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Corrosion control engineering life cycle — Risk assessment

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Foreword

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee *[or Project Committee]* ISO/TC *156*, *[corrosion of metals and alloys]*, Subcommittee SC 1, *[corrosion control engineering life cycle]*.

Introduction

This standard is a general top-level standard supporting the document of ISO/CD 23123 in the standard system. This standard whose assessed object is the risk of Corrosion control engineering life cycle is based on ISO/CD 23123 to ensure the optimal benefits of safety, economy, long-term operation and environmental protection and evaluate the risk of all risk elements in the whole process of corrosion control engineering life cycle is carried out with the procedures specified in ISO/CD 23123. It is the basic standard for risk assessment of the whole life cycle of corrosion control engineering existing in all walks of life, and evaluate the risk of all elements in the whole process of corrosion control engineering life cycle is implemented in accordance with the procedures specified in ISO/CD 23123, while achieving all elements and elements, local and entire could link up with each other, optimize with each other, coordinate with each other and support with each other in the interwoven or not at the same time, and form a holistic, systematic, comprehensive by third party risk assessment. Therefore, it should be as general as ISO/CD 23123.

Corrosion control engineering life cycle — Risk assessment

1 Scope

This document specifies the general requirements for risk assessment in the life cycle of corrosion control engineering.

It is applicable to risk assessment of all types of corrosion control engineering programs.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/CD 23123, *Corrosion control engineering life cycle - General requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

The list below is always included after each option:

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
Elements of corrosion control engineering life cycle
An essential part of all kinds of corrosion control engineering including corrosion sources, materials, technology, design, research and development, manufacturing, construction, storage and transportation, installation and commissioning, acceptance, operation, maintenance, repair, scrapping and disposal, documents and records, resource management, comprehensive assessments, etc.

3.2
Risk assessment
Aiming at achieving the optimum benefits of safety, economy, long-term operation and environmental protection, all elements in the whole process chain of corrosion control engineering are taken as objects, and the principles and methods of evaluation are applied to identify and analyze whether all elements in the corrosion control engineering life cycle are implemented and identified according to ISO/CD 23123. The activities of risk assessment should predict the possibility and severity of the accident or damage to people's life and property, and put forward control measures and draw conclusions of risk assessment.

Risk assessment includes three steps: risk identification, risk analysis and risk evaluation.

3.3
Risk identification
Process of finding, recognizing and describing corrosion risk of all elements in the corrosion control engineering life cycle.

Note 1 to entry: risk identification takes all elements in the corrosion control engineering life cycle as the object.

3.4
Risk analysis
Process to comprehend the nature of corrosion risk and the degree of damage.

Note 1 to entry: risk analysis is the basis of risk assessment.

3.5
Risk evaluation
Process of comparing the results of risk analysis and summarize the traceability and supporting documents to determine whether the corrosion risk of all elements in the corrosion control engineering life cycle and/or its magnitude is acceptable or tolerable.

4 General Principles

4.1 Objective

The objective should be aim at achieving the optimum benefits of economy, long-term operation and environmental protection on the basis of the operation of economic society which should ensure human health, people's life and property safety, national security and ecological environment safety (hereinafter referred to as safety).

4.2 Basis

This document is based on ISO/CD 23123.

4.3 Object

Corrosion control engineering life cycle is the object of this document. And risk assessment is performed on all elements of ISO/CD 23123 that affect to achieve the optimum benefits of safety, economy, long-term operation and environmental protection, the elements of risk assessment include corrosion sources, materials, technology, research and development, design, manufacturing, construction, storage and transportation, installation and commissioning, acceptance, operation, maintenance, repair, lifetime extension, scrapping and disposal, documents and records, resource management, comprehensive assessment of the corrosion control engineering life cycle.

5 Risk assessment procedure

5.1 Summarization

a) Risk assessment process of corrosion control engineering life cycle includes:

b) Identify the corresponding actual risk of all elements in the corrosion control engineering life cycle.

c) Research and analyze whether all elements are implemented according to ISO/CD 23123.

d) Analyze whether to achieve comprehensive and technical control management that makes all link and link, node and node, element and element, local and entire optimization with each other, coordination with each other and support with each other in the interwoven.

e) Analyze the evaluation result and submit the assessment report and confirm.

5.2 Risk identification

The risk of all elements in the corrosion control engineering life cycle should be identified collectively and accurately according to the actual situation of the main project.

5.3 Risk analysis

5.3.1 Risk analysis of all elements in the corrosion control engineering life cycle

5.3.1.1 Risk analysis of objectives

a) It should be analyzed whether the corrosion control engineering is controlled according to the principle of integrity, systematization, mutual coordination and optimization, and whether it can achieve the optimum benefits of safety, economy, long-term operation and environmental protection.

b) It should be analyzed whether the objectives are implemented into the risk analysis of all elements in the life cycle, and be communicated, implemented, and maintained in all aspects of the life cycle. It should be analyzed whether the objectives make the life cycle of the corrosion control engineering be adapted to the life cycle of the protected main project. Corrosion control engineering life cycle depends on, serves, assists in the main project, in some cases it is also restricted to the main project.

5.3.1.2 Risk analysis of corrosion sources

a) It should be analyzed whether the internal corrosion sources and external corrosion sources are found out comprehensively and accurately.

b) It should be analyzed whether the new corrosion sources which are generated in implementation process are found out comprehensively and accurately.

c) It should be analyzed whether the conditions of the main project and the influence of the corrosion control engineering body are taken into account, and the corrosion sources are found out comprehensively and accurately.

d)It should be analyzed whether a certain procedure has been identified.

e) It must be analysed how the corrosion and its sources are monitored and mitigated during the lifetime of the assessment.

5.3.1.3 Risk analysis of design

a) It should be analyzed whether the design takes into account all the elements, links, and nodes throughout the entire life cycle of the corrosion control project.

b) It should be analyzed whether the design takes into account the integrity, systematization, mutual coordination and optimization in the entire life cycle of corrosion control engineering and makes all link and link, node and node, element and element, local and entire optimization with each other, coordination with each other and support with each other in the interwoven and achievements from the optimum benefits of safety, economy, long-term operation and environmental protection.

c) It should be analyzed whether the green plans has been made.

d) It should be analyzed whether the design system is improved constantly to meet the requirements of the main project.

e) It should be analyzed whether the design documents are reviewed in accordance with certain procedures and documented.

5.3.1.4 Risk analysis of research and development

a) It should be analyzed whether all the elements, links and nodes in the entire life cycle of corrosion control engineering are continuously studied, improved and developed in the implementation process to achieve the optimum benefits of safety, economy, long-term operation and environmental protection.

b) It should be analyzed whether the entire research and development process is carried out in accordance with certain procedures and maintains the principles of science, technology and economy.

c) It should be analyzed whether new materials and new technologies have been developed when existing materials and technologies fail to meet the corrosion control requirements, so that they can meet the requirements for material selection and technical application.

d) It should be analyzed whether the data documentation for research and development is built to make it traceable.

5.3.1.5 Risk analysis of materials, technology, manufacturing, construction, storage and transportation, installation and commissioning, repair.

The requirements of risk analysis for each element are as follows,

a) It should be analyzed whether the selected element is corrosion-resistant and achieves the optimum benefits of safety, economy, long-term operation and environmental protection.

b) It should be analyzed whether the selected element is based on the relevant inspection standards or not.

c) It should be analyzed whether the selected element has corresponding specific performance and supporting implementation cases.

d) It should be analyzed whether the selected element is coordinated, optimized and supported with other elements.

e) It should be analyzed whether the selected element has been identified by certain procedures.

5.3.1.6 Risk analysis of acceptance

It should be analyzed whether acceptance is implemented according to ISO/CD 23123 before operation.

5.3.1.7 Risk analysis of operation

It should be analyzed whether to increase monitoring during the operation of corrosion control engineering life cycle on the basis of acceptance to ensure the real-time forewarning.

5.3.1.8 Risk analysis of maintenance

It should be analyzed whether to carry out maintenance according to the corresponding maintenance manual and whether to maintain the monitoring equipments, devices and instruments in the corrosion control engineering life cycle to keep them in a normal and sound state.

5.3.1.9 Risk analysis of scrapping and disposal

a) It should be analyzed whether scrapping and disposal is carried out according to the green plan formulated at the design stage.

b) It should be analyzed whether the recyclable equipments are recycled or not.

c) It should be analyzed whether the social responsibility for the equipments to be scrapped and disposed is clearly defined to prevent environmental pollution.

d) It should be analyzed whether to be subject to the acceptance of the corresponding procedures and to form traceable and supporting documents.