

SSPC: The Society for Protective Coatings

QUALIFICATION PROCEDURE NO. QN 1 Nuclear Supplement

Supplemental Procedure for Evaluating the Qualifications of Contractors (Field or Shop) for Coating Application of Surfaces in Nuclear Power Plants or Coating Application on Fabricated Components Installed in Nuclear Power Plants

1. Scope

- 1.1 This supplemental procedure describes a method for evaluating the primary qualifications of industrial coating contractors that perform work in nuclear power plant facilities and shop facilities that coat parts or components for installation in primary containment or other safety-related areas of light water nuclear power plants and defines a minimum standard for qualification.
- 1.2 This procedure encompasses:
 - 1.2.1 The field application of protective coatings for corrosion control and decontaminability of concrete, non-ferrous metal and steel surfaces in Service Level I and III areas of nuclear power plant facilities.
 - 1.2.2 The shop application of coatings for parts and components to be installed in Service Level I and III areas.
- 1.3 The requirements of this procedure are intended to supplement the requirements of SSPC-QP 1 (field application of steel surfaces) and SSPC-QP 8 (field application of concrete surfaces) or SSPC-QP 3 (shop painting in a fixed facility). Contractors seeking qualification to SSPC-QN 1 (Nuclear Coatings Supplement) must first be qualified in good standing to the appropriate core qualification (i.e. QP 1, QP 3 or QP 8) depending upon the type of coating work it performs.
- 1.4 Contractors or paint shops performing work in or for non-safety-related areas of nuclear power plants (i.e. Service Level II or balance of plant) shall be certified to the requirements of SSPC-QP 1, QP 3 or QP 8, as applicable.

2. Description

2.1 DEFINITIONS:

Contractor: a firm whose business is providing surface preparation and coating application and related services for corrosion control and

decontaminability of surfaces or installed components or structures in safety-related Service Level I and III areas of nuclear power plant.

Paint Shop Facility: a fixed facility where parts, components or structures to be installed in Service Level I and III areas of nuclear power plants are subjected to surface preparation, coating application and related services for corrosion control and decontaminability

Auditor: (NQA-1 definition)

Safety-Related Coating System: coating system used inside or outside of the reactor-containment, the detachment of which could adversely affect the safety function of a safety-related structure, system or component.

Coating Service Level I: term used to describe areas inside the reactor containment where coating failure could adversely affect the operation of post-accident fluid systems and, thereby, impair safe shutdown.

Coating Service Level II: term used to describe areas outside containment where coating failure could impair, but not prevent, normal operating performance; the function of Service Level II coatings is to provide corrosion protection and decontaminability in those areas outside the reactor containment subject to radiation exposure and radionuclide contamination. Service Level II coatings are not safety-related.

Coating Service Level III: term used to describe areas outside the reactor containment where coating failure could adversely affect the safety function of a safety-related structure, system or component.

Balance-of-Plant Coatings: coating systems in a nuclear facility that do not fall under the category of Coating Service Levels I, II or III.

Certification: written documentation of qualification.

Qualification: skills, training and experience required for personnel to perform properly the duties and execute the responsibilities of the appropriate certification level.

Training: program developed to ensure that personnel receive the knowledge and skills necessary for qualification.

Coating Work Inspection: phase of quality control that, by means of examination, observation or measurement, determines the conformance of coating work predetermined quality requirements.

Governing Documents: technical specifications, job-site procedures and reference documents.

Coating Applicator: organization or individual responsible for applying a protective or decorative coating.

Qualifying Agent: A designated representative of the owner or the coating organization, or both, having sufficient experience in the practical application and evaluation of coatings applied to steel surfaces of a nuclear facility.

Nonconformance: deficiency in characteristic, documentation or procedure that renders the quality of an item unacceptable or indeterminate.

Deviation: departure of a characteristic from established procedures or specified requirements.

2.2 Functions to be Evaluated:

This supplement identifies the following functional areas to be evaluated:

- Organization and Personnel
- Quality Assurance Program
- Procurement
- Control of Purchased Materials, Items and Services
- Document Control
- Technical Procedures
- Technical Capabilities
- Inspection
- Measuring and Test Equipment
- Handling, Storage, Shipping and Preservation
- Nonconformances and Corrective Actions
- Quality Assurance Records
- Job Quality Monitoring
- Training
- Audits

NOTE: Safety, Health and General Environmental Compliance requirements for fieldwork are evaluated in Qualification Procedure 1 or Qualification Procedure 8 and are not evaluated separately in this supplement. These items are not evaluated as part of Qualification Procedure 3 for fabrication or paint shops and will be evaluated for facilities coating components or structures for installation in safety-related areas.

3.0 Nuclear Supplement Qualification Requirements

3.1 Organization and Personnel:

3.1.1 The contractor shall identify general requirements and responsibilities for implementing the company's Quality Assurance Program.

a. Persons and organizations performing quality assurance functions shall have the authority to identify quality problems; to initiate, recommend or provide solutions; to verify the implementation of solutions; and to stop work based on quality problems.

b. The contractor's Quality Assurance Manager shall be responsible for defining the overall effectiveness of the QA Program, including:

- Periodic review, assessment and evaluation of the program
- Training and certification of inspection personnel
- Qualifying personnel to perform safety related surface preparation and coating activities
- Maintaining a Measurement & Test Equipment calibration program

3.1.2 The contractor is responsible to ensure that only those personnel within their organization that are certified in accordance with ASTM D4537 or other standards are permitted to perform coating work inspection activities.

3.1.3 Personnel performing coating work in Service Level I, II and III areas shall be qualified in accordance with applicable ASTM or other standards, as applicable for the work being performed.

3.2 Quality Assurance Program: The contractor shall establish and implement a Quality Assurance Program to assure that activities meet the requirements of ASME NQA-1 (or other standard as required by plant licensing commitments) and are in compliance with the customer's specification and quality assurance requirements.

3.2.1 The Quality Assurance Program shall provide for controls to assure that activities affecting quality of structures, systems and components are completed in accordance with approved procedures.

3.2.2 The implementation and verification of compliance with the specified procedures shall be properly documented, detailing the

work requirements, applicable specifications, in-process inspections and final QA approval.

3.2.3 The Quality Assurance Program shall provide for regular audits to assess the effectiveness of the Quality Assurance Program to assure that the program complies with applicable codes, standards and procurement document requirements.

3.3 Procurement Procedures: Procedures shall exist to control the procurement of materials and services for use in safety-related applications.

3.3.1 The contractor shall define the responsibilities for establishing measures by which Safety Related Purchase Orders are prepared, reviewed and approved.

3.3.2 The contractor is responsible for implementing measures to select, assess **and monitor** vendors including suppliers and calibration / test labs.

3.4 Document Control: Procedures shall exist to control the issuance and retrieval of the quality assurance manual, quality related instructions, procedures, documents, drawings and revisions.

3.4.1 The contractor shall establish the responsibility for implementing and maintaining document control activities.

3.4.2 The contractor shall identify the person responsible for document review, approval and distribution.

3.5 Control of Purchased Material, Items and Services: The contractor shall provide for the establishment of procedures to assure that purchased material, items and services that are quality related conform to the procurement documents.

3.5.1 The contractor shall establish and implement procedures for the receiving of safety-related materials used in Service Levels I and III coating work, including receipt inspection, identification/tagging, and storage requirements.

3.6 Technical Procedures: Procedures shall exist for converting awarded contracts into field work orders, job work plans, instructions to craft workers, etc.

3.6.1 The contractor is responsible for establishing measures for communicating specification requirements to field crews and their supervisors.

- 3.6.2 The contractor's quality control program shall contain work and inspection procedures that are written in accordance with applicable ANSI/ASTM standards and plant specifications.
- 3.6.3 Material storage procedures, where applicable, shall be included in the contractor's quality control program.
- 3.6.4 The contractor shall establish measures for the control of work activities using a work order or traveler.
- 3.6.5 The contractor shall establish measures for the control of shipping activities.
- 3.6.6 The contractor shall establish and implement procedures for the control, verification and calibration of measurement and test equipment.

3.7 Technical Capabilities: The contractor must employ qualified personnel (in accordance with applicable industry standards); have adequate technical resources; have suitable job conversion procedures; and have appropriate equipment, facilities and experience to perform nuclear coating work. To demonstrate technical capability, the contractor shall provide the following:

- 3.7.1 **Applicator Qualification:** The contractor shall have a written program for training, qualifying and evaluating the proficiency of applicators.
 - a. Field and shop applicators performing painting of steel surfaces in or for safety-related areas in a nuclear facility, unless otherwise specified by the plant owner, shall qualify in accordance with ASTM D4228, 'Standard Practice for Qualification of Coating Applicators for Application of Coatings to Steel Surfaces'.
 - b. Qualification of applicators performing work on concrete surfaces shall be in accordance with ASTM D4227, 'Standard Practice for Qualification of Coating Applicators for Application of Coatings to Concrete Surfaces'.
- 3.7.2 **Technical Resources:** The contractor shall maintain a library of current technical standards (e.g. ASTM, ANSI/ASME, NACE, plant specifications, technical bulletins, product data sheets, MSDS, and other references, as required).

NOTE: Older revisions of certain standards may be required to meet the requirements of a licensee's plant-specific quality assurance program and licensing commitments.

3.8 Inspection: The contractor shall establish and implement inspection procedures to meet specification requirements.

3.8.1 Criteria shall be established for determining when inspections are required and how and when inspections are to be performed.

3.8.2 Inspections shall be performed by personnel other than those responsible for the activity being inspected. These personnel shall be qualified and certified in accordance with the requirements of the contractor's Quality Assurance Program and applicable implementing procedures.

3.9 Measuring and Test Equipment (M&TE)

3.9.1 M&TE controls shall be established and implemented for the following:

- a. Labeling and identification of M&TE, including who performed the calibration.
- b. M&TE and standards are calibrated at periodic intervals.
- c. Standards are adequate to assure accuracy, stability, range and resolution required for their intended use.
- d. Primary and secondary standards used are traceable to the National Institute of Standards and Technology (NIST) or other recognized standards.
- e. As found and as left information is documented.
- f. Calibration history is documented.
- g. Control and documentation of M&TE found to be out-of-calibration, out-of-tolerance or past due for calibration.
- h. Calibration is performed in an environment that is controlled to the extent necessary to assure required accuracy.

3.10 Handling, Storage, Shipping and Preservation: The contractor shall establish and implement procedures to control handling, storage, shipping and preservation of materials and components.

3.10.1 The identity of quality related materials shall be maintained by labeling, tagging or other means to maintain control and traceability of items.

3.10.2 Storage areas shall comply with specified requirements.

3.10.3 Authority shall be established for the application and removal of identification markings / status controls.

3.10.4 Shelf life requirements for materials shall be defined and implemented.

3.10.5 For shop facilities, measures shall be established and implemented for the control of shipping activities, including packaging, marking, storing, status and shipment of items and components.

3.11 Nonconformances and Corrective Actions: The contractor shall establish requirements, methods and responsibilities for identifying, documenting, dispositioning and correcting nonconforming items.

The contractor shall establish and implement a corrective action procedure that shall be initiated following the detection of deficiencies to program or specification requirements.

3.12 Quality Assurance Records: The contractor shall establish the requirements and responsibilities for the generation, collection, storage and maintenance of those records determined to be quality assurance records.

Procedures shall be established to assure that sufficient records are maintained to furnish evidence of the quality of items and of activities affecting quality.

3.12.1 The retention period and disposition of records shall be identified.

3.13 Job Quality Monitoring: The contractor must demonstrate that it uses qualified personnel and proper inspection and recording procedures for job quality control.

3.13.1 Personnel Certification/Qualification: The contractor shall demonstrate that personnel performing quality control and related functions are trained and qualified in accordance with ANSI/ASME N45.2.6 or ASTM D4537 (as required by individual plant licensing

commitments) for safety-related coating inspection activities, including a certified Level III Inspector. The contractor must also employ a Quality Assurance Manager that meets the requirements of ANSI/ASME NQA-1.

3.13.2 Inspection Procedures and Recording Systems: The contractor shall demonstrate that:

- a. Applicable standards and plant specifications for coating inspection are available and used by inspection personnel.
- b. An implemented system for maintaining and filing complete and accurate daily in-process inspection reports, in accordance with ANSI/ASME NQA-1, is in place.
- c. Measurement and test equipment and calibration verification standards and procedures are in place and available and utilized by QC inspectors.
- d. Non-conforming conditions are documented.
- e. Non-conforming condition log is maintained to ensure work is identified and repaired or otherwise addressed by the owner.
- f. Company or contract specific procedures are in place for verifying that coating and related operations are performed in accordance with contract requirements.
- g. Procedures, inspection plans or travelers are used to ensure that each major operation is properly performed and documented in accordance with contract requirements and are available to site personnel.
- h. A procedure is used to document deviations from contract requirements and that deviation requests are processed through appropriate channels for review and approval.
- i. The contractor is responsible for implementing procedures for record retention of in-process and final inspection records retained in accordance with regulatory and plant specific requirements.

3.14 Training: The contractor shall demonstrate that they have established and implemented a method for the indoctrination and training of management and applicator personnel performing safety-related tasks as outlined in their quality assurance program, plant requirements and project specifications.

3.14.1 The contractor shall identify the responsibilities for establishing and implementing the training program.

3.14.2 The training program shall identify the scope of the training, including procedures, codes, standards, regulations and specification requirements for each job function.

3.14.3 The training program shall provide examinations for each training requirement.

3.15 Audit: The contractor shall establish and implement audit procedures to meet the following requirements:

- A system of planned and documented audits in accordance with established procedures and checklists.
- Development of audit plans to include areas to be audited, assignment of qualified personnel to perform the audit and the method of reporting deficiencies and recommendations.
- Persons performing audits shall have no direct responsibility in the areas being audited.
- Establishment of an audit schedule based on the length of the project.

4.0 Evaluation Sequence

4.1 SUBMITTAL OR WRITTEN APPLICATION PACKAGE: The initial step is to request an application form and instructions. The completed application form, along with an application fee and required submittals, shall be submitted to the qualifying agency.

4.2 REVIEW OF APPLICATION PACKAGE: The qualifying agency's certification manager shall review the contractor's application package using guidelines for evaluation established by the qualifying agency. The evaluation items are based on Section 3 above.

4.3 INITIAL AUDITING OF THE CONTRACTOR OR SHOP FACILITY: Subject to satisfactory evaluation and acceptance of the application package referred to above, and on dates mutually agreed upon by the contractor and the qualifying agency, the qualifying agency will visit the contractor's business office(s) to perform an audit. An audit will also be performed at a job site(s) where surface preparation and coating application is in progress on a steel, nonferrous metal or concrete structure or component (as applicable to the certification applied for). These audits will be performed to verify (through sampling) that the contractor's Quality Program (and Safety Program, when applicable) conform with the requirements of this standard procedure.

4.4 EXIT INTERVIEW: Following the audit, and before the auditor leaves the site, an exit or closing interview will be held with a supervisor and/or officer of the company. At the exit interview, the auditor will review findings with the contractor, including discussions of concerns, corrective actions or deficiencies and omissions, if any. A written list of deficiencies and omissions will be provided to a supervisor and/or officer of the company, who will be asked to confirm receipt of the list. Every attempt will be made by the auditor during the exit interview to fully explain audit findings. Failure of the

supervisor and/or officer of the company to acknowledge, in writing, receipt of the audit finding report will render the audit incomplete, and can result in suspension, revocation or denial of certification.

4.5 EVALUATION OF APPLICATION AND DETERMINATION OF STATUS: At the conclusion of the evaluation process, the auditor will report the findings to the qualifying agency's audit manager and program administrator, who will make the final decision regarding the contractor's status based on the following options:

4.5.1 Qualify: The qualifying agency has determined that the contractor has met or exceeded the requirements of the audit program. The qualifying agency will make final determination of the contractor's qualification status based on the audit findings and any disciplinary or other evaluation criteria defined in the program rules. Upon review of all information, the qualifying agency will issue a certificate identifying the contractor by name and by location of the contractor's home office acknowledging compliance with this procedure and other administrative requirements. Once certified to this standard, the contractor shall reapply for renewal of qualification annually and undergo any submittal reviews or audits required by the qualifying agency to maintain certification to this standard.

4.5.2 Withhold Qualification: Based on audit findings and other factors, the qualifying agency has determined that the contractor has not met the requirements of this standard procedure. If qualification is withheld, the qualifying agency shall formally notify the contractor of the reasons for withholding qualification. The contractor will be allowed up to 45 days after written notification to submit a corrective action plan acceptable to the qualifying agency, and request an audit to verify that nonconformities in the quality system have been identified, root causes have been analyzed and a formal corrective action plan has been implemented to update the quality plan to avoid repeating the system nonconformities that led to denial of qualification.

4.6 METHOD OF APPEAL: If a contractor disputes the audit findings, the contractor may appeal using the following steps of recourse:

- The contractor shall appeal to the qualifying agency's certification manager in writing within 10 working days after the exit interview, identifying the specific reasons for contesting the findings.
- The qualifying agency will evaluate the written appeal and notify the contractor of the evaluation results (in writing) and within 30 calendar days of receipt of the appeal submission. Appeal evaluations will result in either acceptance or denial of the appeal.

- If the contractor disputes denial of the appeal, the contractor can continue the appeal process by requesting an informal conference in writing and within 10 business days of an appeal denial. The time and location of the informal conference shall be determined by the qualifying agency.
- In the event the foregoing steps fail to resolve the dispute, a mutually agreed-upon arbitration panel consisting of three persons (one person chosen by the contractor, one by the qualifying agency, and one agreed upon by both parties) with knowledge of protective coating operations will convene to hear evidence and make a final, binding decision. If the arbitration panel finds for the contractor, the cost of all fees and expenses of the arbitration will be shared by the contractor and the qualifying agency. If the arbitration panel does not find for the contractor, the contractor will be responsible for payment of all fees and expenses. Any other costs incurred by any party to the dispute will be borne by that party.

4.7 RECONFIRMATION OF QUALIFICATION:

- 4.7.1 **Internal Audit:** The contractor shall, at its own expense, perform at least one annual audit of its Quality System, based on the requirements of the standard procedure, following initial qualification. The results of this internal audit shall be retained on file by the contractor and made available to the auditor upon request during any announced or unannounced external qualifying agency audits.
- 4.7.2 **Reconfirmation of Qualification – Owner Comments:** Owners for whom the contractor performs work will be given an opportunity to comment on the qualified contractor's performance by completing an owner comment form provided by the qualifying agency. Comments will be in the form of replies to specific questions asked of owners regarding performance on specific jobs. All owner replies will be treated as confidential.

4.8 REVOCATION: Failure to satisfactorily complete the annual internal audit, pass announced or unannounced external audit(s), cooperate with the auditor or qualifying agency manager, or adhere to disciplinary or administrative criteria established by the qualifying agency will be cause for suspension, revocation or denial of certification.

4.9 QUALIFICATION PERIOD: The qualifying agency will require that the contractor's qualification be reaffirmed annually subject to successful completion of internal or external audits (or both) as well as compliance with administrative and disciplinary requirements. External audits may be conducted at the contractor's office and/or active job site at the qualifying agency's discretion.

4.10 QUALIFYING AGENCY FILES: The qualifying agency will maintain a

published list of certified contractors. Information submitted by owners and users who have used the contractor's services will also be maintained. This information will assist in the validation process during the certification term.

All information gathered will be used only for purposes intended. Information determined to be proprietary, such as audit findings and other non-public information, will be treated as confidential.

5.0 Disclaimer

- 5.1** While every precaution is taken to ensure that all information furnished in SSPC guides and standards is as accurate, complete and useful as possible, SSPC cannot assume any responsibility, nor incur any obligation resulting from the use of any materials or methods specified therein, or of the procedure itself.
- 5.2** This procedure does not attempt to address all problems concerning safety and health associated with its use. The user of this procedure, as well as the user of all products or practices described herein, is responsible for instituting appropriate health and safety practices and for ensuring compliance with all governmental regulations.

6.0 Rating Criteria

The SSPC auditor rates the contractor on all applicable* evaluation items. Only findings rated 1 or 2 are reported on the deficiency schedule, which is given to the auditee at the exit interview. Lack of a finding for an evaluation item means that the auditor rated it '3', or did not rate the item.

*More items are evaluated on initial and full audits that are evaluated on maintenance, spot-check or corrective action follow-up audits.

The ratings and their meaning are listed below:

A rating of '1', (a.k.a. a major CAR or deficiency) indicates that a) the required training, written program, practice or procedure is non-existent; b) the required training or written program is inadequate; or c) the required practice or procedure has not been in place for the minimum amount of time (six consecutive production months) or it has been in place sporadically (e.g. less than 2/3 implemented).

Important Note: Typically, auditors will not issue major deficiencies for isolated breakdowns in a contractor's Quality System. However, there are exceptions. For example, auditors will issue a rating of '1' when they observe one or more safety violations or safety hazards that could result in an injury or serious incident. An obvious example would be a person working without appropriate fall protection as required by the contractor's safety and health plan and/or governing regulations. Auditors will also issue a rating of '1' if they discover one or more unauthorized deviations from contract requirements or deviations from good painting practices found in the paint shop, shipyard or field job site.

A rating of '2', (a.k.a. a minor CAR or deficiency) indicates the training or written program is adequate but requires minor revision. Examples include a practice or procedure that is in place with isolated instances of nonconformance (no more than 1/3 of the time), lack of practice or documentation due to personnel turnover,

nonconformance by field personnel, personal hardship and natural disaster.

A rating of '3' indicates that a contractor, based on audit sampling, consistently adheres to specific training and written program requirements, and required practices and procedures consistently meet the letter of the standard. When there are no audit findings, it means that all items evaluated during the audit were rated '3'.

Corrective Action Report

A Corrective Action Report (CAR), using the SSPC CAP form found on the SSPC website (<http://sspc.org/certification/PCCP/CAPinfo.html>), is required for each major deficiency (rating of '1') found by the auditor. Remedial action for a Major CAR requires the submission of a corrective action report followed by an on-site audit to confirm that the contractor has corrected the deficiency and implemented the corrective action plan submitted.

Remedial action for a Minor CAR requires that the auditor confirm remediation at the next audit. Minor CARs that are not remediated by the contractor by the next audit shall turn into a Major CAR or deficiency.

NOTE: Initial audits require corrective action report submission for all deficiencies cited (major or minor).

Concerns- Occasionally, the auditor will note a 'concern' on an audit report. A concern is not a rating. It is a statement for the contractor to consider for its own business purposes. No response is required for a 'concern'.