The CODE

The Newsletter of
the International Cyanide
Management Institute
www.cyanidecode.org

2nd Quarter 2022 Edition

What's Inside

Welcome to the 2nd Quarter 2022 edition of *The Code*

Annual Report Underscores that Cyanide Code Certification Helps Produce Results That Matter for Signatory Companies

ICMI has published its 2021 annual report, which is focused on the theme *Results That Matter*. It highlights that the goal of the Cyanide Code is not just certification of facilities and operations, but that mines, cyanide producers, and transporters improve their safety, environmental and social responsibility performance throughout an operation, providing results that matter every day to workers, communities, and the environment at mining operations and along every kilometer of the global cyanide supply chain.

The 40-page annual report identifies milestones that the Cyanide Code has achieved and provides statistics on its continued growth, global reach, and implementation. The report also provides highlights regarding the global implementation of the Cyanide Code in 2021 by the 215 signatories to the Code, along with notable developments in the use and management of cyanide within the industry, and presents ICMI's financial statement. Click here to read the 2021 annual report *Results That Matter*.

New Podcasts to Air in August

Five new podcasts will be released by ICMI in August, adding to the current library of seven CodeCast podcasts. These generally short, explanatory podcasts are intended to clarify various aspects of the Cyanide Code, and are directed toward signatories and operations preparing for certification audits. The purpose also is to help operations and auditors understand specific aspects of Cyanide Code compliance. The podcasts are available here [Podcasts | The Cyanide Code], as well as on Spotify and iTunes.

Among the new topics that will be added to the series are pipeline spill prevention and containment, use of the Cyanide Code framework and system to manage dangerous goods other than cyanide, and situations requiring notification to ICMI, such as cyanide-related incidents, or changes in cyanide suppliers.

Follow us on Twitter and LinkedIn

To expand our communications reach, the Cyanide Code has established a social media presence on Twitter and LinkedIn. These sites will offer the latest news, announcements and other timely and important messages for our community. They will also offer people additional ways to get in touch with us and foster dialogues among those involved with the Cyanide Code.

Using Interim Assessments to Support Cyanide Code Compliance

Cyanide Code certified mining operations are increasingly engaging audit professionals to conduct interim assessments, which some call surveillance audits, to assess Code compliance midway through the three-year certification cycle. ICMI's interactions with both auditors and operations indicate that well over half of Cyanide Code certified mining operations rely on interim assessments to help ensure continuous compliance with the Cyanide Code.

Although the Cyanide Code program does not require interim assessments, the benefits of conducting interim audits are clear based on ICMI's review of certification audit reports. Operations that routinely plan, conduct, and document interim assessments have fewer compliance issues in their next certification audit. Interim assessments are particularly effective at reducing compliance issues related to changing cyanide producers and transporters, the retention of inspection and training records, and maintaining the required cyanide concentrations in tailings.

Operational staff conducting interim assessment.

Another benefit is that conducting interim assessments allows the early identification and correction of gaps, deficiencies, or 'soft spots' in an operation's systems and facilities. Identifying potential issues early, through interim assessments, can allow operations to plan, budget, and implement any necessary improvements or corrective actions well in advance of the next recertification audit. Interim assessments can also identify potential problems before they occur and prevent a slow, incremental deterioration of the operation's cyanide management programs that may go unnoticed until a serious incident occurs.

Some Cyanide Code certified operations also participate in other programs that have expectations overlapping with those of the Code, such as ISO certification programs. Many of the Code's requirements and expectations are also similar to external requirements such as monitoring requirements by regulatory authorities. As a result, interim assessments may also provide an opportunity to review compliance with other programs at the same time as assessing Cyanide Code compliance. Interim assessments can also be used to train employees on the Cyanide Code's requirements and on the operational systems needed to meet those requirements. Many mining, production and transport operations experience significant employee turnover during the three-year certification cycle, which can lead to a loss of institutional knowledge. Interim reviews also can be used as a training opportunity to familiarize new employees with the Code's requirements and expectations.

External assessors with operational staff inspecting facilities.

Most importantly, interim reviews help operations meet the Code's ultimate goal of enhanced protection of workers, communities and the environment. Operations that conduct their own internal, third-party audits or program reviews demonstrate to their workforce that responsible cyanide management is an integral part of their operation rather than something that needs attention only every three years.

To realize these benefits, interim assessments should strive to answer the following four general questions:

First, are the systems in place for Code compliance being maintained and are they still effective? Checking data and records should identify issues that may have developed since the most recent certification audit. For example, if an operation relies on a cyanide destruct system for maintaining tailings WAD cyanide concentrations below 50 milligram per liter, an interim assessment could look at whether data indicates that the destruct system is still effective in achieving its target. Interim assessments frequently examine whether training and inspection systems have been maintained, including retaining records that demonstrate their implementation.

A **second** important question is whether there have been any changes at the mining operation that mean its procedures, training, inspection and maintenance programs need updating. Three years can be a long time between certifications, and mining operations can undergo substantial changes between certification audits. For instance, operations frequently construct new heap leach pads or add lifts to tailings dams between audits. Operations also might change cyanide suppliers, or delivery of cyanide to the site from briquettes in intermediate bulk containers to briquettes in solid to liquid Isotainer systems.

Changes like these would typically require updating procedures, training, maintenance and other operational programs. Interim assessments should check whether the operation's change management system has been effectively used to implement the changes.

As mentioned, a **third** question is whether the operation has addressed any areas of concern, or 'soft spots' identified in a previous audit. Auditors frequently note such soft spots during a certification audit, even if they do not rise to the level of substantial compliance. An interim audit provides an opportunity to ensure that a soft spot has been corrected and has not worsened to a potentially substantial or non-compliance level.

Fourth, are there opportunities for improvement that should be implemented? A well-structured interim assessment that carefully reviews an operation's facilities and systems should also examine areas that may get overlooked during reviews for other purposes.

With that in mind, let's turn now to the key considerations for planning, scheduling and conducting interim assessments. When planning an interim assessment, a critical consideration is the scope of the assessment. Some assessments are designed to be a comprehensive review of the operation's compliance with all of the requirements and expectations of the Cyanide Code. In this case, the interim review would be similar in both breadth and depth to a full certification audit.

However, an operation can also focus the assessment on specific operational areas, or on specific Cyanide Code requirements. For example, the assessment could focus primarily on cyanide training and emergency response drills, systems, and equipment. It could focus on new processes or facilities, or ones that have undergone substantial changes since the previous certification audit. Interim reviews are frequently designed to test specific areas that have undergone extensive changes since the previous certification audit or were identified as soft spots in a previous audit.

When deciding on the scope of an interim assessment, it is also important to consider whether the interim assessment should be primarily a desktop or field exercise, and whether to conduct it in-person or virtually. In-person interim audits with both desktop and field activities are typically the most effective approach, but a desktop-only virtual audit might be perfectly acceptable if the interim audit is focused only on specific Cyanide Code Principles.

Scheduling and approaches differ. Some certified mining operations conduct interim assessments annually, while others organize them for the halfway point between certification audits. Still others schedule them for just a year before the certification audit is required. Allowing ample time between the interim audit and the formal certification audit is important, as time may be needed to complete necessary corrective actions before the next scheduled certification audit. Time may also be needed to further investigate compliance issues and implement corrective actions.

It may also be a good idea to schedule an Interim assessment when there are major operational changes. Changes in processing, changes in facilities, and changes in management are all reasons to conduct an interim audit. For example, adding a new tailings storage facility might trigger substantial changes in requirements and needs for inspections, monitoring, emergency response, water balance modeling, wildlife exclusion, and training.

Interim assessments are also sometimes scheduled as a follow-up to an environmental or health and safety incident. A root-cause analysis after an incident may identify system failures, such as for maintenance, inspections or training systems. Operations personnel may then want to critically and comprehensively examine those systems throughout the operation, using an interim review to determine if systems are functioning effectively as designed and intended.

Another scheduling consideration is employee turnover. Many operations experience significant employee turnover during the three-year certification period, with potential impacts on training programs, document and record keeping, emergency response capabilities, and cyanide purchasing. In this case, the interim assessment can be used as a training tool to familiarize new workers with the Cyanide Code's requirements, and to test continuous compliance of the systems in place.

Another approach to scheduling is to conduct reviews of selected Code Standards or Principles on a rotating basis. For example, conformance with Standard of Practice 1.1 for cyanide production and Standard of Practice 2.2, regarding cyanide transportation might be assessed in one month, and the next month Standards of Practice 3.1 and 3.2, with requirements for management of high strength cyanide would be audited, and so on.

The duration of the assessment is also a consideration and should be tailored to the scope. A full review to determine compliance with all of the Cyanide Code's nine Principles might take 3 to 5 days, depending on the number of auditors, their experience, and the operation's preparation and readiness. Partial reviews that target particular Principles, Standards of Practice, or operational issues would take less time, and reduce disruption to the operation. When deciding on the scope, schedule, duration, and frequency of interim audits, it is crucial to consider staff time and availability. Disruption to normal day-to-day responsibilities is inevitable, but should be minimized while ensuring that the interim assessment fulfills its objectives.

Another consideration when planning an interim audit is the expertise of the auditors. Although some operations choose to have interim audits performed by qualified Cyanide Code auditors, others elect to conduct them internally, using operational personnel, corporate staff, or staff from another of the company's operations.

A benefit of using a qualified external auditor is that the operation's systems and facilities are examined with a fresh set of eyes. An external assessor may also bring their particular experience gained in auditing and reviewing similar systems for Cyanide Code compliance at many different operations, and can make recommendations for improvements based on that experience.

On the other hand, a benefit of using internal personnel to conduct an interim review is the experience that can be gained by internal staff by examining facilities and systems and having to critically evaluate implementation of the Cyanide Code's requirements as an assessor, rather than as an operator. This approach also can reduce costs.

However, to avoid any conflicts of interest, if an operation uses internal personnel as assessors, it should ensure that they do not audit systems for which they have responsibility. Use of an interim review for internal training should also be balanced against the need for an effective and rigorous examination.

Some operations use a combination of internal and external assessors. For instance, an operation might use a single qualified lead auditor, teamed with staff from the operation, a corporate group, or from other operations owned by the same company.

All of these models should achieve the objectives of the interim assessment, providing that the assessment is planned and conducted as a rigorous, documented evaluation of the operation's facilities and systems.

By 'documented' we mean that there should be a clear record of what was assessed, the methodology for how it was reviewed, information about the auditors who conducted the assessment, and a record of the results. Depending upon the scope and objectives of the review, documentation could range from a complete internal update of the Detailed Report from the operation's most recent Cyanide Code certification audit, to a detailed color-coded scorecard of items assessed and the results, to a PowerPoint presentation for management. The key is that there should be a record useful to the operation. The target audiences should be identified and the type of documentation should be tailored to those audiences. Audiences might include operational staff, site managers, or corporate managers.

As with certification audits, if necessary, operations should prepare and implement an internal corrective action plan to address any deficiencies with established responsibilities, target completion dates, and budgets.

In conclusion, ICMI firmly believes that well-planned, formal, documented interim assessments provide substantial benefits to operations, not only in terms of continuous Cyanide Code compliance but also in terms of reducing risk to workers and the environment between certification audits.

Auditor's Corner - Signage and Labeling for Cyanide

Welcome to this installment of the Auditor's Corner, a continuing feature of The Code. As readers know, this column is intended not only for auditors but also for operations preparing for audits or gap analyses. We welcome your suggestions for future topics at info@cyanidecode.org.

The Cyanide Code requires mining operations to have proper signage and labeling identifying the presence of cyanide with the objective of protection of worker health and safety. To achieve this objective, there are three fundamental requirements for signage and labeling.

The **first** of these requirements is clear identification of areas in which cyanide is present. These areas typically include storage areas for both dry and liquid cyanide, areas where cyanide is mixed and where high-strength solution is stored, and processing

areas where cyanide solution is present, such as areas with leach tanks. Signage is also expected in areas such as heap leach pads, tailings impoundments, and ponds containing cyanide solution such as pregnant ponds at heap leach facilities. This also includes signage and labeling on pipelines carrying cyanide solution between operational areas. Pipelines carrying tailings slurry from the process area to tailings impoundments should be clearly marked as containing cyanide, as should high-strength feeder lines between cyanide storage tanks and process solution tanks.

The **second** fundamental requirement is for signage to indicate any special requirements or restrictions due to the presence of cyanide. For example, there should be signage prohibiting eating, drinking, smoking, and open flames in areas where cyanide is located. Signage is also needed to identify any required personal protective equipment (PPE) for an area, such as personal hydrogen cyanide monitors, masks with filters, or requirements for special gloves or suits.

The **third** fundamental requirement is that the workforce must clearly understand the signage. Operations should use the types of signage best suited for their particular operational areas and workforce. Signage indicating the presence of cyanide is typically text, such as "Cyanide" or "CN." Where text is used, it must be in a language understood by the workforce.

Pictograms are also frequently used to identify any requirements or restriction for entry into specific areas. Typical pictograms include those for "no smoking," "no eating," or "no drinking." Pictograms are also commonly used for identifying the types of PPE required for entry to an area, such as pictograms indicating that masks, goggles, or gloves must be worn for entry. To ensure that signage is clearly understood, employee training should include the meaning of the pictograms used at the operation.

How the Code's requirements are met, in terms of the size, content, color, locations, and wording of signage and labeling is not mandated by the Code. These details are intentionally left to the judgement of the operation. However, it is important to understand that the intent of the Code, which is the protection of worker health and safety, must be met by the operation's signage.

Warehouses and other areas where either solid cyanide or high-strength liquid cyanide is stored should have signage at their entrances indicating the presence of cyanide. Prohibitions against eating, smoking and drinking are typically placed on entry doors or gates to these areas, and on their external walls. Areas where high-strength cyanide is present also frequently require use of PPE for entry, such as goggles or protective suits and signage should clearly indicate the required PPE. Other requirements such as use of the 'buddy system' should also be clearly identified.

Areas with high-strength cyanide also typically have signage with more detailed information, such as cyanide exposure symptoms and emergency response information.

In storage areas, it is important that individual containers of cyanide be labeled. Boxes and drums of solid cyanide are typically labeled with the product name, weight, producer's name, batch number, and emergency contacts. The potential risks to human life and health and the environment are also typically included.

Identification of high-strength cyanide solution is also accomplished by dying the solution. The Code requires that high-strength cyanide solutions be dyed for clear identification when out of proper containment and for clear differentiation with other solutions or rainwater that may be present. Dye should be added at a concentration that provides a clear visual indicator of the presence of high-strength cyanide solution. Additional details on dye are included in the discussion of Verification Protocol 5.2.6 in ICMI's Guidance for Use of the Mining Operations Verification Protocol (June 2021)

Turning to process areas, signs indicating the presence of cyanide are typically placed on doors, gates, or other entrances leading to the building or other process areas.

Signs must be in a language familiar to the workforce.

Tanks and piping containing cyanide solution should also be clearly marked. This is for the operational workforce, which may need to open or close pipes or valves, examine or take samples from tanks, or perform maintenance duties on these features. Clear identification and awareness of the presence of cyanide in specific tanks and pipelines is essential.

Many operations also use color coding on tanks and piping to identify presence of cyanide. There are different color-coding systems, but purple color coding on pipes and tanks is most commonly used to indicate the presence of cyanide. Purple or violet are typically used as an indicator of strongly-alkali solutions. Where color coding is used, consistency is important.

As a leading practice, many operations also mark tanks containing cyanide solution with the tank volume, the volume of the secondary containment for the tank, the cyanide concentration in the tank, and the most recent technical inspection date, such as thickness testing, for the tank.

Piping carrying cyanide solution should also be marked with the direction of the flow. This is primarily to reduce the potential for releases and exposures during maintenance. Flow direction marking is typically accomplished with arrow labels or painting arrows on the piping. The size and frequency of pipeline labeling should allow personnel to track the line and identify its contents. Signage and color coding on piping is especially important where pipes enter or exit a building, enter or exit conduits, or at other areas where the piping cannot be easily tracked from its source or to its destination. Labels are typically placed at or near pipe junctions, valves, or other locations where releases are most likely or where maintenance typically occurs.

Tailings storage facilities, heap leach pads, and associated ponds, such as pregnant ponds or overflow ponds containing cyanide solution should also be identified. Identification of the presence of cyanide for large features such as tailings facilities and heap leach pads are typically done at entry points to the area, and at locations where exposure is more likely such as at observation and instrumentation points.

Regardless of their location, emergency resources such as showers, eye-wash stations, antidote, and other first aid supplies should also be clearly identified for prompt identification and recognition by the facility workers, as well as meeting points in the event of any emergency involving cyanide.

Cyanide installations and equipment under maintenance must also be clearly identified and an authorization record or work permit should be in place addressing that the equipment was cleaned, decontaminated and that it is safe to work in that area. This requirement is especially important when work in confined spaces is being carried out, such as inside tanks or in areas that are not well-ventilated.

Other recommended and related signage and labeling includes identification of safe work trails, so that workers are guided away from areas that may have high exposure risks, such as mixing areas or other areas with high cyanide concentrations. Safe work trails are typically marked with paint or tape on flooring. Emergency exits and escape routes should also be clearly identified.

Signs and labels should be included in maintenance and inspection programs to ensure that signage is current, and legible. Out of date, faded, or unreadable signs and labels represent safety issues for the workforce.

To recap, both auditors and operations should evaluate the effectiveness of the signage at the operation for protecting worker health and safety. Evaluation should include looking at three fundamental expectations: **first**, is the presence of cyanide identified; **second**, are any special restrictions or requirements identified, and **third**, is signage clear and understandable to the work force.

The workforce should undergo training to make sure they understand the meaning of pictograms.

Auditor judgement and understanding of the operation are also necessary in evaluating signage needs and effectiveness. For example, if no smoking is allowed on site, then 'no smoking signs' at cyanide areas may not be necessary. Likewise, identifying the flow direction on individual pipes may not be necessary if cyanide concentrations are sufficiently low. A WAD cyanide concentration of approximately 10 to 15 mg/l may be an appropriate cut-off for the need to label individual pipes. Where tailings decant water is recycled back to a mill, it may not be necessary to indicate the direction of flow in every individual pipe carrying mill water.

To summarize, a signage-rich environment, with a strong supporting training program, is a simple but effective tool to protect workers.

If you have any questions on this topic, or would like to make any comments, suggestions, or requests for other topics to be covered, please send an email to us at info@cyanidecode.org.