Failed MOCs with Respect to Relief Systems

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Presenter Biography

- Jason Spearow, P.E.
- Senior Process Consultant for Smith & Burgess
- BS in Chemical Engineering from Texas A&M
- Licensed Professional Engineer in Texas
- Nine years of experience
- Specializing in relief systems design basis generation, concern resolution, and relief systems training

Overview

- Introduction
- Typical MOC Types
- Case Studies
- Typical Complications
- Conclusion
- Questions

Introduction to MOCs

- Management of Change (MOC) is a requirement of PSM Standard OSHA §1910.119
- Company must establish MOC procedures
- For each change, the company must
  - Identify impacts
  - Inform personnel
  - Update Process Safety Information (PSI)
- Relief systems documentation is part of PSI
- Almost every MOC requires update to documentation

Types of MOCs

Addition or Removal of Valves

- Block valves: closed outlet, hydraulic expansion
  - "car-sealed open" valve not same as no valve
- Check valves: backflow scenario
  - Inspection criteria makes difference

Control Valve Modifications

- Fail Position Change: instrument air failure
- Limit Stops: required relief rate
- Reading type or location: Alter scenario

Types of MOCs

Vessel Re-rates

- Decreasing MAWP may create scenarios
- Increasing MAWP may remove scenarios

Set Pressure Changes

- Increasing set pressure may create scenarios
- Decreasing set pressure may remove scenarios
- Be cautious of impact to upstream / downstream equipment
- Be cautious of operating pressure

Types of MOCs

New or Altered System Source

- Relief scenarios should be re-evaluated if upstream conditions change (pressure, flowrate, composition, etc.)

Tag Changes on Equipment and Relief Devices

- Failure to maintain documentation leads to confusion, lack of confidence
- Ensure tag changes are correctly implemented in the field and plant documentation

Case Studies

Installation of Multiple Rupture Disks

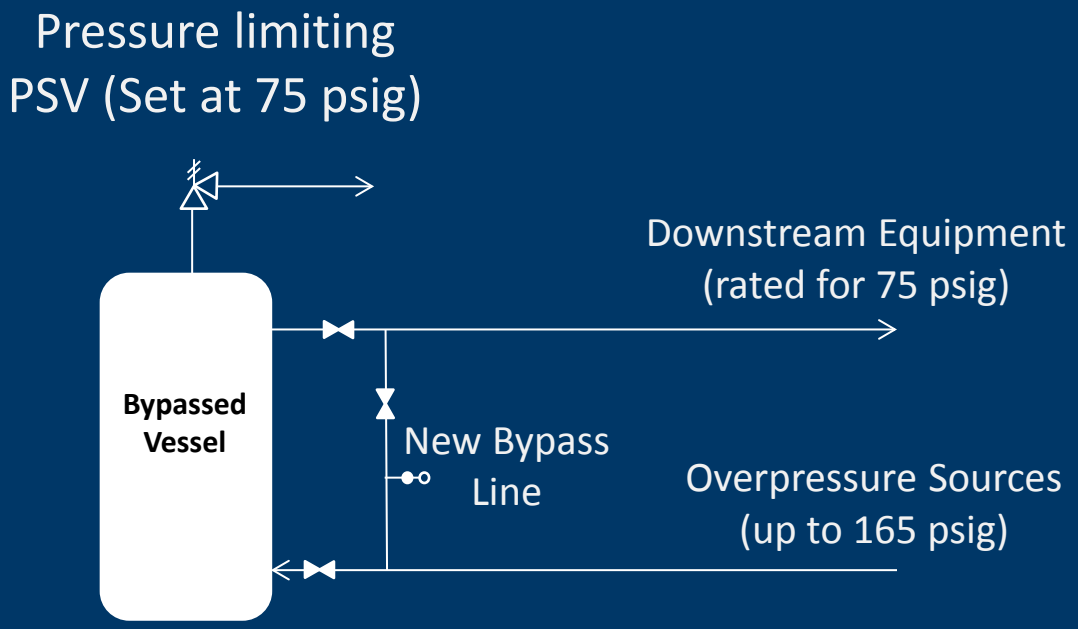
- Rupture Discs were installed in front of multiple PSVs
- PSV capacity was not de-rated and the rupture disc was not considered for inlet pressure drop

	Inlet ΔP at Capacity		Required PSV Area		Installed PSV Area
	Initial	Final	Initial	Final	
PSV 1	2.8%	12.0%	5.53 in^2	6.52 in^2	6.38 in^2
PSV 2	2.2%	6.0%	0.43 in^2	0.50 in^2	0.50 in^2
PSV 3	0.9%	3.1%	2.44 in^2	2.78 in^2	2.85 in^2
PSV 4	0.9%	3.1%	2.44 in^2	2.78 in^2	2.85 in^2
PSV 5	0.3%	4.1%	0.72 in^2	0.86 in^2	0.79 in^2
PSV 6	0.3%	3.4%	0.72 in^2	0.83 in^2	0.79 in^2

Case Studies

Installation of a Vessel Bypass Line

- A bypass line was installed that circumvented a pressure limiting PSV
- Downstream equipment may overpressure if the bypass is opened



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Typical Complications

- The personnel involved do not have proper relief systems training
- The existing relief systems documentation is inadequate or non-existent
- Involved personnel are unaware of the relief system documentation

Conclusion

When implementing MOCs, it is important to:

- Consider the impacts of the MOC on relief systems
- Ensure relief system documentation is properly updated
- Ensure personnel have appropriate relief systems training
- Ensure personnel are aware of available documentation

Questions?

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