

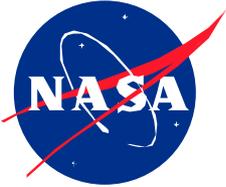


**Presentation to the
Systems Safety Branch
Code 321**

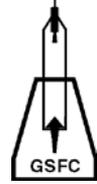
**GSFC PV/S RECERTIFICATION PROGRAM
REQUIREMENTS, ROLES & RESPONSIBILITIES**

**Thom Schafer/540.5
Lead RECERT Engineer
QinetiQ North America
(301) 286-4802**

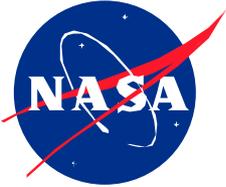
6/20/2011



OVERVIEW



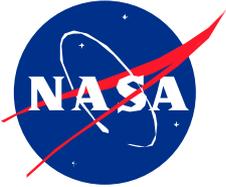
- **Recertification Program (RECERT) Requirements**
- **RECERT Manager's PV/S Responsibilities**
- **PV/S Owner's Responsibilities**
- **Required PV/S Documentation for System Certification**
- **Sample PV/S RECERT Tags**
- **Sample Systems and Components**
- **Wrap-up, Contacts, and RECERT URL**



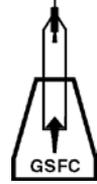
PV/S RECERT REQUIREMENT DOCUMENTS



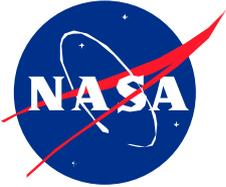
- **OSHA 29CFR1960, 29CFR1910.169, et al.**
- **NPD 8710.5 (Policy for Pressure Vessels and Pressurized Systems).**
- **NPR 8715.3 (NASA General Safety Program Requirements).**
- **NASA-STD-8719.17 (NASA Requirements for Ground-Based Pressure Vessels and Pressurized Systems (PV/S)).**
- **GPR 8710.3 (Cert & Recert of Ground-Based PV/S).**



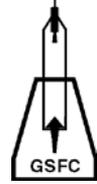
RECERT REQUIREMENTS



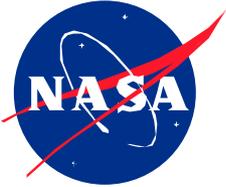
- **Applicable to Greenbelt, Wallops, and off-sites**
- **Applicable to all Ground-Based PV/S, including flight GSE**
 - Purge systems
 - Permanent and temporary set-ups used to test flight components (but not the flight components themselves)
 - Project Environmental Transport Systems (PETS)
- **Center policy requires that PV/S be certified by the RECERT Manager prior to operation.**



RECERT MANAGER'S PV/S RESPONSIBILITIES GPR 8710.3

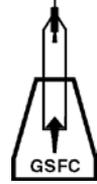


- **RECERT Manager's responsibilities include:**
 - Implements and enforces RECERT requirements
 - Certifies and Recertifies ground-based PV/S
 - Maintains a system for periodic in-service inspection (ISI), including identifying deficiencies, and track owner corrective actions to completion
 - Provides qualified and certified inspectors to perform required Tests & Inspections (T&I) meeting codes and standards
 - Reviews and processes Waiver Requests per GPR 1400.1, NPR 8715.3, and NASA-STD-8719.17 (Technical Waivers)
 - Provides consultation on PV/S compliance for design, specification, and modification
 - Maintains a configuration management and certification status system
 - Performs compliance spot checks on PV/S



PV/S OWNER'S RESPONSIBILITIES

GPR 8710.3

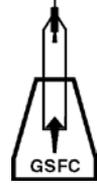


- **PV/S Owner's responsibilities include:**
 - Ensures PV/S are certified before use
 - Ensures pressure system operators are trained and qualified, with documentation, to operate the equipment
 - Ensures new PV/S are designed, fabricated, installed, and tested per Code requirements (ASME B31.3 – Process Piping)
 - Ensures modified, repaired, relocated, or transferred PV/S are certified by RECERT prior to operation
 - Submits proposed modification and upgrades to RECERT / 540 (minimum 2 weeks, longer if a complex system) for compliance review prior to implementation
 - Submits required engineering drawings and documentation to RECERT / 540 for equipment review

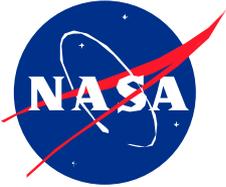


PV/S OWNER'S RESPONSIBILITIES

GPR 8710.3

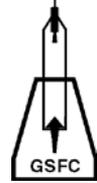


- **Non Code compliant PV/S must obtain a Waiver for initial or continued operation**
 - **Owner's responsibility to prepare Waiver package**
 - **Description of System**
 - **Description of noncompliance**
 - **Risk Assessment (RAC) and mitigation**
 - **Residual risk acceptance**
 - **Approval of package**
 - **RECERT Manager concurrence/nonconcurrence**
 - **Approval by higher authority as appropriate**

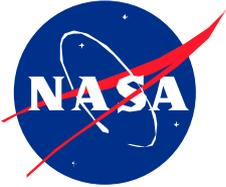


PV/S OWNER'S RESPONSIBILITIES

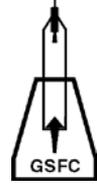
GPR 8710.3 (Cont'd)



- **PV/S Owner's responsibilities include (Cont'd):**
 - **Positively controls uncertified/expired PV/S to preclude inadvertent use**
 - Segregates uncertified/expired items from certified items
 - Either tags each item "Do Not Use Until Certified", or locks them up in storage cabinets labeled "Certify Before Use" or similar wording
 - **Notifies RECERT/540 of all PV/S Close Calls and Mishaps, report per GPR 8621.1A**
 - **Initiates repair of PV/S deficiencies per RECERT T&I report, and notifies RECERT / 540 upon completion so that a reinspection can be scheduled**
 - **Performs OEM recommended maintenance on PV/S**
 - **Allows necessary down time of PV/S for RECERT to perform T&I to maintain system certification**



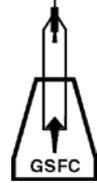
REQUIRED PV/S DOCUMENTATION FOR SYSTEM CERTIFICATION



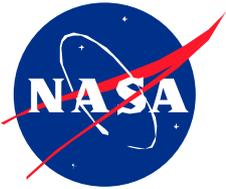
- **Before RECERT can certify a system, the following information from the owner is required:**
 - A. **Building #, Room #, and/or location**
 - B. **Manufacturing Data Reports (MDR) MDR Form U-1A, as applicable (should have been supplied or can be obtained from the vendor)**
 - C. **Piping info, as applicable**
 1. **Design and operating conditions**
 2. **Material Specification (ASTM or ASME)**
 3. **Pipe/tubing Size**
 4. **Pipe/tubing Wall thickness**
 5. **Pipe/tube fitting type and class (socket weld, butt weld, threaded, mechanical (swage))**
 6. **Valve type, manufacturer, model number, material of construction (body, stem, seat(s), pressure and temperature rating)**
 7. **Overpressure protection: Manufacturer, model number, type, size, capacity, set point, seat material**
 8. **Pressure Regulators: Manufacturer, model number, type (single stage, dual stage), material, size, max inlet pressure, max outlet pressure**
 9. **Pressure gages: Manufacturer, model number, inlet size, range**
 10. **As-built piping and instrumentation diagram**
 11. **Certification of Compliance from fabricator and/or installer that the System meets the Code fabrication and installation requirements**
 12. **Record of Code-required NDT**
 13. **Record of Code-required pressure test**



PV/S RECERT TAGS



- **PV/S RECERT tags are applied to Systems and components.**
- **Attention should be paid to the EXPIRATION DATES. System expiration dates indicate when the System, must be recertified by the RECERT Manager. Component expiration dates indicate when the component must be retested by the RECERT Manager in order to maintain System certification. Items that are past their expiration date should be brought to RECERT's attention.**
- **Sample tags follow:**



SAMPLE PV/S SYSTEM RECERT TAGS




**GODDARD SPACE FLIGHT CENTER
 RECERTIFICATION PROGRAM
 CERTIFIED**

SYSTEM NO: SAMPLE
MAC NO: XXXXXX
UPV NO: XXXXXXXX
MAWP/MDP: XXX PSI @ XXX °F
EXPIRATION DATE: XXXXXXXX
RECERT SUPPORT: (301) 286-5181


**GODDARD SPACE FLIGHT CENTER
 RECERTIFICATION PROGRAM
 CERTIFIED**

In accordance with NASA requirements and GPR 8710.3 periodic in service inspections have been performed by RECERT Support on SAMPLE To pressure system Number: SAMPLE and certified in accordance with the following checked of applicable procedures.

<u> XXXXXXXX </u>	NMP-101, Magnetic Particle Test
<u> XXXXXXXX </u>	NMP-102, Liquid Penetrant Test
<u> XXXXXXXX </u>	NMP-109, Ultra Sonic Test
<u> XXXXXXXX </u>	NMP-111, Liquid Penetrant Test
<u> XXXXXXXX </u>	NMP-113, Magnetic Particle Test

If there is a problem with or a question regarding this vessel, contact RECERT Support at extension: (301) 286-5181.
 Report Number : XXXXXXXX Expiration Date: XXXXXXXX



SAMPLE PV/S COMPONENT RECERT TAGS



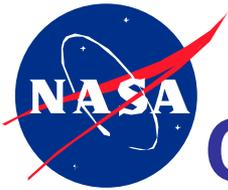
<p>GODDARD SPACE FLIGHT CENTER RECERTIFICATION PROGRAM CERTIFIED GAGE INSPECTION TAG</p> <p>I.D. # <u>SAMPLE</u></p> <p>MAWP: <u>XXXXXX</u></p> <p>INSPECTION DATE: <u>XXXXX</u></p> <p>EXPIRATION DATE: <u>XXXXX</u></p> <p>REPORT # <u>XXXXXXXXXX</u></p> <p>INSPECTOR: <u>XXXXXXXXXX</u></p> <p>RECERT SUPPORT: (301) 286-5181</p>	<p>GODDARD SPACE FLIGHT CENTER RECERTIFICATION PROGRAM CERTIFIED RELIEF VALVE INSPECTION TAG</p> <p>I.D. # <u>SAMPLE</u></p> <p>SET PRESSURE: <u>XXXXXX</u></p> <p>INSPECTION DATE: <u>XXXXXX</u></p> <p>EXPIRATION DATE: <u>XXXXXX</u></p> <p>REPORT # <u>XXXXXXXXXX</u></p> <p>INSPECTOR: <u>XXXXXX</u></p> <p>RECERT SUPPORT: (301) 286-5181</p>
<p>GODDARD SPACE FLIGHT CENTER RECERTIFICATION PROGRAM CERTIFIED GAGE VT INSPECTION TAG</p> <p>I.D. # <u>SAMPLE</u></p> <p>MAWP: <u>XXXXXXXXXX</u></p> <p>INSPECTION DATE: <u>XXXXXX</u></p> <p>EXPIRATION DATE: <u>XXXXXX</u></p> <p>REPORT # <u>XXXXXXXXXX</u></p> <p>INSPECTOR: <u>XXXXXX</u></p> <p>RECERT SUPPORT: (301) 286-5181</p>	<p>GODDARD SPACE FLIGHT CENTER RECERTIFICATION PROGRAM CERTIFIED FLEX HOSE INSPECTION TAG</p> <p>I.D. # <u>SAMPLE</u></p> <p>MAWP: <u>XXXXXXXXXX</u></p> <p>INSPECTION DATE: <u>XXXXXX</u></p> <p>EXPIRATION DATE: <u>XXXXXX</u></p> <p>REPORT # <u>XXXXXXXXXX</u></p> <p>INSPECTOR: <u>XXXXXX</u></p> <p>RECERT SUPPORT: (301) 285-5181</p>
<p>GODDARD SPACE FLIGHT CENTER RECERTIFICATION PROGRAM MAG PARTICLE INSP. TAG</p> <p>PROJECT: <u>SAMPLE</u></p> <p>ID. # <u>XXXXXXXXXX</u></p> <p>INSPECTION DATE: <u>XXXXXXXXXX</u></p> <p>TYPE: <u>XXXX</u> METHOD <u>XXXX</u></p> <p>REPORT # <u>XXXXXXXXXX</u></p> <p>INSPECTOR: <u>XXXXXXXXXX</u></p> <p>RECERT SUPPORT: (301) 286-5181</p>	<p>GODDARD SPACE FLIGHT CENTER RECERTIFICATION PROGRAM DYE PENETRANT INSP. TAG</p> <p>PROJECT: <u>SAMPLE</u></p> <p>ID. # <u>XXXXXXXXXX</u></p> <p>INSPECTION DATE: <u>XXXXXXXXXX</u></p> <p>TYPE: <u>XXXX</u> METHOD <u>XXXX</u></p> <p>REPORT # <u>XXXXXXXXXX</u></p> <p>INSPECTOR: <u>XXXXXXXXXX</u></p> <p>RECERT SUPPORT: (301) 286-5181</p>



Flex Hoses for Gas Service



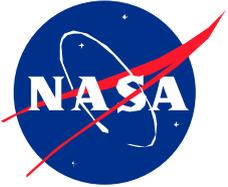
- The following two slides describe two different types of hose couplings that may be seen at GSFC.
- The first, cam and groove, are to be used for liquid transfer only and may not be used for compressed gas service.
- The second, twist lock, are approved for compressed gas service.
- Swagelok end fittings are approved for both types of service.



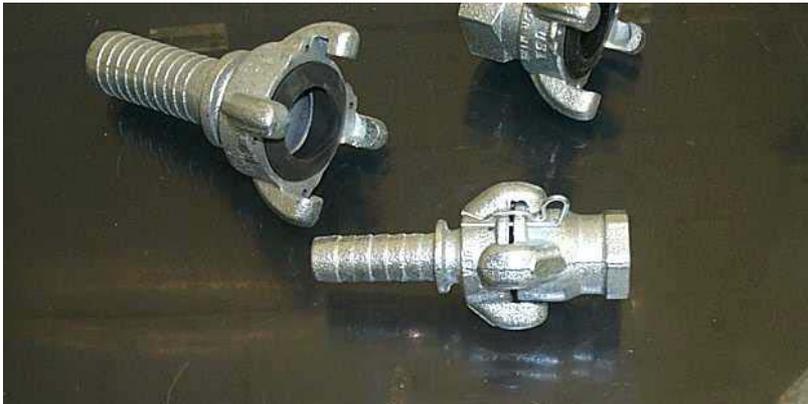
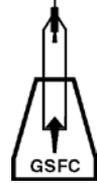
CAM & GROOVE HOSE COUPLING – Not Allowed for Gases



- **Cam & groove couplings were formerly misapplied for compressed air hoses to air pads**
- **OEM intended for liquid & bulk solid transfer - not for compressed air/gas service.**



TWIST-LOCK HOSE COUPLING



- All known cam & groove couplings at GSFC were replaced with twist-lock type
- Correct application - intended for compressed air/gas service.



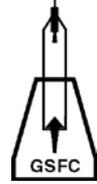
Portable Cryogenic Dewars



- More and more, Center experimenters and those with definite purge or cleanliness requirements have been turning to “high pressure” (~240psi) cryogenic dewars for their source of inert gases.
- These dewars provide a larger source of gas than the standard K-bottle, but also provides a higher risk of asphyxiation due to boil-off that does not occur from a K-bottle.
- Those dewars that are GSFC-owned have their relief valves periodically retested and the vessel inspected by RECERT. Dewars owned by a vendor have the requisite tests and inspections performed by the vendor.



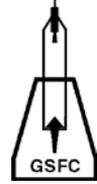
Goddard-Owned LN2 Dewar



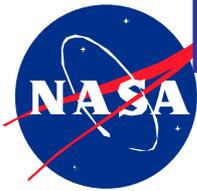
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LESSONS LEARNED



- **Cryogenic dewars have venting mechanisms that automatically prevent the buildup of dangerous levels of pressure. Venting is natural, and these vents should not be confused with relief valves which are set at higher pressures and provide a safety function, not an operational one.**
- **Occasionally, a relief valve will lift along with actuation of the vent, especially after filling. The next two slides show one owner's erroneous solution to the constant hissing of a relief valve.**

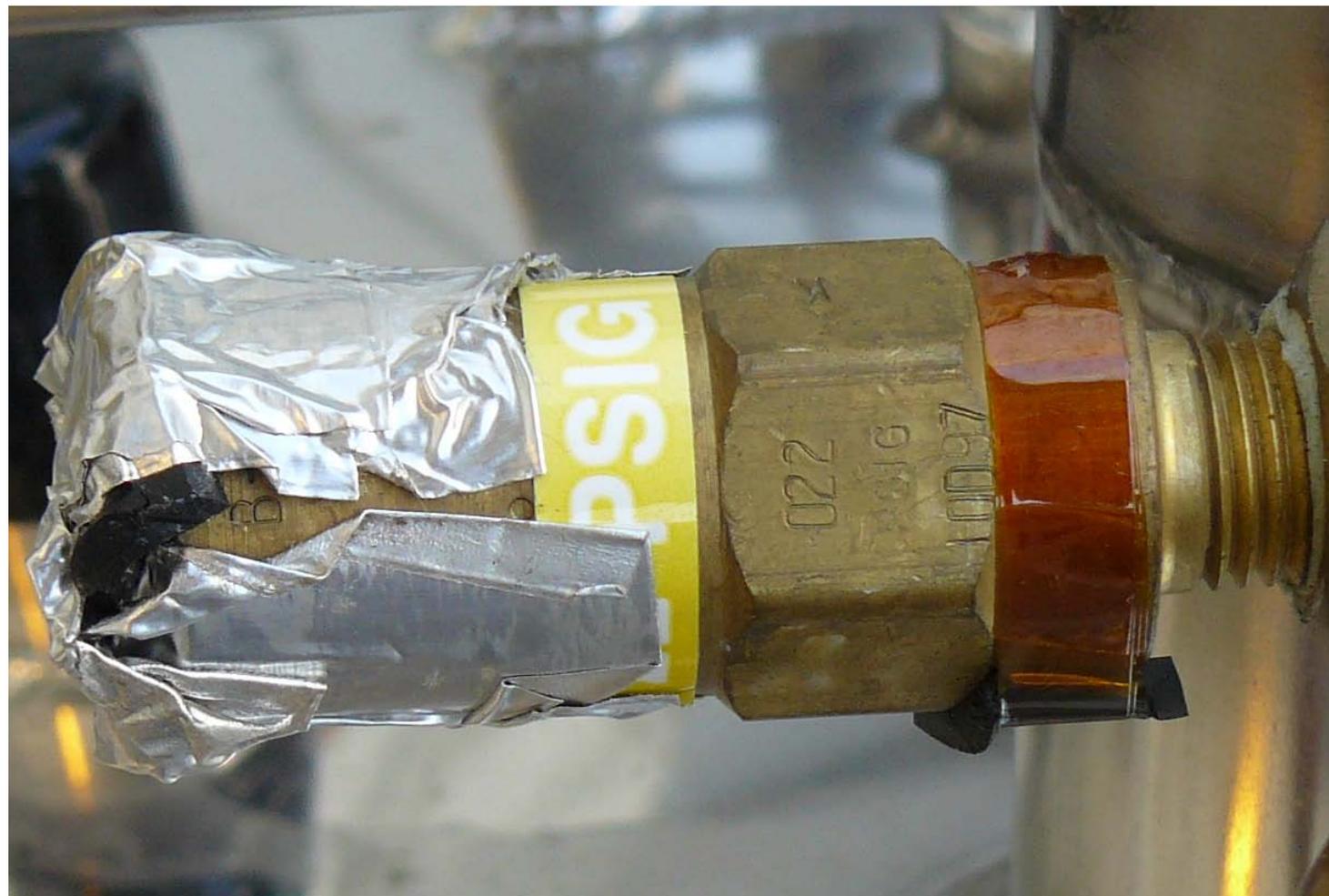


Note Disabled, Taped Over Relief Valve





Note Disabled, Taped Over Relief Valve





Is There an Oxygen Deficiency in this Closet?



Very Possibly



6/20/11 Code 321

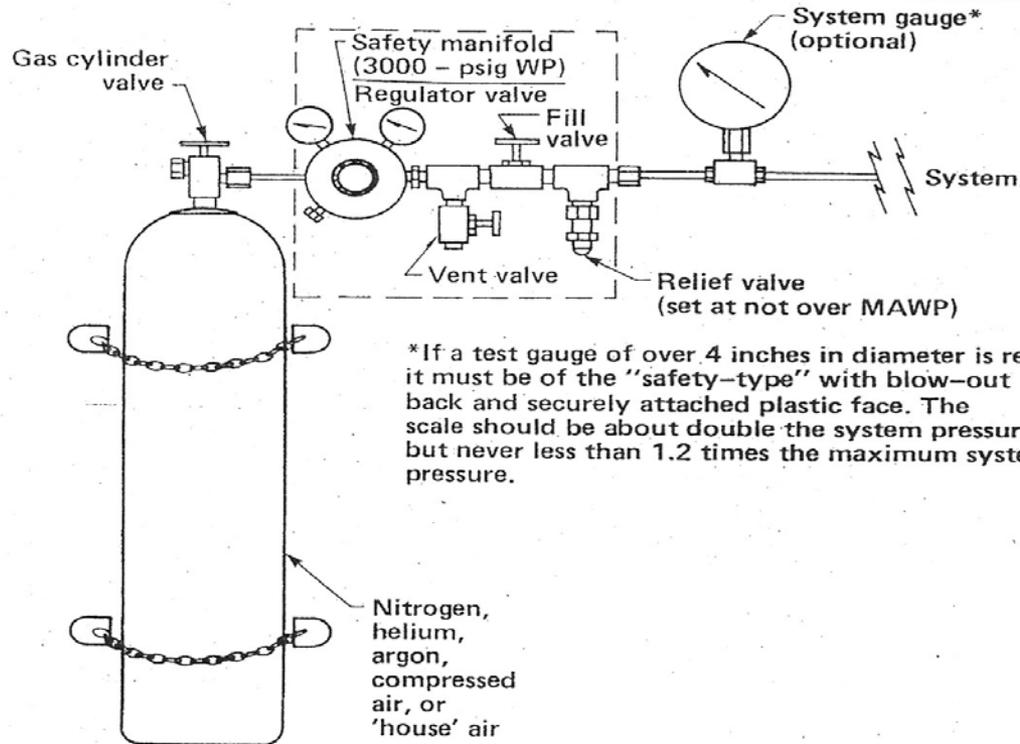
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SAMPLE MANIFOLD SYSTEM HOOKUP

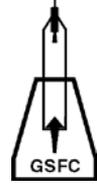


SAFETY MANIFOLD SYSTEM



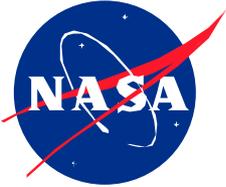


K-Bottle Set-Up With Problems

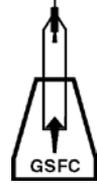


- Plastic Tubing of unknown pressure rating
- No relief valve downstream of regulator





WRAP-UP



- **Safety is everyone's responsibility**
- **Program success can only be achieved with everyone's full participation and cooperation**
- **For RECERT assistance on PV/S, please contact:**
 - **At Greenbelt**
 - **Brian Montgomery / RECERT Manager, Code 540, x6-4209**
 - **Phil Matthews / QNA RECERT Supervisor, Code 540.5, x6-9116**

<http://recert.gsfc.nasa.gov/>