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General requirements for anticorrosion coating corrosion control engineering life cycle

耐蚀涂层腐蚀控制工程全生命周期要求

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Table of Contents

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1 Scope

This Standard specifies requirements for objective, corrosion source, anticorrosion coating, technology, development, design, corrosion control operation, acceptance, use requirements, test and inspection, maintenance, repair, life extension, resource, scrap and post-event green environmental treatment, documentation and record, assessment of each corrosion control element of anticorrosion coating corrosion control engineering life cycle.

This Standard applies to the management of related activities throughout various types of anticorrosion coating corrosion control engineering life cycle.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 33314-2016, Corrosion control engineering life cycle - General requirements

3 Terms and definitions

Terms and definitions determined by GB/T 33314-2016 and the following ones are applicable to this document. For ease of use, some of the terms and definitions in GB/T 33314-2016 are repeated below.

3.1 Anticorrosion coating

A coating that protects the base material.

Note: It includes metal coating, organic coating, inorganic coating, etc.

3.2 Anticorrosion coating corrosion control engineering life cycle

The whole process of the anticorrosion coating, such as corrosion source investigation, scheme design, construction, inspection, acceptance, assessment, operation, maintenance, repair, and scrap.

communication, implementation and maintenance shall be made during all links of the life cycle; regular review and technical improvement of its continuous adaptability shall be made.

5.3 Coordinate and optimize each element in the corrosion control engineering life cycle, so that the corrosion control engineering life cycle is compatible with the life cycle of the protected main engineering, or at least the overhaul period of the protected main engineering.

5.4 The anticorrosion coating corrosion control engineering life cycle must meet the requirements of relevant environmental protection regulations. When it is scrapped, it is necessary to assess the possible environmental hazards and develop a plan to meet the requirements of the green environment.

6 Corrosion source

6.1 The corrosion sources that cause anticorrosion coating corrosion include internal and external factors. Internal factors shall consider factors such as material composition, structure, stress, surface condition, component assembly and connection methods; external factors shall consider the corrosive media and working conditions that interact with the anticorrosion coating under different conditions.

6.2 During the corrosion control engineering life cycle, according to the different influences of corrosion sources on various types of coatings, it shall conduct investigation and analysis of corrosion sources, and adopt targeted corrosion control engineering techniques and management measures.

6.3 It shall identify the overall working conditions of the main engineering corresponding to the corrosion control engineering, including but not limited to the operating temperature, humidity, medium, rainfall, sunshine, wind direction, industrial exhaust gas and other working conditions that are related to the main engineering.

6.4 The conditions of the corrosion control engineering itself shall also be identified, including but not limited to parameters such as coating thickness, corrosion-resistance, abrasion-resistance, impact-resistance, protective area, coating hardness, and the bonding force between the coating and the base material.

7 Anticorrosion coating

7.1 For the selection of anticorrosion coating, according to the type of material, the surface state, and the type and rating of the to-be-faced corrosion

10 Design

10.1 General provisions include:

a) For the corrosion problems that may occur during the anticorrosion coating corrosion control engineering life cycle, corrosion control measures shall be taken;

b) Develop design control measures, so as to ensure that the technical requirements and quality standards of the design are incorporated into the design plan;

c) Develop management procedures to control changes and deviations from design requirements and quality standards;

d) Develop special process management measures, to optimize the selection of key materials, equipment and processes, and to periodically review the applicability.

10.2 Specify the internal and external interfaces between the design unit and personnel; clarify the preparation, proofreading, review, approval, release, distribution and revision responsibilities of documents; specify the transmission and archiving methods of design documents.

10.3 The design content is as follows:

a) It includes structural anticorrosion design, structural material selection, component anticorrosion design, anticorrosion coating selection, manufacturing process, anticorrosion coating maintenance/ repair program, etc.;

b) The designed system, components and materials shall have an adaptable margin to meet the requirements of the corrosion control engineering life cycle under normal operating conditions.

10.4 The design shall follow the following procedures:

a) Design input includes corrosion source, corrosion parameters and grades, design life, operating conditions, structures, materials, regulations, environmental requirements, standards and technical specifications.

b) Design output, according to the requirements of the design input, determines the corrosion control method to form a complete design plan for the corrosion control engineering.

c) The design verification method is as follows:

certificate of quality and inspection data; random inspection and re-inspection shall be performed when it enters the venue.

b) Document preparation: formulate the corrosion control operation quality plan; compile and control the special process control points that affect quality; determine the quality; formulate the engineering schedule control table.

c) Preparation of corrosion control operation documents: the operation unit prepares the construction organization design and submits it to the supervision unit and design unit for technical review.

d) Technical disclosure of safety and environmental protection technology: disclose safety and environmental protection technology to relevant personnel of corrosion control operations; clarify process technology requirements and relevant laws and regulations.

11.5 Safety and quality management shall include:

a) Clarify safety production responsibilities and develop safety measures for the following operations:

1) Loading, storage, transportation, construction and installation of flammable and explosive hazardous materials;

2) Surface treatment and coating;

3) Electrical work;

4) Work high above the ground;

5) Toxic, harmful and radioactive environment operations.

b) Perform raw material and operation process quality control; calibrate equipment, tools and instruments.

c) Perform management of construction supervision units, personnel and procedures.

11.6 Material management shall include the formulation of a material management system and the provision of material security that meets the requirements according to the engineering operation progress.

11.7 After the completion and acceptance of the engineering, sort and submit all the documents of the engineering, and complete the engineering handover.

11.8 Quality control requirements for anticorrosion coating:

spray performance, acidic atmospheric performance, moist heat performance, mold performance, and coating adhesion.

12.3 The following materials shall be submitted for acceptance:

a) factory certificate, anticorrosion coating quality inspection report;

b) design and change documents;

c) process acceptance and hidden acceptance information;

d) manufacturing process records;

e) records of non-conformities;

f) acceptance documents.

13 Requirements of use

13.1 A systematic corrosion control program shall be prepared to ensure safe, economical and long-term operation.

13.2 The corrosion control program shall consider the following experiences and factors:

a) Prepare a systematic corrosion control program according to the anticorrosion coating and corrosion source;

b) Develop corrosion control methods;

c) Carry out reasonable structural design, correct material selection and proper maintenance in accordance with relevant regulations;

d) Design, operation, running and maintenance personnel shall understand the basic knowledge of corrosion control and participate in regular training and assessment;

e) For the dispose of complex corrosion problems, a corrosion control team shall be established, and multiple professions and multiple departments shall be involved;

f) Establish effective internal communication and external communication and experience feedback mechanisms;

g) Establish a corrosion control engineering repair and maintenance database.

13.3 Operation management includes:

15 Maintenance

15.1 Principles for maintenance:

a) According to the anticorrosion coating engineering and the condition of the corrosion source, formulate daily, regular and comprehensive maintenance cycles and plans, and prepare corresponding maintenance procedures, which include the following:

1) Daily maintenance includes inspection, examination and cleaning;

2) Regular maintenance includes performance state inspection and planning performance repairs;

3) Comprehensive maintenance includes comprehensive inspection and maintenance of the engineering;

4) The maintenance procedure documents shall be consistent with the requirements of the materials or equipment maintenance manuals, technical specifications and related standards;

5) For the corrosion situation that can be repaired on site, develop a maintenance plan, and repair it after being approved by the authority;

6) For the corrosion situation that cannot be repaired on site, contact the design unit and operation unit in time, to determine the corrosion cause and degree of harm, and to provide original information for further solving the corrosion problem.

b) The maintenance work shall be arranged by special personnel and shall meet the following requirements:

1) The maintenance personnel shall have corresponding skills and experience;

2) Special maintenance tools shall be used;

3) Before the maintenance, fully evaluate the possible risks; formulate corresponding emergency measures; and make relevant inspection and maintenance records.

c) After the maintenance, timely report problems that occur during the corrosion control engineering to persons in charge; timely follow and treat.

d) The maintenance work shall not cause new risks of corrosion or damage to equipment and facilities.

16 Repair

16.1 The repair of the anticorrosion coating corrosion control engineering shall not affect the overall engineering.

16.2 The repair quality of the anticorrosion coating corrosion control engineering shall not be lower than the original manufacturing requirements.

16.3 The repair of the anticorrosion coating corrosion control engineering that has an impact on the production system shall be undertaken by a qualified unit.

16.4 After the repair of the anticorrosion coating corrosion control engineering is completed, it shall be inspected and accepted in accordance with the provisions of Chapter 12.

17 Life extension

17.1 When the anticorrosion coating has reached the expected service life and still satisfies safe use, life extension shall be considered.

17.2 In order to expound and prove the feasibility of life extension, anticorrosion professional organizations shall evaluate the anticorrosion coating and calculate its economy and life extension.

17.3 The application for life extension shall be submitted by the user department, reviewed by relevant departments, and approved by the person in charge of the unit, so as to handle the application for life extension.

17.4 A maintenance plan for the life extension equipment and facilities operation process shall be formulated; the examination and inspection cycle shall be appropriately shortened.

18 Resource

18.1 Develop resource management plans for personnel, equipment, materials and technologies, methods, and the environment, so as to adapt it to each element throughout the corrosion control engineering life cycle.

18.2 Personnel management content:

a) Establish a sound management organization; clarify work objectives, division of responsibilities, work processes, and interfaces with other organizations and management agencies, so as to coordinate the elements of the corrosion control engineering cycle and to ensure the staffing of the corrosion control engineering life cycle objectives.

19 Scrap and post-event green environmental treatment

19.1 For materials and equipment that are used in the anticorrosion coating corrosion control engineering, if their safety and functionality have been expounded and proven to no longer meet the design and use requirements, and they cannot be repaired or economically repaired, they shall be scrapped.

19.2 The environmental hazards that may be caused by scrapping shall be assessed, and a corresponding green environmental treatment plan shall be formulated.

19.3 For equipment and materials that can be reused after being scrapped shall be formulated with corresponding plans and be handled by qualified professional units.

19.4 The anticorrosion coating corrosion control engineering life cycle shall comply with the requirements of relevant environmental protection regulations. The design, construction and use units of the corrosion control engineering shall also bear social responsibility and fulfill the green environmental protection obligations.

20 Documentation and record

20.1 Documentation management includes:

a) Control the preparation, review, approval and issuance of documents; clarify the release and distribution channels of documents; change and revocation of documents shall be reviewed and approved in accordance with prescribed procedures; foreign documents shall be ensured to be identified and effectively managed.

b) Establish corrosion control management procedures at the stages of corrosion control engineering design, construction, and operation; prepare work outlines and documents with matched technical support.

20.2 Record management includes:

a) The quality assurance records that are prepared in the quality assurance program shall include contents, such as the examination and inspection of the corrosion control engineering quality, the execution of the quality plan, and data analysis, which shall cover GB/T 33314-2016.

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