

COMMON APPROACH FOR ASSET MANAGEMENT AND STATUTORY OBLIGATIONS

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SUMMARY

This paper describes the processes that assure asset management compliance with statutory requirements for maintenance delivery.

The work involved the efficient upgrade of the asset management system from initial asset validation to a final upload of the master data. Four processes have been developed to ensure that data collection, validation, development and management is consistent across the portfolio. The techniques outlined in these processes are presented utilising a case study involving a portfolio of public hospitals.

The first process covers asset validation and data collection, including guidelines for asset attributes and data standards. The second process is asset condition assessment. The third process provides a consistent procedure for asset criticality analysis. The last process is the development of preventive maintenance strategies for maintainable assets.

The main requirement of the maintenance strategies is both assuring equipment reliability and compliance with statutory obligations. The process ensures statutory compliance by providing a line of sight from statute to regulation to asset class and then to maintenance job plans. It provides the asset manager with visibility of the requirements of maintenance for each asset type and assures the compliance of each asset in the asset portfolio.

Category: Health Service Compliance, Asset Validation, Asset Condition Assessment and Asset Criticality Analysis

1. INTRODUCTION

One of the primary functions in Facilities Management is duty of care and the management of risk and liability. Clause 2.2 of ISO 55000, Asset management – Overview, principles and terminology, states that the benefits of asset management can include, but are not limited to:

***“demonstrated compliance:** transparently conforming with legal, statutory and regulatory requirements, as well as adhering to asset management standards, policies and processes, can enable demonstration of compliance;*

***managed risk:** reducing financial losses, improving health and safety, good will*

and reputation, minimising environmental and social impact, can result in reduced liabilities such as insurance premiums, fines and penalties” [1]

Between 2015 to 2017, we performed statutory compliance assessments for maintenance programmes across all Australian States and Territories. These assessments covered over 150 facilities across 500 plus buildings, and over 300 unique asset types. It identified compliance gaps from 10% to 35% based on asset type and maintenance frequency.



Figure 1 Case Study

The main reasons for statutory compliance gaps in the maintenance regimes of these facilities were the level of commitment to technical change management processes either in cases of establishment of new equipment, or modification and decommissioning of existing equipment as well as not keeping up to date with changes in legislation, regulations and standards over a long period of time. In a highly contracted environment like facilities management, it was found that change management is challenging to enforce due to lack of ownership, lack of stringent project handover and operational readiness processes as well as gaps in contracted maintenance services agreements to drive change management.

It was also found that compliance is more challenging for teams that operate nationally across multiple States and Territories due to increased complexities of keeping up to date across multiple legislative and regulatory frameworks.

All organisations must comply with legislation applicable to their assets including preventive maintenance activities. As per The Institute of Asset Management,

“Organisations must have processes to identify the relevant technical standards and legislation and incorporate the requirements into their policies and processes. In order to demonstrate compliance with the requirements, it is good practice for this to be audited by individuals that are independent of the

associated processes, and results reported to an independent compliance committee within the organisation [2].”

This paper describes the processes that enable demonstration of asset management compliance with statutory requirements regarding maintenance delivery.

2. METHODOLOGY

The processes developed for the efficient upgrade of the asset management system in existing facilities from the initial asset validation to the final upload of the master data in the asset management system are:

- asset validation and data collection;
- asset condition assessment;
- asset criticality analysis; and
- development of preventive maintenance strategies for maintainable assets.

As well as operational reliability of the assets, the maintenance strategies must assure compliance with statutory obligations.

The approach commences by resetting the plant configuration by excising retired assets, adding assets which had not been registered and resetting all assets into an appropriate sense of hierarchy. This is followed by a systematic procedure for asset condition assessment and asset criticality ranking.

The existing preventive maintenance procedures were reviewed and additional procedures developed to ensure an optimised maintenance strategy for all maintainable assets. This strategy was formally designed to be compliant with statutory obligations.

The techniques outlined here have been implemented across a portfolio of public hospitals.

3. ASSET VALIDATION AND DATA COLLECTION

Asset validation is required for facilities when there is low confidence in the accuracy of the current asset register. Asset validation is fundamental to the development of maintenance strategies and identifying assets subject to statutory/legislative requirements that have not previously been captured. Establishing an accurate asset hierarchy will clearly identify what needs to be maintained. It is required to ensure the asset information is of sufficient depth, quantity and quality to demonstrate compliance. The information required for the asset hierarchy validation are [3]:

- The current Computerised Maintenance Management Systems (CMMS) asset hierarchy
- Assets lists not included in the CMMS (List of Electrical Switchboards, ...)

- A set of Piping and Instrumentation Diagrams (P&ID's) and a set of Single Line Diagrams (SLD)
- A set of latest inspection reports provided by the site maintenance contractors.
 - Fire protection equipment essential services testing reports
 - Maintenance reports for Thermostatic Mixing Valves, Backflow Prevention Devices
- Additionally, asset data may reside in financial systems, service provider systems, and various CAD systems.

The recommended level of asset detail is to a 'Maintainable Assets' level. A Maintainable Asset is defined as that which would be expected to have a preventative maintenance tactic applied to it. Components of maintainable assets would not normally be considered candidates for asset validation unless the assessor considers sub-assets is of sufficient significance to warrant capture and validation.

The asset validation methods for an established facility are "desk-top" review of the current assets or asset validation based on walk down of the site or a combination of both.

It is recommended that an initial "desk-top" validation occurs, where assets which are known to be decommissioned are removed from the data to be used during the site-work portion of the asset validation process. The existing data is then formatted to match the data capture template, and the physical process of validating the existence of the assets can begin.

Asset validation for an established facility is based on walk down of the site utilising the legacy asset listing as a starting point. Asset validation is a visual practice. If the assets are not accessible for visual validation, such as assets installed in the ceiling space or a sump pump, the assets can be validated by referring to the applicable distribution board or by confirming with the site personnel.

3.1 Asset Condition Assessment

Asset condition assessment is generally performed during asset validation and data collection, but may be conducted separately.

The purpose is to provide a standard statement of the condition of assets owned and maintained at the facility. Accurate and standardised asset condition information is required by the asset managers to ensure the best use of their maintenance funds.

Condition assessment is achieved using visual inspection of asset condition. The condition assessment is useful for asset management processes such as:

1. Life-cycle cost modelling to ensure the model uses actual data rather than nominal life predictions.
2. Development of risk based Asset Management Plans.

The following parameters are collected for asset condition assessment:

1. Current condition: Using a rating system, e.g. 1 to 5 rating system, to identify the rating which is the best estimate of the asset condition by the assessor based on a visual inspection.
2. Current usage: Using a rating system, e.g. 1 to 3 rating system, to identify the rating which is the best estimate of the asset usage by the assessor. Usage ratings are for the usage compared to the entire fleet of assets at the facility.
3. Operating environment: Using a rating system, e.g. 1 to 3 rating system, to identify the rating which is the best estimate of the asset's environment by the assessor based on knowledge of the site. The normal environment is that where the asset would be expected to operate to achieve its usual service life.
4. Age of the assets: The information can be collected during asset validation process or, as a desk-top process based on the age of the facility (for original assets).

3.2 Asset Criticality Analysis

Asset criticality analysis may be performed at any stage in the life cycle of the assets but should be preceded by an asset validation program when there is low confidence in the asset register.

Asset criticality analysis is defined as a systematic procedure for the analysis of a system of assets to identify the consequence and likelihood of failure of an asset to perform its function.

The consequence of failure of an asset defines “how crucial the asset is to the delivery of health care services and how that service delivery is affected should the asset not be performing to its required standard.” A sample set of risk categories (risk criteria) as used by New South Wales Health are [4]:

1. Clinical Care & Patient Safety
2. Health of the Population
3. Workforce
4. Communication & Information
5. Facilities & Assets Management
6. Emergency & Disaster Response
7. Finance & Legal
8. Safety & Security
9. Leadership & Management
10. Community Expectations / Reputation

Failure of an asset usually represents risks in multiple categories with similar or various consequences. For criticality assessment, the relevant risk category is the one which represents the highest severity consequence.

Applicable risk matrix identifies the categories for the consequence and the Likelihood of occurrence of failure of an asset to perform its function. Risk rating is identified based on the asset failure likelihood and consequence. A sample

risk matrix is shown in Table 1. Based on this risk matrix asset critically is ranked as:

1. Low Green
2. Medium Yellow
3. High Orange
4. Extreme Red

		CONSEQUENCE RATINGS				
		Catastrophic (S1)	Major (S2)	Moderate (S3)	Minor (S4)	Minimal (S5)
LIKELIHOOD	Almost certain (L1)	A	D	J	P	S
	Likely (L2)	B	E	K	Q	T
	Possible (L3)	C	H	M	R	W
	Unlikely (L4)	F	I	N	U	X
	Rare (L5)	G	L	O	V	Y

Table 1 Level of Risk; NSW Health Risk Matrix [4]

4. STATUTORY COMPLIANCE FRAMEWORK

The process ensures the statutory compliance by providing the line of sight from statute to regulation to asset class and to maintenance job plans. It provides the asset manager the visibility of the requirements of maintenance for each asset type and ensures the compliance on the maintenance requirement of the asset portfolio.

The process follows the following steps:

1. Ensure we have a current asset register with the required attributes including asset types.
2. Identify the applicable Acts, Regulations or Codes of Practice for the asset types which exist in the facility.
3. Identify the applicable Australian Standards, technical standards, such as industry or sector regulations, with regards to the maintenance of the asset types have been identified.
4. Establish a clear tracking of work to statutory obligations for each asset type by
 - a. Listing of known statutes
 - b. Alignment with asset classes based on their need to be compliant with the regulations referred

- c. Alignment with maintenance job plans
- 5. Establish a clear tracking of statutory maintenance obligations for individual assets.

Figure 2 details the process for identifying statutory maintenance requirements and developing the statutory maintenance procedures for each equipment type.

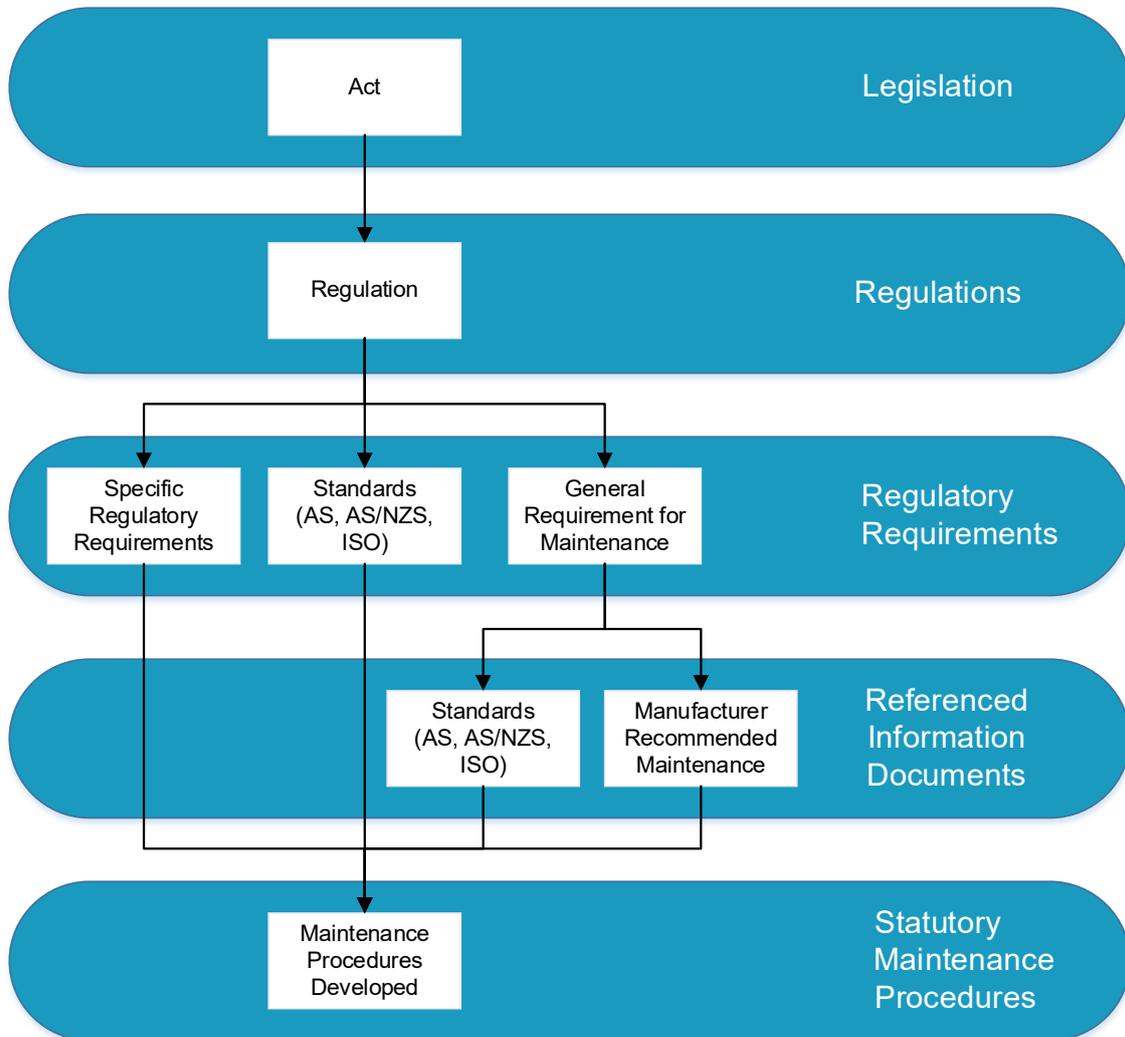


Figure 2 Statutory Maintenance Procedure Development Process

4.1 Legislation

Legislation issued by the Commonwealth or State Governments is consulted to determine the requirements for maintenance of the equipment types. Compliance with the requirements of Acts is mandatory.

4.2 Regulations

Regulations are statutory rules made in accordance with an Act, which set out more prescriptive rules to establish compliance with the requirements of an Act.

It is most often the regulations, rather than the Acts, which set the specific requirements for the maintenance of equipment.

Regulations issued by the Commonwealth Government or the State Government may be consulted to determine the requirements for maintenance of the equipment types. Compliance with the requirements of regulations is mandatory.

4.3 Regulatory Requirements

Applicable regulations typically require maintenance to occur either by:

- (a) Specific maintenance or testing requirements set out in the regulations;
- (b) Specifying compliance with an appropriate Standard; or
- (c) Having a general requirement that maintenance occurs in accordance with manufacturer recommendations, or the recommendations of a competent person.

Where the regulations set out specific requirements for testing or maintenance, these requirements should be directly included in the statutory maintenance procedures.

In other cases, the applicable regulations specify that compliance with an appropriate Standard is required. In these cases, the maintenance requirements of the Standards should be included in the statutory maintenance procedures.

4.4 Referenced Information

Where there is a general requirement in the regulations for equipment to be maintained, but there is no specified maintenance, testing requirements, or a specific requirement for compliance with a Standard, manufacturer's recommendations or the recommendations of a competent person are to be consulted in conjunction with other applicable Standards.

Compliance with the requirements or recommendations of these Standards, and the recommendations set out by equipment manufacturer ensures compliance with the general maintenance requirements of the regulations.

4.5 Statutory Maintenance Procedures

The statutory maintenance procedures are the mandatory maintenance procedures which must be performed in order to comply with the requirements of the various Acts and Regulations. These procedures should be prepared in accordance with all the requirements identified through the process which is highlighted in this section.

4.6 Example – Fire Hose Reels

4.6.1 Applicable Acts, Regulations or Codes of Practice

Table 2 below lists the applicable acts, regulations or other control documents for the maintenance of Fire Hose Reels.

Document	Document Type	Issuing Body
Environmental Planning and Assessment Act 1979	Act	NSW Government
Environmental Planning and Assessment Regulation 2000	Regulation	NSW Government

Table 2 Fire Hose Reels - List of Applicable Acts, Regulations or Codes of Practice

4.6.1.1 Environmental Planning and Assessment Act 1979 No. 203

The Environmental Planning and Assessment Act [5] gives approved investigators the power to determine whether there has been compliance or contravention with the Act, and to determine whether or not adequate provision for fire safety has been made in or in connection with a building.

Part 8, Section 157 of the Act is the general regulation making power, which specifies the government may make regulations with respect to the obligations on persons regarding fire safety.

4.6.1.2 Environmental Planning and Assessment Regulation 2000

The Environmental Planning and Assessment Regulation [6] lists statutory safety measures which must be assessed for the annual fire safety statement.

This regulation is made under the *Environmental Planning and Assessment Act 1979* in accordance with Section 157, the general regulation making power.

Part 9, Division 5, Section 175 of the Regulations requires an annual fire safety statement, in which, all essential fire safety measures have been assessed by a properly qualified person to be capable of performing to a standard no less than that specified in the schedule, or to a standard no less than that which the measure was originally designed and implemented.

Part 9, Division 6, Section 182 of the regulations requires that all essential fire safety measures are to be maintained to a standard no less than that specified in the schedule, or to a standard no less than that which the measure was originally designed and implemented.

4.6.2 Applicable Standards

Table 3 below lists the applicable standards for the maintenance of Fire Hose Reels.

Standard Number	Standard Title	Standard Mandated by Legislation
AS 2441:2005	Installation of Fire Hose Reels	Yes
AS 1851:2012	Routine Service of Fire Protection Systems and Equipment	Yes

Table 3 Fire Hose Reels - List of Applicable Standards

4.6.2.1 AS 2441:2005 Installation of Fire Hose Reels

This Standard [7] sets out the requirements for the distribution, location and installation of fire hose reels.

NOTE: Requirements for the maintenance of fire hose reels are set out in AS 1851

4.6.2.2 AS 1851-2012 Routine Service of Fire Protection Systems and Equipment

This Standard [8] sets out the requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire protection systems and equipment.

Section 9 of AS 1851-2012 sets out the requirements for the routine servicing (inspections, testing, preventive maintenance and survey) of fire hose reels manufactured to comply with AS/NZS 1221 and installed in accordance with AS 2441 or the relevant statutory requirements.

Table 4 below lists the maintenance requirements of AS 1851-2012.

Section	Requirement
9.3	Fire hose reels shall be serviced – a) Six monthly; and b) Yearly.
9.4.1	Six-monthly routine service of fire hose reels shall be completed in accordance with Table 9.4.1
9.4.2	Yearly routine service of fire hose reels shall be completed in accordance with Table 9.4.2

Table 4 Fire Hose Reels - List of Requirements of AS 1851-2012

4.6.3 Maintenance Strategy for Fire Hose Reels

The Table below details the individual procedures which contain the maintenance tasks required to satisfy the maintenance requirements of the above listed Standards.

Procedure Code	Procedure Description	Statutory Requirements Satisfied
BE-FIRE-FHR-R-C-6M	Fire Hose Reel, 6 Months, Running, Contractor	<i>Environmental Planning and Assessment Regulation 2000</i> , Part 9, Division 5, Section 175; Part 9, Division 6, Section 182 <i>AS 1851-2012</i> , Section 9.2.1, Section 9.3, Section 9.4.1

Procedure Code	Procedure Description	Statutory Requirements Satisfied
BE-FIRE-FHR-R-C-12M	Fire Hose Reel, 12 Months, Running, Contractor	<i>Environmental Planning and Assessment Regulation 2000</i> , Part 9, Division 5, Section 175; Part 9, Division 6, Section 182 <i>AS 1851-2012</i> , Section 9.2.1, Section 9.3, Section 9.4.2

Table 5 Fire Hose Reels - List of Procedures Matching Requirements of Standards

4.6.4 Applicable Documents for Maintenance of Fire Hose Reels

The above example, listed the applicable documents for statutory maintenance of fire hose reels in New South Wales. Table 6 lists the Acts of Parliament, Regulations, Codes of Practice, Standards mandated by legislation and other relevant documents applicable to maintenance practices of fire hose reels across Australia.

Document	Issuing Body
Acts of Parliament	
Environmental Planning and Assessment Act 1979	NSW Government
Building Act 1993	Victorian Government
Development Act 1993	South Australian Government
Occupational Safety and Health Act 1984	Western Australian Government
Building Act 2016	Tasmanian Government
Fire and Emergency Act	Northern Territory Government
Building Act 1975	Queensland Government
Regulations	
Environmental Planning and Assessment Regulation 2000	NSW Government
Building Regulations 2006	State Government of Victoria
Development Regulations 2008	Government of South Australia
Occupational Safety and Health Regulations 1996	Government of Western Australia
Building Regulations 2016	Tasmanian Government
General Fire Regulations 2010	Tasmanian Government
Fire and Emergency Regulations	Northern Territory Government
Building Regulation 2006	Queensland Government
Codes of Practice	
National Construction Code	Australian Building Codes Board
Queensland Development Code MP 6.1	Queensland Government
Minister's Specification SA 76 - Maintenance of Essential Safety Provisions	Government of South Australia
Standards Mandated by Legislation	
AS 2441:2005 - Installation of Fire Hose Reels	Standards Australia
AS 1851:2012 - Routine Service of Fire Protection Systems and Equipment	Standards Australia

Table 6 List of Documents Applicable to Maintenance of Fire Hose Reels.

5. CONCLUSION

This paper presented a methodology which enables demonstration of asset management compliance with statutory requirements regarding maintenance delivery. A comprehensive process from the initial asset validation to statutory maintenance compliance covering all asset types across the facility was presented.

The outcome of the process presented here is that the organisation has assurance that they are statutory compliant in their maintenance programme.

ACKNOWLEDGMENTS

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REFERENCES

- [1] ISO 55000, Asset management – Overview, principles and terminology
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- [3] S. Safi “Upgrading Maintenance Strategies for Established Plant” AMPEAK 2015
- [4] New South Wales Health Risk Matrix
- [5] Environmental Planning and Assessment Act 1979 No. 203.
- [6] Environmental Planning and Assessment Regulation 2000
- [7] AS 2441:2005 Installation of Fire Hose Reels
- [8] AS 1851-2012 Routine Service of Fire Protection Systems and Equipment