Integrity Management Program

Prevention, Assessment, & Mitigation Practices for Natural Gas Transmission Pipelines

	Time-Dependent Threats *The threat level accelerates over time*			***Stable Threats*** *The threat is inherent but does not grow over time*			***Time Independent Threats*** *The threat exists outside of the continuum of time*		
	External Corrosion	**Internal Corrosion**	**Stress Corrosions Cracking**	**Manufacturing Related**	**Construction/ Fabrication Related**	**Equipment Related**	**Excavation Damage**	**Incorrect Operations**	**Weather & Outside Forces**
Primary CAUSES	**Poor coating and inadequate cathodic protection**	**Gas quality**	**Discharge Temperature**	**Long-Seam Defects, Pipe Defects**	**Girth Weld, Coupled Welds, Wrinkle Bends, Branch Connections**	**Gaskets, Relief Valves/ Regulators**	**3rd party**	**Human error, inadequate training, failure to follow procedures**	**Weather-related events, ground movement**
Primary PREVENTION	Cathodic protection	Gas quality monitoring	Cathodic protection	Pipe specification	Construction practices	Preventative maintenance	Excavation observation and patrolling	Operating procedures	Continuous Surveillance
	Close interval survey	Site-specific plans	Field inspections	Inspection during manufacturing	Inspection during construction	Inspection during maintenance	One Call System	Training & Development	
MITIGATION PRACTICES	In-line Inspection	Operational pigging	Pressure Testing	Mill Pressure Testing	Pressure Testing	Patrolling	Locating & Marking	Operator Qualification	Emergency Preparedness
		In-Line Inspection		Pressure Testing	Patrolling	Monitoring Pressure & External Loads	Excavation Monitoring	Audits	Slope Monitoring & Stabilization
	Direct Assessment	Direct Assessment	Direct Assessment	Monitoring Pressure & External Loads	Monitoring Pressure & External Loads		Public Awareness		
	Pressure Test	Pressure Test	In-line Inspection		In-line Inspection				

Pilot Testing Phase