

# Development of Asset Management Plans for RE O&M

## Bringing ISO 55001 closer to real assets

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# Agenda



- Project Background
- ISO 55000
- What is an Asset Management Plan
- Key Requirements for Asset Management Plan
- AMP Development Process
- Key AMP Outcomes
- Success Factors

# Project Background

- Project in local renewable energy industry
- One wind farm and two solar PV plants within scope
- Plants constructed in REIPPPP round 1
- EPC warranty period expired
- 18 years remaining in Power Purchase Agreement
  
- Project employer opted for an extensive top-down management system development
- ISO 55001 provided the ideal framework for this



# What is ISO 55000?



“This international standard specifies the requirements for the establishment, implementation, maintenance and improvement of a management system for asset management, referred to as an ‘asset management system’.”

ISO 55001:2014



ISO 55000:2014

AM – Overview, principles and terminology

ISO 55001:2014

AM– Management systems - Requirements

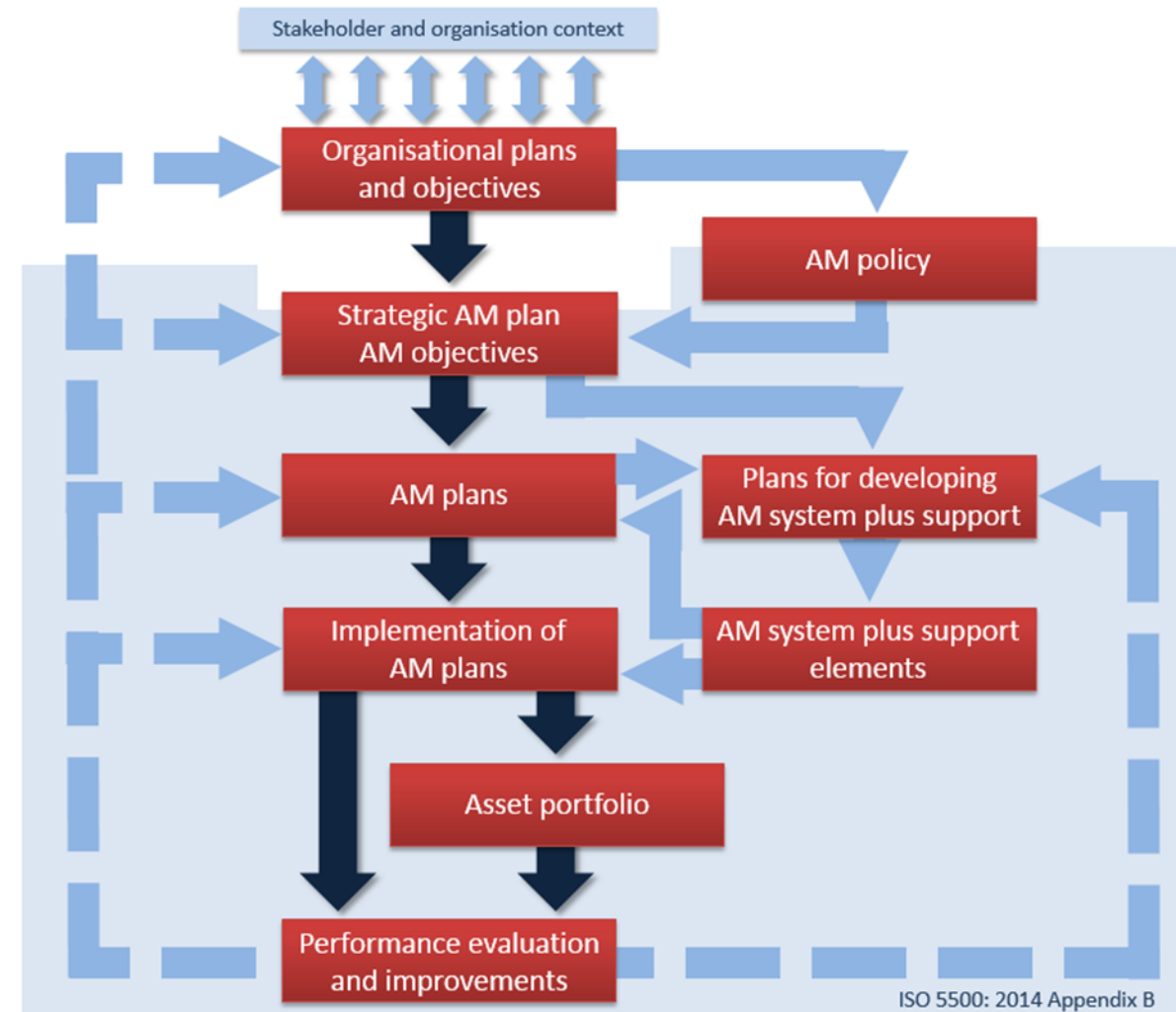
ISO 55002:2014

AM – Management systems - Guidelines for the application of ISO 55001

# Project Roll-out

- Customised AM framework
- Operational Strategic Plan (OSP)
- AM Policy
- Strategic AM Plans (SAMP, one per plant)
- *Asset Management Plans for critical asset types (PV Inverters, PV modules, SCADA, Step-up Transformers, Power Transformers)*

Steering Committee established to support Change Management in the organisation



# Asset Management Plan



The organisation shall establish, document and maintain asset management plan(s) to achieve the asset management objectives. An **asset management plan** is documented information that specifies the activities, resources and timescales required for an individual asset or grouping of assets.

ISO 55000: 2014

It is common practice for such a plan to contain a rationale for AM activities, operational and maintenance plans and capital investment plans (overhaul, renewal, replacement and enhancement.)

ISO 55000: 2014

# Key Requirements for Asset Management Plan

*Provides a consolidated view of how to manage a critical asset type over its life cycle*

- Clear link between business service level expectations and the equipment performance
- Provides estimate of long term financial commitments
- Presents a clear and up to date status of equipment performance, condition and health
- Defines risks and contains risk mitigation plans
- Modelling future costs and asset performance and process to identify future work and staff needs
- Integrates all information and processes associated with equipment
- Tool to communicate organisation's asset management activities to stakeholders, customers and other parties

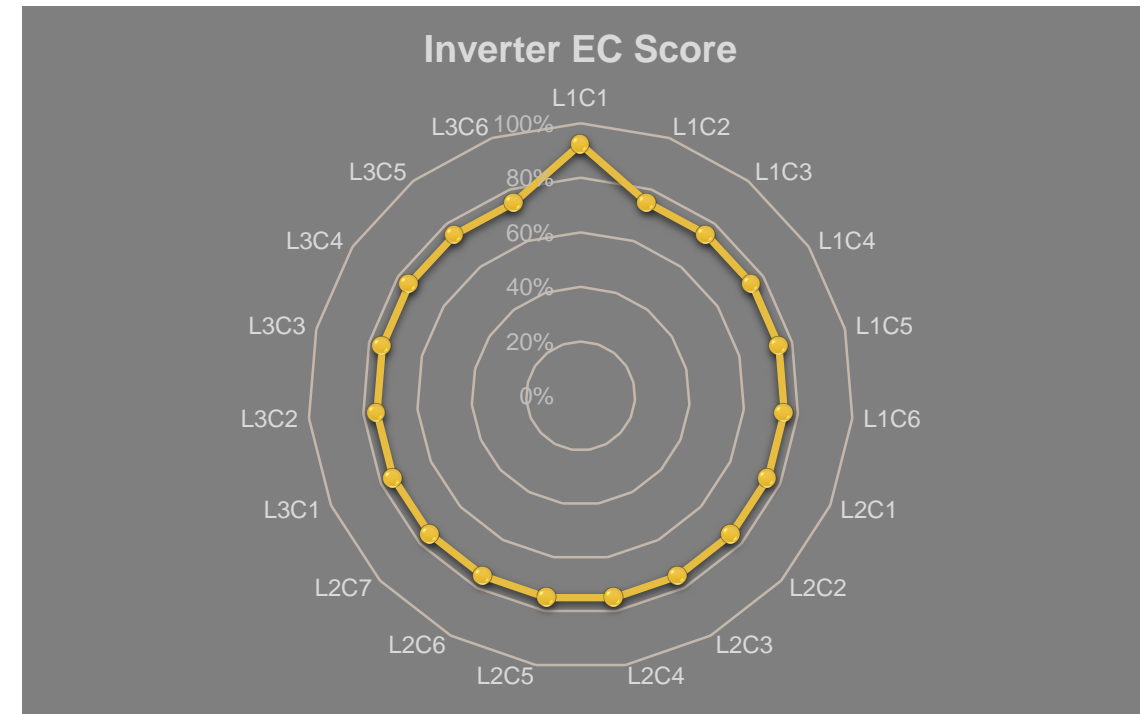


# AMP Development Process (1)

- Find agreement on AMP contents and the format
- Conduct detailed Failure Mode and Effect Analyses (FMEA) for each asset type in scope
- Consultants source information from combination of options:
  - Plant as-built information and data
  - Organisation's staff members (Plants, Operations, Commercial, Financial)
  - Subject Matter Experts (SMEs) external to the organisation
  - Suppliers and OEMs
  - General technical, engineering and financial literature (public domain)

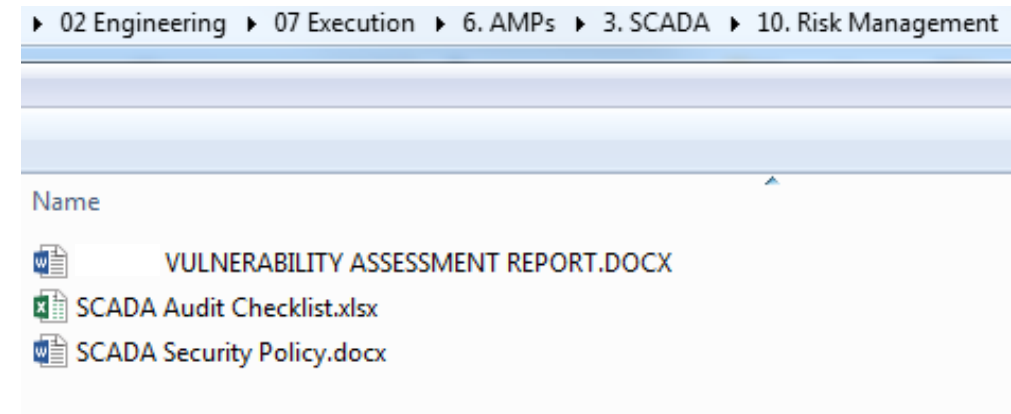
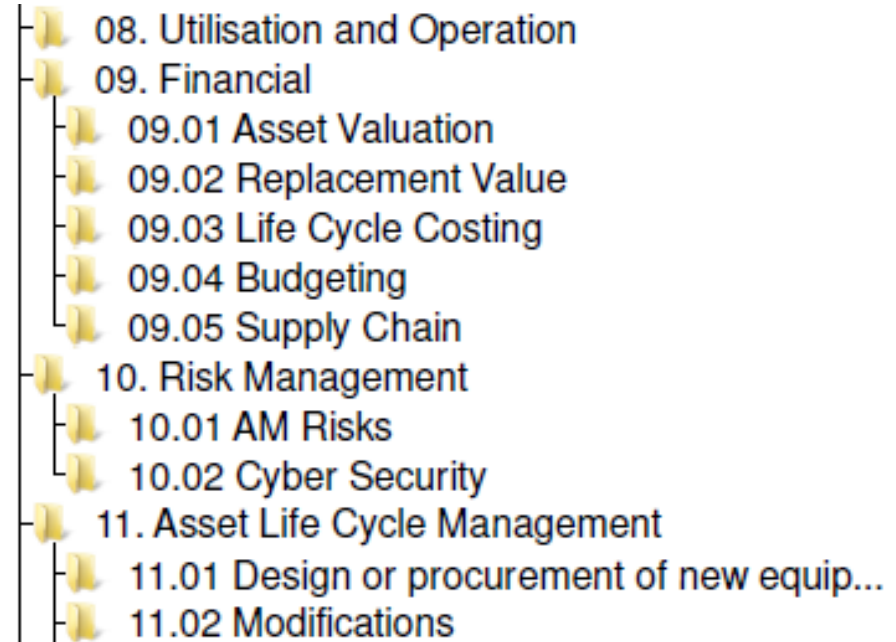
# AMP Development Process (2)

- Conduct structured asset condition assessments, for at least pilot samples of the operational equipment in scope
- Construct and populate life cycle costing (LCC) models for the projected plant life of 20 years



# AMP Development Process (3)

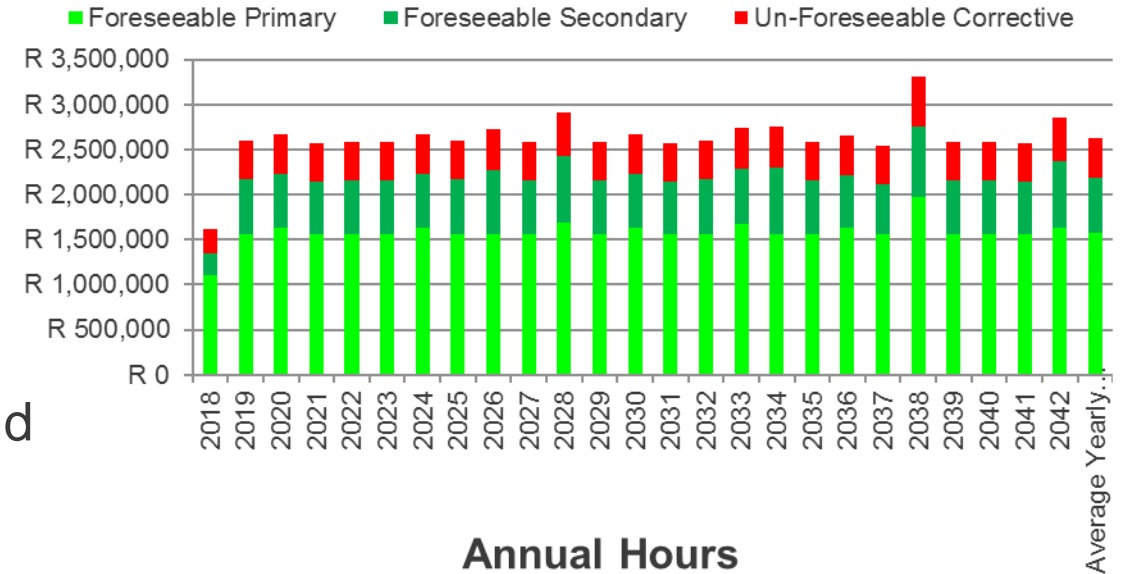
- Document high-level information in AMP Master Document
- Reference details stored in underlying folder structure
- Review progress regularly with as wide an audience as possible
- Development featured high on the agenda of the Steering Committee



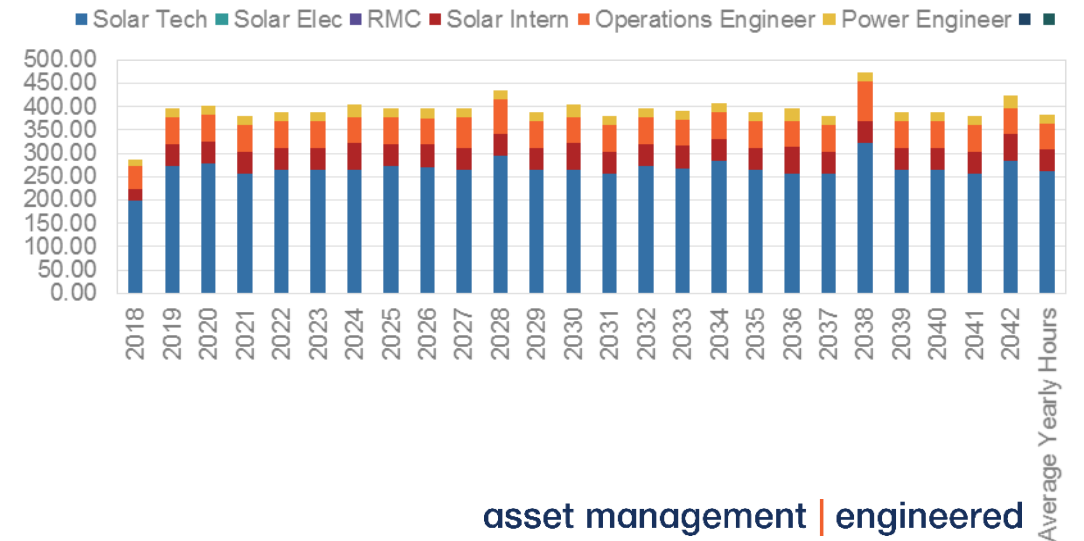
# Key AMP Outcomes for Organisation Stakeholders

- Management Team
  - Identification of AM Risks with mitigation plans
- Financial Department
  - Life Cycle Costing (LCC) to aid budgeting
- Human Resources
  - Resourcing requirements to aid organisation and competency development
- Plant Manager/Power Engineer
  - Guiding principles/rationale for LCM decisions
- O&M Site Teams
  - Defined standards for equipment performance
  - Condition assessments to aid decision making
  - Life cycle planning

## Annual Costs



## Annual Hours



# Success Factors

Inclusive approach

Multi-disciplinary approach  
(both wind and solar experts)

Dynamic structure (Live document)

Recommended actions are driven by risks and opportunities  
(noted and allocated to individuals)

Stakeholders identified, with requirements noted

AMP Ownership defined





# Thank you

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