EEA Asset Health Indicator Guide

Asset Health Indicator (AHI) Guide

Revision I

HEALTH + SAFETY
ASSET MANAGEMENT
PROF DEVELOPMENT

Why was the EEA AHI Guide Created?

- Provide a common and consistent language and framework that would enable informed governance level discussions to take place over the stewardship of fleets of assets;
- Help asset owners provide answers on the science behind asset replacement,
- Provide a means of communication to answer medium and long term investment questions, and
- Enable informed strategic discussions around asset replacement such as
  - What is the life cycle distribution of the current assets?
  - What is the health of the assets under the organisation's stewardship as of today?
  - How will a specific investment profile affect the assets' health?

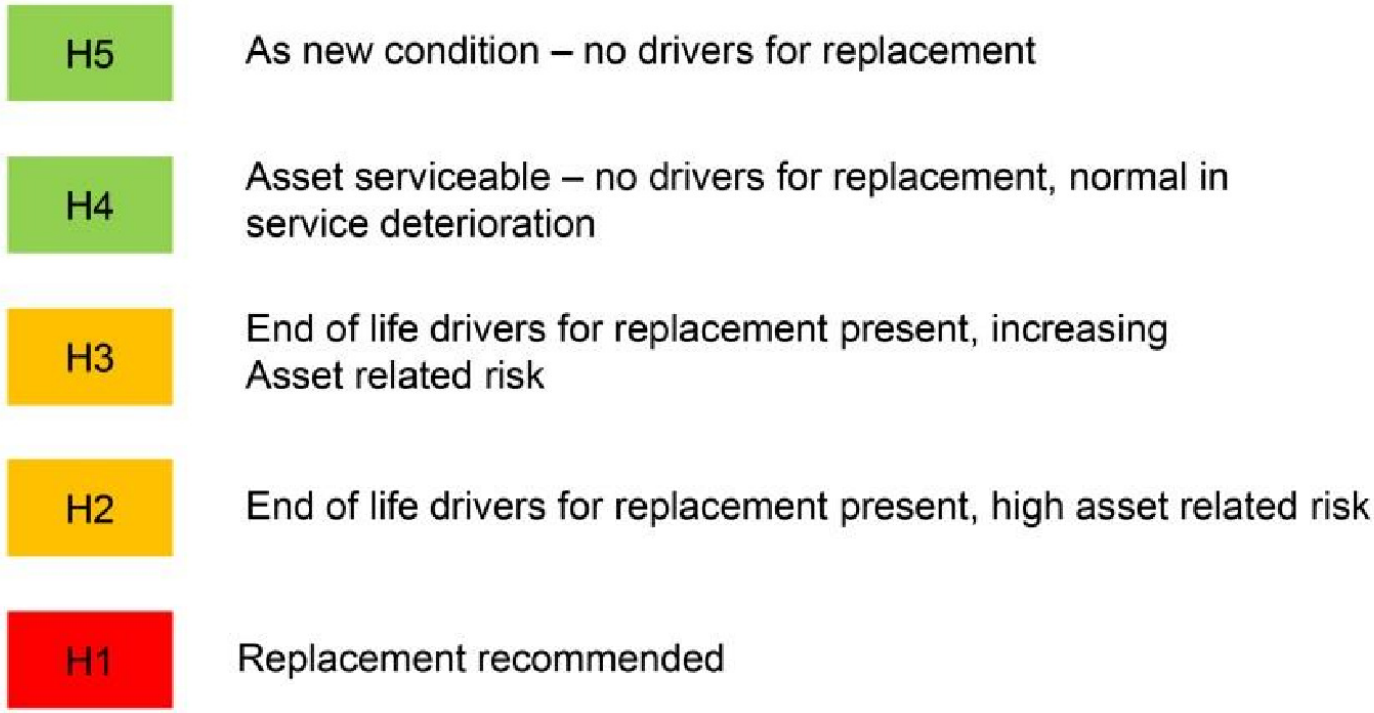

Figure 1: EEA Asset Health Indicator (AHI) Scale

Condition end of life drivers

Table 6: Power transformers – Condition EOL drivers

Condition EOL driver	H5	H4	H3	H2	H1
Paper degree of polymerisation (DP)	>950	950 - 700	700 - 500	500 - 200	<200
Tank external condition	As new condition	Some deterioration of paintwork and/or minor repairable oil leaks. Manageable through normal maintenance	Transformer tank, fins and ancillaries have significant corrosion or damage and/or significant oil leaks. Repairs/refurbishment practicable and cost effective	Transformer tank, fins and ancillaries are corroded or damaged to an advanced extent. Refurbishment is either marginally or not cost effective	Transformer tank, fins and ancillaries are corroded or damaged to an extent where repair or refurbishment is not economic and failure to exclude water or contain oil is likely
Bushing condition	No deterioration detected	Minor deterioration, bushing insulation diagnostics, within normal operating limits	Bushing insulation diagnostics show some deterioration classified as fair and within serviceability limits. Increased surveillance recommended. Bushing housing may have minor chipping or burn damage. No evidence of oil or compound leaks	Bushing insulation diagnostics show some deterioration classified as poor and near serviceability limits. Replacement recommended. Bushing housing may have significant chipping or burn damage and or evidence of oil or compound leaks	Bushing insulation diagnostics outside of serviceability limits indicating high probability of failure. Bushings not recommended to be put back into service. Bushing porcelain may have significant chipping or burn damage and/or evidence of advanced oil or compound leaks
Mechanical integrity of transformer cores, windings, and press frames (susceptibility to through faults)	SFRA traces show no anomalies – no changes in comparison to previous result	No criteria – use H5	No criteria – use H5	SFRA traces indicate possible defect placing transformer at some risk of failure during network fault conditions	SFRA positively indicates a serious defect placing transformer at high risk of failure during network fault conditions

Non condition end of life drivers

Table 7: Power transformers – Non-condition EOL drivers

Non-condition EOL driver	H5	H4	H3	H2	H1
Safety	Design features meet all current requirements for safety.	Design features do not meet all current safety requirements, however no additional operating precautions are required.	Design features do not meet all current safety requirements, but risk may be effectively managed at acceptable cost with operational precautions.	Design features do not meet all current safety requirements and present an elevated safety risk. Hazard management causes significant operational issues and added cost.	Design features don't comply with statutory requirements or represent an intolerable safety hazard that cannot be effectively managed.
Availability of maintenance parts	Spare parts are readily available from the OEM.	Spare parts are readily available from aftermarket sources.	New parts are not readily available but the transformer and accessories can be effectively maintained and repaired through use of second hand, re-manufactured components or retrofit with new OLTC or accessories.	New parts are not available but transformer, OLTC and accessories can be maintained with difficulty through use of second hand and re-manufactured components.	Parts to properly maintain and/or repair the transformer, OLTC and accessories in the event of failure are not available.
Noise	Transformer meets noise regulations.	No criteria – use H5	Transformer does not meet noise regulations but is in a location where noise does not impact on neighbours.	Transformer does not meet noise regulations, rectification is desirable, or may be cost effectively addressed by other means.	Transformer does not meet noise regulations, rectification is mandatory and cannot be cost effectively addressed by other means.

Age based grading where condition data is not available

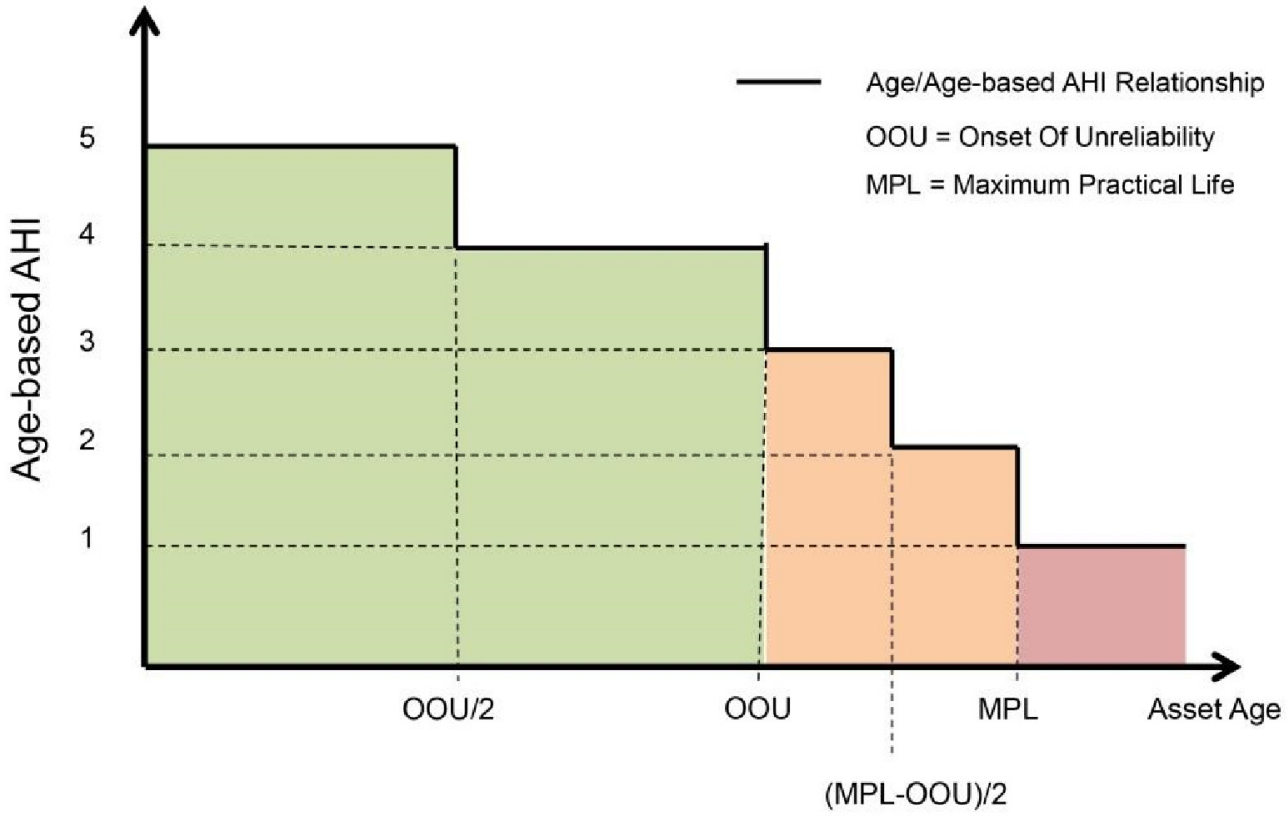

Figure 3: Relationship between age and AHI

Can be used to populate commerce commission grading scheme

Table 5: Relationship between AHI and Commerce Commission condition grading scale

EEA AHI (condition factors only)	Commerce Commission condition grade	Commerce Commission criteria
H1	Grade 1	End of serviceable life, immediate intervention required
H2	Grade 2	Material deterioration but asset condition still within serviceable life parameters, intervention likely within 3 years
H3 and H4	Grade 3	Normal deterioration requiring regular monitoring
H5	Grade 4	Good or as new condition
Not applicable	Grade Unknown	Condition unknown or not yet assessed

Three Questions….

1. Is anyone here actively using the AHI guide? If so can you please share how you are using it and your experience (good/bad)?

2. If you are not using the AHI guide because it does not meet your needs, could you share your thoughts on how it could be improved?

3. What role do you see the AHI guide playing in the future? Does it need to evolve?