



UK Petroleum Industry Association Ltd.

Self-Assessment Module

TANK INSPECTION

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Foreword

As part of its Process Safety Leadership Commitment, UKPIA has developed, through its members, a series of common self-assessment modules for process safety. This document provides detailed guidance on the use of a self-assessment tool for the element of Tank Inspection.

This self-assessment tool was developed by UKPIA and its member companies. The completed tool is distributed to member companies to allow them to perform self-assessment in accordance with the Process Safety Leadership Commitment.

It is not the intention of this document, or the self-assessment tool itself, to specify how Tank Inspection processes should be developed, nor replace any existing corporate assessment or audit activities. The intent of this module is to provide a means by which organisations can further assess themselves against a common framework of excellence in process safety.

There are no limitations on further distribution of this module to other organisations outside of UKPIA, provided that:

1. It is understood that the Tank Inspection document and self assessment tool represents UKPIA's view of a common framework.
2. UKPIA owns all rights to the Tank Inspection document and self assessment tool.
3. UKPIA accepts no responsibility in terms of the use or misuse of this document.
4. The Tank Inspection document and self assessment tool is distributed in a read only format, such that the name and content is not changed and that it is consistently referred to as "The UKPIA Self Assessment Module Tank Inspection".
5. It is understood that no warranty is given in relation to the accuracy or completeness of information contained in the document except that it is believed to be substantially correct at the time of publication.

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1. Introduction

This is one of a suite of documents used to perform self-assessment against process safety excellence, as defined within UKPIA_PSL_002, Overview for Self-Assessment¹.

As part of a review in preparation for the creation of this module, it was identified that existing guidance was sufficient and effective, and would not benefit from an additional self assessment tool. The purpose of this document is therefore to provide an overview and reference to this existing guidance, including a simple checklist to highlight the key elements.

Tank Inspection refers to the techniques and methods used to prevent loss of primary containment from above ground cylindrical steel storage tanks through their continued maintenance, inspection and repair.

1.1 Scope

This document applies to tank inspection processes used by members at their refinery, petrochemical and fuel storage facilities in the UK.

The module has been developed through a consultation process with experts from each member organisation.

1.2 Principles for Use

This document should be used as a reference to existing good practice guidance, which may be used, where appropriate and necessary, to enhance existing tank inspection processes.

1.3 Analysis

No formal analysis will be provided for the Tank Inspection module.

¹ The overview for self assessment is the controlling document which defines all modules which form the basis of the self assessment process, as identified in the UKPIA Process Safety Leadership Commitment.

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2. Existing Good Practice Guidance

Reference should primarily be made to the following publications:

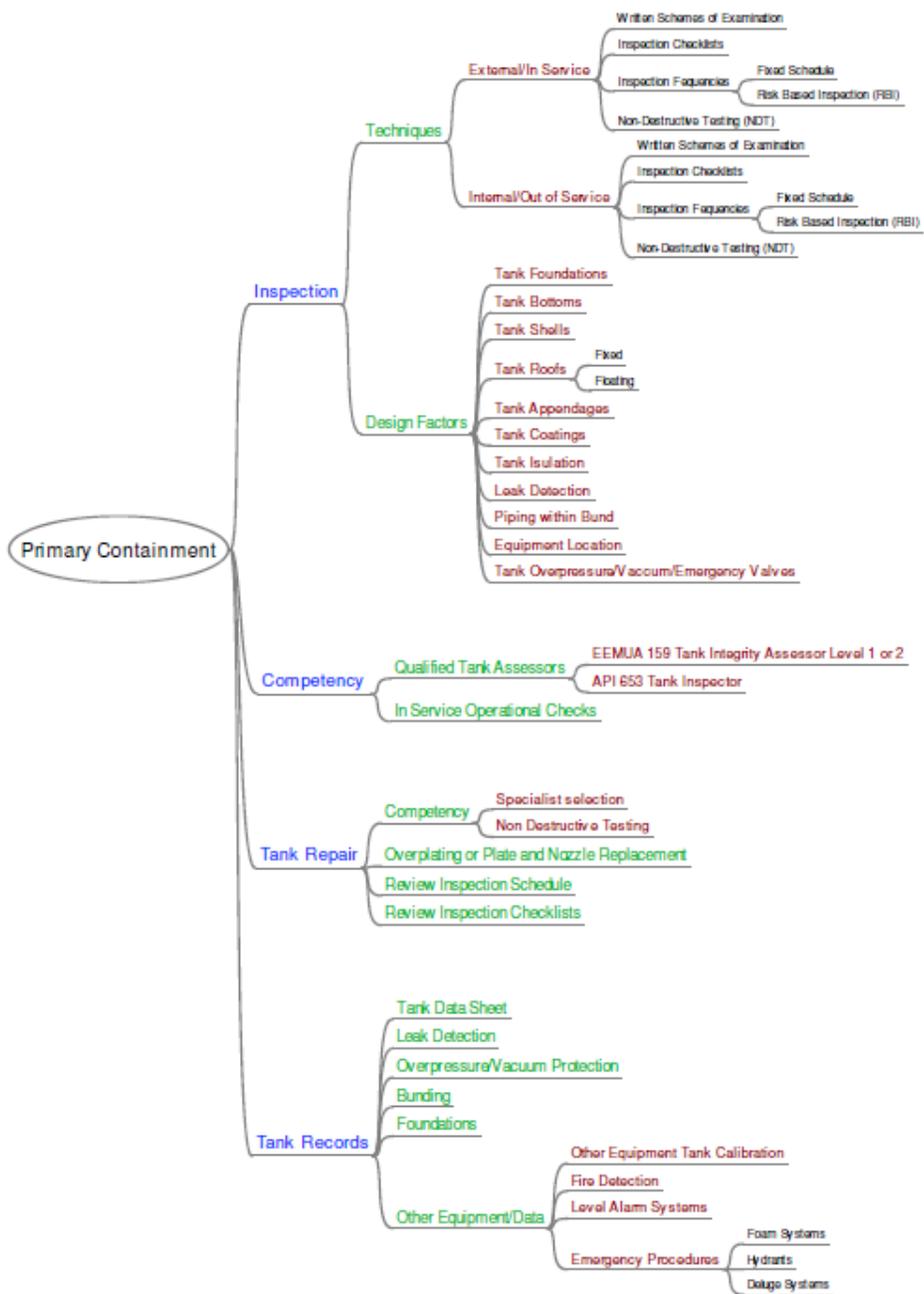
- EEMUA 159, *Users Guide to the Inspection, Maintenance and Repair of Above Ground Vertical Cylindrical Steel Storage Tanks*
- EEMUA 183, *Guidance for the Prevention of bottom leakage from Vertical cylindrical steel storage tanks*
- API 653, *Tank Inspection, Repair, Alteration and Reconstruction*.

Further guidance, as applied to gasoline storage, can also be found in the Process Safety Leadership Group (PSLG) Final Report, Part 3, *Engineering against escalation of loss of primary containment*.

2.1 Summary

A summary of the key tasks associated with tank inspection, and derived from the standards quoted is provided below.

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2.2 Checklist

Based on the summary tasks identified in section 2.1, and the guidance provided within Part 4 of the final PSLG Report, the following basic checklist may be used to identify the key elements of tank inspection that may be considered as part of an overall site maintenance process.

Note, this presents an overview of key elements only; reference should be made to the appropriate standards and guidance for detailed requirements.

Task	Activity	Key Element
Inspection	Internal/Out of Service Inspection	Written schemes of examination/Inspection checklists in place
		Inspection frequencies determined, either fixed or through RBI assessment
		NDT Techniques
	External/In Service Inspection	Written schemes of examination/Inspection checklists in place
		Inspection frequencies determined, either fixed or through RBI assessment
		NDT Techniques
	Design Factors Considered	Tank foundations
		Tank shells
		Tank roofs (fixed or floating)
		Piping within the bund & position of isolation valves, dry and wet riser safety piping & distributors.
		Tank appendages (e.g. ladders, instrumentation)
		Tank coatings
Tank overpressure / vacuum valves / emergency valves.		
Tank insulation		
Competency	Tank Assessors	Qualified tank assessors (e.g. EEMUA 159 Tank Integrity Assessor Level 1 or 2, API RP 653)
	Online Operational Checks	Suitably trained personnel
	Tank Repair	Selection of suitably competent personnel/contractors in tank design, reconstruction and repair works
Non destructive testing by suitably qualified personnel (e.g. TWI Welding and Inspection)		
Tank Repair	Repair Options	Suitability of over-plating or plate and nozzle replacement
		Suitability of double bottom design and loss of vacuum indication

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Tank Records	Content	Tank data sheet
		Leak detection facilities
		Overpressure / Vacuum protection
		Bunding requirements and design
		Foundation requirements and design
		Other appropriate equipment data
	Review	Maintenance of records following repair/maintenance/design changes

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References

The following table provides references to documentation used to develop the self-assessment module.

Description	Reference
Users Guide to the Inspection, Maintenance and Repair of Above Ground Vertical Cylindrical Steel Storage Tanks	EEMUA 159
Guidance for the Prevention of bottom leakage from Vertical cylindrical steel storage tanks	EEMUA 183
Tank Inspection, Repair, Alteration and Reconstruction	API 653
Safety and environmental standards for fuel storage sites - Process Safety Leadership Group Final report	ISBN 978-0-7176-6386-6

NOTE: For the documents referenced above, ensure that the latest revision is used when determining the suitability of tank inspection regimes.

The following table provides details of applicable UKPIA process safety leadership documents that should be referenced where indicated within this self-assessment module.

Description	Reference
Overview Self Assessment Framework	UKPIA_PSL_002

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Abbreviations

Abbreviation	Description
API	American Petroleum Institute
EEMUA	Engineering Equipment And Materials Users Association
NDT	Non-Destructive Testing
PSLG	Process Safety Leadership Group
RBI	Risk Based Inspection
TWI	The Welding Institute
UK	United Kingdom
UKPIA	United Kingdom Petroleum Industry Association

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Revision History

Rev.	Section	Description	Date	Changed By
0.0	All	First Issue	6-Apr-2010	PSD
1.0	All	Updated following comments from PSLN	28-Jun-2010	PSD

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