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SCHWENCER,A. Licensing Branch 2

SUBJECT: Forwards revised FSAR Section 6.1.2 re unqualified organic coating on misellaneous equipment inside drywell.

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July 7, 1982
G02-82-582
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Docket No. 50-397

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Schwencer:

Subject: NUCLEAR PROJECT NO. 2
WNP-2 CONTAINMENT PROTECTIVE COATINGS

Reference: Letter G02-82-287, G.D. Bouchey (SS) to
A. Schwencer (NRC), Same Subject, dated March 3, 1982

The reference letter indicated there is an estimated 49 square feet of unqualified organic coating inside the drywell. A recent evaluation indicates there is approximately 5,000 square feet of coating on miscellaneous equipment and components in the drywell, which has not been qualified in accordance with ANSI N101.2 and ANSI N101.4 requirements. The original evaluation assumed that these components in the drywell would be recoated. Subsequently, the Supply System has concluded that this limited amount of unqualified coating on miscellaneous equipment does not pose a safety hazard. The attached revision to FSAR Section 6.1.2 documents this additional quantity of unqualified coating, and updates other information in this section.

Very truly yours,

G. D. Bouchey
Deputy Director, Safety and Security

CDT/jca
Attachment

cc: R Auluck - NRC
WS Chin - BPA
R Feil - NRC Site

B001

The quality of water stored in the condensate storage tanks is maintained as follows:

Conductivity*	1 umho/cm at 25°C
Chlorides (as Cl)	0.05 ppm
pH*	6 to 8 at 25°C
Boron (as BO_3)	0.1 ppm

The suppression pool is initially filled with high purity water of the above quality from either the condensate storage or demineralized water make up system. The chloride concentration in the suppression pool water is originally maintained at less than 0.5 ppm Cl. To maintain suppression pool water quality, provision is made for periodic filtration and demineralization using the fuel pool filter demineralizer, or via blowdown and reprocessing through the radwaste treatment system.

Since the water quality of the coolants for the ESF systems is controlled, stress corrosion cracking of austenitic stainless steel components and corrosion of containment metals is minimized during a loss-of-coolant accident.

To minimize corrosive attack during long term storage the condensate storage tanks are epoxy lined and the suppression pool surfaces are lined with an epoxy coating (See 6.1.2).

6.1.2 ORGANIC MATERIALS

Significant quantities of organic materials that exist within the primary containment consist of cable insulating material, motor insulation material and coatings for containment surfaces, equipment and piping.

Electric power cables for high voltage service, 6,900 volt, are manufactured by the Okonite Company. Cable insulations are EPR (Okoguard), a thermosetting ethylene-propylene elastomer. Cable jackets over insulation are flame-retardant neoprene rubber.

Electric cables, rated 1000 volts and below for low voltage power, control and instrumentation purposes, are manufactured by Raychem Corporation. Insulation and jacket material are Flamtrol, a radiation cross-linked polyolefin. Insulation material is an extruded, thermally stabilized, highly flame-retardant, noncorrosive, radiation cross-linked polyolefin. Jacket material is an extruded, thermally and sunlight (ultraviolet) stabilized, highly flame-retardant, noncorrosive, radiation-crosslinked polyolefin.

* Conductivity and pH limits apply after correction for dissolved CO_2.

Six types of electric cables manufactured by the Raychem Corporation are specifically designed for use in the containment.

Five of these cables have dual or triple insulations over flexible stranded copper conductor. The first insulation is alkane-amide polymer which retains high strength under high temperature conditions. The second and third insulations are cross-linked, radiation resistant polyolefin. Cable jackets are flame-retardant, noncorrosive, cross-linked polyolefin. The remaining cable has a single cross-linked, radiation resistant polyolefin insulation over a solid copperclad steel conductor and the same type of jackets as described for the five cables above.

All power and control cables are designed for a 40-year life plus a loss-of-coolant accident (LOCA) requiring radiation resistance of 200 megarads with no breakdown in dielectric resistance. Environmental tests on samplings of these power and control cables indicate the insulations and jackets meet the radiation and thermal requirements of the primary containment environment.

Electric motors for pump and valve operators are insulated with Class B silicone synthetic elastomer insulation. Motors for the reactor recirculating pumps and drywell fan coil units contain small quantities of lubricating oil. Control lines for the hydraulically operated recirculation system flow control valves contain small quantities of hydraulic fluid. Motor-operated valve bearings are grease lubricated.

Equipment, piping, and primary surfaces are provided with various coatings including galvanized zinc and aluminum. The amount of hydrogen liberated from zinc paint, galvanize, radiolytic and/or thermal decomposition of organic materials, in total, is below the safe level of the hydrogen recombiner capacity to be able to cope with in the event of a postulated loss-of-coolant accident. No hydrogen will be liberated from aluminum during a postulated loss-of-coolant accident. Other coatings consist of the following:

a. Drywell

The containment vessel in the drywell is coated with one prime coat Dimetcote 6 (Inorganic zinc) and a coat of Ameron 90 (modified phenolic epoxy) finish.

c. ~~Sacrificial Shield Wall~~, Miscellaneous Steel, Mechanical Equipment and Low Temperature Piping (70° to 350°F).

The subject surfaces are coated with a prime coat of Keeler and Long 7107 epoxy primer and one coat of Keeler and Long 7475 epoxy finish. ~~Coatings previously applied to the sacrificial shield wall which have been damaged during construction will be removed by sandblasting. Surfaces treated this way will not be recoated.~~ Det

d. Diaphragm Floor

The diaphragm floor between the wetwell and drywell is coated with Keeler and Long 6548 epoxy primer, 6548 tinted, and 7475 epoxy enamel finish coat.

e. Suppression Chamber (Wetwell)

1) The vessel above the water level from elevation 472'-0" is coated with one coat of Dimetcote 6 (inorganic zinc). Insert ①

2) The vessel below elevation 472'-0" to the concrete floor is coated with two coats of Amercoat 90 (modified phenolic epoxy).

3) All structural steel and seismic bracing below elevation 472'-0" is coated with two coats of Amercoat 90.

4) All structural steel and bracing above elevation 472'-0" is coated with either one coat of Dimetcote 6 or two coats of Amercoat 90.

5) The downcomer external surfaces below elevation 472'-0" and all internal surfaces are coated with two coats of Amercoat 90. The downcomer external surfaces above elevation 472'-0" are coated with either one coat of Dimetcote 6 or two coats of Amercoat 90.

6) The concrete pedestal, concrete columns and concrete floors are coated with a multi-coating (3/16" maximum thickness) of Nu-Klad 110 AA epoxy surfacer followed by two coats of Amercote 90. At concrete and steel interfaces and at concrete floor/column interfaces, the above system will include fiberglass cloth to add coating strength.

f. High Temperature Piping and NSSS Vendor Equipment and Piping

This equipment was coated with corrosion resistant metal primers and finish coats suitable for the environmental conditions of the component or piping.

g. Stainless Steel Piping and Components

Stainless steel piping and components have no protective coatings.

In general protective coatings, except NSSS vendor supplied equipment and valve contracts placed prior to issuance of Regulatory Guide 1.54 Rev. 0, 6/73, have been applied in accordance with the guidelines included in ANSI N101.4-1972, "Quality Assurance for Protective Coatings Applied to Nuclear Facilities". In addition, the coatings used meet the requirements of ANSI N101.2-1972 for the design basis accident and are resistant to an integrated radiation exposure of 5. to 7.8 x 10^9 rads from a cobalt 60 source at an intensity of 6 x 10^5 rads/hr. Insert (2)

In repairing protective coating surfaces the maximum total coating thickness is in accordance with the manufacturers recommendations. Film thickness is checked using a non-destructive dry film thickness gauge. Repair areas are tested for pin holes and holidays with a nondestructive holiday detector of less than 100 volts, such as Tinker and Razor Model M-1.

6.1.3 POST-ACCIDENT CHEMISTRY

Since the water chemistry conditions of the reactor coolant are similar to suppression pool water with the exception being the addition of activation, corrosion, and fission products no appreciable pH changes are expected to occur.

There are no soluble acids and bases within the primary containment.

environmental controls during a LOCA. All equipment required to mitigate the consequences of an accident is designed to perform the required functions for the required duration of time in the accident environment. The equipment accident environment is listed in Table 3.11-2.

Reflective metal insulation, manufactured and installed in panels, is used exclusively within the primary containment.

The panels used for the pipes are typically 2 feet long, 3" - 4" thick, and cover half of the pipe's circumference. These panels have 24 gauge stainless steel sheets which fully encase the 6 mil aluminum sheets. The panels used for the RPV are larger, typically 2' x 6', and are encased by 18 gauge stainless steel.

All panels on piping covering areas which require inservice-inspection, such as welds, are fastened by quick release buckle bands. Non-removable insulation panels around pipes are fastened, one to another, using self taping screws.

The fasteners have been designed to be weaker than the panels; and therefore, it is postulated that some panels near a pipe break will be blown away but that the panels themselves will not be sheared open.

The blown off panels constitute ~~the only~~ a credible debris source within the primary containment following a LOCA and seismic event. All equipment within the primary containment, if not designed to Seismic I standards, is at least supported so as to remain fastened during a seismic event.

Large pieces of debris are not considered to have deleterious effects on the containment systems. The grating (see Figure 6.2-24) at the 501'-0" elevation, which covers approximately 80% of primary containment cross sectional area, would stop the majority of the loose insulation panels. Any of the remaining panels could be pressed against the outer perimeter of the jet deflectors, but it is not considered credible that the panel could enter the actual downcomer vent. Partial blockage of several jet deflectors would have an insignificant effect on the containment vent system.

b. Concrete Reactor Pedestal in the drywell

The reactor pedestal is coated with a prime coat of Keeler and Long 6548 epoxy primer (lead free), a coat of Keeler and Long 6548S epoxy surfacer in thickness required to produce a smooth surface, and a coat of Keeler and Long 7475 epoxy finish.

Insert 1:

Approximately 4000 ft.^{2} of this coating does not meet ANSI N101.4 requirements because of damage. This coating will not be a source of debris which can clog emergency cooling suction strainers because it fails as a finely divided particle small enough to pass through the strainers.

Insert 2:

Certain items of equipment in the drywell have been coated with unqualified organic paint. There are an estimated 5000 square feet of unqualified organic paint in the drywell. Under certain post-accident conditions, the unqualified organic paint could fail in flakes and, therefore, has been evaluated as a potential source of debris which can clog emergency cooling suction strainers. This is determined not to be a safety problem since: (1) the total amount of paint involved is small; (2) it is unlikely that all paint would fail simultaneously; (3) it is unlikely that a significant portion of paint flakes would be transported to the suppression pool because of the tortuous path flakes would follow; (4) suction strainers are located neither at the bottom nor near the pool water surface so that sinking or floating particles would not clog them; low approach velocities would minimize suspended particle migration toward the strainers; and, (5) the emergency core cooling system analyses are performed assuming 50% clogging of strainers.