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				
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No				12. Major Assm. Dwg. No.: N/A				
				13. Permit/Permit Application No.: N/A				
				14. Required Response Date: N/A				
15. DATA TRANSMITTED				(F)	(G)	(H)	(I)	
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Design- Nator	Reason for Trans- mittal	Orig- inator Dispo- sition	Receiv- er Dispo- sition
1	SNF-3933		0	NUPRO Process Vent/MCO Check Valve – Prevent Backflow from Process Vent into MCO	Q	2	1	N/A

[illegible]

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
C. Van Katwyk <i>[Signature]</i> 2-9-99	T. Choho <i>[Signature]</i> 2/22/99	J. J. Irwin <i>[Signature]</i> 2/11/99	☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
Signature of EDT Originator	Authorized Representative for Receiving Organization	Design Authority/ Cognizant Manager	
Date	Date	Date	

NUPRO Process Vent / MCO Check Valve – Prevent Backflow from Process Vent into MCO

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

EDT/ECN: 626282 UC: 620
Org Code: 2G300 Charge Code: 105559/A000
B&R Code: 39EW40400 Total Pages: 13

Key Words: Process Vent – MCO Pressure

Abstract: NUPRO Process Vent/MCO Check Valve – Prevent Backflow from Process Vent into MCO
CGI-SNF-D-30-3-P4-040

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Release Approval

4/1/99

Date

Release Stamp

Approved for Public Release

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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.: **PV-CKV-112**

Specification No.: **W-441-P4, Rev. 2**

Manufacturer: **Nupro Valve Mfg. Company**

Past P.O. No.: **NA**

Manufacturer's Part/ Model No.: **SS-CHVC08-30**

Equipment Supplier (if different from manufacturer): **TBD**

Equip. Supplier's Part No.: **NA**

Component Description: **This valve is a 1/2 inch check valve located between the MCO pressure safety element and the process vent. The valve prevents air backflow from the process vent into the MCO.**

Section 2b Qualified Vendor/Supplier Survey

1. Is the Item available from a catalog from a qualified NQA1 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 suppliers

company name and 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)

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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.

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. Check valve closure prevents air back leakage from the process vent to the MCO to prevent hydrogen explosion.

2. Confinement - Prevents air leakage into the MCO during vacuum operation or after rupture disc burst.

3. Maintain critical function during and after Seismic event.

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.

Error

An error occurred while processing this page. See the system log for more details.

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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)				
Nameplate Data	Per Vendor Manual	1,IN	X	
Model Number	SS-CHVCO8-30	1,IN	X	
Manufacturer	Nupro Valve Mfg. Company	1,IN	X	
Process Connection	1/2" Male VCO	1,IN	X	
2. Physical Critical Characteristics (necessary for reasonable assurance that the Item delivered is the Item specified)				
Material, Body	Stainless Steel	1,T	X	
Material, Process Connection	Stainless Steel	1,T	X	
3. Performance Critical Characteristics (necessary & sufficient for reasonable assurance that the Item will perform its intended safety function(s))				
Confinement	No leakage at test pressure of 165 psig. Note 3.	1,T		X
Cracking Pressure Setting	Nominal 30 psig	1,T		X
Seat Leakage, Reverse Flow After Cracking	Pressure test to design pressure (150 psig) (bubble tight standards < 10⁻⁴cc He/sec.)	1,T		X
Environmental	Note 1			
Seismic Condition A	Note 2	1,T		X

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4. Notes and Legend:

1. The check valve packing (VITON) is not subject to degradation at ambient conditions of 40°F and 60% RH or 115°F and 22% RH and is suitable for Environmental Condition B application.
2. Maintain critical function during and after Seismic event. W-441-P4, Appendix L, page L-TBD provides a seismic testing plan for this safety class, Seismic Condition A component at a Seismic Spectra TBD.
3. Pressure test at 110% of design accident condition pressure of 150 psig.

Acceptance Method:

1. Special Test and Inspection
1,IN for Inspection
1,T for Test
2. Commercial Grade Survey
3. Source Verification
4. Vendor/Item History

Section 10 Initial Reviews and Approvals

Approvals:

Designated Engineer: C. Van Kleeberg 12/22/98

Design Authority: 12/22/98

QA Engineer: TD Day 12/22/98

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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 []	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 []	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 []	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 []	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 []	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 []	No [X]; If Yes, indicate failure Mode. _____
Seizure	Binding of a normally moving item through excessive pressure, temperature, friction, jamming.	Yes []	No [X]; If Yes, indicate failure Mode. _____
Unacceptable Vibration	Mechanical oscillations produced are beyond the defined permissible limits due to unbalancing, poor support, or rotation at critical speeds.	Yes []	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 []	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 []	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 []	No [X]; If Yes, indicate failure Mode. _____
Ductile Fracture	Fracture characterized by tearing of metal accompanied by appreciable gross plastic deformation.	Yes []	No [X]; If Yes, indicate failure Mode. _____

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

- Failure of check valve to seat and prevent reverse flow/failure of check valve to open and provide flow path for pressure safety element PV-PSE-1 *33.**
- Process connection/body break.**

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CHECKLIST 1

ACCEPTANCE METHOD 1

SPECIAL TEST/INSPECTION VERIFICATION

SECTION 1			
Item Description: Nupro Process Vent/Mco Check Valve		Equip #: PV-CKV-*112	
System #: 30-3		Model #: SS-CHVCO8-30	
Manufacturer (Address/Phone): Nupro Valve Mfg. Company		Supplier (Address/Phone):	
P.O. #			
SECTION 2 CRITICAL CHARACTERISTICS TO BE VERIFIED BY METHOD 1.			
Insp	Test	Post-Test	
☒	☐	☐	1. Nameplate Data
☒	☐	☐	2. Model Number
☒	☐	☐	3. Manufacturer
☒	☐	☐	4. Process Connection
☐	☒	☐	5. Material, Body
☐	☒	☐	6. Material, Process Connection
☐	☒	☐	7. Confinement
☐	☒	☐	8. Cracking Pressure Setting
☐	☒	☐	9. Seat Leakage, Reverse Flow After Cracking
☐	☒	☐	10. Seismic Condition A
SECTION 3 BY INSPECTION			
* See Attachment G of Desk Instruction for Sampling Size			
Characteristic: Nameplate Data			
Sample Size*: All Items			
Acceptance Criteria: Per Vendor Manual			
Receipt Inspection Plan / Report #: _____			
References (see Section 7): Nupro Poppet Check-Valves _____			
Characteristic: Model Number			
Sample Size*: All Items			
Acceptance Criteria: SS-CHVCO8-30			
Receipt Inspection Plan / Report #: _____			
References (see Section 7): _____			

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Characteristic: **Manufacturer**

Sample Size*: **All Items**

Acceptance Criteria: **Nupro Valve Mfg. Company**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Process Connection**

Sample Size*: **All Items**

Acceptance Criteria: **1/2" Male VCO**

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: **Material, Body**

Acceptance Criteria: **Stainless Steel**

Sample Size*: **Normal Sampling Size**

Actual Test Value: _____

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

Characteristic for Test: **Material, Process Connection**

Acceptance Criteria: **Stainless Steel**

Sample Size*: **Normal Sampling Size**

Actual Test Value: _____

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

Characteristic for Test: **Confinement**

Acceptance Criteria: **No Leakage at Test Pressure of 165 psig**

Sample Size*: **Normal Sampling Size**

Actual Test Value: _____

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

Characteristic for Test: **Cracking Pressure Setting**

Acceptance Criteria: **Nominal 30 psig**

Sample Size*: **Normal Sampling Size**

Actual Test Value: _____

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

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Characteristic for Test: **Seat Leakage, Reverse Flow After Cracking**

Acceptance Criteria: **Pressure test to design pressure (150 psig) (bubble tight standards < 10-4cc He/sec.)**

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 During and After Seismic Event**

Sample 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**

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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/IN	Procedure or R/R#	Check-List ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date		
Nameplate Data	Per Vendor Manual	X											
Model Number	SS-CHVC08-30	X											
Manufacturer	Nupro Valve Mfg. Company	X											
Process Connection	1/2 INCH Male VCO	X											
Material, Body	Stainless Steel	X											
Material, Process Connection	Stainless Steel	X											
Confinement	No Leakage at Test Pressure of 165 psig	X											
Cracking Pressure	Nominal 30 psig	X											
Seat Leakage, Reverse Flow After Cracking	Pressure test to design pressure (150 psig) (bubble tight standards < 10 ⁻⁴ cc He/sec.)	X											
Environmental	NA												
Seismic Condition A	Maintain Critical Function	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 _____		BUYER VERIFICATION	
Testing Agency QA Engineer: _____ Date _____		Design Authority: _____ 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:	