



ASTM INTERNATIONAL
Manual

Maintenance Coatings for Nuclear Power Plants 2nd Edition



Compiled by ASTM Subcommittee D33.10 on Protective Coatings
Maintenance Work for Power Generation Facilities

Maintenance Coatings for Nuclear Power Plants—2nd Edition

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Foreword

THIS PUBLICATION WAS sponsored by ASTM Committee D33 on Protective Coating and Lining Work for Power Generation Facilities. Its creation and maintenance is the responsibility of Subcommittee D33.10 on Protective Coatings Maintenance Work for Power Generation Facilities. This subcommittee is composed of representatives from various organizations involved with manufacturing, specifying, applying, and using protective coatings to control corrosion and erosion issues in nuclear power facilities. Subcommittee members include individuals from utilities, architects/engineers/constructors, coating inspection service providers, and other interested parties. The first edition was originally published in December 1990.

In the 1990s and early 2000s, numerous changes evolved with regard to nuclear power coatings. Operating experience, lessons learned, and regulatory changes have resulted in many changes to the way nuclear power plant coatings are selected, evaluated, applied, monitored, and repaired. Due to the magnitude of these changes, Subcommittee D33.10 felt it was prudent to revise this publication to reflect those changes. The information presented herein reflects a consensus of the subcommittee members of D33.10 as of 22 May 2015.

This manual was prepared to address a need perceived by ASTM Committee D33 for guidance in selecting and applying maintenance coatings in nuclear plants but is not to be considered a standard. In addition to serving as that source of guidance, this document has the equally necessary role of acting as a focal point for a rapidly changing technology. While Subcommittee D33.10 considers the information contained in this manual to be state of the art, the book offers limited historical data upon which to establish detailed requirements or methodologies. Accordingly, the user will find this edition rather general. The details of these practices are found in the various cited standards and standard guides referenced throughout and listed in the appendix. ASTM Standard **D4538**, "Standard Terminology Relating to Protective Coating and Lining Work for Power Generation Facilities," contains the definitions of the terms used in this publication.

This manual does not purport to address all the safety concerns, if any, associated with the use of the referenced standards. It is the responsibility of the user of this manual to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

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Acronyms

| | |
|---------|---|
| 3M | Minnesota Mining and Manufacturing |
| ABWR | Advanced boiling water reactor |
| ALARA | As low as reasonably achievable |
| ANSI | American National Standards Institute |
| ASTM | ASTM International (formerly American Society for Testing and Materials) |
| BWR | Boiling water reactor |
| CFR | Code of Federal Regulations |
| CSL I | Coatings Service Level I |
| CSL II | Coatings Service Level II |
| CSL III | Coatings Service Level III |
| DBA | Design basis accident |
| DSC | Digital still camera |
| ECCS | Emergency core cooling system |
| EPA | Environmental Protection Agency |
| EPRI | Electric Power Research Institute |
| ESS | Engineered safety system |
| FME | Foreign material exclusion |
| FSAR | Final safety analysis report |
| GC | Gas chromatograph |
| HEPA | High efficiency particulate air |
| HP | Health physics |
| HPWC | High pressure water cleaning |
| HVAC | Heating, ventilation, and air conditioning |
| LOCA | Loss of coolant accident |
| LOTO | Lockout/tagout |
| LPWC | Low pressure water cleaning |
| MOS | Maximum operating speed |
| MP | Magnetic particle testing |
| NACE | NACE International (formerly National Association of Corrosion Engineers) |
| NFPA | National Fire Protection Association |
| NIOSH | National Institute of Occupational Safety and Health |
| NIST | National Institute of Standards and Technology |
| NPP | Nuclear power plant |
| NRC | Nuclear Regulatory Commission |

| | |
|------------|---|
| OSHA | Occupational Safety and Health Administration |
| PA | Protected area |
| PC | Protective clothing |
| PT | Penetrant (dye) testing |
| PWR | Pressurized water reactor |
| QA | Quality assurance |
| QC | Quality control |
| RCA | Radiological controlled area |
| Reg. Guide | Regulatory guide |
| RHR | Residual heat removal |
| ROS | Recommended operating speed |
| RT | Radiographic testing |
| SAR | Safety analysis report |
| SSC | System, structure, or component |
| SSPC | The Society for Protective Coatings (formerly Steel Structures Painting Council) |
| TTP | Time temperature pressure |
| UHPWC | Ultra-high pressure water cleaning |
| UT | Ultrasonic test |
| VOC | Volatile organic compound |
| WJ | Water jetting |

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