ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 662315

Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. T. Nuxall, CVDF, R3-86, 372-3739	4. USQ Required? ☐ Yes ☒ No	5. Date 9/2/00	
	6. Project Title/No./Work Order No. SNF/W-441 Spent Nuclear Fuel Cold Vacuum Drying	7. Bldg./Sys./Fac. No. CVDF 142-K	8. Approval Designator Q	
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) See block 13a	10. Related ECN No(s). N/A	11. Related PO No. N/A	
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	
13a. Description of Change SCHe SNF-3893, Rev. 1, SNF-3895, Rev. 2, SNF-3920, Rev. 2, SNF-3921, Rev. 4, SNF-3922, Rev. 1, SNF-3924, Rev. 1, SNF-3925, Rev. 1, SNF-3927, Rev. 3, SNF-3928, Rev. 2, SNF-3929, Rev. 5, SNF-3931, Rev. 2, SNF-3932, Rev. 3, SNF-4627, Rev. 2 Updated document numbers and deleted revision numbers. USQ Approval: CX B.1 from AP-NS-4-001-15.				
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 Editorial changes for configuration control. The design verification method for SS/SC components is by independent review in accordance with EN-6-027-01. Documentation of this review is accomplished by the independent review approval signature provided on page 2 of this ECN.				
15. Distribution (include name, MSIN, and no. of copies) See distribution sheet.				

RELEASE STAMP	
SEP 3-2 2000 (JCB 9/3/00) DATE: STA. # 19	MANFORD RELEASE ID: 15

[illegible]

SNF-3893
Revision 2

ECN 662315

Check-All SCHe Supply Purge Check Valves-Prevent Back Flow From SCHe Into Helium Supply

Project No: W-441

Document Type: RPT

Division: SNF

C Miska
FH

Date Published
September 2000

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford
P.O. Box 1000
Richland, Washington

Janis Braden
Release Approval

9/3/00
Date

Release Stamp

Check-All SCHe Supply Purge Check Valves- Prevent Back Flow From SCHe Into Helium Supply

Prepared for the U.S. Department of Energy
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Richland, Washington

SNF-3893
Rev 2

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Total Pages: 17

Commercial Grade Item Upgrade Dedication Form

SNF-3893, Rev. 2

ECN No. **NA**

CGI No. **CGI-SNF-D-13-P5-020**

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Title: **CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES – PREVENT
BACK FLOW FROM SCHe INTO HELIUM SUPPLY**

Section 1 Part Information

Item No.: **NA**

Manufacturer: **NA**

Supplier: **NA**

Mfg. Part/Model No.: **NA**

Supplier's P/N: **NA**

Part Description: **NA**

End Use Description: **NA**

Section 2a Component Information

Equipment No.: **SCHe-
CHK-*090, *091,
*092, *093, *118,
*119, *120, *121,
*122, *123, *124,
*125**

Specification No.:
**SNF-5304
(W-441-P5)**

Manufacturer:
Check-All

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

Procurement and/or Model
No.: **UN-3-050-SS-V-
1/2**

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

Equip. Supplier's Part No.:
NA

Component Description: **These valves are ½-inch check valves used to prevent SCHe backflow into the Helium System if pressure in the Helium System drops below the pressure of the control valve downstream of the SCHe supply bottles. (14 psig in trains A and B and 2 psig in trains C and D).**

Section 2b Qualified Vendor/Supplier Survey

1. 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.)

2. List of Candidate qualified suppliers or ISO 9000 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)

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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. **Assures a SCHe purge availability to the MCO by check valve closure to prevent backflow of helium from the SCHe supply system into the normal Helium System should the normal helium system pressure drop below 14 psig in Trains A and B and 2 psig in Trains C and D.**

2. **Pressure Boundary Integrity– Prevents helium leakage from the normal Helium System or SCHe System or air leakage into the system during vacuum operation.**

3. **Maintain critical function before 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): **NA**

1.

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BACK FLOW FROM SCHe INTO HELIUM SUPPLY**

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

1. **Seizure – failure of the check valve to close as required. Failure of a valve in Train A (or C) would not affect SCHe flow in Train B (or D) and Trains A and B are backed up by Trains C and D.**

2. **Fracture of the valve body or piping attachment.**

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

SNF-5304

If yes: NPH Design Requirements

Performance Category: **PC-3**

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

Required Safety Functions: **Check valve closure to provide isolation between Helium System and Safety Class Helium System; Pressure Boundary Integrity.**

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:

ASME B31.3

Safety Analysis Report (SAR):

HNF-SD-SNF-SAR-002

Drawings: **H-1-82165**

HNF-SD-SNF-SEL-002

CVDF-SSD-003

Vendor Manuals/Manufacturer/Supplier Information: **Check-All Valves Style TCV Tubing Check Valve**

Other: **NA**

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Title: **CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES – PREVENT
BACK FLOW FROM SCHe INTO HELIUM SUPPLY**

Section 9 Critical Characteristics

Critical Characteristics	Acceptance Criteria/Tolerances	Acceptance Method	ID	Function
Verification Document: Vendor Specifications, HNF-SD-SNF-SEL-002				
1. Item Identification Critical Characteristics (necessary for reasonable assurance that the Item delivered is the Item specified)				
Component Number-Procurement and/or Model Number	UN-3-050-SS-V-1/2, (Per SNF-5304, Section H, Design Data Sheet)	1,IN	X	
Nameplate - Manufacturer	Check-All	1,IN	X	
Process Connection	1/2 Inch FNPT	1,IN	X	
2. Physical Critical Characteristics (necessary for reasonable assurance that the Item delivered is the Item specified)				
Material, Body	Stainless Steel (Note 4)	1, IN 1,T	X	
Material, Process Connection	Stainless Steel (Note 4)	1, IN 1,T	X	
3. Performance Critical Characteristics (necessary & sufficient for reasonable assurance that the Item will perform its intended safety function(s))				
Pressure Boundary Integrity	No Leakage at Test Pressure of 165 psig (No Bubbles) Note 3	1,T		X
Seat Leakage, Reverse Flow	Pressure Test to Design Pressure (150 psig) (Bubble Tight Standards < 10⁻³ ml/Sec)	1,T		X
Environmental	Note 1			
Seismic Condition A	Note 2	1,T		X
4. Notes and Legend:		Acceptance Method:		
1. The check valve non-metallic seat (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.		1. Special Test and Inspection 1,IN for Inspection 1,T for Test		
2. Maintain critical function before and after seismic event. SNF-5304, Appendix I, page I-2, provides a seismic testing plan for these components at a seismic spectra SNF-4895. 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.		2. Commercial Grade Survey		
3. Pressure test at 110% of design accident condition pressure of 150 psig.		3. Source Verification		
4. Material verification acceptance method may be by either inspection or test.		4. Vendor/Item History		
Rev. 2: Updated reference documentation.				

VITON trademark of E. I. DuPont de Nemours + Company.
(JKB 9/3/00)

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Title: CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES - PREVENT
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Section 10 Initial Reviews and Approvals

Approvals:

Designated Engineer

Design Authority:

QA Engineer:

9/1/00
Carl Vandenberg 9/1/00
C. Miskin 9/2/00
Hank M. Chafin 9/2/00

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Title: CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES – PREVENT
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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		
1. Failure Of Check Valve To Seat And Prevent Reverse Flow		
2. Process Connection/Body Break		

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BACK FLOW FROM SCHe INTO HELIUM SUPPLY**

CHECKLIST 1

ACCEPTANCE METHOD 1

SPECIAL TEST/INSPECTION VERIFICATION

SECTION 1			
Item Description: SCHe Supply Check Valve System #: 13		Equip #: SCHe-CHK-*090, *091, *092, *093, *118, *119, *120, *121, *122, *123, *124, *125 Procurement and/or Model #: UN-3-050-SS-V-1/2	
Manufacturer (Address/Phone): Check-All P.O. #		Supplier (Address/Phone):	
SECTION 2 CRITICAL CHARACTERISTICS TO BE CERTIFIED BY METHOD 1			
Insp	Test	Post-Test	
[X]	[]	[]	1. Component Number-Procurement and/or Model Number
[X]	[]	[]	2. Nameplate - Manufacturer
[X]	[]	[]	3. Process Connection
[X]	[X]	[]	4. Material, Body (Verification may be by either inspection or test)
[X]	[X]	[]	5. Material, Process Connection (Verification may be by either inspection or test)
[]	[X]	[]	6. Pressure Boundary Integrity
[]	[X]	[]	7. Seat Leakage, Reverse Flow
[]	[X]	[]	8. Seismic Condition A
SECTION 3 BY INSPECTION			
* See Attachment G of Desk Instruction for Sampling Size			
Characteristic: Component Number-Procurement and/or Model Number Sample Size*: All Items Acceptance Criteria: UN-3-050-SS-V-1/2, (Per SNF-5304, Section H, Design Data Sheet Receipt Inspection Plan / Report #: _____ References (see Section 7): Check-All Valves Style TCV Tubing Check Valve			
Characteristic: Nameplate - Manufacturer Sample Size*: All Items Acceptance Criteria: Check-All Receipt Inspection Plan / Report #: _____ References (see Section 7): _____			

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Title: CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES – PREVENT
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Characteristic: **Process Connection**

Sample Size*: **All Items**

Acceptance Criteria: **1/2 Inch FNPT**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Material, Body**

Sample Size*: **Normal Sampling Size**

Acceptance Criteria: **Stainless Steel**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Material, Process Connection**

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: **No Leakage at Test Pressure of 165 psig (No Bubbles)**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

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

Acceptance Criteria: **Pressure Test to Design Pressure (150 psig) (Bubble Tight Standards < 10⁻³ ml/sec)**

Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

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Characteristic for Test: **Seismic Condition A**

Acceptance Criteria: **Maintain Critical Function Before and After Seismic Event**

Sample Size*: **SNF-5304, Appendix I, page I-2, provides the seismic testing plan for these components. The seismic testing is conducted for one complete panel with the components assembled on the panel and tested as a complete assembly. The test seismically qualifies the entire assembly, including mountings, piping, and components. The number of components tested is dictated by the panel assembly design.**

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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Title: CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES - PREVENT BACK FLOW FROM SCHe INTO HELIUM SUPPLY

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/N	Procedure or RR#	Check- list ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date
Component Number- Procurement and/or Model Number	UN-3-050-SS-V-1/2, (Per SNF-5304, Section H, Design Data Sheet)	X									
Nameplate - Manufacturer	Check-All	X									
Process Connection	1/2 Inch FNPT	X									
Material, Body	Stainless Steel	X									
Material, Process Connection	Stainless Steel	X									
Pressure Boundary Integrity	No Leakage at Test Pressure of 165 psig		X								
Seat Leakage, Reverse Flow	Pressure Test to Design Pressure (150 psig) (Bubble Tight Standards < 10 ⁻³ ml/sec)		X								
Seismic Condition A	Maintain Critical Function Before and After Seismic Event.		X								

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Title: <u>CHECK-ALL SCHe SUPPLY PURGE CHECK VALVES - PREVENT BACK FLOW FROM SCHe INTO HELIUM SUPPLY</u>	

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: _____	Design Authority: _____
Testing Agency QA Engineer: _____	QA Engineer: _____
Date _____	Date _____
Date _____	Date _____

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BACK FLOW FROM SCHe INTO HELIUM SUPPLY**

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:	