Case Pipeline Safety OIR_DR_TURN_015-Q03Atch01-CONF

APPENDIX 2

Survey Question		Survey Response															
1.0	Company	12163551	1214821	1130837	12171105	12171218	1130829	1220925	1220926	12201209	12270710	12300105	1031119		Sum Total	% Affirmative	Count
2.0	Asset Type	Interstate	Intrastate	Intrastate/LDC	Interstate	Interstate	Interstate	Interstate	Interstate	LDC	Intra/Interstate	Intra/Interstate	Intrastate/LDC		-		12
3.0	Miles of Transmission	886.41	6000	2304	3700	1645	5800	10500	700	173	25000	6246	6438		69,392		12
4.0	Do you currently have AVs installed in your system?	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		-	83%	12
4.1	If yes, where do you use them?	Mainline block valves, receipt and delivery point isolation valves	4 - 12 years ago installed at test locations			Pipeline isolation		Mainlines		NA	Entire system	On interstate mainline block valves and intrastate system segregation valves.	Where a specific external threat exists (e.g. earthquake fault, very high dig-in risk, bridge crossing, river crossing, high landslide risk). Also, we will be installing AVs as part of a permit condition for a new pipeline in 2011.		-		8
4.2	If yes, do you have any standards or guidance documents for when/where to install?	No				Yes Consider at HCA & > 30% SMYS		No Class 3&4	No	Yes	Yes Yes- design standards	No	No		-	38%	8
4.3	If yes, do you have any standards or guidance documents for how to use them?	No				Yes Emergency procedures, (O&M manual)		No	No	Yes	Yes Yes O&M Procedures	No	No		-	38%	8
5.0	Do you currently have Automatic Shut-off Valves (ASV) in your system?	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes		-	58%	12
5.1	If yes, number of ASVs	48	-	200				388			600	20	10		1,266		7
5.2	Number of Transmission Valves	48	-	238		2410		651			1200	395	2000		6,942		8
5.3	If yes, do you still install ASVs?	Yes		Yes				Yes	Yes	NA	Yes	Yes	Yes looking to expand their use		- -	75%	8 1
6.0	Do you currently have Remote Control Valves (RCV) for Line Rupture Control in your system?		Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		-	73%	11
6.1	RCV Valves Installed		4	0		148		70		5	1500	38	60		1,825		8
6.2	Number of Transmission Valves		Many	238		2410		651		15		395	2000		5,709		7
6.3	If yes, do you still install RCVs?		No			Yes		Yes	Yes	Yes	Yes	Yes	Yes		-	88%	8
7.0	Comments	AV's that are also ASV's and RCV's		The majority of AV's are ASV(pneumatic, rate of drop, line break on hydraulic actuators). They are generally disabled due to concern of inadvertent closure. Intend to install 13 RCV's at 7 locations as part of TIMP (in accordance with Rule 192.935c)	RCV's in compressor stations however none on Transmission Line main valves	We also consider segments below 30% SMYS in populated areas	Utilize Automated Valves for Station operation. Automated Valves are not part of our system with the designated purpose of line isolation.				RCV's installed at major pipeline interconnect, major meter stations and storage field connections		looking to expand their use		-		6
A.1	Miles of Transmission Main	866.41	6000	2304	3700	1645	5800	10500	700	173	20000	5921	6438		64,047		12
A.2	Valves Classified as AV's	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		-	83%	12
A.3	Type of analysis conducted for AV's	NA	Installed 4 in test location 12 years ago	Historically installed pneumatic rate of drop ASV's on most MLV's		P&M Measures review following all pipeline assessment projects	NA	Rate of Drop for Class 3 or 4, Some RCV's to replace ACV's		RCV's are installed between systems with different MAOPS	a. Compliance b. Risk c. Hydraulic	No formal analysis process is documented. Placement and spacing of valves is specified by engineering standard.	We analyze identified high risk external threats for the most effective prevention and mitigation measures in reducing risk to our pipelines. AVs is one mitigation measure that we evaluate		-		10
A.4	Any Standards or Guidance for installation of AV's	No	No	No		Yes Must be considered in HCA & >30% SMYS.	NA	No it is understood philosophy	No	Yes	Yes Design standards and o&m procedures	No	No		-	27%	11
A.5	Factors consider when deploying	There are no specific factors considered: Installation of AV's is standard for our facilities	*Populated Urban Area*	ASV's are almost universally installed but are disabled. Moving to RCV's determined by study per Rule 193.935c. RCV study considered all factors listed. Intend to review ASV in light of recent events		Design Conditions, operating conditions, closure time, proximity of personnel, utilities, installation, proximity to populated areas	NA	Mainly Class location, operational requirements and single/multiple line requirements		MAOP	All the listed examples are considered. Continued regulatory emphasis and contemplated rate making continues to influence installation decisions	Response time for personnel, valve site accessibility, pipeline failure consequence.	Class location, HCA, Pipe Size, Operating Pressure, Outside Force Threat, Operational Criticality of the pipeline		-		3
A.6	How does line configuration affect decision to use ASV	NA	?	Not highly considered in study. Will be considered in reexamining disabled existing ASV's		AV installations may not significantly reduce shutdown time for complex configurations		Will not uses ASV on single line. Use actuators with remote capability for opening and closing		It doesn't	Line configurations have to be considered. Risks have to be included in the analysis.	Line configuration has not been a factor	Not directly taken into consideration, but Operational Criticality of the pipeline is often linked to the configuration		-		10
A.7	Do you perform a study on new pipelines to determine if ASV's are warranted	No	No	No		No		No	No	Yes		No	Yes		-	22%	9
A.8	Under what circumstances would you evaluate if existing manual valves should be automated	See A5 Case by Case	?	No. Historically provided ASV capability, but not being utilized. As recommended by 192.935c study, and eventually extended to next lower risk level pipeline.		Isolation times are considered by the project teams but not a formal study. If needed for faster HCA isolation		No formal studies If the valves bracket Class 3 or Class 4 area or for operational reasons	Vast majority of valves have remote capabilities	RCV's are installed between systems with different MAOPS RCV's are installed between systems with different MAOPS	Recent pipeline projects are subject to 1) special permits or 2) potential regulatory requirements that require AV's or ACV's Risk analysis; population density, pipeline integrity	No Change in response time or an increase in population density or land use.	Evaluate as part of the normal project scoping process. In the past, when a new high risk external threat is identified. Currently we are evaluating policy on where to use AV's		- -		8 10
A.9	What spacing do you use when installing AV's	Minimum distance as prescribed 49 CFR Part 192	10 to 15 miles apart	Generally according to 192.179		Approximately 10 miles or 1 Hr blow down		No standard for AV's, mainline blocks per 49 CFR 192.179		Spacing is not a consideration	New pipeline- every mainline valve. Legacy pipeline - risk ranking based on -population density, pipeline integrity	Spacing has not been a factor	No specific spacing since each case of use has been unique.		-		9
A.10	When would you use RCV over the ASV or vise versa?	NA	Would not consider an ASV	Headed toward installation of RCV's at select locations based on study and historical concern with ASV performance.		We do not use ASV's		RCV chosen over ASV for single line. RCV for major single line delivery points		We do not use ASV's. We want human interaction to decide to operate the valve	Varies by circumstance. Have been considering RCV's over AV's due to technology and communication availability and advances.	There is no formal decision process.	Preference is to use RCV's to minimize any risk of inadvertent closure. ASV are utilized where there is a very high external risk, especially for earthquake faults where SCADA systems may not be available to close an RCV after an event.		-		9

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A.11	For High population or other high consequence of failure areas where Avs are not installed, do you employ any additional mitigative measures?	No	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes		-	90%	10
		NA	Yes, increased gas control monitoring, maintenance	Yes. Additional line patrols(aerial or vehicular) during the construction season to observe encroachments		Increased assessment frequency and pipeline replacement on a case by case basis.		AV's for all high risk areas		All transmission lines both inside and outside high consequence areas with precautionary measures	Yes, increase aerial and foot patrols. Also frequent evaluation of AV/RCV retrofits	Yes, those that are prescribed by regulation	Yes . Specific to the risk.		-		9
B.1	Do you have Automatic Shut-off valves in your system?	Yes	No	Yes		No		Yes	Yes	No	Yes	Yes	Yes		-	70%	10
B.1a	If yes, how many ASVs do you have in your system? What approximate percent of total transmission valves does this represent?	48 of 48	-	200 (80%)		-		388		NA	No ASV's are employed on transmission mainline valves. ASV's are only employed on select pipeline interconnects and meters.	20, 5%	>10, >0.5% of MLV's		388		9
B.2	Have you had any reliability issues with ASVs? Describe.	No		Yes		Yes		Yes	Yes	No	Yes	Yes	No		-	67%	9
		No	-	Inadvertent closure due to freezing probably due to historical issues with gas quality		False closure		No functional reliability issues		NA	Have had less reliability issues with ASV's vs. AV's primarily due to being able to set ASV's to a level above normal operating pressures.	Yes. Set point drift	No, but some systems require high maintenance to stay operative.		-		9
B.3	Have you had any false closures? If so, explain the circumstances.	No		Yes		Yes		Yes	Yes	No	Yes	Yes	No		-	67%	9
		No	-	Freezing of restriction orifice		Yes due to instrumentation failures		Yes, 1. some instances had to do with activation of a compressor station upstream or downstream rate of drop device. 2. Trapped gas in signal line caused valve to partially close.		NA	Very rarely	Yes. Flow surge when increasing delivery to a customer	No		-		9
B.4	What have you done to minimize false closures?	NA	-	Nearly all ASV's disabled		Converted ASV to RCV		1. Time delay in rate of drop 2. replace type of actuator		NA	Readjust the set points and schedule more frequent calibrations and maintenance.	Advise Gas Control and develop flow rate change procedure.	Modified valves to be RCVs instead of ASVs		-		9
B.5	Describe any additional experiences with ASVs.	NA	-	-		-		NA		NA					-		9
B.6	What do you feel are the advantages of an ASV?	ASV's provide the operator with the knowledge that the system can close the valves even if there is a loss of communication	-	Autonomous. Rapid response. No power or communication required.		None since our system is closely supervised and alarmed		Quick response		Improves the response time to a pipeline incident if designed, operated and maintained properly	Use primarily to help manage non-responsive interconnect operators.	Reduced product release in the event of a failure	Close immediately upon detection of a line break without human intervention. Control function can be self-contained at site.		-		6
B.7	What do you feel are the disadvantages of an ASV?	Human input and/or control of the system is minimized during a shutdown event	-	Inadvertent closure. No indication of valve closed without power/communication. And only then at locations with monitoring.		Unnecessary outages due to premature closure.		Nuisance shut-ins		1.Possibility of pneumatic, electric, instrument failure as a result of vandalism. 2. No human interaction to prevent shutoff of customers	Gas flow interruption	Technology is not currently developed to differentiate between normal and abnormal operating conditions.	Complexity of controls required to properly detect line break - false activation risk and risk of not activating when required; Lack of human involvement in taking into account specific operational conditions.		-		9
C.1	What type of equipment do you use?	Bettis Actuators, Cameron valves	-	Pneumatic rate of drop line break controls on gas hydraulic actuators		We do not use ASV's		Rate of drop-EIM devices		NA	Various manufacturers	EIM and Shafer actuators	Have a mix of off-the-shelf line break controls and custom design line break controls		-		9
C.2	What parameters are monitored to activate the ASV? Example: Low Pressure, Rate of Pressure Change, High Flow, Rate of Flow Increase	Low pressure	-	Rate of pressure drop		-		Rate of Pressure Change		NA	Typically maximum flow rate set points	Rate of pressure change.	Typically low pressure and high rate of flow increase in the past.		-		9
C.3	Is data integrated from multiple points or is a single localized data point used to determine whether to activate the ASV?	Single	-	Single point		-		Single localized point		NA	For our application …single data point.	Single	Single localized data point		-		9
C.3a	If multiple, what is the configuration of typical monitoring points?	NA	-			-		NA		NA		N/A	N/A		-		9
C.4	What type of equipment do you use for the detection of line break?	Pressure Transmitter	-	See above		-		Rate of drop-EIM devices		Telemeters	Various ..primarily Shafer orifice, PLC	Rate of pressure drop sensor	Pressure transducers or transmitters providing information to an off the shelf line break detection system, or to an RTU or SLDC		-		7
C.4a	If computer/electronic controller based, is it an "off the shelf" program or custom software?	Custom Software	-	-		-		NA		NA	Both.. Most manufacturers offer both.	N/A	Both		-		9
C.5	Does your SCADA system monitor to determine whether or not the ASV is closed?	Yes		Yes		-		No	No	No	Yes	No	Yes		-	44%	9
		Yes	-	Only at some locations (source of concern with using ASV's system wide)		-		No		NA	Yes.. In most cases we will often get quick notification from the interconnected operator as well.	SCADA does not directly monitor the valve position	Typically but have two ASVs installed without SCADA		-		9
D.1	Do you use RCVs with dual intent - automated valve for line operation and also rupture/line break control?	Yes	Yes	No		Yes		Yes	Yes	Yes	Yes	Yes	Yes		-	90%	10
		Yes	Yes	None yet installed		Yes		A few locations	Vast majority of valves have remote capabilities and dual purpose line break monitored by Gas Control	Yes	Primarily for line operation and overpressure protection; however, we have recently employed RCV's to replace problematic AV applications.	Yes	Yes		-		10
D.2	Have you had any RCV malfunctions causing the RCV to close unexpectedly? Describe.	No	No			No		No	No	No	Yes	No	No		-	11%	9
		No	No			No		No		No	Yes ..failed transducers, frozen actuators, etc	No	No		-		8
D.3	Have you had any occurrences of the RCV failing to close when commanded by the dispatcher? If so, what has been the cause?	Yes	No			No		No	No	No	Yes	No	Yes		-	33%	9
		Yes, mechanical failures and/or incorrect operation	No			No		No		No	Yes..same as D.2 above	No	Yes, communication link down		-		8
D.4	Have you experienced any other reliability issues? If so, describe.	No	No			Yes		Yes	Yes	No	No	No	No		-	33%	9
		NA	NO			Opening too fast with large pressure differential		Communication issues		No	Overall the RCV's have been reliable.	No	No		-		8

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D.5	Describe any additional experiences with RCVs.	NA	?			Valves closed during lightning strike at a station Remote isolation thus saving time		NA		N/A		None			-		6
D.6	What do you feel are the advantages of an RCV?	RCV's provide flexibility of operation and speed of response	?	Trained operator can be alerted and then integrate data from multiple sources before deciding to close the valve.				Monitor and evaluate alarms, avoid nuisance closures.		Human interaction makes pipeline failure more manageable by lowering the pressure to make safer without losing large number of customers	Judgment and human intervention	Faster emergency response. Generally immune to affects of weather	Lower risk of inadvertent closure than ASV. Trained human operator can evaluate all operational data before deciding to close valve.		-		9
D.7	What do you feel are the disadvantages of an RCV?	RCV's are dependent on communication	?	Requires power and communications. Not failsafe.		Subject to power failure, should add generator back-up		Expensive for retrofitting into existing valves		1.Possibility of pneumatic, electric, instrument failure as a result of vandalism. 2. Potentially difficult to make the decision to activate the valve.	Judgment and human intervention. Good gas controller can prevent problems: bad/inexperienced gas controllers can cause more problems by operating valves w/o good information.	They generally require manual reset to resume operation. They depend on SCADA in and in some cases external power (electrical actuators)	Typical time to implement closure is longer than for an ASV due to requirement of human intervention. Dependence upon communication link.		-		9
E.1	What type of equipment (valve type, actuator, controls) do you use?	Bettis Actuators, Cameron valves	Bettis	Full opening ball or gate valves, gas hydraulic actuator, pressure transmitter on both sides of valve, PLC cell phone/modem corporate SCADA		Various valve types with pneumatic or electric actuators.		Bettis and EIM actuators on mainly ball valves. MicroLogix and CompacLogix controllers	Cameron Ball Valves, Bettis hydraulic actuators, Rosemont transmitters, Control Logix PLC for monitoring and rate of change and MLV control	Fisher V-BallControl valve and Mooney regulators	Various large systems w/varied legacies	Ball and plug valve with pneumatic, pneumatic/hydraulic, or electrical actuators with RTU/SCADA controls.	Typical piston actuator with solenoid operated valve controlled by signal from RTU.		-		9
E.2	What type of communication system do you use?	Satellites and dial back-up	?	See above		SCADA, leased lines, satellite, radio and dial-up lines.		SCADA		Phone line and Microwave	Various..landline, radio, microwave, satellite	Telephone, satellite, and radio	Radio or lease line.		-		10
E.3	What parameters are alarmed to notify an operator of the potential need to operate a RCV? Example: Line Break Detection Algorithm, Low Pressure, Rate of Pressure Change, High Flow, Rate of Flow Increase	Low pressure	Low Pressure	High pressure, low pressure, pressure rate of drop, line pack. New SCADA system will also have cpability(if purchased separately) to implement line pack/line break algorithm		Low pressure		Line Break Detection Algorithm and rate of pressure change		Elevated pressures that are near the MAOP	RCV's are primarily used at large custody transfer points. The RCV's can be configured to work in conjunction with local automation or be overridden by gas control or a local operations person.	Rate of pressure change alarms.	Low Pressure		-		9
E.4	Do you utilize automated line break detection software? If yes, is it an "off the shelf" program or custom software, and how does it identify a line break?	Yes	No	No		No		No	No	No	Yes	No	No		-	20%	10
		Custom Software	No	Not yet		No		No		No	Only on certain AV's..both "off the shelf" and customized. Primarily look at rates of pressure drop.	No	No		-		9
E.5	Do you have formal procedures and protocol for when to initiate a closure?	Yes	No	No		Yes		No	No	Yes	Yes	No	No		-	40%	10
		Yes	No	RCV's to be install in 2011. Will develop procedure concurrent with installation.		Yes , emergency shutdown procedures		No, it is understood protocol ..all available information is considered to confirm line break		Yes	Yes, both general guidelines and site specific	No	No				
E.6	Describe your procedures (formal or informal) for how to recognize and confirm a line break prior to closing a remote valve.	Rate of pressure change over the system	?	TDB		Line break would be recognized by pressure drop and confirmed on site prior to closing		No, it is understood protocol ..all available information is considered to confirm line break		Monitoring telemeters	Formal. We require formal management of change to revise procedures	Gas control operators and field operations personnel review available data and get visual confirmation if possible. A written emergency plan goes into effect when a suspected line break occurs.	No formal procedure. Look for concurrence from secondary SCADA points as to line break.		-		9
E.7	Do you have a process for confirming your primary line break detection system? Describe. Example: Visual confirmation of line break.	Yes	No	No		Yes		No	No	Yes	Yes	Yes	No		-	50%	10
		Yes, visual confirmation	?	TDB		Line break would be recognized by pressure drop and confirmed on site prior to closing		No		Yes, visual confirmation	Visual confirmation	Visual confirmation of escaping gas.	No formal process.				
E.8	What is your protocol for re-opening an RCV after closure due from suspected line break?	The Area Office responsible for the section of pipeline which the valve(s) was close would be responsible for re-opening an RCV. Maintenance Technicians would be dispatched from the responsible Area Office to verify that there was not a line break. The pipeline system would then be balanced to minimize the pressure differential across the valve(S) and then the valve(s) opened	?	TDB		Emergency procedures, Restoration of Service(O&M manual)		Direct Gas Control contact with field observers		Verification that the issue was resolved	Visual confirmation..Operations management approval and formal plan development and documentation	Formal procedure for pipeline shutdown and start up.	Varies. Some sites require manual reset at the site, others can be-reopened by Gas Control after confirmation it is safe to do so.		-		9
E.9	What is your operator training program for monitoring and operation of RCVs?	OQ program for the tasks performed	It is Rolled in with other automatic valves	TDB		DOT Operator qualification and procedural review		Review of diagrams, drawings, procedures	Review of written Mainline Valve Operations procedure	Gas Control procedures and table top exercises.	Included in knowledge and verification portion of DOT "Operator Qualification" requirements.	Operators are qualified for covered tasks related to testing and maintaining valves and actuators.	Included in overall Gas Operator training program.		-		9
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