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Ameron

Protective Coatings
Division

Allegation?
Archib

Date: March 7, 1984

RADIATION AND DBA TESTING
OF DIMETCOTE 6 REPAIRED
AND TOUCHED UP WITH
DIMETCOTE 6

NAME: _____

*Rec'd
4/6/84 @BNK*

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GARDE85-59 PDR

STATEMENT FROM OAK RIDGE
ON PROCEDURES USED IN THEIR EVALUATION

Manufacturer: Bechtel/3M
Saint Paul, Minnesota

Analytical Chemistry Division
Oak Ridge National Laboratory
Date: October 10, 1979

Report of Irradiation and DBA Testing

The irradiation and design basis accident (DBA) tests are conducted, respectively, in accordance with Bechtel Corp. *Standard Specification Coatings for Nuclear Power Plants*, specs. CP-951 and CP-956 (or with modifications as noted in Table 2, DBA test conditions). The tests are designed to meet the specifications set in both A.N.S.I. report N 101.2-1972, *Protective Coatings (Paints) for Light Water Nuclear Reactor Containment Facilities*, and N 5.12-1974, *Protective Coatings (Paints) for the Nuclear Industry*. The DBA test spray solution and the test conditions are listed in Tables 1 and 2. After both the DBA and the irradiation tests, the coatings are examined for signs of chalking, blistering, cracking, peeling, delamination, and flaking, according to ASTM standards where applicable. All test panels are returned to the coating manufacturer.

The irradiation tests are run using a spent fuel assembly, removed from the High-Flux Isotope Reactor (HFIR) at ORNL, as the source of radiation. These fuel assemblies are stored under 20 feet of demineralized water. The fuel is 93% enriched U^{235} as U_3O_8 combined with aluminum. The spent fuel assemblies are removed after each 23-megawatt day period. Irradiation is done using the gamma energy from the accumulated mixed fission products. This more readily simulates conditions around a reactor than does a cobalt source. Also, the higher gamma activity affords shorter irradiation time to achieve accumulated doses. The dose rate four days after removal of a fuel assembly from the reactor is 1×10^8 rads/hr.

The fuel assembly is 20 inches high. A 20-foot long, 3-1/2-inch diameter pipe, with one end capped, is used for the air irradiation tests. The capped end is lowered into the four-inch opening of the center of the fuel assembly. The open end, above the water level, is covered with an "O" ring sealed flange to which is attached a steel cable and an air outlet hose. The air inlet is located at the bottom of the pipe. The test specimens are connected to the bottom of the cable and lowered into the radiation field. Also at the center of the fuel assembly is a stainless steel clad cadmium tube used as a neutron absorber. This prevents contamination of the test specimens by induced radiation.

Evaluated

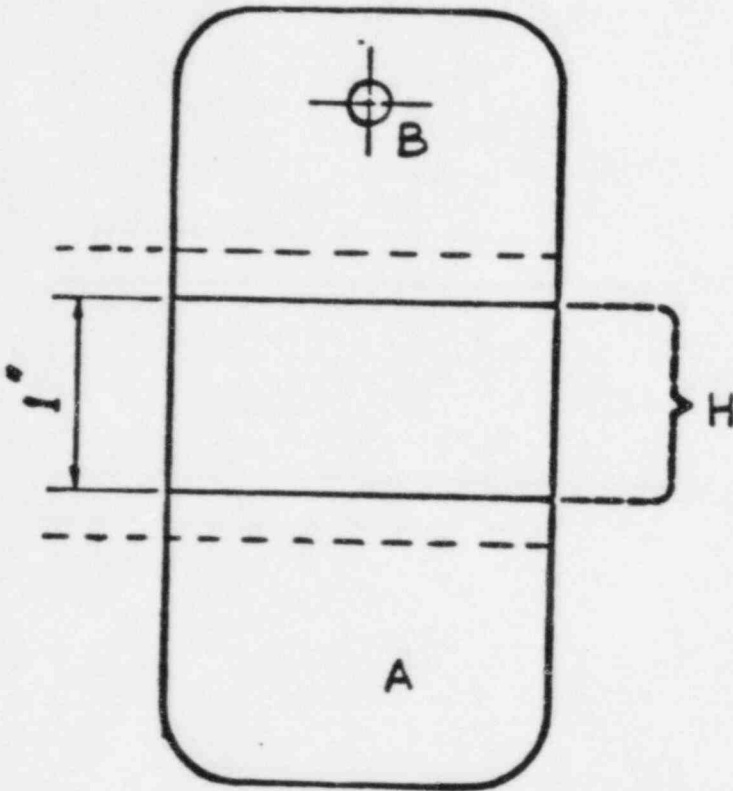
Approved

Ralph F. Apple
L. T. Corbin

DBA AND RADIATION TOLERANCE

TEST PANEL PREPARATION DATA

PANEL ID# 811

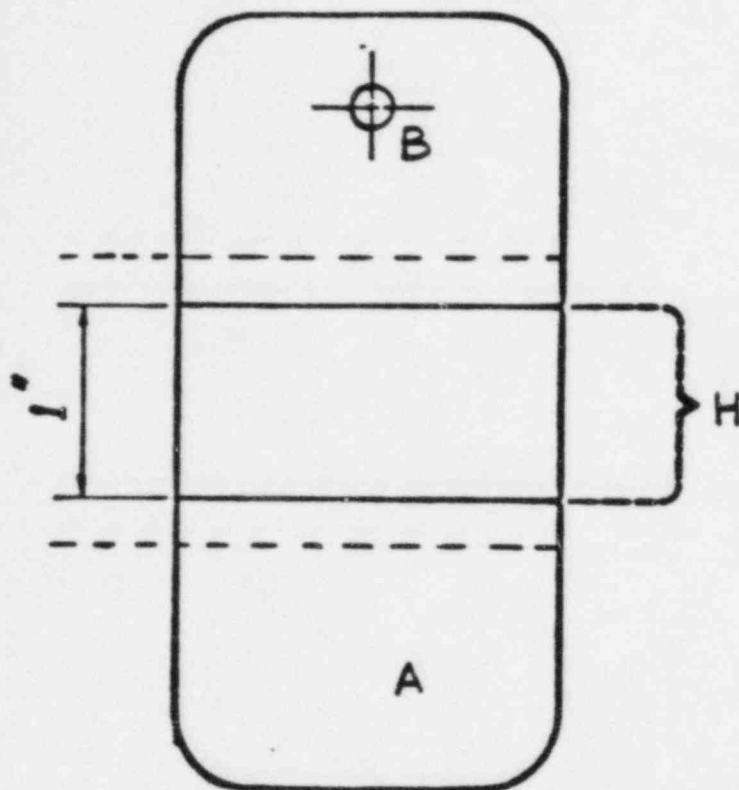


	COATING MATERIAL	DFT*
A.	Ameron D6N	4.0
B.	Ameron D6N	4.0
T. U.	Ameron D6N	3.1
F.	None	---

1. ABRASIVE BLAST TO SSPC-SP10 WITH A PROFILE FROM 1.5 TO 3.0 MILS.
2. APPLY THE INDICATED PRIMER TO DESIGNATED AREA OF PANEL. (NO PRIMER IS TO BE APPLIED TO CENTER SECTION H.)
3. ALLOW BARE AREA H TO RUST.
4. PHOTOGRAPH PANEL AT THIS POINT.
5. POWER TOOL CLEAN RUSTED AREA OF PANEL USING THE CLEAN AND STRIP WHEEL AND/OR DISC FOLLOWED BY THE ROTO PEEN WHEEL (MANUFACTURED BY 3M COMPANY.)
6. PHOTOGRAPH PANEL AT THIS POINT.
7. COAT THE PREPARED AREA WITH THE INDICATED TOUCH-UP COATING MATERIAL (TU).
8. PHOTOGRAPH PANEL AT THIS POINT.
9. APPLY INDICATED FINISH COAT ONTO AREAS A, B AND H.
10. PHOTOGRAPH PANEL AT THIS POINT.

* ACTUAL - AVERAGE OF TWO OR MORE READINGS


										BECHTEL LOS ANGELES	
										GEORGIA POWER COMPANY ALVIN W. VOSTLE NUCLEAR PLANT	
										DBA REPAIRABILITY TEST PANELS	
										DATE	SCALE
REVISIONS	DATE	BY	CHK	APPV	DES	CHK	P.E.	P.A.E.	JOB NO. 9816	811	



	COATING MATERIAL	DFT*
A.	<u>Ameron D6N</u>	<u>3.8</u>
B.	<u>Ameron D6N</u>	<u>3.8</u>
T. U.	<u>Ameron D6N</u>	<u>3.2</u>
F.	<u>None</u>	<u>---</u>

1. ABRASIVE BLAST TO SSPC-SP10 WITH A PROFILE FROM 1.5 TO 3.0 MILS.
2. APPLY THE INDICATED PRIMER TO DESIGNATED AREA OF PANEL. (NO PRIMER IS TO BE APPLIED TO CENTER SECTION H.)
3. ALLOW BARE AREA H TO RUST.
4. PHOTOGRAPH PANEL AT THIS POINT.
5. POWER TOOL CLEAN RUSTED AREA OF PANEL USING THE CLEAN AND STRIP WHEEL AND/OR DISC FOLLOWED BY THE ROTO PEEN WHEEL (MANUFACTURED BY 3M COMPANY.)
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9. APPLY INDICATED FINISH COAT ONTO AREAS A, B AND H.
10. PHOTOGRAPH PANEL AT THIS POINT.

* ACTUAL - AVERAGE OF TWO OR MORE READINGS

										 DECHTEL LOS ANGELES	
										GEORGIA POWER COMPANY ALVIN W. VOSTLE NUCLEAR PLANT	
										DBA REPAIRABILITY TEST PANELS	
										SERIAL NO.	
										DATE	
										SCALE:	DRAWING NO.
										JOB NO. 9818	831

SAMPLE IDENTIFICATION
AND
SPECIFIC TEST DESIGNATION

<u>Sample No.</u>	<u>Primer/Touch-Up</u>	<u>Test Designation</u>
811	Dimetcote 6/Dimetcote 6	Radiation & DBA
821	Dimetcote 6/Dimetcote 6	DBA
831	Dimetcote 6/Dimetcote 6	Radiation & DBA
841	Dimetcote 6/Dimetcote 6	DBA

RADIATION TOLERANCE TEST RESULTS

Manufacturer Bechtel/3M
Saint Paul, Minnesota
Report Number TRC-089-03

Analytical Chemistry Division
Oak Ridge National Laboratory
Date October 10, 1979
Page 41 of 48

System Identification^a

x Steel panel

Concrete block

GR - Inorganic Zinc D-6
PT - Inorganic Zinc Touch-Up D-6
No finish

Radiation Tolerance Test Results

ORNL Master Analytical Manual Method No. 2 0921, Bechtel Corp. Spec. No. CP-951
ORNL Log Book No. A 7562; A8-23-9

Initial dose rate 1×10^7 rad/h

Test conducted in x air water

Sample No.

Cumulative dose rate 2×10^8 rads: comments

811

Coatings intact, no defects all areas. 4.0 / 2.1

831

Coatings intact, no defects all areas. 3.1 / 3.2

^aGR = grit blast cleaning; PT = power tool cleaning; SW = solvent wash cleaning.

Evaluated

Ralph F. Apple

Approved

L.T. Cochran

DBA TEST RESULTS

Manufacturer Bechtel/3M
Saint Paul, Minnesota
ORNL Log Book No. A7562; A8-31-9

Analytical Chemistry Division
Oak Ridge National Laboratory
Date October 10, 1979

Table 1. DBA solution composition, distilled water

Solution A: 0.28 M boric acid (3000 ppm boron)
Adjusted to pH 10.5 with sodium hydroxide
Solution B: 0.28 M boric acid (3000 ppm boron)
Adjusted to pH 8.5 with sodium hydroxide

Table 2. DBA test conditions^a

Time	Temperature (°F)	Pressure (psig)	Comments
Start			Autoclave preheated.
10 seconds	307	60	Steam injected.
2 minutes	307	60	
20 seconds	310	60	Spray solution A added at 310°F.
5-minute recovery	310-307	62-60	
64 minutes	307	60	
20 seconds	282	52	Spray solution B added at 260°F after draining autoclave.
5-minute recovery	282-307	60	
167 minutes	307	60	
15 minutes	307-250	30	Temperature and pressure reduced via cooling coil.
4 days	250	30	Pressure adjusted with N ₂ .
20 seconds	180	-7	Fresh spray solution B added at 75°F after draining autoclave.
15 minutes	180-200	10	Pressure adjusted with N ₂ .
3 days	200	10	
End of test			

^aThe above data are taken from recorder charts on permanent file at ORNL.

Evaluated

Ralph L. Apple

Approved

Luigi Corbino

Manufacturer Bechtel/3M
Saint Paul, Minnesota
Report Number TRC-089-03

Analytical Chemistry Division
Oak Ridge National Laboratory
Date October 10, 1979
Page 41 of 48

System Identification^a

x Steel panel Concrete block

GR - Inorganic Zinc
PT - Inorganic Zinc Touch-Up
No finish

DBA Test Results

ORNL Master Analytical Manual Method No. 2 0922
ORNL Log Book No. A 7562; A8-31-9

<u>Sample No.</u>	<u>DBA phase</u>	<u>Comments</u>
811 ^b	spray	Coatings intact, no defects all areas.
821	spray	Coatings intact, no defects all areas.
831 ^b	spray	Coatings intact, no defects all areas.
841	spray	Coatings intact, no defects all areas.

^aGR = grit blast cleaning; PT = power tool cleaning; SW = solvent wash cleaning.

^bIrradiated.

Evaluated Ralph L. Apple
Approved L. T. Coshin

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Post Office Box 1020
Brea, California 92621
(714) 525-1951 Telex: 655342

Helington

Ameron
Protective Coatings
Division

Date: March 7, 1984

RADIATION AND DBA TESTING
OF DIMETCOTE 6 REPAIRED
AND TOUCHED UP WITH
DIMETCOTE 6

NAME: _____

STATEMENT FROM OAK RIDGE
ON PROCEDURES USED IN THEIR EVALUATION

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Analytical Chemistry Division
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Date: October 10, 1979

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Evaluated

Approved

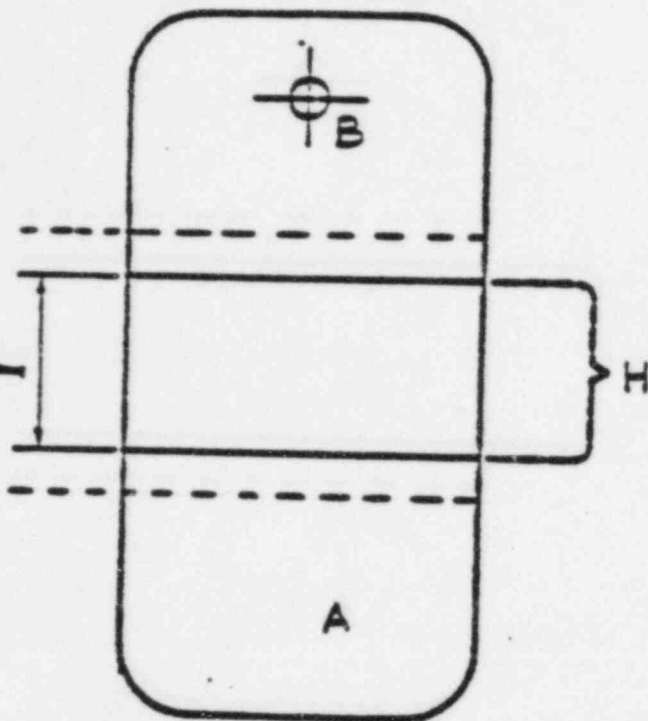
Ralph L. Apple
L. T. Conner

DBA AND RADIATION TOLERANCE

TEST PANEL PREPARATION DATA

THIS DRAWING AND THE DESIGN IT SHOWS ARE THE PROPERTY OF BECHTEL. THEY ARE LOANED TO YOU BY THE CONTRACTOR'S ENGINEER. YOU ARE NOT TO REPRODUCE, ADAPT, REUSE, OR DISSEMINATE IT IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF BECHTEL. IT IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR ANY OTHER PURPOSE.

PANEL ID# 811



COATING MATERIAL DFT*

A.	AMETON D6N	4.0
B.	AMETON D6N	4.0
T. U.	AMETON D6N	3.1
F.	None	—

1. ABRASIVE BLAST TO SSPC-SP10 WITH A PROFILE FROM 1.5 TO 3.0 MILS.
2. APPLY THE INDICATED PRIMER TO DESIGNATED AREA OF PANEL. (NO PRIMER IS TO BE APPLIED TO CENTER SECTION H.)
3. ALLOW BARE AREA B TO RUST.
4. PHOTOGRAPH PANEL AT THIS POINT.
5. POWER TOOL CLEAN RUSTED AREA OF PANEL USING THE CLEAN AND STRIP WHEEL AND/OR DISC FOLLOWED BY THE ROTO PEEN WHEEL (MANUFACTURED BY 3M COMPANY.)
6. PHOTOGRAPH PANEL AT THIS POINT.
7. COAT THE PREPARED AREA WITH THE INDICATED TOUCH-UP COATING MATERIAL (TU).
8. PHOTOGRAPH PANEL AT THIS POINT.
9. APPLY INDICATED FINISH COAT ONTO AREAS A, B AND H.
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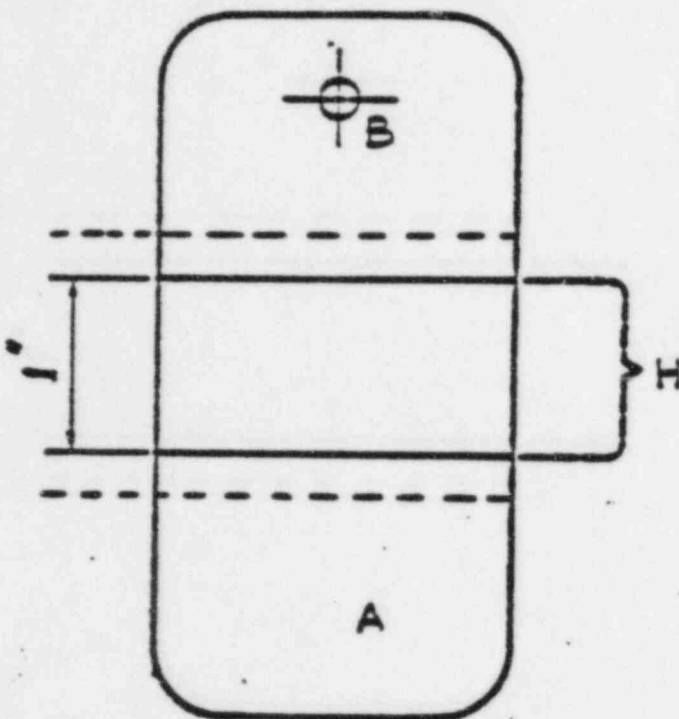
* ACTUAL - AVERAGE OF TWO OR MORE READINGS

BECHTEL LOS ANGELES			
GEORGIA POWER COMPANY WYNN W. VOGLTLE NUCLEAR PLANT			
DRA REPAIRABILITY TEST PANELS			
DATE	SCALE	DRAWING NO.	REV.
		811	

SEE A 811

PANEL ID# 831

	COATING MATERIAL	DFT*
A.	ARMSTRONG D6N	3.8
B.	ARMSTRONG D6N	3.8
T. U.	ARMSTRONG D6N	3.2
F.	None	—



1. ABRASIVE BLAST TO SSPC-SP10 WITH A PROFILE FROM 1.5 TO 3.0 MILS.
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										SECTEL LOS ANGELES			
										GEORGIA POWER COMPANY WILKINSON CREEK NUCLEAR PLANT			
										DRA REPAIRABILITY TEST PANELS			
										DATE		SCALE	DRAWING NO.
										JOB NO. 831		831	

SAMPLE IDENTIFICATION
AND
SPECIFIC TEST DESIGNATION

<u>Sample No.</u>	<u>Primer/Touch-Up</u>	<u>Test Designation</u>
811	Dimetcote 6/Dimetcote 6	Radiation & DBA
821	Dimetcote 6/Dimetcote 6	DBA
831	Dimetcote 6/Dimetcote 6	Radiation & DBA
841	Dimetcote 6/Dimetcote 6	DBA

RADIATION TOLERANCE TEST RESULTS

Manufacturer Bechtel/3M
Saint Paul, Minnesota
Report Number TRC-089-03

Analytical Chemistry Division
Oak Ridge National Laboratory
Date October 10, 1979
Page 41 of 48

System Identification^a

x Steel panel Concrete block

GR - Inorganic Zinc D-6
PT - Inorganic Zinc Touch-Up D-6
No finish

Radiation Tolerance Test Results

ORNL Master Analytical Manual Method No. 2 0921, Bechtel Corp. Spec. No. CP-951
ORNL Log Book No. A 7562; A8-23-9

Initial dose rate 1×10^7 rad/h

Test conducted in x air water

Sample No.

Cumulative dose rate 2×10^8 rads: comments

811	Coatings intact, no defects all areas. <u>4.0 / 2.1</u>
831	Coatings intact, no defects all areas. <u>3.1 / 3.2</u>

^aGR = grit blast cleaning; PT = power tool cleaning; SW = solvent wash cleaning.

Evaluated

Approved

Ralph L. Rapp
L.T. Rapp

DBA TEST RESULTS

Manufacturer Bechtel/3M
Saint Paul, Minnesota
ORNL Log Book No. A7562; A8-31-9

Analytical Chemistry Division
Oak Ridge National Laboratory
Date October 10, 1979

Table 1. DBA solution composition, distilled water

Solution A: 0.28 *N* boric acid (3000 ppm boron)
Adjusted to pH 10.5 with sodium hydroxide
Solution B: 0.28 *N* boric acid (3000 ppm boron)
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Table 2. DBA test conditions^a

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4 days	250	30	Pressure adjusted with N ₂ .
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3 days	200	10	
End of test			

^aThe above data are taken from recorder charts on permanent file at ORNL.

Evaluated

R. L. Apple

Approved

L. F. G. G. G.

Manufacturer Bechtel/3M
Saint Paul, Minnesota
Report Number TRC-089-03

Analytical Chemistry Division
Oak Ridge National Laboratory
Date October 10, 1979
Page 41 of 48

System Identification^a

x Steel panel Concrete block

GR - Inorganic Zinc
PT - Inorganic Zinc Touch-Up
No finish

DBA Test Results

ORNL Master Analytical Manual Method No. 2 0922
ORNL Log Book No. A 7562; A8-31-9

<u>Sample No.</u>	<u>DBA phase</u>	<u>Comments</u>
811 ^b	spray	Coatings intact, no defects all areas. -
821	spray	Coatings intact, no defects all areas.
831 ^b	spray	Coatings intact, no defects all areas.
841	spray	Coatings intact, no defects all areas.

^aGR = grit blast cleaning; PT = power tool cleaning; SW = solvent wash cleaning.

^bIrradiated.

Evaluated

Approved

Robert L. Apple
L. T. Cochran