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 ☒ 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"
12a. Modification Work ☐ Yes (fill out Blk. 12b) ☒ 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
9. Document Numbers Changed by this ECN (includes sheet no. and rev.) <u>All Rev 0</u> 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). <u>N/A</u>			
11. Related PO No. <u>N/A</u>			
13a. Description of Change Revision to meet SEL, Rev. 6.			
13b. Design Baseline Document? ☐ Yes ☒ No			
14a. Justification (mark one) Criteria Change ☒ 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: <u>MAY 06 1999</u> STA: <u>4</u> ID: <u>2</u>	

A-7900-013-2 (05/96) GEF095

653776

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

GRISWOLD TEMPERED WATER FLOW REGULATOR VALVES USED A SANTI-SIPHON VALVES

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

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Key Words: Griswold Tempered Water Flow Regulator Valves

Abstract: Griswold Tempered Water Flow Regulator Valves

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MAY 06 1999		
Date	Release Stamp	

Approved for Public Release

RECORD OF REVISION

(1) Document Number	
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(2) Title

GRISWOLD TEMPERED WATER FLOW REGULATOR VALVES USED A SANTI-SIPHON VALVES

Change Control Record

[illegible]

Commercial Grade Item Upgrade Dedication Form

SNF-3878, Rev. 1

ECN No. **NA** CGI No. **CGI-SNF-D-47-P4-003**
 Title: **GRISWOLD TEMPERED WATER FLOW REGULATOR VALVES
 USED AS ANTI-SIPHON VALVES**

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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.: TW-FCV-1*22; TW-FCV-1*23	Specification No.: W-441- P4, Rev 2	Manufacturer: Griswold Controls	Past P.O. No.: NA
Procurement and/or Model Number: 4902F	Equipment Supplier (if different from manufacturer): TBD		Equip. Supplier's Part No.: NA
Component Description: FCV-1*22 and 1*23 are Griswold constant flow regulators used as anti-siphon valves in the tempered water system, they fail closed but valve cartridge orifice allows minimum flow to prevent loss of water from the MCO/CASK annulus.			

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)
- 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 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. The tempered water system's safety function is to prevent overheating the MCO contents and a runaway reaction. The anti-siphon valves contribute to this function by preventing reverse flow siphoning from the MCO/CASK annulus.

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

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. Valve Binding - Failure to remain minimally open - Siphon of Annulus Water

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Section 4 Environmental & Natural Phenomena Hazard Design

Environmental Qualification Required:

Yes ☐

No ☒

If yes: Environmental Qualification Requirements

Limiting Environmental Conditions: Required Safety

Functions:

Qualification Period:

Environmental Condition B

Natural Phenomena Hazard (NPH) Design Required:

Yes ☒

No ☐

If yes: NPH Design Requirements

Performance Category: **PC-3**

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

Required Safety Functions: **Prevent siphon of**

MCO/CASK tempered water

HNF-PRO-97 REV. 0

W-441-P4, Rev. 2,

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:

ASME B 31.3

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: **Griswold F-2723A**

Other: **NA**

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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	Griswold Controls	1, IN	X	
Valve-Component Number-Procurement and/or Model Number	4902F (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)				
Valve body and plug material	Stainless steel (Note 4)	1, IN 1, T	X	
End Connection	3/4" FNTF	1, IN	X	
Dimensions	Nominal length 4" and 1.5 lbs. weight	1, IN	X	
3. Performance Critical Characteristics (for reasonable assurance that the Item will perform its intended safety function(s))				
Pressure Boundary	Pressure Test At 165 psig (Zero Leakage) Note 3	1, T		X
Valve Reverse Flow	Apply 30 psid reverse flow (Ensure Nominal orifice flow)	1, T		X
Flow Rate	Maintain nominal 1 gpm output over input range of 4 to 30 psid.	1, T		X
Environmental	Note 1			
Seismic Condition A	Note 2	1, T		X
4. Notes and Legend: 1. These valves contain a non-metallic Viton O-ring, and this material is not subject to degradation at 40°F and 60% RH or 115°F and 22% RH and are suitable for Environmental Condition B. 2. Maintain critical function before and after Seismic event. W-441-P4, Rev. 2, Appendix L, page L-16, provides a seismic testing plan for these components at a (TBD) seismic spectra. 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. 3. Pressure test at 110% of design accident condition pressure of 150 psig and full vacuum. 4. Material verification acceptance method may be by either inspection or test.		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 Review and Approval

Approvals:

Designated Engineer: [Signature]Design Authority: [Signature] 4/22/99QA Engineer: [Signature] 4/26/99

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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 [] 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 [X] No []; If Yes, indicate failure Mode Valve Binding - Failure to remain open _____
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

1.

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Title: GRISWOLD TEMPERED WATER FLOW REGULATOR VALVES
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CHECKLIST 1

ACCEPTANCE METHOD 1

SPECIAL TEST/INSPECTION VERIFICATION

SECTION 1			
Item Description: Griswold Flow Regulator Valves		Equip #: TW-FCV-1*22 & 1*23	
System #: 47		Procurement and/or Model #: 4902 F	
Manufacturer (Address/Phone): Griswold Controls 2803 Barranca Road PO Box 19612 Irvine, CA 92714 (714) 559-6000 P.O. #		Supplier (Address/Phone): KJ Barnett (425) 881-1128	
SECTION 2 CRITICAL CHARACTERISTICS TO BE VERIFIED BY METHOD 1.			
Insp	Test	Post-Test	
☒	☐	☐	1. Nameplate - Manufacturer
☒	☐	☐	2. Valve-Component Number-Procurement and/or Model Number
☒	☒	☐	3. Valve body and plug material (Verification may be done by either inspection or test)
☒	☐	☐	4. End Connection
☒	☐	☐	5. Dimensions
☐	☒	☐	3. Pressure Boundary
☐	☒	☐	4. Valve Reverse Flow
☐	☒	☐	5. Flow Rate
☐	☒	☐	6. Seismic Condition A

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Title: GRISWOLD TEMPERED WATER FLOW REGULATOR VALVES
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SECTION 3 BY INSPECTION

* See Attachment G of Desk Instruction for Sampling Size

Characteristic: **Nameplate - Manufacturer**Sample Size*: **All Items**Acceptance Criteria: **Griswold Controls**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Valve-Component Number-Procurement and/or Model Number**Sample Size*: **All Items**Acceptance Criteria: **4902F (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)**

Receipt Inspection Plan / Report #: _____

References (see Section 7): **Griswold F-2723A** _____Characteristic: **End Connection**Sample Size*: **All Items**Acceptance Criteria: **3/4" FNTF**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Dimensions**Sample Size*: **All Items**Acceptance Criteria: **Nominal length 4" and 1.5 lbs. weight**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Valve Body Material**Sample Size*: **Normal Sampling Size**Acceptance Criteria: **Stainless Steel**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

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Title: GRISWOLD TEMPERED WATER FLOW REGULATOR VALVES
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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**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: **Valve Reverse Flow**Acceptance Criteria: **Apply 30 psid reverse flow (Ensure Nominal orifice flow)**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Flow Rate**Acceptance Criteria: **Maintain nominal 1 gpm output over input range of 4 to 30 psid.**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.**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/IN	Procedure or RR#	Check- list ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date
Nameplate - Manufacturer	Griswold Controls	X									
Valve-Component Number-Procurement and/or Model Number	4902F (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)	X									
Valve body and plug material	Stainless steel	X									
End Connections	3/4" FNTF	X									
Dimensions	Nominal length 4" and 1.5 lbs. weight	X									
Pressure Boundary	Pressure Test at 165 psig (Zero Leakage)		X								
Valve Reverse Flow	Apply 30 psid reverse flow (Ensure Nominal orifice flow)		X								
Flow Rate	Maintain nominal 1 gpm output over input range of 4 to 30 psid.		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 _____	BUYER VERIFICATION	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:	