APR 01 1999
STA# 4

4 ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 626284

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) SNF Project		4. Related EDT No.: N/A				
5. Proj./Prog./Dept./Div.: Spent Nuclear Fuel Project		6. Design Authority/ Design Agent/Cog. Engr.: C. Van Katwijk		7. Purchase Order No.: N/A				
8. Originator Remarks: N/A				9. Equip./Component No.: N/A				
				10. System/Bldg./Facility: Spent Nuclear Facility				
				12. Major Assm. Dwg. No.: N/A				
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No				13. Permit/Permit Application No.: N/A				
				14. Required Response Date: N/A				
15. DATA TRANSMITTED								
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Design- Nator	(G) Reason for Trans- mittal	(H) Orig- inator Dispo- sition	(I) Receiv- er Dispo- sition
1	SNF-3935		0	Worcester Ball TW Cask Manual Fill Valves, TW-V*21, *27	Q	2	1	N/A

16. KEY											
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)					
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)				1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged					
17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
2	1	Designated Engineer	C. Van Katwijk								
2	1	Design Authority	J. J. Irwin								
2	1	QA	T. D. Hays	2-18-99							

18. C. Van Katwijk Signature of EDT Originator 2-9-99 Date		19. T. Chohor Authorized Representative for Receiving Organization 2/22/99 Date		20. J. J. Irwin Design Authority/ Cognizant Manager 2/11/99 Date		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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Worcester Ball TW Cask Manual Valves , TW-V*021, *027

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

EDT/ECN: 626284 UC: 620
Org Code: 2G300 Charge Code: 105559/A000
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Key Words: Full port Ball valve

Abstract: Worcester Ball TW Cask Manual Fill Valves, TW-V*021, *027
CGI-SNF-D-47-P4-043

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Release Approval

4/1/99

Date

Release Stamp

Approved for Public Release

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 1 of 11

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

SNF 3935

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
Manufacturer's Part/ 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

1. Is the Item available from a catalogue from a qualified NQA1 supplier or ISO 9000 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)

2. List of Candidate qualified suppliers or ISO 9000 suppliers
 company name & type contact name phone

NA

3. Recommended Procurement Strategy (coordinate with project CGI interface Engineer or BTR): **NA**

Section 2c CGI Determination

1. 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)

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 manufacturers catalog?

☐ NO (the Item is not commercial grade)

☒ YES (continue)

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

12/18/98

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 2 of 11

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

*021, *027

SNF 3935

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. **Confinement**

2. **Maintain Critical Function During And After Seismic Event.**

3.

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

Safety Function #3:

☐ 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):

1. **NA**

2.

3.

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 makeoff of TW to the cask.**

3.

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NACGI No. CGI-SNF-D-47-P4-043

Page 3 of 11

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

SNP 3935

Section 4 Environmental & Natural Phenomena Hazard Design

Environmental Qualification Required:

Yes []

No [X]

Environmental Condition B

If yes: Environmental Qualification Requirements

Limiting Environmental Conditions:

Required Safety Functions:

Qualification Period:

Natural Phenomena Hazard (NPH) Design Required:

Yes [X]

No []

HNF-PRO-97, Rev. 0~~**WHC-SD-GN-DGS-3006**~~

If yes: NPH Design Requirements

Performance Category: **PC-3**NPH Design Req'ts.: **Seismic Condition A**Required Safety Functions: **Confinement**

Section 5 Component Functional Classification

[X] 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 B31.1**B16 Series**

Safety Analysis Report (SAR):

HNF-SD-SNF-SAR-002,**Rev. 4A**Drawings: ~~**H-1-82163, Rev. 2**~~**HNF-SD-SNF-SEL-002, Rev. 4****H-1-82161, Rev. 2****WCE 12/22/98****J/V 12/22/98**Vendor Manual/Manufacturer/Supplier Information: **Worcester Series 59 Full Port Ball Valve PB 451-22**

Other:

12/18/98

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 4 of 11

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

SNF 3935

Section 9: Critical Characteristics

Critical Characteristics Verification Document: Vendor Specifications; HNF-SD-SNF-SEL-002, Rev. 4	Acceptance Criteria/Tolerances	Acceptance Method	ID	Function
1. Item Identification Critical Characteristics (necessary for reasonable assurance that the Item delivered is the Item specified)				
Manufacturer	Worcester Controls	1, IN	X	
Model Number	1" K5966 RTBW4	1, IN	X	
Nameplate Data	Per Vendor Manual	1, IN	X	
2. Physical Critical Characteristics (for reasonable assurance that the Item delivered is the Item specified)				
Body Material	Stainless Steel	1, T	X	
Configuration/Mounting	Factory Installed Locking Mechanism	1, IN	X	
Process Connection	1" Buttweld 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 (zero leakage) Note 3	1, T		X
Seat Leakage	Pressure Test to 150 psig (< 10⁻⁴ cc He/Sec Bubbletight)	1, T		X
Environmental	Note 1			
Seismic Condition A	Note 2	1, T		X

4. Notes and Legend:

- 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 during 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.
- Pressure test at 110% of design accident condition pressure of 150 psig.

Acceptance Method:

- Special Test and Inspection
1, IN for Inspection
1, T for Test
- Commercial Grade Survey
- Source Verification
- Vendor/Item History

Section 10 Initial Review and Approval

Approvals:

Designated Engineer:

Design Authority:

QA Engineer:

[Signature] 12/31/91
[Signature] 12/22/98

12/18/98

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 5 of 11

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

SNF 3935

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 Mode _____
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 Mode _____
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 Mode _____
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 Mode _____
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 Mode _____
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 Mode _____
Seizure	Binding of a normally moving item through excessive pressure, temperature, friction, jamming.	Yes [X] Mode _____	No []; If Yes, indicate failure Mode Structural Failure or Seizure of Valve Seat
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 Mode _____
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 Mode _____
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 Mode _____
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 Mode _____
Ductile Fracture	Fracture characterized by tearing of metal accompanied by appreciable gross plastic deformation.	Yes [] Mode _____	No [X]; If Yes, indicate failure Mode _____

Section 2. Additional Failure Modes Applicable to the Component Under Evaluation

1. _____
2. _____
3. _____
4. _____
5. _____

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 6 of 11

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

SNF 3935

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		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. Manufacturer
☒	☐	☐	2. Model Number
☒	☐	☐	3. Nameplate Data
☐	☒	☐	4. Body Material
☒	☐	☐	5. Configuration/Mounting
☒	☐	☐	6. Process Connection
☐	☒	☐	7. Pressure Boundary Integrity
☐	☒	☐	8. Seat Leakage
☐	☒	☐	9. Seismic Condition A
SECTION 3 BY INSPECTION			
* See Attachment G of Desk Instruction for Sampling Size			
Characteristic: Manufacturer Sample Size*: All Items Acceptance Criteria: Worcester Controls Receipt Inspection Plan / Report #: _____ References (see Section 7): _____			
Characteristic: Model Number Sample Size*: All Items Acceptance Criteria: 1" K 5966RTBW4 Receipt Inspection Plan / Report #: _____ References (see Section 7): Worcester PB451-22			

12/18/98

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 7 of 11

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

SNF 3935

Characteristic: **Nameplate Data**

Sample Size*: **All Items**

Acceptance Criteria: **Per Vendor Manual**

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): _____

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: **Body Material**

Acceptance Criteria: **Stainless Steel**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Pressure Boundary Integrity**

Acceptance Criteria: **Pressure Test at 165 psig (zero leakage)**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Seat Leakage**

Acceptance Criteria: **Pressure Test to 150 psig ($< 10^{-4}$ cc He/Sec Bubbletight)**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA CGI No. CGI-SNF-D-47-P4-043

Page 8 of 11

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

SNF 3935

Characteristic for Test: **Seismic Condition A**

Acceptance Criteria: **Maintain Critical Function During and After Seismic Event.**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

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

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA

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

Page 9 of 11

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

*021, *027

SNF 3935

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/IN	Procedure or RR#	Check-list ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date
Manufacturer	Worcester Controls	X									
Model Number	1" K5966 RTBW4	X									
Nameplate Data	Per Vendor Manual	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 (zero leakage)		X								
Seat Leakage	Pressure Test to 150 psig ($< 10^{-4}$ cc He/Sec Bubbletight)		X								
Seismic Condition A	Maintain Critical Function		X								

12/18/98

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA

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

Page 10 of 11

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

*021, *027

SNF 3935

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 _____

Testing Agency QA Engineer: _____ Date _____

Design Authority: _____ Date _____

QA Engineer: _____ Date _____

Commercial Grade Item Upgrade Dedication Form

Rev. No. 0

ECN No. NA

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

Page 11 of 11

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

SNF 3935

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:	