SUSTAINABILITY
FUTURE GROWTH

HINDUSTHAN CHEMICALS COMPANY

Re-certification Audit: International Cyanide Management Code - Production Verification Protocol

Summary Audit Findings Report

21-22 June 2022

SUSTAINABILITY
FUTURE GROWTH

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SUMMARY AUDIT REPORT

Facility:	Hindusthan Chemicals Company
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LOCATION DETAIL AND DESCRIPTION OF OPERATION

Hindusthan Chemicals Company - HCC (formerly known as Cyanides & Chemicals Company) is a unit of Hindusthan Engineering & Industries Ltd. HCC cyanide production facility is located at the GIDC Industrial Estate of Olpad, 20 km from Surat city in Gujarat Province of India. Manufacturing activities commenced at the HCC production facility in 1982 with the manufacture of hydrogen cyanide to produce solid sodium cyanide and potassium cyanide tablets for gold mining. Subsequently, through research and development efforts, HCC added additional non-mining related cyanide products including sodium ferrocyanide, potassium ferrocyanide, diphenyl guanidine, sodium dicyanamide and mandelonitrile. The site has approximately 230 employees and has gained third party accreditation to ISO 9001:2015 Quality Management Certifications. The company produces solid cyanide products (Main production is sodium cyanide and a minor proportion is potassium cyanide).

The aspects of the operation that are included in the scope of the audit include the following:

- HCN Plant which produces hydrogen cyanide;
- NaCn plant (Also referred to as the Cyanides plant) which produces both Na CN and KCN;
- Effluent Treatment Plant where cyanide concentrations are reduced to allow for re-use in the process plant;
- Zero liquid discharge (ZLD) where all water is recovered and contaminants are reduced to solid waste;
- Warehouse facility where product is pelletised and packaged in steel drums and wooden boxes with heat sealed plastic liners.

Since the previous audit, there have been no new facilities or existing facilities that have undergone substantial changes.

AUDITOR'S FINDING

This operation is:

☑ in full compliance

☐ in substantial compliance

☐ not in compliance

with the International Cyanide Management Code Production Facility Verification Protocol. This compliance has contributed to HCC not having experienced any significant cyanide incidents or compliance problems during the previous recertification audit cycle.

Audit Company

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Names and Signatures of Other Auditors

John Miragliotta
9th September 2022

Date(s) of Audit

Inclusive of the period from 21-22 June 2022.

Auditor Attestation

I attest that I meet the criteria for knowledge, experience and conflict of interest for a Cyanide Code Certification Audit Lead Auditor, 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 Cyanide Code Auditors. I attest that this Summary Audit Report accurately describes the findings of the certification audit. I further attest that the certification 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.

Hindusthan Chemicals Company		9th September 2022
Name of Facility	**Signature of Lead Auditor**	**Date**

PRINCIPLE 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.

The operation is
- ☑ in full compliance with
- ☐ in substantial compliance with
- ☐ not in compliance with

Production Practice 1.1

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 1.1, requiring the operation to design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures. Records of the original construction and design documentation have been maintained at the HCC production facility which include quality assurance and controls processes completed during construction. Engineering records from initial construction and later modifications include verification, by a suitable qualified engineer, of completion of construction in accordance with design standards. Commissioning records from the original construction and for subsequent modifications to plant at HCC include results of quality assurance tests. There has been no significant change to the design or operation of the HCC cyanide production facilities since the completion of the Zero Liquid Discharge Facility in 2014. The site has in place a Management of Change Procedure that requires hard copy paper records to be retained for all material changes to the plant design or operational management.

The basis for design documentation indicated that the materials used are compatible with use. Interlocks and Alarms are provided in the HCN (hydrogen cyanide) Plant and the NaCN (sodium cyanide) Plant. These include alarms, and level indications to prevent overfilling of vessels. These are checked and maintained to ensure that they present a reliable mechanism to prevent overfilling. The HCC plant has been constructed within an engineered low permeability and corrosion resistant secondary containment structure designed to contain seepage and spillage from cyanide production activities. The secondary containment system is designed to contain the volume of the largest storage vessel with additional allowance for containment of a design rainfall event. Inspection of the secondary containments for the cyanide facilities found these to be maintained in good condition. The majority of pipe work is continuously welded and is also under vacuum and located within the secondary containment area of the plant. Where pipe joins occur, flange guards have been installed. Where cyanide piping crosses roads it is double sleeved. The outside sleeve contains brine solution at higher pressure than cyanide. Therefore, any failure of the internal piping will lead to brine ingress and not release of cyanide solution.

Cyanide product is stored in warehouse which is totally roofed and waterproofed, the floor is elevated above ground level and walls are solid concrete. The roof overhangs the walls so that moisture cannot enter from the vents at the top of each wall. Ventilation is designed through the upper section of wall to allow air flow throughout the building without letting in moisture. The warehouse is dedicated to cyanide products. The warehouse in in a secure fenced compound that has a permanent security presence. Warehouse doors are locked at all times unless required operationally.

Production Practice 1.2

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

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 1.2
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 1.2, requiring the operation to develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases. These documents include manuals, procedures, plans and work instructions for safety and environment management controls of identified significant risks. HCC procedures and plans have been developed and document controlled in accordance with a certified ISO9001:2015 quality management system. HCC has a "Contingency Cyanide Management Plan" which describes the procedures to be followed during plant upsets that may result in cyanide exposures or releases. Process control sheets and Standard Operating Procedures also include abnormal operations, shut-down and emergency shut-down and the consideration of worker safety and environmental protection measures. A Management of Change Procedure is documented and implemented at the HCC plant. There was evidence of modifications occurring in the re-certification period. A sample of these was reviewed and it was found that the Modification Control Procedure had been applied. This included subsequent updating of drawings, operating procedures and in some cases required the undertaking of HAZOP studies. A preventative maintenance programme is in place and is implemented. HCC has created Work Instructions for mechanical and electrical maintenance that include lists of equipment items and specify the required frequency of maintenance. There is then another set of Work Instructions that specify how maintenance activities are to be undertaken. Records of the inspection and maintenance having occurred are also retained in hard copy and are available for the full period of recertification. Various process parameters are monitored throughout the production facility to ensure operation within the design parameters including pressure, temperature, flow and vessel levels. Calibration procedures are in place for all monitoring instruments and calibration records are maintained. Records were available for the recertification period. HCC has procedures in place for collection of cyanide containing liquids from secondary containment and reuse of this material through the Effluent Treatment Plant. Since April 1, 2016 HCC has been operating a Zero Liquid Discharge Plant in which any effluent treated in the plant is subsequently retained onsite rather than being released to surface water. Operating and maintenance procedures are in place for this plant. Procedures are in place and implemented for the collection of solid cyanide containing wastes and recycling of this material through the cyanide production facility or disposal to approved external waste treatment facilities. There is a procedure for the reprocessing of off-specification or otherwise unsellable cyanide products. Records of disposal of cyanide waste at external waste treatment facilities were available for the recertification period. Packaging material and labelling is certified to relevant dangerous goods codes and has the required markings placed on the containers.

Production Practice 1.3

Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

The operation is ☑ in full compliance with Production Practice 1.3
☐ in substantial compliance with
☐ not in compliance with

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 1.3, requiring the operation to inspect cyanide production facilities to ensure their integrity and prevent accidental releases. Routine inspections are carried out throughout the HCC cyanide production facility including vessels, pipes, secondary containment, valves and pumps. Inspection frequencies are specified in accordance with the maintenance plans for specific equipment and are completed by adequately trained personnel in accordance with inspection procedures. The plant has developed, and refined inspection frequencies based on 40 years of operation experience; external hazard assessments; regulatory requirements and project design recommendations. Inspection records are maintained, and corrective actions and work orders are documented where identified from inspections.

Inspection records of plant and equipment, such as boilers, pressure vessels, pressure relief valves, HCN carrying pipelines, were available for the re-certification period. In addition, during this period there were regular inspections by Plant Managers and shift personnel. Records are maintained in accordance with the ISO 9001 certified system.

PRINCIPLE 2 – WORKER SAFETY

Protect workers' health and safety from exposure to cyanide.

Production Practice 2.1

Develop and implement procedures to protect plant personnel from exposure to cyanide.

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 2.1
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 2.1, requiring the operation to develop and implement procedures to protect plant personnel from exposure to cyanide.

Work instructions exist for all sections of the plant covering normal plant operations from receipt of raw materials through finished product packaging and shipping, non-routine and emergency operations and maintenance related activities. These procedures are included within the ISO9000 system.

A Safety Manual has also been developed and implemented, that describes the safety management system as it applies to the management of cyanide risk as well as other risks.

Safety manual captures safety training requirements, Site Safety Rules, PPE requirements and inspections.

Specific PPE requirements and pre work inspections are captured within the Process Control sheets.

The HCC Permit to Work System provides controls to ensure safety and health measures are identified prior to undertaking any potentially hazardous tasks, including routine operations, non-routine, emergency and maintenance related activities. A Work Permit is required for all jobs (except daily routine low risk work) and a Fire/Safety Permit addresses hot-work, confined spaces and excavation. The Fire and Safety Permit Procedure captures the requirement for decontamination of equipment by operations, prior to maintenance. Ongoing training in the Permit to Work System had occurred and there was evidence of completion of Work Permits.

The key mechanism for soliciting and considering worker input is the statutory required Workman Safety Committee. This committee was found to comprise of 50% management and 50% elected worker representatives. In addition to this, there is also a Central Safety Committee which includes the department heads which meets quarterly, shopfloor safety committee meetings held weekly and monthly department safety committee meetings that include both operator and heads. Minutes were available to demonstrate the effective conduct of these meetings.

Hazard identification and monitoring has been used to identify areas and activities where workers may be exposed to hydrogen cyanide gas and/or cyanide dust exceeding 10 parts per million (ppm) on an instantaneous basis or 4.7 ppm continuously over an 8-hour period, as cyanide. The key areas being the HCN plant, the NaCN reaction area and the packing shed.

Within these areas PPE is required. This is addressed in the Safety Manual. Sign boards have been erected at the plant and a PPE Matrix has been developed based upon expected exposures.

A key protective mechanism is that the system is under negative pressure.

There are seven fixed HCN detectors in the plant; 4 in the HCN plant and 3 in the NaCN plant. In addition to this, portable monitors are used. Workers are required to use personal monitors in production areas to warn of unsafe HCN gas levels. Two alarms are set for the fixed and portable monitors: First alarm at 4.7 ppm and Second alarm at 10 ppm.

Procedures and training in place ensures that an individual monitor alarming would cause the person to evacuate and advise the control room. A fixed monitor alarming will bring the control room operator immediately into action. They would make an announcement on the plant PA. There is an emergency response plan tailored for specific scenarios.

Fixed and portable HCN gas monitors are calibrated, inspected and maintained by the supplier on a 6 monthly rotation in accordance with manufacturer recommendations. Calibration records are maintained indefinitely.

Dust monitoring is undertaken on a routine basis in the packaging area to ensure controls are adequate to prevent unsafe exposure to cyanide dust.

It is a safety rule that the employees must follow buddy system while working in HCN / NaCN Plant.

An Emergency Button is present in the plant and this is addressed within the induction. A PA System is also provided in the plant to allow easy communication with the Control Room. Daily routine checks of the Buzzer and PA System are undertaken

Pre-employment medicals are undertaken as per regulatory requirements (this is done externally). A six-monthly medical is undertaken, internally. Records of medicals from are available to demonstrate the conduct of medicals.

HCC requires that all cyanide plant workers, including maintenance workers and contractors, wear plant specific clothing which is laundered onsite subsequent to use and before next use. Potentially contaminated water from the laundering is transferred to the effluent treatment and zero discharge plant where cyanide concentrations are reduced to allow for reuse of the water. Visitors entering the plant for a short period of time are required to wear protective clothing and are provided with relevant PPE including mask and gloves.

Signage in the plant has been maintained/updated with clearly visible signage available on pipes, tanks, etc. Various warning signs are available within the plant requiring specific PPE requirements relative to that work area. Major safety warning signage is provided in three languages (English, Hindi and local Gujarati language).

Prohibitions on smoking, eating, drinking and open flames are addressed within the Safety Manual. The Safety manual is supported by signage within the plant. In addition to this, it is a safety rule that carrying matchboxes & cigarette lighters inside plant premises is strictly prohibited.

Production Practice 2.2

Develop and implement plans and procedure for rapid and effective response to cyanide exposure.

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 2.2
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 2.2, requiring the operation to develop and implement plans and procedures for rapid and effective response to cyanide exposure. HCC has developed an Emergency Response Plan to cover all major scenarios, including cyanide release, ammonia release, major fire, and chemical spill. The site has also developed a Contingency Plan which deals directly with cyanide related events and provides specific guidance for response. The data from these has been summarised in a visual chart that captures the key information.

Eye wash stations, safety showers and dry powder fire extinguishers are provided throughout the plant and storage warehouse, and these are routinely inspected. Inspection records for eye wash stations, safety showers and fire extinguishers were available for the recertification period. A fire water deluge system is in place for the facility, and its operation was demonstrated during site inspection.

Drinking water is available in the cyanide control room and medical centre. Oxygen reviver bottles and cyanide antidote kits are available in the HCC medical centre adjacent to the cyanide plant and near the office block. The medical centre is attended to by dedicated medical staff at all times.

An emergency notification and communication system exists on the plant which includes a system that requires personnel entering the HCN plant to notify the control room before entering. Buddy systems are a requirement defined within the Safety Manual, with direct communication to the control room as is the case with the distress alerts. Alarms are place at all work locations within the cyanide production plant so that workers can raise an alarm in case of emergency. The control room staff has access to CCTV to monitor workers within the plant. This has been demonstrated as being effective in mock drills conducted.

First aid kits are checked monthly as are the contents of the ambulance and the medical centre. Medicines and antidote stock-takes were found to be done and recorded so as to ensure tracking of use by dates and suitable storage. This checking along with equipment checking is described within the Safety Manual which also includes a schedule. A sample indicated that inspections were done as scheduled. The sample included firefighting equipment, SCBA, eye wash / emergency showers, oxygen cylinders, compressors etc.

Safety Data Sheets (MSDS) and first aid procedures are available in areas where cyanide is handled and is documented in three languages.

All process vessels, tanks, etc. are provided with signage. Cyanide lines are indicated with red circumference markings and flow directions are marked on the lines.

The site has a doctor or nurse available onsite at all times and these personnel are trained to administer cyanide antidote. Where an incident occurs out of hours the doctor can attend the site within five minutes as he is required to reside within close proximity of the plant. An alternative doctor is provided during holiday periods. Nearby hospital doctors have also been trained by HCC Doctor to respond to cyanide medical emergencies. In addition to this, there are qualified first aiders.

Antidote stock-takes indicate that 20 antidote kits are maintained on site. Systems are in place for

- suitable storage (refrigerated and secured),
- tracking of use by dates, and
- stock-takes to validate quantities.

There is a protocol in place for the treatment of cyanide exposure this includes the decontamination, administering of oxygen, Amyl Nitrate, Sodium Nitrite and Sodium thiosulphate.

The HCC Emergency Plan and the Contingency Plan provide for the transport of persons in case of medical incidents by HCC ambulance to nearby hospitals where arrangements have been made to ensure medical staff are familiar with cyanide response measures and can attend to emergency situations quickly. This is done via a MOU and the provision of training by the Company Doctor.

HCC has prescribed protective clothing requirements that cover all persons entering the plant. Those persons who work in the cyanide plant are required to wear plant specific clothing which is laundered (onsite) subsequent to use and before next use. Visitors entering the plant for a short period of time are required to wear protective clothing and are provided with relevant PPE including mask and gloves. There was ongoing evidence of wearing of the appropriate clothing and PPE. This information was also communicated as a part of inductions.

Incident Reports for the recertification period were available. Records indicated that these were investigated in accordance with the Incident Reporting and Investigation System as defined in the HCC safety manual, including the identification of the root cause and the taking of action to prevent recurrence. In addition to this there was clear evidence of reporting to the regulator as required and appropriate first aid treatment including decontamination.

PRINCIPLE 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.

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 3.1
	☐ not in compliance with	

Basis for this Finding:

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

Since April 1, 2016 HCC has operated a Zero Liquid Discharge Plant, as such, there is no longer any planned discharge to surface water.

The monitoring point established downstream of the established mixing zone is at the point where the site effluent/storm water discharge channel downstream of the final effluent pond intersects the natural surface water creek (the Masma Khadi) which flows outside the HCC site. This statutory monitoring point was established by the Gujarat Pollution Control Board who issues the HCC Effluent Discharge License. The monitoring results for the compliance monitoring point in the Masma Khadi indicate that no results that have exceeded the HCC laboratory limit of detection of 0.01 ppm Total Cyanide for the period of interest. The reported limits of detection for the HCC and external laboratory methods is 0.01ppm Total CN.

An indirect discharge to surface water occurs via storm water during the wet season. Discharge of storm water does occur during the wet season. The initial discharge of storm water is managed by the same pond system which ultimately leads to treatment by the Zero Liquid Discharge Plant. Monitoring is undertaken to demonstrate that storm water does not contain any cyanide. Once this has been established, storm water is discharged during the wet season to the Masma Khadi natural surface water system outside the HCC boundary. Daily monitoring undertaken by HCC at the Masma Khadi monitoring point has not identified any result in excess of the 0.01 ppm Total CN detection limit. Sampling is undertaken for each batch discharge from the ETP and daily at the natural surface water creek. Validation sampling and analysis is completed monthly by an external laboratory and on an ad hoc basis by the government regulator. Surface water monitoring frequency is adequate.

Three groundwater wells located outside the perimeter of the facility were monitored by HCC on a monthly basis, and also by an external laboratory in the re-certification period no cyanide has been detected from analysed results.

The Gujarat Pollution Control Board has identified beneficial users of groundwater in the vicinity of the HCC operations associated with non-potable abstraction from bore holes and requires monitoring of Total Cyanide in groundwater from the 4 monitoring bore locations. There are no specific limits for cyanide concentrations in groundwater established for the HCC facility, however the national standards in India include a limit of 0.05 mg/l for Total CN. Monthly internal and external laboratory monitoring has not identified any concentrations of Total Cyanide above detection limits (0.01ppm Total Cyanide) over the period of recertification.

The HCC statutory limits for HCN gas from the incinerator gas emissions are 30mg/Nm3. Monitoring of incinerator gas emissions has occurred by HCC and an external laboratory for the re-certification period. Monitoring of incinerator emission by external laboratory indicates emission < 1 mg/Nm3.

The monitoring frequencies are considered sufficient considering the batch discharge controls and in consideration of the historic record of results. Monthly monitoring of air emissions from the gas incinerator and monthly sampling of groundwater at nearby wells is sufficient frequency in consideration of historic and recent results.

PRINCIPLE 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 minimises the potential for cyanide exposures and releases.

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

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 4.1, requiring the operation to train employees to operate the plant in a manner that minimises the potential for cyanide exposures and releases. Over the period of certification, HCC has continued to train all personnel who undertake work on the site on the recognition of cyanide hazards and the necessary measures to protect human health and the environment from cyanide release and exposure, including effective plant operation, first aid measures and protective clothing/equipment. This is captured in the induction process (a seven-day intensive training programme), and a safe cyanide handling course and in the plant specific training. This induction and safe cyanide handling course is refreshed every 2 years.

The inductions are required to be complete before any work is undertaken onsite and over the period of certification have been done. Emergency response actions to alarms and evacuation requirements are provided for all personnel entering the site. Detailed safety inductions include specific measures to protect human health and the environment from cyanide release and exposure for those personnel that undertake work in and around the cyanide facilities.

Over the period of certification, operator training has been provided in accordance with a needs analysis and scheduled in a training plan on a plant by plant basis. The training has included effective plant operation in accordance with defined procedures and work instructions, use of appropriate PPE and emergency response equipment.

All HCC training sighted from the period of certification has included assessment of competency to verify effectiveness of the training either through written assessment and / or task observation. Refresher training is provided on every 2 years for all workers in cyanide production and packaging. Training is based on work instructions and manuals and is provided by highly experienced operational employees of HCC. Training records are documented and retained for all personal, including contractors and visitor inductions in accordance with the ISO9001 certified system.

Production Practice 4.2

Train employees to respond to cyanide exposures and releases.

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 4.2
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 4.2, requiring the operation to train employees to respond to cyanide exposures and releases. All personnel working in or around cyanide facilities are trained in the response to emergency cyanide release incidents in accordance with the planned response detailed in the Onsite Emergency Response Plan and the Contingency Plan.

Operators in the cyanide production area were found to have been trained annually over the period of certification for response to small spills inside the containment area through the procedure training. Emergency Response Training has been provided to the HCC Fire Fighting and Rescue Team. There are 14 members of this team who are trained as first response to plant wide emergency incidents. The trained emergency response personnel include operators drawn from each operational area of the plant. The emergency response personnel have a dedicated training matrix which identifies all the training needs. Training of emergency response personnel includes emergency scenario training via desktop mock drill exercises and routine practical mock drills. Mock drills are a critical component in ensuring response competence and were found to occur at least quarterly over the period of certification. Emergency training and mock drill exercises were found to be evaluated for efficacy and documented with improvement actions. Training records are maintained for all emergency response personnel and workers who undertake emergency response training.

PRINCIPLE 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.

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 5.1
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 5.1, requiring the operation to prepare detailed emergency response plans for potential cyanide releases. The emergency response plans for the HCC cyanide production facilities are contained within the Emergency Response Plan and the Contingency Plan.

The Emergency response plan is an overarching emergency plan for all emergencies that may occur at the premises, which includes, but is not limited to cyanide release incidents. This plan addresses both onsite and offsite events and covers all identified emergency scenarios. The plan includes responsibilities, emergency equipment lists, emergency telephone contacts, the use of cyanide antidote kits and importantly provides the ability to escalate an onsite emergency into an offsite emergency. The Emergency Response Plan is required by regulation and is also required to be updated annually which was found to be done throughout the certification period with the current version being dated 2022. The Emergency Plan details the response actions for community notification, evacuation and engagement of external response providers.

The Contingency Plan provides a more detailed emergency planning framework for specific response to release scenarios relevant to the HCN and NaCN plants. The Contingency Plan includes lists of preventative controls and also actions to be undertaken in response to a range of different scenarios including HCN gas release, liquid and solid cyanide spills. The Contingency Plan includes the use of cyanide antidotes and first aid measures for cyanide exposure

The basis for the ERP and Contingency plan is the identification and analysis of potential failure scenarios, utilising quantitative risk assessment and consequence analysis studies.

Production Practice 5.2

Involve site personnel and stakeholders in the planning process.

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

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 5.2, requiring the operation to involve site personnel and stakeholders in the emergency response planning process. The Emergency Response Plan and the Contingency Plan are reviewed on an annual basis by HCC with input from the HCC employees.

Employee input occurs through the emergency drill debrief meetings which allow workers participating in drills to make recommendations for plan improvements. Over the period of certification, the mock drills were found to be done at least quarterly. In addition to this, consultative central safety committee and Workman Safety Committee meetings which are a forum for communication, consultation and involvement have occurred on a regular basis throughout the certification period. Potentially affected communities have been consulted on the HCC emergency planning process through various emergency planning engagement including forums which include the District Crisis Group, the provision of information to the and community public hearings. Information related to cyanide emergencies has been provided to the Director of Industrial Health and Safety and to the Magistrate Olpad so as to include detail in the District Emergency Management Plan.

A full practical Emergency mock drill involving various offsite agencies and communities occurs at the discretion of the District Magistrate. The last full emergency mock drill involving offsite agencies and communities conducted under the direction of the Chief Magistrate occurred in 2011. Inhouse emergency drills have been held quarterly throughout the re- certification period. The outcomes from the full emergency drill include liaison with all participants to define emergency planning improvements and corrective actions. HCC has provided Community Awareness Booklets in two languages for local communities which outlines the nature of hazards posed by emergency scenarios at the HCC plant. Over the period of certification, HCC has communicated and consulted with the community through a community awareness program, public hearings and factory visits. The HCC operation does not rely on external medical services to treat cyanide cases. The expertise and antidotes are available onsite and external providers would only be used to respond to other aspects of emergencies, e.g. injuries through falls, fire, etc. or where the HCC medical treatment capacity is exceeded. However, in spite of this, the facility has engaged with nearby hospitals for response to medical emergencies at HCC and includes training of medical staff on response to cyanide exposure. This was found to have been done on a regular basis throughout the certification period. A Memorandum of Understanding with the local Hospital is in place.

Production 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	Production Practice 5.3
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 5.3, requiring the operation to designate appropriate personnel and commit necessary equipment and resources for emergency response. The Emergency Response Plan which has been maintained current throughout the certification period, designates primary and alternate Emergency Response Coordinators (These are members of Top Management) and assembly locations. The Plan also addresses Emergency Response Teams and the minimum resources and training required for each team. The Plan includes contact numbers for internal and external responders. The majority of HCC staff live in an accommodation building a short distance from the plant and all responders are required to live within a kilometre of the plant and therefore are able to be contacted easily and mobilised quickly. The Plan addresses specific duties and responsibilities of coordinators and team members. Suitable Emergency Response Equipment is available at HCC and is routinely inspected and maintained. The role of external emergency responders is included in the Emergency Response Plan. These response organisations are represented on the District Crisis Group which meets as required to review emergency planning. HCC has arrangements with local hospitals which outline what medical services may be required by HCC in case of emergency.

Production Practice 5.4

Develop procedures for internal and external emergency notification and reporting.

	☑ in full compliance with	
The operation is	☐ in substantial compliance with	Production Practice 5.4
	☐ not in compliance with	

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 5.4, requiring the operation to develop procedures for internal and external emergency notification and reporting. The HCC Emergency Response Plan which has been reviewed annually throughout the certification, includes the processes for declaring an emergency and internal and external notifications / communication required. The plan also includes the contact details.

The Plan prescribes: the various authorities and regulators required to be reported in the event of an emergency; communications with potentially affected communities; liaison with external response providers; public relations; and, the communication protocols required for offsite evacuations.

HCC's Safety Manual requires that after any significant cyanide accident/incident that the administrative department will notify the ICMI.

Production 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 Production Practice 5.5

☐ not in compliance with

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 5.5, requiring the operation to incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals. The business is a zero-discharge operation which involves the treatment and reuse in the process. Nevertheless, the Emergency Response Plan, the contingency plan and the safety manual includes a description of potentially hazardous wastes from emergency scenarios and clean-up/decontamination and the appropriate handling, treatment and disposal of these wastes. Post emergency activities are described including removal of contamination, disposal to appropriate approved facilities; use of decontamination chemicals, monitoring requirements/methods and provision of alternative drinking water where necessary. The emergency plan includes a general prohibition on the use of chemicals such as hydrogen peroxide, ferrous sulphate or sodium hypochlorite for the removal of cyanide in or near surface waters.

Production Practice 5.6

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

☑ in full compliance with

The operation is ☐ in substantial compliance with Production Practice 5.6

☐ not in compliance with

Basis for this Finding:

HCC is in FULL COMPLIANCE with Production Practice 5.6, requiring the operation to periodically evaluate response procedures and capabilities and revise them as needed. The HCC Emergency Response Plan is reviewed annually in accordance with regulatory requirements. Over the period of certification, the facility has carried out onsite emergency mock drills on a routine basis (at least quarterly) to test the adequacy of response readiness and resources. Offsite drills which include participation of local communities and external responders are planned and conducted on instruction from the District Magistrate. It is noted that based on dispersion models, that the risk of an off-site emergency is small. The contingency plan requires that the plan be reviewed and amended following emergency events; changes to the facility that materially changes the potential for fires, explosions, or releases; the list of emergency coordinators changes; or the list of emergency equipment changes. Evidence of this was sighted. The facility undertakes a review of outcomes from emergency drills to identify improvements and implement corrective actions as required. HCC also use audits to validate the suitability and effectiveness of the system.