Cyanide Production Operation

Summary Audit Report

for

The International Cyanide Management Institute

and

Proguigel Camaçari Unit/ 2023

Prepared by NCABrasil Expert Auditors Ltd.

(www.globalsheq.com)

This audit report contains 15 (fifteen) pages

Proquigel Camaçari		21/01/2024
Name of Producer	Signature of Lead Auditor	Date

SUMMARY AUDIT REPORT
FOR CYANIDE PRODUCTION OPERATIONS

Instructions

1. The basis for the finding and/or statement of deficiencies for each Standard of Practice should be summarized in this Summary Audit Report. This should be done in a few sentences or a paragraph.

2. The name of the mine operation, lead auditor signature and date of the audit must be inserted on the bottom of each page of this Summary Audit Report. The lead auditor's signature at the bottom of the attestation on page 3 must be certified by notarization or equivalent.

3. An operation that is in substantial compliance must submit a Corrective Action Plan with the Summary Audit Report.

4. The Summary Audit Report and Corrective Action Plan, if appropriate, with all required signatures must be submitted in hard copy to:

ICMI
1400 I Street, NW, Suite 550.
Washington, DC, 20005, USA.
Tel: +1-202-495-4020.

5. The submittal must be accompanied with 1) a letter from the owner or authorized representative which grants the ICMI permission to post the Summary Audit Report on the Code Website, and 2) a completed Auditor Credentials Form. The letter and lead auditor's signature on the Auditor Credentials Form must be certified by notarization or equivalent.

6. Action will not be taken on certification based on the Summary Audit Report until the application form for a Code signatory and the required fees are received by ICMI from the applicable gold mining company.

7. The description of the operations should include sufficient information to describe the scope and complexity of the gold mining operation and gold recovery process.

SUMMARY AUDIT REPORT

Name of Producer: Unigel – Acrinor/ Camaçari unit.
Name of Producer Owner: Proquigel Química S.A
Name of Producer Operator: Proquigel Química S.A.
Name of Responsible Manager: Jeovan Cardoso de Oliveira
Address: Rua Hidrogênio, 824, Camaçari, Bahia State.
Country: Brasil
Telephone: (5571) 986-741-343
Fax: not applicable
E-Mail: jeovan.oliveira@unigel.com.br

Location detail and description of operation:

Location and access:

Proquigel´s Camaçari unit has its plant within the petrochemical complex in Camaçari city located in Bahia, in northeastern Brazil. It is 50 kilometers far from Salvador, the capital of the state of Bahia. The operation access is by an asphalted road.

Operation process description:

The industrial process of obtaining sodium cyanide is very simple, summing up basically to a neutralization reaction acid / base between the hydrocyanic acid (HCN), supplied by Acrinor (another Proquigel plant, at the same site. Acrinor and Proquigel are the same company), with sodium hydroxide (NaOH = sodium hydroxide = Caustic Soda). In practice, the process occurs in two steps: dilution of the hydroxide and cyanide synthesis.

a) Dilution of hydroxide:

The caustic soda is supplied in bulk at a concentration of 50% (w/w). Initially this feedstock needs to be diluted to avoid cyanide crystallization in solution. Typically, the solution of cyanide sodium with a concentration of 30 to 35% (w/w) is produced for gold/ silver mining operations, while 39 to 42% (w/w) are specified only for NaCN briquette production (solid sodium cyanide) at Proquigel Candeias unit. The hydroxide, with 49 to 50% concentration, is diluted to the same concentration of between 34% to 45% for caustic soda (NaOH).

The concentration of soda after dilution, will meet the needs required by the process to the desired concentration of sodium cyanide (NaCN).

b) Summary of cyanide synthesis:

At the top of the reactor, a gas absorption column, and recycle loop reactor the same itself is fed soda solution. Then hydrocyanic acid (HCN) is added in a mixer in the recycle loop reactor. The recycle contains, in addition to the sodium cyanide solution, a minimal excess of 1.5% (w/w) caustic soda to react with hydrocyanic acid (HCN). In the reactor, a constant recycles responsible for the perfect homogenization of the solution with an excess of hydroxide of 1.0% is maintained. Due to the heat given off in the reaction, the reactor flow passes through a heat cools pain that is responsible for controlling the temperature not exceeding 45ºC in solution. The production of sodium cyanide is made by direct reaction between liquid hydrocyanic acid and sodium hydroxide solution and the reaction is as follows: HCN + NaOH → NaCN + H2O. This reaction is exothermic.

After the production, NaCN solution is stored in tanks within appropriate secondary containments. The expedition to customers occurs in sealed, certified and specifically designed iso-containers or iso-tanks. All transporters must be ICMI certified.

Proquigel Camaçari — Name of Producer
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21/01/2024 — Date

SUMMARY AUDIT REPORT

Auditor's Finding

This operation is:

X in full compliance
□ in substantial compliance ***(see below)
□ not in compliance

with the International Cyanide Management Code.
During the previous three years certification cycle, Proquigel Camaçari did not experienced no significant cyanide related incidents, nor any compliance problems related to cyanide production management.

***** The Corrective Action Plan to bring an operation in substantial compliance into full compliance must be enclosed with this Summary Audit Report. The plan must be fully implemented within one year of the date of this audit.

Audit Company: NCABrasil Expert Auditors Ltd. (www.globalsheq.com)
Acting Audit Team Leader: Celso Sandt Pessoa
E-mail: celsopessoa@ncabrasil.com.br (ICMI qualified lead auditor and TEA since 2006).
Names and Signatures of Other Auditors: not applicable.

Date(s) of Audit: 27/02 ~ 07/03/2023 (on-site) and 23~24/05/2023 (off-site)

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code certification 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 certification audit. I further attest that the certification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Producer Operations (June 2021) and using standard and accepted practices for quality, health, safety and environmental audits.

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SUMMARY AUDIT REPORT

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.

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The operation is:

X in full compliance with
□ in substantial compliance with Production Practice 1.1
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation installations and configuration remain unchanged since the last recertification audit. The operation maintains a technical library with the design and construction documentation related to the operation facilities (initial and new ones). Sampled technical documentation related to reactor R3210 and tanks F3320, F3310 and F3350. The commissioning records of the operation facilities are retained by the operation and the initial and new installation were reviewed approved by qualified engineers. The operation facilities were commissioned by qualified engineers as evidenced in the sampled commissioning records. Basically pipelines, tanks and reactors were constructed with carbon steel and austenitic stainless steel, in accordance with American Petroleum Institute, American Society of Mechanical Engineers and American Society for Testing Materials specifications. There is an interlock system that controls the caustic soda flows to the reactor R3210. All operation facilities are managed and monitored from the control room. The hydrocyanic acid supplied by Acrinor (Acrinor and Proquigel are in the same site) through pipelines that are controlled from Proquigel´s control room and the pumping system may be shut down by the control room or at the field, by the operators, where there are shutdown buttons and a specific emergency button (“Z” button) that shuts down the entire process plant. Shutdown buttons are available in specific places at the process plant, as evidenced during the field audit. All process tanks, reactor and pipelines are inside concreted secondary containments, which are included in the preventive maintenance plan and as evidenced during the field audit. All monitoring and alarm instruments, such as level and alarm sensors, HCN detectors and alarms are included in the preventive maintenance system and inspected and calibrated on a regular basis. Reviewed maintenance, inspection and calibration records for level sensors 33-LT-104, 33-LT-111 and 33-LT-112 and for HCN detectors 32-AI-190, 32-AI-192 and 32-AI-193. All process tanks are allowed to be fulfilled up to 90% of their volume (pumping system is shut down), but alarm 1 level is set for 80%. Related to the fulfilling of the isotanks with cyanide solution, this operation is performed by the control room operators and the isotanks are fulfilled up to 80% of its volume. The fulfilling activity is interrupted automatically when this value is reached. At the same time, a second operator, at field, is monitoring the fulfillment of the isotank and, if necessary, there is a shutdown button that interrupts automatically the fulfillment of the isotank. All secondary containments are constructed of structural concrete with 115% of the volume of the biggest tank inside and considering the design storm event, as evidenced in the design documentation.

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During the field audit, it was evidenced that all the secondary containments are kept clean and empty. The process pipelines are covered with polyurethane foam and stainless-steel foil and, in most of the cases, are inside the secondary containments, when containing liquid cyanide solution, as evidenced during the field audit and at the as built documentation (areas 32 and 33). All cyanide solution is stored in closed carbon steel tanks, as evidenced in the fabrication documentation and during the field audit. All tanks are installed in open areas, with natural ventilation, as evidenced during the field audit. All process plant perimeter is fenced, and the access is controlled and only allowed personnel have access to the process plant, as evidenced during the field audit. Cyanide solution is kept stored inside closed carbon steel tanks, which provides an excellent barrier to avoid the contact the cyanide solution with other materials. It is important to note that no other materials are stored inside the secondary containments where the cyanide containing tanks are placed.

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:

X in full compliance with
□ in substantial compliance with Production Practice 1.2
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

It was evidenced that the operation developed, documented, implemented and maintains a production manual (MN-CNS-393-001(11)) and associated work instructions. Please refer to section 6 of this report. The production manual (MN-CNS-393-001(11)) addresses non-standard operating situations and how to manage them. The operation developed, documented, implemented and maintains a change management procedure (NO-SGI-013(10)) where all proposed changes must be reviewed and approved (or not) by a multidisciplinary team which includes representatives of the environmental, occupational health and safety processes. It was evidenced one case (3470.116202.107.001) of change management process. The operation developed, documented, implemented and maintains a preventive maintenance program. Reviewed preventive maintenance plans and associated records for the following equipment: R3210 (reactor), J3211A/B, J3331, J3341, J3371 and J3381 (pumps), F3350, F3310, F3320 and F3370 (tanks). All process instrumentation (e.g: sensors, transmitters, detectors) is included in the maintenance and calibration management system, as previously mentioned. All production facility is managed and monitored through a DCS system (Distributed Control System), all digital, which includes production parameters such as pressure, temperature, flows, tank level, pH, HCN level, valve system, interlock system, among other aspects. This system works 24 hours and several alarms (visual and sound) and sensors. All process instrumentation is included in the preventive maintenance and calibration program as previously mentioned. All effluent (e.g: water from washing, rainwater) retained at secondary containments are directed to a wastewater treatment tank, where this effluent is treated and then sent to CETREL treatment plant (Camaçari petrochemical complex treatment plant). All cyanide contaminated material (real or potential) are packed, identified and sent to a qualified environmental services supplier and incinerated. Cyanide solution certified iso-tanks or iso-containers are clearly identified according to Brazilian legislation. Reviewed the following iso-tanks (all certified by Bureau Veritas Brasil): TCVU-361663-6, TCVU- 361658-0, TCVU-366114-7 and TCVU- 961035-8.

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

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The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 1.3
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All cyanide containing tanks are inspected on a daily basis by the operational team and monthly by the maintenance team. All secondary containments are inspected on a daily basis by the operational team and monthly by the maintenance team. All pipelines, pumps and valves are inspected on a daily basis by the operational team and monthly by the maintenance team. The operation has an integrated inspection protocol (one for the operational team and another to the maintenance team), where such inspections are made together. All iso-containers (used to transport cyanide solution) are inspected and neutralized by a qualified supplier after returning from a delivery to a mining operation. According to my professional experience, as a mechanical engineer, the defined inspection frequencies are adequate to ensure that that facilities are working within the design parameters. During the field audit, it was evidenced that the operation facilities are well maintained. As previously mentioned, there are specific inspection protocols, addressing the quality aspects to be inspected, by the operational team and by the maintenance team. All corrective maintenance orders, resulting as an output from the inspections, indicates the corrections and corrective actions to be implemented. All corrective maintenance orders records are retained by the operation. Reviewed corrective maintenance orders dated 04/11/22 (pump J3331), 10/02/23 (pump J3381) and 13/08/22 (secondary containment for tank F3370).

Principle 2 | WORKER SAFETY

Protect workers' health and safety from exposure to cyanide.

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

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 2.1
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

It was evidenced that the operation developed, documented, implemented and maintains a production manual (MN-CNS-393-001(11)) and associated work instructions. The production manual (MN-CNS-393-001(11)) addresses non-standard operating situations and how to manage them. All reviewed operational work instructions (or safe work procedures) address pre-work activities, such as inspection of collective protective equipment, personal protective equipment, tools, handling/ transport resources, among other aspects. The required personal protective equipment (e.g: overall, full face masks, boots, gloves, HCN detectors, among others) that must be used to perform that specific task.

It was also evidenced that the operation developed, documented, implemented and maintains an Emergency Response Plan (ERP). Please refer to Principle 5. The operation developed, documented, implemented and maintains a preventive maintenance program. There are specific documented protocols to be followed by the operational team to prepare a facility to be maintained, including neutralization and liberation of such facility to the maintenance team to work. The production manual and its associated work instructions was developed by a multi-disciplinary team, led by the production team, but involving other processes such as environmental management and occupational health and safety teams. The operation identified areas where HCN may exist in an in an instantaneous or continuously basis. Such places are monitored and calibrated HCN detectors installed. The operation has a specific documented procedure to identify hazards and analyze risks and such procedure is used as a basis to develop operational procedures and identify potentially risky areas or activities. The operation installed HCN detectors in such places where alarm 1 is set for 2.5 ppm (alarm sounds at control room) and alarm 2 is set for 4.5 ppm (operators must leave the area). Reviewed calibration records for HCN detectors 32-AI-190, 32-AI-192 and 32-AI-193. If necessary, operators may use portable HCN detectors, that are set with the same alarm levels of the fixed ones. Calibration of such portable HCN detectors is performed by an authorized OEM (Original Equipment Manufacturer (e.g: Dräger or MSA) and calibration records are retained by the operation maintenance (instrumentation) process. Reviewed calibration records performed between 2020 and 2023. All reviewed calibration records address the detector brand, serial number, TAG number, HCN standard gases used and their traceability, all calibration results before and after calibration, calibration method used, uncertainty of the equipment, acceptance criteria and if they are approved for use or not. All plant operators have radios and are in touch with the control room. CCTV (closed circuit television) system is also available, and monitoring of the areas is made from control room. Both systems were evidenced during the field audit. According to the Brazilian legislation, all employees must pass an annual occupational health evaluation and obtain a permit (ASO = Atestado de Saúde Ocupacional) to be allowed to work. The annual occupational health evaluation scope includes clinical analysis (e.g: blood and urine), lung, heart, liver, kidneys and eyes evaluations, audiometry evaluation and effort tests, in accordance with Brazilian legislation. Reviewed ASO records from plant and maintenance teams. There is a clothing policy in the operation where people leaving such areas must change their clothes or disposable overall into identified plastic bags and disposed for washing or incineration. The number of operators transiting in the process plant is very low. The plant facilities are richly identified related to the presence of cyanide and the mandatory personal protective equipment that must be used, as evidenced during the field audit. Such kind of signage (smoking, eating, drinking, and open flames is prohibited) is available is several places at the process plant, as evidenced during the field audit.

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

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 2.2
□ not in compliance with

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Summarize the basis for this Finding/Deficiencies Identified:

The operation developed specific written emergency response plans and procedures to respond to cyanide exposures (please refer to Principle 5). It was evidenced during the field audit that the operation installed and maintains, in several places, emergency showers and low pressure eye-washers (to avoid the eyes to be hurt by high pressure water jet) that are inspected and maintained in a routine basis and were tested during the field audit, all operational. It was also evidenced that the operation installed ABC type (dry chemical powder) fire extinguishers in different places in the process plant. These fire extinguishers are maintained in accordance with the Brazilian legislation and the Military Firefighters of Bahia State by a qualified maintenance supplier. Records of such maintenance are retained by the operation and were reviewed during this opportunity. It was evidenced the operation dispose oxygen bottles in the vicinity of emergency showers and eye-washers. Beyond that, the operation has a full operation ambulatory equipped with oxygen bottles, oximeters, resuscitator, AED (Automatic External Defibrillator), ambu (Artificial Manual Breathing Unit), antidotes (sodium thiosulfate, sodium nitrite and methylene blue), diphoterine, radio, telephone, ambulances and a medical team (two nurses and a doctor (toxicologist)). All evidenced during the field audit. The operation developed, documented, implemented and maintains an inspection program related to first aid hardware and resources, including drugs (antidotes´ expire date). Depending on the resource, the inspection frequency may be daily, weekly or monthly. Records of such inspections are retained by the operation and were reviewed during this audit. Inspections are performed by the ambulatory nurses and security team (ambulances testing). Safety data sheets and first aid procedures (intoxication and chemical burning) are available in different places at the operation, all in Portuguese, as evidenced during the field audit. All cyanide containing installation (tanks, pipelines, containers) are clearly identified. The cyanide flow is clearly marked in the pipelines, as evidenced during the field audit. The operation installed a washing station in the exit of the process plant (and in other places). Before leaving the process plant it is mandatory to wash your safety boots and, as previously mentioned, change your uniform or overall. The operation has a full-equipped ambulatory, as previously mentioned. The operation has three ambulances (advanced life support configuration) to transport stabilized victims to the Camaçari petrochemical complex hospital or to São Rafael hospital in Salvador city. As previously mentioned, the operation has formal agreements with São Rafael Hospital and the Camaçari petrochemical complex hospital. The operation documented and implemented a procedure ((NO-SGI-005(16)) to investigate real and potential incidents. There was one minor case in 2020 (case # ACR-01/2020 (31/01/2020)), where a contractor was not impacted by cyanide. The real incident causes were identified, corrective actions were defined and implemented and showed to be effective.

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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.

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The operation is:

X in full compliance with
□ in substantial compliance with Production Practice3.1
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation developed, documented, implemented and maintains a Water Resources Management Program (which was developed by environmental/ chemical engineers and technicians and reviewed and approved by the environmental process manager), which includes the monitoring od surface waters (sea) and underground waters. The plan addresses the places were the samples shall be taken, the number of samples (in accordance with the operation environmental permit), the types of cyanide to be analyzed (total and free). All samples are collected by CETREL technicians and CETREL protocols clearly describe the sample preservation and transportations methods. Chain of custody records are left at the operation addressing all the previous mentioned information. The operation does not have direct discharges to surface waters. All operation effluents are treated inside the operation and then sent to an external treatment center (CETREL manages this effluent treatment plant), which treats all the Camaçari petrochemical complex effluents, before final disposition at the sea (under water discharge). Rainwater is discharged, after treatment at CETREL, at the Capivara Pequena creek, which is monitored, up and down stream by CETREL, all in accordance with the operation environmental permit. All monitoring results, between 2020 and 2023, for total cyanide were below 0.005 mg/l (not detectable). Although the operation does not have a direct discharge to the sea, they monitor the sea water quality (total cyanide and free cyanide) in ten different points and in different depths, twice a year. Reviewed CETREL monitoring reports, between 2020 and 2023 and the highest value for total cyanide was 0.235 mg/l and all values for free cyanide were below 0.005 mg/l (not detectable). CETREL laboratory is an ISO 17025/2017 certified and accredited laboratory by Inmetro Brasil (Instituto Nacional de Metrologia). As previously mentioned, the operation monitors the sea water quality (total cyanide and free cyanide) in ten different points and in different depths, twice a year. Reviewed CETREL monitoring reports, between 2020 and 2023 and the highest value for total cyanide was 0.235 mg/l and all values for free cyanide were below 0.005 mg/l (not detectable). CETREL laboratory is an ISO 17025/2017 certified and accredited laboratory by Inmetro Brasil (Instituto Nacional de Metrologia). The underground water could be used by the operation as industrial water, but the operation does not use groundwater for any purpose. The operation buys treated water from the municipality of Camaçari. Anyway, the operation monitors the underground water quality (through CETREL laboratory). Samples are taken from water wells available at the operation and all values for total cyanide, between 2020 and 2023, were below 0.005 mg/l (not detectable). Between 2020 and 2023 there were no impacts, caused by cyanide, on underground waters.

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The beneficial use of groundwater is preserved by the operation. The operation (cyanide process plant) does not have fixed sources of emissions (where HCN could be present), so the operation is not demanded to monitor air emissions, for HCN. All monitoring frequencies are in accordance with the Brazilian environmental legislation and the operation environmental permit.

Principle 4 | TRAINING

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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 facility in a manner that minimizes the potential for cyanide exposures and releases.

The operation is:

X in full compliance with
□ in substantial compliance with Production Practice 4.1
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation developed and implemented two induction programs, both addressing cyanide related risks, where the first one is mandatory to all employees and contractors entering the operation. The second one, entitled Cyanide Basic Training, is an integration training for those, who passed the induction training, that will work in the process plant. In both cases, the training effectiveness is verified through a written examination. Both training programs are refreshed every two years. During this audit, records of such trainings (initial and refresh) performed between 2020 and 2023 were reviewed. For all employees and contractors, it is mandatory to be trained in the use of escape masks, that must be used everywhere in the operation. This is the first PPE related training that everyone entering the operation receives. For those employees and contractors that will work in the process plant, there is a second training session focused on the PPEs that must be used in the process plant. The third one is for those who will act in emergency situations, where specific PPEs must be used. In all cases, the training effectiveness is verified through a written examination and observations. During this audit, records of such trainings (initial and refresh) performed between 2020 and 2023 were reviewed. All PPE related trainings are in conformance with Brazilian legislation (NR-6/ Norma Regulamentadora-6). Such trainings are refreshed every two years. All workers that will work with cyanide must pass through an “on the job” training program (theoretical and practical), which includes the training in the operational procedures and safe work procedures. The trainee receives practical training under the supervision of qualified workers (operators and supervisors) and, if approved, they will work under supervision for three months, before being allowed to work alone. Such operational training program is refreshed every two years. Records of such trainings were reviewed during this audit. All workers that will work with cyanide must pass through an “on the job” training program (theoretical and practical), which includes the training in the operational procedures and safe work procedures. The trainee receives practical training under the supervision of qualified workers (operators and supervisors) and, if approved, they will work under supervision for three months, before being allowed to work alone. Such operational training program is refreshed every two years. Records of such trainings were reviewed during this audit. The “on the job” training program (theoretical and practical), includes the training in the operational procedures and safe work procedures.

The "on the job" training program (theoretical and practical), includes the training in the operational procedures and safe work procedures. The trainee receives practical training under the supervision of qualified workers (operators and supervisors). The effectiveness of all mentioned training programs is verified through written examinations and observations, as previously mentioned.

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

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 4.2
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All plant operational team is trained on cyanide related emergency situations, including releases to the environment and exposures to cyanide. All plant operational team is trained on cyanide related emergency situations, including releases to the environment and exposures to cyanide. All provided training is recorded and retained by the operation. The training records identify the trainee, the instructor, the training date, the training scope and the trainee performance. Reviewed training records for three new employees contracted in 2023 and one new employee contracted in 2023. The job rotation in the operation is very low. Also evidenced refresh training records performed between 2021 and 2023.

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.

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 5.1
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

It was evidenced that the operation developed and maintains an emergency response plan/ERP (PP-SGI-SIN-347-019(13), updated in 10/Feb/2023). It was also evidenced that the operation is also covered by the Camaçari´s Petrochemical Complex emergency response plan, entitled PAM (Plano de Auxilio Mútuo). The emergency response plan (ERP) considers the following scenarios:

Catastrophic release of hydrogen cyanide, releases of liquid cyanide during packaging, storage, loading and unloading operations, releases during fires and explosions, pipe, valve and tank ruptures, power outages and equipment failures and overtopping of ponds, tanks and waste treatment facilities. The ERP was developed by a multi-disciplinary team, including plant operators and supervisors, control room team, maintenance team, environmental experts, occupational safety experts and the medical team.

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After a risk evaluation, all potential emergency scenarios were identified and specific responses for each scenario were defined. Evacuation plan for internal and external stakeholders (Dias D´Ávila community) is clearly defined by the operation. There are specific first aid protocols related to cyanide intoxication, that includes the use of antidotes and for chemical burning. The emergency response team is composed of plant operators and maintenance technicians. All responses related to cyanide releases involves the emergency response team, the control room team and the maintenance process team. The operation also has interlock systems, that shutdown the process plant in the event of cyanide release during processing. The emergency response plan addresses specific actions, according to the emergency scenario, that shall be implemented to contain, assess, mitigate and prevent future release of cyanide.

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

The operation is:
- **X** in full compliance with
- □ in substantial compliance with Production Practice 5.2
- □ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation ERP was developed by different and multi-disciplinary team including plant operators and supervisors, control room operators, maintenance technicians, occupational safety and health technicians, environmental technicians and brigade members. External stakeholders are involved also, mainly the ones included in the PAM (Plano de Assistência Mútua/ emergency response plan developed to the Camaçari Petrochemical Complex), civil defense of the Dias D´Ávila municipality and military firefighters of Bahia State. External stakeholders such as other operations installed in the Camaçari petrochemical complex and the civil defense of Dias D´Ávila municipality are aware about the operation emergency response plan (ERP). Such stakeholders are informed directly by the operation planned meetings and participation on emergency response drills.

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

The operation is:
- **X** in full compliance with
- □ in substantial compliance with Production Practice 5.3
- □ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation designated two emergency response coordinators (Environmental, Occupational Health and Safety Coordinator and Manager) with corporate authority to provide the necessary resources to implement the emergency response plan. The operation has a specific and qualified emergency response team. The operation emergency response team is trained and qualified in accordance with Brazilian legislation and technical specifications developed by the Military Firefighters of Bahia State. Annually, the emergency response team receives a planned refresh training, in accordance with the Brazilian legislation. Records of both trainings' sessions are retained by the operation and were reviewed during this opportunity. There is an annex in the ERP addressing all contact information related to the emergency response team and with the external stakeholders that may be necessary to participate in the emergency response.

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There is a WhatsApp group related to the emergency response team and coordinators. The responsibilities and authorities of the emergency response coordinators and the emergency response team are clearly defined. In another ERP annex there is a master list of all resources available to the emergency response team. Monthly all the available resources to the emergence response team are inspected. Records of such inspections are retained by the operation and were reviewed during this audit. During the field audit, it was evidenced that such resources are kept in order and in good condition and are promptly available to be used. As previously mentioned, all external stakeholders (PAM members, civil defense, military firefighters, hospitals) duties are clearly defined in the ERP. As previously mentioned, all external stakeholders' duties are communicated in planned meetings and during the participation of emergency drills.

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

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 5.4
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

As previously mentioned, there is an annex in the ERP addressing all contact information of internal and external stakeholders that are involved with emergency response activities. ICMI contacts are informed in the ERP. There were no cyanide related emergencies in the last three years.

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

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 5.5
□ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All cyanide containing tanks are installed inside secondary containments (concreted) with sumps and floor pumps, as evidenced during the field audit. Neutralization protocols are based sodium hypochlorite solutions (12%), available in containers in the process plant, also evidenced during the field audit. All contaminated materials are neutralized and disposed into plastic bags and send to incineration as a final disposition (at CETREL). The operation has a contract with a mineral water supplier (drinking water) and has its own water wells to provide water for domestic use, which are transported by tank trucks. The operation´s emergency response plan clearly addresses that the use of chemicals products such as sodium hypochlorite, ferrous sulfate and hydrogen peroxide, to neutralize cyanide that was released into surface water or could be expected to enter surface water, is forbidden. The operation environmental monitoring plan includes the mandatory environmental monitoring that must be performed in the event of emergencies. The emergency environmental monitoring plan addresses the parameters to be monitored, the acceptance criteria and the sampling methods.

SUMMARY AUDIT REPORT

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

The operation is:
X in full compliance with
□ in substantial compliance with Production Practice 5.6
□ not in compliance with

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Summarize the basis for this Finding/Deficiencies Identified:

The emergency response plan is reviewed and evaluated after real or potential emergencies and after planned emergency drills. The operation annually establishes a mock emergency drill program. In 2020 there were no emergency drills due to the Covid 19 pandemic situation. In 2021, the operation performed three emergency drills. In 2022 the operation performed two emergency drills. In 2023 performed one emergency drill. There are two more emergency drills planned to be performed in 2023. The emergency response plan is kept updated and is reviewed after real or potential emergencies and after emergency drills. The emergency response plan was updated in 10/February/2023, after one emergency drill. All emergency drills planning includes cyanide leakages and/or cyanide exposures scenarios.

Audit team conclusions:

Based on the sampled evidences, reviewed documented procedures, records, drawings, data sheet, the physical conditions of the site (installations), in the interviewed personnel, the audit team concludes that the cyanide management system **is FULLY** implemented and maintained in accordance with the Cyanide Producers Verification Protocol for the International Cyanide Management Institute – ICMI dated June 2021. Being usual in all audit process, through sampling, opportunities of improvement (corrective and preventive) may exist and were not identified in this opportunity.

Celso Sandt Pessoa

Rio de Janeiro, RJ, Brasil, 21/January/2024.

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Proquigel Camaçari		21/01/2024
Name of Producer	Signature of Lead Auditor	Date