Potential Adverse Flow Effects on Nuclear Power Plant Components

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Background:

- Recent operating experience
- Component degradation
- Revised regulatory guidance

New Reactors:

- Lessons learned from operating experience
- Design Certification reviews
- Industry initiatives

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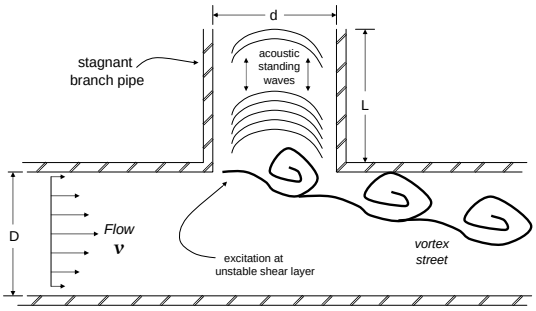
Flow-excited acoustic resonance
Feedback Mechanism



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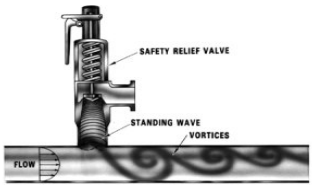
"Singing" Safety Relief Valve



Reference: Hambric, S.A., Mulcahy, T.M., Shah, V.N., et. al., "Flow-Induced Vibration Effects on Nuclear Power Plant Components Due to Main Steam Line Valve Singing," Proceedings of the Ninth NRC/ASME Symposium on Valves, Pumps, and Inservice Testing, NUREG/CP-0152, Vol. 6, pp. 3B:49-3B:69, July 2006

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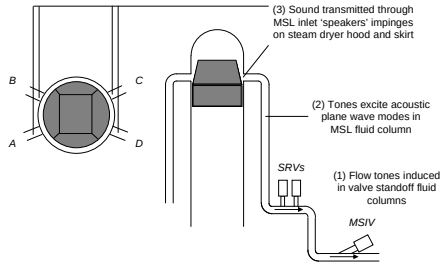
Acoustic Loading Feedback



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Regulatory Guidance (March 2007):

SRP 3.9.5 Reactor Pressure Vessel Internals

- BWR / PWR core supports and internals
- Appendix A, other plant components

SRP 3.9.2 Dynamic Testing and Analysis

- Piping, pumps, in-line valves, safety-relief valves

R.G. 1.20 Comprehensive Vibration Assessment Program

- BWR / PWR core supports and internals
- Other components subject to adverse flow effects

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