1. Refer to Table R&D-REVIEW below and determine the review requirements based on the type of pressure system.
   1. Low risk pressure systems require a minimum of a peer review.
   2. 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](https://engstandards.lanl.gov/ESM_Chapters.shtml#esm17)) R&D pressure systems. It must be completed and archived as a record.
   1. A tag is issued by the PSO to inventory each R&D pressure system
   2. When a change occurs, the “Experiment number” is incremented to the next number and recorded on the form
   3. If a PSO review is required, the review is recorded on this form as well.
   4. 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).
   5. The signed form serves as the Permit to Operate except as noted (highest risk).
   6. 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.
   1. 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 |
| 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 |