SUMMARY AUDIT REPORT

for the April 2017
International Cyanide Management Code Certification Audit

Prepared for:
Lučební závody Draslovka a.s. Kolín

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

FINAL
5 September 2017

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SUMMARY AUDIT REPORT

Name of Plant: Draslovka a.s. Kolín

Name of Plant Owner: Lučební závody Draslovka a.s. Kolín

Name of Plant Operator: Lučební závody Draslovka a.s. Kolín

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Location details and description of operation:

Lučební závody Draslovka a.s. Kolín (Draslovka) is located approximately 50 km east of Prague as presented in Figure 1. The facility is situated in a mainly industrial/commercial area on the southeast side of the town of Kolín. The facility is bounded to the north by a railway right-of-way, beyond which is the River Labe (also known as River Elbe in other parts of Europe); to the west by an alcohol distillery BIOFERM Lihovar Kolín, a.s (BIOFERM); to the east by commercial and residential apartment blocks, and to the south by the main road into Kolín.

Figure 1 – Site Location

Lučební závody Draslovka a.s. Kolín — Name of Plant
Signature of Lead Auditor
5 September 2017 — Date

The Draslovka facility started operation, including production of cyanides around 1906. Hydrogen cyanide was produced from molasses stillage supplied by distilleries. Production halted in April 1945 as a result of damage during an air raid and commenced in 1946 when the plant was nationalised. In the early 1960s a pilot plant was constructed for the production of synthetic hydrogen cyanide. The first unit for the production of hydrogen cyanide using the Andrussow process began operation in 1968. In 1984 the Kolín Company was integrated into s.p. Lachemo Brno - Lučební závody výrobní podnik Kolín. In 1992 Lučební závody Kolín a.s., gained independence from the State and in 1994 Lučební závody Draslovka a.s. Kolín began operations as a private company, when the original company was split. In 1998 new investors entered the company as major shareholders.

The company manufactures a range of products at the facility including alkali cyanides, sodium cyanide, sodium cyanide solution, potassium cyanide, diphenylguanidine (DPG), syntron, chlorocholine chloride (CCC) and special chemicals based on hydrogen cyanide e.g., EDN (an eco-friendly biocide).

Hydrogen cyanide is manufactured at the facility using the Andrussow process. In this process, natural gas (methane), ammonia and oxygen are reacted over a platinum/rhodium catalyst to form hydrogen cyanide (HCN) gas. The HCN gas is then absorbed into sodium hydroxide to form a solution of sodium cyanide (or potassium hydroxide to form potassium salts). This cyanide liquor is concentrated, crystallised, dried and compacted into solid cyanide briquettes. The site has approximately 235 employees and is ISO9001 and ISO 14001 certified, and currently manufactures around 20,000 tonnes of cyanide products per annum.

SUMMARY AUDIT REPORT

Auditors' Finding

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

with the *International Cyanide Management Code.*

Draslovka has not experienced any ICMC compliance issues during the previous three year audit cycle.

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Names and Signatures of Other Auditors

Technical Auditor: Ivan Senchenya
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Date(s) of Audit: 24 April 2017 through 27 April 2017

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the *International Cyanide Management Institute* for Code Verification Auditors. I attest that this Detailed Audit Findings Report (DAFR) accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the latest version of the *International Cyanide Management Code Verification Protocol for Cyanide Production* and using standard and accepted practices for health, safety and environmental audits.

Lučební závody Draslovka a.s. Kolín — Name of Plant

Signature of Lead Auditor

5 September 2017 — Date

SUMMARY AUDIT REPORT

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

Production Practice

1.1 Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control / quality assurance procedures.

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 1.1.

Summarize the basis for this Finding/Deficiencies Identified:

Quality control and quality assurance programs were implemented during construction of cyanide production and storage facilities. These records are retained in Draslovka's records library located in the administration building. More recent documentation is stored electronically if allowed by the regulators. Records were also available for construction projects completed in the past three years. These included, installation of Scrubber Z308, installation of portable air-conditioned operator observation hut "box" on the upper floor of the cyanide plant, installation of air-conditioning and associated overhead door in the packing area, and installation of tanks associated with a wastewater reuse project. The records show that appropriately qualified personnel reviewed facility construction and provided documentation that the facility was built as proposed and approved.

In 1995 after Draslovka began operation as a private company, a "Permission to Operate" the cyanide plant was issued from the Regional Authority (Městský Úřad v Kolíně) to Lučební závody Draslovka a.s. Kolín based on the as built plant and operation at that time. Without this permit the plant would not be allowed to operate. In 2007, an *Integrated Pollution Prevention and Control* (IPPC) permit was obtained for the cyanide plant. The permit sets out requirements for construction, operation and aspects of environmental and safety control and monitoring based on best available technology. There have been eight updates to the permit since it was issued. The permit is still current with the last update issued on 23 June 2015.

Each year an integrated inspection of the facility is performed under the law of prevention of serious accidents by a number of authorities (Czech Inspectorate, County Office of Kolín, Police of Central Bohemian Region, Work Inspectorate, Fire Brigade and Regional Environmental Inspectorate). These inspections allow the site to continue operation, assuming the findings are not serious and can be managed. The Integrated Inspection

Reports for inspections conducted in September 2014, 2015 and 2016 were reviewed. No issues of concern were identified.

Annual safety inspections and tests of process equipment including reactor vessels, pipelines and pressurized systems are also performed by certified external engineers, working on behalf of the government to ensure that the equipment is approved for use. Inspection reports for May 2014, 2015 and 2016 were reviewed and no significant issues were identified.

The materials used for the construction of cyanide production facilities are compatible with the reagents and process used by the operation. All new construction design is reviewed internally by experienced engineers and technologists prior to approval and by the government authorities for approval prior to construction. A Material Certificate of Compliance is issued for all equipment installed. Review of material specifications records confirmed that equipment used in cyanide production is constructed of stainless steel or carbon steel. Concrete floors in production areas are urethane coated or covered with tiles with chemical resistant tiles and mortar. For cyanide wastewater tanks, polyethylene has been selected and used.

The hydrogen cyanide and sodium/potassium cyanide production facilities are equipped with “interlocks” at critical areas which automatically shut down the process if there are power outages, equipment failures, or if temperatures, pressures, feed flows or tanks levels fall outside of safe operating conditions. These systems have basically remained unchanged since the ICMC recertification audit conducted three years ago.

All areas where cyanide is produced, stored or handled are underlain by concrete to minimize the potential for cyanide release into the environment and with two exceptions all pipelines are located within these concrete contained areas. The first exception is the above ground HCN supply pipeline between the HCN plant and the cyanide production plant. This supply line is about 100 m long and is constructed of welded steel and equipped with sensors and interlock valves to shut down flow and prevent a release if there is an upset from normal operating conditions. The second is a small section of above ground pipeline that spans across an access roadway between the cyanide production building and the adjacent tank farm. This pipeline is double-walled and has a minimum 1.5% gradient such that liquid in the pipeline would drain to the storage tanks.

The concrete floors and containment areas of the production buildings, cyanide warehouse and tank containment basins are coated with urethane or covered with chemical resistant tile to prevent degradation of the concrete. The cyanide storage tanks located outside of the production building situated within containment basins which have more than sufficient capacity to retain 110% of the volume of the largest tank plus precipitation from a maximum design storm. In addition to shift inspections, the building floors and concrete containments are inspected on a quarterly schedule by the production engineer and records for the past three years were available for review. The floor in the cyanide production and storage area and the containment basins for tanks and rail-loading areas area were observed to be in good

condition at the time of the site audit. The concrete containments are leak tested every five years.

Level indicators and high level alarms are fitted to all reaction vessels and storage tanks. According to Czech law, storage tanks are only allowed to be filled to 75% of their capacity. The high level alarms are therefore set at this level. The tank levels are automatically read and displayed on the control room console. The sensors are set to automatically shut-off flow when the high level is reached.

In the event that a cyanide release occurs, spill procedures are in place to prevent discharge to the nearby river. The site drainage system is separated into three colour coded zones. Spillage within one of these zones can be controlled by manually closing penstock valves that link drainage between them. There is also an automatic effluent discharge stop valve that would be activated to halt any discharge to the river in the event of a spill.

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 1.2.

Summarize the basis for this Finding/Deficiencies Identified:

Draslovka continues to maintain the environmental, health and safety (EH&S) environmental management system that was in place during the 2014 ICMC recertification audit. The management system is modelled on the ISO 14001, OHSAS 18001 and Responsible Care management systems. Within the system the company has developed and implemented procedures for the safe and environmentally sound operation of the facility. The system includes organization procedures and technical documentation which are available to all employees on the intranet and are included in training to all employees. These documents undergo periodic review and revision as set out in the management system.

The facility has developed specific procedures for non-routine and emergency situations. The hydrogen cyanide and sodium/potassium cyanide production facilities are equipped with “interlocks” at critical areas which automatically shut down the process if there are power outages, equipment failures, or if temperatures, pressures, feed flows or tanks levels fall outside of safe operating conditions. Alarms register on the control room console in the event of upset conditions and operators have on-line instructions to address such situations. Specific instruction is provided in the event of non-standard situations occurring with the operation of the reactor. Procedures are also in place to address emergency situations.

Training is provided for these plans and procedures and mock drills are performed regularly to test and hone response

Fixed and portable HCN detectors are in place to limit worker exposure to HCN gas. Fixed HCN detectors are located in critical areas of the plant and also at locations around the boundary of the plant. The fixed detectors are fitted with visual and audio alarms. These detectors also report to the fire brigade control room and plant control room. The HCN detectors located around the boundary of the property report to the fire brigade control room and to the municipal and police departments of the City of Kolín.

Management of Change is an integral part of Draslovka's management system and procedures are in place for making changes to site operating practices and for updating documentation and worker training as required. Operational changes require review and approval by committee made up of representatives from affected departments as well as the safety and environmental managers.

Preventative maintenance programs are in place and activities documented for the maintenance of equipment and devices necessary for cyanide production and handling. Equipment maintenance is tracked through SG Maintenance software. Much maintenance is conducted by specialist approved contractors and most statutory maintenance occurs during plant shut downs which are scheduled three times a year. The timing of each shut down is scheduled in advance and the Maintenance Manager determines inspection and maintenance actions to be completed and which contractors need to be scheduled for the work.

Process parameters are constantly monitored on control room consoles. The parameters measured include temperature, flow, pressure, weight, and liquid levels in the reaction vessels and tanks, and moisture in the pipelines. Calibration of the detectors and sensors is performed in accordance procedure and a list is maintained of each instrument and its calibration history and schedule for calibration. With exception of the personal HCN detectors which are calibrated by the fire department, all calibrations, are performed externally by the instrument suppliers or their agents. The fixed and personnel HCN monitors are calibrated on a six month schedule.

A Water Management Emergency Plan is in place to prevent unauthorized /unregulated discharge of cyanide contaminated water to the environment. The facility is bound by the conditions of its IPPC permit and this includes the setting of discharge limits for cyanide in water. Cyanide contaminated wastewater is treated with hydrogen peroxide prior to discharge to the site drainage system which flows out to the River Labe. There is an automatic effluent discharge stop valve located just upstream of the site boundary that would be activated to halt any discharge to the river in the event of a spill. In the past three years there have not been any cyanide spills.

Procedures set out the requirements for the management of cyanide wastes. Cyanide waste from the production process is able to be dissolved and the liquid sent to the wastewater

treatment plant for treatment prior to discharge. In general, therefore, solid cyanide wastes are limited in quantity and include contaminated cardboard boxes, sorbent and items of contaminated PPE. These wastes are briefly stored in wooden Intermediate Bulk Containers (IBC) boxes in the temporary product storage room awaiting collection and disposal. These boxes are disposed offsite via an appropriately licensed contractor in compliance with Czech regulation.

The cyanide is packed in 50 kg steel drums or 1,000 kg plywood IBC containers. For one customer, cyanide briquettes are packed into 1,000 kg ISO containers that are owned by the customer. The packaged cyanide container are temporarily stored (usually less than 2 days) in an interim storage area (which has a capacity for 50 tonnes) located within the building of the cyanide production plant immediately adjacent to the packing area.

The cyanide containers are then transferred to the warehouse (which has a capacity for 300 tonnes) for storage until transported off site. There is no specific mechanical ventilation within the storage areas but windows were observed to be routinely left open maintain adequate air flow to prevent the build-up of HCN gas. Because of the nature of the packaging (double bagged in polyethylene) and in building storage providing protection from precipitation, the risk of HCN generation is considered extremely low. The storage facilities and located within the secure site boundary and there is no public access. In addition there is restricted security access within the plant and only authorized access to workers to the production plant and warehouse. Liquid cyanide is stored in above ground stored tanks located outside in the tank farm adjacent to the cyanide production plant. The tank farm and railcar loading facility are located within the secured and CCTV monitored area of the site where public access is prohibited.

Draslovka has United Nations international transport of hazardous goods treaty certificates for the packaging and labelling of solid cyanide in steel drums and wooden boxes. These certificates are unchanged since the 2013 ICMC recertification audit. The packaging and labelling of cyanide in accordance with the certificate allows the transport of cyanide in all jurisdictions currently supplied by Draslovka. Similar appropriate labelling and placarding is used on railcars that transport liquid cyanide and on ISO containers owned and supplied by one of Draslovka's customers.

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 1.3.

Summarize the basis for this Finding/Deficiencies Identified:

Draslovka conducts routine inspections of the cyanide production plant. These include ongoing inspections by plant operators during their shifts; semi-annual visual inspections of the integrity of tanks, piping, valves, and containment systems; quarterly fire prevention inspections that include checking the location and pressure of extinguishers as well as the condition and operation of emergency showers; quarterly visual inspections of containment systems for the above-ground storage tanks to identify any defects, damaged tiles and the presence of liquid; and, under Czech law, inspection and testing of certain equipment immediately after installation, after 14 days of operation, and then annually (with some equipped requiring additional testing). In addition there are non-statutory inspections conducted during planned maintenance shutdowns that occur three times a year. The facility is also subject to an annual integrity inspection by the Czech Environmental Inspectorate and an annual safety inspection by a consortium of various government authorities.

Based on observations of the condition of the plant and level of house-keeping; completeness of the inspection and maintenance program observed from the records reviewed; as well as the lack of significant findings presented in the annual government inspections reports covering the past three years, it is the auditors opinion that the inspection frequencies are sufficient to assure that equipment is functioning within the design parameters

Semi-Annual inspections are documented in a logbook that includes the date of the inspection, name of the inspector and details evidence of corrosion leakage or other issues identified that require attention. All statutory testing records performed by external authorised contractors are retained by the Maintenance Manager. These records include the date of inspection/testing, name of the inspector and any observed deficiencies and corrective actions. Maintenance planning records are retained in planned maintenance binders. Shift inspections are conducted daily by the shift lead and although not formally documented any issues are entered into the shift log and reported to maintenance as required.

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

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 2.1.

Summarize the basis for this Finding/Deficiencies Identified:

Documented safe work procedures have been implemented which specifically address safety provisions at the cyanide production plant. These describe the main hazards to be encountered and controls to minimize exposure in the workplace. Controls include basic rules of work, fire/explosion safety, personal hygiene, personal protective equipment, not working alone, job hazard assessment and decontamination of equipment prior to hand over for maintenance. The documents also include symptoms of cyanide exposure and first aid for cyanide poisoning. Technical documentation is also in place for managing normal and non-routine plant operations. Alarms register in the control room in the event of upset conditions and operators have on-line instructions to address such situations.

In addition to safe operating procedures the facility has fixed HCN detectors located at high risk locations around the production areas and also requires all personnel that enter the site to carry respirators in the event of an alarm. Personnel that work in production areas are also required to carry a portable HCN detector.

Management of Change procedures are in place for making investment changes including new facilities or modification to the existing plant. Proposed changes require review and approval by an investment committee that includes representatives from each department, technology specialists, as well as the safety and environmental managers prior to implementation. The following investments were completed in the past 3 years all of which followed the management of change procedure:

- The installation of a new scrubber unit to increase the capacity of off-gas treatment;
- Modification of the wastewater system by installation of three tanks to allow recycling of wastewater by into the production circuit;
- Installation of a portable air-conditioned operator observation hut “box” on the upper floor of the cyanide plant; and
- Installation of air-conditioning in the product finalization packing area.

The Maintenance Department is responsible of realization of the project. Draslovka makes enquires with the government on all proposed changes to confirm whether the government wants to be involved with the change process. In general, small changes that do not modify the process, or alter process equipment, building structures or discharges do not require an approval.

Procedures are in place to solicit and consider worker input in developing and evaluating health and safety procedures. A suggestion is submitted to a Technical Development Department Committee that meets monthly. If accepted the employee receives a one-time bonus. Another initiative that has gained more recent popularity is the SMARTER (Smarter, Measurable, Achievable, Realistic, Time bound, Evaluate, Revaluate) program. In this program technological, environmental, safety and /or energy saving programs and goals are established within a department and bonus incentives are provided when goals are met or exceeded. All workers contribute to the program and are rewarded when the goals are achieved. Workers also have opportunities to provide input during scheduled meetings.

A site wide monitoring system is installed for HCN and other gases both inside facilities and outside along the site perimeter that is continually monitored internally in the production control rooms and in the fire brigade control room. The system is also monitored externally by the municipal authority and the police department. In addition, fixed HCN detectors are installed in areas where there is a risk of worker exposure to greater that 4.7 ppm cyanide and workers are required to use specified personal protective equipment (PPE) as well as carry a portable HCN detector when entering and working in these areas. The maintenance and calibration of the fixed and portable HCN detectors are undertaken on a six month schedule. Calibration of the fixed detectors was previously conducted by the Fire Department but since 2014 the detectors are maintained by the manufacturer's representative in Czech Republic. The portable HCN gas detectors are still calibrated by the Fire Department. Records of the calibration for the fixed and portable detectors are maintained by the Fire Department.

It is mandatory for all persons entering the production areas to carry a respirator equipped with an A2B2E2K2P3 filter canister for protection against HCN in the event of an emergency. It is the responsibility of all workers to ensure that they and other workers wear appropriate PPE. Draslovka considers non-application of prescribed PPE a serious breach of work duties and will be dealt with in accordance with the Labour Code. Mandatory PPE is also required when undertaking prescribed tasks.

In the event that a portal HCN detector alarms at 5 ppm the operator is required to don their respirator, finish their immediate task safely, and evacuate. If the alarm exceeds 10 ppm the operator is required to don their respirator and immediately evacuate. When HCN concentrations are above 10 ppm, entry is only allowed to firefighters using self-containing breathing apparatus (SCBA).

Workers are banned from entering alone into enclosed spaces and spaces where there is an imminent danger of poisoning and requires workers to report to the control room prior to entering a facility. Procedures are set up where the shift lead operator is kept informed of where operators are located at all times. Operators are equipped with radios and there are surveillance cameras at all entrances and hazardous areas of the production facilities that are used by plant that allow control room operators and the fire brigade to monitor personnel entering and working in these areas.

Draslovka has implemented an occupational procedure that sets out the responsibilities of the employer and employee with respect to health care. The procedure is in line with the current Czech Medical Services Act and requires all new employees to undertaken a fitness exam to ensure they are able to perform there specified tasks. Employees are reassessed when they take up a new position that has different fitness criteria. The facility has a health centre staffed by a doctor and a nurse that provides general practitioner/occupational services.

Coveralls required to be worn within designated areas of the plant are not allowed to be taken outside of the plant and must be left for washing or disposal. There is a requirement that

workers in the cyanide production plant change their cloths and shower at the end of a work shift. The used coveralls are collected by a laundry contractor.

Warning signs (in accordance with standard pictograms in Czech ČSN ISO 3864-1) are posted throughout the facility to identify safety hazards, specify required PPE, and areas, equipment and vessels where cyanide and other hazardous substances are located. There is also signage posted prohibiting smoking and open flames. All piping is colour coded and labelled to identify contents and flow direction.

Safety procedures prohibit smoking, eating and drinking where there is the potential for cyanide contamination. These activities are only permitted in designated areas of the site. No activities which generate open flames are permitted without a hot work permit. Workers are required to wash hands before eating.

Production Practice

2.2 Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 2.2.

Summarize the basis for this Finding/Deficiencies Identified:

The facility has developed specific written emergency response plans and procedures to respond to cyanide exposures. The plans provide the response actions to be taken for various emergency scenarios including cyanide exposure first aid. The Plans are approved and signed off by senior management of Draslovka and representatives of government response agencies.

Showers and eyewash are located in the stair well on each floor of the production plant and non-acid fire extinguishers are located at strategic locations throughout the facility. The showers and extinguishers are inspected by the shift supervisor at the start of each shift although these inspections are not documented. Formal inspections are conducted by the fire brigade on a quarterly basis and records were available for the past 3 years. Draslovka also retains a contractor to annually conduct inspect and maintain fire extinguishers.

Medical oxygen with valve and respirator, and cyanide antidote are stored adjacent to the production plant control room. In 2014 Draslovka replaced amyl-nitrite antidote with hydroxocobalamin (Cyanokit) antidote. There are also two SCBA units stored near the control room, although these are only for used by members of the fire brigade. Additional first aid equipment, cyanide antidote and medical oxygen are kept at the fire brigade centre. All

operators are equipped with radio and stay in direct contact with the control room to confirm their location and readily communicate if there is an emergency.

All high risk areas are monitored by the fire brigade on CCTV camera and all HCN alarms report to the fire brigade control room. The fire brigade is able to respond to an emergency within 5 minutes and can communicate and emergency using an alarm signal (siren) or over the site load speaker system, as needed.

First aid equipment is regularly inspected to ensure that it is available as needed. The first aid and emergency response equipment is stored and maintained as directed by the manufacture and replaced on a schedule that assures they will be effective when used. The Cyanokits are monitored by the Fire Brigade and are replaced prior to their expiry dates. Showers are inspected by the shift leader at the start of each shift and are inspected by the Fire brigade during quarterly inspections. Medical oxygen kits are inspected and maintained by an outside contractor.

Material Safety Data Sheets (SDS) are available for the raw materials and products at Draslovka. They are also available on the Draslovka intranet for employees and in the production and fire department control rooms. In addition, safety procedures provide information on the properties of cyanide, symptoms of acute and chronic poisoning, and cyanide first aid. The SDS are in Czech, the language of the labour force, but are also produced in various languages to meet their customer requirements.

Warning signs (in accordance with standard pictograms in Czech ČSN ISO 3864-1) are posted throughout the facility to identify safety hazards, hazard areas, and content of equipment and vessels that contain cyanide and other hazardous substances. All piping is colour coded and labelled to identify contents and flow direction.

As discussed in Section 2.1, Draslovka has a decontamination policy. Coveralls are not allowed to be taken outside of the plant and must be left for washing or disposal. Workers in the cyanide production plant must change their cloths and shower at the end of a work shift.

The facility has a health clinic on site which is staffed by a doctor and nurse during general office hours. Although the clinic is available to respond to a cyanide incident the Draslovka site is less than 5 minutes from the Nemocnice Kolín hospital and would be contacted in the event of a cyanide incident. Ambulance and paramedics based at the hospital are able to quickly respond. Should the need arise the fire brigade have a vehicle which can transport a casualty to the hospital. As the hospital does not maintain cyanide antidote the Cyanokit would be transported with the casualty.

The facility developed procedures to transport exposed workers to locally available qualified off site medical facilities. In the event of any exposure of workers on site an ambulance is requested and there is a clear communication process between the site and the external responders. If external medical support or follow-up care is required, medical facilities and

care are available at Nemocnice Kolín hospital located less than 5 minutes away. All medical facilities across the country are ready to provide emergency first aid.

Mock emergency drills are conducted regularly to test response procedures for various potential chemical exposure and release scenarios at the Draslovka complex, and lessons learned from these drills are incorporated into response planning. Of these drills approximately three or four annually involve cyanide spill and cyanide exposure scenarios.

Procedures have been implemented for the investigation and evaluation of cyanide exposure incidents to determine programs and procedures to protect worker health and safety and response to cyanide exposures are adequate of need revision. Since the last ICMC recertification audit there have been seven incidents as of May 2017, all non-cyanide related. Records are available that show that the investigation and evaluation procedure was followed.

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

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 3.1.

Summarize the basis for this Finding/Deficiencies Identified:

Draslovka directly discharges to the River Labe (also known as Elbe) which is located just beyond a railway right-of-way north east of the property boundary. The discharge includes storm water drainage and discharge from the wastewater treatment plant. All discharge from the site passes through a concrete channel located near the east boundary of the site that is equipped with a quick automatic shut off valve that will be immediately be activated using a button in the fire brigade control room if a spill or an issue with the discharge occurs.

Wastewater from the cyanide production plant and water pumped from tank containments, the rail loading sump and groundwater from beneath the production plant that may contain cyanide is treated through the wastewater treatment plant prior to discharge. The wastewater is treated in batches and tested prior to discharge to ensure that it meets the regulatory requirements specified in the IPPC Permit.

The site wide surface drainage system comprises three separate colour coded basins that can be isolated from one and other in the event of a spill by a series of manually operated gate

valves. In the event of a spill the release can be isolated tested and diverted through the wastewater treatment plant prior to discharge.

The monitoring point for the combined wastewater discharge is located on the east boundary of the site just prior to the discharge flowing under the railway and out to the River. Samples are collected and analysed on a monthly basis and results covering the period 2014, 2015 and 2016 showed maximum Weal Acid Dissociable (WAD) cyanide concentrations in each of those years to be 0.01 mg/L, 0.082 mg/L and 0.053 mg/L, respectively. This is significantly lower than the 0.5 mg/L WAD cyanide permitted by the Code.

After leaving the site boundary the discharge from the site combines with discharge from the neighbouring BIOFERM Lihovar Kolín, a.s (BIOFERM) facility into a common sewer channel before discharging into the river. The BIOFERM facility discharges at least 10 times the volume of wastewater and this merging significantly reduces the cyanide concentrations prior discharging into the river. Using the maximum WAD cyanide concentrations measured at the Draslovka site boundary and a dilution factor of ten attributed by the mixing with discharge from the BIOTHERM facility, the concentrations of cyanide in discharge to the river will be significantly lower than the 0.022 mg/L WAD cyanide and therefore also the concentration of free cyanide set by the Code.

Although groundwater beneath the site is contaminated a groundwater containment wall and pump and treat extraction system is in place to prevent indirect discharges to surface water. Groundwater beneath the site has been contaminated with cyanide as a result of the facility being bombed during the Second World War. Poor practices during the communist era may have contributed to the contamination. The Regional Authority (Městský Úřad v Kolíně) considers the cyanide from these sources as legacy issues and that Draslovka are not responsible based on an agreement dated March 1994. As a consequence of this agreement, a remediation system comprising a groundwater containment wall at the boundary between the site and the River Labe was constructed in December 2012. Draslovka does not have a responsibility to meet the groundwater quality criteria beneath the site, although they operate the groundwater abstraction and treatment system on behalf of the Regional Authority. The abstracted groundwater is passed through the wastewater treatment plant along with other cyanide contaminated waste streams.

There are a total of 14 wells on the site that are sampled on a quarterly schedule and five wells downgradient of the site, two of which are located on the east side of the River Labe. The offsite wells are sampled twice a year by the Regional Authority. In the past 3 years cyanide concentrations in monitoring all onsite and offsite wells have been below the detection limit for the method of analysis (0.02 for Total Cyanide and 0.002 for WAD Cyanide) except for onsite wells DR8 and DR20 which have low concentrations of cyanide. Groundwater extracted from these two wells is passed through the wastewater treatment plant. The results show that containment wall has performed as intended in controlling further migration and degradation of the groundwater, and the pumping and treatment of groundwater has limited the extent of the plume to the immediate vicinity of the production plant.

The IPPC Permit sets air emission limits of 10 mg/m^3 of cyanide (Cyanide plus HCN) and also a 100 g/hour limit for specific air emission within the plant. The 10 mg/m^3 limit can be exceeded so long as the 100 g/hour limit is not. The permit requires that the emissions to be monitored every three years from locations identified in the permit. There were originally three outlets in the Permit that needed to be monitored; however in 2015 two of these outlets were combined so since 2015 only two outlets (the dryer and the briquette stack) have to be monitored. The monitoring is conducted by an outside contractor and the results of monitoring conducted in May 2016 showed that the Permit conditions were being met.

A site wide monitoring system is installed for HCN and other gases both inside facilities and outside along the site perimeter that is continually monitored internally in the production control rooms and in the fire brigade control room. The system is also monitored externally by the municipal authority and the police department.

Good engineering controls are in place through concrete containments for cyanide facilities and shut-off valves to control site drainage and stop surface water discharge to prevent cyanide seepage into the ground or unauthorized /unregulated discharges off-site. The waste water treatment plant monitors the effectiveness of treatment and is not permitted to discharge unless cyanide levels are below discharge criteria (below 1 ppm WAD cyanide). Discharge from the site is monitored monthly and the results are consistently well below the concentrations that would impact the River Labe. The results of quarterly monitoring of groundwater also demonstrate that the concentrations of cyanide in groundwater are stable to improving. The auditors are therefore of the opinion that the surface and groundwater monitoring frequencies are adequate to characterize the medium.

With regard to air emissions the internal and external air monitoring system monitors air quality on a continuous basis and the IPPC permit requires the stack emissions to be checked every 3 years. The auditors are also of the opinion that air emissions monitoring frequencies are adequate.

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

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 4.1.

Summarize the basis for this Finding/Deficiencies Identified:

The facility trains employees to understand the hazards of cyanide and refresher training is periodically conducted. All new employees are formally trained in health and safety before being allowed to work with cyanide. This training includes hazards associated with cyanide and response to cyanide related emergencies. Refresher training in handling cyanide is conducted every year. A record of the training is entered into every worker's personal training card and records are maintained for a minimum of 10 years as required by law.

As a part of induction training, employees receive training in the use of appropriate PPE including gas masks and respirators. Procedures list the work places where special PPE must be used, and address PPE distribution, cleaning, disinfection and inspection. Training covers all aspects of PPE use with special attention in the use Human Resources (of filter masks, detection, protective suits in hazardous areas, as well as SCBA. There is appropriate signage around the site to indicate the PPE requirements in each area. Entry to the cyanide production area is prohibited without protective suits, shoes and filter mask.

Employees undergo formal task training under direct supervision of relevant head of department or head of shift, and where necessary, external organisations to help them perform their normal production tasks. The detailed training requirements for each employee are defined by their roles and provided in training materials. Roles are defined for each workplace and include requirements on safe conduct of the production process, emergency response, maintenance and other types of works. A training plan is developed each year that includes details of internal and external training to be delivered.

The training is provided by qualified engineering personnel from cyanide production and is certified in compliance with the procedures established at the Company. Internal trainers have ongoing Continued Professional Development in safety management. Specific chemical training is provided by managers with degrees in chemistry. The Production Manager that provides on the job training has specific chemical training and, every 3 years, also passes through additional health and safety training with the Safety Manager.

The effectiveness of cyanide training is evaluated using a range of techniques including written tests, verbal tests and observation of work. At the end of each training event (including those for employees working within cyanide production and handling areas) tests are completed. Job competence is also assessed informally through task observation. People working in the Maintenance Department are provided with training in specific maintenance activities. After such training their work is inspected to ensure it was effective. All training courses are scored and the courses are reviewed each year by the Human Resources (HR) Manager. Records of the effectiveness of internal and external training are maintained with the HR Manager.

All employees have a standard annual performance review, which is an assessment by the appropriate manager and a self-assessment through an on line system. In addition, there is an annual multiple choice health and safety test for senior managers, the proforma for which

was reviewed during the audit. The effectiveness of emergency training is assessed through the completion of drills which are evaluated and any lessons learned identified.

Production Practice

4.2 Train employees to respond to cyanide exposures and releases.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Production Practice 4.2.

Summarize the basis for this Finding/Deficiencies Identified:

Training is provided on the procedures to be followed in the event of a cyanide release. Production workers have trained on the release of dangerous chemicals (especially cyanide) and on response to worker exposure to cyanide. Mock emergency drills are conducted periodically that involve both spill and cyanide exposure scenarios. Emergency drills are evaluated from a training aspect to determine if personnel have the knowledge and skills required for effective response and training procedures are revised if deficiencies are identified.

Training requirements are documented in an Organisation Regulation. For each training event a report is produced which details the name of the person being trained, department and location, elements of training, training test details and name of trainer. A demonstration of the understanding of the training is provided through the annual appraisal and drills in addition to written and verbal tests specific to each training element. Records of training as well as annual appraisals, drills and any written tests are maintained throughout an individual's employment.

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

Production Practice

5.1 *Prepare detailed emergency response plans for potential cyanide releases.*

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Production Practice 5.1.

Summarize the basis for this Finding/Deficiencies Identified:

The facility has an emergency response plan to address potential releases of cyanide that may occur on site, and considers all relevant and potential failure scenarios that may otherwise

require response. Elements of the plan include and Internal Emergency Plan and Water Emergency Plan. There is also an External Emergency Plan that is produced by the regional authority that details actions required by the regional authorities, emergency services and local communities in the event of a catastrophic release of hydrogen cyanide.

All relevant and potential failure scenarios are addressed in the emergency response plan. All units of the plant have been assessed in relation to hazardous chemicals including such parts of the processing equipment in which dangerous substances may be found, and which could be quickly and effectively isolated during the operation from the other parts of the equipment. All respective risk sources are identified and unit risk rates are defined. A detailed risk analysis has been carried out for units with elevated risk rates. A detailed systematic safety analysis with the HAZOP (Hazard and Operability Study) method has been used for a detailed systematic safety analysis.

The Internal Emergency Plan details the actions to be undertaken in the event of a HCN gas or cyanide release. Emergency response cards provide information specific information for each building regarding: character of the building, type and maximum quantity of chemicals present within the building, alarm levels, extinguishing substances present within the building, plans showing the location of hydrants, necessary internal and external telephone numbers for emergency services, evacuations plans and other recommendations. The External Emergency Plan details the actions to be undertaken by the Kolín emergency services and the Regional Authority in the event of a major spill including evacuation of the community surrounding the site. This would be done by the police and Kolín fire brigade. In addition Draslovka has a public address system and alarm that would be heard by the immediate surrounding neighbours.

The Internal Emergency Plan contains a traumatology plan with a pre-set system for securing medical measures to affected people. This plan details the first aid actions required, location of first aid kits, antidote administering instructions, availability of the on-site doctor and general first aid instructions.

The Water Emergency Plan provides details on actions to be undertaken to prevent or minimize impact to surface water or groundwater, including securing the emergency quick seal valve, plugging pipe work, pumping residue from tanks, repairing tanks, etc. The fire brigade have pneumatic plugs to isolate the relevant branches of the drainage system, and other spill containment equipment and materials.

Production Practice

5.2 Involve site personnel and stakeholders in the planning process.

The operation is: ■ in full compliance
in substantial compliance

not in compliance…with Production Practice 5.2.

Summarize the basis for this Finding/Deficiencies Identified:

The Internal Emergency Plan was prepared by a licenced contractor in close consultation with the fire brigade, heads of departments and employees. When emergency response planning documents are updated they are provided in draft format to all employees for comment before the final draft is produced. The emergency plans are also sent to the Regional Authority who send them on to the local response agencies for comment. When the External Emergency Plan is updated by the Regional Authority, Draslovka is provided an opportunity to provide comment before it is finalized.

Draslovka site is located in the town of Kolín and the town is likely to be affected if there is a significant release of hydrogen cyanide. The potentially affected community in Kolín is made aware of the nature of the risks through their representatives in the Regional Authority. The Regional Authority is aware of the risks associated with accidental cyanide releases, through review of the Draslovka's emergency response plans, the conduct of periodic joint mock drill exercises with the town emergency services, and through HCN detectors located around the boundary of the property which, in addition to reporting to the fire brigade control room, also report to the municipal and police departments of the City of Kolín.

The facility is engaged in regular consultations/ communications with relevant stakeholders to ensure that the plans address current conditions and risks. The municipal fire service and local hospitals and other outside responders are involved in development of the emergency response plans and measures. The hospitals are directly involved in order to evaluate their capacity to deal with an emergency and what back up capacity may be required. This is detailed in the External Emergency Plan. In case of an emergency threat or its occurrence an operator of the facility notifies the local emergency response agencies using the means of the local alerting network.

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 5.3.

Summarize the basis for this Finding/Deficiencies Identified:

As prescribed in the national fire regulation the Commanding Officer is responsible for an emergency response and is the primary emergency response coordinator with the explicit

authority the resources necessary to for emergency response. The Commanding Officer for Draslovka is the head of shift of the Fire Brigade who coordinates all internal parties and any external responders. There are two persons in each shift of the fire brigade that are capable to be the Commanding Officer. The specific duties and responsibilities of the coordinators and team members are described in the Internal Emergency Plan. Call-out procedures and 24-hour contact information for the coordinators, response team members and heads of departments is included in the Internal Emergency Plan.

Members of the fire brigade have the same training as the municipal fire service. The Ministry of the Interior provides documented requirements for the training of all fires services on an annual basis. These requirements are incorporated into the Draslovka fire brigade training requirements.

The fire brigade is equipped with mobile vehicles and equipment, spill clean-up materials, first aid equipment and gas detection monitors. In addition, all of the departments have appropriate first aid equipment oxygen, and SCBA. This equipment is located in the first aid room outside HCN production and is listed in the Internal Emergency Response Plan. All emergency response equipment is checked, inspected and maintained by the Safety Department. A licensed contractor is used to check and maintain the oxygen and resuscitation equipment. Inspection records were reviewed and appeared to be in order.

The details of outside responders, medical facilities and communities in emergency response procedures are contained within the External Emergency Plan and Internal Emergency Plan. The facility has confirmed that outside entities included in the Plan are aware of their involvement and are included as necessary in mock drills and implementation exercises. In case of emergency threat or its occurrence the site notifies these parties using the means of the local alerting network. Outside entities are represented through the involvement of the Regional Authority. Once every three years an emergency drill is undertaken on site with the involvement of the Regional Authority and the local emergency services. The last such drill was undertaken on 15 April 2016.

Production Practice

5.4 Develop procedures for internal and external emergency notification and reporting.

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 5.4.

Summarize the basis for this Finding/Deficiencies Identified:

The emergency response plans include procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities of an

emergency. The fire brigade as the first responders and the Commanding Officer fulfills the legal requirement to contact the appropriate external agencies. This includes contacting the Kolín Police station representatives who coordinate the community response measures. The community response measures are detailed by the in the *External Emergency Plan*. If external medical support or follow-up care is required, medical facilities and care are available at Kolín's hospitals. The Internal Emergency Plan contains a detailed notification flow chart that shows the various parties to be contacted in the event of an emergency together with the contact numbers. In addition the Emergency Response Cards located in each building detail the procedures to be followed in the event of an emergency.

The Draslovka Communications Officers have the responsibility for co-ordinating the company's response to the media in the event of an emergency. There are six Communication Officers on duty on rotation.

Production Practice

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

The operation is:
- ■ in full compliance
- in substantial compliance
- not in compliance…with Production Practice 5.5.

Summarize the basis for this Finding/Deficiencies Identified:

The Plan incorporates specific, appropriate remediation measures for addressing release of hydrogen cyanide gas or solid or liquid cyanide releases. Actions are to limit the leakage if safe to do so, with any liquid HCN being diluted with water and neutralised with caustic soda. The solids will be disposed of by contractors by incineration. Procedures detail the use of the emergency quick seal valve and drainage shut off valves. The procedures also provide actions to be taken in the event of spills. This includes extraction of contaminated water by the fire brigade and placement of contaminated water in the retention basins prior to analysis and appropriate treatment through the waste water treatment plant. It is not necessary to designate an alternate drinking water supply due to the distance to the nearest potable water supply well. However, sources of bottled water are available as these are used in many areas of the facility.

The possibility for cyanides being released into surface water is extremely low due to the provision of secondary containments and a system for collection of cyanide releases into wastewater collection reservoirs and subsequent treatment at the local treatment facilities. The response plans therefore do not prohibit the use of chemicals such as sodium hypochlorite, ferrous sulphate and hydrogen peroxide to treat cyanide because of the provision of this drainage control system at the facility. Any release of such chemicals to the

River is prohibited under national legislation. The results of monitoring of discharge from the site between 2014 and 2016 indicate that cyanide concentrations entering the River Labe are well below 0.022 mg/L WAD cyanide and there have been no unauthorised releases of cyanide to the River Labe to date.

The Water Management Emergency Plan addresses the potential need for environmental monitoring to identify the extent and effects of a release, and include sampling methodologies, parameters, and where practical, possible locations. This would comprise the formation of Work Management Emergency Response Committee to provide a quick and unambiguous response to an incident that impacts soil and groundwater. The Plan also details that Draslovka may undertake monitoring upstream and downstream of the facility to determine the extent of contamination. This monitoring would be undertaken by an appropriate laboratory to approved standards.

Production Practice

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

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Production Practice 5.6.

Summarize the basis for this Finding/Deficiencies Identified:

Emergency response plans are required by law to be reviewed for adequacy on a five year basis. Draslovka reviews its emergency response plans every year and revises them as required. These plans are also reviewed and approved by the Regional Authority. The External Emergency Plan produced by the Regional Authority is reviewed every five years and proposed changes are provided to Draslovka for review and comment.

Mock emergency drills are conducted periodically as part of the Plan evaluation process. Intensive and routine mock emergency drills have been conducted with all necessary respective interested parties as described in the previous sections of this report. Tactical drills related to the fire department such as a fire in the administration building, a vehicle accident on the facility and a fire at a train locomotive Draslovka are also carried out on regular basis. Drills involving outside agencies are undertaken on a three yearly basis at different locations, which involves local and area emergency services in addition to Draslovka's employees. The last such drill took place on 15 April 2016.

In addition Draslovka is part of a Mutual Aid Scheme (MAS) that involves providing assistance for any cyanide related emergencies in Europe. This includes undertaking drills with other members of the MAS and reviewing performance. The last such drill at Draslovka included participation of Sitech Services BV (from the Netherlands) and took place on 18 and 19

October 2016. Draslovka fire brigade team members participated in a drill at Sitech Services BV (Chemelot Industrial Site) on 24 and 25 January 2017.

There are provisions to evaluate the Plan after any emergency. The Internal Emergency Plan lists the reasons for reviewing and modifying the plan. These include legal, requirements, recommendations from internal/external audits, changing in security and services, and systematic evaluation of the emergency response plans and lessons learned from mock drills. This is the basis for the continuous improvement of the safety and security at the site within the industrial area of Kolín. There have not been any emergencies at the site since last ICMI audit in August 2014 and no review has taken place directly relating this circumstance. However, the plan is subject of annual review and is updated as required. The most recent version of the Internal Emergency Plan is dated 16 December 2016.