewater pipelines are made of carbon steel (Q235B) suitable for cyanide containing wastewater transfer.

AASCC has automatic system and "interlocks" that shut down production system and prevent releases due to power outage or equipment failure. Two power supply lines are maintained at the site, therefore in the event of one power line failure, the other

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power line will be initiated. In the event of power failure or other upset, causes any of the eight parameters (e.g., temperature, pressure, flow rate, pump, and etc) to migrate outside of normal operating conditions, the Distributed Control System (DCS) will initiate the emergency shutdown system.

Extensive instruments (e.g., radar level meters, high pressure alarm, high level alarm, high level gauge) are installed for the onsite reactors and storage tanks. These instruments are connected to the central control room to manage the risks in any accidental conditions.

The surfaces of the production process area and packaging workshop are paved with concrete with epoxy coatings. In addition, the cyanide storage farms are also with concrete and epoxy coating and constructed with the bund capacity at least 110% of the volume of the largest tank. The packaging workshop and cyanide products warehouse are also constructed with concrete floors to minimise the potential for seepage to the subsurface.

There are extensive level control instruments and trip systems throughout the facility to minimize the release of cyanide from process pipelines. These include level indicators and level switches that are controlled by the DCS system. The pressured pipelines for sodium cyanide, sodium hydroxide and steam are identified as special equipment in China and therefore regular compulsory inspection by the local authority. Thickness inspection is conducted by AASCC on annual basis and all pipelines containing cyanide solution are welded without flanges except for some valves and instrumental connections.

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

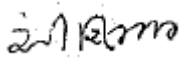
The operation is **■ in full compliance with Production Practice 1.2**
in substantial compliance with
not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

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

AASCC has extensive procedures and instructions that describe the standard practices necessary for its safe and environmentally sound operation. Currently, AASCC operates under an integrated management system which has been certified by licensed third-party for ISO 9001, ISO 14001 and OSHA 18001. The procedures

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implemented at AASCC cover both the normal operating conditions and abnormal operating conditions.

A change management procedure is in place to ensure all plant modifications are implemented in a manner which does not present negative impact on safety, health and environment.

An annual preventive maintenance plan is prepared each year in accordance with the maintenance procedure for major facilities. This procedure sets out the maintenance frequencies and requirements. A monthly maintenance plan is developed on the basis of the annual plan.

AASCC has extensive instrumentation to monitor and control tank levels, pipeline flows, temperatures and pressure, representative of processing conditions. Some instruments have displays at the process equipment location to allow direct monitoring whilst others indicate equipment status in the central control room.

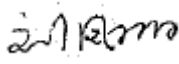
There are online monitoring devices and alarms installed at the wastewater discharge point to the AQPC treatment plant and from the treatment plant to the storm water discharge point to ensure the discharge of cyanide water in compliance with applicable standards. If either alarm sounds, the relevant valve is closed immediately. Water collected in the bund and first flush (first 15 minutes of rainwater) are collected and treated in the WWTP and if the clean storm water quality exceeds the applicable limit (0.2mg/L), the flow will be diverted to the WWTP for treatment.

Procedures are in place to ensure the cyanide containing wastes are disposed of appropriately. Sludge from the WWTP is treated and then disposed of by licensed vendor. Contaminated soil if generated is tested for cyanide concentration and if found to exceed the limit, soil will be treated before final disposal. Solid cyanide spills will be collected and then treated at the site's solid dissolving pond.

The cyanide warehouse buildings are appropriate fenced and provided with good ventilation. There are also cameras installed in the warehouses which report to the Security Guard House. Products are packaged using interior polyethylene bags and exterior steel or timber containers.

Procedures are in place to ensure the cyanide is packaged as required by the political jurisdiction through which the load will pass. Products supplied from the facility are labelled with two or three languages (Chinese, English and Russia) depending on customer requirements.

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

- **in full compliance with Production Practice 1.3**

The operation is in substantial compliance with
not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

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

Inspections for the 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.

Routine inspections of the production facility are conducted every two hours, covering the tanks, pipelines and pumps. The inspections are undertaken by a team which typically comprises at least five personnel from different departments.

Inspection frequencies are identified as sufficient to assure that equipment is functioning within design parameters and sufficient to ensure that deficiencies would be detected and equipment maintained in good operating condition.

Daily and monthly inspection records and checklists are maintained at the site. The inspection records include the date of the inspection, the name(s) of the inspector(s) and any deficiencies observed and corrective actions undertaken are also included in the maintenance records.

2. WORKER SAFETY: *Develop and implement procedures to protect personnel from exposure to cyanide.*

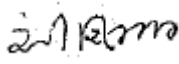
Production Practice 2.1: Develop and implement procedures to protect personnel from exposure to cyanide.

- **in full compliance with Production Practice 2.1**

The operation is in substantial compliance with
not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

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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 facility has developed procedures to minimize worker exposure during normal plant operations, non-routine and emergency operations, and maintenance related activities.

Procedure Process Operation Regulation for Sodium Cyanide Production and Safety Production Procedure stipulates the main standard operating procedures and safe work practices. *Procedure Production Design Management and Emergency Response and Emergency Incident Management Plan* stipulates the safety measures for the non-routine and emergency operations.

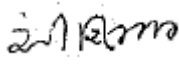
The facility has a procedure implemented to review proposed process and operational changes and modifications for their potential impacts on worker health and safety, and to incorporate the necessary worker protection measures. *Change Management Procedure* stipulates that prior to any modification, the relevant department prepares a modification implementation plan, stipulate risk control measures, and submit a Change Application form to the responsible department. The responsible department then arranges review meetings with participants. Qualified personnel from the EHS department are part of review panel to assess the potential risks for worker and environmental protection. The proposed change then requires approval and sign off by the General Manager.

The facility solicits and considers worker input in developing and evaluating health and safety procedures. Prior to the release and implementation of the health and safety procedures, the draft procedures will be distributed to all workers groups for their internal review, discussion and comments. Employees are also involved in the hazard identification and risk control measures through regular team meetings, department meetings and etc.

The facility uses 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 (5mg/m³) or less, as cyanide. The site has sixteen fixed HCN monitors installed at strategic locations throughout the cyanide production facility and also has four portable HCN monitors. Weekly air monitoring has been conducted by AASCC at major working stations including the warehouse, packaging station, V504 area, formatting area, and the central control room to ensure emissions are below the 1mg/m³ Chinese requirement.

Hydrogen cyanide monitoring equipment is maintained, tested and calibrated in a manner consistent with the direction of the manufacturer and records are retained

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for at least one year. Both fixed and portable HCN monitoring equipments are calibrated on annual 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/m³) or less, as cyanide, and requires the use of personal protective equipment as necessary in these areas when these activities are being performed. Procedure *Personal Protection Equipment Use Regulation* stipulates the detailed PPE requirement and PPE signs were noticed posted in the HCN bearing areas.

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. Procedure of *Production Design Management and Emergency Response* clearly states that all the operations must be conducted by at least two operators, and at least two inspectors are required for each site inspection tour. Workers are equipped mobile phones and walkie talkies and there are several fixed calling points located in the major HCN bearing areas,

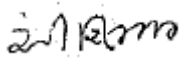
The facility assesses the health of employees to determine their fitness to perform their specified tasks. Pre- On- and Post-employment medical checks are conducted at the site. Employees with occupational contraindication are forbidden to perform the contraindicate works. The procedure of *Occupational Disease Prevention System* specifies the health requirement for each job task.

The 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 protection 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 were observed posted extensively around the production facility. At locations with potential exposure to cyanide, warning signs about the potential injury and PPE are provided. The signs are obvious and in generally good conditions.

Personnel are prohibited from smoking, eating and drinking, and having open flames in areas where there is the potential for cyanide contamination. Procedure *Occupational Disease Prevention System* clearly stipulates that smoking, eating, drinking and open flames at the cyanide work stations are strictly prohibited. Warning signs were also observed at the entrance of the production area.

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

- in full compliance with Production Practice 2.2

The operation is in substantial compliance with
not in compliance with

Summarize the basis for this Findings/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. Procedure *Emergency Incident Management Plan (Rev E)* identifies the possible scenarios in the event of the cyanide exposures including rescue by an operation partner and rescue by the First Aid Station. An *Emergency Response Knowledge Question and Answer Card* has been prepared and distributed to each on-site employee. This card specifies the emergency response procedures in case of any cyanide exposure.

Warning signs that provide emergency response procedures are also posted in the plant.

There are currently eighteen showers and eighteen low-pressure eye wash stations located in the plant. The showers and low-pressure eye wash stations are generally located within 15 m radius of the nearest work stations and are inspected twice every week. Dry powder fire extinguishers are located extensively in the plant and a few carbon dioxide fire extinguishers are also maintained at the site, but they are restricted for use on electrical fires and are not located in cyanide bearing areas.

Emergency response medical kits are reported and observed in the following areas: production workshop, packaging workshop, storage warehouse, and control rooms of the production building. The emergency response equipment maintained on site includes the oxygen cylinders, oxygen cylinder trolley, resuscitators and ambulance. Antidote injection medicines are stored in the first aid station. Each cyanide related work station is also provided with amyl nitrite as the antidote. In addition, mobile phones, walkie-talkies and fixed calling points provide a means of communication in the event of emergency.

The facility inspects its first aid equipment to assure that it is available when needed. First aid emergency response equipment is stored and tested in accordance with the manufacturer's specifications, and replaced on a schedule that assures they will be effective when used. Eye washes and showers are inspected twice a week. Other emergency aid equipment are inspected on monthly basis.

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Antidotes are stored in the first aid station under temperature conditions as by the manufacturer.

Material Safety Data Sheets (MSDS) are 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. First aid procedures and MSDS are maintained by the EHS Department as well as the First Aid Station which is accessible to employees 24 hours/day.

Storage tanks, process tanks and containers are labelled to identify their content and chemical formula in both Chinese and English. The flow directions are clearly indicated with yellow and black lines on the pipelines and the content (e.g., NaCN) are also posted in Chinese together with the chemical formula. The facility has a decontamination procedure for employees, contractors and visitors leaving areas with the potential for skin exposure to cyanide.

All visitors and contractors receive introduction trainings about the cyanide hazards, risks and safety procedures information before being permitted entry to the production facility. Procedure *Occupational Disease Prevention System* also clearly states the decontamination policy for employees, visitors and contractors.

The facility has on-site capability to provide first aid and medical assistance to workers exposed to cyanide.

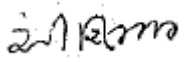
The facility has developed procedures to transport exposed workers to locally qualified, off-site medical facilities. Procedure *Emergency Incident Management Plan* stipulates that in the event of the cyanide leakage incident, the first aid station should immediately treat the injuries and in the case of severe injuries the injured person should be transferred to the nearby hospital (Anqing Petrochemical Hospital, 3km away to the site) in a timely manner for treatment.

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 response to cyanide exposures.

Mock emergency drills are conducted periodically 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 program and procedures, to protect worker health and safety and to respond to cyanide exposures, are adequate or need to be revised.

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AASCC reported that until now, there has never been an incident related to the cyanide leakage.

3. MONITORING: ***Ensure that process controls are protective of the environment***

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

The operation is ■ **in full compliance with Production Practice 3.1**
 in substantial compliance with
 not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

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

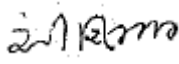
The facility does not have a direct discharge to surface water nor is there any indirect discharge of contaminated groundwater to surface water. The facility has its own wastewater treatment plant (WWTP) for preliminary treatment prior to sending the wastewater AQPCC treatment plant for additional treatment together with other wastewater streams generated by AQPCC before ultimate discharge to the Yangtze River. Domestic wastewater (e.g., bathroom, toilet, laundry room) is discharged directly to AQPCC without site treatment by the WWTP.

Clean storm-water runoff from the facility is collected and stored in the on-site storm water storage pit (312 m³) before discharge to the storm water collection system of AQPCC and finally to the municipal storm water drainage system of Anqing City. The first flush storm water from areas where the water may possibly be contaminated by cyanide is segregated and treated in the WWTP of AASCC.

Wastewater monitoring is conducted daily by AASCC and annually by a third-party testing institute. Results over the past three years showed that both the wastewater and storm water discharges are in compliance with the applicable standards.

Total cyanide concentration in groundwater beneath the facility is below levels that are protective of identified beneficial uses of the groundwater. Two groundwater wells are installed at the western and eastern site boundaries. Groundwater monitoring is conducted by a third party vendor on an annual basis and by AASCC every month, and the results show compliance with the applicable standards.

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Air emissions are controlled by cyclone-type dust removal, water and alkaline scrubber, and local exhaust ventilation prior to discharge. Fifteen online HCN detectors are located at key locations throughout the facility and constantly monitor the manufacturing processes areas.

Monitoring is conducted at frequencies adequate to characterise the medium being monitored and to identify changes in a timely manner. Groundwater monitoring is conducted by a third party vendor on an annual basis and by AASCC every month. Wastewater monitoring is undertaken by AASCC daily and by a third-party company annually at the final discharge outlet. Stormwater monitoring is undertaken by AASCC daily at the final discharge outlet and an online monitoring device is also installed at the final discharge point to provide real-time monitoring. Air emission monitoring is conducted by AASCC on a weekly basis at various locations and an online monitoring device is also installed at the bottom of the 50-m high stack from the drying process.

4. TRAINING: *Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.*

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

The operation is **in full compliance with Production Practice 4.1**
 in substantial compliance with
 not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

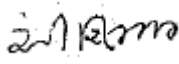
The Production Facility is in FULL COMPLIANCE with the Production Practice 4.1 requiring an operation train employees to operate the plant in a manner that minimises the potential for cyanide exposures and releases.

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

The site has established a training programme for new employees, which includes:

- Company level safety training;
- Department level safety training;
- Team level safety training;
- Job skill training;

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- Annual refresher training.

The facility trains workers in the use of PPE and when and where this equipment is required. During the orientation training for new employees, PPE use is one of the key topics and PPE training is also conducted during annual refresh trainings to teach and emphasize “how, when and where” to use PPE.

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. Internal procedures, national and local regulations, emergency response plan and health and safety related procedures and rules are used as training materials. Training elements necessary for each job are identified in training materials.

The annual training plan for all the employees outlines the training content, training target and training method for each training session and relevant procedures are used to provide the training details.

Training is provided by appropriate qualified personnel. AASCC has 51 trainers who are qualified on both the technical competence and their communication skills. AASCC assesses the communication abilities of trainers via interviews conducted by the department leader and the training centre of AASCC will verify and sign off to ensure the communication skills are satisfactory.

Employees are trained prior to being allowed to work with cyanide. Prior to allowing the new employees are required to participate in three levels of training (i.e., company-level, department-level and team level) and undertaken job skill training for three months under the guidance of a professional technician. Upon completion of the three months job skill training, the employee is required to pass an examination before starting the job.

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

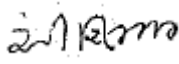
- **in full compliance with Production Practice 4.2**
in substantial compliance with
not in compliance with

The operation is

Summarize the basis for this Findings/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.

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The facility trains workers in the procedures to be followed if a cyanide release is discovered. Emergency response is one of key topics for the three level training program for new employees and for annual refresher trainings. AASCC also conducts annual mock drills in emergency response that involves all the employees. An annual Employee Training Plan is developed which includes training in the emergency response plan, dangerous sources control, chemical poisoning and prevention measures, etc. An *Emergency Response Knowledge Questions and Answer Card* is also provided to workers as an aid that documents the key points for emergency response.

The mock drill is considered as an effective way to test and improve the response skills of employees in the event of exposure to cyanide. Emergency drills are evaluated from a training aspect to determine if personnel have the knowledge and skills required for effective response. If any deficiency identified, a specific review session will be held to develop corrective actions to be taken to address the deficiencies identified. Based on the review of the previous three years mock drill records, it is concluded that the drills went well and no deficiencies identified.

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.

Training records for selected employees were reviewed during the site audit. Records showed that they have participated in appropriate company level, department level and team level trainings as well the annual refresher trainings.

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

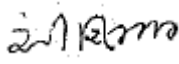
Production Practice 5.1: Prepare detailed emergency response plans for potential cyanide releases.

The operation is **■ in full compliance with Production Practice 5.1**
in substantial compliance with
not in compliance with

Summarize the basis for this Findings/Deficiencies Identified:

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

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The facility has developed emergency response plans to address potential releases of cyanide that may occur on site or may otherwise require response. Procedure *Emergency Incident Management Plan* and Chapter 8 - Emergency Response Plan for Chemical Release, Control System of Cyanide of Procedure *Cyanide Manufacturing Design, Management, and Emergency Response* document the emergency response plans and procedures.

The *Emergency Incident Management Plan* outlines 17 emergency scenarios of which nine are specifically related to cyanide release. Specific response actions, such as evacuating site personnel and potentially affected communities from the area of concern and response actions required for each department involved in the management of the emergency are detailed. In addition, use of cyanide antidotes and first aid measures are well developed. Procedure *Emergency Incident Management Plan* describes specific steps to control cyanide release at the source for a number of scenarios.

After the emergency if any, an incident investigation team will be organized to investigate and identify the cause of the incident and other characteristics of the event, lessons learned and the corresponding corrective to be also drawn up to prevent similar incidents.

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

The operation is **in full compliance with Production Practice 5.2**
 in substantial compliance with
 not in compliance with

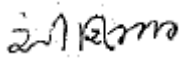
Summarize the basis for this Findings/Deficiencies Identified:

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.

AASCC has involved its workforce and stakeholders in the emergency response planning process. Employees of AASCC have opportunities to comment on the emergency response procedures and external stakeholders (i.e., Wu Li Village, Anqing Petrochemical Company, Anqing Work Safety Bureau, Anqing EPB, and Anqing Petrochemical Hospital) are issued the latest version of the emergency response documentation following each update be invited to provide comment.

AASCC has signed an emergency protocols with the Wu Li village regarding the communication and response actions to be taken if evacuation is necessary, and with

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the local Anqing Petrochemical Hospital to provide AASCC with immediate and professional treatment in the event of emergency.

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

The operation is **■ in full compliance with Production Practice 5.3**
in substantial compliance with
not in compliance with

Summarize the basis for this Findings/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.

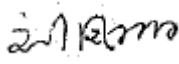
The emergency response documentation states that in the event of emergency, the General Manager will be the commander in chief, and Vice General Manager will be the backup and leaders of each department will be the members of the commander team. Emergency response and rescue team is formed by designated personnel in responsibility from each department. Annual training for Emergency Commanders and Emergency Rescue Team members is required.

Detailed contact information for all internal and external persons directly responsible for the Emergency Response actions are provided in Procedure *Production Design Management and Emergency Response* and the specific duties and responsibilities for the coordinators and team members are also included.

A list of emergency response equipment is included in Procedure *Production Design Management and Emergency Response*. The procedure requires inspections to be conducted by the responsible department on a monthly basis.

The facility confirmed that outside entities included in the Plan are aware of their involvement and are included as necessary in mock drills or implementation exercises. Based on the records review, the external responders (Anqing Firefighting Department, Anqing Environmental Protection Bureau, Anqing Work Safety Bureau and Anqing Petrochemical Hospital) participated in the mock drills in 2014, 2015 and 2016.

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

The operation is **■ in full compliance with Production Practice 5.4**
in substantial compliance with
not in compliance with

Summarize the basis for this Findings/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.

Procedure *Production Design Management and Emergency Response* describes the procedures, roles and responsibilities for each department, regulatory agencies and outside responders. The procedure also provides detailed contact information for all internal and external persons directly responsible for the Emergency Response actions.

Based on the review of surrounding environment, Wu Li village has been identified as the residential community that would be potentially affected given the short distance to the facility. Meanwhile, the AQPCC is also nearby the site and has also been identified as potential affected facility.

In case of an incident in which the affected area extends beyond the facility boundary, the facility is responsible to inform the Wu Li village. ASSCC is also responsible to inform the Wu Li village for evacuation preparation and report to other relevant authorities and facilities including media for notifying the incident conditions.

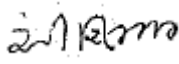
Production Practice 5.5: Incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The operation is **■ in full compliance with Production Practice 5.5**
in substantial compliance with
not in compliance with

Summarize the basis for this Findings/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

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monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The emergency response plan describes specific, appropriate remediation measures, such as recovery or neutralization of solutions or solids, decontamination of soils or other contamination media and management and/or disposal of treated spill clean-up debris. Alternate drinking water supply is regarded as not applicable to AASCC given that the drinking water supply is municipal water and reportedly the nearest surface water is approximately 3 km from the site. The intake for the drinking water source (Yangtze River) is located about 11 km southeast of the facility.

Procedure *Production Design Management and Emergency Response* prohibits the use of chemicals such as sodium hypochlorite, ferrous sulfate and hydrogen peroxide to treat cyanide that has been released into surface water.

Procedure *Pollution Remediation Management* specifies the environmental monitoring requirement for groundwater and soil in connection with any emergency. Affected groundwater would be monitored continuously for two months. This procedure also sets out the steps involved, the sample test methods and clean-up criteria.

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

The operation is **■ in full compliance with Production Practice 5.6**
in substantial compliance with
not in compliance with

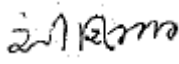
Summarize the basis for this Findings/Deficiencies Identified:

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 plan is required to be evaluated annually and updated if any deficiencies are identified during the procedure implementation. Emergency response plan review record was reviewed during the site audit and no deficiencies had identified during recent review meetings.

Mock drills were conducted in March, June and September 2014, April, June and October 2015, April and June 2016 with the involvement of external stakeholders. The post mock drill evaluation documents for 2014, 2015 and 2016 reviewed during the site audit showed that no deficiencies had been identified during the evaluation meetings.

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