ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 662881

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	DL McGrew/TFR&SO/R3-25/372-2296	☐ Yes ☒ No	9/28/00

6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
Project W-314, Tank Farm Restoration and Safe Operations	N/A	ESQ

9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
HNF-SD-W314-PDS-005, Rev. 2	N/A	N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Completed	12d. Restored to Original Condition (Temp. or Standby ECNs only)
☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? ☒ Yes ☐ No

Revised to incorporated changes per Phase 2 Rebaseline Report, HNF-5109, Rev. 0

14a. Justification (mark one)	14b. Justification Details
Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const. ☐ Const. Error/Omission ☐ Design Error/Omission ☐	See above "This modification will not increase collective dose since it has no impact on radiological sources, contamination control, or shielding." USQ not required per HNF-IP-0842, IV, 5.4, Rev. 12. Any temporary or permanent changes to facilities and procedures covered by the RPP Authorization Basis that result from the requirement of this document will have a USQ evaluation performed prior to initiation of field work activities.

15. Distribution (include name, MSIN, and no. of copies)

See Distribution Sheet

RELEASE STAMP

SEP 28 2000

DATE:

STA: 4

HANFORD RELEASE

ID: 3

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 662881

16. Design Verification Required	17. Cost Impact		18. Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
☐ Yes	Additional ☐ $ N/A	Additional ☐ $ N/A	Improvement ☐ N/A
☒ No	Savings ☐ $	Savings ☐ $	Delay ☐

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☐	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐	Tickler File	☐
Environmental Report	☐	Inspection Plan	☐	_____	☐
Environmental Permit	☐	Inventory Adjustment Request	☐	_____	☐

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
None		

21. Approvals

	Signature		Date
Design Authority	D.E. Bowers	D.E. Bowers	9/25/00
~~Cog~~ Eng.	D.L. McGrew	R3-25	9-26-00
Cog. Mgr.	K.N. Jordan	R3-25	9/27/00
QA	T.L. Bennington	S6-15	9-21-2000
Safety	R.J. Fogg	S5-12	9/22/00
Environ.	J.D. Guberski	R1-51	9/21/2000
Other	Maint. T.L. Jennings	S7-83	9/21/00
	Rad. Con. S.H. Pearce	S5-07 ~~S7-75~~	9/25/2000
	Ops. R.P. Raven	S0-09	9/21/00
	J.L. Gilbert	R3-25	9/25/00
	J.W. Bailey	R3-25	9/26/00
CA	Burke	R3-25	9/21/2000

	Signature	Date
Design Agent		
PE		
QA		
Safety		
Design		
Environ.		
Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	TFR&SO	Date 9/28/00
Project Title/Work Order		EDT No.
W-314, Tank Farm Restoration and Safe Operations		ECN No. 662381

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
J.B. Bailey	R3-25	X			
D.E. Bowers	S5-13	X			
T.L. Bennington	R2-89	X			
K.N. Jordan	R3-25	X			
J.L. Gilbert	R3-25	X			
R.R. Bevins	R3-25	X			
R.W. Root	R3-53	X			
D.L. McGrew	R3-25	X			
B.L. Syverson	G3-12	X			
J.W. Lentsch	R3-25	X			
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Project Files	R1-29	X			
Project Library	R3-25	X			
R.P. Raven	S0-09	X			
T.L. Jennings	S7-90	X			
C.A. Burke	R3-25	X			

Project Development Specification for Special Protective Coating

DL McGrew
NHC
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-99RL14047

EDT/ECN: 662881 UC:
Cost Center: 7C900 Charge Code: 109749
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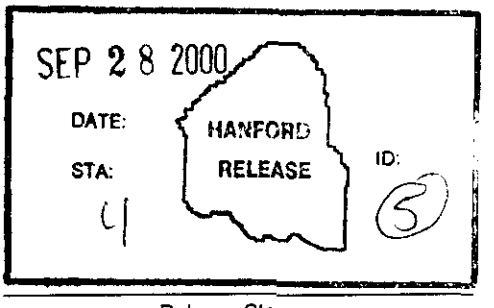
Key Words: Project W-314, Tank Farm Restoration and Safe Operations, Valve Pits, Special Protective Coating

Abstract: Establishes the performance, design development, and test requirements for the Special Protective Coating. The system engineering approach was used to develop this document in accordance with the guidelines laid out in the Systems Engineering Management Plan for Project W-314.



Release Approval 9/28/00 Date

Release Stamp

Approved For Public Release

RECORD OF REVISION

(1) Document Number: HNF-SD-W314-PDS-005

(2) Title: Project Development Specification for Special Protective Coating

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT ~ 613058 dated 01/20/97	DL McGrew	WW Rutherford
1	ECN- 652185- Complete revision/supersede. Incorporate ECN's 652185, 636319, 162741, 162745, 162743, 162734	DL McGrew	JL Homan
1A	ECN- 162748- Supplemental	DL McGrew	JL Homan
2	ECN- 653761- Complete revision/supersede	DL McGrew	JW Lentsch
RS 3	ECN- 662881- Complete revision/supersede	DL McGrew	KN Jordan 7/27/00

Project Development Specification

for

Special Protective Coating

Project W-314
Tank Farm Restoration and Safe Operations

July 2000

Approval: _____ 9/27/00
~~J. W. Lentsch~~, Project Manager K. N. Jordan — Date

Approval: _____ 9/25/00
D. E. Bowers, RPP Design Authority — Date

Approval: _____ 9/21/00
R. P. Raven, CHG, Project W-314 Retrieval Operations — Date

Table of Contents

Appendices

List of Tables

1 SCOPE

This Project Development Specification (PDS) establishes the performance, design development, and test requirements for the Special Protective Coating (SPC). The system engineering approach was used to develop this document in accordance with the guidelines laid out in the Systems Engineering Management Plan (SEMP) for Project W-314.

New SPC will be applied to the new cover blocks provided for Valve Pits 241-AN-A and -B, 241-AW-A and -B, new AZ Valve Pit, and new Slurry Receiver Pit 241-AN-04D, as applicable. In addition, SPC will be applied to the top portion of the AZ Valve Pit walls above the stainless steel liner (i.e., cover block support ledge and above). The SPC shall be repaired where disturbed during the construction process. Additionally, the total SPC in the pits will be examined and repaired as required in the following pits:

- Valve Pits 241-AN-A and -B; 241-AW-A and -B; and 241-SY-A and -B
- Central Pump Pits 241-AY-01A and -02A; 241-AZ-01A and -02A; 241-AN-01A through -07A; 241-AP-01A through -08A; 241-AW-01A through -06A; and 241-SY-01A through -03A
- Drain Pits 241-AP-03D; 241-AW-02D; and 241-SY-02D
- Feed Pump Pits 241-AW-02E and 241-SY-02E

2 APPLICABLE DOCUMENTS

See Section 5.3 for notes regarding applicable documents.

2.1 DOE Documents

Not applicable to this specification.

2.2 Code of Federal Regulations

Not applicable to this specification.

2.3 Tank Farm Contractor Documents

RPP-PRO-224, *Document Control Program Standards*, Rev. 0.

RPP-PRO-233, *Review and Approval of Documents*, Rev. 0.

WHC-SD-WM-SARR-016, *Tank Waste Compositions and Atmospheric Dispersion Coefficients for use in Safety Analysis Consequence Assessments*, Rev. 2.

2.4 Project W-314 Documents

HNF-SD-W314-QAPP-001, *Quality Assurance Program Plan for Project W-314.*

2.5 Codes and Standards

ASTM D 4060, *Standard Test Method for Abrasion Resistance of Organic coatings by the Taber Abraser.*

ASTM D 5144, *Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants.*

ASTM E-84/NFPA 255, *Test Method for Surface Burning Characteristics of Building Materials.*

Factory Mutual 1-57, *Loss Prevention Data - Rigid Plastic Building Materials.*

ICRP Publication 37, *Cost Benefit Analysis in the Optimization of Radiological Protection.*

2.6 Other Documents

WAC 173-303, *Dangerous Waste Regulations*, 1/98.

2.7 Drawings

Not applicable to this specification.

3 REQUIREMENTS

3.1 Item Definition

The SPC system consists of filler, joint sealant surfaces, and multiple top coats that forms a solid protective film after application. The solid film isolates the substrate from the environment, as required per WAC 173-303, and provides the decontaminability in areas of secondary confinement, such as pits, subject to radiation exposure and radionuclide contamination.

3.1.1 Item Diagrams

Not applicable to this specification.

3.1.2 Interface Definition

3.1.2.1 Functional Interface. Not applicable to this specification.

3.1.2.2 Physical Interfaces. The physical interface points are defined to be the interior surfaces of pits consisting of floors, walls, and underside of cover blocks, all exposed surfaces of the pits and cover blocks, and the nozzle locations associated with the existing piping system located within the pits. Stainless steel liners will not be coated with SPC.

3.1.3 Major Component List

Not applicable to this specification.

3.2 Characteristics

3.2.1 Performance Characteristics

The performance requirements of the SPC system are as follows:

3.2.1.1 Provide Chemical Resistance

3.2.1.1.1 Chemical Resistance. The SPC system shall be capable of withstanding the liquid waste chemical composition ranges listed in Table 3-1.

Table 3-1 Chemical Composition Range

Retrieved waste				
Species	DST		SST	
	Anion/cation		Anion/cation	
	min mol/L	max mol/L	min mol/L	max mol/L
Ag	0	0.0013	-	-
Al	0.05	1.1	0.029	0.5
As	0	0.0066	-	-
B	0	0.013	-	-

Table 3-1 Chemical Composition Range (Continued)

Retrieved waste				
Species	DST		SST	
	Anion/cation		Anion/cation	
	min mol/L	max mol/L	min mol/L	max mol/L
Ba	0	0.0004	0	0.0014
Bi	-	-	0	0.076
Ca	0.0014	0.1	0	0.17
Cd	0	0.0074	0	0.0007
Cr	0.0067	0.28	0.0001	0.091
Cu	0	0.02	-	-
Fe	0.0004	0.26	0.0057	0.89
Hg	0	2.8E-05	0	0.0001
K	0.044	0.55	0.0002	0.0095
La, Nd	0	0.0066	0	0.001
Mg	0.0004	0.046	-	-
Mn	0.0003	0.16	0.0009	0.41
Mo	0	0.0029	-	-
Na	1.6	10.7	1.6	7.1
Ni	0.0002	0.008	0	0.042
Pb	0	0.004	0	0.12
Pd, Rh	0	0.0063	-	-
Si(SiO2)	0.0024	0.028	0.0004	0.46
Ti	0	0.002	-	-
U	0	0.0092	-	-
Zr(ZrO2)	0	0.3	0	0.065
Acetate	-	-	0	0.0055
Citrate	0	0.03	0.0042	0.06
EDTA	0	0.016	0	0.011
HEDTA	0	0.021	-	-
Fe(CN)6	-	-	0	0.025
Cl	0.003	0.17	0	0.022
CO3	0.03	0.69	0.014	0.38
F	0.014	1	0.001	0.71

Table 3-1 Chemical Composition Range (Continued)

Species	Retrieved waste			
	DST		SST	
	Anion/cation		Anion/cation	
	min mol/L	max mol/L	min mol/L	max mol/L
Fission product	0	0.0001	-	-
NO2	0.1	1.8	0.0086	0.83
NOX(NO3)	0.15	3.6	0.64	5.1
OH	0.24	4.4	0.25	6.9
PO4	0	0.4	0.0007	3.8
SO4	0.003	0.16	0.01	0.22
TOC	0	2	-	-

DST = Double-shell tank
EDTA = Ethylenediametetraacetic acid
HEDTA = n-(hydroxyethyl)-Ethylenediametetraacetic acid
SST = Single-shell tank
TOC = Total organic carbon

3.2.1.2 Provide Decontaminability

3.2.1.2.1 Radionuclide Compatibility. The SPC system shall be compatible with the waste radionuclide concentrations listed under the W-314 column in Table 3-2.

Table 3-2 Radionuclide Concentrations

Nuclide	Nuclide Concentrations (Bq/L)		
	(a)All liquids	(a)All solids	(b)W-314
14C	2.3E+05	1.6E+05	2.3E+05
60Co	9.5E+06	4.9E+08	1.7E+08
79Se	(c)	1.7E+04	1.7E+04
90Sr	1.1E+10	2.9E+12	9.6E+11
90Y	1.1E+10	2.9E+12	9.6E+11
99Tc	1.7E+07	1.2E+10	4.0E+09
106Ru	9.9E+02	7.2E+04	2.4E+04
125Sb	3.4E+04	1.8E+08	5.9E+07
129I	2.0E+04	6.4E+06	2.1E+06
134Cs	6.1E+06	9.4E+06	7.2E+06
137Cs	8.8E+10	1.0E+11	9.2E+10

Table 3-2 Radionuclide Concentrations (Continued)

Nuclide	Nuclide Concentrations (Bq/L)		
	(a)All liquids	(a)All solids	(b)W-314
144Ce	9.1E+00	3.4E+02	1.2E+02
147Pm	3.6E+07	(c)	3.6E+07
154Eu	2.4E+09	1.1E+10	5.2E+09
155Eu	5.9E+07	5.0E+06	5.9E+07
237Np	2.3E+05	9.9E+08	3.3E+08
238Pu	1.8E+06	1.9E+08	6.4E+07
239Pu(d)	3.6E+07	1.6E+09	5.5E+08
241Pu	2.6E+08	3.8E+09	1.4E+09
241Am	4.2E+07	1.1E+10	3.7E+09
242Cm	1.1E+01	2.0E+02	7.3E+01
244Cm	4.2E+05	6.1E+07	2.0E+07

(a) From Table 1a., Van Keuren, J. C., 1996, Tank Waste Compositions and Atmospheric Dispersion Coefficients for Use in Safety Analysis Consequence Assessments, WHC-SD-WM-SARR-016, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
(b) W-314 values represent a bounding mixture for design of 67% liquid and 33% solid, except for 14C and 155Eu where the maximum liquid value was used as it is higher than the mix and for 79Se and 147Pm where data is not available.
(c) No available data.
(d) The 239Pu activity concentration also includes 240Pu.

3.2.1.2.2 Decontamination Factor. The top coating of the SPC system shall demonstrate relative ease of decontamination with a minimum Decontamination Factor (DF) of 100. The DF after initial water wash shall be a minimum of 20.

3.2.2 Physical Characteristics

3.2.2.1 Surface Application. The SPC system shall develop the ability to resist the development of holidays with time.

3.2.2.2 Thermal Stress Endurance. The SPC system shall successfully fill or bridge cracks of 1.0 - 1.5 mm (0.040 - 0.060 inches) caused by thermal movement and stresses within concrete.

3.2.2.3 Volatile Organic Content Compliance. The SPC system shall be volatile organic content (VOC) compliant with a maximum VOC of 2.9 lbs/gallon (350 grams/liter).

3.2.2.4 Tensile Properties. The SPC system shall have minimum acceptable tensile properties tabulated in Table 3-3, and -4, and -5.

Table 3-3 Tensile Properties of Coatings

Properties	Rigid Coating (Epoxy)	Flexible Coating (Elastomeric)
Tensile Strength	N/A	Minimum 20,700 KPa (3,000 psi) at 30 days
Elongation at break at 24 °C (75 °F)	Minimum 5 percent	Minimum 400 percent at 30 days

Table 3-4 Tensile Properties of Joint Sealants

Properties	Flexible Epoxy	Fluoroelastomer, Polysulfide, Polyurethane
Tensile Strength	Minimum 3,500 KPa (500 psi)	Minimum 10,400 KPa (1,500 psi)
Elongation at break at 24 °C (75 °F)	Minimum 100 percent	Minimum 100 percent

Table 3-5 Tensile Properties of Fillers

Properties	Solid Epoxy Mastic
Tensile Strength	Minimum 3,500 KPa (500 psi)
Elongation at break at 24 °C (75 °F)	Minimum 20 percent

3.2.2.5 Abrasion Resistance. The top coating shall demonstrate the abrasion resistance property. The acceptable abrasion resistance values of the installed coating are tabulated in Table 3-6. The weight loss values are for 1000 cycles when a CS-17 wheel is used with a 1000 g load in accordance with ASTM D 4060.

Table 3-6 Abrasion Resistance Properties of Coatings

Properties	Rigid Coating (Epoxy)	Flexible Coating (Elastomeric)
Abrasion Resistance	Weight loss less than 100 mg	Weight loss less than 10 mg

3.2.2.6 Permeability. The SPC system shall be capable of resisting the migration of liquid waste/water into the pit wall. The permeability shall be measured as follows:

- The maximum water vapor transmission (WVT) rate for a top coating shall be 8 gm/square meter/24 hr.
- The maximum water absorption rate for a top coating and joint sealant shall be 0.5 percent

per 24 hours.

3.2.2.7 Adhesion to Substrate. The SPC system shall display an adhesion property to the underlying concrete and previously coated surfaces. Minimum pull-off strength shall be 6,200 KPa (900 psi). Existing pit interior SPC repairs are excluded from this requirement when ALARA considerations prevent surface preparation per manufacturer's recommendations.

3.2.2.8 Color. The color of the top coat shall be white or near white such that nozzle labels and markers can be painted over the top coat.

3.2.2.9 Labeling Paint. Paint (coating) use for identification marking on the SPC top coat shall be compatible with the SPC system.

3.2.3 Reliability

The SPC system shall have a design life of 12 years when installed per the manufacturer's recommendations.

3.2.4 Maintainability

The SPC system shall be repairable for cracks appearing through the applied coated surface to the substrate or for chips and flaking on account of mechanical damage.

3.2.5 Environmental Conditions

The systems and components covered by this specification shall be compatible with the environmental conditions listed below, as applicable.

3.2.5.1 Natural Environments

3.2.5.1.1 Ambient Air Temperature. The ambient air temperature range is 48.9°C (120°F) to -35.5°C (-32°F), and with a maximum 24 hour differential of 28.9°C (52°F).

3.2.5.1.2 Soil Temperature. Not applicable to this specification.

3.2.5.1.3 Seismic Loads. Not applicable to this specification.

3.2.5.1.4 Wind Loads. Not applicable to this specification.

3.2.5.1.5 Snow Loads. Not applicable to this specification.

3.2.5.1.6 Relative Humidity. The relative humidity range is 0 to 100% (Rate of change is negligible).

3.2.5.1.7 Surface Precipitation. The surface precipitation is 4 cm (1.56 in) in a 24 hour period.

3.2.5.1.8 Hail Events. The hail diameter is less than or equal to 1.9 cm (0.75 in).

3.2.5.1.9 Sand and Dust. The sand/dust concentration is 0.177 gm/cubic meter with a

typical size of 350 µm.

3.2.5.1.10 Solar Radiation. The solar radiation range is between 4 Watts/square meter and 406 Watts/square meter.

3.2.5.1.11 Glaze. (See definition is Section 5.1) The glaze is 2.54 cm (1 in.).

3.2.5.1.12 Ashfall Events. Not applicable to this specification.

3.2.5.1.13 Load Combinations and Allowable Stresses. Not applicable to this specification.

3.2.5.2 Induced Environments

3.2.5.2.1 Waste Properties. Materials used that come in contact with the waste shall be capable of safely handling waste with the following properties:

Specific Gravity	1 to 1.5
Viscosity	1 to 30 centipoise (Newtonian)
Miller Number	100 Maximum
pH	7 to 14
Temperature	10 to 93 °C (50 to 200 °F)
Solids Content	30 Vol. %
Particle Size	0.5 to 4000 microns

Note: 95% of total particles 0 to 50 microns
<5 percent of total particles 50 to 500 microns
<1 percent of total particles 500 to 4000 microns

3.2.5.2.2 Radiation Tolerance

3.2.5.2.2.1 Inside Pit Radiation Level. Materials used that are located inside a pit shall be capable of operating in the following radiation environment:

total accumulated dose:	6.0E+7 rads
dose rate:	1.0E+7 mr/hr

3.2.5.2.2.2 Background Radiation Level. Materials used that are located outside a pit, above ground, shall be capable of operating in the following radiation environment:

total accumulated dose:	4.4 rad/year
dose rate:	0.5 mrem/hour

3.2.6 Transportability

Not applicable to this specification.

3.2.7 Flexibility and Expansion

Each system design shall, to the maximum extent practicable, provide sufficient flexibility to accommodate for programmatic changes or operation modifications.

3.3 Design and Construction

3.3.1 Materials, Processes, and Parts

3.3.1.1 Materials

3.3.1.1.1 SPC System

3.3.1.1.1.1 Service Area. The SPC system shall be suitable for Service Level II Area.

3.3.1.1.1.2 SPC System Schedule. A SPC system schedule shall be prepared during definitive design stage, based on manufacturer recommendations, published data for the SPC system and field ALARA conditions. The schedule shall provide descriptions of prime, base, intermediate, and finish coats as applicable; minimum dry film thickness in mils; and color.

3.3.1.1.2 SPC System Accessory Materials. Coating accessory materials such as joint sealants, fillers, primers, thinners, form release agents, and scrim cloth shall be as recommended by the manufacturer of the SPC system suitable for environmental conditions specified in this document.

3.3.1.2 Processes

3.3.1.2.1 Surface Preparation

3.3.1.2.1.1 Surface Preparation (Excluding Existing Pit Interior SPC Repairs). The design document will incorporate a surface preparation procedure prepared in consultation with the manufacturer of the SPC system. Substrate preparation method(s) and acceptance criteria will be selected and documented in the design media during the design phase.

3.3.1.2.1.2 Surface Preparation for Existing Pit Interior SPC Repairs. The design document will incorporate a surface preparation procedure prepared in consultation with the manufacturer of the SPC system when field radiological/toxicological conditions permit. When field radiological/toxicological conditions prohibit surface preparation per manufacturer's consultation, the design document will provide minimum surface preparation details consistent with ALARA.

3.3.1.2.2 SPC System Application. The SPC system shall be installed only when ambient and surface temperatures are within the range recommended by the coating manufacturer for the respective coating. The application procedure for the SPC system shall be in accordance with the manufacturers' specification.

3.3.1.3 Optimization. During the design of facilities, optimization principles, as discussed in ICRP Publication 37, shall be utilized in developing and justifying facility design and physical controls.

3.3.1.4 Dome Loading. The equipment used for installation and maintenance shall comply with the DST dome loading constraints.

3.3.2 Electromagnetic Radiation

Not applicable to this specification.

3.3.3 Identification and Marking

Not applicable to this specification.

3.3.4 Workmanship

Not applicable to this specification.

3.3.5 Interchangeability

Not applicable to this specification.

3.3.6 Safety

3.3.6.1 Material Safety Data Sheets. Material Safety Data Sheets (MSDS) for the SPC system components shall be furnished during the data transmittal review stage for approval. Obtain inspection and acceptance by the construction engineer before opening containers or removing labels.

3.3.6.2 Fire Protection

3.3.6.2.1 Fire Characteristics. Any materials with unusual fire characteristics, such as urethane foams, and any materials that develop significant quantities of toxic or other harmful products of combustion, shall not be used as interior finishes or other interior applications without the approval of the cognizant DOE fire protection authority. The use of foamed plastics in construction shall be prohibited unless it fully complies with Factory Mutual 1-57.

3.3.6.2.2 Interior Finishes. Nuclear facilities and laboratories shall have interior finish materials (decorations, furnishings, and exposed wall or insulating material) that have an Underwriters Laboratories (ASTM E-84/NFPA 255) flame spread rating of 25 or less, and smoke developed rating of 50 or less.

3.3.7 Human Performance/Human Engineering

Not applicable to this specification.

3.4 Documentation

3.4.1 Document Control

Records, documents, and document control pertinent to design functions shall be in accordance with RPP-PRO-224 and RPP-PRO-233.

3.5 Logistics

3.5.1 Maintenance

Not applicable to this specification.

3.5.2 Supply

3.5.2.1 Parts and Components. The system design shall, to the greatest extent practicable, use readily available parts and components.

3.5.3 Facilities and Facility Equipment

Not applicable to this specification.

3.6 Personnel and Training

3.6.1 Personnel

Not applicable to this specification.

3.6.2 Training

Not applicable to this specification.

3.7 Major Component Characteristics

Not applicable to this specification.

4 SYSTEM QUALIFICATION PROVISIONS

4.1 General

The Project W-314 QAPP (HNF-SD-W314-QAPP-001) defines the quality assurance requiremnts for this project.

Table 4-1 listed verifications may be performed in conjunction with QAPP verifications. Inspections as defined in 4.2 shall be conducted during the design and development of each system to provide assurance of compliance with the requirements of this PDS.

4.1.1 Responsibility for Inspections

The design contractor shall be responsible for the performance of all inspections for each system developed in accordance with this PDS. Inspections shall be conducted at the contractor facilities or the facilities of his choice with the approval of the procuring authority. The procuring authority reserves the right to witness or perform the specified inspections.

4.1.2 Special Tests and Examinations

Not applicable to this specification.

4.2 Quality Conformance Inspections.

Qualification shall be performed on System hardware representative of the approved production design. Qualification of the System to assure compliance with the requirements of Section 3 shall be by examination, demonstration, test, and/or analysis, as defined herein. Test program data may be used to assure compliance with requirements.

a. Examination is an element of inspection consisting of investigation, without the use of special laboratory appliances or procedures, to determine compliance with requirements. This method is intended to be construction related and consists of examination of documents and construction activities.

b. Demonstration is an element of inspection that is limited to readily observable functional operation to determine compliance with requirements. This element of inspection does not require the use of special equipment or sophisticated instrumentation. This method is intended to be utilized for any mock-up testing.

c. Test is an element of inspection that employs technical means including (but not limited to) the evaluation of functional characteristics by use of special equipment or instrumentation, simulation techniques, and the application of established principles and procedures to determine compliance with requirements. The analysis of data derived from test is an integral part of this inspection. This method is intended to be utilized for any acceptance testing in the field.

d. Analysis is an element of inspection, taking the form of the processing of accumulated results and conclusions, intended to provide proof that verification of a requirement(s) has been accomplished. The analytical results may be comprised of a compilation of interpretation of

existing information or derived from lower level examinations, tests, demonstrations, or analyses.

The environmental capability of equipment shall be demonstrated by appropriate testing, analysis, and operating experience, or other methods that can be supported by auditable documentation, or a combination of these methods.

Table 4-1 Quality Conformance Inspection Matrix

Section 3 Paragraph Number	Title	Level of Assembly	Inspection Element				
			Exam	Demo	Test	Anly	N/A
3.2	Characteristics						X
3.2.1	Performance Characteristics						X
3.2.1.1	Provide Chemical Resistance						X
3.2.1.1.1	Chemical Resistance					X	
3.2.1.2	Provide Decontaminability						X
3.2.1.2.1	Radionuclide Compatibility					X	
3.2.1.2.2	Decontamination Factor					X	
3.2.2	Physical Characteristics						X
3.2.2.1	Surface Application		X			X	
3.2.2.2	Thermal Stress Endurance					X	
3.2.2.3	Volatile Organic Content Compliance					X	
3.2.2.4	Tensile Properties					X	
3.2.2.5	Abrasion Resistance					X	
3.2.2.6	Permeability					X	
3.2.2.7	Adhesion to Substrate					X	
3.2.2.8	Color		X			X	
3.2.2.9	Labeling Paint					X	
3.2.3	Reliability					X	
3.2.4	Maintainability					X	
3.2.5	Environmental Conditions						X
3.2.5.1	Natural Environments						X
3.2.5.1.1	Ambient Air Temperature					X	
3.2.5.1.2	Soil Temperature						X
3.2.5.1.3	Seismic Loads						X
3.2.5.1.4	Wind Loads						X

Table 4-1 Quality Conformance Inspection Matrix (Continued)

Section 3 Paragraph Number	Title	Level of Assembly	Inspection Element				
			Exam	Demo	Test	Anly	N/A
3.2.5.1.5	Snow Loads						X
3.2.5.1.6	Relative Humidity					X	
3.2.5.1.7	Surface Precipitation					X	
3.2.5.1.8	Hail Events					X	
3.2.5.1.9	Sand and Dust					X	
3.2.5.1.10	Solar Radiation					X	
3.2.5.1.11	Glaze					X	
3.2.5.1.12	Ashfall Events						X
3.2.5.1.13	Load Combinations and Allowable Stresses						X
3.2.5.2	Induced Environments						X
3.2.5.2.1	Waste Properties					X	
3.2.5.2.2	Radiation Tolerance						X
3.2.5.2.2.1	Inside Pit Radiation Level					X	
3.2.5.2.2.2	Background Radiation Level					X	
3.2.6	Transportability						X
3.2.7	Flexibility and Expansion					X	
3.3	Design and Construction						X
3.3.1	Materials, Processes, and Parts						X
3.3.1.1	Materials						X
3.3.1.1.1	SPC System						X
3.3.1.1.1.1	Service Area					X	
3.3.1.1.1.2	SPC System Schedule					X	
3.3.1.1.2	SPC System Accessory Materials					X	
3.3.1.2	Processes						X
3.3.1.2.1	Surface Preparation						X

Table 4-1 Quality Conformance Inspection Matrix (Continued)

Section 3 Paragraph Number	Title	Level of Assembly	Inspection Element				
			Exam	Demo	Test	Anly	N/A
3.3.1.2.1.1	Surface Preparation (Excluding Existing Pit Interior SPC Repairs)					X	
3.3.1.2.1.2	Surface Preparation for Existing Pit Interior SPC Repairs					X	
3.3.1.2.2	SPC System Application		X			X	
3.3.1.3	Optimization					X	
3.3.1.4	Dome Loading					X	
3.3.2	Electromagnetic Radiation						X
3.3.3	Identification and Marking						X
3.3.4	Workmanship						X
3.3.5	Interchangeability						X
3.3.6	Safety						X
3.3.6.1	Material Safety Data Sheets					X	
3.3.6.2	Fire Protection						X
3.3.6.2.1	Fire Characteristics					X	
3.3.6.2.2	Interior Finishes					X	
3.3.7	Human Performance/Human Engineering						X
3.4	Documentation						X
3.4.1	Document Control		X			X	
3.5	Logistics						X
3.5.1	Maintenance						X
3.5.2	Supply						X
3.5.2.1	Parts and Components					X	
3.5.3	Facilities and Facility Equipment						X
3.6	Personnel and Training						X

Table 4-1 Quality Conformance Inspection Matrix (Continued)

Section 3 Paragraph Number	Title	Level of Assembly	Inspection Element				
			Exam	Demo	Test	Anly	N/A
3.6.1	Personnel						X
3.6.2	*Training*						X
3.7	Major Component Characteristics						X

5 NOTES

5.1 Definitions

5.1.1 Abrasion Resistance

The property of a surface by which it resists being worn away as the result of friction.

5.1.2 Adhesion

The bond or attraction of a coat of paint to the underlying material, such as a substrate or another coat.

5.1.3 Chip

The detachment of small pieces of the substrate.

5.1.4 Decontamination

The act of removing radioactive nuclides from a surface.

5.1.5 Decontamination Factor

The ratio of the original number of radioactive nuclides on the surface of a specimen to the number remaining after a decontamination process.

5.1.6 Dry-film Thickness

Depth of applied coating when dry, expressed in mils (0.001 in).

5.1.7 Flaking

The detachment of small pieces of the coating film.

5.1.8 Glaze

Coating of ice formed when rain or drizzle freezes on contact with any surface having a temperature that is below freezing.

5.1.9 Holiday

Pinhole, skip, discontinuity, or a void in coating film.

5.1.10 Laitance

A fine, whitish accumulation on concrete surfaces. It consists mainly of cement particles that were carried by water rising to the surface of freshly placed concrete.

5.1.11 Permeability

The measure of water or water vapor transmission rate through films of coating.

5.1.12 Service Level II Area

That area outside primary containment subject to radiation exposure and radionuclide contamination in accordance with ASTM D 5144.

5.1.13 Substrate

The base surface to which a coating is to be applied.

5.1.14 Wet-Film Thickness

Depth of applied coating expressed in mils measured immediately after application.

5.1.15 Water Vapor Transmission Rate

The steady water vapor flow in unit time through unit area of a body.

5.2 Acronym List

AIM	Architectural and Industrial Maintenance
ANSI	American National Standard Institute
ASTM	American Society for Testing and Materials
DF	Decontamination Factor
DFT	Dry Film Thickness
DOE	U.S. Department of Energy
DRD	Design Requirements Document
EPA	Environmental Protection Agency
FDNW	Fluor Daniel Northwest
MSDS	Material Safety Data Sheet
N/A	Not Applicable
NACE	National Association of Corrosion Engineers
PC	Performance Category
RPP	River Protection Project
SPC	Special Protective Coating
VOC	Volatile Organic Components
WVT	Water Vapor Transmission

5.3 Applicable Documents

National codes and standards will be identified within Section 2, Applicable Documents, of the PDS without dates or revision numbers. Government documents and Hanford site standards will be identified by the effective date or revision number.

APPENDIX A

FUNCTIONAL FLOW BLOCK DIAGRAMS (FFBDs)

Not applicable to this specification.

APPENDIX B

REQUIREMENTS BASIS

Table B-1 Requirements Basis

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
3.2.3.7 Provide Chemical Resistance	3.2.1.1.1 Chemical Resistance Basis: This is the cross-site transfer system chemical composition from Internal Memo 22170-93-012, *Recommended Waste Composition Changes to the MWTF FDC*, Rev. 1, Waste Management Engineering to J. M. Light, June 23, 1993, Westinghouse Hanford Company, Richland, Washington. The waste composition from the cross-site transfer system is the worst-case for the W-314 transfer piping.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
3.2.3.8 Provide Decontaminability	3.2.1.2.1 Radionuclide Compatibility Basis: The radionuclide concentrations in Table 3-2, column "W-314" represent a bounding mixture for design and were derived by assuming a mixture comprised of two-thirds of the maximum sample activity composite from the "All liquids" column and one-third of the maximum sample activity composite from the "All solids" column with the exceptions of where either a solid or liquid composite is unknown then the total of the known composite is used and for 14C and 155Eu where the maximum liquid value was used as it is higher than the mix. The All Solids and All Liquid columns are from WHC-SD-WM-SARR-016, *Tank Waste Compositions and Atmospheric Dispersion Coefficients for use in Safety Analysis Consequence Assessments*, Rev. 2, Table 1a.,Van Keuren, J. C., 1996, Westinghouse Hanford Company, Richland, Washington.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
3.2.3.8 Provide Decontaminability	3.2.1.2.2 Decontamination Factor Basis: Decontaminabilty is measured by the (DF) in accordance with ASTM D 4256. The higher the overall DF, the easier the coating will be to decontaminate. DF 100 corresponds to 99% removal of contamination which is achievable with current coating technology. A DF value of 20 is achievable with water wash and a desirable criteria in accordance with ANSI N512. These criteria were outlined in GS09855.SP, *Chemical Resistant Decontaminable Coating Guide Specification.*	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.2.2.1 Surface Application Basis: This is a desirable characteristic of the SPC system followed industry wide in accordance with NACE RP0169, *Control of External Corrosion on Underground or Submerged Metallic Piping Systems.*	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.2.2 Thermal Stress Endurance Basis: ACI 224R-90, *Control of Cracking in Concrete Structures*, states that cracking, if any has occurred, results from initial shrinkage, imposed loads, thermal stresses, and from uneven settlement. ACI states that cracks from 1.0 - 1.5 mm (0.040 to 0.060 inches) can be expected from these crack producing events.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.2.3 Volatile Organic Content Compliance Basis: The requirement is based on the Environmental Protection Agency (EPA) Architectural and Industrial Maintenance (AIM) Coating rules. The acceptable value is in accordance with the VOC requirements for Industrial Maintenance Coatings outlined in Appendix II of the Proposed Alternative AIM Reg/Neg Framework and Industry Caucus Response.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.2.4 Tensile Properties Basis: The tensile strength and percent elongation at break are measures of the tensile properties of coating and sealant materials. The acceptable values are in accordance with the requirements outlined in GS09855.SP, *Chemical Resistant Decontaminable Coating Guide Specification.* The requirements are based on available data from manufacturers of the type of coatings currently used at Hanford Site.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.2.2.5 Abrasion Resistance Basis: The SPC system on substrates can be damaged by abrasion during installation and operation. ASTM D 5144 requires that where abrasion is a factor, the coating shall demonstrate the abrasion resistance property. The acceptable values are dependent on the types of SPC systems and in accordance with the requirements outlined in GS09855.SP, *Chemical Resistant Decontaminable Coating Guide Specification*. The requirements are based on available data from manufacturers of the type of SPC systems currently used at Hanford Site.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.2.6 Permeability Basis: One function of the coating is to isolate the substrate from the environment by arresting the passage of liquid. The above requirements are measure of how well the function is performed. The acceptable values are in accordance with the requirements outlined in GS09855.SP, *Chemical Resistant Decontaminable Coating Guide Specification*. The requirements are based on available data from manufacturers of the type of SPC systems currently used at Hanford Site.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.2.2.7 Adhesion to Substrate Basis: ASTM D 5144 requires that the SPC system shall demonstrate the adhesion to substrate property. The acceptable value is dependent on the types of SPC system and is in accordance with the requirement outlined in GS09855.SP, *Chemical Resistant Decontaminable Coating Guide Specification* . The requirement is based on available data from manufacturers of the type of SPC systems currently used at Hanford Site. Adhesion is directly related to preparation. For repair of existing coatings on the interior of pits, the preparation required of the substrate to meet the manufacturers recommended preparation could expose workers to unacceptable radiation levels and/or possible airborne release of contamination. Preparation of the substrate must be evaluated on a pit by pit basis.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.2.8 Color Basis: The nozzle labels and flow diagram are painted over the top coat. The flow diagram is painted on the top surface of the cover block to assist the operator in valving to the correct tank. Each nozzle in the pit is assigned an unique number which is painted on the pit wall near the nozzle to assist the operator in reconnection during the jumper change.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.2.9 Labeling Paint Basis: The labeling paint must be compatible with the SPC system such that the label is visible and the paint does not degrade the effectiveness of the SPC system.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.2.3 Reliability Basis: The life expectancy of SPC systems as claimed by manufacturers seldom exceeds 20 years in any environment. Even these claims have a qualifying requirements of being properly maintained including subsequent re-coatings with a topcoat and repair of chips and flaking. The life expectancy of SPC system in a pit at Hanford without maintenance is estimated to be around 12 years.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.4 Maintainability Basis: The repair of cracks or chips and flaking is considered minor repair which does not involve significant areas of the SPC system.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.1.1 Ambient Air Temperature Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.4.1.1.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.1.6 Relative Humidity Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.4.1.2.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.1.7 Surface Precipitation Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.4.1.3.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.2.5.1.8 Hail Events Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.4.1.3.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.1.9 Sand and Dust Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.4.1.4.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.1.10 Solar Radiation Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.4.1.6.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.1.11 Glaze Basis: The basis for this requirement is based on engineering judgement from years of experience in the area.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.2.1 Waste Properties Basis: The waste properties are from WHC-SD-WM-DGS-006, Rev. 0, draft, Table 4-1 except particle size and specific gravity. Particle size basis is WHC-SD-W058-FDC-001, *Preliminary Design Requirements Document for Project W-058, Replacement of the Cross-Site Transfer System*, Rev. 0, Section 3.2.6.5. The transfer system piping components must be compatible with transferring liquid waste with a SpG of 1.5 based on receipt of waste from Privatization per DE-RP06-96RL13308, *TWRS Privatization Contract*, Part 1, Section C, Table TS-9.1 "Physical Requirements for Liquids or Slurries Transferred to DOE."	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.2.5.2.2.1 *Inside Pit Radiation Level* Basis: The dose rate for new components in contact with HLW is 1E+07 mr/hr. Total accumulated dose for components in contact with HLW is 2E+11 mrad in 40 years. The prorated accumulated dose for the design life of 12 years is 6E+10 mrad = 6E+07 rads for components in contact with the waste of the 12 years. Both basis HLW requirements are consistent with Letter W-058-076, *Project W-058 Cross-site Transfer System*, J. L. Henderson to C. van Katwijk, May 13, 1996.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.5.2.2.2 Background Radiation Level Basis: WHC-SD-GN-DGS-30011, *Radiological Design Guide*, Rev. 0, Table 7.1 for accumulated dose and Section 2.4 for dose rate.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.2.7 Flexibility and Expansion Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.2.5.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.1.1.1 Service Area Basis: ASTM D 5144, *Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants.*	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.1.1.2 SPC System Schedule Basis: The SPC system schedule forms part of the subsection chemical resistant decontaminable coating of the construction specification. The schedule will be prepared based on the properties of the selected coating system during the definitive design stage.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.3.1.1.2 SPC System Accessory Materials Basis: The accessories materials are components of the SPC system and will either be supplied or recommended by the manufacturer of the coating for warranty purposes.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.2.1.1 Surface Preparation (Excluding Existing Pit Interior SPC Repairs) Basis: ASTM D 5144, *Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants.*	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.2.1.2 Surface Preparation for Existing Pit Interior SPC Repairs Basis: ASTM D 5144, *Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants.*	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.2.2 SPC System Application Basis: Mixing, application, and curing of SPC system materials are performed in accordance with the instructions of the manufacturer of representative products. The application procedure for the SPC system is prepared in accordance with the manufacturers' specification.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.3 Optimization Basis: DOE 5480.11, *Radiation Protection for Occupational Workers*, Section 9.j (1)(a).	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.1.4 Dome Loading Basis: HNF-IP-1266, *Tank Farm Operations Administrative Controls*, Section 5.16, "Tank Dome Controls."	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.6.1 Material Safety Data Sheets Basis: SPC system components are considered as hazardous materials.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating

Table B-1 Requirements Basis (Continued)

FUNCTION NUMBER AND NAME	TECHNICAL REQUIREMENTS	SYSTEM ELEMENT NUMBER
	3.3.6.2.1 Fire Characteristics Basis: DOE 6430.1A, *General Design Criteria*, Section 0110-6.1.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.3.6.2.2 Interior Finishes Basis: DOE RLIP 5480.7, *Fire Protection*, Section 8.2(e).	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.4.1 Document Control Basis: RPP-PRO-224, *Document Control Program Standards*, Rev. 0, and RPP-PRO-233, *Review and Approval of Documents*, Rev. 0 are site standards that must be adhered to.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating
	3.5.2.1 Parts and Components Basis: WHC-SD-W314-DRD-001, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, Rev. 1, Section 3.5.5.	hsems.2.3.1.1.2.1.2.1 W-314 New and Repaired Special Protective Coating