

INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Cyanide Production Summary Audit Report Form

PROQUIGEL

Camaçari Unit - Sodium Cyanide Solution

1st Recertification

November 07- 08, 2012

Name of Cyanide Production Cyanide unit: <u>UNIGEL – CAMAÇARI UNIT</u>

Name of Cyanide unit Owner: PROQUIGEL QUIMICA S/A

Name of Cyanide unit Operator: PROQUIGEL QUIMICA S/A (Principal)

Name of Responsible Manager: <u>Deiviti Caetano</u>

Address: Rua Hidrogênio, 824, Camaçari

State/Province: BAHIA Country: BRASIL

Telephone: <u>(55) 71-3602-5540</u> Fax: _----

E-Mail: deiviti. caetano@unigel.com.br

Location detail and description of operation:

Summary

The Unigel - Camaçari unit is located in the Camaçari Petrochemical Complex, State of Bahia, Brazil. It is part of the Salvador Metropolitan Region, and Camaçari is the largest industrial city there. Several chemical and petrochemical plants form one of the largest industrial complexes in Brazil, the largest of the Northeast region of the Country.

The Camaçari Unit produces sodium cyanide solution with at a concentration of 40-41%, as a result of the hydrocyanic acid and sodium hydroxide reaction at a concentration of 44-45%.

The production process of sodium cyanide is divided into the following steps:

Dilution of the soda solution

Reaction of hydrocyanic acid with soda

Dilution of the sodium solution

This step has the purpose of diluting, with demineralized water, the 50% NaOH solution, in order to make this solution reach a 44- 46% concentration. The diluted soda is stored and then directed to the hydrocyanic acid reaction.

Description of Operation

The hydrocyanic acid produced at Acrinor (another Unigel Plant) is fed to a mixer in the reactor circulation circuit where the sodium cyanide solution runs with an excess of 0,7 - 1,0% p/p.

The diluted soda is fed to the R-3210 Reactor. Circulation is kept inside the reactor responsible for the perfect homogenization of the solution.

Due to the heat caused by the reaction, circulation in the reactor goes through a heat exchanger which has the function of keeping the solution at a temperature that cannot surpass 50°C. Through the reactor's top the soda solution is introduced and flows throughout the absorption column where the possible hydrocyanic acid vapors released by the solution are retained. The inert gases flowing inside the absorption column are conducted to the chimney by an exhaustion system.

Nitrogen is continuously introduced in the reactor, in order to carry possible hydrocyanic acid vapors to the absorption columns and keep the inside inert. The extraction of sodium cyanide solution is continuously carried out.

The effluent of the cyanide unit stored in the F-3330 tank is pumped out to Acrinor, a Unigel plant and a Proquigel supplier of HCN where, after being analyzed, it is sent through ducts to CETREL, where it is treated and sent to its final destination.

The present report describes the results of the first re-assessment of the ICMI.

EDÉSIO RIBEIRO DA SILVA

Auditor's Findings

This operation is

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

with the International Cyanide Management Code.

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

Auditing Company: Julio Monteiro Auditores da Qualidade Ltda

Auditing Team Leader: Julio C. M. Monteiro

E-mail: jmaq@ig.com.br

Other Auditors: Not Applicable

Date(s) of Auditing: November/07-08/2012

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

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

Signature of Lead Auditor

CARTÓRIO 10° OFÍCIO DE NITERÓ! A GAVIÃO PEIXOTO, Nº 148 - LOJA - ICARAÍ - NITERÓ! - RJ - TEL: (21) 2610-5

Reconheço por SEMELHANCA a firma de: JULIO CESAR MACEDO MONTEIRO.

Niterói, 14/08/2013. Valor:R\$5,36 561536 SMX46243

Maria de Vina Sant'Ana da Silva-Substituta-Mat.:

24/4480

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

1. OPERATIONS: Design, build and operate cyanide production facilities in order to prevent cyanide leakage.

<u>Production Practice 1.1</u>: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

X in full compliance with

The operation is in substantial compliance with Production Practice 1.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Camaçari cyanide unit was built using sound, accepted engineering practices and quality control/quality assurance procedures. Extensive QC and QA records regarding the construction of the production, loading and warehouse facilities were reviewed and were found to be acceptable. Appropriate Quality Assurance and Quality Control, management of change documentation, drawing control is under control by Management System documentation. The plant is monitored 24 hours a day by a digital system (SDCD Digital Control Managed System), that controls levels, pressure, temperature and concentration and starts alarms when needed, described in the Operational Control Plan. All cyanide pipeline flanges use a flange-cover to avoid spills. Acceptable materials of construction are defined by technical Specifications of the cyanide plant. In the productive process the following materials were used piping in carbon steel and stainless steel, as specified in the construction materials list; Pressure vessels in carbon steel and stainless steel, as specified in the construction materials list; Concrete was used in civil structure and in the tanking area waterproofing was done with coal tar. The plant is monitored 24 hours a day by a digital system (SDCD - Digital Control Managed System) that controls levels, pressure, temperature and concentration, and starts alarms when needed, as described in the Operational Control Plan. The operation has a Maintenance Plan manages inspections and maintenance tasks, according to Engineering Practices and Brazilian Legislation.

All tanks have containment dikes and the area is fully done in concrete. Even so, besides the dikes, the plant is provided with a secondary basin for emergency containment. It has been demonstrated that the storage capacity was calculated in the projects and the containment capacity is in accordance with engineering rules.

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

Production Practice 1.2: Develop and implement plans and procedures to operate

cyanide production facilities in a manner that prevents

accidental releases.

X in full compliance with

The operation is in substantial compliance with Production

Production Practice 1.2

Date: November/08/2012

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified: (Due to the sensitivity of security issues regarding storage of cyanide, no descriptions of substantial or non-compliance with

this aspect of the Production Practice should be provided.)

The cyanide unit has a full set of procedures that describe the standard practices necessary for it's safe and environmental sound operation, for contingencies during upsets in it's activities that may result in cyanide exposures or releases. All further work instructions are still maintained, updated and valid. Procedures related to operation, contingency and changes in operating practices were checked and found in compliance. Well implemented maintenance plan including calibration program was verified. The Unit follows a job instruction that describes the interlocking of containment valves against discharges and criteria to open valves. There is a maintenance plan for the entire cyanide plant, and SGE software is used. The service orders are generated, informing the criticism level of the equipment so tasks can be prioritized. The instrumentation equipment is part of the maintenance plan and they are properly calibrated Accordance to the manufacturer's recommendations. There is a Job Instruction for Drainage and Wastewater Disposal that describes the interlocking of containment valves against discharges, as well as criteria to open valves for the purpose of sampling and analyzing products and afterwards requesting the Lead Operator to discharge solution or water. All residues generated in the cyanide unit are properly stored in containers that have signs and are placed in the unit. After storage, they are sent to temporary residue disposal, with restricted access. Residues generated are sent to a specialized and licensed company for the purpose of being incinerated. All rules applicable to residue disposal are described in the Program for Solid Waste Management. The cyanide solution is stored in tanks that are hermetically closed, with adequate ventilation. Due to the fact that it is a chemical process, the product toxicity, and that there is no gas venting to the atmosphere, systems work in closed circuits. The area is completely closed and access is controlled, in order to avoid inappropriate exposure. All cyanide units are closed and have controlled access.

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

There is a specific standard defining the training and development criteria for employees who are authorized to access the unit. There is safety signaling all around the plant. The cyanide solution is packaged for sale in Isotanks (specific equipment for the packaging of dangerous chemicals). It has been demonstrated that the Camaçari Unit has made a change in management procedure, by means of procedure TEC.NO.01 – Change Management.

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

X in full compliance with

The operation is in substantial compliance with Production Practice 1.3

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

There is a formal inspection program implemented in the company. Visual inspection, hydrostatic tests and internal inspection are carried out. Piping has a specific inspection program. The company maintains a specialized team of professionals in order to carry out the equipment inspection program. For the inspection management program there is specific software called SGE - Equipment Management System. There are specific technical instructions for the inspection of all equipment. One example would be a Technical Instruction to Storage Tank Inspection. As to the frequency of visual inspection, they are defined based on a matrix of flaws used by the company and endorsed by equipment inspection rules. We should point out to the fact that when these inspections are carried out, they focus on reliability. Routine inspections are also carried out by the operational team on a six-month frequency basis. The frequencies of cyanide plant equipment inspection follow the minimum recommendations of Brazilian Legislation - Law. Inspection frequencies comply with Brazilian Legislation and are properly documented. The plant was awarded ISO 9001 - 2008 and adopts in its management system controls, standardized documents and control records, and also preventive and corrective actions in response to this rule.

2. WORKER SAFETY: Protect workers' health and safety from exposure to cyanide.

<u>Production Practice 2.1</u>: Develop and implement procedures to protect plant personnel from exposure to cyanide.

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

X in full compliance with The operation is in substantial compliance

in substantial compliance with Production Practice 2.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The cyanide unit developed procedures to minimize worker exposure through the implementation of several procedures and personal training. Presentation of tests with Operators concerning: position of masks, negative and positive tests, saccharine use, and seal tests in masks. By means of chronograms of targets and implementation preventive and corrective actions during the non — routine and emergency situations. The Company developed a procedure Health and Safety Environmental Care in the maintenance activities related to the cyanide unit. This procedure contains detailed description of all the actions needed in order to carry out maintenance in the cyanide unit. Good practice to be pointed out is the procedure for Permit for Safe Work and the Safety Labeling Program (lock-out and tag-out). There is a chart in the unit control room showing all equipment that are in maintenance and another chart where locking pads are placed, together with the red labels that isolate the equipment.

Before the intervention done by the maintenance team, all equipment go through a decontamination process so to ensure there are no cyanide residues. Environmental monitoring is also carried out before maintenance in order to ensure there is no cyanide, by means of the ALTAIR PRO equipment, which is able to detect HCN (hydrocyanic acid). Training was carried out with engineering and supervision teams during the change management procedure. In the cyanide plant specifically there were no changes that could justify a specific analysis to be run based on the criteria adopted during this procedure Nevertheless, analysis was run in other plants, which demonstrates that the procedure is effectively implemented. Operators carry all the time portable detectors and the unit has fixed detectors at the following points: two by the side of reactor and another one near the pipe rack access platform. In order to have access to the cyanide area it is demanded that basic individual protection equipment are used. Besides, they carry a portable detector for HCN. It should be pointed out that any maintenance task in the plant can only be performed after risk analysis is done. Safe Work Permit is required and there is a specific field in the form for the definition of the Individual Protection Equipment needed for the task accomplishment. Periodic medical tests are run (every six months) and exposure biological control for cyanide by means of the urine tiocyanide test that is done. The unit maintains a Medical Doctor responsible for the health control of all of the population. The medical services are equipped for medical appointments and for emergency cases as well. In areas with the potential cyanide contamination, there are procedures and signs that informing people that eating, smoking and drinking are not

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

Auditor Signature

allowed.

<u>Production Practice 2.2</u>: Develop and implement plans and procedures for rapid and effective

response to cyanide exposure.

X in full compliance with

The operation is in substantial compliance with Production Practice 2.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The cyanide unit has developed and implemented an General Emergency Plan that responsibilities, actions, human resources and material to see to internal/external emergency situations (communities and neighbors) are defined, as well as criteria to escape, in order to mitigate the effects on people, installations, products and the environment, Accordance to the scenarios and risks detected in "Apollo II Project".

The cyanide unit has low-pressure eye wash stations and non-acidic fire extinguishers were in strategic locations throughout the cyanide unit, and that they are maintained, inspected and tested on a regular basis, Accordance to the maintenance plan. The cyanide unit has water, oxygen, a resuscitator, antidote, freezers, stretchers, and means of communication or emergency notification readily available for use in the plant. A sign depicting Cyanide Plant Security System shows all the equipment placed in the area.

The cyanide unit has a program for the inspection of first-aid equipment, which can be noticed in document Preventive Inspection of Medical Devices and Ambulatory Equipment. Material Safety Data Sheets, first aid procedures and informational materials on cyanide safety is produced in the language of the workforce and is available to workers in all areas where cyanide is handled. Storage tanks, process tanks, containers and piping containing cyanide are properly identified to alert workers of their contents, and the direction of cyanide flow in the pipes is designated. As a matter of fact, visual identification in the plant is a very strong point. The cyanide unit has a medical team qualified to work in cases of cyanide intoxication. Besides the medical team trained rescue people to promptly act in cases of cyanide intoxication. Procedure Cyanide Victim Care was implemented and it supplies the Brigade and

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

PAME Medical Team with basic information that will be needed for the treatment of cyanide intoxication victims. PAME is formed by professionals of acknowledged experience in the treatment of accident victims, mainly in accidents related to events in the chemical and petrochemical industry. The cyanide unit has an ambulance at its disposal 24 hours a day, and since the company is part of a Mutual Aid Plan, other ambulances from participating companies can come if requested or necessary. Local hospitals and clinics were alerted of the potential need to treat cyanide exposed patients. The company has made available antidote kits for the treatment of those intoxicated by cyanide in the São Rafael Hospital units in Camaçari (PAME) and the main unit is in Salvador City. Mock emergency drills are periodically conducted to test response procedures for various exposure scenarios, and the lessons learned from the drills are incorporated into response planning. Procedure is implemented by communication and investigation of accidents and incidents establishes criteria for recording, communication, investigation, classification and analysis of occupational diseases and other accidents and incidents.

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

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

X in full compliance with

The operation is in substantial compliance with Production Practice 3.1

not in compliance with

Summarize the basis for the Finding/Deficiencies Identified:

The cyanide unit does not have a direct discharge for surface water. There is internal treatment that specifies the effluent and sends it to an effluent treatment central point for the petrochemical complex that is carried out by CETREL – Effluent Central Treatment. A CETREL discharges effluent after analysis is run and they show cyanide content is lower than 0.02 mg/l WAD in accordance with Brazilian legislation. Environmental protection using EPA 335.2 Methodology and ISO 670. The results in 10 Stations showed <0,001mg/l WAD Cyanide. Procedure from the Management Plan for Ground Water establishes criteria for ground water management. These criteria are included in the Management Plan of Water Resources of the Camaçari Petrochemical Complex.

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

The cyanide unit does not use underground water in its productive process, since all of the water is supplied by another Company - Braskem. There is a program for the monitoring of underground water, which analyzes several parameters, including cyanide, and no contamination has been so far identified. The Company maintains a monitoring program for underground water and effluents discharged to CETREL. In the ground water program monitoring is done in two piezometric wells installed in the unit. Campaigns are done every six months. Reports from the last campaigns were analyzed and it was proven there was no contamination in ground water. Accordance Emissions Management establishes the process of Procedure Atmospheric management and control of atmospheric emissions, punctual and fugitive results of activities at Proquigel - Camaçari, with emphasis on the mitigation, control and monitoring of these emissions. Air, water and soil monitoring programs were analyzed. Their frequency was adequate and they were in accordance with what established in the conditions of the unit Operation License, complying with the requirements of the local Environmental Agency.

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.

Date: November/08/2012

X in full compliance with

The operation is in substantial compliance with Production Practice 4.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Human Resources area that is common to both facilities (Camaçari and Candeias), has established, documented and implemented Organizational Standard. Training for workers to understand the hazards of cyanide and refresher training is periodically given. The procedure Code to Cyanide Productions establishes workers should be trained to understand the risks of cyanide and should regularly receive refresher training. Records of training document this training. Cyanide unit uses the table of functions in the program and training is given for each job. Instructors, who are Engineers and Technicians specialized in this subject had to fulfill minimum requirements. Qualification was proven by means of diplomas issued by certified educational institutions in Brazil. Employees receive specific training before they are allowed to work with cyanide. They will afterwards receive additional and refresher training to go on working with cyanide.

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

<u>Production Practice 4.2</u>: Train employees to respond to cyanide exposures and releases.

X in full compliance with

The operation is in substantial compliance with Production Practice 4.2

not in compliance with

not subject to

Summarize the basis for this Finding/Deficiencies Identified:

All employees at the Cyanide Unit undergo periodical training lesson regarding safety issues when cyanide handling occurs. This includes potential exposures and releases. The training contents are mostly and outcome of the Emergency and Response Plan scenarios. The risks scenarios are practiced carried out according a planning drills. Corrective actions are derived, define and realized according the results of the drills. One way of documenting the training is the Presence List and Participation Protocol, kept for the record, including names of the employee and of the trainer, the date of training, the topics covered, and how the employee demonstrated understanding of the training materials. There is also a table that is elaborated with the objective of showing how much did the individual retain of the materials presented throughout his employment time.

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

<u>Production Practice 5.1</u>: Prepare detailed emergency response plans for potential cyanide releases.

X in full compliance with

The operation is in substantial compliance with Production Practice 5.1

not in compliance with

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

Auditor Signature

Summarize the basis for this Finding/Deficiencies Identified:

The Company established a Response Emergency Plan using the following documents: Emergency Response Plan in the cyanide plant, General Emergency Plan and Crisis Communication. The local emergency responders such as fire brigade and medical doctors are involved in the process of developing these Emergency and response Plan. Objectives and contents of this ERP are define and described. The cyanide unit has a medical team qualified to work in cases of cyanide intoxication. Besides the Medical Team trained rescue people to promptly act in cases of cyanide intoxication. Procedure Cyanide Victim Care was implemented, and it supplies the Brigade and PAME Medical Team with basic information that will be needed for the treatment of cyanide intoxication victims. With an infrastructure that is considered a model one, PAME is supplied with antidotes for the treatment of intoxication through cyanide and it has a comprehensive database with information on chemical products, which facilitates work when victims of hazardous substances come in. PAME has also gotten a fully equipped mobile ICU and a heliport in case it's needed, as well as an airplane for victims' rescue

<u>Production Practice 5.2</u>: Involve site personnel and stakeholders in the planning process.

X in full compliance with

The operation is in substantial compliance with Production Practice 5.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The program "View" from the Inside shows objective evidence that workforce and the communities were involved.

In Superintendent Director's letter dated November 2008, the cyanide unit informed stakeholders of the project regarding the International Cyanide Code, which established the implementation of the requirements needed to comply with ICMI Code and enclosed a CD containing important information on the group, cyanide and the code management, its origin, principles and elements. It also contained details concerning the Emergency and Response Plan, PAM – Mutual Aid Plan and PAME – Medical Emergency Plan.

As part of the Emergency Response Program the company, together with other ones that are part of the Camaçari Petrochemical Complex Contingency Plan, annually performs drills that involve approximately 20,000 people.

The company takes part in the program called "Paths to Self Sustainability" developed by

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

the Committee of Underground Pipes and the Subcommittee on Social Responsibility with the primary objective of establishing relations with the surrounding community. Several initiatives were taken, such as job training, environmental education, first aid, preparedness for response to emergency. In the Participation Protocol has several outside responders and medical facilities were involved in the emergency planning and response process.

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

X in full compliance with

The operation I in substantial compliance with Production Practice 5.3

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The General Emergency Plan contains detailed description in relation to the responsibility of each group member as to emergency response, and the Emergency and Response Plan for cyanide plant that establishes respectively the responsibilities given to primary and alternate emergency response coordinators with explicit authority to commit the resources necessary to implement the plan. They can also establish the procedures to be observed and accomplished in emergency situations with cyanide, in order to reestablish operation to normality and mitigate as much as possible accidental damages caused by emergency. Emergency Brigade was fully trained, in accordance with the scenarios established in the Emergency and Response Plan. Human Resources participation is recommended in this process, and training must be foreseen in PAT - Annual Training Plan. The cooperation with outside responders is also part of the ERP: telephone numbers, addresses and contract persons (includes internal contacts and external contacts such as authorities. police, neighbored companies, public institutions, transport companies, hospitals and medical support, public media such press....).

<u>Production Practice 5.4</u>: Develop procedures for internal and external emergency notification and reporting.

X in full compliance with

The operation is in substantial compliance with Production Practice 5.4

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

Auditor Signature

A communication system was implemented on the plant based on Procedure Emergency Communication and the Use of Radio thus establishing communication and consultations between: workers, contracts, visitors, other facilities, authorities, police, neighbored, Communities, public institutions, transport companies, hospitals and medical support, public media such press.

<u>Production Practice 5.5</u>: Incorporate into response plans and remediation

measures monitoring elements that account for the additional

hazards of using cyanide treatment chemicals.

X in full compliance with

The operation is in substantial compliance with Production Practice 5.5

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Emergency General Plan, Emergency and Response Plan for the cyanide unit respectively establish responsibilities to primary and alternate emergency response coordinators, with explicit authority to commit the resources necessary to implement the plan and establish the procedures to be observed and accomplished in emergency situations with cyanide, in order to restored operation to its normal conditions to reestablish the operation normality and to mitigate as well as accidental damages caused by emergency. It has been demonstrated that the procedure is carried out in accordance with the code requirement, and there are important points in the procedure described after: Cyanide Analysis in Water Course, Disposal of contaminated material, Water supply, Electric power and equipment failure, Cyanidric gas catastrophe with fire, Environmental emergency control, Combat actions in the affected area. Chemical products such as sodium hypochlorite, ferrous sulfate and hydrogen peroxide cannot be used under any circumstances for the treatment of sodium cyanide that was spilt on the surface area.

<u>Production Practice 5.6</u>: Periodically evaluate response procedures and capabilities and revise them as needed.

The operation is ir

X in full compliance with in substantial compliance with Production Practice 5.6 not in compliance with

Date: November/08/2012

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

Summarize the basis for this Finding/Deficiencies Identified:

The Cyanide unit incorporated to the Response Plans and Remediation Plan measures for the monitoring of elements that account for additional hazards of using cyanide treatment chemicals and periodically evaluates response procedures and capabilities—and revises them as needed. The routine and the non-routine process for plan reviewing procedure is described in the different scenarios. Planning by performed mock emergency drills has been conducted with all necessary according the results of these exercises. It has been demonstrated that the Plan is annually revised—in accordance with establish in the Plan, and the evaluation report for simulated emergency.

This is the basis of continuous improvement of the safety and security at the Proquigel - Camaçari Unit.

PROQUIGEL QUÍMICA S.A. Camaçari Unit – Bahia – Brazil

Auditor Signature