



Versatile Process Safety Calculation Software

Process Safety Office® ioViper™ is a software tool for evaluating vibration induced fatigue in process and relief pipework. The software utilizes the methodologies outlined in the “Guidelines for the Avoidance of Vibration Induced Fatigue Failure and Process Pipework” (2nd edition) published by the Energy Institute, a de facto industry standard for managing vibration in process pipework.

Main Features & Benefits

- The program is designed to automate the established methods and mitigation measures, considered for both new and existing process systems.
- As a component of Process Safety Office®, ioViper™ directly integrates SuperChems® where mechanical data and simulation fluid properties are readily available.

ioVIPER Report - Identified Issues

Project: PRV-100 - VAPOR FLOW

Condition and Operational Factors				
Excitation Factors	Issues	Low	Medium	High
	Build Quality		Medium	
	Corrosion/Maintenance Management		Medium	
	Cyclical Loading	Low		
	Process Upsets	Low		
	Pulsation: Reciprocating	Low		
	Pulsation: Rotating Stall	Low		
	Pulsation: Flow Induced Excitation			
	High Frequency Acoustic Excitation			
	Surge/Momentum			
	Cavitation and Flashing	Low		
	Vortex Shedding from Intrusive Elements	Low		
	Slug Flow	Low		
	Known Vibration	Low		

Examples of qualitative assessment reports.

ioVIPER Report - Main Lines										
Project: PRV-100 - VAPOR FLOW										
Scenario	Pipe Size	Flow Induced Turb.	Mech. Excit.	Recip. Pumps & Compressors	Rotating Stall	Flow Induced Excit.	High Freq. Acoustic Excit.	Surge	Cavitation	Main LOF
PRV-100 - VAPOR FLOW - Gas										
V-100-A-2-80S-00000004-FLARE	2"80S	0.165	--	--	--	0.2			--	1.0
V-100-B-2-80S-00000144-FLARE	2"80S	0.169	--	--	--	1.0			--	1.0
V-100-C-3-40-00000120-FLARE	3"40	0.191	--	--	--	0.2	0.29	0.856	--	1.0
V-100-D-3-40-00000003-FLARE	3"40	0.198	--	--	--	0.2	0.29	0.852	--	1.0
V-100-E-3-40-00000300-FLARE	3"40	0.248	--	--	--	0.2	0.29	0.851	--	1.0
V-100-F-3-40-00000003-FLARE	3"40	0.262	--	--	--	0.2	0.29	0.846	--	1.0
V-100-G-3-40-00000012-FLARE	3"40	0.266	--	--	--	0.2	0.29	0.845	--	1.0
V-100-H-3-40-00000003-FLARE	3"40	0.425	--	--	--	0.2	0.29	0.844	--	1.0
V-100-I-12-40-00000003-FLARE	12"40	0.003	--	--	--	0.2	0.29	0.016	--	1.0

An example of a quantitative main line LOF report.