

Attachment A. R&D Pressure System Certification Process

1. Refer to Table R&D-REVIEW below and determine the review requirements based on the type of pressure system.
 - a. Low risk pressure systems require a minimum of a peer review.
 - b. Higher risk systems require both peer review and PSO review and certification by the CPSO/DCPSO to issue a permit to operate.
2. Form FM-R&D-REVIEW captures the review and approval of all new and major-modified (defined by Ch 17 [GEN-1](#)) R&D pressure systems. It must be completed and archived as a record.
 - a. A tag is issued by the PSO to inventory each R&D pressure system
 - b. When a change occurs, the "Experiment number" is incremented to the next number and recorded on the form
 - c. If a PSO review is required, the review is recorded on this form as well.
 - d. If a CPSO/DCPSO certification is required, it is annotated on this form and then CPSO will note as certified in the LANL master pressure database (e.g., PSCS).
 - e. The signed form serves as the Permit to Operate except as noted (highest risk).
 - f. The relief device initial date and due date will be checked. If the experiment extends past the due date, the relief device will be replaced as required by ESM Chapter 17 ADMIN-4.
3. Form FM-R&D-DOCS is the minimum amount of documentation that is required for review of a system.
 - a. Enter into the form in the Entry Field those items that are associated with the Record Items to be checked. The PSO or RLM-appointed Peer reviewer will verify the information is complete and acceptable and check "Completed".
4. All the pressure system records must be maintained and accessible. The Pressure System Certification System is available for document storage, as is EDRMS.

Table R&D-REVIEW Required Reviews for New or Major Modified Pressure System

Type of Pressure System	Qualified Peer Review	PSO Duty Area B Review	Permit to Operate	CPSO/DCPSO Review And Certify
High Pressure – Pneumatic	Not Required	Required	No, follow ESM Ch 17	Yes
Toxics (Category M)	Not Required	Required	No, follow ESM Ch 17	Yes
High Pressure Steam above 15 psig	Not Required	Required	No, follow ESM Ch 17	Yes
High Temperature Service	Not Required	Required	No, follow ESM Ch 17	Yes
High Pressure – Liquid High Volumetric Rate	Not Required	Required	No, follow ESM Ch 17	Yes
Brittle Failure Mode (not leak before burst)	Not Required	Required	No, follow ESM Ch 17	Yes
Pyrophoric	Not Required	Required	No, follow ESM Ch 17	Yes
Corrosive	Not Required	Required	No, follow ESM Ch 17	Yes
Oxygen and other Strong Oxidizers	Not Required	Required	No, follow ESM Ch 17	Yes

Attachment A. R&D Pressure System Certification Process

Flammables	Not Required	Required	Yes	No
Cryogenic Liquids	Not Required	Required	Yes	No
Natural Gas Distribution/Transmission	Not Required	Required	Yes	No
Compressed Gas > 150 psig	Not Required	Required	Yes	No
Compressed Inert Gases – DOT Cylinders greater than 2 cubic feet	Not Required	Required	Yes	No
Type of Low Risk Pressure System	Qualified Peer or PSO Duty Area A Review	Permit to Operate	CPSO/DCPSO Review And Certify	
Low Pressure Steam 15 psig max	Required	Yes	No	
Hot Water	Required	Yes	No	
Steam Condensate	Required	Yes	No	
Compressed Gas ≤150 psig	Required	Yes	No	
Compressed Inert Gases – DOT Cylinders less than 2 cubic feet	Required	Yes	No	
Compressed Inert Gases – Building Systems	Required	Yes	No	
High Pressure –Low Liquid Volume	Required	Yes	No	
Refrigeration Systems	Required	Yes	No	
Hydronic piping	Required	Yes	No	
Water Systems	Required	Yes	No	
Under 1000 pound-foot energy level and nontoxic, nonflammable, not oxygen, not corrosive, not steam, not cryogenic, not high temperature, and not LANL-fabricated components Treated as Exempt; verify relief protection	Required	No	No	