Environmental and Safety Management Systems

ISO 14001, R2, ISO 45001, RIOS

AN EXECUTIVE OVERVIEW

PERRY JOHNSON
CONSULTING, INC.

www.pjcinc.com • 1-888-248-0256

ENVIRONMENTAL AND SAFETY MANAGEMENT SYSTEMS

ISO 14001:2015
R2V3
ISO 45001:2018
RIOS:2016

An Executive Overview

PERRY JOHNSON CONSULTING, INC.

200 East Big Beaver Rd. • Troy, Michigan 48083
1-888-248-0256 or (248) 519-2602

Website: www.pjcinc.com • **Email:** pjc@pjcinc.com

ENVIRONMENTAL AND SAFETY MANAGEMENT SYSTEMS

PART I – ISO 14001:2015

The Groundwork for Environmental Management

CONTENTS

FOREWORD

ISO 14000 is a generic series of international environmental management systems (EMS) standards devised to harmonize environmental management requirements for organizations all over the world. This series was created by the International Organization for Standardization (ISO), under the guidance of Technical Committee (TC) 207, Environmental Management. The registration standard, ISO 14001, *Environmental Management Systems – Specification with Guidance for Use*, was released in 1996.

The ISO 14000 series is already having an impact on companies in every industrialized nation. These standards place environmental management responsibilities directly into the hands of management. The people with the greatest influence over company policies and procedures also have flexibility and freedom to define methods for implementing ISO 14000 EMS. Once a company decides to control the environmental aspects and impacts of its activities, products and services, it can establish targets and objectives for achieving identified environmental management goals.

ISO 14000 has made a big splash in corporate waters as it outlines methods for companies to manage their environmental activities. While ISO 14001 is intended to be voluntary, some government agencies may require registration to the standard. This was the same action taken by some governments when ISO 9000 was released. As a result, companies that fail to implement effective EMS may not be able to compete in markets, such as the European Union (EU), where ISO 14001 registration may become a requirement.

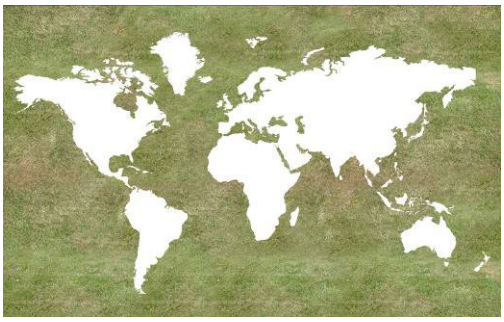
Market forces, government mandates and the growing pressure of public interest groups, all urging companies to operate sound environmental management practices, are expected to ultimately fuel the success of ISO 14000.

The public sector is not the only advocate of sound environmental management practices. Many companies have also recognized this need and have encouraged the creation of these internationally accepted EMS standards. Firms have also sought to avoid duplicate, and sometimes competitive, legislative and corporate programs that can waste precious resources.

The environment is everyone’s concern. This booklet was created to help organizations become grounded in the world’s first international standard for environmental excellence. It explains the intent and content of ISO 14000, including detailed descriptions of the standard, its requirements, objectives, and the implementation process that assists organizations in accomplishing their environmental objectives.

Since registration to ISO 14001 is a lengthy and detailed process, it is strongly suggested that organizations seeking registration retain the services of a reputable consulting firm, Like Perry Johnson Consulting, Inc.

THE USERS OF THISGUIDE



Since ISO 14000 has universal application, this guide can be used by any organization, in any type of business or industry, in the private or public sector, anywhere in the world, that is seeking to control its impact on the environment. Therefore, the use of this guide and the information contained herein is unlimited.

The ISO 14000 environmental management systems (EMS) standards affect almost everyone, from companies that manufacture products or provide services to individuals who are concerned about the environment. The principles of ISO 14000 extend beyond business and industry and apply to the very readers and producers of this guide.

We all influence the environment. Driving a car, using the backyard grill or mowing the lawn are all activities that move or produce microscopic chemical particles that interact with air, water, soil and plants, thereby affecting the environment. While no one disputes that these types of activities are necessary, we need to learn to how manage them to minimize their environmental impact.

The same concerns arise regarding an organization's activities, the processes it engages in, and the products and services it produces. Each activity can have an impact on the environment in varying degrees. An organization seeking to control environmental aspects and impacts through its EMS needs to identify them and considers writing appropriate procedures to deal with these situations.

Business suppliers should also take note of this guide, for some companies have mandated that their suppliers become registered to ISO 14001.

The Environmental Protection Agency (EPA) has contributed extensively to the development of ISO 14000, and its representatives have suggested that ISO 14001 registration is likely to reduce the need for multiple environmental audits in the future.

WHAT IS ISO14000?

ISO 14000 is a series of generic environmental management systems (EMS) standards created by the International Organization for Standardization (ISO), a federation of 132 national standards bodies based in Geneva, Switzerland. The American National Standards Institute (ANSI) is the member body representing the United States. The goal of these standards is to give top management of any organization a framework for managing its environmental aspects and impacts.

An environmental aspect is defined by ISO 14001 Section 3.2.2 as an "element of an organization's activities, products or services that can interact with the environment." ISO 14001 Section 3.2.4 defines an environmental impact as "any change in the environment, whether adverse or beneficial, wholly or partially resulting from an organization's *environmental aspects*."

The ISO 14000 series of standards attempt to harmonize environmental management activities for industries all over the world. The series promotes a common approach to environmental management that can be used by any organization, of any size, anywhere in the world.

These standards are divided into two classifications:

- Organization Evaluation
- Product and Service Evaluation

Organization Evaluation, in turn, consists of three components:

- Environmental Management Systems (EMS)
- Environmental Auditing
- Environmental Performance Evaluations (EPE)

Product and Service Evaluation also consists of three components:

- Environmental Labeling
- Life-Cycle Assessment (LCA)
- Environmental Aspects in Product Standards (EAPS)

The most important ISO 14000 standard, and the key member of the EMS component, is ISO 14001:*2015, Environmental Management Systems – Specification with Guidance for Use*. This standard sets EMS requirements to which an organization conforms and is the single standard within the ISO 14000 series to which an organization may become registered.

All other ISO 14000 standards are guidance documents and technical reports, assisting an organization in developing its EMS. These standards contain recommendations that organizations may use to clarify or go beyond ISO 14001 requirements.

Before we examine the ISO 14000 standards, let's take a brief look at their development process.

The Origin of ISO 14000

The international environmental movement that developed in the 1960s spurred environmental legislation around the globe during the 1970s, with the strongest regulations in industrialized nations. Regulatory compliance proved costly for many companies, with environmental improvements sometimes falling short of expectations. Attempts by some industries to police themselves failed to establish a viable and credible worldwide consensus.

ISO, which had released the ISO 9000 quality management systems standards in 1987, stepped into the breach to create a voluntary global approach to environmental management. In 1991, ISO established the Strategic Advisory Group on the Environment (SAGE) to research the need for international environmental standardization. In addition to its ISO responsibilities, SAGE was a major contributor to the 1992 United Nations Earth Summit in Rio de Janeiro, Brazil, particularly in adopting a commitment to sustainable development.

At the same time, the British Standards Institution (BSI) released BS 7750*, Environmental Management Systems*, the first EMS standard. BS 7750 stressed overall environmental systems performance, with mandatory audits to confirm and maintain a company's conformity and registration to the standard. The European Union (EU) followed with its Eco-Management Audit Scheme (EMAS), which contained similar requirements.

Considering these developments, SAGE recommended developing an international series of EMS standards, and ISO established Technical Committee (TC) 207, Environmental Management, to carry out this work. Both BS 7750 and EMAS were influential in developing the ISO 14000 standards.

In 1996, the first five ISO 14000 standards were released. They were ISO 14001; the guidance document ISO 14004:1996, *Environmental Management Systems – General Guidelines on Principles, Systems and Supporting Techniques*; and three auditing standards: ISO 14010:1996, *Guidelines for Environmental Auditing – General Principles*, ISO 14011:1996, *Guidelines for Environmental Auditing – Audit Procedures – Auditing of Environmental Management Systems*, and ISO 14012:1996, *Guidelines for Environmental Auditing – Qualification Criteria for Environmental Auditors*.

ISO/TC 207 has continued its work, releasing additional ISO 14000 standards, guidance documents and technical reports*, updating to keep pace with the most recent revision in 2015*.

The ISO 9000 quality management systems standards, which underwent minor revisions in 1994, were thoroughly overhauled in 2000, *minor changes in 2008 and another thorough overhaul most recently in 2015*. ISO/TC 176, Quality Management and Quality Assurance, coordinated development of the revised standards with the work of ISO/TC 207 Subcommittee (SC) 1, Environmental Management Systems, to ensure that the two series of standards can be jointly implemented while avoiding duplication and conflicts

As part of this process, the Joint Working Group (JWG) on Quality and Environmental Auditing, consisting of experts from ISO/TC 207/SC 2, Environmental Auditing, and ISO/TC 176/SC 3, Auditing, drafted a joint quality and environmental management systems auditing standard. ISO 19011:2011 replacing 19011:2002, *Guidelines for Quality and/or Environmental Management Systems Auditing*, replaced ISO 14010:1996, ISO 14011:1996 and ISO 14012:1996, along with the three quality auditing standards: ISO 10011-1:1990, *Guidelines for Auditing Quality Systems – Part 1: Auditing*, ISO 10011-2:1991, *Guidelines for Auditing Quality Systems – Part 2: Qualification Criteria for Quality Systems Auditors*, and ISO 10011-3:1991, *Guidelines for Auditing Quality Systems – Part 3: Management of Audit Programs*.

The ISO 14000 Series of Standards

ISO 14001 is part of a series of Environmental Management (EMS) standards which has been developed by the International Organization for Standardization (ISO), a worldwide federation based in Geneva which was founded to promote global standards and free up trade barriers.

ISO 14001 was developed by TC 207 (the 207th Technical Committee of ISO). Membership in TC 207 is worldwide. The ISO 14001 standard came out in 1996 and is the blueprint for developing an organization's EMS. An EMS is a plan to address the immediate and long-term environmental impacts of an organization's products, services, and operations. To be registered, an organization's EMS needs to meet the requirements of the ISO 14001 standard.

An EMS is a continuous improvement cycle based on "Plan-Do-Check-Act". Here's a list of the standards in the ISO 14000 series:

- ISO 14001: Environmental Management Systems - Specification with guidance for use
- ISO 14004: Environmental Management Systems - General guidelines on principles, systems, and supporting techniques
- ISO 14010, 14011 and 14012: Guidelines for environmental auditing
- ISO 14020, 14021, and 14024: Environmental Labels and Declarations
- ISO 14031 and 14032: Environmental Management - Environmental Performance Evaluation (EPE)
- ISO 14040, 14041, 14042, and 14043: Environmental Management - Life Cycle Assessment
- ISO/TR 14061: Information to assist Forestry Organizations in the use of environmental management system standards
- ISO Guide 64: Guide for the inclusion of Environmental Aspects in Product Standards

ISO 14000 Components

Let's briefly review the ISO 14000 series of standards, organized into two classifications and six components.

Organization Evaluation Standards

Environmental Management Systems (EMS)

Environmental Management Systems (EMS) is the entire environmental program planned by an organization. ISO 14001 Section 3.1.2 defines an EMS as "part of the management system used to manage environmental aspects, fulfill compliance obligations, and address risks and opportunities."

Certain aspects of an EMS are required to be documented. An environmental policy sets the tone for other necessary documents. These documents help to detail your EMS and clearly state the organization's environmental objectives and targets. An EMS manual, while not required, can provide structure to your EMS.

The environmental policy is defined by ISO 14001 Section 3.1.3 as "intentions and direction of an organization related to environmental performance as formally expressed by top management." ISO 14001 Section 3.7 defines an environmental objective as an "intentions and direction of an organization related to environmental performance, as formally expressed by its top management."

EMS standards are:

- ISO 14001:2015, *Environmental Management Systems – Specification with Guidance for Use*, which specifies EMS requirements that may be objectively audited for self-declaration or registration purposes.

- ISO 14004:2016, *Environmental Management Systems – General Guidelines on Implementation*, provides guidance for an organization on the establishment, implementation, maintenance and improvement of a robust, credible and reliable environmental management system, including guidance that goes beyond ISO 14001 requirements.

- ISO 14050:2009, *Environmental Management – Vocabulary*, which helps an organization understand the terms and definitions used in the ISO 14000 series standards.

Environmental Auditing

The ISO 14000 series rely heavily on auditing to ensure that ISO 14001 requirements are being met. ISO 14001 mandates audits, with Element 4.5.4 stating, "The organization shall establish and maintain (a) program(s) and procedures for periodic environmental management system audits to be carried out." Both internal and external audits are used to ensure conformity to ISO 14001 and can be of great benefit to a facility.

Environmental Auditing standards are:

- ISO 19011:2018, *Guidelines for Auditing Management Systems*, which provides guidance on auditing principles, audit program management, the conduct of audits and auditor competence.

- ISO 14015:2001, *Environmental Management – Environmental Assessment of Sites and Organizations (EASO)*, which helps an organization to identify and assess the environmental aspects and associated business consequences of sites and organizations to support the transfer of properties, responsibilities and obligations from one party to another.

- ISO 17021-1:2015, *Conformity Assessment – Requirements for Bodies Providing Audit and Certification of Management Systems – Part 1: Requirements.* Contains principles and requirements for the competence, consistency and impartiality of bodies providing audit and certification of all types of management systems.

Environmental Performance Evaluation (EPE)

Once an EMS is implemented, its performance is evaluated for effectiveness. Environmental Performance Evaluation (EPE) should be conducted by front-line employees who continually monitor the production process to ensure that environmental requirements are met.

EPE standards are:

- ISO 14031:2013, *Environmental Management – Environmental Performance Evaluation – Guidelines*, which provides guidance on selecting and using indicators to evaluate an organization's environmental performance.

- ISO 14063:2006, *Environmental Management – Environmental Communications – Guidelines and Examples*, provides guidance on communication of an organization's environmental aspects and performance.

Product and Service Evaluation Standards

Environmental Labeling

Many companies use environmental claims as a marketing tool for their products and services. With ISO 14001 registration providing a similar labeling opportunity, these support documents seek to prevent unwarranted claims, ensure that environmental claims are accurate and verifiable, and set standards for the three types of environmental labels. These labeling categories are:

- **Type I:** Third-party certified labels
- **Type II:** Self-declared labels
- **Type III:** Product information claims based on life cycle

Inventory data Environmental Labeling standards are:

- ISO 14020:2000, *Environmental Labels and Declarations – General Principles*, which provides general principles for developing ISO guidelines and standards on environmental claims and declarations.

- ISO 14021:2016, *Environmental Labels and Declarations – Self-Declared Environmental Claims (Type II Environmental Labeling)*, which provides guidance on the terminology, symbols, and testing and verification methodologies an organization could use for self-declaring the environmental aspects of its products and services.

- ISO 14024:2018, *Environmental Labels and Declarations – Type I Environmental Labeling – Principles and Procedures*, which provides the guiding principles and procedures for third-party environmental labeling certification programs.

- ISO/TR 14025:2006, *Environmental Labels and Declarations – Type III Environmental Declarations*, which identifies and describes elements and issues to be considered when making quantified product information declarations based on life cycle inventory data.

Life Cycle Assessment (LCA)

Several support documents provide life cycle assessment study guidance. These standards describe how to conduct a study of the environmental performance of a company's products, including inventory analysis, impact assessment and interpretation.

LCA standards are:

- ISO 14040:2006, *Environmental Management – Life Cycle Assessment – Principles and Framework*, which provides the general principles, framework and methodological requirements for the LCA of products and services.

- ISO 14044:2006, *Environmental Management – Life Cycle Assessment – Requirements and Guidelines*, which provides guidance for determining the goal and scope of an LCA study, and for conducting a life cycle inventory.

- ISO/TS 14048:2002, *Environmental Management – Life Cycle Assessment – Data Documentation Format*, which provides information regarding the formatting of data to support an LCA.

- ISO/TR 14047:2012, *Environmental Management – Life Cycle Assessment – Examples of Application of ISO 14044:2006*, provides examples that illustrate how to apply the guidance in ISO 14044.

- ISO/TR 14049:2012, *Environmental Management – Life Cycle Assessment – Examples of Application of ISO 14044:2006 to Goal and Scope Definition and Inventory Analysis*, which provides examples to illustrate how to apply the guidance in ISO 14044.

Environmental Aspects in Product Standards (EAPS)

Guidelines for environmental aspects in product standards recognize the potential effects of products on the environment and recommend consideration of environmental aspects in developing future products and product standards.

EAPS standards are:

- ISO/TR 14062:2002, *Environmental Management – Integrating Environmental Aspects Into Product Design and Development*, which provides concepts and current practices for integrating environmental aspects into product design and development.

- ISO Guide 64:2008, *Guide for the Inclusion of Environmental Aspects in Product Standards*, which helps product standard writers address environmental aspects.

- ISO 14064, *Guidelines for Measuring, Reporting and Verifying Entity Project-Level Greenhouse Gas Emissions Package* provides specification with guidance at the organization and project level for quantifying, monitoring and reporting of greenhouse gas emission reductions or removal enhancements. Package contains the following ISO documents: ISO 14064-1:2006, ISO 14064-2:2006, ISO 14064-3:2006, ISO 14065:2013 and ISO 14066:2011.

Implementing an Environmental Management System

Implementing an EMS affects an entire organization and requires commitment across the board. The implementation process begins with top management identifying the appropriate resources and then creating a personnel structure to plan and oversee the process.

IS0 14001 places this initial task in the hands of top management to provide direction for the program and convey the importance of the EMS to employees. It also requires top managers to draft policies, allocate resources, establish support systems, mandate training, formulate appraisal systems and provide necessary communication.

Top management *also assigns responsibilities and authorities to ensure the EMS conforms to the requirements of ISO 14001 and reporting on the performance of the EMS, including environmental performance, to top management.* (ISO *14001 Element 5.3)* Prior versions of ISO 14001 required that a member of management be appointed to shepherd the EMS and that person was given the title of Management Representative (MR). Today those duties fall on the shoulders of top management, however it is still common practice to have an MR. Typically the MR identifies available resources and personnel, develops procedures, tracks costs and benefits, and gathers information from each department manager for EMS review and improvement.

Every employee needs to play a role in EMS implementation. Department managers are involved to the degree that their operations produce environmental aspects and impacts. Floor employees are the backbone of the whole system, since they carry out most of the organization's activities that can affect the environment.

Environmental training plays a big role in ISO 14001 EMS implementation. Element *7.2* requires all employees whose job duties may significantly affect the environment to be competent on the basis of appropriate education, training and/or experience.

To ensure that employees have the resources they need to meet EMS requirements, the organization identifies training needs. Element *7.3 requires that anyone working under the organizations control is aware of the environmental policy, of its significant environmental aspects, their contribution to the effectiveness of the EMS, inclusive of the benefits of enhanced environmental performance and the implications of nonconformance to EMS requirements.*

Auditors who evaluate an organization's EMS need to be competent. Guidance that can be used for internal auditor training and how to perform internal audits is contained in ISO 19011:2018.

ISO 14001 requires documentation, which top management is responsible for establishing and maintaining. Element *5.2* mandates an environmental policy to set the EMS framework. Other documents include an environmental manual, procedures, work instructions and records. Documents are controlled under procedures required by Element *7.5.*

Documentation presents a clear picture of a facility's EMS as it compares to ISO 14001 requirements, providing objective evidence of EMS status. It also establishes an archive of EMS information that aids in both operations and audits.

Meeting Environmental Auditing Requirements

ISO 14001 requires organizations to continually monitor their performance through a systematic auditing approach that compares a company's environmental achievements to its objectives and targets.

Auditing guidelines are found in *ISO 19011:2018*, *Guidelines for Auditing Management Systems,* which contains definitions of auditing terms, sets forth auditing principles, describes audit program management guidance, provides guidance for conducting EMS audits, and presents auditor competence and evaluation guidance.

Understanding the Audit Process

An audit evaluates an EMS to determine if it has been effectively implemented and is meeting environmental performance objectives in accordance with the organization's environmental policy. During an audit, an auditor measures the adequacy of the EMS, its effectiveness, and its conformity to ISO 14001.

ISO 14001 Element *9.2.2* requires periodic audits of an organization's EMS, with the scope, frequency and methodologies of these audits covered by procedures. In registering an organization to ISO 14001, the environmental policy, manual and other documentation are reviewed first during the Stage 1 audit. Following this process, the auditor then examines the company's on-site operations during the Stage 2 (registration) audit, to ensure that the EMS plan is being followed. Both stages are incorporated into an internal audit.

Upon completing the Stage 2 audit, it is the auditor's job to identify areas of operation where the EMS does not meet ISO 14001 requirements. The auditor will require the organization to take corrective action to close out any nonconformities before a registration certificate can be issued. In an internal audit, implementation of these actions is verified during either a follow-up audit or the next surveillance audit.

If corrective actions are required for the organization's environmental policy, procedures, or other EMS components because of nonconformities, the ISO 14000 management representative, together with the department manager of the affected area, should guide these activities. The management representative is also responsible for updating documentation to reflect changes that result from corrective and preventive actions.

Documentation Review

ISO 17021 requires a thorough review of an organization's EMS documentation as part of Stage 1 Audit activities. Documentation includes the environmental policy, environmental objective results, manual (if you choose to have one), procedures, work instructions and records, which are reviewed for conformity to ISO 14001 requirements, along with other applicable requirements, such as regulatory mandates. Documentation is an invaluable reference source because it serves as the foundation of the EMS and provides objective evidence on its status.

If this review shows that the organization's documentation fails to meet ISO 14001 requirements, the Stage 2 audit cannot be scheduled until the situation is corrected.

Performing Internal Audits

An internal audit is conducted by an organization's personnel and may be carried out by the management representative or any employee who has successfully completed auditor training. See ISO 19011:2018 for guidance. The goal of an internal audit is to get an accurate look at the EMS so that the organization can prepare for registration and top management can regularly review it to track continual improvement.

To maintain impartiality, internal auditors need to be impartial and objective. As a rule of thumb, at least five to eight percent of a company's personnel should be trained to conduct internal audits. Alternatively, appropriately credentialed contract auditors may be used.

Auditor training is a critical component for ISO 14001 registration. It is important for auditors, especially internal auditors, to receive training that is relevant and comprehensive regarding the entire ISO 14000 series. ISO 19011:2018 may be used for internal auditing guidance.

Taking Corrective Action

There are several reasons why an EMS might not meet ISO 14001 requirements. The program may have failed to keep up with environmental regulations during a period of rapid change. Perhaps employees have not been trained in new procedures, or no provisions have been made to ensure that all employees have the resources needed to implement these procedures.

In any case, it is the responsibility of top management to identify responsibility and authority to review the plan and correct it when necessary. The goal is to detect and then correct the root causes of deficiencies. This is another area in which an external auditor or consultant may prove invaluable.

If an audit reveals that your company needs to take corrective action for nonconformities, it is not a cause for alarm. If the nonconformity was identified as a minor, it is a problem that can be easily rectified and will not usually block the registration process

The corrective action process is more involved for a major nonconformity, a deficiency, or breakdown in the EMS that is preventing the organization from achieving its environmental objectives and targets. When a major nonconformity is identified, it often means that a significant change needs to be made to the EMS by adding a procedure or changing a practice to eliminate its root cause and prevent it from recurring.

Once the nonconformities are corrected, a follow-up audit specific to the areas of concern is sometimes required. This is being done to confirm that the problem has been resolved. In the case of a Stage 2 audit, registration cannot be achieved until it is verified that all nonconformities have been corrected.

REGISTERING TO ISO 14001

ISO 14001 registration is a tangible expression of an organization's commitment to managing its environmental aspects and impacts that is internationally understood and accepted. There are a variety of reasons for seeking registration. These include customer mandates, a competitive advantage through reduced energy costs and improved efficiency, cutting liability and regulatory compliance costs, and increased community goodwill from preventing pollution and reducing waste.

ISO 14001 registration is carried out by certification bodies (aka registrars), Certification bodies are accredited organizations that review the facility's environmental policy and other documentation during the Stage 1 audit to ensure that they meet the standard, and examine the firm's processes during the Stage 2 (registration) audit to ensure that the EMS described in the documentation is in place and is effective. Once registration is obtained, the certification body conducts regular surveillance audits of the facility to determine if its EMS continues to meet the standard's requirements.

As it typically takes 6 to 18 months to complete the ISO 14000 registration process, organizations are advised not to put off registration for too long.

Key Steps to Completing Registration

Before an organization can be considered for registration, several preliminary steps are taken.

1) Implement an EMS that meets ISO 14001 requirements.

2) Create an environmental policy which stipulates the facility's environmental commitments, procedures, and practices. This document plays a vital role in the registration process. The policy is the principal document used during an audit, so it needs to be a true reflection of the facility's EMS.

3) The facility's EMS needs to be in operation for a minimum of three to six months. During that time, employees become familiar with it and an evidentiary trail of documents will have been created for auditors to review.

After successfully completing the preliminary steps, a relationship is established with a certification body (aka registrar). The certification body's job is to verify whether an organization's EMS has been properly implemented and conforms to ISO 14001 and any other applicable requirements.

Once the services of an accredited certification body have been obtained, a formal application is filed. When all paperwork has been submitted, the certification body examines the facility's environmental policy and other documentation during the Stage 1 audit. After the certification body has verified that the policy and other documentation satisfactorily reflect the organization's EMS and meet all ISO 14001 requirements, and any nonconformities have been corrected, the on-site Stage 2 (registration) audit of the organization's facility is scheduled.

During the Stage 2 audit, the certification body's auditor interviews employees, reviews records, and performs a detailed inspection of the facility's EMS and procedures. The purpose of the audit is to ensure that the facility's EMS is functioning adequately and conforms to all ISO 14001 requirements.

Afterward, the certification body auditor reports its findings in an audit report. If any nonconformities were found, the organization (or auditee) takes corrective action to remedy them within a set time frame, determined by the certification body. Once the certification body has closed out all outstanding nonconformities, a registration certificate is issued.

The standard life of a registration certificate is three years, after which a full re-audit is done for renewal. To ensure that organizations are following ISO 14001 requirements after registration is obtained, the certification body conducts on-site surveillance audits at least annually.

Remember: To achieve registration to ISO 14001, the organization needs to completely embrace the standard, which focuses on performance, documentation and objective evidence.

What to Look for in a Certification Body

In selecting a certification body, it is extremely important for every organization to be aware of the relevant qualifications.

A certification body:

- Is accredited by a national accreditation body, such as the ANSI-Registrar Accreditation Board (RAB) National Accreditation Program (NAP) of the United States, the Raad voor Accreditatie (RvA) of the Netherlands, or the United Kingdom Accreditation Service (UKAS).

- Maintains a listing of its ISO 14000 qualified auditors.

- Has personnel on its executive (registration) committee or governing board with environmental experience and expertise.

- Conforms to ISO 17021:2015, Conformity Assessment – Requirements for Bodies Providing Audit and Certification of Management Systems – Part 1: Requirements.

What to Look for in an Auditor

Requirements have been established for the auditors working for accredited ISO 14000 certification bodies. Before an auditor can evaluate an organization's facility to verify whether its EMS conforms to ISO 14001 requirements, the auditor satisfies the following conditions:

1) Auditors have satisfactorily completed ISO 14000 training courses and demonstrated their knowledge of ISO 14001 by passing an exam. A certificate is awarded to those auditors who have successfully completed this training.

2) Auditors comply with *ISO 17021:2015*, *Conformity Assessment – Requirements for Bodies Providing Audit and Certification of Management Systems – Part 1: Requirements.*

3) They are recognized and qualified as ISO 14000 auditors under the certification body's criteria.

Before hiring the services of a certification body, it's a good idea to make sure the certification body and its auditors have met the above qualifications.

THE BENEFITS OF ISO 14000

ISO 14001 registration creates innumerable advantages and unlimited benefits for organizations within both the public and private sectors. Reasons for seeking registration include fulfilling legal requirements, satisfying contractual requirements, achieving internal improvements, reducing multiple audits, regulatory and legal concerns, and marketplace benefits.

ISO 14001 registration enhances a company's public image while offering safeguards against lawsuits through reduced exposure to liabilities. Companies can face stiff fines and time-consuming lawsuits for not adhering to environmental regulations. Furthermore, registration can greatly improve a company's competitive stance, especially when it comes to overseas trade.

In the business sector, ISO 14001 registration has become a contractual requirement of some major companies in purchasing products and services. Additional mandates are expected in the future.

To consumers, a company's registration to ISO 14001 provides assurance that it is committed to protecting the environment through proactive activities that can be objectively demonstrated.

Even if ISO 14001 registration is not a customer-mandated requirement, businesses may opt to pursue it for such benefits as cost reduction, prestige, an assumed perception of environmental responsibility, and a positive public response.

Most companies realize that self-improvement is imperative for business prosperity and growth. Internal improvement is yet another reason for ISO 14001 registration. When environmental management is a high priority of a company's management team, this positive message is reinforced throughout the workplace.

Organizations that have implemented ISO 14001 often see improvements in productivity, waste reduction, energy efficiency and regulatory compliance costs.

ISO 14001 ENVIRONMENTAL MANAGEMENT SYSTEM REQUIREMENTS

4.1 Understanding *the Organization and its Context*

The organization *determines external and internal issues and inclusive of environmental conditions, relevant to its purpose and impact its ability to achieve the intended outcomes of the environmental management system (EMS),*

4.2 Understanding *the Needs and Expectations of Interested Parties*

The organization determines the interested parties that are relevant to the EMS, their relevant needs and expectations and which of these needs and expectations become compliance obligations.

4.3 Determining *the Scope of the EMS*

The organization determines the boundaries and applicability of the EMS for determination of scope of the EMS. External and internal issues are referenced, compliance obligations are referenced, as well as the organization units, functions, physical boundaries, activities, products and services. Consideration is also given to its ability to exercise control and influence. Once defined, the scope is documented inclusive of all products and services of the organization, and additionally be made available to interested parties.

4.4 Environmental Management System

To achieve intended outcomes inclusive of enhancing its environmental performance the organization establishes, implements and maintains, and continually improve the EMS inclusive of the processes and their interactions, in accordance with the ISO 14001 requirements.

5.1 Leadership and Commitment

Top management demonstrates leadership and commitment to the EMS by;

- *Taking accountability for the EMS effectiveness*
- *Ensuring an environmental policy and objectives are established and are compatible with the organizations context and strategic direction*.
- *Ensure integration of the EMS requirements into the organizations business processes*.
- *Ensure availability of resources for the EMS*;
- *Communication of the importance of an effective EMS and conformance requirements*;
- *Ensuring that the EMS intended outcomes are achieved*;
- *Directing and supporting persons to contribute to the EMS effectiveness;*
- *Promoting continual improvement;*
- *Supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility.*

5.2 Environmental Policy

Top management establishes, implements, and maintains an Environmental policy that, within the defined scope of the EMS:

- *Is appropriate to the purpose and context of the organization, inclusive of the nature, scale and environmental impact of its activities, products and services:*
- *Provides a framework for environmental objectives:*
- *Includes of a commitment to the protection of the environment, including prevention of pollution and other specific commitments relevant to the context of the organization.*
- *Includes a commitment to fulfil its compliance obligations;*
- *Includes a commitment to continual improvement forth EMS and environmental performance.*

5.3 Organizational Roles, Responsibilities and Authorities

Top management ensures that the responsibilities and authorities for relevant roles are assigned and communicated within the organization. Top management assigns the responsibility and authority for:

- *ensuring that the environmental management system conforms to the requirements of this International Standard*
- *reporting on the performance of the Environmental Management System, including performance, to top management*

6.1 Actions to Address Risks and Opportunities

The organization establishes, implements, and maintains the processes to meet the identified requirements. When planning for the environmental management system, the organization considers:

- *external and internal issues relevant to the organizations purpose which may impact ability to achieve intended outcomes relevant environmental conditions and the organizations EMS;*
- *the relevant needs and expectations of interested parties;*
- *the scope of its environmental management system;*
- *and determine the risks and opportunities, related to its environmental aspects, compliance obligations and other issues and requirements, as identified above, that need to be addressed to:*
  - *give assurance that the environmental management system can achieve its intended outcomes;*
  - *prevent or reduce undesired effects, including the potential for external environmental conditions to affect the organization;*
  - *achieve continual improvement.*

Within the scope of the environmental management system, the organization shall determine potential emergency situations, including those that can have an environmental impact.

The organization retains documented information related to risks and opportunities that need to be addressed and processes to the extent the organization determines to ensure they are carried out as planned.

6.1.2 Environmental Aspects

Within the defined scope of the environmental management system, the organization determines the environmental aspects of its activities, products and services that it can control and those that it can influence, and their associated environmental impacts, considering a life cycle perspective. When determining environmental aspects, the organization takes into account:

- *change, including planned or new developments, and new or modified activities, products and services;*
- *abnormal conditions and reasonably foreseeable emergency situations.*

The organization determines those aspects that have or can have a significant environmental impact, i.e. significant environmental aspects, by using established criteria.

The organization communicates its significant environmental aspects among the various levels and functions of the organization, as appropriate.

The organization maintains documented information of it's:

- *environmental aspects and associated environmental impacts;*
- *criteria used to determine its significant environmental aspects;*
- *significant environmental aspects.*

6.1.3 Compliance Obligations

The organization:

- *determines and has access to the compliance obligations related to its environmental aspects;*
- *determine how these compliance obligations apply to the organization;*
- *take these compliance obligations into account when establishing, implementing, maintaining, and continually improving its environmental management system.*

The organization maintains documented information of its compliance obligations.

6.1.4 Planning Action

The organization plans:

a) to take actions to address its:
   1) significant environmental aspects;
   2) compliance obligations;
   3) risks and opportunities as identified
b) how to:
   1) integrate and implement the actions into its environmental management system processes (see 6.2, Clause 7, Clause 8 and 9.1), or other business processes;
   2) evaluate the effectiveness of these actions.

When planning these actions, the organization shall consider its technological options and its financial, operational and business requirements.

6.2.1 Environmental Objectives

The organization establishes environmental objectives at relevant functions and levels, taking into account the organization's significant environmental aspects and associated compliance obligations, and considering its risks and opportunities. The environmental objectives are:

- *consistent with the environmental policy;*
- *measurable (if practicable);*
- *monitored;*
- *communicated;*
- *updated as appropriate.*

The organization retains documented information on the environmental objectives.

6.2.2 Planning Actions to Achieve Environmental Objectives

When planning how to achieve its environmental objectives, the organization determines:

- *what will be done;*
- *what resources will be required;*
- *who will be responsible;*
- *when it will be completed;*
- *how the results will be evaluated, including indicators for monitoring progress toward achievement of its measurable environmental objectives (see 9.1.1).*

The organization considers how actions to achieve its environmental objectives can be integrated.

7.1 Resources

The organization determines and provides the resources needed for the establishment, implementation, maintenance and continual improvement of the environmental management system.

7.2 Competence

The organization:

- *determines the necessary competence of persons doing work under its control that affects its environmental performance and its ability to fulfil its compliance obligations;*
- *ensures that these persons are competent on the basis of appropriate education, training or experience;*
- *determines training needs associated with its environmental aspects and its environmental management system;*
- *takes actions to acquire the necessary competence, and evaluates the effectiveness of the actions taken.*

For example, applicable actions can include, for example, the provision of training to, the mentoring of, or the reassignment of currently employed persons; or the hiring or contracting of competent persons. The organization shall retain appropriate documented information as evidence of competence.

7.3 Awareness

The organization ensures that persons doing work under their control are aware of:

- *the environmental policy;*
- *the significant environmental aspects and related actual or potential environmental impacts associated with their work;*
- *their contribution to the effectiveness of the environmental management system, including the benefits of enhanced environmental performance;*
- *the implications of not conforming to the environmental management system requirements, including not fulfilling the organization's compliance obligations*.

7.4 Communication

The organization establishes, implements and maintains the processes needed for internal and external communications relevant to the environmental management system, inclusive of what, when, with whom, and how to communicate. When establishing its communication processes, the organization considers its compliance obligations and ensures that environmental information communicated is consistent with information generated within the environmental management system, and is reliable. The organization responds to relevant communications on its environmental management system and retains documented information as evidence of its communications, as appropriate.

7.4.2 Internal Communication

The organization internally communicates information relevant to the environmental management system among the various levels and functions of the organization, including changes to the environmental management system, as appropriate. Additionally, they ensure communication processes enable persons doing work under the organization's control to contribute to continual improvement.

7.4.3 External Communication

The organization externally communicates information relevant to the environmental management system, as established by the organization's communication processes and as required by compliance obligations.

7.5.1 Documented Information

The organization's environmental management system includes:

- *documented information required by ISO 14001;*
- *documented information determined by the organization as being necessary for the effectiveness of the environmental management system, this may vary based on the size, activities, processes, products and services of the organizations. Additionally, the need to demonstrate fulfilment of its compliance obligations, the complexity of processes and their interactions, and the competence of persons doing work under the organization's control are considered when determining documented information needs.*

7.5.2 Creating and Updating

When creating and updating documented information, the organization ensures appropriateness of identification and description method, format, media and review and approval for suitability and adequacy.

7.5.3 Control of Documented Information

Documented information required by the environmental management system and by ISO 14001 is controlled to ensure that it is available and suitable for use, where and when it is needed, it is adequately protected from improper use, or loss of confidentiality or integrity. For the control of documented information, the organization addresses the following activities as applicable:

- *distribution, access (view/change), retrieval and use;*
- *storage and preservation, including preservation of legibility;*
- *control of changes (e.g. version control);*
- *retention and disposition.*

Documented information of external origin determined by the organization to be necessary for the planning and operation of the environmental management system is identified, as appropriate, and controlled.

8.1 Operational Planning and Control

The organization establishes, implements, controls and maintains the processes needed to meet environmental management system requirements, and to implement the actions identified by risk and opportunity assessment and to address objectives and targets by establishing operating criteria for the processes and implementing control of the processes, in accordance with the operating criteria. Examples of controls can include engineering controls and procedures. Controls can be implemented following a hierarchy (e.g. elimination, substitution, administrative) and can be used individually or in combination.

The organization also controls planned changes and review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.

The organization ensures that outsourced processes are controlled or influenced. The type and extent of control or influence to be applied to the processes is defined within the environmental management system.

Consistent with a life cycle perspective, the organization:

- *establishes controls, as appropriate, to ensure that its environmental requirements are addressed in the design and development process for the product or service, considering each life cycle stage;*
- *determines its environmental requirements for the procurement of products and services, as appropriate;*
- *communicates its relevant environmental requirements to external providers, including contractors;*
- *considers the need to provide information about potential significant environmental impacts associated with the transportation or delivery, use, end-of-life treatment and final disposal of its products and services.*

The organization retains documented information to the extent necessary to have confidence that the processes have been carried out as planned.

8.2 Emergency Preparedness and Response

The organization establishes, implements and maintains the processes needed to prepare for and respond to potential emergency situations identified in risks. The organization:

- *prepares to respond by planning actions to prevent or mitigate adverse environmental impacts from*
- *responds to actual emergency situations;*
- *takes action to prevent or mitigate the consequences of emergency situations, appropriate to the magnitude of the emergency and the potential environmental impact;*
- *periodically tests the planned response actions, where practicable;*

- *periodically review and revise the processes and planned response actions, in particular after the occurrence of emergency situations or tests;*
- *provide relevant information and training related to emergency preparedness and response, as appropriate, to relevant interested parties, including persons working under its control.*

The organization retains documented information to the extent necessary to have confidence that the processes have been carried out as planned.

9.1 Monitoring, Measurement, Analysis and Evaluation

The organization monitors, measures, analyzes and evaluates its environmental performance.

The organization determines:

- *what needs to be monitored and measured, the methods for monitoring, measurement, analysis and evaluation, as applicable and to ensure valid result;*
- *the criteria against which the organization will evaluate its environmental performance, and appropriate indicators*
- *when the monitoring and measuring will be performed;*
- *when the results from monitoring and measurement is analyzed and evaluated.*

The organization ensures that calibrated or verified monitoring and measurement equipment is used and maintained, as appropriate. The organization evaluates its environmental performance and the effectiveness of the environmental management system. Additionally, the organization communicates relevant environmental performance information both as identified in its communicated processes and as required by its compliance obligations.

The organization retains appropriate documented information as evidence of the monitoring.

9.1.2 Evaluation of Compliance

The organization establishes, implements, and maintains the processes needed to evaluate fulfilment of its compliance obligations. The organization determines the frequency that compliance will be evaluated, implement the evaluation of compliance and take action if needed. Additionally, knowledge and understanding of the organizations compliance status is maintained. The organization retains documented information as evidence of the compliance evaluation results.

9.2.1 Internal Audit

The organization conducts internal audits at planned intervals to provide information on whether the environmental management system:

- *conforms to the organization's own requirements for its environmental management system;*
- *conforms to the requirements of this ISO 14001:2015;*
- *is effectively implemented and maintained.*

9.2.2 Internal Audit Program

The organization establishes, implements, and maintains an internal audit program, including the frequency, methods, responsibilities, planning requirements and reporting of its internal audits. When establishing the internal audit program, the organization takes into consideration the environmental importance of the processes concerned, changes affecting the organization and the results of previous audits. The organization:

- *defines the audit criteria and scope for each audit;*
- *selects auditors and conduct audits to ensure objectivity and the impartiality of the audit process;*
- *ensures that the results of the audits are reported to relevant management.*

The organization retains documented information as evidence of the implementation of the audit.

9.3 Management Review

Top management reviews the organization's environmental management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. The management review includes consideration of:

- *the status of actions from previous management reviews;*
- *changes in:*
  - *external and internal issues that are relevant to the environmental management system;*
  - *the needs and expectations of interested parties, including compliance obligations;*
  - *its significant environmental aspects;*
  - *risks and opportunities;*
  - *the extent to which environmental objectives have been achieved;*

- *information on the organization's environmental performance, including trends in:*
  - *nonconformities and corrective actions;*
  - *monitoring and measurement results;*
  - *fulfilment of its compliance obligations;*
  - *audit results;*
  - *adequacy of resources;*
  - *relevant communication(s) from interested parties, including complaints;*
  - *opportunities for continual improvement. The outputs of the management review include:*

- *conclusions on the continuing suitability, adequacy and effectiveness of the environmental management system;*
- *decisions related to continual improvement opportunities;*
- *decisions related to any need for changes to the environmental management system, including resources;*

- *actions, if needed, when environmental objectives have not been achieved;*
- *opportunities to improve integration of the environmental management system with other business processes, if needed;*
- *any implications for the strategic direction of the organization.*

The organization retains documented information as evidence of the results of management reviews.

10.1 General

The organization determines opportunities for improvement and implements necessary actions to achieve the intended outcomes of its environmental management system.

10.2 Nonconformity and Corrective Action

When a nonconformity occurs, the organization:

- *react to the nonconformity and, as applicable:*
  - *take action to control and correct it;*
  - *deal with the consequences, including mitigating adverse environmental impacts*
- *evaluate the need for action to eliminate the causes of the nonconformity, in order that it does not recur or occur elsewhere, by:*
  - *reviewing the nonconformity;*
  - *determining the causes of the nonconformity;*
  - *determining if similar nonconformities exist, or could potentially occur;*
- *implement any action needed;*
  - *review the effectiveness of any corrective action taken;*
- *make changes to the environmental management system, if necessary.*

Corrective actions are appropriate to the significance of the effects of the nonconformities encountered, including the environmental impacts. The organization retains documented information as evidence of the nature of the nonconformities and any subsequent actions taken and the results of any corrective action.

10.3 Continual Improvement

The organization continually improves the suitability, adequacy and effectiveness of the environmental management system to enhance environmental performance.

CONCLUSION

We are all becoming increasingly aware of the costs of environmental damage: contaminated ground water, polluted air, doubts and uncertainties about a sustainable future, and the expense of remediation.

ISO 14000, by requiring organizations to plan, implement and maintain an EMS, can be used to prevent and minimize environmental impacts through a commonsense approach, allowing companies to take charge of their environmental affairs while improving regulatory compliance.

There are monetary benefits as well. Through the continual improvement process, an organization can save money by preventing pollution, avoiding cleanup and liability costs, using energy more efficiently and reducing waste.

ISO 14001 registration, besides easing regulatory compliance, can improve a company's competitiveness, as a growing number of major firms have set supplier registration mandates. Registration can also aid companies seeking to enter the EU and Japanese markets.

There are many benefits to be derived from implementing a well-structured ISO 14001 EMS, and the registration process is rigorous and timely. For this reason, not to mention the high rate of failure that afflicts organizations seeking registration for the first time, it is a good idea to seek the services of an outside professional consulting firm.

A competent environmental consultant can walk your organization through the ISO 14001 requirements, interpret and implement the standard to your specific situation, and identify problems that may halt the implementation and registration process.

PART II – RESPONSIBLE RECYCLING (R2v3)

The Responsible Recycling (R2V3) Standard for Electronics Recyclers

CONTENTS

Introduction

The responsible recycling ("R2v3") standard is applicable to organizations engaged in electronic recycling and related activities. R2v3 defines practices supported by accredited certification programs that assess the effectiveness of electronics recyclers' environmental, health and safety, and security practices.

The standard considers the needs of various interested parties. Customers benefit from confidence that due diligence is practiced when processing and handling used and end-of life electronic equipment. Participating recyclers and refurbishers benefit through adherence to value-added practices. Employees benefit through enhanced safety. Local and global communities benefit by knowing that used and end-of-life electronics are processed in a manner consistent with environmental responsibility and stewardship.

R2v3 requirements are conformance requirements and are not intended to replace legal or other requirements to which participating organizations subscribe. Adherence to this set of R2 practices are determined and implemented on a voluntary basis. Where conflicts exist, legal requirements take precedence over R2 or other requirements in all cases.

Electronics possess unique properties that differ from other Waste Streams. Most electronics dispositioned for recycling are not classified as hazardous waste. Electronics are complex devices that consist of a wide variety of materials, many of which would not be classified as hazardous under EPA testing procedures.

Electronics contain hundreds of elements, compounds, and alloys including steel, plastic, glass, ceramics, copper, aluminum, lead, nickel, zinc, lithium, carbon, cadmium, mercury, beryllium, gold, silver, palladium, flame retardants, etc. Many of these materials possess residual value and may pose risks if improperly disposed of or recycled.

Challenges related to the disposal of electronics have given rise to numerous environmental concerns over the past many years including concerns about toxics from electronics leaching from landfills and improper disposal methods such as open burning utilized in some developing countries. Electronics that end up in landfills or incinerators represent lost resources.

Fact: In a gold mine, one ton of ore contains only five to 10 grams of gold. One ton of cell phones (about 10,000 cell phones) contain 300 to 400 grams of gold.

Focus Materials (FMs)

Some of the primary materials contained in electronic products represent hazards to the environment or possess latent value that makes them prime candidates for reuse and/or recycling. These materials are referred to as Focus Materials (FMs) and are given special importance regarding disposal.

Focus Materials include equipment and components containing:

- Cathode ray tubes and glass
- Circuit boards
- Batteries
- Items containing mercury/PCBs

The History of R2

The EPA Recognized the need for a certification program that addressed the operational and environmental needs of the electronics recycling industry and utilized a multi-disciplinary process to develop the R2 Standard, *"Responsible Recycling practices"*.

A multi-stakeholder electronics summit was convened in March 2005. The objective was to create a voluntary, market-based mechanism for ensuring best practices, which also provides prospective customers with an enhanced sense of confidence by knowing that their used electronics are processed in a safe, secure manner that is consistent with applicable environmental requirements.

The R2 standard was developed through these collaborative efforts. It took 3 years to develop the R2 standard. The R2 Standard was released on October 30, 2008, and revised in 2013.

Participants in the multi-stakeholder group included representatives from: The U.S. EPA, Regulators from state agencies, Electronics recyclers, refurbishers, and their trade association, OEMs and customers of electronics recycling services. Non-Governmental Organizations.

Representatives from environmental justice organizations participated throughout much of the R2 development process but withdrew participation prior to inception of the standard.

The Responsible Recycling (R2) Standard was developed as an output of this meeting. The R2 standard was issued as an authorized document after it was reviewed and approved by ANAB.

Development of the R2 standard included the following steps:

- R2 was drafted by an EPA funded neutral facilitator in a consensus-driven process.
- Each version was discussed by the quorum and revised by the facilitator.
- All versions were reviewed by 4 experienced auditors.
- Each version was field tested at 6 recyclers (including a range of sizes and processes).
- EPA's role in helping to get documentation from foreign countries was tested (China, Hong Kong, India).

The R2 Technical Advisory Committee (TAC) develops and recommends changes to the R2 Standard. The TAC is comprised of representatives from the stakeholder group.

The electronics industry is ever changing and to keep pace, it is recognized that best practices and standards need to evolve as well. R2v3 incorporates is the culmination of experience gained from more than a decade of auditing and implementing the R2 Standard and reflects changes in the electronics landscape, customer demands, and the regulatory environment. In fact, many of the changes in v3 are a result of feedback submitted by customers, members of the industry, and the public. The result is an R2 Standard that's more powerful, easier to implement, and works even harder to protect data, people and the planet, while enriching lives all around the globe.

About SERI

SERI is the current non-profit organization established to administer and promote the R2 Standard. It consists of an independent Board of Directors and staff. In addition, the R2 Technical Advisory Committee is a voluntary group of concerned stakeholders appointed by the SERI Board and charged with the responsibility for maintaining the integrity and effectiveness of the R2 Standard and related guidance. SERI is the authoritative administrator and owner of the R2:2013 Standard.

Essential R2 Concepts

- Prioritizing Reuse and Recycling is required.
- Focus materials can be disposed of only under exceptional circumstances.
- Provides for on-site workers and environmental protection.
- Requires downstream due diligence when handling and processing Focus Materials.
- Requires written programs based on a "Plan-Do-Check-Act" model for continual improvement.
- Requires knowledge of and compliance with applicable legal requirements.
- Complementary to ISO 14001 and ISO 45001 requirements.
- Requires certification to ISO 14001 and ISO 45001 standards. To further ensure the integrity and strength of the Standard, R2 also requires facilities to obtain certification to one or more generally accepted environmental health and safety management systems. Certain activities, like the test and/or repair of used electronics for reuse, require an additional quality management system certification.
- Ensures facility security and the security of data during storage and disposal of hard drives and other equipment.
- Recyclers and refurbishers are required to track throughput and maintain records.
- Requires a written policy based on a hierarchy of Reuse-Recover-Dispose.

R2 Certification provides additional value by demonstrating that your organization:

- Cares about the environment.
- Both implemented and maintain an effective environmental health and safety management system.
- Assumes accountability for electronic products, components, and materials.
- Places a strong emphasis on controls necessary to ensure data security.
- Adheres to the highest industry standards and best practices.
- Is committed to safety.

Electronics Use and Recycling Facts

- Americans purchase over 500 million new consumer electronic products annually.
- Over 15 separate electronic products can be found in the average American household.
- In 2010, the Federal Government spent approximately 75 billion on IT goods and services.
- Approximately 3-5 million tons of electronics are processed by the electronics recycling industry annually.
- Electronic recycling volumes have more than doubled in past 5 years. This rate of growth is expected to expand in the future.
- Consumer electronics comprise less than 5% of the electronics waste stream.
- Developing countries are on the fast track to generate more than double the developed world's used and end-of-life computers.

Integration & Comparison with ISO 9001 and ISO 14001and ISO 45001 Requirements

There are many situations where R2 requirements do not specifically align with requirements of ISO 9001, 14001, and 45001. Additional requirements that are distributed throughout the standard serve to meet corresponding requirements of ISO 9001, 14001 and 45001, but are not clearly aligned with the requirements of the other standards. These requirements include but are not limited to requirements for:

- An R2 manual
- Objectives and Targets
- Internal Audits
- Maintenance and Calibration
- Nonconformance and Corrective Action
- Training
- Document and Record Control

R2 Manual

There is no specific requirement for an R2 manual, however, an R2 Facility is required to develop in writing and adhere to a policy stating how it manages used and end-of- life electronic equipment, components, and materials There is a requirement to document a written EHSMS that includes additional requirements for a policy in addition to written goals and procedures. The scope of the management system also needs to be identified within the documented EHSMS. Many organizations choose to have an R2 manual to provide structure. Additionally, an R2 Facility must develop and maintain a documented process to evaluate, sort, and categorize electronic equipment, components, and materials controlled and processed.

Objectives and Targets

There are no R2 Practices that address requirements for establishing and/or monitoring goals, objectives and targets. R2 does require participating organizations to establish objectives and targets for tracking performance and planning activities that work toward achieving identified goals. Additional requirements address the creation and implementation of an action plan for continual improvement.

Internal Audit

There is no R2 Practice for internal auditing. There are requirements for a recycler to use an EHSMS to plan and monitor its processes and activities to conform to R2 Practices. Additional requirements mandate that a recycler confirm "through audits or other similarly effective means" that downstream vendors comply with FM controls. There are also requirements for tracking throughput. The R2 checklist used by recyclers also meets requirements for "internal auditing".

Maintenance/Calibration

There is no R2 Practice that addresses equipment maintenance or calibration of test equipment but there are implied requirements throughout the standard.

Nonconformance/Corrective Action

There is no R2 Practice specifying requirements for nonconformances and corrective action. The PDCA structure of the standard tends to be complimentary to the use of corrective action. Other requirements implied within the standard can easily be accommodated using a formal nonconformance and corrective and preventive action process.

Training

Training requirements are not called out in explicit terms within the standard, but training issues are addressed. There are requirements that recyclers possess expertise and technical capability to process each type of equipment, component and material to protect employees, public, and the environment. The standard also requires regular, documented health and safety training as well as refresher training.

Additional training requirements apply to volunteer and temporary workers. There are also requirements for the assignment of an individual (consultant or employee) to coordinate and promote worker health and safety and requirements for employees involved in data destruction to be trained on a regular basis.

Document/Records Control

There is no R2 practice for the control of internal/external documents, obsolete documents, records retention times, etc. These requirements, however, are clearly implied. There are requirements for record maintenance included within the standard.

The EHSMS must be documented implying some level of document control be implemented. There are additional requirements for written procedures, a list of the documentation and multiple other references to requirements for documents requiring at least minimal control interspersed throughout the standard.

R2 Certification

This first step in the certification process is to fill out a license application with SERI. This is a short process that asks for some basic information about your company/facility and designates a point of contact who SERI will communicate with during the certification process.

After the license has been obtained, choose a SERI authorized certification body (CB). The CB will provide the 3rd party Stage 1 and Stage 2 audits and issue a certificate once a determination has been made that your system meets R2v3 requirements. You will need to contract with the CB.

The next step is evaluation and training. You may want to hire a consultant to aid your preparation. An experienced consultant can help make the preparation and training much smoother and quicker. A thorough evaluation of our facility and its operations will be needed. A gap analysis may help. An internal audit will need to be completed. SERI provides webinars, an implementation guide, and checklist that may help. Some of the CBs also offer webinars and other aids.

When you have determined that your system is complete you are ready for the Stage 1 and Stage 2 Registration Audits. Stage I is mostly a document review. It is used to determine that you have a system in place and that it appears you are ready for the Stage 2 Audit. An Audit Report is provided identifying any deficiencies.

After all deficiencies found during Stage I are corrected, you are ready for the Stage 2 Audit. Stage 2 is also known as the Implementation Audit. The auditor will make an extensive tour of the facility, extensively interview personnel, particularly key personnel, evaluate the implementation of your procedures, and confirm the appropriateness of your scope statement. An Audit Report is provided that includes identification of any nonconformities found.

Once all the nonconformities have been resolved you will receive your certificate.

R2 Certification Requirements Stage 1 Requirements:

- Documents needed to address R2 requirements
- Client understanding and awareness of requirements and of the of the organization's significant environmental/safety/quality risks
- Site-specific conditions/profiles
- The scope of the ESHMS is defined
- Compliance evaluations need to be completed, and findings addressed
- Evaluate internal audit planning and performance processes and annual (management) reviews

Stage 2 Requirements:

- Conformity to requirements – Implementation
- Performance monitoring against key performance indicators (KPIs)
- Evidence of ongoing legal compliance
- Provision of operational controls
- Internal audits and annual reviews are carried out as required
- Determining responsibility and authority for policies

Certification Steps:

In addition to Stage 1 and 2 requirements, the following steps need to be followed:

- Contract with an accredited certification body
- Address any nonconformities determined during the Stage 1 and 2 audits
- Certification granted

Going Forward:

Going forward, you will enter a repeat cycle of recertification audits every three years with annual surveillance audits between. A new certificate is issued at the successful completion of each recertification audit.

Security Benefits

Data breach from discarded computers are ranked as the number one concern when disposing of IT equipment. Establishing environmental practices, ensuring proper e-waste disposal, and finding asset disposition support for remarketing or reusing equipment are also high priorities. The R2v3 Standard put added emphasis and addresses all these areas of concern. Certified R2v3 recyclers are subject to independent, third-party audits to assess the effectiveness of the management system and conformance to related requirements.

Additional Rules and Requirements

International and Governing Rules

The Organization for Economic Cooperation and Development (OECD Countries) has developed additional controls for hazardous waste recovery. Only CRTs have been exported as hazardous waste under OECD controls.

Basel Convention

Basel established a control system for importing and exporting hazardous wastes to prevent unauthorized processing or dumping in developing countries. Hazardous waste cannot be moved or transported to non-OECD countries without a bilateral agreement. The U.S. is not a Party to the Basel Convention but is in favor of ratification.

Hazardous Waste Definitions

Basel Waste definitions vary between different countries. The Basel definition of “hazardous waste” is not the same as the U.S. Definition. The U.S. conditionally exempts hazardous waste from regulation or excludes certain materials from being defined as waste to encourage recycling Basel treats material dispositioned for recycling and disposal in the same manner.

Basel convention requirements state that transboundary shipments should be reduced. The waste should be treated where it is generated.

BAN and the BAN Amendments to the Basel Convention

The BAN (Basel Action Network) is an independent charitable organization with NO direct relationship with the Basel Convention. BAN charges licensing fees for e-stewards certification as well as a general cost for certification.

Many states have adopted electronic take-back laws. For a list of participating states, see **www.electronicsrecycling.org.**

Universal Waste Rule

The Universal Waste Rule applies to mercury-containing devices considered to be hazardous waste. Additional requirements have been streamlined to accommodate materials designated for recycling or disposal.

CRT Rule

The CRT Rule and related requirements have been established to address Cathode Ray Tube (CRT) processing. CRTs and CRT glass are not considered solid or hazardous waste when reused or recycled if certain conditions are met (i.e., mercury and batteries have been removed) (see 40 CFR, Subpart E, 261.39).

Whole used and shredded circuit boards are exempted from regulation if they meet certain requirements.

R2V3 OVERVIEW

"R2 Facility" includes, but is not limited to, entities that perform the following activities related to electronics:

- Collect
- Refurbish
- Repair
- Reselling
- De-manufacture
- Recover Assets
- Broker
- Recycle

The standard identifies both Core Requirements and several Process Specific requirements based on the scope of activities undertaken at the facility. An R2 facility must provide evidence that all the R2 Core Requirements and any R2 Process Requirements applicable to the scope of activities undertaken are available.

Core Requirements

1. Scope

General Principle – To identify and certify all processes; equipment, component and material streams managed; and activities related to the collection, refurbishing, repair, resale, de-manufacturing, asset recovery, brokering and recycling of used electronic equipment, components, and materials.

- Clear identification of all used electronic equipment, components, and materials managed.
- Clear identification of all processes and activities undertaken at the facility, as well as any external processes, activities and locations under the control of the R2 Facility and associated with its certification, including all R2 Core Requirements and R2 Process Requirements applicable to its scope of operations.
- Clear identification of all legal entities associated with the certifiable activities operating at or in conjunction with the R2 Facility.
- Clear identification of any additional locations owned and/or operated by the R2 Facility that are not R2 Certified and are used to manage used or end-of-life electronic equipment, components, or materials.

An R2 Facility shall not have been included by SERI, within the previous 24 months of any certification audit, in a list of organizations maintained by SERI on its website that have been found to have engaged in deceptive marketing, illegal acts or other fraudulent activities which could reasonably lead to a false impression that the R2 Facility was certified to the R2 Standard during that period.

2. Hierarchy of Responsible Management Strategies

General Principle – To develop and adhere to a policy for managing used and end-of-life electronic equipment, components, and materials that is based on a hierarchy of responsible management strategies prioritizing reuse first, followed by materials recovery for recycling into new products.

- Development, documentation and adherence to a policy stating how it manages used and end-of- life electronic equipment, components, and materials – with respect to off-site and on-site activities, as well as the selection of downstream vendors – that is based on a hierarchy of responsible management strategies.
- Requirement for evaluation and sorting of equipment, components, and materials in accordance with the policy and Core Requirement 6, and take all practical steps to direct items for processing utilizing a Reuse/Materials Recovery/Disposal (Focus Materials/Non Focus Materials) hierarchy.

3. EH&S Management System

General Principle – To maintain a certified Environmental, Health, and Safety Management System (EHSMS) to plan, implement, and monitor environmental, health, and safety practices, including the activities to conform to each requirement of the R2 Standard.

- Requirement for certification by an accredited Certification Body, to one or more of the approved EHSMS standards2, to plan and manage the environmental, health, and safety aspects of its operations.
- Requirement for full integration of the requirements of this R2 Standard into the EHSMS, including maintaining all documents and records necessary to demonstrate conformance with each of the R2 Requirements, and review the system at least annually through internal audits.
- Requirement to ensure that all documents and records required to demonstrate conformance with this R2 Standard are readily available at the certified facility and maintained for a minimum of three years.

General Principle – To use practices and controls designed to protect the health and safety of workers, the public, and the environment under both normal and (reasonably foreseeable) exceptional circumstances.

- Requirement for demonstratable expertise, knowledge, and technical capability to process each type of electronic equipment, component, and material it accepts in a manner that takes into account legal compliance as well as the need to protect the health and safety of workers, the public, and the environment, and
- Requirement for identification, analyzation, and demonstration of effective control of important environmental impacts, and health and safety risks that it can control and those that it can influence, both internal to the R2 Facility and through its recycling chain activities, and
- Requirement to maintain a process to periodically evaluate the risk of exposure to hazardous substances contained in electronic waste through processing or handling of electronic equipment, and visual inspection of electronic components and materials received for any damage that may result in adverse environmental, health or safety incidents and controls for the containment, segregation, and storage of items requiring special handling, and
- Requirement for designation of a qualified employee(s) or contract worker(s) to coordinate its efforts to promote worker health and safety, and environmental protection.

4. Legal and Other Requirements

General Principle – To comply with all applicable environmental, health, safety, and data security legal requirements, and only import and export electronic equipment, components, and materials in full compliance with all applicable importing, transit, and exporting countries' laws

- Requirement for the creation and implementation of a plan to maintain compliance with environmental, health, and safety legal requirements including those related to export of equipment and components containing Focus Materials. The plan should also include facility compliance related to environmental, health and safety and data security legal requirements. The plan should be up to date and periodically audited with corrective action taken if found to be out of compliance.

Additionally, import/export compliance identification and maintenance of records for all international shipments of equipment containing Focus Materials in any condition. (OEC.org is a good reference guide for this).

- Requirement for Monitoring Compliance inclusive of identification and implementation of the actions and controls required to ensure compliance with all requirements, and maintain the legal compliance plan, consistent with changes in the requirements and the FM Management Plan. Periodic audit of compliance should be completed by a competent auditor knowledgeable in the operations and applicable requirements. Corrective action should be taken promptly to stop and resolve any issues of non-compliance.
- Requirement for notification to the Certification Body within 30 days of receiving any regulatory order or notice of violation that requires any action to address the violation and follow up with the issuing agency.
- Requirement for the prohibition of:

  a. Child and Forced Labor: An R2 Facility shall not use child labor, as defined by the International Labor Organization (ILO) or forced labor, where the worker cannot leave or terminate employment freely.

  b. Prison Labor: The use of prisoners is only acceptable if it is voluntary, compensated beyond room and board, and skills are taught for gainful employment after release.

  And documentation of:

  c. Non-Discrimination Policy: An R2 Facility shall document a non-discrimination policy stating the fair and equal treatment of all workers, regardless of aspects such as, but not limited to, age, gender, race, religion, or sexual orientation, including compensation in compliance with applicable wage laws. The policy shall define the process to report, investigate, and respond to discrimination complaints, and shall be periodically communicated to all staff.

5. Tracking Throughput

General Principle – To track and manage the throughput of all electronic equipment, components, and materials, and maintain sufficient records to document the flow of all electronic equipment, components, and materials.

- Requirement for properly documented records (i.e., bills of lading) for all inbound electronic equipment, components, and materials controlled by the R2 Facility through physical possession, title, or other contractual agreement to be maintained and include a summary report of all transactions.
- Requirement for all electronic equipment, components, and materials controlled by the R2 Facility, inclusive of both inbound and outbound materials, to be tracked and managed from receipt through processing, storage and shipment and maintain accurate records of the quantity of R2 Controlled Streams in the R2 Facility's control.

- Requirement to ensure total inventory levels are below the defined limits in conformance with the R2 Facility's legal requirements, closure plan, and financial assurance.
- Requirement to ensure. R2 Controlled Streams, or materials with a negative value, are not stored for longer than one year, with some identified exceptions.

6. Sorting, Categorization, and Processing

General Principle - To evaluate, sort, and categorize all equipment, components, and materials in accordance with the R2 Equipment Categorization reference document to ensure the applicable R2 requirements are followed throughout processing and outbound through the downstream recycling chain. Equipment and components may change categorization through stages of processing.

- Requirement for an R2 facility to **develop and maintain a documented process to evaluate, sort, and categorize** electronic equipment, components, and materials controlled and processed. This process must include:
  - Identification of conformance with the hierarchy in Core Requirement 2; and
  - Include the applicable categories from the R2 Equipment Categorization (REC) or maintain a documented correlation of existing categories in use to those defined in the REC, to demonstrate the levels of functionality, data sanitization status and physical condition of the items; and
  - Identify all data storage devices; and
  - Define the instructions and criteria to determine if the equipment and components are capable of reuse based on physical condition, functionality, and value in the destination market; and
  - Include steps to re-evaluate R2 Controlled Streams when processing changes the category of the stream.
- Requirement **to Categorize** all equipment, components, and materials controlled by the R2 Facility to be identified with its corresponding R2 equipment categories from the REC (R2 Equipment Categorization (REC) reference document that is to be used in conjunction with the R2v3 Standard to identify the functional, cosmetic, and data sanitization status of electronic equipment, components and materials), or equivalent correlated internal categories.
- Requirement for all equipment, components, and materials shall be managed as an R2 Controlled Stream that requires further **processing** in accordance with the R2 requirements, with some defined exceptions.
- Requirement for **Evaluation** of all equipment and components in accordance with the R2 facilities defined process to determine the possibility of reuse and direct evaluated equipment, components, and materials to the appropriate next process.
- Requirement for the **evaluation of all equipment and components for data**, and identified with the corresponding data sanitization status from the REC, that product must be secured and controlled to prevent unintended access or theft of data, until processed in accordance with Core Requirement 7 for data security.

- Requirement prohibiting the reuse, sale, or donation of equipment or components prohibited by written and binding commercial agreements with those from whom the equipment or components were received, and that equipment must still be processed utilizing the Core Requirement 7 for data security and Appendix E – Materials Recovery.
- Requirement for equipment or components that are evaluated and fit for reuse:
  a) Identified with unique identifier for each piece of whole equipment, or grouped in batches and assigned a unique batch identifier for non-serialized equipment or components, and
  b) Tested, refurbished and/or repaired internally according to Appendix C – Test and Repair, or
  c) Transferred to a downstream vendor qualified in accordance with Appendix A – Downstream Recycling Chain, for testing, repair, and refurbishing, or
  d) Processed in accordance with Appendix D – Specialty Electronics Reuse.
- Requirement for equipment and components where determination is made it is not capable of reuse and other materials for recovery to be:
  e) Processed by the R2 Facility in accordance with Appendix E – Materials Recovery, or
  f) Transferred to a downstream vendor qualified in accordance with Appendix A – Downstream Recycling Chain.
- Requirement for any equipment or components evaluated and determined to be an Unrestricted Stream as defined in the REC, must be:
  g) Clearly identified and managed separately from R2 Controlled Streams, and
  h) Have demonstrated justification for the unrestricted classification, and
  i) Have adequate records maintained tracking the type of stream, any reason for return, and evidence of all transfers.
- Requirements for transferring functioning products4, an R2 Facility shall:
  j) Must be Identified to the appropriate REC, or equivalent correlated internal categories, for Functioning Product, Data Sanitization Status, and either the Cosmetic Condition or provide other detailed description of the cosmetic condition5 of the equipment or components to the buyer, and
  k) Must reference the unique identifier(s) in commercial sales and shipping records, and
  l) Prior to any international shipment, verify import/export compliance of each shipment in accordance with its legal compliance plan in Core Requirement 46 that affirms the international shipment is legal, and
  m) Package and protect equipment and components in such a way as to prevent damage during shipment in accordance with Core Requirement 10, and
  n) Make the product return policy available to potential buyers prior to sale in accordance with Appendix C – Test and Repair.

- Requirement regarding Collectible and Specialty Electronics indicating it may be transferred: in accordance with Section €(2) of Core Requirement 6, without testing restricted to sales not in excess of 1% sold on a rolling 12-month average, and equipment may be returned by the buyer if not wanted under a documented warranty/return policy at no charge to the buyer, or
- In accordance with Appendix D – Specialty Electronics Reuse as applicable to Verified Specialty Electronic.

7. Data Security

General Principle – To provide for the security and sanitization of all data storage devices as appropriate to the type of device and level of sensitivity of the data.

Documentation:

- Requirement for an R2 Facility to document and maintain a Data Sanitization Plan and procedures, including defining the following:
  - Security controls to protect data in the R2 Facility's control, including declarations of secured areas dedicated to data sanitization with access limited to authorized individuals, and
  - Identification of types of data storage devices accepted, and types of data to be sanitized, and
  - Declaration of general information that does not need to be sanitized, and
  - Identification of potential associations to network services that could automatically repopulate data on the device, and
  - Written contractual requirements not to sanitize data on user's data storage devices when requested, and
  - Applicable legal, supplier, and other requirements for data sanitization including applicable data breach and privacy regulations, and
- Where legal, supplier, and other requirements are addressed in written policies and procedures to ensure conformance, and
  - Methods for data sanitization for each type of data storage device;
  - Durations to sanitize data from the time of receipt;
  - Downstream vendors that perform data sanitization in accordance with this plan, if data sanitization is not performed internally, and, where applicable, those downstream vendors whose services will be provided in another country;
  - Records to be maintained to demonstrate the effectiveness of the sanitization and verification activities;
  - Process for control of those having permitted access to equipment and components containing data.

- An R2 Facility must document and maintain a written data security policy that:
  - Prohibits unauthorized individuals from accessing or handling equipment containing data;
  - Assigns a competent Data Protection Representative with the overall responsibility and authority for the R2 Facility's data security and legal compliance, including oversight of all related duties otherwise assigned;
  - Requires reporting of known and suspected breaches of security and data to the Data Protection Representative;
  - Requires completed training and confidentiality agreements prior to individual authorization to handle equipment containing data; and
  - Identifies penalties for noncompliance with the policy, including personal liability.
- Requirement for all workers to be trained regularly and verified to be competent on these policies and procedures for data security, consistent with their level of authorization.

General Principle – To employ security measures appropriate for the electronic equipment it handles and the suppliers it serves.

Security

- Requirement for the implementation and maintenance of a security program that controls access to all or parts of the facility in a manner and to a degree appropriate given the type of electronic equipment handled, sensitivity of data on storage devices, and the needs of the suppliers served. This security program should consider risk of theft and unauthorized access to the facility and equipment.
- Requirement to develop and implement levels of security authorizations to control access for employees, visitors, and contract workers based on the types of equipment received, the sensitivity of the data handled, and the legal, supplier and other requirements applicable to the facility. Authorizations shall be granted by the Data Protection Representative and based on documented evaluations allowed by law.
- Secured areas shall be clearly identified and labeled with signage to warn against unauthorized access.
- Appropriate security controls must be implemented and monitored to limit access to equipment based on established security authorizations and the workers' need for access.
- Records must be maintained indicating acknowledgement of the responsibility of authorized workers to prevent disclosure of data, and report any theft responsibility to prevent disclosure of data; and to report any theft of equipment or data, or data breaches; and to disclose any incidents that may change their security authorization.
- An incident response procedure must be created and implemented to investigate potential data or security breaches, and to notify affected suppliers, legal authorities and other interested parties as required by law, of any potential or actual breaches.

Process

- For the receiving of any equipment or components that may contain data, the R2 Facility must provide to the supplier confirmation of:
  - Receipt of equipment or components containing data,
  - The method7 of data sanitization to be used,
  - Identification data sanitization performed internally or by a downstream vendor.
- Equipment and components containing data shall be sanitized in a timely and effective manner, in accordance with one of the following methods, as disclosed to the supplier:
  - Sanitize the data on the data storage devices in accordance with Appendix B – Data Sanitization, or
  - Physically destroy the data storage media in accordance with an applicable method defined in Appendix A of the NIST Guidelines for Media Sanitization: Special Publication 800-88 (rev.1), and verify destruction in accordance with a defined process to demonstrate 100% effectiveness of the destruction process, or
  - Ship/transfer data storage devices under written contract to a downstream vendor that has been verified in accordance with Appendix A – Downstream Recycling Chain, with the capabilities to sanitize data from the type of equipment shipped in accordance with the planned method disclosed to the supplier.
  - Internal data security and sanitization audits must be performed at minimum annually by a competent and independent auditor to validate the data sanitization processes are effective and conforming to the R2 Standard, legal requirements, and the data sanitization plan.

Notifications

- An R2 Facility must maintain a process to provide information to suppliers where requested of the following:
  - Changes in downstream vendors to process supplier's equipment and components containing data, and
  - Breaches in security.

8. Focus Materials

General Principle – To manage, both on-site and in the selection of downstream vendors, the Focus Materials that pass through its facility or control in a manner protective of the health and safety of workers, the public, and the environment.

Development and Adherence to an FM Management Plan

- Requirement for an FM Management Plan included in its EHSMS which documents how the R2 Facility and its downstream vendors conforms to the applicable requirements of the R2 standard. Standard including:

- Demonstrated expertise and capabilities required to process each type of electronic equipment containing an FM, and
- Planned methods and demonstrated capacity needed to process each type of electronic equipment containing an FM, and
- When not the final point of processing, a flowchart of the downstream recycling chain selected according to Appendix A – Downstream Recycling Chain, including identification of international movements, to either final disposition or the first downstream R2 Certified facility.

The FM Management Plan must be regularly reviewed and updated as necessary.

Non-Focus Materials Requiring Specific Management

- Requirement for an R2 Facility to manage print cartridges in accordance with Core Requirement 2 through print cartridge remanufacturers, recyclers, or Original Equipment Manufacturers (OEM), in facilities that meet all applicable regulatory requirements to receive these print cartridges, and that use technology designed to safely and effectively manage ink and toner print cartridges.
- Requirement for an R2 Facility to manage all equipment, components, and materials that pass through its facility or control that do not contain Focus Materials or are not electronic equipment, in accordance with Core Requirement 2, and otherwise integrated into the EHSMS, to ensure handling that is in full legal compliance, protective of the environment, and protective of worker and public health and safety.

9. Facility Requirements

General Principle – To process and store electronic equipment, components, and materials in a manner that is legally compliant and protects the health and safety of workers, the public and the environment.

- Requirement for the facility to conduct **all processing operations indoors** unless the risks of the outdoor operations have been assessed and controls established to prevent uncontrolled releases to the environment.
- Requirement for the facility to store all R2 Controlled Streams, in a manner that, protects them from adverse weather conditions, is in accordance with the legal compliance plan, provides security from unauthorized access, and maintains materials in clearly labeled containers and/or storage areas.
- Requirement for the facility to store all equipment destined for reuse in an enclosed environment protected from the elements, unless intended for outdoor use.

General Principle – To possess insurance that is appropriate to cover the potential risks and liabilities associated with the nature and size of the operations.

- Requirement for demonstration that the R2 Facility has evaluated the risks related to the scope of its operations, including any changes in operations and volume of material processed, and that it has used the evaluation to obtain insurance or reserves that it can demonstrate is appropriate to cover liabilities arising from all activities and locations in which it operates. Insurance or reserves must include:
  - Coverage for treatment of work-related injury and illnesses of workers, and
  - Any process insurance requirements specified elsewhere in this R2 Standard.

General Principle – To have legal and financial assurances in place for the proper closure of its facility.

- Requirement for the development, and maintenance of a current written plan to provide for the closure of the facility in the event of abandonment. The plan must:
  - Include the use of appropriate commercial businesses to manage any electronic equipment, components, and materials under the R2 Facility's control, and
  - Consider the risks identified, including equipment and materials that could be received under the R2 Facility's certification scope, and applicable law, and
  - Include reasonably foreseeable costs in the financial instrument for processing remaining inventory, sampling for environmental contamination, and possible site remediation to restore the premises to sellable condition, and
  - Establish a financial instrument to provide the necessary funds for closure, including in the event of abandonment, consistent with applicable law and the closure plan, and
  - Include any process or other closure requirements specified elsewhere in this R2 Standard.
- Exceptions to the requirement for need for the Financial instruments to assure closure in the event of abandonment are made if the total cost to properly cost the facility is less than is less than $10,000 United States Dollars or the size of all buildings owned, leased, or used by the R2 Facility is less than 1,000 square meters. Additionally, if the facility prohibits and never accepts equipment or materials containing mercury, CRT glass, lithium primary batteries, or polychlorinated bi-phenyls.

10. ***Transport***

General Principle – To transport all electronic equipment, components, and materials using entities that meet the applicable legal requirements for the transportation, and in a manner protective of physical and data security, health, safety, and the environment.

An R2 Facility must ensure that: all electronic equipment, components, and materials to be **transported** are **packed appropriately**. **Risk must be considered** during transport related to **security, health, safety and the environment.** Electronic equipment, components and materials must consider the level of care required based on intended use, and in accordance with Core Requirement 7, and to comply with any **legal requirements** identified under Core Requirement 4.

- When electronic equipment or components **containing data** are transported:
  - Defined security measures are implemented as planned and transportation is tracked as appropriate for the sensitivity of the data on the devices and the requirements of the suppliers served, and
  - Contracts are enforced with the transporter with a level of service that conforms to these requirements, and
  - Additional security controls are used to conceal the package contents from public view and prevent unintended access during transportation.
  - All shipping documentation, labeling, and import/export declarations use accurate codes, descriptions, and required declarations consistent with regulatory requirements for the equipment, components, and materials being transported.
  - Transporters meet the legal requirements under Core Requirement 4 to transport the electronic equipment, components, and materials.

PROCESS REQUIREMENTS

Appendix A – Downstream Recycling Chain

General Principle – To manage the downstream recycling chain for all R2 Controlled Streams to ensure that all downstream vendors operate in conformance with the R2 Standard.

- **This Appendix gives the option for facilities to track entire downstream chain, OR register their portion of the chain with SERI and stop tracking at the first downstream R2 Certified facility**.
- Numerous requirements related to controlling the path of the recycling chain to ensure An R2 Facility shall manage the movement of R2 Controlled Streams through their downstream recycling chain, to final disposition or the first R2 Facility, using the REC, and confirm conformance by each downstream vendor to this Appendix A.
- If the equipment, components, or materials handled have a negative value, then the R2 Facility must:
  - Maintain pollution liability insurance addressing these risks, and
  - Include this equipment, components, and materials in the closure plan and financial instrument calculations in accordance with Core Requirement 9.
- Additional requirements are identified related to:
  - Transboundary Movements
  - Transparency
- Downstream Vendor Qualification (inclusive of enhanced requirements for verifying non-R2 downstream vendors for data sanitization.
- R2 facilities must confirm with records the receipt of all FMs by the downstream vendor.

Appendix B – Data Sanitization

General Principle – To recognize organizations that maintain enhanced data security controls and perform physical or logical data sanitization in accordance with best practices, where data devices are managed to the highest level of sensitivity as required by the supplier or regulation.

Core Requirements for Data Security (R2v3 Prov. 7) apply to ALL R2 Certified facilities. Appendix B-Data Sanitization provides an enhanced level of security, practices, verification, and tracking.

- Covers all requirements for logical sanitization (erasure) activities, as well as any physical destruction where additional tracking and verification of sanitization is required.
- Additional quality controls to confirm successful sanitization and identify any discrepancies.

Appendix C – Test and Repair

General Principle – To recognize organizations with the competency and tools to test, repair, or refurbish electronic equipment in accordance with best practices, to produce functional equipment, and accurately communicate the level of functionality, cosmetic condition, and data sanitization status.

Only applies to facilities performing test & repair in-house.

- Requirement for companion certification to Quality Management System standard ISO 9001 or RIOS.
- Data must be sanitized in accordance with the requirements of Appendix B Data Sanitization.
- Requires detailed R2 Reuse Plan for test and repair by equipment type; test results recorded for each function tested; and
  - product safety evaluation.
  - 1-year limit to process equipment and components.
  - Technical competency requirements for workers.

Appendix D – Specialty Electronics Reuse

General Principle – To allow for the legitimate reuse of untested specialty electronics which often require sophisticated test equipment and simulations to test functionality and often cannot be tested by specialty electronics refurbisher.

- New requirements for R2 Facilities concentrating on specialty equipment markets such as medical and commercial telecom equipment. **Allows specific verifications where full testing is not possible**.
- This Process Requirement will not eliminate the ability for most R2 facilities to sell Specialty Equipment for Reuse under the 1% rule.

Appendix E – Materials Recovery

General Principle – To maintain processes for the recovery of materials for recycling and the proper management of Focus Materials in the process of recovery.

(In R2:2013, primarily covered by Provisions 4 & 5)

- **This Appendix is mandatory for facilities engaged in processing electronics for materials recovery** (e.g. manual dismantling, mechanical separation, or other engineered methods).
- Requires Environmental Pollution Liability Insurance.
- Additional EH&S hazard identification and controls.
- Enables precious metal refiners, lead smelters, battery recyclers, etc. to be R2 Certified.

Appendix F – Brokering

General Principle – To enable an R2 Facility to source and control the delivery of equipment, components, or materials directly to a downstream vendor, while ensuring that the same R2 requirements apply to all brokered R2 Controlled Streams.

(Replaces Broker Allowance in R2:2013)

- Requirements specific for brokering only (no facility), AND for facilities that perform brokering service.
- Requirement for QMS Certification (ISO 9001 or RIOS) for brokering activities.
- Certified to Process Requirement A - Downstream Recycling Chain.
- Must provide packaging requirements to seller prior to shipment in accordance with CORE 10 transport.

PART III – ISO 45001:2018

International Occupational Health & Safety Management Systems Specification

CONTENTS

FOREWORD

ISO 45001:2018 adopted the high-level outline format (annex SL) first introduced in ISO 9001:2015 Quality Management Systems and ISO 14001:2015 Environmental Management Systems. Using a common format makes it much easier to coordinate efforts to manage multiple systems in the same company. It is anticipated that eventually most if not all related standards will follow the high-level outline.

Benefits of implementation of ISO 45001:2018 include improving global health and safety, enhancing business performance, integrating occupational health and safety (OH&S) into quality and environmental management systems, and improving conditions in countries where OH&S regulations don't exist, are not enforced or have been insufficiently developed. Other possible benefits include the ability for organizations to demonstrate sound OH&S performance in a manner consistent with their OH&S policy and objectives, improved risk management, fewer injuries and illnesses on the job, healthier and more productive employees, and less money spent on insurance.

This guide was created for organizations interested in implementing and registering to ISO 45001:2018. It outlines ISO 45001:2018 requirements and discusses OH&S developments. As ISO 45001:2018 implementation can be a complex and detailed process, especially when integrating it with existing QMS and/or EMS programs, it is strongly suggested that organizations retain the services of a reputable consulting firm like Perry Johnson Consulting, Inc. (PJC).

THE USERS OF THIS GUIDE

This guide will be useful to all companies that either have or want to implement an occupational health and safety management system (OH&S management system). This includes organizations that:

- Want to gain a competitive advantage in the marketplace.
- Are required to meet corporate, legal, or regulatory requirements for occupational health and safety.
- Seek to make occupational health and safety a top priority.
- Want to implement, maintain, and continually improve an occupational health and safety management system.
- Care about employee health and safety on the job.
- Desire to reduce costs of liability, workers compensation insurance, and medical treatment.
- Wish to eliminate or reduce as much as possible the incidences of accidents, fatalities, near-misses, injuries, and other hazards that contribute to ill health in their workplaces.
- Want to increase employee productivity and decrease absenteeism and lost work hours by preventing injuries, accidents, and incidences of ill health.
- Seek to demonstrate conformity to their occupational health and safety management system to themselves and others.
- Desire to monitor conformance with occupational health and safety requirements, and compliance with occupational health and safety laws and regulations.
- Wish to pursue registration to an occupational health and safety management systems standard, now unaccredited, but which may become formally accredited in the near future.
- Make a self-determination and declaration of conformity to ISO 45001:2018.
- Want to establish occupational health and safety as a unique system or integrate it with existing programs, such as quality and/or environmental management systems.

The History of ISO 45001

In highly industrialized countries, occupational health and safety (OH&S) has long been subject to government regulation. Following the development of the ISO 9001 Quality Management Systems (QMS) standards, issued in 1987, and the ISO 14001 Environmental Management Systems (EMS) standards, issued in 1996, a demand arose for development of an international Occupational Health and Safety Management Systems (OH&S) standard. Many organizations have opted to perform "self-reviews" or "self-audits". The effectiveness of these activities is difficult to assess where there is no structured approach to support consistency.

Proponents of an OH&S standard argued that it could allow non-government entities, such as certification bodies and accreditation bodies, to provide oversight into companies and facilities generally in compliance. This, in turn, would thereby free up regulators to focus on recalcitrant and tough cases, reducing their caseloads, and improving global trade by leveling the playing field for regulated businesses. In addition, an OH&S could be integrated with a QMS and EMS for more efficient management, particularly with companies that already combine environmental health and safety (EHS) operations.

In 1994, before the first series of ISO 14000 standards were published, International Organization for Standardization (ISO) Technical Committee (TC) 207, Environmental Management, which was developing these standards, passed a resolution requesting that ISO explore the possibility of developing an OH&S standard.

To help push this proposal along, the British Standards Institution (BSI), which issued BS 5750 as a model for ISO 9001 and BS 7750 as a model for ISO 14001, published BS 8800, *Guide to occupational health and safety management systems*, in 1996. BS 8800 provided guidance and goals for designing and implementing an OH&S but did not offer a process for registration.

During 1996, ISO held international and national workshops on developing an OH&S standard, in which stakeholders from business, industry, government, labor, standards developing organizations and the insurance industry participated. No consensus on developing a standard was achieved at these workshops, with the largest proportion of participants concluding that standards development was premature at that time. Again, in highly industrialized countries, many companies had already developed their own unique OH&S.

Following these workshops, the ISO Technical Management Board (TMB), which oversees the development of standards, rejected the OH&S proposal in 1997, noting the lack of stakeholder support.

The TMB rejection did not stop demand for an OH&S standard, with several national standards bodies and management systems certification bodies from the European Union, North America, and Asia publishing their own standards. These OH&S standards and guidance documents include:

- NSAI SR 320*, Recommendation for an Occupational Health and Safety (OH&S) Management System* – National Standards Authority of Ireland (NSAI).
- AS/NZ 4801, *Occupational health and safety management systems – Specification with guidance for use* – Standards Australia (SAA).
- *Occupational Health and Safety Management System: An AIHA Guidance Document* – American Industrial Hygiene Association (AIHA).
- OHSMS:1997, *Standard for Certification of Occupational Health and Safety Management Systems* – Det Norske Veritas (DNV) of Norway.
- SafetyCert, *Occupational Safety and Health Management Standard* – Bureau Veritas Quality International (BVQI).
- SGS & ISMOL ISA 2000:1997, *Requirements for Safety and Health Management Systems* – SGS Yarsley International Certification Services and International Safety Management Organisation Ltd. (ISMOL) of Great Britain.
- LRQA SMS 8800, *Health & safety management systems assessment criteria* – Lloyds Register Quality Assurance (LRQA).
- NPR 5001:1997, *Guide to an occupational health and safety management system* – Nederlands Normalisatie-instituut (NNI) of the Netherlands.
- BSI PAS 088, *Occupational health and safety management systems* – BSI.
- UNE 81900, *Standards on the prevention of occupational risks* – Asociación Española de Normalización y Certificación (AENOR) of Spain.
- *Management Principles for Enhancing Quality of Products, Occupational Health & Safety and the Environment* – Norges Standardiseringsforbund (NSF) of Norway.

Other organizations involved in developing OH&S standards included the South African Bureau of Standards (SABS), National Quality Assurance (NQA), SFS Certification, Standards and Industry Research Institute of Malaysia (SIRIM), and International Certification Services.

This proliferation of OH&S specifications and standards, each of which was proprietary and unique to a standards body or certification body, created confusion in the marketplace. While each of these specifications or standards enjoyed modest success, they all lacked international credibility, with companies continuing to demand a universal standard like ISO 9001 and ISO 14001. To resolve this confusion, the sponsors of these specifications and standards worked to reach a consensus on an international OH&S standard.

BSI, with input from many of these standards organizations and certification bodies, spent just nine months working on BSI-Occupational Health and Safety Assessment Series (OHSAS) 18001, *Occupational health and safety requirements – Specification*, released in 1999. This specification was based on BS 8800 and several other proprietary OH&S standards and uses the same structure as ISO 14001.

The OHSAS 18000 series of standards was created by the OHSAS Project Group. The OHSAS Project Group was comprised of representatives from various national standards, academic, accreditation, and certification bodies with additional participation from OSH institutions. The UK's national standards body, British Standards Institution (BSI) Group, functioned as the secretariat.

OHSAS 18001 was not produced through the formal ISO standards development process. In 2000, a proposal to convert OHSAS 18001 into an ISO OH&S standard was rejected by the TMB by a 29 to 20 vote, falling short of the two-thirds needed for approval. The TMB can revisit the issue every three years.

BSI released an accompanying publication, OHSAS 18002, *Guidelines for the implementation of OHSAS 18001*, in 2000.

In the meantime, other proposals have surfaced. The American National Standards Institute (ANSI) was drafting a U.S. occupational health and safety standard for internal corporate use. It would integrate an OH&S into overall business management systems and not be used as a registration standard.

The International Labor Organization (ILO) released its own safety and health management system standard, ILO-OSH:2001, *Guidelines on Occupational Safety and Health Management Systems*.

OHSAS 18001 was revised in 2007. Shortly after the revised version of the BS OHSAS standard was released in 2007, the BSI Group elected to adopt OHSAS 18001 as a British standard, hence the name BS OHSAS 18001:2007, *Occupational Health and Safety Management System Requirements*. The standard was revised to support better alignment with ISO 14001:2004 as well as the ILO-OSH:2001 standards. While there are apparent differences between OHSAS 18001 and ILO-OSH:2001, an organization that is certified to the requirements of BS OHSAS 18001:2007 is generally accepted to be in conformance with ILO-OSH:2001 requirements as well. The OHSAS 18002 guidance specification was later revised, similarly adopted by the BSI Group and was published as BS OHSAS 18002:2008.

Eventually ISO agreed to make OH&S an international standard and ISO 45001:2018 is the result. ISO 45001:2018 builds on the efforts shown above while aligning it with other related standards.

ISO 45001:2018 Preview

ISO 45001:2018 sets forth OH&S requirements that enable an organization to control its occupational health and safety risks, identify opportunities, and improve its performance. The standard does not state specific occupational health and safety criteria, nor does it present detailed specifications for designing an OH&S. Companies that have implemented an OH&S based on ISO 45001:2018 have enjoyed reductions in both accidents and workers' compensation costs.

ISO 45001:2018 applies to organizations that want to establish occupational health and safety as a unique system or integrate it with existing management systems. As such, it was developed to be compatible with ISO 9001:2015 and ISO 14001:2015, thereby allowing a company to integrate its quality, environmental, and occupational health and safety management systems. The standard is also complimentary to the requirements of other international labor and safety specifications.

ISO 45001:2018 follows the high-level outline as follows:

- *Context of the Organization*
- *Leadership and Worker Participation*
- *Planning*
- *Support*
- *Operation*
- *Performance Evaluation*
- *Improvement*

Making Occupational Health and Safety a Priority

Every year in the United States, roughly between 4,500 and 6,000 workers are killed on the job. In 2023, over seven million U.S. workers suffered from non-fatal workplace injuries, costing U.S. companies over $176 billion in 2023. That is a pace of one workplace injury occurring every 6 seconds in the United States.

- **5,283 U.S. workers were killed while on the job in 2023 (down from 19,000 in 1928 – the first year for which statistics are maintained)**
- **5,283 workers died from events or exposure in the workplace in 2023**
- **Over 7 million workers suffered non- fatal injuries while at work in 2023**
- **The cost to U.S. companies = $176 billion in 2023**

To put it into proper perspective, in 2010, workplace injury costs to industry had the following impacts on industry costing:

- 24 cents of every dollar of corporate dividends to stockholders.
- 10 cents of every dollar of pre-tax corporate profits.
- More than the combined profits reported by the 5 largest Fortune 500 companies.

Work and Injury Deaths Statistics for 2023

- Total cost - $176 Billion
- Cost per worker - $1,100
- Cost per medically consulted injury - $42,000
- Cost per worker death - $1,150,000
- Days lost due to injury – 70,000,000

(Source: National Safety Council – Injury Facts).

Financial margins can be wiped out through compensation claims resulting from unsafe work practices. An organization's financial survival frequently can depend on a single catastrophic accident or even a series of small accidents.

There are numerous indirect costs related to injuries, such as defending against a lawsuit, training replacement workers, increased insurance premiums, production interruptions and poor morale among employees. According to the National Safety Council, direct compensation costs are between four and 15 times the cost of the injury itself.

These numbers are too high, considering that nearly half of workplace hazards can be avoided. As such, there are sound economic, ethical and regulatory reasons for reducing work-related accidents and illness by implementing an Occupational Health and Safety Management System (OH&S).

In addition to reducing costs, an effective OH&S promotes business efficiency. Productivity becomes stifled when workers are ill or injured. Businesses around the world need to dramatically increase productivity if they are to meet the challenges of market globalization.

What Are Workplace Hazards?

A workplace hazard is anything that can cause injury or illness to employees. A hazard can be as visible as a hammer lying on the floor of a production area, or as invisible as a non-odorous toxic chemical that permeates the air.

Some examples of hazards include:

- Objects lying on the floor.
- The failure of employees to follow work instructions. For example, they may use shortcuts instead of following step-by-step instructions.
- Improperly stored chemicals, which may cause illness if toxic.
- Employees who do not wear personal protection equipment.
- Employees who wear jewelry or other items that can get caught in machinery.
- Employees who are not properly trained for their jobs.
- Employees who are not made aware of changes in job procedures.

- Equipment that is in poor condition.
- Failure to display hazard signs in appropriate areas.
- Missing machine guards, errant or frayed electrical cords, or insufficient lighting.
- Poor ventilation in work areas, especially where chemicals are used.
- Angry employees who may harm others.
- Falling object hazards.

The Purpose of an Occupational Health & Safety Management System

An occupational health and safety management system (OH&S) helps organizations prevent workplace accidents, which can result in illness and injury, while increasing productivity. Increased productivity reduces costs associated with workplace accidents, while increasing the quality of manufactured products and services. An OH&S also enables a company to meet internal, statutory and regulatory requirements.

Implementation of this system will depend on the size, resources and the type of organization, for example, industrial, governmental, commercial or educational.

To achieve top-notch occupational health and safety performance, OH&S follows modern management trends. It makes a commitment to quality and stakeholder needs, fostering collaboration across work teams, empowering employees to take ownership as process and risk managers, and cultivating a value-driven organizational culture.

In summary, an OH&S can:

- Minimize risk, injuries and death to employees and others.
- Improve business performance.
- Assist organizations in establishing a responsible image within the marketplace.
- Help meet legal and regulatory requirements.

ISO 45001 OVERVIEW

Scope of the Standard

ISO 45001:2018 addresses occupational health and safety, not product and services safety. Its requirements are, like those of ISO 9001:2015 and ISO 14001:2015, quite general to give organizations flexibility in implementation. It does not state specific occupational health and safety performance criteria, nor does it give detailed specifications for the design of an OH&S management system.

The standard is designed for any organization that wants to:

a) Establish an occupational health and safety management system (OH&S) to eliminate or minimize risk to employees and other interested persons who may be exposed to occupational health and safety (OH&S) risks associated with its activities.

b) Implement, maintain, and continually improve OH&S.

c) Ensure conformity with its stated OH&S policy.

d) Demonstrate this conformity to others.

e) Seek registration of its OH&S by an external organization.

f) Make a self-determination and declaration of conformity to ISO 45001:2018.

All ISO 45001:2018 requirements are intended to be incorporated into any OH&S. The extent of the application depends on such factors as the organization's OH&S policy, the nature of its activities, and the risks and complexity of its operations.

4 Context of the Organization

4.1 Understanding the organization and its context

Establishes the need of the organization to determine the external and internal issues that are relevant to its purpose and can affect its goals.

4.2 Understanding the needs of workers and other interested parties

The determination of the needs and expectations of the organizations interested parties, including workers. Determining what of the needs and expectations are or are likely to become requirements including legal requirements.

4.3 Determining the scope of the OH&S management system

Determining the boundaries and applicability of the OH&S management system to develop the scope.

4.4 Implementation and Operation

Determining the processes needed for the operation of the OH&S management system and how they interact.

5 Leadership and Worker Participation

5.1 Leadership and Commitment

Top management's full commitment and involvement to provide OH&S leadership is detailed. Key topics include accepting overall responsibility and accountability, insuring integration of the OH&S management system into the company management system and involving workers.

5.2 OH&S Policy

Top management's need to provide and maintain an appropriate OH&S policy.

5.3 Organizational Roles, Responsibilities, and Authorities

Defines the requirements for assigning roles, responsibilities, and authorities including maintaining appropriate documented information of them. Workers at every level of the organization are responsible for how the system behaves in the areas they have control over.

Top management assigns responsibility to ensure the system meets requirements and the reporting of the performance of the system to top management.

5.4 Consultation and Participation of Workers

The necessity of workers at all levels and functions involvement in the development, planning, implementation, performance evaluation, and actions for improvement of OH&S. Safety Rep, employee rep Lous, monthly walk around.

6 Planning

6.1 Actions to Address Risks and Opportunities

Very detailed treatment of why the need for risk management, identifying risk, and managing risk. Also aids in determining opportunities related to risks.

6.2 OH&S Objectives and Planning To Achieve Them

Provides requirements for determining, monitoring, and achieving OH&S objectives.

7 Support

7.1 Resources

The organization's requirements to determine, provide, and maintain resources needed for an effective OH&S system.

7.2 Competence

Provides requirement that employees be competent, that management determines the needed competencies, and takes action to achieve them.

7.3 Awareness

Workers need to be aware of:

- OH&S policy and objectives.
- Their contribution to the effectiveness of the OH&S.
- The implication and potential consequences of not conforming.
- Incident and outcomes investigations that are relevant to them.
- Hazards, OH&S risks, and outcomes that are relevant to them.
- The ability to remove themselves from hazardous situations.

7.4 Communication

Provides requirements for communicating both internally and externally.

7.5 Documented Information

Provides requirements for controlling documents and records.

8 Operation

8.1 Operational Planning and Control

Planning to ensure that work takes place under controlled conditions. Work planning includes adapting work to workers, eliminating hazards and reducing OH&S risks, controlling change, handling of hazards and OH&S risks when outsourcing.

8.2 Emergency Preparedness and Response

The establishment, implementation, and maintenance of processes for preparing and responding to potential emergencies.

Adapt to current location.

9 Performance Evaluation

9.1 Monitoring, Measurement, Analysis, and Performance Evaluation

Provides requirements for monitoring and measuring to ensure the OH&S system is performing as planned.

Requirements given for calibrating and maintaining measuring tools. Evaluation of compliance requirements are detailed.

9.2 Internal Audit

Perform internal audits at planned intervals to ensure the OH&S management system follows the organizations requirements and the requirements of ISO 45001:2018.

Requirements for performing internal audits are provided.

9.3 Management Review

Management review to be held at planned intervals to ensure the OH&S management system is suitable and effective.

Input topics for discussion are specified.

After the input topics are discussed, specified output topics help determine action items for maintaining and improving the OH&S management system.

10 Improvement

10.1 General

Requirement to seek opportunities for improvement that will enhance the OH&S management system.

10.2 Incident, Nonconformity, and Corrective Action

Incidents and nonconformities concerning the OH&S management system need to be appropriately dealt with in a timely manner to control and correct it and deal with the consequences.

The need to evaluate incidents and nonconformities to determine if there is a need to escalate it to a corrective action. Corrective action starts with determining the cause of the incident and then fixing the cause.

The resolutions of incidents and nonconformities require follow up to confirm the effectiveness of the cure.

10.3 Continual Improvement

The OH&S management system needs to be continually improved by applying the standard including:

- Enhancing OH&S performance.
- Promoting a culture that supports the OH&S management system.
- Promotes the participation of workers.
- Communicating relevant results to the workers.

CONCLUSION

Occupational health and safety is an important component in business success. When it is properly handled, employees are more productive, and organizations can save significant amounts of money by preventing on the job accidents, illness, injury and death.

An OH&S management system can have a tremendous impact in ensuring workplace safety. Implementing an OH&S management system based on the requirements specified in ISO 45001:2018 can help position an organization ahead of its competitors in dealing with occupational health and safety issues, complying with government regulations and preparing for possible future mandates.

Registration to ISO 45001:2018 provides an objective third party confirmation that an effective OH&S management system has been implemented and the registered organization or facility has adopted a logical approach to OH&S management based on a Plan – Do – Check – Act approach that embraces a philosophy of continual improvement.

Implementing an OH&S management system can be time consuming and difficult. For this reason, not to mention the high rate of failure that afflicts organizations seeking registration for the first time, it is a good idea to seek the services of an outside professional consulting firm.

A competent occupational health and safety consultant can walk your organization through the ISO 45001:2018 requirements and identify any problems that may halt the implementation and registration process.

PART IV – RIOS:2016

Recycling Industry Operating Standard

CONTENTS

WHAT IS RIOS:2016?

The History of RIOS:2016

The Recycling Industry Operating Standard (RIOS) is a comprehensive certification system that provides a framework for integrated management systems tailored to the recycling industry. Combining elements of quality, environmental, and health & safety management, RIOS was created to promote sustainability and operational excellence.

The journey of RIOS began in the early 2000s when the recycling industry sought a dedicated management system to address the unique challenges faced by recyclers. While general standards such as ISO 9001 (quality management), ISO 14001 (environmental management), and OHSAS 18001 (occupational health and safety) were available, they were not specifically designed with the needs of the recycling industry in mind. This led to the recognition of a need for an all-encompassing framework that addressed the distinct operational, regulatory, and environmental complexities of the industry.

The Institute of Scrap Recycling Industries (ISRI), a leading trade association representing recyclers globally, spearheaded the development of RIOS. The vision was to create a standard that would integrate quality assurance, environmental stewardship, and workplace safety into a single, cohesive system. This approach would enable recyclers to streamline compliance, enhance efficiency, and demonstrate a commitment to sustainable practices.

RIOS was officially launched in 2006 after extensive consultation with industry stakeholders, environmental experts, and regulatory bodies. Its development process drew inspiration from existing international standards while incorporating specific provisions and guidelines tailored to recycling operations.

In the years following its release, RIOS gained traction among recyclers eager to demonstrate their commitment to operational excellence and sustainability. Certification under the RIOS standard became a mark of distinction, signaling to customers, regulators, and the public that a facility adhered to world-class practices.

The adoption of RIOS was further bolstered by its recognition from prominent organizations and governments. In the United States, the Environmental Protection Agency (EPA) acknowledged RIOS-certified facilities for their role in advancing sustainability goals. Internationally, the standard began to gain ground as recycling companies across Europe, Asia, and Latin America adopted its framework.

To remain relevant in a rapidly changing world, RIOS has undergone periodic updates since its inception. These updates reflect advancements in technology, shifts in regulatory requirements, and emerging trends in sustainability. For instance:

- In 2013, a significant revision of the standard introduced enhanced guidelines for e-waste recycling, addressing the growing importance of responsible electronics disposal.
- Later revisions focused on integrating circular economy principles, emphasizing the role of recyclers in creating closed-loop supply chains and reducing reliance on virgin materials.
- Updates have also incorporated feedback from certified facilities, ensuring that the standard remains practical and user-friendly for recyclers of all sizes.

RIOS has had a profound impact on the recycling industry, enabling facilities to improve operations, reduce risks, and achieve sustainability objectives. Some notable benefits include:

- Enhanced Operational Efficiency: By adopting streamlined processes and best practices, RIOS-certified facilities have achieved higher productivity and reduced costs.
- Improved Environmental Outcomes: Certification encourages facilities to minimize waste, conserve energy, and implement pollution prevention measures.
- Worker Safety: The standard's focus on health and safety has helped create safer workplaces, reducing incidents and injuries.
- Market Differentiation: RIOS certification has enabled recyclers to stand out in a competitive market, attracting environmentally conscious customers and partners.

RIOS:2016 Preview

RIOS:2016 is an updated version of the original RIOS standard, which was created to address the unique operational challenges faced by the recycling industry. It integrates key aspects of quality, environmental, and occupational health and safety management systems into a single framework. By combining these elements, RIOS:2016 eliminates redundancy and promotes a unified approach to management, ensuring businesses can achieve compliance, improve performance, and meet stakeholder expectations more effectively. Membership with RIOS is necessary to achieve certification.

Core Components of RIOS:2016

Quality Management

RIOS:2016 prioritizes quality by helping businesses establish processes to deliver consistent, reliable products and services. It focuses on continuous improvement, customer satisfaction, and effective management of resources. This ensures that recycled materials meet stringent industry and regulatory standards while fostering trust among clients and partners.

Environmental Management

Sustainability is at the heart of RIOS:2016. The standard provides strategies for reducing environmental footprints, managing waste responsibly, and conserving resources. From energy efficiency to pollution prevention, the environmental management component empowers organizations to operate in harmony with the planet while remaining competitive.

Health and Safety Management

The health and safety of employees is a cornerstone of the RIOS:2016 standard. Businesses are guided on identifying potential workplace hazards, implementing risk mitigation measures, and fostering a culture of safety. By prioritizing employee well-being, RIOS:2016 helps organizations reduce accidents, enhance productivity, and maintain a motivated workforce.

Key Features of RIOS:2016

Integrated Approach

One of the standout features of RIOS:2016 is its integrated approach. Instead of managing separate systems for quality, environment, and health and safety, organizations can streamline their efforts under a unified framework. This reduces complexity, saves time, and ensures that all aspects of operations are aligned with overarching business goals.

Flexibility

RIOS:2016 is designed to be adaptable, accommodating a wide range of recycling operations, from small-scale facilities to large, multi-faceted enterprises. This flexibility ensures that organizations can tailor the standard’s requirements to fit their specific needs and operational structures.

Global Applicability

Recognizing the international nature of the recycling industry, RIOS:2016 aligns with global standards and best practices. This makes it a valuable tool for businesses seeking to expand their reach, engage in international trade, or demonstrate their commitment to sustainability on a global stage.

Continuous Improvement

At its core, RIOS:2016 encourages a culture of continuous improvement. By regularly monitoring and evaluating performance, organizations are better equipped to adapt to changing market conditions, technological advancements, and evolving stakeholder expectations.

RIOS:2016 RECYCLING INDUSTRY OPERATING STANDARD REQUIREMENTS

1 General Requirements

1.1 Scope and Application

Recyclers shall consider activities performed by the Recycler and Outside Providers, and determine and document the scope of the RIOS management system.

(a) The scope statement shall be documented.

(b) Recyclers shall develop, implement and continually improve a management system that includes the core elements of RIOS and relationships to documentation necessary to conform to the requirements of RIOS.

1.1.1 RIOS Outcomes

Recyclers shall implement a RIOS management system that:

(a) Prevents adverse quality, environmental, and health and safety outcomes;

(b) Promotes improved product or service quality, positive environmental results, and worker health and safety;

(c) Systematically manages its risks, opportunities, and stakeholder and legal requirements in an organized and controlled manner;

(d) Manages change to proactively address impacts to quality, environment, and health and safety;

(e) Monitors and measures QEH&S performance; and

(f) Identifies and corrects causes of nonconformance to improve the Recycler's QEH&S performance.

1.2 QEH&S Infrastructure

Management Structure

Senior Management shall establish, document, and communicate a hierarchy of roles and responsibilities for the effective operation of the RIOS management system.

(a) Senior Management shall identify the senior manager responsible for health and safety for all Recycler activities.

(b) Senior Management shall identify the QEH&S management representative(s) responsible for the RIOS management system.

1.2.2 Resources

Senior Management shall determine and ensure the necessary resources for the effective implementation, operation, and continual improvement of the RIOS management system.

Resource needs shall consider:

- existing internal resources, including competent workers;
- need for external resources of outside providers;
- financial resources; and
- infrastructure.

Note: Infrastructure may include equipment, technology, transportation, working space, buildings, etc.

1.2.3 Senior Management

Senior Management of the organization shall demonstrate leadership and commitment by:

(a) Planning

- ensuring policies are established and applied to the RIOS management system;
- ensuring the RIOS management system is consistent and integrated with the business operations;
- ensuring QEH&S goals are established relevant to the Recycler's operations;
- ensuring that hazard identification, evaluation, and control is applied to the entire scope of the RIOS management system; and
- allocating resources, supporting management, and directing personnel to ensure the effective implementation, maintenance, and continual improvement of the RIOS management system.

(b) Implementation

- ensuring outside providers and suppliers are incorporated into the plans and policies of the RIOS management system; and
- supporting and communicating the organization's commitment to the RIOS management system.

(c) Monitoring Performance and Continual Improvement

- monitoring the effectiveness of the RIOS management system and ensuring the RIOS management system achieves the intended results; and
- promoting continual improvement of the RIOS management system.

1.3 Document and Recordkeeping Controls

The RIOS management system developed by Recyclers shall:

(a) Be maintained in paper or electronic format;

(b) Establish documentation where required by the RIOS standard or necessary for the operation of the RIOS management system;

(c) Provide direction to related documentation necessary to conform to the requirements of RIOS; and

(d) Establish records, as required by RIOS or to demonstrate conformance with the requirements of RIOS.

1.3.1 Control of Documents

Recyclers shall establish written plans to ensure that all documents within the RIOS management system are:

- established and maintained;
- include information to uniquely identify, describe, and control the document through revisions;
- legible and dated;
- approved prior to use;
- available in approved formats;
- current and available at the point of use;
- protected from loss;
- reviewed, revised, and updated, as necessary, with changes controlled;
- removed from use when obsolete, and if kept for any purpose, clearly identified as obsolete; and
- identified and distribution controlled if from external parties;

Note: Controlled documents include a variety of formats. Each is formally and deliberately organized into a plan, procedure, standard operating procedure, work instruction, graphical flowcharts, forms, etc.

1.3.2 Control of Records

(a) Recyclers shall establish written plans to ensure that all records within the RIOS management system are:

- established and maintained;
- legible;
- identifiable, traceable to the pertinent process, and readily retrievable; and
- stored and protected from damage or loss.

(b) Record retention times shall be established in writing and be consistent with relevant stakeholder and legal requirements.

2 Policy

Senior Management shall establish and implement a written RIOS policy(s) that:

- is/are relevant to the scope of the Recycler's operations;
- consider(s) environmental impacts of the Recycler's operations and outputs;
- consider(s) health and safety risks of the Recycler's operations and outputs;
- include(s) commitments to:
- comply with all relevant QEH&S legal requirements;

- comply with all relevant stakeholder requirements;
- continually improve performance;
- the prevention of workplace injuries and illness; and
- the prevention of pollution;
- provide(s) a framework for establishing QEH&S goals; and
- demonstrate(s) Senior Management's commitment to customer satisfaction.

The RIOS policy shall be:

(a) communicated to, understood by, and applied by workers;

(b) made available to the stakeholders; and

(c) reviewed at least annually by Senior Management and updated as necessary.

Note: One or multiple policies are acceptable to include all required elements.

3 Planning

3.1 Identifying the RIOS Footprint

Recyclers shall proactively identify and document their RIOS footprint to facilitate goals, controls, and monitoring consistent with their RIOS footprint.

(a) Recyclers shall document the process for determining the RIOS footprint.

(b) The RIOS footprint shall consider:

- the activities, products, and services of the Recycler, including those of outside providers that can be influenced by the Recycler, including but not limited to:
- purchasing and acquisition of source materials;
- on-site processing operations and activities;
- transportation, distribution, and delivery; and
- changes in operational processes, products, or equipment;
- both negative and positive impacts;
- actual and potential conditions;
- routine and nonroutine activities, including emergencies;
- relevant stakeholder requirements and views; and
- legal requirements.

(c) The RIOS footprint shall remain current, be reviewed at least annually, and be updated before planned changes to the system occur.

3.1.1 Important Quality Risks

Recyclers shall identify risks to product and service quality.

(a) Controls shall be planned and documented for each quality risk to manage the risk.

(b) Controls shall be integrated in the RIOS management system, implemented, and monitored for effectiveness.

(c) Recyclers shall plan quality controls for:

- qualification of suppliers, outside providers, and customers, where applicable;
- material and product tracking and traceability, if required; and
- control of customer property, if applicable.

3.1.2 Important Environmental Impacts

Recyclers shall evaluate environmental factors and potential impacts to identify those important environmental impacts of their operations.

(a) Criteria used in determining actual or potential environmental impacts and the results of evaluation shall be documented in the RIOS footprint.

(b) The environmental impacts of all activities, products, and services within the scope of the RIOS management system, including outside providers and activities listed in 3.1 shall be evaluated.

(c) Important environmental impacts shall be controlled, monitored, and evaluated.

3.1.3 Important Health & Safety Risks

Recyclers shall identify the health and safety hazards associated with their operations and RIOS footprint.

(a) In determining important risks, Recyclers shall consider activities listed in 3.1 and:

- the nature of the workforce, contractors, and other visitors to the workplace;
- the nature of the processes;
- source materials; and
- past performance of the Recycler related to each risk.

(b) Recyclers shall identify controls to eliminate or reduce important health and safety risks to an acceptable tolerance. Controls shall be documented as defined in section 4.6 and monitored and evaluated as defined in section 5.1.

3.1.4 Legal Requirements

Recyclers shall identify, document, and have access to their QEH&S legal requirements and determine how QEH&S legal requirements apply to their operations. Controls to manage requirements shall be documented and integrated into the RIOS management system, including implementation and monitoring of effectiveness.

3.1.5 Product, Service, and Customer Requirements

Recyclers shall establish plan(s) to identify and document product, service, and customer requirements. The plan(s) shall:

(a) Define specifications and supplier requirements for source material as inputs;

(b) Define specifications and outside provider requirements for outsourced products;

(c) Determine required product and service specifications, including applicable legal requirements;

(d) Determine customer requirements for acceptance of the product or service;

(e) Determine the resources needed to meet product or service requirements;

(f) Consider the Recycler's capability of providing products or services to the defined requirements;

(g) Define methods to verify, validate, monitor, measure, inspect, or test products for production or shipment; and

(h) Generate records to demonstrate product or service conformity.

3.1.6 Other Stakeholder Requirements

Recyclers shall identify and document other QEH&S requirements associated with commitments they make to stakeholders. Recyclers shall:

(a) Identify stakeholders that are relevant to the Footprint within the RIOS management system;

(b) Document relevant requirements of these stakeholders, including:

- obligations to stakeholders;
- compliance with regulations; and
- conformance with voluntary commitments, such as standards;

(c) Determine how these requirements apply to their operations;

(d) Document and integrate controls to manage stakeholder requirements in the RIOS management system, including implementation and monitoring of effectiveness; and

(e) Monitor and review these stakeholders' requirements and update as requirements and obligations change. Review shall be documented at least annually.

Note: Stakeholders influence behaviors and decisions of the Recycler and can impact the Recycler's QEH&S performance.

3.2 Improvement Planning

Recyclers shall continually improve the suitability, adequacy, and effectiveness of the RIOS management system to prevent nonconformities and improve product and service quality.

3.2.1 Establishing Goals

In order to achieve QEH&S improvement, Senior Management shall establish written QEH&S goals. Goals may apply to the entire operations or may be specific to a particular function, responsibility, product, or service.

(a) Goals shall be:

- Measurable, as appropriate;
- monitored;
- communicated; and
- updated as needed.

(b) In establishing goals, Recyclers shall consider:

- QEH&S policies;
- the RIOS footprint;
- technological options;
- financial considerations;
- operational and business requirements;
- legal requirements;
- the views of stakeholders;
- opportunities for improvement from its monitoring and measuring activities (see 5.1)
- enhancement of customer satisfaction; and
- enhancement of product and service quality.

3.2.2 Plans for Goal Achievement

Recyclers shall integrate actions to achieve goals within the RIOS management system. Each goal shall have written plans that:

- describe what will be done;
- identify resources required for completion;
- assign responsibility for tasks;
- assign due dates for tasks; and
- define how the results will be evaluated.

3.3 Change Management

Recyclers shall document a written plan for changes that impact the RIOS management system.

(a) Changes shall be documented and evaluated to determine potential QEH&S impacts in the RIOS footprint prior to implementation.

(b) Change management plans shall update the RIOS management system to control important risks.

4 Implementation

4.1 Recycler Knowledge

4.1.1 Competence

For work activities that can affect the quality of the Recycler's products or services; or have important environmental impacts; or have important health and safety risks, Recyclers shall:

(a) Determine the required competence of the person(s) performing or responsible for the activity;

(b) Ensure that the person(s) is competent based upon education, training, skills or experience;

(c) Keep records of competence;

(d) Acquire competence, where needed, with external resources or provide training;

(e) Verify the effectiveness of competency training;

(f) Ensure required training considers:

- different levels of responsibility, ability, literacy, and required work activities;
- the RIOS footprint;
- QEH&S controls;
- roles and responsibilities; and
- frequency.

Note: Attaining competence may include mentoring, reassignment of workers, hiring workers, or contracting with external resources.

4.1.2 Awareness

Recyclers shall document and implement plans to ensure that workers are aware of:

- the RIOS policy(s);
- QEH&S roles and responsibilities within the RIOS management system;
- QEH&S impacts of their work activities;
- relevant QEH&S goals;
- QEH&S performance results;
- emergency response plans;
- the importance of meeting supplier, customer, and legal requirements;
- how they contribute to the effectiveness of the RIOS management system;
- the potential consequences of nonconformance to the RIOS management system; and
- the benefits of improved QEH&S performance.

4.2 Communication

Senior Management shall document communication plans to define how to communicate internally and with external parties, customers, outside providers, and suppliers. Records of communication shall be kept.

4.2.1 Internal Communication

Internal communications plans in the RIOS management system shall:

(a) Ensure important RIOS management system information is effectively communicated between workers and management, including feedback and consultation from workers;

(b) Require timely reporting of newly identified hazards, incidents, or near misses based on the level of severity; and

(c) Provide information about RIOS management system effectiveness (see 6.c).

4.2.2 Customer Communication

Recyclers shall plan and communicate with customers regarding:

- QEH&S requirements including customer qualification requirements, if applicable;
- feedback and complaints; and
- assessments of customer satisfaction.

4.2.3 Supplier Communication

Recyclers shall plan and communicate with suppliers regarding:

- source control requirements for the purchase or acquisition of source materials;
- material that is not acceptable source material prior to receipt; and
- lost or improper processing of supplier property.

4.2.4 Outside Provider Communication

Recyclers shall plan and communicate QEH&S requirements with outside providers including:

- written specifications for outsourced products and services;
- outside provider’s responsibilities in the Recycler’s RIOS management system; and
- monitoring activities and QEH&S controls applied to the outside provider.

4.2.5 External Communication

Recyclers shall:

(a) Plan for and respond to external inquiries about the RIOS management system.

(b) Communicate relevant information, including emergency plans, to visitors and stakeholders about the RIOS management system.

4.3 Operational Control

Recyclers shall consider their operations and activities relevant to their RIOS footprint and goals to establish operational controls to manage their QEH&S risks and impacts. Processes and documented plans shall be established, implemented, and maintained to ensure operations and activities are performed in a controlled manner.

4.3.1 Source Material

Recyclers shall establish processes to control source materials.

(a) Recyclers shall specify criteria and implement controls for the acceptance of source material. The type and extent of control is based on the source material's impact on QEH&S, including the Recycler's ability to meet customer requirements.

(b) Recyclers shall document processes for the identification and control of any QEH&S supplier requirements for Recyclers to process source material.

(c) Source material that is not accepted shall be identified and controlled to prevent QEH&S impacts while in the Recycler's control.

(d) Source material that is not accepted shall be returned to the supplier or managed in accordance with the RIOS standard.

(e) Records of source material control shall be kept.

Note: Recyclers acquire source materials from upstream suppliers, often referred to as customers by the recycler. The recycler then processes that source material through sorting, shredding, dismantling, refurbishment, or another recycling process. The outputs of processing source materials are products.

4.3.2 Outsourced Providers, Products, and Services

Outsourced products or services shall be controlled to conform to the RIOS requirements of the Recycler.

(a) Specifications for outsourced products and services shall be documented in writing.

(b) QEH&S controls of outside providers, outsourced products, or services shall be implemented and monitored to conform to the RIOS Standard. The type and extent of control is based on the outsourced providers' and outsourced products' or services' impact on QEH&S.

(c) Records of evaluation, selection, and monitoring shall be kept.

4.4 Quality Controls

(a) Product and service specifications and customer requirements shall be documented, approved, and changes controlled in the RIOS management system.

(b) Documented production and service instructions shall be provided to workers.

(c) Monitoring and measurement controls for quality shall be implemented at relevant points in the process.

4.5 Environmental Controls

Recyclers shall control those operations and activities that are associated with the identified important actual or potential environmental impacts (in 3.1.2) in the RIOS footprint and where the implementation of controls is necessary (including legally required) to limit adverse environmental impacts.

(a) Recyclers shall document and implement controls for all important environmental impacts, stipulating operating criteria in the plan.

(b) Environmental controls shall be established for all activities, source materials, products and services within the scope of the RIOS management system that are identified in the RIOS footprint as having an important environmental impact.

4.6 Health & Safety Controls

Recyclers shall control those operations and activities that are associated with the identified hazards (in 3.1.3) in the RIOS footprint and where the implementation of controls is necessary (or required legally) to manage the health and safety risks.

(a) Recyclers shall implement health and safety controls in the following order of priority:

- elimination;
- substitution;
- engineering controls;
- signage/warnings and other administrative controls; and
- personal protective equipment.

(b) Health and safety controls shall be established for all activities, products, and services within the scope of the RIOS management system, including health and safety hazards related to source materials, outsourced products and services, on-site contractor activities, off-site activities, chemicals, and operational equipment.

4.7 Emergency Preparedness

Recyclers shall establish written plans to identify the potential for and response to incidents and emergency situations.

(a) Emergency plans shall include preventing and mitigating the adverse environmental impacts in the RIOS footprint and injuries and illnesses that may be associated with each.

(b) The Recycler shall periodically test these plans to the extent practical.

(c) The Recycler shall review and, where necessary, revise its emergency plans after tests, incidents, or emergency situations.

(d) Emergency plans shall be communicated in accordance with the communication plans in the RIOS management system (see 4.2).

5 Checking and Corrective Action

5.1 Monitoring and Measurement

Recyclers shall establish plans to monitor, measure, and record characteristics of their operations that are important to ensuring effective QEH&S performance, achievement of goals, and conformity to product and service requirements. Plans shall define the measurements, methods, criteria, indicators, and timing of monitoring activities. Monitoring and measurement data shall be analyzed to evaluate the effectiveness of the management system and assess continual improvement.

5.1.1 Activities Requiring Monitoring or Measurement

(a) Important elements of the RIOS footprint (see 3.1) including:

- quality risks;
- environmental impacts;
- health and safety risks;
- legal requirements;
- product and customer requirements, including nonconforming products and customer feedback; and
- relevant stakeholder requirements.

(b) Progress on goals (see 3.2) and change management (see 3.3).

(c) Operational controls (see 4.3).

5.1.2 QEH&S Compliance

Recyclers shall establish a written plan to evaluate compliance, at least annually, to applicable QEH&S legal requirements and other relevant stakeholder requirements. Compliance evaluation plans shall consider the auditor's competency in legal requirements. Results shall be recorded and actions taken to correct noncompliance.

5.1.3 Maintenance and Calibration of Monitoring Equipment

(a) Recyclers shall document the necessary QEH&S monitoring and measurement equipment.

(b) Monitoring and measurement equipment shall be maintained and calibrated or verified to ensure it functions properly.

(c) Calibration and verification shall identify the standard used.

(d) Maintenance and calibration records shall be kept.

(e) If measurement equipment is determined not to be within tolerance, Recyclers shall take corrective action appropriate to the QEH&S impacts of erroneous measurements.

5.1.4 Analysis of Monitoring and Measurement Results

Recyclers shall analyze monitoring and measurement results to identify areas of underperformance to intended results, including areas of potential nonconformance and opportunities for improvement. Results of analysis shall be an input into management reviews.

5.2 Nonconformance and Corrective Action

Recyclers shall ensure appropriate investigations into incidents and nonconformance and take actions to correct underperformance of the RIOS management system to prevent nonconformances.

5.2.1 Control of Nonconforming Product

Recyclers shall establish documented plans to ensure that product that does not conform to product specifications or customer requirements is identified and controlled to prevent its unintended delivery or use.

(a) Nonconforming product shall be corrected, released with concessions, re-classified, or used for other purposes.

(b) Records of nonconforming product and subsequent actions shall be maintained.

5.2.2 EH&S Incident Investigations

(a) EH&S Incident investigations shall include incidents, emergencies, and near misses.

(b) Recyclers shall establish plans to record, investigate, and analyze EH&S incidents to determine root cause.

(c) Investigation shall identify the criteria for correction, corrective action, and prevention of recurrence.

5.2.3 Nonconformance and Corrective Action

Recyclers shall establish written plans to address and eliminate the causes of nonconformances and potential nonconformances in the RIOS management system.

(a) Corrective actions are required, but not limited to, the following when:

- feedback and complaints identify nonconformances;
- determined as the result of an incident investigation;
- internal nonconformances are identified by workers; or
- external audits or reviews identify nonconformances.

(b) Written corrective action plans shall:

- identify the root cause(s) of the nonconformance and take action to prevent its recurrence;
- implement corrective action that is adequate to the QEH&S impact and assigns responsibilities and timelines;
- record actions taken and the results achieved; and
- review the effectiveness of corrective actions.

5.3 Internal RIOS Audits

Recyclers shall establish a written plan to evaluate:

- the RIOS management system's conformance to RIOS;
- the proper implementation of the RIOS management system; and
- the effectiveness of the RIOS management system;

(a) The internal audit plan(s) shall consider:

- frequency;
- methods of audit;
- audit criteria and scope;
- relative importance of QEH&S processes and impacts;
- changes impacting the Recycler's operations;
- results from previous audits;
- audit responsibilities;
- auditor competency, objectivity, and independence;
- recording and reporting of results; and
- addressing nonconformances.

(b) Auditors shall not audit their own responsibilities.

(c) Audits shall occur at least annually and ensure that the RIOS management system has been fully evaluated prior to certification or recertification.

(d) Recyclers shall use the results of internal audits to take corrective action.

6 Management Review

Senior Management shall review the RIOS management system at least annually to ensure its adequacy and effectiveness.

(a) Input to management review shall include:

- RIOS audit (see 5.3) results;
- QEH&S compliance audit (see 5.1.2) results;
- feedback from customers and stakeholders;
- progress on goals;
- status of incident investigations and corrective actions;
- follow-up actions from previous management reviews;
- changes in scope;
- important quality impacts;
- important environmental impacts;

- important health and safety risks;
- QEH&S performance, including analysis of monitoring and measurement results; and
- recommendations for improvement.

(b) Output from management review shall include decisions and actions regarding the future direction of the RIOS management system, including:

- targeted product and service improvements;
- continual improvement opportunities;
- resource needs;
- risks to the RIOS management system; and
- changes needed to the RIOS policy(s), goals and the RIOS management system.

(c) Relevant QEH&S performance and output information from management review shall be communicated in accordance with documented communication plans (see 4.2).

(d) Records shall be kept of the results of management review.

CONCLUSION

Enhanced Operational Efficiency

By adopting RIOS:2016, businesses can streamline their processes, eliminate waste, and optimize resource utilization. This not only reduces costs but also improves overall productivity and profitability.

Regulatory Compliance

RIOS:2016 ensures that organizations remain compliant with local, national, and international regulations. This reduces the risk of legal penalties, enhances reputation, and provides peace of mind to stakeholders.

Improved Stakeholder Confidence

Adhering to a recognized standard like RIOS:2016 demonstrates a commitment to quality, sustainability, and safety. This builds trust with customers, partners, and investors, fostering stronger relationships and opening doors to new opportunities.

Environmental Responsibility

Implementing the standard helps businesses minimize their environmental impact, contributing to global efforts to combat climate change and conserve natural resources. This aligns with the growing demand for sustainable practices from consumers and regulators alike.

Workplace Safety

With its emphasis on health and safety, RIOS:2016 helps organizations create safer work environments. This not only protects employees but also reduces costs associated with workplace accidents and insurance claims.

RIOS:2016 represents a significant step forward for the recycling industry. By integrating quality, environmental, and health and safety management into a single, cohesive framework, it empowers organizations to operate more efficiently, responsibly, and sustainably. Whether you are a small recycling facility or a global operation, adopting RIOS:2016 is an investment in the future—one that benefits your business, your employees, and the planet.

With its emphasis on continuous improvement, adaptability, and global applicability, RIOS:2016 not only sets a high standard for the recycling industry but also serves as a model for other sectors seeking to balance profitability with social and environmental responsibility.