General Qualitative Risk Evaluation for Low Pressure Steam and Steam Condensate

RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	9/17/2014	Initial issue. Administrative update to ES-DO-QR-2010-001.0, 5/18/2010.	Ari Ben Swartz, *ES-EPD*	Larry Goen, *ES-DO*

Contact the Standards POC for upkeep, interpretation, and variance issues.

Chapter 17	**Pressure Safety POC and Committee**

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Legacy Systems Only

Assumptions:

Fluid Service

1. Steam or steam condensate.

System Operation

2. No superheated steam.
3. System pressure less than 14.7 psia (212 deg. F saturated steam)
4. Piping systems only.
5. The pressure item is not an ASME Section I, ASME Section IV, or VIII stamped item or unstamped item performing the same task (e.g. unstamped pressure vessel).
6. The pressure system is not subject to low-cycle fatigue (where significant plastic straining occurs).
7. High-cycle fatigue (where stresses and strains are largely confined to the elastic region) is controlled to less than 100,000 cycles for the life of the pressure system.
8. The pressure system does not operate in the creep range.
9. There are no stress intensification factors for example cracks or acute angles of pressure boundaries.

System Hardware

10. The system components have exhibited extensive, successful service experience under comparable conditions with similarly proportioned components of the same or like material.
11. Corrosion is not a significant factor.
12. Materials of construction are compatible with the system fluid service.

13. The system is equipped with a properly sized, set, and functional pressure relief device(s).
14. Flexible elements are restrained to prevent whipping.

Failure Mode

15. A ductile failure mode is assumed (not brittle fracture).

Consequence of Failure

16. The result of the failure will not result in personnel injury

Safety Class

17. Applicable to ML4 only.

Allowance: ESM Chapter 17 Section IV

RL2-A. Vessel pressure rating indeterminate, or non-ASME stamped vessel without design documentation (unknown MAWP)
Risk-based engineering evaluations may be applied for FS3 deficiencies

RL2-B. Piping component pressure rating indeterminate, or unlisted piping component (unknown MAWP)
Risk-based engineering evaluations may be applied for FS2 and FS3 deficiencies

RL3-A-inside. Missing weld examination documentation (within a glove box)
Risk-based engineering evaluations should be applied for FS1 and FS2 system deficiencies to determine if further action is required

RL3-A-outside. Missing weld examination documentation (outside a glove box)
Risk-based engineering evaluations should be applied for FS1 and FS2 system deficiencies to determine if weld examination is required

RL3-B. Missing pressure test documentation
Risk-based engineering evaluations may be applied for FS2 and FS3 system deficiencies

Applicable Systems
Steam and steam condensate, for example building heating and condensate return piping.

A system with a relief device set equal to less than 150 shall be rated as FS2.

These systems shall be exempt from the requirements of having pressure test documentation, weld documentation (inside or outside the glovebox), may continue to use unlisted components, or components with an indeterminate pressure rating, or ASME non-stamped vessels.

This equipment will be considered grandfathered and will not be replaced with like items. System shall be upgraded to ASME compliance as items age out of service by attrition.

Qualitative Risk Assessment

Probability: Remote (note: evaluation is remote for probability to cause significant consequence)

Consequence: Significant

QR Factor: 4

Table 3 Qualitative Risk (QR) Determination

Consequence			Probability				
			A	B	C	D	E
			Frequent	Probable	Occasional	Remote	Improbable
	I	Major	1	1	1	2	3
	II	Serious	1	1	2	3	4
	III	Significant	1	2	3	4	5
	IV	Minor	2	3	4	5	6
	V	Insignificant	3	4	5	6	7