ENGINEERING CHANGE NOTICE

Page 1 of 21. ECN 653776Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedeure ☐ Cancel/Void ☐		3. Originator's Name, Organization, MSIN, and Telephone No. Treah Nuxall, SNF CVD, R3-47, 372-3739		4. USQ Required? [] Yes [X] No		5. Date 3/31/99	
		6. Project Title/No./Work Order No. Spent Nuclear Fuel Cold Vacuum Drying		7. Bldg./Sys./Fac. No. CVDF		8. Approval Designator Q, S ⁿ	
		9. Document Numbers Changed by this ECN (includes sheet no. and rev.) Alt Rev 0 SNF-3876, SNF-3877, SNF-3878, SNF-3879, SNF-3880, SNF-3881, SNF-3882, SNF-3883, SNF-3884, SNF-3886, SNF-3887, SNF-3888, SNF-3890, SNF-3891, SNF-3892, SNF-3893, SNF-3894, SNF-3895, SNF-3920, SNF-3921, SNF-3922, SNF-3923, SNF-3924, SNF-3925, SNF-3926, SNF-3927, SNF-3928, SNF-3929, SNF-3930, SNF-3931, SNF-3932, SNF-3933, SNF-3934, SNF-3935, SNF-3936		10. Related ECN No(s). N/A		11. Related PO No. N/A	
12a. Modification Work [] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)		12b. Work Package No. N/A		12c. Modification Work Complete N/A Design Authority/Cog. Engineer Signature & Date		12d. Restored to Original Condition (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date	
13a. Description of Change Revision to meet SEL, Rev. 6.				13b. Design Baseline Document? [] Yes [X] No			
14a. Justification (mark one) Criteria Change [X] Design Improvement [] Environmental [] Facility Deactivation [] As-Found [] Facilitate Const [] Const. Error/Omission [] Design Error/Omission []							
14b. Justification Details Revision to SEL.							
15. Distribution (include name, MSIN, and no. of copies) <i>see attached distribution</i>						RELEASE STAMP DATE: STA: <i>A</i> KANFORD RELEASE ID: <i>2</i> MAY 06 1999	

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653776

A-7900-013-3 (05/96) GEF096

WORCESTER BALL TW CASK MANUAL FILL VALVES, TW-V-*021, *027

Carl Van Katwijk
Numatec Hanford, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words: Worcester Ball TW Cask Manual Fill Valves

Abstract: Worcester Ball TW Cask Manual Fill Valves

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MAY 06 1999		
Date	Release Stamp	

Approved for Public Release

RECORD OF REVISION

(1) Document Number

SNF-3935

Page 1

(2) Title

WORCESTER BALL TW CASK MANUAL FILL VALVES, TW-V-*021, *027

Change Control Record

(3) Revision

(4) Description of Change - Replace, Add, and Delete Pages

Authorized for Release

(5) Cog. Engr.

1(6) Cogn Mgr.

Date _____

1

~~RS~~

(7)

REVISION TO MEET SEL REV. 6, Ecn 653776

Cory A. Williams 5/6/99

Commercial Grade Item Upgrade Dedication Form

SNF-3935, Rev. 1

ECN No. **NA**

CGI No. **CGI-SNF-D-47-P4-043**

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Title: **WORCESTER BALL TW CASK MANUAL FILL VALVES, TW-V-
*021, *027**

Section 1 Part Information

Item No.: NA	Manufacturer:	Supplier:
Mfg. Part/Model No.:	Supplier's P/N:	
Part Description:		
End Use Description:		

Section 2a Component Information

Equipment No.: TW-V-*021, *027	Specification No.: W-441-P4, Rev. 2	Manufacturer: Worcester Controls	Past P.O. No.: NA
Procurement and/or Model No.: 1" K5966RTBW4	Equipment Supplier (if different from manufacturer): TBD		Equip. Supplier's Part No.: NA

Component Description: **Worcester full port ball valves for manual TW cask fill.**

Section 2b Commercial Availability of the Item

- Is the Item available from a catalogue of a qualified NQA1 supplier? (coordinate with project CGI interface Engineer or BTR)
 - ☐ YES (go to #2 below)
 - ☒ NO (go to procedure step 5.3.2, proceed to dedicate Item.)

If not available from a qualified NQA1 supplier, is it available from an ISO 9000 supplier? (coordinate with project CGI interface Engineer or BTR)

 - ☐ YES (go to #2 below, then go to procedure step 5.3.2, proceed to dedicate Item)
 - ☒ NO (go to procedure step 5.3.2, proceed to dedicate Item.)

- List of Candidate qualified suppliers or ISO 9000 suppliers

company name & type	contact name	phone
NA		

- Recommended Procurement Strategy(coordinate with project CGI interface Engineer or BTR):
NA

Section 2c CGI Determination

- Question #1: Is the Item subject to design or specification requirements that are unique to nuclear facilities or activities?
 - ☐ YES (the Item is not commercial grade)
 - ☒ NO (continue)

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2. Question #2: Is the Item used in applications other than nuclear facilities or activities?

☐ NO (the item is not commercial grade)

☒ YES (continue)

3. Question #3: Is the Item ordered from manufacturer/supplier on the basis or specifications set forth in the Published product information (e.g., manufacturer's catalog)?

☐ NO (the Item is not commercial grade)

☒ YES (continue)

☒ All three criteria have been satisfied. The Item meets the definition of commercial grade.

Section 2d Reason for Dedication

The above described Item is being Dedicated for use in the application cited for the following reason(s):

☒ Item is being purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Class application.

☐ Item is being purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Significant application.

☐ Item was purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Class application.

☐ Item was purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Significant application.

☐ Other ('like-for-like', similar, substitution, replacement evaluation)

Section 3 Failure Effects Evaluation

A. Part/Component Safety Function:

1. **Maintain Critical Function Before And After Seismic Event.**

2. **Flow Path for Tempered Water Refill.**

B. Part/Component Functional Mode:

Safety Function #1:

☐ Active – Mechanical or Electrical change of state is required to occur for the component to perform its safety function

☒ Passive – Change of state is not required for the component to perform its safety function

Safety Function #2:

☐ Active – Mechanical or Electrical change of state is required to occur for the component to perform its safety function.

☒ Passive – Change of state is not required for the component to perform its safety function

C. Host Component Safety Function (if applicable): **NA**

1.

D. Failure Mode(s) and the effects on component or system safety function (see Worksheet 1):

1. **Structural Failure of valve or seat-**

2. **Valve failure to open results in loss of capability for manual makeup of TW to the cask.**

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Title: WORCESTER BALL TW CASK MANUAL FILL VALVES, TW-V-
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Section 4 Environmental & Natural Phenomena Hazard Design

Environmental Qualification Required:

Yes ☐

No ☒

Environmental Condition B

If yes: Environmental Qualification Requirements

Limiting Environmental Conditions:

Required Safety Functions:

Qualification Period:

Natural Phenomena Hazard (NPH) Design Required:

Yes ☒

No ☐

HNF-PRO-97, Rev. 0

W-441-P4, Rev. 2

If yes: NPH Design Requirements

Performance Category: **PC-3**

NPH Design Req'ts.: **Seismic Condition A**

Required Safety Functions: **Provide post accident
monitoring of cash annulus water level for
runaway reaction prevention.**

(Flow Path for Tempered Water Refill)

Section 5 Component Functional Classification

☒ Safety Class (SC)

☐ General Service

☐ Safety Significant (SS)

If part/component classification is different from host component/system, document basis.

Section 6 (Reserved)

Section 7 (Reserved)

Section 8 References (for Functional Classification)

National Codes/Standards:

AMSE B31.3

Safety Analysis Report (SAR):

**HNF-SD-SNF-SAR-002,
Rev. 4A**

Drawings: **H-1-82161, Rev. 2**

HNF-SD-SNF-SEL-002, Rev. 6

Vendor Manual/Manufacturer/Supplier Information: **Worcester Series 59 Full Port Ball Valve PB 451-22**

Other:

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Section 9 Critical Characteristics				
Critical Characteristics Verification Document: Vendor Specifications; HNF-SD-SNF-SEL-002, Rev. 6	Acceptance Criteria/Tolerances	Acceptance Method	ID	Function
1. Item Identification Critical Characteristics (necessary for reasonable assurance that the Item delivered is the Item specified)				
Nameplate - Manufacturer	Worcester Controls	1, IN	X	
Component Number- Procurement and/or Model Number	1" K5966 RTBW4, (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)	1, IN	X	
2. Physical Critical Characteristics (for reasonable assurance that the Item delivered is the Item specified)				
Body Material	Stainless Steel (Note 4)	1, IN 1, T	X	
Configuration/Mounting	Factory Installed Locking Mechanism	1, IN	X	
Process Connection	1" Butt weld SS, SCH 40	1, IN	X	
3. Performance Critical Characteristics (for reasonable assurance that the Item will perform its intended safety function(s))				
Pressure Boundary Integrity	Pressure Test at 165 psig (No Leakage- No Bubbles) Note 3	1, T		X
Seat Leakage	Pressure Test to 150 psig ($< 10^{-3}$ ml He/sec Bubbletight)	1, T		X
Environmental	Note 1			
Seismic Condition A	Note 2	1, T		X
4. Notes and Legend:		Acceptance Method:		
<ol style="list-style-type: none"> These valves have TFE Packing and Buna & Vitron Seals. These materials are not subject to degradation at 40°F and 60% RH or 115°F and 22% RH and are suitable for Condition B Application. Maintain critical function before and after Seismic event. W-441-P4, Rev. 2 Appendix L, Page L- (later) provides a seismic testing plan for these safety class, Seismic Condition A valves at a Seismic Spectra TBD. Equipment that has been shaker-table tested should not be installed in a plant (Ref. IEEE Standard 344-1984, Section 7). Consequently, the seismic test constitutes a destructive test. The industry sampling practice for destructive test is to test only one item. Pressure test at 110% of design accident condition pressure of 150 psig. Material verification acceptance method may be by inspection or test. 		<ol style="list-style-type: none"> Special Test and Inspection 1, IN for Inspection 1, T for Test Commercial Grade Survey Source Verification Vendor/Item History 		

04/26/99

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Section 10 Initial Review and Approval

Approvals:

Designated Engineer:

Design Authority:

QA Engineer:

[Signature]
[Signature] 4/20/99
[Signature] 4/20/99

04/20/99

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WORKSHEET 1
DETERMINATION OF FAILURE MECHANISMS/MODES
SECTION 1

Typical Failure Mechanisms	Definition	Applicable to Component under Evaluation	
Fracture	Separation of a solid accompanied by little or no macroscopic plastic deformation.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Corrosion	The gradual deterioration of a material due to chemical or electrochemical reactions, such as oxidation, between the material and its environment.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Erosion	Destruction of materials by the abrasive action of moving fluids, usually accelerated by the presence of solid particles carried with the fluid.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Open Circuit	An electrical circuit that is unintentionally broken so that there is no complete path for current flow.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Short Circuit	An abnormal connection by which an electrical current is connected to ground, or to some conducting body, resulting in excessive current flow.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Blockage	Clogging of a filtering medium resulting in the inability to perform its purification function or blockage of flow.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Seizure	Binding of a normally moving item through excessive pressure, temperature, friction, jamming.	Yes [X] Mode Structural Failure or Seizure of Valve Seat	No []; If Yes, indicate failure
Unacceptable Vibration	Mechanical oscillations produced are beyond the defined permissible limits due to unbalancing, poor support, or rotation at critical speeds.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Loss of Properties	A loss of mechanical and physical properties of a material due to exposure to high temperatures, radiation exposure.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Excess Strain	Under the action of excessive external forces the material of the part has been deformed or distorted.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Mechanical Creep	From prolonged exposure to high temperature and stress, the object will show a slow change in its physical (shape and dimension) and mechanical characteristics.	Yes [] Mode _____	No [X]; If Yes, indicate failure
Ductile Fracture	Fracture characterized by tearing of metal accompanied by appreciable gross plastic deformation.	Yes [] Mode _____	No [X]; If Yes, indicate failure

Section 2 Additional Failure Modes Applicable to the Component Under Evaluation

1.

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Title: WORCESTER BALL TW CASK MANUAL FILL VALVES, TW-V-

*021, *027

CHECKLIST 1 ACCEPTANCE METHOD 1 SPECIAL TEST/INSPECTION VERIFICATION

SECTION 1			
Item Description: TW Manual Cask Fill Valves		Equip #: TW-V-*021,*027	
System #: 47		Procurement and/or Model #: 1" K5966RTBW4	
Manufacturer (Address/Phone): Worcester Controls P.O. Box 538 33 Lock Dr. Marborough, MA 01752 (508) 481-4800 P.O. #		Supplier (Address/Phone): TBD	
SECTION 2 CRITICAL CHARACTERISTICS TO BE VERIFIED BY METHOD 1.			
Insp	Test	Post-Test	
☒	☐	☐	1. Nameplate - Manufacturer
☒	☐	☐	2. Component Number-Procurement and/or Model Number
☒	☒	☐	3. Body Material (Verification may be by either inspection or test)
☒	☐	☐	4. Configuration/Mounting
☒	☐	☐	5. Process Connection
☐	☒	☐	6. Pressure Boundary Integrity
☐	☒	☐	7. Seat Leakage
☐	☒	☐	8. Seismic Condition A
SECTION 3 BY INSPECTION			
* See Attachment G of Desk Instruction for Sampling Size			
Characteristic: Nameplate - Manufacturer			
Sample Size*: All Items			
Acceptance Criteria: Worcester Controls			
Receipt Inspection Plan / Report #: _____			
References (see Section 7): _____			

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Characteristic: **Component Number-Procurement and/or Model Number**

Sample Size*: **All Items**

Acceptance Criteria: **1" K 5966RTBW4, (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)**

Receipt Inspection Plan / Report #: _____

References (see Section 7): **Worcester PB451-22**

Characteristic: **Configuration/Mounting**

Sample Size*: **All Items**

Acceptance Criteria: **Factory Installed Locking Mechanism**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Process Connection**

Sample Size*: **All Items**

Acceptance Criteria: **1" Buttweld SS, SCH 40**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Body Material**

Sample Size*: **Normal Sampling Size**

Acceptance Criteria: **Stainless Steel**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

SECTION 4 BY SPECIAL TEST

* See Attachment G of Desk Instruction for Sampling Size

Test To Be Performed by:

☐ Purchaser

☐ Supplier/Manufacturer**

☐ Other

Number of Items to be Tested:

Test/Inspection Location:

Characteristic for Test: **Pressure Boundary Integrity**

Acceptance Criteria: **Pressure Test at 165 psig (No Leakage-No Bubbles)**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

Test Plan and Report #: _____ References (see Section 7): _____

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Title: WORCESTER BALL TW CASK MANUAL FILL VALVES, TW-V-
*021, *027Characteristic for Test: **Seat Leakage**Acceptance Criteria: **Pressure Test to 150 psig ($< 10^{-3}$ ml/sec Bubble-tight)**Sample Size*: **Normal Sampling Size**

Actual Test Value:

Test Plan and Report #: _____ References (see Section 7): _____

Characteristic for Test: **Seismic Condition A**Acceptance Criteria: **Maintain Critical Function Before and After Seismic Event.****(Valve must be operable (open & close with handle) and have flow path through valve when open after seismic event)**Sample Size*: **Destructively Test Only One Item**

Actual Test Value:

Test Plan and Report #: _____ References (see Section 7): _____

****If Supplier/Manufacturer or Other, Refer to CGI Checklist-2 for Support Information**

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Section 5: Test / Inspection Summary (Acceptance Method 1)

1. SUMMARY OF VERIFIED CRITICAL CHARACTERISTICS, THEIR VERIFICATION METHODS, AND RESULTS

ITEM DESCRIPTION:

Critical Characteristics				Verification Results							
Critical Characteristics	Acceptance Criteria/Tolerances	ID	Function	Method T/V/N	Procedure or RR#	Check- list ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date
Nameplate - Manufacturer	Worcester Controls	X									
Component Number- Procurement and/or Model Number	1" K5966 RTBW4, (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)	X									
Body Material	Stainless Steel	X									
Configuration/Mounting	Factory Installed Locking Mechanism	X									
Process Connection	1" Buttweld SS, SCH 40	X									
Pressure Boundary Integrity	Pressure Test at 165 psig (No Leakage-No Bubbles)		X								
Seat Leakage	Pressure Test to 150 psig (<10 ⁻³ ml/sec Bubbletight)		X								
Seismic Condition A	Maintain Critical Function Before and After Seismic Event.		X								

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2. DISPOSITION OF UNVERIFIED OR FAILED CRITICAL CHARACTERISTICS	
Critical Characteristic	Disposition
3. SIGNATURE INDICATES ALL CRITICAL CHARACTERISTICS VERIFIED SATISFACTORY OR ACCEPTABLY DISPOSITIONED AND COMMERCIAL GRADE DEDICATION IS SATISFACTORY AND COMPLETE.	
Testing Agency Approval: _____ Date _____	Design Authority: _____ Date _____
Testing Agency QA Engineer: _____ Date _____	QA Engineer: _____ Date _____

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Section 6 Contacts/Phone Numbers

Name	Phone
Design Authority	()
QA	()
QC	()
Cog - Engineer	()
CGI Engineer	()
Procurement Engineer	()
Other	()

Section 7 Supporting Documentation for this Checklist

Initial Procurement Documents	For Critical Characteristics
☐ Drawings:	
☐ Manuals (specify type & number):	
☐ Design Calculations	
☐ Installation Instructions	
☐ Operation Instructions	
☐ Calibration Instructions	
☐ Manufacturer's Recommended Spare Parts List	
☐ Other:	
Procurement Documents	
☐ Certificate of Conformance/Compliance	
☐ Seismic Qualification Certificate	
☐ Environmental Qualification Certificate	
☐ Test Report (s):	
☐ Inspection Report (s):	
☐ CMTRs for ASME Pressure Retaining Materials	
☐ Valve Seat Leakage Report	
☐ Weld Records	
☐ Material Traceability Record	
☐ Other:	