Olkiluoto NPP ageing management

Status and path forward

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Working with TVO:

Engineering

- 2018 Materials specialist
- 2020 Ageing Management Engineer

Operations, Development and Assets

- 2022 ER and Ageing Management Lead

Keywords:

- Ageing Management process
- ER Process
- Obsolescence process

Ageing Management so far

WANO has proposed ER process since 2012. Regulators took and active role in integrating AM requirements since 2013. AM process development began 2014 in engineering organization

- 2016 System health reporting update
- AMR 2016 – 2017 and Commodity Groups
  - 2016 – 2019 Plant level Ageing Management Program
  - 2018 – 2022 AMP's with some creative reorganisation to grouping
  - 2018 – 2020 POMS with Data Clean Up

Whats left?

- Defining roles and resposibilities according total need
- Needs for the organisations due to AM and ER Process structure
- Obsolescence process

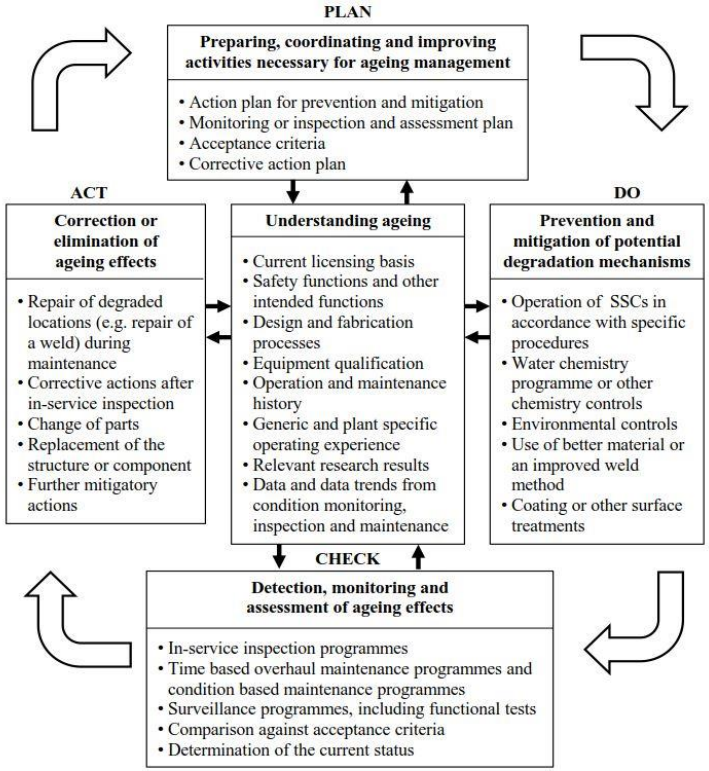

FIG. 1. Systematic approach to ageing management.

IAEA SSG-48

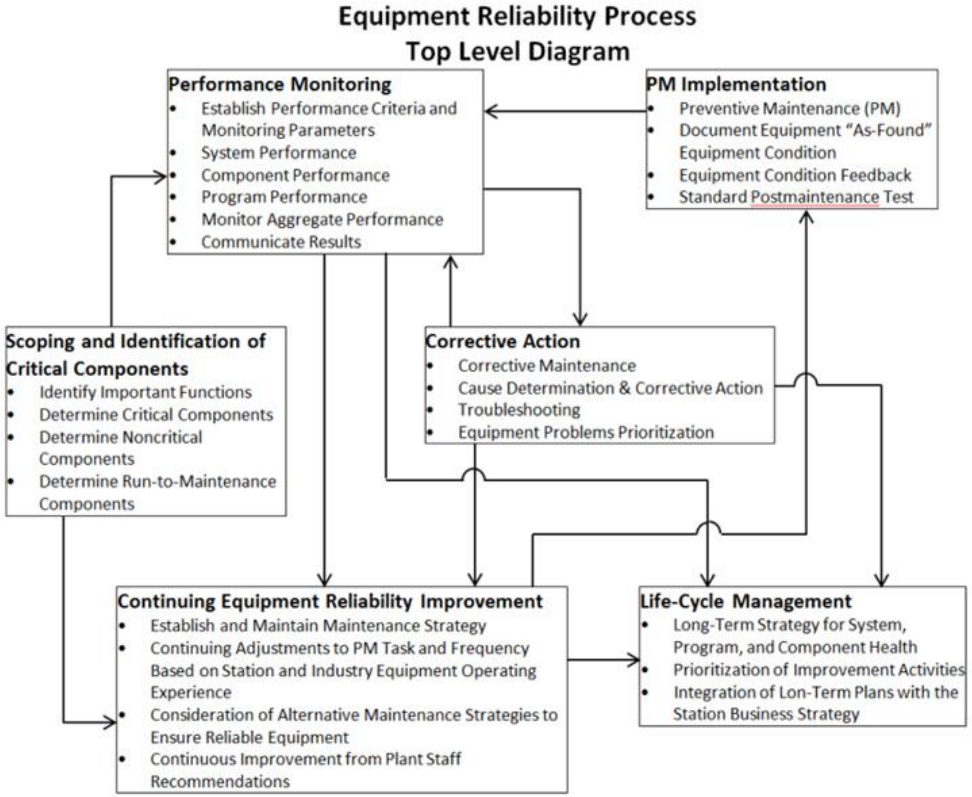

Figure 1

ER AP-913 rev 6

Ageing management

Ageing management is referred as engineering, operations and maintenance actions to prevent or to control within acceptable limits degradation mechanisms of SSCs of its NPPs. With regard to safety, it ensures the availability of required **safety functions throughout the service life of the plant**, with account taken of **changes that occur with time and use and by considering all service conditions**.

Ageing management is an important element for the safety of all phases of operation and should cover all applicable SSCs.

The scope of ageing managements covers both the active (a) and passive (p) **intended safety functions** of the involved structures and systems.

ER Process

The equipment reliability process represents the integration and coordination of a broad range of equipment reliability activities into one process for plant personnel to evaluate:

- ***important station equipment,***
- ***develop and implement long-term equipment health plans,***
- ***monitor equipment performance and condition,***
- ***make continuing adjustments to preventive maintenance tasks and frequencies based on equipment operating experience.***

This process includes activities normally associated with such programs as:

- reliability-centered maintenance,
- preventive maintenance (periodic, predictive, and planned),
- Maintenance Rules*, Refers to 10CFR50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.
- surveillance and testing,
- life cycle management (LCM) planning,
- equipment performance and condition monitoring.

The intent is to identify, organize and integrate equipment reliability activities into a single efficient process.

Technological ageing (Obsolescence)

The Five Stage Approach

approach is recommended for the development of a strong obsolescence strategy.

- **Identify:** *Reactive/Proactive*
- **Prioritise:** *Classifications*
- **Implement solutions**
- Monitor, improve, and share
- Develop organisational interfaces to support the four basic elements

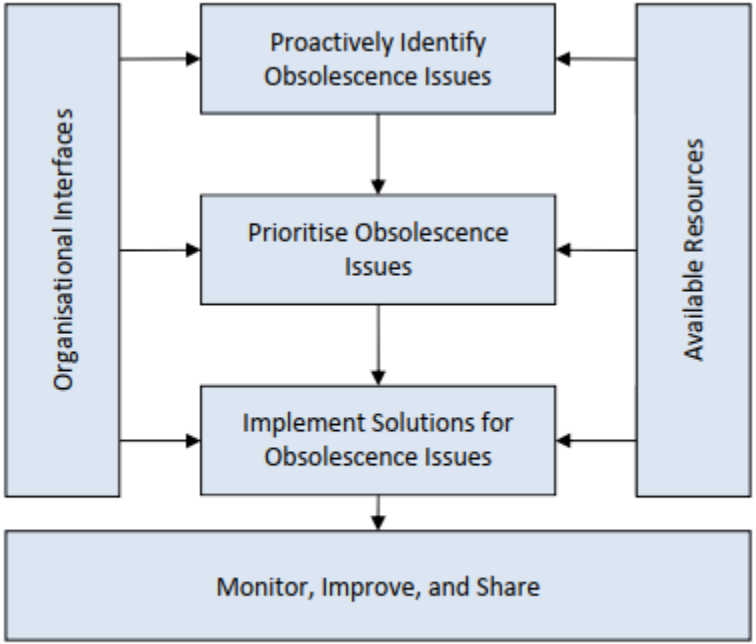

Figure 3. Five Stage Approach.

ER & AM & Obsolescence

The Big questions

- Do these have anything in common?
- How to achieve proactivity?
- What tools are needed?

Is there any common ground for a holistic approach?

ER-Process: The intent is to identify, organize and integrate equipment reliability activities into a single efficient process.

The common ground

Scope and scope differences

Classifications

Understanding current condition

Long term planning/Short term fixing

Strategy and Life Cycle management

Integrating the processes

Make sure that the roles can do their tasks

System, component and program levels

Scope

AM:

The scope of ageing managements covers both the active (a) and passive (p) **intended safety functions** of the involved structures and systems.

ER:

Determine the SSC functions that are important to maintaining safety, reliability and power generation.

Obsolescence:

All of the above and some more. A component might become

Classifications

There is a need for some global prioritization, the concept of a Critical Component.

Single-point vulnerabilities (SPVs) **are a subset of critical components** and should include, as a minimum, those components whose failure will directly result in a reactor scram or turbine trip.

Example: 4 Tier criticality classification

1. High Critical

→ **Zero tolerance for failures with High Critical components.**

2. Low Critical

→ **Very low tolerance for failures with Low Critical components.**

3. Non Critical/significant

Safety non critical and Safety significant

4. Run to Failure/maintenance

It is a continuous process and have to be kept up to date

Understanding the current condition

- Plant and equipment condition. This is a must because it will serve as the basis of long range planing
  - If the foundation is lacking, nothing can be built upon it.
  - Understanding your equipment and what to expect from them.
  - Ageing management review
- Process condition
  - Understanding what are you doing
- Capability condition
  - Understanding what can you do and what is holding you back

Life cycle management

- Establish the optimal maintenance methods for each potential failure, and define the frequency for long-term condition-based maintenance, planned refurbishment and replacement.
- A long-term strategy for component types that exist in multiple systems should be included in each applicable system strategy for consistency.
- These plans will serve as a base of proactive process. They create a path with important milestones.
- The Long range planes must be reactive if and when the need of change arises.

Roles and responsibilities

- Make sure that the roles can do their tasks
- I’m inclined to use pre existing guides and standards. They are there for a reason.
- Responsibilities have to be clear.
- Destroy silo working!

Process requirements

3 main levels:

- System, component and program levels
- The capability to monitor
- Aggregate level also needed

Integrating the process

- It is a team sport.
- Goes without saying, Roles have to be aligned with process needs.
- Need to be conducted and shared vision of what can be acheaved!

IT systems

- It is possible to do everything with pen and paper.
- Connected and compatible IT systems are more efficient.
- The quality of data is always going to be an issue. It has to be good enough.
- What works for you? It doesn’t matter how good the system is if no one uses it.

Continuos improvement:
Monitor, improve, share

Kiitos!

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