

Structuring an Asset Management System for Compliance with Both API 1173 and ISO 55001 Requirements

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A comparison has been made between the requirements of API 1173 *Pipeline Safety Management Systems* and the requirements of ISO 55001 *Asset Management – Management systems – Requirements* to provide guidance to pipeline operators in structuring a program that complies with both documents. Compliance with these requirements, while providing for a functional Asset Management system, can be facilitated via the structuring of a system with ISO 55001 as the overarching document for all asset classes and API 1173 as the supporting document for the provision of more detailed guidance for pipeline assets.

Other requirements – PHMSA, DIMP, TIMP, etc. – can also easily be addressed as sub-elements under the API 1173 framework. For example, Subparts O and P of 49 CFR 192 could be covered as sub-elements under the API 1173 elements of Risk Management and Operational Controls, whereas the PHMSA *Guidance for Strengthening Pipeline Safety Through Rigorous Program Evaluation and Meaningful Metrics* document could be captured as sub-elements under the API 1173 elements of Goals and Objectives and Safety Assurance. Pipeline specific policy can also be captured as a component of the API 1173 requirements.

This structural recommendation for an Asset Management system is based upon the following:

- ISO 55001 is a general (non-specific) asset management document that provides an overall framework for an Asset Management System
- ISO 55001 and API 1173 share many common elements and requirements with no contradiction
 - Table 1 provides a summary of how API 1173 fits within an overall ISO5501 framework
 - Table 2 summarizes, for those implementing a pipeline safety management system, the linkage between the two documents from an API 1173 standpoint
- Both ISO 55001 and API 1173 emphasize the importance of integrated Process Management
- The guidance provided in ISO 55001 may be suitable for overall corporate risk
- API 1173 includes some pipeline specific requirements either not addressed in ISO 55001 or more explicitly detailed than in ISO 55001
- Both ISO 55001 and API 1173 expound on the requirement for a Plan, Do, Check and Act quality management methodology

Table 1: Comparison of ISO 55001 and API 1173 Requirements

ISO 55001	API 1173	Comments
4. Context of Organization		
4.1 Understanding the organization and its context	n/a	This assessment under ISO 55001 would direct the scope of the API 1173 sub-elements for pipelines
4.2 Understanding the needs and expectations of stakeholders	6. Stakeholder Engagement	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
4.3 Determining the scope of the asset management system	n/a	This assessment under ISO 55001 would direct the scope of the API 1173 sub-elements for pipelines
4.4 Asset management system	5.1 General	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
5. Leadership		
5.1 Leadership and commitment	5.4 Responsibilities of Leadership	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
5.2 Policy	5.2 Goals and Objectives	
5.3 Organizational roles, responsibilities and authorities	5.4 Responsibilities and Leadership	
6. Planning		
6.1 Actions to address risks and opportunities for the asset management system	5.3 Planning	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
	7. Risk Management	
6.2 Asset management objectives and planning to achieve them	5.3 Planning	
	7.4 Risk Prevention and Mitigation	
7. Support		
7.1 Resources	5.4 Responsibilities of Leadership	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
7.2 Competence	13 Competence, Awareness and Training	
7.3 Awareness	13 Competence, Awareness and Training	
7.4 Communication	6. Stakeholder Engagement	
7.5 Information requirements	7.2 Data Gathering and Evaluation of Quality	
7.6 Documented information	14.1 Control of Documents	
	14.2 Control of Records	
	14.3 Pipeline Safety Management System Documents	
14.4 Procedures		
8. Operation		
8.1 Operational planning and control	8.1 Operating Procedures	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
8.2 Management of change	8.4 Management of Change	
8.3 Outsourcing	8.5 Outsourcing of Contractors	
9. Performance evaluation		
9.1 Monitoring, measurement, analysis and evaluation	10.1 General	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
9.2 Internal audit	10.2 Audit and Assessment	
9.3 Management review	11.1 Management Review	
10. Improvement		
10.1 Nonconformity and corrective action	9.1 Investigation of Incidents	ISO 55001 is broader in scope, API 1173 sub-element for pipelines would define more detailed requirements
	12 Emergency Preparedness and Response	
10.2 Preventive action	7.4 Risk Prevention and Mitigation	
10.3 Continual improvement	11.2 Continuous Improvement	

Table 2: Comparison of API 1173 and ISO 55001 Requirements

API 1173	ISO 55001	Comments
5. Leadership and Management Commitment		
5.1 General	4.4 Asset Management System	ISO 55001 easily addressed by API 1173
5.2 Goals and Objectives	5.2 Policy	Some elements of ISO 55001 5.2 covered in API 1173 5.3, 6, 11
5.3 Planning	6 Planning	Some elements of ISO 55001 covered in API 1173
	6.2.2 Planning to achieve asset management objectives	ISO 55001 more explicit about overall asset management plan requirements, can be easily accomplished within API 1173 framework
5.4 Responsibilities of Leadership	5.1 Leadership and commitment	ISO 55001 easily addressed by API 1173
5.5 Responsibility, Accountability and Authority	7.1 Resources	
	5.3 Organizational roles, responsibilities and authorities	
5.6 Making Communication, Risk Reduction & Continuous Improvement Routine	7.4 Communication	
6. Stakeholder Engagement		
6.1 General	4.2 Understanding the needs and expectations of stakeholders	API 1173 more specific, can be easily structured to meet ISO 55001 requirements, ISO 55001 includes financial reporting
6.2 Internal		
6.3 External	7.4 Communication	ISO 55001 includes financial reporting
7. Risk Management		
7.1 General		API 1173 much more explicit regarding Risk Management; ISO 55001 easily met by API 1173 compliant PSMS
7.2 Data Gathering	7.5 Information requirements	ISO 55001 more broad; API 1173 PSMS can be easily adopted to ISO 55001
7.3 Risk Identification and Assessment		API 1173 more explicit
7.4 Risk Prevention and Mitigation	10.2 Preventative action	ISO 55001 easily addressed by API 1173
7.5 Periodic Analyses		API 1173 more explicit
7.6 Risk Management Review		
8. Operational Controls		
8.1 Operating Procedures	8.1 Operational planning and control	ISO 55001 easily addressed by API 1173
8.2 System Integrity		API 1173 more explicit
8.3 Management of Change (MOC)	8.2 Management of change	ISO 55001 easily addressed by API 1173
8.5 Use of Contractors	8.3 Outsourcing	
9. Incident Investigation, Evaluation, and Lessons Learned		
9.1 Investigation of Incidents	10.1 Nonconformity and corrective action	ISO 55001 easily addressed by API 1173
9.2 Follow-up and Communication of Lessons Learned		API 1173 more explicit
9.3 Learning from Past Events		
9.4 Learning from External Events		
10. Safety Assurance		
10.1 General	9.1 Monitoring, measurement, analysis and evaluation	ISO 55001 easily addressed by API 1173
10.2 Audit and Evaluation	9.2 Internal audit	
10.3 Reporting and Feedback System		API 1173 more explicit
10.4 Performance Measurement and Analysis of Data		
11. Management Review and Continuous Improvement		
11.1 Management Review	9.3 Management review	ISO 55001 easily addressed by API 1173
11.2 Continuous Improvement	10.3 Continual improvement	
11.4 Top Management Review		API 1173 more explicit



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12. Emergency Preparedness and Response		
	10.1	Significantly less detail in ISO 55001
13. Competence, Awareness and Training		
	7.2 Competence	ISO 55001 easily addressed by API 1173
	7.3 Awareness	
14. Documentation and Record Keeping		
14.1 Control of Documents	7.6.3 Control of documented information	ISO 55001 easily addressed by API 1173
14.2 Control of Records	7.6.1 General	
14.3 Pipeline Safety Management System Documents	7.6.2 Creating and updating	
14.4 Procedures	7.6.3 Control of documented information	