Saratovorgsintez LLC

CYANIDE PRODUCTION SUMMARY AUDIT REPORT

FOR THE

INTERNATIONAL CYANIDE MANAGEMENT CODE

AUGUST 2026

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Operation General Information

Name of Production Facility	Saratovorgsintez LLC
Name of Facility Owner:	Saratovorgsintez LLC
Name of Facility Operator:	Saratovorgsintez LLC
Name of Responsible Manager:	Alexey Ivanov, Chief Executive Officer
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Operation Location Detail and Description

Saratovorgsintez LLC is a petrochemical company situated in an industrial zone approximately 15 km southwest of Saratov's city center in Russia. The company specializes in the production of acrylonitrile, acetonitrile, and technical-grade sodium cyanide briquettes. As a subsidiary of the LUKOIL Company—a prominent entity in the oil, gas, and petrochemical industries—Saratovorgsintez is part of a vast network of production and refining complexes operating within Russia and internationally.

The company operates a large-scale petrochemical facility comprising multiple production subdivisions. Its product lineup includes polymer-based materials, solid sodium cyanide, and other chemicals. Within the broader operations of the company, which has been focused on expanding production capabilities through modernization and advanced technologies, Saratovorgsintez represents an important component of the supply chain, particularly in the mining industry.

A key aspect of the plant's operations is the manufacturing of sodium cyanide briquettes**,** which are critical for mining applications. These are produced using hydrogen cyanide, a by-product from the acrylonitrile facility within the complex. The production system consists of two parallel lines. The first line commenced operations in 2008 with an annual capacity of 18,000 tonnes, while a second line was added in 2015 with an initial capacity of 15,000 tonnes/year. In 2019, the capacity of the second line was enhanced to 18,000 tonnes/year, bringing the total output to 36,000 tonnes annually.

The production process involves combining liquid hydrocyanic acid with sodium hydroxide

to create a sodium cyanide solution. This solution is then concentrated via evaporation and directed into a crystallizer under controlled conditions. The resulting cyanide crystals are separated, and the recycled filtrate recycled is returned back into the system. The collected crystals are dried and molded into briquettes, which are then packaged in one-ton intermediate bulk containers (IBCs). These IBCs are transported to a dedicated warehouse via an enclosed conveyor system for storage prior to shipment.

From there, cyanide freight is managed by Krok-Trans LLC, a rail company that handles shipping from Saratovorgsintez to gold mining operations at Polyus Krasnoyarsk and Polyus Verninskoye.

To ensure environmentally responsible operations, all exhaust gases from production and ventilation systems are routed through a wet scrubber to remove cyanide and hydrogen cyanide before being processed through an incinerator. Additionally, all wastewater generated during production and cleaning is treated with sodium hypochlorite and directed to the facility's biological treatment plant before being safely discharged into the Volga River.

Auditor's Finding

The operation is	✓	**in full compliance with**	with the International Cyanide Management Code
	☐	in substantial compliance with	
	☐	not in compliance with	

This operation has not experienced any compliance issues or significant cyanide incidents during the previous three-year audit cycle.

The Saratovorgsintez operational certification audit was conducted in April 2026 by an independent third-party auditor approved by the International Cyanide Management Institute (ICMI). This auditor served as both a Lead Auditor and a Technical Expert for ICMI audits related to gold and silver mining, as well as cyanide production and transportation activities.

During the recertification audit, the production operations of solid sodium cyanide, alongside associated policies, procedures, and facilities, underwent comprehensive evaluation. The audit process consisted of interviews and discussions with various personnel groups, including operations staff, senior management, engineering teams, and environmental, health, safety, and quality (EHSQ) staff. All participating personnel were employees of Saratovorgsintez. The auditor relied on the International Cyanide Management Institute's 2021 "Cyanide Production Verification Protocol" for assessing compliance with the International Cyanide Management Code (the Code or the Cyanide Code).

Locally established procedures were also reviewed as part of the audit. The compliance assessment was based on random samples of relevant information, with methods including interviews, on-site observations, and analysis of records and data. These methods followed typical processes for audits focusing on EHSQ management systems and regulatory compliance.

The audit concluded that the overall preparedness for the assessment was exemplary, with personnel showing a thorough understanding of the ICMI Cyanide Code requirements. The operation management systems were deemed highly advanced, while employees demonstrated strong operational discipline.

All components of cyanide production operations were scrutinized during this ICMI recertification audit. The operation ultimately achieved FULL COMPLIANCE with the Code Cyanide Production Operational requirements.

Auditor Information

Audit Company:	Cyanide Auditors S.A.	
Lead Auditor:	Bruno Pizzorni	bpizzorni@cyanideauditor.com
Production Technical Auditor:	Bruno Pizzorni	
Dates of Audit:	April 21 to 24, 2026	

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.

Saratovorgsintez		August 10, 2026
Name of Facility	Bruno Pizzorni - Lead Auditor	Date

PRODUCTION VERIFICATION PROTOCOL

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.

	✓	**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 auditor confirmed through discussions with the head of the Design Department (PKO) and an inspection of the PKO archive that the facility has diligently preserved records detailing regulatory agencies' review and approval of its design and construction. Additionally, the auditor verified that the facility maintains dedicated documentation archives for construction quality control and quality assurance, housing these records alongside all manuals for the equipment installed at the Plant. These files are meticulously labeled and systematically organized for easy access.

It was observed that, during previous certification audits, the quality control and assurance programs were validated. Since the last audit, no new cyanide production facilities have been constructed. Sodium cyanide continues to be produced on two production lines commissioned in 2008 and 2015. The design of the first production line began in 2004 under the supervision of Giprosintez, with construction starting in 2007 following approval by State Expertise. Giprosintez also oversaw the construction phase. Upon completion, Rostekhnadzor approved the project, issuing a Commissioning Act which allowed production to commence.

The second line was designed by the German engineering firm GLATT Ingenieurtechnik GmbH under a license from E.I. du Pont de Nemours and Co., Inc. (USA). After receiving approval from Glavgoseksperitza, construction supervision and final acceptance prior to commissioning were managed by LUKOIL Nizhegorodniinefteproekt, LLC. In June 2015, a Certificate of Conformity to Technical Regulations was issued for Capital Construction. Both production lines are housed within the same facility (frame 650).

All engineering documentation and construction approvals related to Saratovorgsintez are stored within the PKO archive, located in the company's main office. The archive is overseen by a dedicated specialist who ensures strict control of document retention, permitting only

copies of documents to be taken outside the archive.

The quality control and quality assurance documents related to the construction of this facility were easily accessible for review. As a result, this protocol question is not applicable to the facility.

The materials used in constructing the cyanide production facility were chosen to ensure compatibility with the reagents involved in the production processes. During the initial certification audit, material specifications were thoroughly reviewed and deemed acceptable. The project's compatibility is further supported by the Certificate of Conformity to Technical Regulations for Capital Construction.

Moreover, the "Permanent Technological Rule Book for the Production of Sodium Cyanide and Degassing Cyanide Compounds (PTSN and DTSS)" outlines material specifications in Section 11, titled “Specifications of the Main Technological Equipment.” This document provides detailed information about the materials used in fabricating the facility’s equipment and piping. Most of the piping and vessels that handle and process cyanide solutions are made from various grades of stainless steel, selected based on their use and the country of origin of each component. In some cases, impellers and specific components are made from carbon steel. These requirements were confirmed through on-site inspections and a detailed review of the Technological Rule Book.

The audit included a thorough review of the interlock mechanisms across critical systems. These mechanisms are designed to prevent cyanide releases in the event of power outages or equipment failures. The compliance with this requirement was confirmed through discussions with the shop manager, on-site inspections, and an examination of the Technological Rule Book.

All critical systems are interconnected through a centralized interlock system, ensuring the containment of cyanide even in cases of power disruptions. Both cyanide production lines have a similar design, featuring pipeline valves that respond to deviations in pressure, temperature, or feed rate. The liquid hydrocyanic acid supply line is fitted with interlock valves that automatically shut off the flow and flush the associated piping with nitrogen in case of any issues. Additionally, the supply line is positioned on the fourth floor, providing a vertical head of 11 meters. This design offers an additional safety measure by enabling drainage of the Hydrogen Cyanide (HCN) line in the rare event that the nitrogen flush system fails.

The Technological Rule Book, specifically Section – Table 8: Technological Controls, outlines the safety controls in place for each piece of equipment. It specifies the pressure, flow, and temperature thresholds that trigger alarms and activate these interlock systems.

Beyond the interlock valves, HCN sensors are installed at valve boxes along the hydrocyanic acid lines to detect potential leaks. Should HCN gas be detected, these sensors immediately engage the interlock systems, further enhancing plant safety.

All production activities take place on a concrete surface, ensuring controlled operations. No cyanide-related processes are conducted outside the designated containment area. During the recertification audit, the auditor observed that the concrete surfaces and their construction joints were in good condition, ensuring an adequate barrier to prevent infiltration into the subsoil. During the site inspection, the auditor verified that the impermeable surfaces remained intact with no visible cracks that could compromise their effectiveness in containing potential cyanide releases.

The facility, including the structure labeled as Frame 650, is specifically designed to handle spills. Any spillages or wash water from the floors are channeled to wastewater collection tanks 602 and 606. These tanks are situated just outside the production plant within separate concrete containment basins for each production line. Wastewater unsuitable for reintroduction into the process is directed to the local sodium hypochlorite treatment plant (Frame 572) before finally being processed at the industrial complex's biological wastewater treatment facility. During inspections, each floor of the facility was noted to be well-maintained and competent for operations.

The auditor also inspected the secondary containment in the sodium hypochlorite treatment plant, where acid-resistant brick flooring is utilized. However, it was noted that the seals between the bricks require maintenance to ensure an impermeable barrier against infiltration in case of spills. When examining engineering drawings, it was confirmed that a reinforced 20 cm-thick concrete slab lies beneath the bricks, which is coated with two layers of polybutylene rubber—a protective measure to prevent spill infiltration into the subsurface. As a recommended improvement, the auditor suggested repairing the brick joints to enhance containment integrity, a suggestion welcomed by the workshop management as an opportunity for improvement.

The wastewater tanks are connected to Frame 650 by two pipelines—one for each production line—which are buried over a short distance between the plant and their respective containment basins. Although these pipelines lack double containment, they are made of durable stainless steel. Given that the operation is regulated as a Class I hazardous facility, all piping undergoes annual external inspections and hydraulic testing at least every eight years, as required by regulations. The auditor verified compliance with these requirements by consulting the head of production and reviewing inspection and testing records, confirming that the pipelines had been periodically hydrostatically tested and approved by Rostekhnadzor for continued use.

Interviews with the Chief Metrologist of the facility, along with samples of maintenance schedules and logbooks, have confirmed that all tanks and storage vessels are equipped with tank level indicators and high-level alarms integrated into the control system. Process tanks are configured with both low- and high-level visual and audio alarms that alert the shop control room, helping to prevent overflows. Typically, these alarms are set to activate when the solution level falls below 20% or rises to 80% of the vessel's volume, at which

point locking mechanisms are triggered to halt further filling. The specific alarm settings for different vessels are outlined in the Technological Rule Book. This instrumentation is considered adequate to prevent overfilling of cyanide process and storage vessels.

The plant has established procedures and programs to ensure regular inspections of all instrumentation, including tank level indicators, verifying that alarm systems and measurement devices remain in proper working condition. Control and measurement devices for hazardous production facilities meet local regulatory requirements. Shift-based checks of tank level alarms are logged in accordance with the operational protocols specified in the Instruction for the Operation and Maintenance of Automatic Alarm Systems (SAS) and Emergency Automatic Protection (PAZ), implemented in the Saratovorgsintez workshops. Additionally, monthly checks of alarm functionality are conducted as per manufacturer recommendations and the standards set by the Russian Federation Certificate of Approval for these devices.

The secondary containment systems for the process and storage tanks, as well as containers, have been constructed using materials that provide an effective and reliable barrier to leakage. Since the previous International Cyanide Management Code (ICMC) certification audit, there have been no alterations to the secondary containment structures surrounding cyanide production facilities. These containment systems are specifically engineered to minimize the risk of environmental releases. Monitoring during construction, accompanied by stringent quality assurance and quality control measures, was carried out to ensure compliance with federal standards. The containment structures received formal approval prior to the commissioning of the site.

The hydrocyanic acid storage is within the scope of this audit. There is sufficient secondary containment for the tanks. For spill protection the warehouse is equipped with chemical protected tiles. In the event of spills through the drainage system, the bottling is directed to a buried container D-204, designed to hold all hydrocyanic acid. This tank is provided with a water supply for dilution and a pump for sending it to an intermediate tank park of 510 kW for further thermal neutralization or return to the process. There is also a container D-203 into which it is possible to remotely drain a container of hydrocyanic acid during depressurization or polymerization. The tank room and pump room are equipped with a deluge installation, a floor flushing installation, as well as a supply of caustic soda to the floors for degassing.

A container with sulfuric acid is intended for squeezing it into container D-201 (with hydrocyanic acid) in the event of a sharp increase in temperature and pressure (signs of polymerization). When gas contamination appears in the warehouse, automatically: the intake of hydrocyanic acid is transferred to a reserve tank, the pumps for transfer to the cyan salt production workshop are stopped, and the shut-off valves in the cyan salt production workshop are closed.

Sulfuric acid and sulfur dioxide are used as stabilizers. The quality of hydrocyanic acid is

controlled by the Production Laboratory at the stage of the technological process according to the following indicators:

- content of inhibitors (sulfuric acid and sulfur dioxide) and appearance - 3 times a day with the same period of time;
- the sum of organic impurities, the mass fraction of water and ammonium nitrogen
- is monitored once a day. The concentration of stabilizers (sulfur dioxide and sulfuric acid) is controlled before hydrocyanic acid enters the warehouse. Selection at the discharge of transfer pumps.

All operational and process equipment is either housed within the Plant building's internal containment or situated externally in designated concrete secondary containment areas. These external areas are equipped with pump sumps and are generally shielded from precipitation by a canopy roof. The capacity of every secondary containment area has been carefully designed to exceed the volume of the largest tank located within, including additional provisions for any associated piping capable of draining back to the tank. Comprehensive reviews of engineering specifications, structural calculations, and regional precipitation data were conducted during the initial certification audit, and all information was deemed valid and satisfactory.

For process tanks located outdoors without roofing protection, containment systems have been appropriately designed to ensure complete containment. These systems also feature sufficient capacity to accommodate runoff resulting from a design-level storm event. During this audit, the auditor confirmed that all secondary containment systems are in good condition. However, as part of a continuous improvement initiative, the auditor recommended enhancing impermeability by sealing all joints in the acid-proof bricks installed on the floor of the secondary containment area within the sodium hypochlorite treatment facility.

All cyanide solution pipelines, with the exception of the liquid hydrocyanic acid (HCN) supply line to the workshop wastewater tank, are positioned within secondary containment areas provided by the plant. The HCN supply line is constructed from double-welded stainless steel and incorporates advanced safety features, such as shut-off valves. These valves are designed to flood and flush the pipeline with nitrogen in response to any critical deviations in flow rate, pressure, or temperature beyond standard operating parameters. The pipeline has a diameter of 57 mm, with wall thickness varying between 3 mm and 6 mm. It is strategically mounted on an above-ground gantry system, extending between the hydrocyanic acid warehouse (frame 508) and the plant (frame 650).

During the 2016 International Cyanide Management Code (ICMC) audit, the pipeline routed indirectly between the acrylonitrile production plant (frame 650) and frame 508. However, in September 2018, the construction of a new hydrocyanic acid warehouse (frame 508) allowed for the redirection of the HCN supply line along a more direct route to frame 650.

This modification substantially reduced the pipeline's total length, thereby decreasing inspection and maintenance requirements.

Stainless steel pipelines are also utilized for the transfer of wastewater generated from cyanide sodium production (frame 650). This wastewater is conveyed to the sodium hypochlorite water treatment plant (frame 572) via collection tanks situated within containment basins west of the plant. Between frame 650 and the secondary containment basin, these pipelines are buried underground for added security. Beyond this point, up to frame 572, the lines are elevated on an above-ground gantry system.

In accordance with regulatory and operational safety standards, all pipelines and their supporting structures undergo annual visual inspections. Hydrostatic testing is performed at intervals prescribed by established guidelines, specifically outlined in Instruction MO-10—Manual on Audit and Repair of Technological Pipelines with a Pressure Capacity of up to 10 Megapascals (MPa) or 100 kgf/cm². These guidelines incorporate federal safety regulations governing hazardous production facilities. The HCN pipeline is hydrostatically tested every three years, while wastewater pipelines are tested at least once every eight years.

Comprehensive integrity assessments for all pipelines have been conducted, including visual inspections, ultrasonic testing, valve inspections, and hydraulic tests. An accredited organization specializing in industrial safety carried out a detailed evaluation of these pipelines, subsequently granting approval for their continued operation. Compliance with regulatory requirements was confirmed through discussions with the Head of the Technical Supervision Department, site inspections, a review of pipeline inspection and maintenance protocols, and an examination of maintenance records pertaining to inspection and hydrostatic testing of the buried wastewater pipelines situated between the plant and the wastewater containment basins.

Cyanide is packed in closed wood boxes Intermediate Bulk Containers (IBC), packaged in polyethylene and polypropylene bags which protect the product from the air-environment moisture. IBCs are stored on concrete floor in good conditions to prevent contact with water. No water systems for potable use is near this area. The surfaces adjacent to the warehouse are graded away from the warehouse to prevent ponding of water near the walls.

The IBC boxes are packed and sealed in the packing area located on the ground floor of building 650 and transferred to the warehouse via a covered conveyor system (transport gallery), which prevents the containers being exposed to moisture.

The warehouse is equipped with 25 fixed HCN gas analyzers. A balanced general exchange natural ventilation system is provided at the warehouse for the finished products. The exhaust is channeled through baffles, and air is supplied through windows and structural openings. Emergency extraction ventilation inside the warehouse is designed to turn on in

response to hydrogen cyanide gas detectors, in order to ensure the air exchange necessary to maintain the content of pollutant to less than the maximum permissible concentration level (i.e., 0.3 mg/m3). The amount of air exhausted is compensated by intake of air through the automatically opened accesses.

The production and storage facilities are located within an industrial area that is protected by a very restricted access control system. Access to the territory of the plant is controlled by a security company. Access to the warehouse is further restricted to authorized personnel only and entry requires signed authorization.

The cyanide storage is in a dedicated warehouse for sodium cyanide; no other material is stored inside. Cyanide is separated of incompatible materials in all cases. This requirement was verified through site inspection and discussion with the shop deputy.

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	

Summarize the basis for this Finding/Deficiencies Identified:

The facility has developed comprehensive management and operational plans supported by detailed procedures for the operation of its cyanide production plant. It also upholds management system certifications aligned with the standards set by the International Standards Organization (ISO), including ISO 9001:2015 for quality management systems, ISO 14001:2015 for environmental management systems, ISO 50001:2018 for energy management systems, and ISO 45001:2018 for occupational health and safety management.

A robust set of operational procedures governs the plant's activities, ensuring safe and environmentally responsible operations. These procedures thoroughly detail the practices and parameters necessary for cyanide production. Key operational documents include:

- A Permanent Technological Rule Book for producing sodium cyanide compounds at the Sodium Cyanide Production and Degassing Plant.
- Fire safety instructions for the workshop monitoring station and Distributed Control System (DCS).
- Instructions for synthesizing various categories of sodium cyanide within the production department, including operations in workshops, central monitoring

stations, and DCS facilities.

- Guidelines for degassing cyanide compounds in specific categories of the production department, addressing workshop standards and central monitoring protocols.
- Instructions for oxidation operations and discharge department, focusing on degassing cyanide compounds and monitored within the workshop and DCS.
- Process standard lists monitored by the workshop to facilitate self-assessment and compliance with control measures.
- Regulations specific to the workshops involved in sodium cyanide production and associated DCS operations.

The facility has also implemented detailed guidelines on personal protective equipment (PPE) and respiratory protection measures. These include:

- Safety, industrial hygiene, and fire safety instructions for central monitoring stations and DCS workshops.
- Labour protection guidelines for operators working in DCS, as well as for personnel handling raw materials, semi-finished products, and finished goods in workshops with central monitoring oversight.
- A manual on industrial filtration and isolating equipment for respiratory protection.
- Instructions for labor protection during loading and unloading tasks.
- Safety protocols for handling chemicals in the workplace.

The facility's adherence to these policies was verified through extensive documentation reviews and interviews with workshop personnel, demonstrating its commitment to maintaining a safe and compliant operational environment.

The written operating plans and procedures for the facility's cyanide production plant incorporate contingency measures designed to address non-standard operating scenarios. These detailed instructions outline the actions to be taken in the event of an upset that could lead to cyanide exposure or release. The procedures specify the steps required during emergencies or disruptions. Critical equipment is equipped with alarms and interlocks to automatically shut down operations and notify operators in situations that could escalate into serious incidents. All foreseeable scenarios are accounted for in the documented procedures, along with the corresponding responses necessary to manage and resolve such events. This compliance was confirmed through a thorough review of the operating procedures.

Procedures are well-defined to manage any changes within the facility, including modifications to equipment, operational practices, personnel, and product specifications. Legal requirements mandate following a specific process for structural changes to projects

previously approved by Glavgosekspertiza. When changes are proposed, they are initiated through a formal company directive that engages all affected departments, including safety and environmental teams, to review the proposal. These departments collaborate to create a detailed terms of reference, which subsequently guides the development of the engineering design. Once finalized, the proposed modifications are submitted to Glavgosekspertiza for approval and issuance of a construction permit. Notably, no alterations have been made to the cyanide production facility requiring Glavgosekspertiza's review or approval since the last ICMI certification audit.

In cases where regulatory changes impact operations at the site, the relevant procedures are updated to align with plant regulations. Any development or amendments to technical regulations and workshop instructions must be reviewed and approved by the Head of Industrial Safety, Labor Safety, and Environmental Protection before implementation. Additionally, plant employees are required to undergo specialized training and pass examinations on labor protection and industrial safety to ensure readiness for their roles. If an employee is considered for promotion, they must complete role-specific training prior to assuming their new responsibilities. For any updates to product specifications, prior agreement must be obtained from customers and other stakeholders potentially affected by these changes.

The procedures extend to evaluating the potential impacts of any proposed changes on worker health and safety (H&S) and the environment. Before implementing changes in projects, processes, personnel, or equipment, a thorough risk analysis is conducted to identify any factors that might increase the risk of cyanide releases or exacerbate adverse effects on health and safety. This ensures that such risks are assessed and mitigated, as necessary. Changes cannot proceed without written notification to the environmental and health and safety teams, as well as their formal approval. Compliance is ensured through a review of procedures and completed management-of-change documentation, which must include signed verification by environmental and H&S personnel.

The facility operates a robust preventative maintenance program guided by the Regulation "Provisions on the Maintenance and Repair of Technological Equipment." This Regulation aligns with Company standards and outlines procedures for inspecting and maintaining piping and valves. Since the facility is classified as a Class I hazardous operation, Rostekhnadzor conducts monthly inspections of the Plant.

An annual maintenance plan is created, listing equipment by name and schematic reference along with maintenance frequency, as specified in the manufacturer's technical documentation. The plan also includes estimated hours required to complete each maintenance activity. Based on this annual outline, a detailed monthly maintenance schedule is prepared. This schedule specifies the equipment, planned maintenance dates, and estimated completion times for each task. Once tasks are performed, the monthly schedule is updated to serve as a record of maintenance activities. These records document

the total hours spent on maintaining the equipment and the hours of active operation recorded for each piece of equipment annually.

At the warehouse of technical briquetted sodium cyanide, loading operations are carried out using carts and forklifts. For preventive purposes, shift personnel inspect loaders on a daily basis at the beginning of the shift. Every 250 operating hours, the loaders are serviced by the contractor “World of Forklifts”. The auditor reviewed the schedule for inspecting equipment used to extinguish a fire in the warehouse, carts and forklift preventive maintenance reports . There is no other equipment in stock.

Saratovorgsintez ensures an annual plant shutdown to perform maintenance on critical equipment. This usually takes place in September or October, coinciding with the scheduled shutdown of the acrylonitrile plant that supplies liquid hydrocyanic acid. This practice was confirmed through discussions with the Head of Technical Supervision, as well as a review of Company Maintenance Standards and selected maintenance records. The auditor examined work orders detailing completed tasks, spare parts replacements, and recommendations. All reviewed maintenance records were found to be well-documented and satisfactory.

Process parameters at the plant are closely monitored using appropriate instrumentation. Calibration activities are carried out by trained and qualified personnel following a defined procedure, utilizing calibrated testing equipment. These calibrations are performed at intervals aligned with manufacturer recommendations. During the audit, the master schedule for calibrations and associated records was reviewed as part of the assessment.

The production process is under continuous supervision by shift operators located in the plant control room, utilizing a centralized control system. Instrumentation outputs are observed directly on display consoles within the control room. Each of the two production lines is managed by dedicated operators at separate consoles. Routine checks and calibrations of the control systems are conducted every two years to ensure functionality and accuracy.

Section 7.2 of the Technological Rule Book, titled "Technological Controls," details the instrument controls in place for each piece of equipment, along with the pressure, flow, and temperature settings of alarms and interlock systems. These instruments are inspected and calibrated in accordance with the standards outlined by the Company's Metrological Maintenance Organization. A dedicated team within the Department of the Chief Metrological Engineer oversees all tasks related to instrumentation maintenance. Additionally, this team is supported by full-time contractors from specialized organizations. Instruments that cannot be removed are calibrated on-site by government-approved contractors, while all other equipment is sent to specialized licensing centers for maintenance and calibration.

This information was validated through discussions with the Head of the Cyanide Plant and

the Chief Metrological Engineer, as well as through a review of site inspection logs and instrument maintenance records.

All wastewater generated by the facility is directed to dedicated wastewater tanks situated within a concrete containment basin at frame 650. Each containment basin associated with the various operational lines is partially shielded from precipitation through the installation of canopy roofs. Each tank is further equipped with a pump system designed to transfer sediment into one of the designated wastewater tanks. Non-domestic wastewater undergoes routing to local treatment facilities located at frame 572, where cyanide neutralization is performed. Following this initial treatment, the effluent is transported to the biological wastewater treatment plant situated at the Saratovorgsintez industrial site for comprehensive processing. The concentration of free cyanide in wastewater leaving the local treatment unit at frame 572 is maintained at levels not exceeding 3 mg/L. At the biological treatment plant, additional procedures are undertaken to eliminate residual contaminants, including any remaining cyanide, thereby ensuring compliance with environmental standards governing surface water quality prior to discharge into the Volga River. All discharges are conducted in accordance with regulatory permits.

Both the wastewater storage tanks and treatment facilities at the local treatment plant are enclosed within secondary containment structures made of concrete. These reservoirs, intended for the storage and pre-treatment of wastewater, are further reinforced with chemical protective measures to prevent potential leaks or contamination.

Rigorous laboratory testing is carried out to monitor discharges at two critical points: first, upon leaving frame 572, and second, prior to entering the biological treatment plant. This ensures that the concentration of free cyanide does not exceed the prescribed threshold of 0.569 mg/L. Although stormwater from adjacent areas commingles with wastewater from frame 572 en route to the biological treatment facility, maximum discharge levels are mandated to ensure that free cyanide concentrations do not surpass 0.048 mg/L at the plant's outlet. Exceeding this limit poses significant toxicity risks to both human health and aquatic ecosystems.

Compliance with these stringent requirements has been verified through consultations with the facility's Environmental Specialist and the Head of Industrial Safety, Labor Safety, and Environmental Protection, as well as through a thorough review of relevant environmental analyses and data.

The Plant ensures that no solid cyanide waste is produced, as it is consistently recycled within the process. To further enhance environmental responsibility, the facility has established robust procedures for effectively decontaminating cyanide-contaminated materials and properly disposing of all related waste.

In the Workshop for Sodium Cyanide Production and Cyanide Compounds Degassing (PTSN and DCS), safety, sanitation, and fire safety protocols are governed by Instruction PTSN-TB-

1. Specifically, item 2.8 focuses on safety measures for waste disposal and maintaining a clean production environment. This includes a clear procedure to address incidents where cyanide compounds come into contact with workwear during operations. In such cases, protective clothing must be immediately removed while adhering to strict precautionary practices, such as the use of respiratory and skin protection equipment. Contaminated clothing is then subjected to a two-hour soaking process in hot water for decontamination. Following this, neutralization is carried out within the workshop. Once neutralized, the overalls may either be laundered or disposed of according to established guidelines for contaminated waste.

All refuse, including garbage and waste materials, is to be collected in metal containers before being transported to designated disposal areas. The Instruction also provides detailed guidance on managing cyanide waste and contaminated materials, such as used Tyvek suits, personal protective equipment (PPE), or other items employed during cyanide spill recovery efforts. Furthermore, any equipment contaminated with cyanide must undergo thorough decontamination before disposal or reuse.

Documentation of compliance is meticulously maintained. Records confirming the use of an authorized hazardous waste disposal company were reviewed, ensuring proper handling of toxic materials. Additionally, all relevant permits from this transport company are systematically filed by the Plant for verification.

The requirements for the packaging and labeling of sodium cyanide briquettes are detailed in the document "Sodium Cyanide Briquettes Technical Conditions" and adhere to the United Nations (UN) Recommendations on the Transport of Dangerous Goods, as well as the Agreement on International Goods Transport by Rail. These measures ensure compliance with the packaging and labeling standards mandated by the various political jurisdictions through which the product will transit. The packaging has been certified as conforming to the standards outlined in the UN Maritime Dangerous Goods Code (IMDG), the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), and the Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). Both the packaging and labeling of the cyanide fully meet international regulations for transporting hazardous goods. These compliance requirements were confirmed through a site inspection and further verified in discussions with the Head of the Sodium Cyanide Plant, who is currently also handling responsibilities in the sales department.

Production Practice 1.3

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

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

Summarize the basis for this Finding/Deficiencies Identified:

The facility implements routine inspections to ensure the structural integrity of tanks holding cyanide solutions, carefully checking for any signs of corrosion or leakage. Similarly, the maintenance department routinely inspects pipelines, pumps, and valves to detect wear, deterioration, or leakage, adhering to the guidelines outlined in the *Provisions on Engineering Maintenance and Repair of Technological Equipment* and detailed work instructions. Specific standards for the inspection and maintenance of piping and valves are outlined in *Instruction MO-10: Exploitation, Revision, and Repair of Technological Pipelines with Pressure up to 10 MPa*. Additional maintenance instructions address routine checks for the various types of pumps used in the facility.

Operators perform regular plant installation integrity checks during each shift in line with the workshop monitoring station's work instructions and distributed control system (DCS) protocols. Any identified issues are logged in a shift record maintained in the operator's room. The Head and Deputy Head of the Sodium Cyanide Plant review and sign off on this log daily. Documentation for these inspections has been retained for the past three years.

Beyond shift-level inspections, the Chief Mechanical Engineer’s maintenance team conducts periodic evaluations of industrial building structures, including secondary containment areas. These assessments focus on ensuring structural integrity, checking for fluids' presence, verifying containment capacity, and confirming that drains are closed—and locked if necessary—to prevent accidental environmental releases. These activities conform to Section 5.8 of *Instruction C-1: Operation and Maintenance of Industrial Buildings and Facilities of LLC Saratovorgsintez*. Structures in standard environments are inspected quarterly, while those in harsh conditions undergo monthly checks. Results are documented in technical journals; significant issues are recorded as formal reports or directives to address the deficiencies. Observations confirmed that floors within the plant, warehouse areas, and secondary containment systems for wastewater collection tanks remain in good condition.

Before every cyanide shipment, container integrity is inspected by the facility. However, maintenance responsibilities for the containers lie with Krok-Trans LLC, a rail freight forwarding company specializing in shipping intermediate bulk containers (IBCs) of cyanide. This company assumes responsibility for ensuring container maintenance and integrity

throughout transport.

The aforementioned practices were verified through site inspections, interviews with the shop manager and technical supervision department head, as well as a review of relevant operating procedures, work instructions, and maintenance records.

The inspection frequencies were deemed adequate to ensure that all equipment operates within the specified design parameters. These frequencies are detailed in the comprehensive work instructions for the inspection and maintenance of equipment and facilities. They are determined based on the specific equipment passport requirements, which align with Rostekhnadzor regulations. As the facility is classified as a Class I hazardous operation, monthly inspections are conducted by Rostekhnadzor inspectors.

During the site visit, observations indicated that the plant was well-maintained and organized, and its equipment appeared to be in good condition. This suggests that the established inspection frequencies effectively ensure compliance with design parameters. This conclusion was further confirmed through an interview with the head of technical supervision for site inspections, as well as a review of the facility's operating instructions, maintenance procedures, and records. All records were readily available for review and found to be complete.

The facility maintains meticulous documentation of inspections and retains records in both electronic and physical formats. Any issues identified during shift inspections of the plant are systematically recorded in a shift logbook, which is kept in the control room. This logbook undergoes daily review and is formally signed by both the Head and Deputy Head of the Sodium Cyanide Plant.

Inspections are carried out following the established procedure titled "Provisions on Organization and Performance of Preventive Activities in the Areas of Industrial Safety, Labor Safety, and Environmental Protection at Saratovorgsintez LLC." According to this procedure, designated inspection services complete a standardized form or checklist documenting the inspection results. These records detail the nature of observed deficiencies, the inspection date, the deadline for remedial action, the name of the responsible inspector, and the corrective measures implemented to address the issues.

The accuracy and adequacy of this documentation process were verified through staff interviews and an examination of records. The auditor determined that all practices and documentation were in full compliance with required standards.

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.

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

Summarize the basis for this Finding/Deficiencies Identified:

The facility has established and implemented comprehensive procedures aimed at minimizing worker exposure during routine cyanide production, storage, and shipment operations. These safe work practices are outlined in the manual titled "Instruction for Personnel of the Shop for the Production of Sodium Cyanide and Degassing of Cyanide Compounds." This document covers key aspects such as potential hazards, foundational workplace safety guidelines, fire safety measures, appropriate use of Personal Protective Equipment (PPE), and first aid protocols for cyanide exposure. Additionally, it includes detailed instructions for handling specific high-risk tasks, such as respiratory protection, confined space entry, hot work, chemical handling, working at heights, managing mobile equipment operations, load handling, maintenance procedures, energy isolation, transportation and storage of hazardous substances, safe usage of HCN personal analyzers, and storing compressed gas cylinders.

The facility has also developed specific procedures to address normal operations, unexpected deviations, maintenance activities, and emergencies. A comprehensive catalog of operational, maintenance, and health and safety procedures was reviewed and deemed satisfactory. For example, the Permanent Process Regulations governing sodium cyanide production and cyanide compound degassing include critical sections like "Possible Incidents in Operation and Methods for Their Elimination," which provides guidance on evaluating and addressing non-routine or abnormal situations. Sections 9.2 and 9.4 further detail steps for managing emergencies, including incident response and emergency shutdown procedures to mitigate potential risks.

To ensure compliance and effectiveness, the facility conducts regular audits involving procedure sampling, employee interviews, and record reviews. These methods confirm proper implementation of safety practices. The documents mandate pre-work inspections and the use of PPE where necessary to support safe plant operations. Pre-work inspections focus on identifying safety and operational concerns and are systematically documented to ensure accountability.

Emergency response plans are also in place, including detailed protocols for decontaminating equipment that may come into contact with cyanide during emergency response activities. The auditor's review confirmed that these procedures comprehensively outline safe work practices and are being actively adhered to by employees. This was validated through observations and discussions with personnel on site.

The facility provides several channels for workers to contribute to the development and evaluation of health and safety procedures. Employees can share feedback when updated procedures are issued, during pre-shift briefings, and in daily work-planning meetings where operational topics and safety matters are discussed.

The Plant actively encourages workers to propose improvements to procedures and operational changes, and it takes that input into account when reviewing health and safety practices. Formal participation mechanisms include:

- Designated worker Health and Safety (H&S) representatives on the Saratovorgsintez Professional Union H&S Committee, which meets quarterly to present worker feedback.
- An annual H&S review competition in which employees submit improvement ideas; winners receive a financial bonus.
- The ongoing 5S competition between departments, which promotes efficiency, organization, housekeeping, and H&S performance; the winning department receives a financial reward.
- The Six Sigma Lean program, which supports continuous improvement in process and energy efficiency.
- An anonymous suggestions box located at the main office reception.

This requirement was verified through an interview with the Head of the Department of Standardization of Management Systems and by reviewing office noticeboards displaying the names and photos of employees from the department recognized as the annual winner. Based on this evidence, employee participation in the development and maintenance of safety practices was found to be acceptable.

The facility has identified the areas and tasks where workers may be exposed to hydrogen cyanide gas and/or cyanide dust. To support safe working conditions, experienced engineers evaluated the Plant and cyanide warehouse to determine where exposure could occur. Portable HCN analyzers are required for tasks with potential elevated HCN or cyanide exposure. These devices include audible and visual alarms set at 0.3 mg/m3, the maximum permissible concentration. Operators are required to carry portable analyzers, and fixed analyzers are installed in areas where elevated HCN gas or cyanide dust may be present.

Workplace hazards are documented in the Instruction Manual for Health and Safety. Fixed HCN gas detectors are installed in all areas where HCN may be present. Workers are trained

in the use of appropriate PPE, including mandatory equipment for routine work and additional PPE for specific tasks. Required PPE is indicated on signs throughout the Plant. Respiratory protection requirements are set out in the Instruction on the Use of Filtering and Insulating Respiratory Protection. These instructions also require the use of gas analyzers and PPE in areas with potential HCN exposure.

The auditor verified implementation through direct observation of workers carrying portable HCN analyzers, fixed detectors in operation, and warning systems functioning in relevant areas. The auditor also confirmed the use of appropriate PPE and the application of administrative controls through interviews with workers and the Head of the Cyanide Plant, as well as a review of the relevant instructions.

HCN gas analyzers are installed throughout the Plant and warehouse. Fixed Honeywell detectors are located on all floors of the Plant and in warehouse frame 232, with 15 units positioned at key points on each production line and 25 in the warehouse. These detectors monitor workplace air and the interstitial spaces of liquid hydrocyanic acid lines and conduits for potential leaks. All fixed detectors have audibled, and visual alarms set at 0.3 mg/m3, the maximum permissible concentration. To maintain coverage, the Plant keeps 25 spare units available while detectors are removed for calibration by organizations accredited by the Federal Service of Accreditation (Rosaccreditation). The site also has 12 portable HCN detectors.

Federal regulations require all workers to be trained in the Instruction on Personnel Actions in Emission-Related Emergencies. If a gas alarm is activated, workers must warn others, use the escape respirator they are required to carry at all times, determine the direction of the gas, and evacuate quickly and calmly to a safe area, moving perpendicular to the wind. They must then report their location to the shift supervisor. Dispatch notifies the emergency response team, and a loudspeaker system provides additional instructions.

This requirement was verified through site inspection and an interview with the Head of the Gas Rescue Squad.

Fixed and portable HCN gas detectors are maintained under the site's metrological inspection program, which establishes maintenance schedules for all measuring and testing equipment. Maintenance is performed annually in accordance with manufacturer recommendations and applicable regulatory certificates, and only accredited organizations are authorized to carry it out. Each year, the HCN detectors are sent to ERIS LLC in St. Petersburg or to the Federal Budgetary Institution (FBU) Saratov State Regional Centre for Standardization, Metrology and Testing for sensor replacement and calibration. Relevant records and supporting documents are retained.

This requirement was verified through an interview with the Head of Instrument Control and a review of calibration certificates for the fixed and portable HCN detectors issued during the current recertification period.

The Instruction Manual for Health and Safety and the Instruction on Labour Protection for Operators, Section 1.5-5, identify the tasks that require a second person to be present. Working alone in areas where cyanide is present is prohibited.

Operators are required to work in pairs during cyanide-related activities considered hazardous. On entering the production area, each person signs in with the area operator. All employees carry radios for communication, and the Plant also uses a loudspeaker system. In addition, 17 cameras installed throughout the workshop are monitored from the control room.

The auditor verified compliance with this requirement through a review of the relevant instructions and interviews with the Head of the Sodium Cyanide Plant and the Head of Industrial Safety, Labour Safety, and Environmental Protection.

Fitness-for-duty medical examinations are conducted before employment and at least annually thereafter. All employees are subject to mandatory pre-employment and periodic medical assessments to confirm their fitness for assigned tasks, as required by the Russian Federation Labour Code, the Order of the Ministry of Health and Social Development, and the site's occupational health and safety instructions. The site medical clinic performs these examinations, which include respirator fitness evaluation, mandatory hearing and vision tests, and spirometry to assess pulmonary function.

This requirement was verified through an interview with the Head of Industrial Safety, Labour Safety, and Environmental Protection and a review of the relevant documents. Records are maintained in employee medical files.

The Plant's clothing-change policy requires operators to change before starting work and again before leaving the site. This policy has remained unchanged since the last ICMC certification audit. All employees, contractor personnel, and visitors entering relevant areas must wear PPE provided by the facility, including coveralls and safety shoes, as required by Plant instructions. At the end of each shift, coveralls must be removed, vacuum-cleaned in a dedicated room, and stored in separate lockers. Work clothing must be laundered using the onsite laundry facilities. Workers are issued two sets of coveralls, must shower at the end of each shift, and must launder their coveralls at least every four days.

This requirement was verified through an interview with the workshop foreman and a review of the relevant policy document.

Appropriate cyanide hazard and PPE signs are posted throughout all operational areas. These signs alert workers to the presence of cyanide and indicate the personal protective equipment required. During the audit, both supervisors and workers demonstrated a strong understanding of the restrictions in place and the risks of not following them.

Hazard signs are prominently displayed throughout the Plant to identify chemical and other workplace hazards. Additional signs indicate the PPE required in specific areas. All piping is color-coded and labeled to identify its contents and flow direction, in accordance with

Section 2.6.2 of the Instruction Manual for Health and Safety.

The auditor verified compliance through site observation of signage, interviews with personnel, and a review of the relevant procedures in the Instruction Manual.

The facility enforces strict prohibitions on eating, drinking, smoking, and the use of open flames within production and storage areas. As outlined in Section 1.5-5 of the Health and Safety Instruction Manual, personal hygiene protocols mandate that food preparation and consumption are strictly confined to designated areas, such as the dining room. Employees are also required to wash their hands prior to consuming food. Smoking is restricted to specifically designated smoking areas, while the use of open flames is only permitted when accompanied by a hot work permit, in accordance with the guidelines set forth in the Instruction on the Safe Conduct of High-Risk Work.

The auditor conducted a comprehensive review of relevant training plans and records, engaged with employees through interviews, and evaluated on-site signage throughout the facility. The findings indicated full compliance with these regulations. Employees demonstrated a clear understanding of the restrictions and an awareness of the potential hazards associated with non-adherence to these safety rules..

Production Practice 2.2

Develop and implement plans and procedures 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	

Summarize the basis for this Finding/Deficiencies Identified:

The facility has implemented a thorough emergency response strategy, referred to as the Plan of Measures for Localization and Liquidation of Accidents in the Plant (the Plan), designed to ensure a swift and effective reaction to cyanide exposure incidents. These Plans have been reviewed and verified as comprehensive. They outline detailed procedural steps to address instances of cyanide ingestion, skin or eye contact, as well as inhalation of cyanide dust or gas.

The Plans specify actions to be taken during various emergency situations, delineate employee responsibilities in such events, and emphasize collaboration with local and regional chemical protection organizations. They have been formally approved and signed by the senior management of Saratovorgsintez in conjunction with representatives from government response agencies. Additionally, the facility's Instruction Manual for Health and Safety outlines specific response measures for protecting personnel against cyanide

exposure. This compliance was confirmed through an evaluation of the Plans, the Instruction Manual, and an interview with the Head of the Group of Civil Defense and Emergency.

Low-pressure eye wash stations and safety showers are strategically placed across each floor of the plant site to ensure quick access in case of emergencies. Additionally, non-acid fire extinguishers are positioned in key areas and are routinely inspected and serviced. Each eyewash station is equipped with bottled eyewash for direct use. To prevent water from interacting with cyanide powder and producing hydrogen cyanide (HCN), showers are not installed within the designated dry zone. However, an emergency shower and eyewash station are located in an adjoining room near the dry zone, providing safety measures in case of accidental exposure to cyanide. These units are included in daily shift inspections and undergo regular maintenance.

The plant does not utilize acidic portable fire extinguishers. Fire extinguisher locations can be found in Section 3 of the Health and Safety Instruction Manual. In the event of a fire, the building is equipped with an automatic suppression system that operates using Freon gas. For the warehouse areas, an automatic "Buran" type sprinkler system is installed, which employs a dry powder fire suppressant mechanism.

Routine inspection and maintenance of all fire suppression equipment comply with the established procedures outlined in Section 7 of the "Regulations for Maintenance of Security and Fire Alarm Systems." An annual program ensures consistent upkeep per manufacturers' recommendations. The LLC Tech Center "LUKOM-A," licensed for installing, maintaining, and repairing fire safety systems, carries out these activities. Requirements for periodic inspections of fire extinguishing equipment are detailed in Section 3 – Fire Safety of the Health and Safety Instruction Manual. Compliance has been verified through site inspections and discussions with the Sodium Cyanide Plant's Head Manager.

The cyanide production plant has the equipment needed to respond to worker cyanide exposure. Amyl nitrite antidote is available on site, together with procedures for its use, and is stored in refrigerators in the control room, medical clinic, warehouse, and Rescue Team Centre. At the Rescue Team Centre, amyl nitrite is kept in ice inside an emergency medical response bag. Maintenance personnel also carry amyl nitrite when performing work in the plant and return it to the shift supervisor for refrigerated storage at the end of the shift. Medis, the emergency response and medical contractor for the Saratovorgsintez industrial complex, maintains medical oxygen and amyl nitrite kits at the Rescue Team Centre, where a doctor is on duty at all times. Medis doctors also keep a supply of sodium thiosulphate antidote

The site’s emergency response and medical service provider, Medis, ensures that medical oxygen is maintained at the Rescue Team Centre and at the medical center. A doctor is always on duty at the center, and Medis personnel also maintain supplies of sodium thiosulphate antidote. The Rescue Team Centre houses medical oxygen and resuscitator

kits, including resuscitator air mask bag units (AMBU), and keeps additional equipment on the rescue team vehicle. Further, it is equipped with gear for recharging self-contained breathing apparatus air bottles.

To ensure clear communication, operators are equipped with radios linked to the control room, and a central communication system comprising a loudspeaker and telephones is available. The Rescue Team Centre also hosts an emergency dispatch control center that operates 24 hours a day.

An inspection by the auditor confirmed compliance with these safety measures. This included a review of the facility, medical equipment, and consultation with the medical officer located in the same building as the emergency team center, as well as interactions with other workers on-site.

The facility regularly inspects its cyanide first-aid equipment, and inspection records were available for review. Inspection of the amyl nitrite kits kept in the Rescue Team Centre and the control room confirmed that all ampoules in stock were within their expiry dates. The H&S department inspects the amyl nitrite kits and sodium thiosulfate antidote monthly and replaces them according to an approved schedule to ensure their effectiveness. The antidotes are stored in refrigerators with thermostat-controlled temperature gauges to maintain the manufacturer's recommended storage conditions, and expiry dates are strictly observed.

The auditor reviewed inspection records at both the control room and the Rescue Team Centre and confirmed that all antidotes were within their expiration period. Additionally, interviewed personnel demonstrated knowledge of antidote locations and the emergency notification process. Sampled inspection records covering the audit period were reviewed and found to be complete and compliant.

Employees have access to Safety Data Sheets (SDS) that provide details on hazard information, proper personal protective equipment (PPE), symptoms of exposure, and cyanide first aid procedures. This information is available in areas where cyanide is used and is included in the Health and Safety Instruction Manual.

In compliance with Russian legal requirements, additional written information is provided at workplaces where cyanide is handled. First-aid instructions were observed to be present in all areas inspected during the site audit. Furthermore, the site features supplementary signage indicating the presence of cyanide and necessary safety precautions. During the evaluation, the signage was found to be clear and appropriate.

Through site inspections, the auditor confirmed that safety and warning signs, SDS documentation, first-aid procedures, and safety information are available in Russian, the primary language of the workforce. This ensures that the provided materials align with the operation's safety protocols and training programs, meeting the overall requirements for a safe working environment.

Process and storage equipment, including tanks, vessels, pipelines, and containers that contain cyanide, are clearly identified within the cyanide production operation. Tanks, vessels, and piping are marked to inform workers of the chemicals they hold, highlight associated hazards, and ensure that anyone who might come into contact with cyanide or its solutions—including maintenance staff or others potentially exposed to released materials—is adequately warned of its presence. The labeling on pipelines is applied with sufficient size and frequency, allowing personnel to trace pipelines and identify their contents effectively.

All piping is color-coded and labeled to specify its contents, accompanied by directional flow arrows. This practice minimizes the risk of accidental releases or exposures during maintenance activities and complies with the Instruction Manual for Health and Safety, Section 2.6.2. This section mandates that all piping and vessels be appropriately labeled and color-coded.

Observations made during the site visit confirmed that the labeling was clear and appropriately implemented across the facility. These measures provide necessary warnings about the hazardous materials present, ensuring workers' and others' health and safety. Labels are strategically placed near pipe junctions, valves, and along longer pipe runs—locations where releases are most likely or maintenance is frequently required.

The facility has established strict protocols regarding hand washing and showering for employees who have been in areas where skin exposure to cyanide might occur. As part of the personal hygiene guidelines, activities such as cooking, eating, or handling food are strictly prohibited on the industrial premises, except in designated areas like the dining room. Employees are also required to wash their hands before eating. These measures are detailed in Instruction PCN-TB-1, Section 4.5, and the Monitoring Station Instruction CMS-1, Section 5. During the audit, these instructions were evaluated through staff interviews and on-site observations. Employees demonstrated a strong awareness of decontamination procedures and a thorough understanding of necessary safety precautions.

The operation has on-site trained medical staff, emergency medical technicians, and operations personnel capable of responding to cyanide exposure. Cyanide awareness training, including the symptoms of cyanide poisoning and first-aid measures, forms part of the training for all cyanide plant personnel. Several employees are trained as first responders to administer amyl nitrite. The Saratovorgsintez complex also has an emergency rescue team and medical centre under contract. Medis Medical Center (Medis) staffs the site with three doctors on the night shift and ten on the day shift, and the rescue team consists of 32 emergency response personnel. All doctors and rescue team members are trained to administer amyl nitrite and medical oxygen. Doctors and medical technicians also have sodium thiosulfate available, and only they are authorized to administer these intravenous antidotes.

During interviews with the workshop foreman and the rescue team doctor on duty, the

auditor reviewed training records confirming that several facility personnel had received specific training in cyanide first aid, including the use of amyl nitrite and the administration of oxygen..

The facility has established written protocols for managing situations where an exposed worker needs transportation to an off-site medical facility for treatment. In cases of cyanide exposure, initial treatment will be carried out by the on-site medical team. If the injuries are beyond what can be effectively treated at the site, the affected individuals will be transferred to local hospitals. The facility's medical center is equipped with an ambulance to transport workers to these hospitals when necessary.

The auditor examined the operation's response procedures and confirmed they comply with this requirement. Compliance was further validated through an interview with the Rescue Team Medic on duty.

The decision to transport a worker exposed to cyanide to a specific medical facility is determined by ambulance personnel upon their arrival at the site. According to Russian Federal Law No. 323, dated November 21, 2011, all medical facilities nationwide are obligated to provide emergency first aid without requiring any prior agreement.

The enterprise has informed local hospitals of the potential need to treat patients affected by cyanide exposure and is confident in the capability of the designated medical provider. The facility has confirmed that the provider possesses appropriately trained staff, as well as the necessary equipment and expertise to manage cyanide-related emergencies. This assurance was substantiated through interviews conducted with both the on-duty Rescue Team Medic and the Head of the Rescue Team.

The plant has established comprehensive instructions, extending beyond cyanide-related incidents, to investigate and evaluate all occurrences. These guidelines aim to assess whether operational policies and programs are sufficient to prevent such events or require adaptation. Specifically, Saratovorgsintez LLC has implemented formal procedures for the registration, documentation, and investigation of accidents and incidents. This ensures a thorough review to determine the adequacy of the facility's programs and procedures designed to protect worker health and safety, as well as its ability to respond effectively to cyanide exposures.

During the certification audit period, there were no cyanide-related incidents reported. However, records of other incidents were reviewed, demonstrating consistent application of the procedure. In compliance with Russian regulations, every incident must undergo evaluation, and Emergency Response Plans (ERPs) are required to be reviewed and updated accordingly. This dual approach, driven both by events and time, is a mandatory practice under Russian legislation governing hazards in the oil and gas industry.

The verification process included a review of non-cyanide-related incident records and investigation reports, along with interviews conducted with the shop manager of the

cyanide plant to confirm adherence to these protocols.

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	

Summarize the basis for this Finding/Deficiencies Identified:

The facility actively monitors the discharge and quality of both surface water and groundwater in areas both upstream (upgradient) and downstream (downgradient) of the discharge points. Wastewater arising from processes and cleaning activities is collected in tanks and treated with sodium hypochlorite. Following this initial treatment, the wastewater is piped to the industrial complex's biological wastewater treatment plant before being discharged into the Volga River.

A scheduled monitoring program is in place to regularly assess surface water discharge and groundwater quality. The treated wastewater from the hypochlorite treatment stage is first checked by process operators before its transfer to the biological treatment plant for further processing. Additionally, the Environmental Department conducts monthly monitoring of the discharge at sampling point 147, which is located just downstream of frame 572. To assess the impact on the Volga River, water quality monitoring is carried out both upstream and downstream of the biological treatment plant’s discharge point.

A network of groundwater monitoring wells is strategically situated across the industrial complex, with nine of these wells managed by Saratovorgsintez. Additional wells are located outside the boundaries of the plant. Specifically, monitoring wells numbered 16, 18a, 20, and 21 are positioned downstream of the cyanide production facility, while other wells are situated laterally or upstream.

The verification of these monitoring efforts included interviews with the environmental specialist overseeing the program, a review of surface and groundwater quality records, and an examination of the established monitoring schedule. These measures ensure compliance with environmental standards and safeguard water quality in the area.

Before being discharged into the Volga River, all wastewater from the production area is treated with sodium hypochlorite at a local treatment plant to neutralize cyanide. After this initial treatment, the water is sent to a biological treatment plant. The standard specifies

that the free cyanide concentration at the control monitoring point, before the water reaches the biological treatment facility, should be 0.055 mg/L.

Process operators monitor the wastewater after sodium hypochlorite treatment and before it enters the biological treatment plant. Additionally, the environmental team conducts monthly checks at sampling point 147, located just downstream from frame 572. As the wastewater flows toward the biological treatment facility, located about 1.3 km from the sodium cyanide plant, it is further diluted with other sources of wastewater. The maximum allowable concentration of free cyanide for the biological treatment plant is 0.048 mg/L to avoid toxic effects on the biological process.

During this recertification period, data from monitoring point 147 revealed that free ion cyanide concentrations stayed below 0.569 mg/L in effluent directed to the biological wastewater treatment facility and under 0.5 mg/L otherwise. Cyanide concentrations are further reduced at the biological treatment facility before the water is discharged into the Volga River. To protect fishery water bodies, the regulated maximum permissible concentration at the discharge point to the river is 0.05 mg/L.

Monthly checks are performed on the discharges into the Volga River, and surface water samples are collected between April and October at locations 1,000 meters upstream and downstream from the discharge point. An analysis of records over the past three years indicated that free cyanide ion concentrations in the Volga River never surpassed 0.005 mg/L, staying well below both the maximum permissible and the concentration limits specified in the Code (0.022 mg/L) for aquatic life protection. The mass concentration of cyanides in both natural and wastewater is measured using a photometric method involving pyridine and barbituric acid. This was confirmed through interviews with the Head of Quality Department and an Ecologist, as well as a review of environmental monitoring records.

To measure the concentration of cyanides, they use the method of measuring the mass concentration of cyanides in natural and waste waters using the photometric method with pyridine and barbituric acid. The technique is registered with the Federal Information Foundation for Ensuring the Uniformity of Measurements (which is a method approved in Russia). The method specifies the detection limits of free, WAD and total cyanide (in mg/dm3) below the regulated maximum permissible concentration. Measurement range mg/dm3 from 0.005 to 0.25 inclusive for all types of cyanide.

There are no indirect discharges into surface water. All wastewater is routed to frame 572 for sodium hypochlorite treatment before being transferred to the plant's biological treatment facility and ultimately discharged into the Volga River. The sodium cyanide plant features a protective screen designed to prevent groundwater contamination. Over the past three years, there have been no cyanide-related spills outside the designated containment areas. This compliance was confirmed during a site inspection and through discussions with the Head of the Industrial Safety, Labor Protection & Ecology Department, as well as the

individual responsible for groundwater monitoring.

The employees of the enterprise have indicated that local authorities have yet to determine the beneficial use of groundwater in the area. The Plant currently receives its water supply through a local centralized system. For the protection of fishery water bodies, the regulated maximum permissible concentration of contaminants at the discharge point into the Volga River is set at 0.05 mg/l.

A network of groundwater monitoring wells is established within the Saratovorgsintez industrial complex, with nine wells regularly monitored on a quarterly basis by the laboratory. Additionally, there are offsite wells located beyond the Plant boundary, including four (Wells Nos. 18, 19, 20, and 21) situated near and downstream of the sodium cyanide Plant. An ongoing initiative aims to upgrade these offsite wells by replacing them with new ones. From 2017 to 2019, five wells (Nos. 17, 18a, 19, 20, and 21) underwent successful upgrades. These offsite wells are sampled biannually.

Monitoring data collected between 2023 and 2026 from both onsite and offsite wells confirm that cyanide production activities have not affected groundwater quality. The concentrations of free cyanide ions in all sampled wells, both within and outside the industrial complex, have consistently remained below the detection limit of 0.005 mg/l—also well under the standard of 0.022 mg/l established for the protection of aquatic life.

This compliance was confirmed during discussions with the Head of the Industrial Safety, Labor Protection & Environmental Protection Department, as well as the official responsible for groundwater monitoring.

There has been no seepage from the facility causing cyanide levels in the groundwater to surpass the limits required to safeguard any beneficial uses. In fact, the concentrations of free cyanide ions in all wells, both inside and outside the complex, remained undetectable, falling below the threshold of 0.005 mg/l.

The facility actively monitors hydrogen cyanide (HCN) gas and cyanide dust emissions, as well as ambient air quality, to ensure compliance with established regulatory standards. HCN gas analyzers, strategically positioned across the plant, are equipped with both audible and visual alarms that activate when concentrations reach 0.3 ppm—the legal maximum exposure limit for HCN. Air quality monitoring is conducted following the Schedule of Analytical Control of Industrial Emissions of Pollutants at Saratovorgsintez LLC. This schedule forms a key component of the Project for Maximum Permissible Emissions Standards, which has been approved by Rosprirodnadzor.

Emissions generated by production lines are treated using gas recovery systems, including scrubbers and waste incinerators, to maintain compliance with air quality limits at the enterprise's sanitary zone boundary. Additional safeguards, such as system blockages triggered by excessive temperature or flow rates, ensure the quality of atmospheric emissions remains within acceptable limits. The facility features 88 point emission sources,

22 of which are associated with central heating stations and DCS operations. These sources are systematically monitored through quarterly sampling. Analysis over the past three years confirms that emissions have consistently remained within regulatory limits.

Atmospheric air quality is further assessed via a mobile automotive laboratory equipped with advanced instruments for air sampling and analysis. This mobile unit allows for real-time evaluation and rapid data transmission to the environmental protection group and the sanitary laboratory at Saratovorgsintez. Sampling is carried out daily at several downwind locations around the industrial complex, excluding weekends. Certain critical points are monitored twice a day to ensure accuracy. Data collected during this recertification period indicates no exceedances of permissible limits; measurements have consistently remained below 0.007 mg/m³ at the enterprise's sanitary zone boundary.

This compliance was verified through interviews with the facility's ecologist, an inspection of the mobile laboratory vehicle, and a review of air quality records.

Wastewater quality monitoring following biological treatment processes is conducted in alignment with the Schedule for Analytical Control of Wastewater and Natural Surface Water Bodies, as outlined by the Wastewater Service Center and Water Protection Facilities LLC "Saratovenergoneft," and approved by the relevant authorities. Onsite groundwater wells are inspected quarterly, while offsite wells undergo monitoring every six months.

Air quality is assessed in accordance with the Schedule of Analytical Control of Industrial Emissions of Pollutants at Saratovorgsintez LLC. This schedule is an integral component of the Standards for Maximum Permissible Emissions Project, which has been approved by Rosprirodnadzor.

Based on the professional judgment of the auditor, the monitoring frequencies established for these operations are deemed sufficient to accurately characterize the respective environmental mediums. These frequencies enable timely detection of changes, considering the volume of historical data, the stability of monitored parameters, and—in the case of groundwater—the depth and flow rate of the water table.

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

	✓	**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 facility has developed comprehensive training programs and materials to educate all personnel who may come into contact with cyanide. These resources focus on identifying the cyanide materials present in the operation, understanding the health risks of cyanide, recognizing symptoms of exposure, and following the appropriate response procedures in case of an incident.

All new employees are mandated to complete a training program that emphasizes hazard awareness and emergency response. This includes detailed information on cyanide-related risks and the corresponding emergency response measures. Additionally, anyone accessing the site receives instructions on how to respond to alarms and adhere to evacuation protocols.

For staff working in near cyanide facilities, extensive safety inductions are conducted. These sessions outline specific precautions to safeguard human health and the environment from cyanide exposure or spills. Regular training sessions are also held as per obligatory regulations, with records of attendance meticulously documented in each worker's personal training file.

To confirm the adequacy of these measures, the auditor reviewed the training materials and corresponding records. Interviews with the Head of the Industrial Safety, Labor Protection & Environmental Protection Department, as well as other employees, reinforced that potential risks related to cyanide are thoroughly addressed and that all personnel, particularly those at risk of exposure, receive both initial training and periodic refresher sessions.

The facility provides workers with comprehensive training on the proper use of personal protective equipment (PPE) and the specific types required for various tasks throughout its different areas. This mandatory training includes instruction on PPE such as gas masks and

respirators and is conducted on a recurring schedule as per approved guidelines.

The site ensures that employees are trained in the correct use of PPE, as well as when and where it must be utilized. Detailed guidance on PPE usage is covered under specific procedures, including the "Instruction for Sodium Cyanide Production Area and Degasification Area" and the "Instruction on the Use of Industrial Filtering and Isolating Respiratory Equipment." These training sessions are held biannually to maintain consistent awareness and compliance.

The training program also addresses critical aspects such as PPE storage, maintenance, and the selection of appropriate gear for various operations within the cyanide production plant. Feedback from employee interviews confirmed that training is regularly provided, ensuring workers know how and when to safely use PPE.

During the audit, the facility's training records were reviewed, observations of PPE usage were conducted, and interviews took place with both employees and senior staff, including the Head of the Industrial Safety, Labor Protection & Environmental Protection Department, along with departmental engineers. The findings validated that the facility is compliant with established PPE training protocols.

All personnel involved in the production and management of cyanide undergo comprehensive training to ensure they can perform their tasks safely and with due regard for environmental protection. At the start of each year, an annual training plan is developed, detailing the necessary training modules and specific materials tailored to each job function. Newly hired employees are required to work under direct supervision for a probationary period of two months, during which they must successfully complete all elements of the job before being authorized to work independently.

Operational staff are qualified as skilled chemical workers based on their professional education. Their training includes a three-month period of on-the-job professional development, culminating in an examination that grants them a certified degree. This certification serves as a foundation for further specialized training aligned with the requirements of their specific roles. Among the various training modules offered, basic safety training remains essential, as mandated by Russian regulations or derived from risk assessments conducted for operational activities. This training covers critical topics such as handling hazardous materials, proper use of personal protective equipment (PPE), emergency response procedures, participation in drills, dealing with cyanide exposure, and adherence to operating protocols. These courses, often mandatory, must be completed annually and are delivered by qualified trainers.

All training requirements are outlined in the company's standard, STO IMS 1.25-2019 Personnel Management. Following the approved plan, workers at the cyanide production plant receive instruction on industrial safety, environmental protection, occupational health and safety, and other relevant areas during each recertification period. Additionally,

they are required to undergo specialized training for handling pressurized vessels, working at heights, maintaining technological pipelines, and administering first aid. Training certificates for employees are maintained on-site, and a logbook is used to record details such as certification information, training dates, and future certification deadlines.

Detailed instructions are developed for every individual workstation, encompassing safe operational practices, emergency response protocols, maintenance procedures, and other necessary activities. Training records are meticulously documented and retained for all personnel, including contractors, government inspectors, and visitors completing induction programs.

Compliance with these requirements is verified through interviews with the Head of the Industrial Safety, Labor Protection & Environmental Protection Department, other departmental specialists, and thorough reviews of documented training records..

Induction and task-specific training are mandatory for employees before they can handle cyanide independently. During their initial training and safety instruction period, all new employees must work under the supervision of designated personnel, such as supervisors or qualified specialists, as stipulated by a Company Order. This hands-on approach allows them to gain practical experience in the workplace. If a newly hired employee lacks the requisite qualifications, the company facilitates enrollment in a training program through an educational institution that aligns with their occupational specialties.

To earn authorization for unsupervised work, employees must undergo a thorough evaluation upon completing their training and apprenticeship. This assessment, conducted by the workshop’s qualification committee, ensures competency in standard operating procedures and specific job-related skills.

In addition, workers and engineering staff involved in managing technological processes and operating equipment at facilities classified with Class I and II explosion hazards are required to complete specialized safety training. This qualification process includes lessons on accident prevention and the mitigation of risks in high-hazard production environments. The training is bolstered by modern learning tools and skills development technologies, such as computer simulators, in compliance with Federal industrial safety regulations. These guidelines are outlined in the General Codes on Explosion Protection applicable to explosive and fire-prone chemical, petrochemical plants, and oil refineries.

The auditor confirmed adherence to these requirements by reviewing training materials, employee support records, and conducting interviews with operational and supervisory staff. The effectiveness of the training is assessed using testing methods and observations of employees' performance in real-world tasks..

Workers undergo regular training sessions, supplemented by mandatory refresher courses conducted biannually. These periodic refresher sessions are designed to ensure that employees maintain their understanding of essential, potentially life-saving knowledge. The

auditor assessed compliance with this requirement by reviewing training materials and conducting interviews with both workers and trainers.

The facility's training programs outline the key aspects of cyanide handling that employees must be trained in to competently carry out their assigned tasks. This training is conducted based on written instructions, ensuring alignment with the stated requirements. A checklist of critical topics is provided to new employees, specifying how various cyanide-related tasks should be executed. These training components are comprehensively documented within the station's operating manuals and instructions. Additionally, there are established written guidelines for creating, modifying, and updating documents as needed. Occupational health and safety procedures are developed and implemented as required, accompanied by updates to feedback questionnaires for gathering input from staff.

Verification of this process included discussions with the Head and specialists from the Health, Safety, and Environment (HSE) Department, as well as representatives from the HR Department. The auditor also reviewed training materials and records, conducted interviews with workers and relevant departmental representatives, and confirmed compliance with the requirement.

Task-oriented employee training is delivered by professionals who possess comprehensive expertise in the relevant activities and are proficient in effective communication methodologies. The trainers are primarily engineers who hold advanced academic qualifications and have undergone specialized safety training. Furthermore, they must meet stringent criteria, including having a minimum of three years of work experience at the Plant. According to Russian regulatory standards, these trainers are obligated to renew their qualifications through periodic refresher training, which involves an examination administered by a designated committee every five years.

The adherence to this regulatory requirement was corroborated through interviews conducted with the Head of the Industrial Safety, Labour Protection, and Environmental Protection Department, as well as other specialists within the department. Additional validation was provided by representatives from the Human Relations (HR) Department and by a thorough assessment of relevant training documentation.

The cyanide production facility assesses the effectiveness of its task-specific training programs through a combination of testing and observational methods. Employee evaluations are conducted at the conclusion of training sessions and during routine task performance observations following initial training. Formal examinations are completed immediately after training and repeated annually as part of mandatory refresher courses to reassess knowledge. These examinations are overseen by a specialized committee approved under Company Order. Informal assessments of job competence are also carried out through on-the-job task observations.

Before employees are allowed to work unsupervised, they must pass a comprehensive test

administered by an attestation commission. This commission comprises engineering and technical staff from production and degassing sites, representatives from the Health, Safety, and Environment (HSE) department, the human resources team, and the production and operational technical departments.

In compliance with Russian regulations, all training activities are meticulously documented. These records trace each individual's participation, covering details such as the subjects taught, trainers involved, topics covered, date and duration of sessions, as well as the methods used to verify understanding and effectiveness.

The facility employs standardized questionnaires during multi-tiered induction training, which are retained for reference. New hires are paired with experienced supervisors who guide them through the required tasks while assessing their performance.

Auditors verified the effectiveness of these evaluation procedures by reviewing formally documented records and conducting interviews with site personnel to confirm compliance and reliability..

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	

Summarize the basis for this Finding/Deficiencies Identified:

Employees operating in areas where cyanide is present undergo specialized training to handle potential cyanide releases or exposures. Depending on the structure of the operation's emergency response protocols, employees may be instructed either to alert a designated Emergency Response Team or to administer cyanide first aid directly. It is a requirement that all personnel be trained to manage these scenarios effectively, ensuring their readiness for responses to both cyanide exposure and release incidents. Specifically, employees working in and around the cyanide production plant receive training aligned with the emergency procedures outlined in the site's emergency response plans.

Civil defense and emergency preparedness training for employees is conducted annually at the workplace, encompassing a 16-hour program. Within the cyanide production plant, four training groups have been established, led by trainers who have undergone specialized regional training in Saratov. As a result, the entire plant staff has received comprehensive instruction in civil defense measures and emergency response protocols.

The training is conducted according to a formalized course curriculum for civil defense and emergency protection, as approved by the Minister of the Russian Federation for Civil

Defense, Emergencies, and Elimination of Consequences of Natural Disasters. This framework is further sanctioned by the site's General Director. In compliance with regulatory standards set by the Russian Federation, detailed documentation of the training process is maintained. These records include information on individual employees, topics covered during training, data on instructors, dates, session durations, methods used to verify efficacy, and assessments of information retention.

To ensure compliance, an auditor reviewed and assessed the facility’s training programs and safety practices. This evaluation included interviews with staff, examinations of training and drill materials, and inspection of related records. The implementation of emergency response provisions was confirmed through a thorough review of response plans, associated documentation, and additional staff interviews..

Personnel involved in production operations are systematically trained to execute response actions related to cyanide exposure and release, as outlined in the facility’s emergency response plans. The requirements for employee training, along with documentation of training activities, are comprehensively incorporated into the operation's training program, emergency response protocols, and training records.

Employees receive specific instruction on managing incidents involving cyanide exposure and participate in routine drills designed to evaluate and enhance their response capabilities. These drills are conducted on a regular basis, and insights gained from these exercises are carefully analyzed to inform updates and improvements to the training programs.

The operation manages emergency response training records with a structured system. Training details are documented in a logbook, which includes the type of training, the trainee's name and signature, the training date, and the trainer's name and signature. Additionally, a Personal Registration Form is completed and stored in the employee's personal file. Training session schedules and corresponding logbooks are signed by the trainers and retained by the HSE Department, where they are securely stored in the Training and Information Centre.

An integrated information system tracks all employee data, including training-related details. This system captures key records such as training dates, topics covered, and certification validity periods. It also stores specific training records for emergency response personnel and workers who undergo emergency response training.

Compliance with these processes was confirmed through interviews with company staff responsible for training and emergency preparedness, along with a review of the training materials and recorded documentation.

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	

Summarize the basis for this Finding/Deficiencies Identified:

The cyanide production facility has an established emergency response strategy outlined in the Plan for Localization and Liquidation of Accidents for both the monitoring station and DCS. This plan addresses procedures for managing cyanide release emergencies and potential failure scenarios requiring intervention. In compliance with Russian regulations, the operational alarm and emergency response plan is a mandatory document that accounts for the roles of various parties and ensures all relevant stakeholders are informed. Details on emergency response procedures in the event of a release are specified in Saratovorgsintez LLC's Plan for Localization and Liquidation of Accidents for the monitoring station and DCS, as well as in the Plan of Actions to Enhance Security at Saratovorgsintez LLC, a critically important facility.

The Plans are comprehensive, carefully constructed documents designed to address potential release scenarios at the site in a practical and detailed manner. They focus on specific site conditions and responses, including those involving cyanide. The auditor confirmed that these documents realistically consider release scenarios that could reasonably occur and result in significant impacts on workers, the community, or the environment, based on the unique characteristics and environmental context of the operation.

Each Plan is tailored to particular emergency situations and outlines appropriate procedures and responses within the site's operational systems. They cover all potential accidental cyanide releases and failure scenarios, such as the release of hydrogen cyanide or other hazardous chemicals, explosions, fires, transport-related incidents, structural collapses, energy resource unavailability, terrorist acts, and natural disasters. Specific to the cyanide production and degasification areas, the Plans identify all potential scenarios, assess their likelihood, and evaluate the areas potentially at risk.

The emergency response plans also detail credible scenarios involving catastrophic hydrogen cyanide releases, incidents during loading and dissolution operations, ruptures of

pipes, valves, and tanks, as well as other factors like power outages and fires. These requirements were verified by reviewing the corresponding scenarios outlined in the Plans and through interviews with plant staff responsible for emergency preparedness..

The emergency response planning documents comprehensively outline anticipated release types and corresponding responses tailored to the site. They include sufficient detail to enable personnel to understand and execute their specific roles during emergencies effectively. These plans are designed with a level of detail appropriate to the facility's environmental context, the nature of potential receptors, and the established controls in place.

In the event of natural or man-made emergencies, the plans incorporate procedures for personnel evacuation. They clearly define the steps to be taken during both threats and actual occurrences of emergencies. Additionally, they detail response processes for the cyanide production and degasification areas, including specific first aid actions, utilization of cyanide antidotes, and environmental monitoring protocols. Response measures are systematically organized into modules, addressing various emergency scenarios to enhance preparedness.

The plans also specify actions for controlling releases at their source, evacuating workers and nearby communities, administering first aid and antidotes, and implementing containment, assessment, mitigation, and preventive measures for future incidents. Furthermore, once normal operations resume, the plans mandate a thorough investigation compliant with established incident investigation procedures.

An auditor's assessment confirmed that the level of detail in these emergency response plans is appropriate for their intended purpose. This determination was supported by interviews with Plant staff responsible for emergency preparedness and a review of the scenarios outlined within the plans..

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	

Summarize the basis for this Finding/Deficiencies Identified:

The plant has actively engaged its onsite personnel in reviewing the emergency planning process, leveraging their extensive knowledge of the operation, identified potential release scenarios, available resources, and practical response measures tailored to the site's specific conditions.

Given that cyanide is classified as a hazardous substance in Russia, its production, storage, transportation, and handling are strictly regulated by government authorities. As such, government involvement in emergency planning is legally mandated. The site has incorporated input from both its workforce and relevant stakeholders into the emergency response planning process. Employees contribute through post-drill debriefings, where participants can provide recommendations for improving emergency response plans. Additionally, workers are given opportunities to review and comment on emergency response documentation during regular training sessions focused on this material. Subdivision Managers play a key role in the development of all emergency response plans.

The plans have also been reviewed by stakeholders representing potentially affected communities to ensure their effectiveness, particularly in scenarios requiring the evacuation of nearby areas. Furthermore, the plans were endorsed by the Saratov Municipality Administration Department for Protection of the Population and Territories from Emergency Situations. Final approval was granted by the Head of Administration of the Zavodsky District, part of the Municipality of the City of Saratov.

The auditor verified compliance with this provision by conducting interviews with site personnel and inspecting approval documents issued by stakeholders..

The Plant has shared its emergency response plans with potentially affected communities, including the governing authorities of the Region, the City of Saratov, Saratovsky District, as well as enterprises and organizations situated within the 2.5 km zone. The purpose is to ensure they are aware of potential risks, understand possible release scenarios—such as the potential release of hydrogen cyanide gas—and know how the Plant will communicate during an emergency.

These plans also provide a detailed list of industrial neighbors that might be impacted in the event of a cyanide release. If there is a threat or an actual incident, the facility's senior dispatcher will inform the concerned parties through the local notification system. This protocol was confirmed during interviews with Plant staff responsible for emergency preparedness.

External entities with designated roles in the facility’s emergency response plans are clearly identified within these documents. Key participants include the Fire Brigade, operating under agreement PCh-11/FB-11, the Paramilitary Gas Rescue Squad, LLC Medis medical institution, and the security team assigned to the facility. Additionally, the planning process actively involves local response agencies such as external responders and nearby medical facilities. To strengthen preparedness, the company regularly conducts joint drills with city emergency services. These drills ensure proper evaluation of communication protocols and emergency measures while enabling local agencies to familiarize themselves with the site and its available resources. The auditor verified compliance with this requirement through interviews with on-site personnel and a review of mock drill reports.

Stakeholder consultations on emergency response are conducted on a regular basis. The Plant collaborates with the Saratov Oblast and Saratovsky District governing bodies, as well as relevant federal executive authorities, to address various aspects of emergency management. These include the collection and exchange of emergency-related data, deployment of additional forces and resources for managing emergencies, determination of response measures to be implemented, and ensuring security at the facility during emergencies, such as terrorist attacks or other critical scenarios requiring their involvement. This process was confirmed during an interview with the Plant staff responsible for emergency preparedness.

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	

Summarize the basis for this Finding/Deficiencies Identified:

The emergency response plans comprehensively address all aspects outlined in this Production Practice concerning cyanide release or exposure incidents. The auditor verified the site's documentation to ensure it adequately encompasses the necessary measures tailored to the operation's specific needs.

These plans include provisions for sodium cyanide production and a degassing section for cyanide compounds. They specify responsible parties and detailed procedures for managing emergencies. The plans outline designated primary and alternate emergency response coordinators, who possess explicit authority to allocate resources essential for plan execution. The roles, responsibilities, and functions of emergency response teams are clearly defined, encompassing security personnel, the fire brigade, medical services, a 24-hour duty group, and the emergency rescue team. Team members are individually identified, listed, and their details are routinely updated. Responsible leaders and functional managers have also been designated, including the general director of the Saratovorgsintez site, his deputies, the emergency response coordinator, and the head of the fire department.

Emergency responders are required to undergo specialized training facilitated through emergency drills, shift-specific training modules, and sessions involving external response services. The training requirements for the organization are clearly outlined within the emergency response plans, with formal education provided to all personnel involved in handling or producing cyanide. Updated contact lists covering phone numbers, addresses,

and key contacts—both internal and external—are maintained. These include authorities, police, neighboring companies, public institutions, transport providers, hospitals, medical facilities, and media outlets. A comprehensive inventory of emergency response equipment is included in Appendix 3 of the Plan for the Elimination of Accidents for the Central Station and DCS Shop.

Adequate emergency response equipment is housed at the Rescue Team Centre and undergoes routine inspections and maintenance to ensure readiness. Maintenance records, including those for compressed air breathing apparatuses, protective suits, explosion-proof lamps, and gas rescue equipment, are meticulously logged. Furthermore, the plans detail the involvement of external responders, medical facilities, and local communities in coordinated emergency response activities.

The auditor confirmed that these measures are effectively implemented at the site through a combination of site inspections, reviews of relevant documentation, and interviews with employees..

External response teams have been duly informed of their respective roles within the Plant's emergency response plans. These roles were established collaboratively, involving third-party organizations responsible for managing the containment and mitigation of emergencies, as well as the facility's security services, fire brigade, and gas rescue squad. The Plant maintains an annual schedule of mock drills across its various operational areas. This schedule is disseminated not only to internal facility units but also to relevant external entities—security services, the fire brigade, the gas rescue squad, and medical response teams. The site confirmed that all external parties integrated into the emergency response framework are fully aware of their roles. Furthermore, they are actively involved in periodic training exercises simulating scenarios, such as cyanide releases or exposures, which necessitate their intervention.

The inclusion of external entities in the emergency response strategy is facilitated through coordination with the Regional Authority, which oversees the development of the External Emergency Plan for the City of Saratov. During this recertification period, records of drills and associated follow-up training sessions were reviewed, demonstrating that these activities were systematically evaluated and endorsed by the relevant parties.

The auditor assessed compliance with these requirements by examining meeting records, verifying that external entities were provided with copies of the emergency response plans, and conducting interviews with on-site personnel. Additionally, mock drill reports were analyzed to confirm the participation of various stakeholders in these training activities..

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	

Summarize the basis for this Finding/Deficiencies Identified:

The emergency response plans mandate notifying Plant management and relevant government agencies overseeing worker safety and environmental protection in the case of a cyanide-related incident. These plans outline procedures and provide contact details for external entities that may be involved in the response efforts. Should there be a need for additional medical support or follow-up care, the required services are available at Saratov City hospitals.

The security enhancement plan for the critically important Saratovorgsintez facility includes appendices containing notification protocols for Plant management, along with detailed communication procedures. Additionally, the emergency response plan specific to the cyanide production and degasification area features a comprehensive notification flowchart. This flowchart delineates communication pathways with security services, the fire brigade, gas rescue squads, and medical services.

In cases of "significant cyanide incidents," as defined by the Code's Definitions and Acronyms, the plans require notifying the International Cyanide Management Institute (ICMI). However, no such events occurred during the latest recertification period, eliminating the necessity for notification to the ICMI, Plant management, or relevant regulatory agencies at this time.

The auditor conducted a thorough review of the emergency response plans along with supporting documentation, confirming the information is current, complete, and accessible.

The response planning documents outline procedures and contact information for notifying nearby communities potentially impacted by a cyanide emergency, as well as protocols for engaging with the media. In the event of an imminent threat or an actual emergency, the facility's Dispatch Service dispatcher is responsible for informing enterprises and organizations within a 2.5 km radius using the local notification network. Communication with local civil defense and emergency management authorities is conducted through direct channels. The plant manager's remote control operator, who works in shifts to ensure round-the-clock coverage, maintains an updated contact list for immediate notifications. This list undergoes an annual review. The auditor was able to verify this information within the facility's emergency response plans.

The plant's emergency response plans mandate the notification of the International Cyanide Management Institute (ICMI) in the event of any significant cyanide-related incidents, as outlined in the ICMI Definitions and Acronyms document. However, no such notifications have been made during the current recertification period, as no significant incidents have occurred in the operation.

Production Practice 5.5

Incorporate remediation measures and monitoring elements into response plans and 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	

Summarize the basis for this Finding/Deficiencies Identified:

The emergency response plan for the cyanide production and degasification area, detailed under the section Measures and Means for Emergencies Localization and Liquidation, outlines specific actions for emergency spill clean-up and personnel response tailored to various scenarios. It also covers post-emergency procedures such as contamination removal, disposal of waste at approved facilities, the application of decontamination agents like sodium hypochlorite, monitoring protocols, and provision of alternative drinking water when necessary. The emergency response team is equipped with the resources and expertise to manage all but the most severe incidents, with arrangements in place to enlist third-party responders if required. Post-incident remediation efforts would be organized and carried out by the environmental department, supported by specialized environmental contractors as needed.

While the likelihood of cyanides being released into surface water remains exceptionally low, established protocols strictly prohibit the utilization of chemicals such as sodium hypochlorite, ferrous sulfate, and hydrogen peroxide to mitigate cyanides that may enter or have already entered surface water. This prohibition aligns with robust preventative measures, including the provision of secondary containment systems and mechanisms for collecting cyanide releases into designated wastewater reservoirs. These safeguards significantly reduce the risk of cyanide contamination in surface water.

The facility is equipped with localized treatment systems within areas dedicated to cyanide production and degasification. Here, cyanide is neutralized via the application of sodium hypochlorite solution, following which the processed wastewater is transferred to the Saratovenergoneft biological treatment facility for further purification. Staff interviews indicate a comprehensive understanding of the institutional prohibition on using chemicals like hydrogen peroxide, ferrous sulfate, or sodium hypochlorite for cyanide removal near or

within surface water bodies.

Continuous analytical monitoring is conducted across all phases of production to ensure compliance with regulatory standards. Wastewater discharge into the biological treatment facility is strictly regulated, requiring prior authorization based on laboratory analyses of samples collected at the inlet point. To ensure stringent monitoring, cyanide concentration levels at this inlet are assessed bi-hourly. Pollutants within the wastewater are treated using activated sludge—a microorganism-driven method—at the biological treatment facility, effectively reducing contaminant concentrations to negligible levels. Prior to discharge into the Volga River, cyanide ion concentrations are precisely evaluated, with levels recorded at 0.0048 mg/l.

The operational plans are designed to offer comprehensive guidance for decision-making during emergencies, adhering diligently to both the Code and all relevant regulatory mandates.

The operational plans delineate the monitoring processes required in the event of a hazardous cyanide release. Drawing upon the emergency response plans and the associated release scenarios, the operation has established specific sampling and analytical methodologies to be employed in cases where cyanide is discharged onto land surfaces or into surface waters. To mitigate the risk of elevated cyanide concentrations entering the biological treatment plant, a systematic monitoring structure is in place, wherein wastewater samples are collected at two-hour intervals. In emergency situations, wastewater is redirected to reserve reservoirs for subsequent treatment, which involves a two-stage purification process. Additional pollutant monitoring measures are implemented as stipulated in the emergency response procedures.

Prior to discharging wastewater into biological treatment facilities, supplementary sampling is performed at a designated monitoring well to ensure compliance with operational standards. The storm sewer system is engineered to channel wastewater into storage tanks, which then transfer the effluent into the industrial sewerage network for advanced treatment protocols. Furthermore, all effluents originating from cyanide production and degassing activities are segregated from the storm sewer infrastructure and subjected to localized treatment processes at the hypochlorite plant facilities utilizing sodium hypochlorite within Building 572. Once treated, these effluents enter the industrial sewer system for comprehensive downstream processing.

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	

Summarize the basis for this Finding/Deficiencies Identified:

The requirements for reviewing and evaluating the adequacy of emergency response plans, as well as their revision protocols, are outlined within the Plans. The process for reviewing various emergency responses is described in detail. According to regulations in the Russian Federation, an emergency response plan remains valid for two years. These regulations mandate that plans must be updated either at least 15 days before their expiration or within one month following any changes to the facility or technical production processes.

The updating process involves revising critical details, such as the names and contact information of emergency response coordinators and team members, ensuring the information remains accurate when the plans are executed. Additionally, the Plans specify that revisions may also be made based on lessons learned from actual emergency situations or from conducting mock drills.

The auditor confirmed that these updates had been properly implemented by reviewing documentation showing dated revisions to the emergency response plans, as well as copies of the pre-revision versions. The implementation of the review process was further verified through interviews conducted with onsite personnel..

At Saratovorgsintez mock emergency drills form a critical component of the operation response plan, aimed at assessing and refining procedures for addressing cyanide releases, exposures, and other hazardous scenarios. These exercises are integral not only for testing the effectiveness of emergency protocols but also for evaluating the adequacy of training received by response personnel. Such drills are conducted periodically, encompassing a diverse range of emergency scenarios, including chemical releases, explosions, fires, and incidents involving worker exposure or injury. During the current certification period, these drills were carried out in collaboration with all relevant stakeholders.

The emergency exercises were meticulously documented, detailing the scenarios, personnel involved, responses implemented, and outcomes achieved. This thorough documentation enabled the operation to critically evaluate the effectiveness of its response strategies and assess the sufficiency of its training programs for personnel. Although no updates to the overall emergency response plans were deemed necessary, it was decided to expand the dissemination of specific training materials across different services within

the organization for wider accessibility.

To ensure focus and thoroughness, the topics addressed during the emergency drills were segmented by operational process blocks, such as crystallization units, tanks, and pipelines. Drills were conducted on a quarterly basis under the supervision of shift master's and included active participation from rescue teams and medical personnel. Additionally, annual drills incorporated the direct involvement of responsible engineers. The frequency and comprehensiveness of these cyanide-specific exercises demonstrated their adequacy in evaluating the operation's preparedness, resources, and response capabilities in handling emergencies involving cyanide releases or worker exposures.

During the recertification period, several important mock drills were carried out, addressing various potential emergency scenarios. The auditor examined a summary of the drills conducted in 2024 and 2025.

In 2025, a series of training exercises were conducted at the Central Monitoring Station and the Central Control Center Workshop to enhance emergency preparedness for industrial accidents involving hazardous substances. All four training alerts adhered to the "Plan of Measures for Localization and Elimination of Accidents" (PMLA). Minor issues identified during the exercises included delays in emergency response measures, insufficient identification signage for shift foremen, and inadequate labeling of shut-off valves. Recommendations were provided to address these deficiencies. Overall, the drills demonstrated effective collaboration among workshop teams, emergency response units, and external agencies.

The plan incorporates measures to assess its effectiveness and make revisions if necessary following any emergency that necessitates its activation. The systematic evaluation process includes analyzing findings and identifying areas for improvement during emergency response actions and mock drills. This approach underpins the continuous enhancement of safety and security at the site situated within the Saratov industrial area. Additionally, the procedure for developing emergency response plans mandates conducting such reviews. However, no reviews have been carried out since no cyanide-related incidents have occurred that would require the plan to be activated.