ENGINEERING CHANGE NOTICE

Page 1 of 21. ECN 653776Proj.
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. Treach 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"	
		9. Document Numbers Changed by this ECN (includes sheet no. and rev.) All 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) ☒ 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 ☒ 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: STA: <i>A</i> KANFORD RELEASE ID: <i>2</i> MAY 06 1999	

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

A-7900-013-1

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

WORCESTER SOLENOID-ACTUATED GAS-OPERATED MCO ISOLATION VALVES

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

EDT/ECN: ~~626879~~ ⁶⁵³⁷⁷⁶ UC: 620
Org Code: 2G300 Charge Code: 105559/A000
B&R Code: 39EW40400 Total Pages: 15

Key Words: Worcester Solenoid-Actuated Gas-Operated MCO Isolation Valves

Abstract: Worcester Solenoid-Actuated Gas-Operated MCO Isolation Valves

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5/6/99
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MAY 06 1999		
Date	Release Stamp	

Approved for Public Release

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Commercial Grade Item Upgrade Dedication Form

SNF-3876, Rev. 1

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Title: **WORCESTER SOLENOID-ACTUATED GAS-OPERATED MCO
ISOLATION VALVES**

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.: **VPS-
GOV/SOV-1*05, 1*09**Specification No.:
W-441-P4, Rev. 2Manufacturer:
Worcester ControlsPast P.O. No.: **NA**Procurement and/or Model
Number:
**1" E 5966RTBW4 With
15I939SWM212OPBC**Equipment Supplier (if different from manufacturer):
TBDEquip. Supplier's Part No.:
NA

Component Description: **These valves are 1" gas-operated full-port ball valves incorporating a solenoid and limit switches as integral parts of the actuator that are used in different process streams within the CVDF hood. The valves fail closed (on loss of pressure or electrical) for MCO isolation to either reduce air in leakage or loss of He. All valves have coupling for transverse actuator mounting.**

Section 2b Commercial Availability of the Item

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 & type

contact name

phone

NA

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

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ISOLATION VALVES

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 published product information (eg., 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 an intact pressure boundary/confinement.**
2. **Isolate the MCO in the event of loss of vacuum to reduce air inleakage or loss of He, prevent an H₂ explosion.**
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**

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ISOLATION VALVES

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

1. **Structural or mechanical failure of these valves could cause loss of MCO isolation functions and resultant rapid bleed off of the He to the MCO, air inleakage to the MCO, or inadvertent MCO water drainage.**

2. **Electrical fault in solenoid. Valve fails closed.**

3. **Loss of air pressure to actuator. Valve fails closed.**

4. **Loss of control signal to solenoid. Valve fails closed.**

5.

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: **Boundary/Confinement,**
Isolation, Prevent H₂ Explosion

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 31.3Safety Analysis Report (SAR): **HNF-**
SD-SNF-SAR-002, Rev 4ADrawings: **H-1-82161, Rev. 2****HNF-SD-SNF-SEL-002, Rev. 6**Vendor Manual/Manufacturer/Supplier Information: **Worcester PB 451-22, PB 302-26, PB 303-1**

Other:

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Title: **WORCESTER SOLENOID-ACTUATED GAS-OPERATED MCO ISOLATION VALVES**

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	
Valve-Component Number-Procurement and/or Model Number	1" E 5966RTBW4 (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)	1, IN	X	
Actuator-Component Number-Procurement and/or Model Number (Includes SOV)	15I939SWM2120PBC (Per Procurement Package W-441-P4, Rev 2, Section H, Design Data Sheet)	1, IN	X	
Nameplate Data of Actuator (Includes SOV)	Per Vendor Manual. To Include "R6" (Upper Right Corner)	1, IN	X	
2. Physical Critical Characteristics (for reasonable assurance that the Item delivered is the Item specified)				
Valve Body Material	Stainless Steel (Note 4)	1, IN 1, T	X	
Configuration/Mounting	Integral Actuator/Valve Assembly. Transverse Actuator Mounting. Black Recessed Override Button.	1, IN	X	
Process Connection	1" Butt Weld	1, IN	X	
3. Performance Critical Characteristics (for reasonable assurance that the Item will perform its intended safety function(s))				
GOV Pressure Boundary	Pressure Test At 165 psig (Zero Leakage) Note 3	1, T		X
Internal Pressure	150 psig and Full Vacuum	1, T		x
GOV Seat Leakage	Pressure Test to 150 psig ($< 10^{-3}$ ml He/Sec Bubbletight Standards)	1, T		X
GOV Fail Safe Position	Valve Fails Closed on Loss of Air Pressure or Electrical Power to the Solenoid. Stroke Time Less Than 1 Second	1, T		X
Insulation Resistance	Greater Than 10 Megohm Resistance to ground at 1000v	1, T		X
Solenoid Inrush Current	Nominal 0.4 Amp @ 120 Vac	1, T		X
Solenoid Holding Current	Nominal 0.2 Amp @ 120 Vac	1, T		X
Current Carrying Capability Of Contacts	Nominal 5 Amps @ 120 Vdc, Less Than 0.5 V Drop Across Contacts	1, T		X
Environmental	Note 1			
Seismic Condition A	Note 2	1, T		X

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ISOLATION VALVES

4. Notes and Legend:

1. These valves have coro-lube (nickel-acetate), acetal resin, and NEMA Enclosed Solenoids, 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.
2. Maintain critical function before and after seismic event. W-441-P4, Rev. 2, Appendix L, pages L-2 & L-4, provide 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:

Design Authority: CR NW 4/22/99

QA Engineer: TD Hays 4/26/99

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Title: WORCESTER SOLENOID-ACTUATED GAS-OPERATED MCO
ISOLATION VALVES

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 [☒]; 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 [☒]; 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 [☒]; 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 [☐]; If Yes, indicate failure Mode <u>Open or Short in Motor</u>
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 [☒]; If Yes, indicate failure Mode <u>Actuator Circuit</u>
Blockage	Clogging of a filtering medium resulting in the inability to perform its purification function or blockage of flow.	Yes [☐]	No [☒]; If Yes, indicate failure Mode _____
Seizure	Binding of a normally moving item through excessive pressure, temperature, friction, jamming.	Yes [☒]	No [☐]; If Yes, indicate failure Mode <u>Structural Failure or Seizure of Valve/Disc</u>
Unacceptable Vibration	Mechanical oscillations produced are beyond the defined permissible limits due to unbalancing, poor support, or rotation at critical speeds.	Yes [☐]	No [☒]; 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 [☒]; 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 [☒]; 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 [☒]; If Yes, indicate failure Mode _____
Ductile Fracture	Fracture characterized by tearing of metal accompanied by appreciable gross plastic deformation.	Yes [☐]	No [☒]; If Yes, indicate failure Mode _____

Section 2 Additional Failure Modes Applicable to the Component Under Evaluation

1. **Loss of Air Pressure**

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Title: WORCESTER SOLENOID-ACTUATED GAS-OPERATED MCO
ISOLATION VALVES

CHECKLIST 1 ACCEPTANCE METHOD 1 SPECIAL TEST/INSPECTION VERIFICATION

SECTION 1

Item Description: **1" MCO Solenoid Isolation
Valves**

Equip #: **GOV/SOV-1*05, 1*09**

System #: **7**

Procurement and/ or Model #: **1" E 5966RTBW4 With
151939SWM2120PBC**

Manufacturer (Address/Phone):

Supplier (Address/Phone):

Worcester Controls

P.O. Box 538

33 Lock Dr.

Marborough, MA 01752

(508) 481-4800

P.O. #

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. Actuator-Component Number-Procurement and/or Model Number (Includes SOV)
☒	☐	☐	4. Nameplate Data of Actuator (Includes SOV)
☒	☒	☐	5. Valve Body Material (Verification may be by either inspection or test)
☒	☐	☐	6. Configuration/Mounting
☒	☐	☐	7. Process Connection
☐	☒	☐	8. GOV Pressure Boundary
☐	☒	☐	9. Internal Pressure
☐	☒	☐	10. GOV Seat Leakage
☐	☒	☐	11. GOV Fail Safe Position
☐	☒	☐	12. Insulation Resistance
☐	☒	☐	13. Solenoid Inrush Current
☐	☒	☐	14. Solenoid Holding Current
☐	☒	☐	15. Current Carrying Capability of Contacts
☐	☒	☐	16. Seismic Condition A

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ISOLATION VALVES

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): _____

Characteristic: **Valve-Component Number - Procurement and/or Model Number**Sample Size*: **All Items**Acceptance Criteria: **1" E 5966RTBW4 (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)**

Receipt Inspection Plan / Report #: _____

References (see Section 7): Manual PB 302-26, PB 451-22, PB 303-1Characteristic: **Actuator-Component Number - Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet (Includes SOV))**Sample Size*: **All Items**Acceptance Criteria: **15I939SWM2120PBC**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Nameplate Data of Actuator (Includes SOV)**Sample Size*: **All Items**Acceptance Criteria: **Per Vendor Manual. To Include "R6" (Upper Right Corner).**

Receipt Inspection Plan / Report #: _____

References (see Section 7): Manual PB 302-26, PB 451-22, PB 303-1Characteristic: **Process Connection**Sample Size*: **All Items**Acceptance Criteria: **1" Butt Weld**

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

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Characteristic: **Configuration/Mounting**Sample Size*: **All Items**Acceptance Criteria: **Integral Actuator/Valve Assembly. Transverse Actuator Mounting. Black Recessed Override Button.**

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): _____

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: **GOV 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: **Internal Pressure**Acceptance Criteria: **150 psig and Full Vacuum**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **GOV Seat Leakage**Acceptance Criteria: **Pressure Test to 150 psig ($<10^{-3}$ ml He/Sec Bubbletight Standards)**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

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Characteristic for Test: **GOV Fail Safe Position**Acceptance Criteria: **Valve Fails Closed on Loss of Air Pressure or Electrical Power to the Solenoid.
Stroke Time Less Than 1 Second,**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Insulation Resistance**Acceptance Criteria: **Greater Than 10 Megohm Resistance to Ground at 1000v.**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Solenoid Inrush Current**Acceptance Criteria: **Nominal 0.4 Amp @ 120 Vac**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Solenoid Holding Current**Acceptance Criteria: **Nominal 0.2 Amp @ 120 Vac**Sample Size*: **Normal Sampling Size**

Actual Test Value:

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

Characteristic for Test: **Current Carrying Capability Of Contacts**Acceptance Criteria: **Nominal 5 Amps @ 120 Vdc, Less Than 0.5 V Drop Across Contacts**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#	Checklist ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date
Nameplate - Manufacturer	Worcester Controls	X									
Valve-Component Number-Procurement and/or Model Number	1" E 5966RTBW4, (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)	X									
Actuator-Component Number-Procurement and/or Model Number (Includes SOV)	151939SWM2120PBC , (Per Procurement Package W-441-P4, Rev. 2, Section H, Design Data Sheet)	X									
Nameplate Data of Actuator (Includes SOV)	Per Vendor Manual. to Include "R6" (Upper Right Corner).	X									
Valve Body Material	Stainless Steel	X									
Configuration/Mounting	Integral Actuator/Valve Assembly. Transverse Actuator Mounting. Black Recessed Override Button.	X									
Process Connection	1" Butt Weld	X									
GOV Pressure Boundary	Pressure Test at 165 psig (Zero Leakage)		X								
Internal Pressure	150 psig and Full Vacuum		X								

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GOV Seat Leakage	Pressure Test to 150 psig (<10 ⁻³ ml He/Sec Bubbletight Standards)	X																		
GOV Fail Safe Position	Valve Fails Closed on Loss of Air Pressure or Electrical Power to the Solenoid. Stroke Time Less Than 1 Second	X																		
Insulation Resistance	Greater Than 10 Megohm Resistance to ground at 1000v	X																		
Solenoid Inrush Current	Nominal 0.4 Amp @ 120 Vac	X																		
Solenoid Holding Current	Nominal 0.2 Amp @ 120 Vac	X																		
Current Carrying Capability of Contacts	Nominal 5 Amps @ 120 Vdc, Less Than 0.5 V Drop Across Contacts	X																		
Seismic Condition A	Maintain Critical Function Before and After Seismic Event	X																		

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: _____
BUYER VERIFICATION	

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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:	