# PROCEDURE

# NETWORK ASSET USEFUL LIVES

ELE-999-PR-IN-012

Revision Number: 5
Revision Date: 12/08/2024

## AUTHORISATION

### Reviewed by

| Name | Job Title | Signature | Date |
|---|---|---|---|
| Stephen Henry | Asset Investment Analyst | | |

### Approved by

| Name | Job Title | Signature | Date |
|---|---|---|---|
| David Speairs | Network Investment and Delivery Manager | | |

INTERNAL



Jemena
bringing energy to life

# DOCUMENT HISTORY

| Revision | Date | Author | Description of Changes |
|---|---|---|---|
| 1 | 15/10/2014 | Fatimah Husin | First Issue. |
| 1.1 | 24/08/2015 | Dalibor Balicevic | Document reclassified from Public to Internal. Public classification relates to the regulatory review process only. |
| 2 | 11/10/2018 | Stephen Henry | Update of graphics and useful lives data |
| 3 | 10/11/2021 | Stephen Henry | Template update and minor changes |
| 4 | 09/05/2022 | Stephen Henry | Minor updates |
| 5 | 12/08/2024 | Stephen Henry | Addition of new equipment types into useful lives table |

# OWNING FUNCTIONAL GROUP & DEPARTMENT / TEAM

Asset and Operations : Network Investment and Delivery

# REVIEW DETAILS

| | |
|---|---|
| Review Period: | Review Date + 2 years |
| Next Review Due: | August 2026 |

# TABLE OF CONTENTS

# 1 INTRODUCTION

## 1.1 PURPOSE

This document outlines the historical development of the asset useful lives for the infrastructure assets installed on the Jemena Electricity Network (**JEN**). The asset useful lives are used as inputs for JEN asset management documentation; Asset Class Strategies, the Condition Based Risk Management (**CBRM**) Model and Business Cases. The asset useful lives are also used for accounting purposes.

The asset useful lives are listed on Section 2.4 of this document.

## 1.2 SCOPE

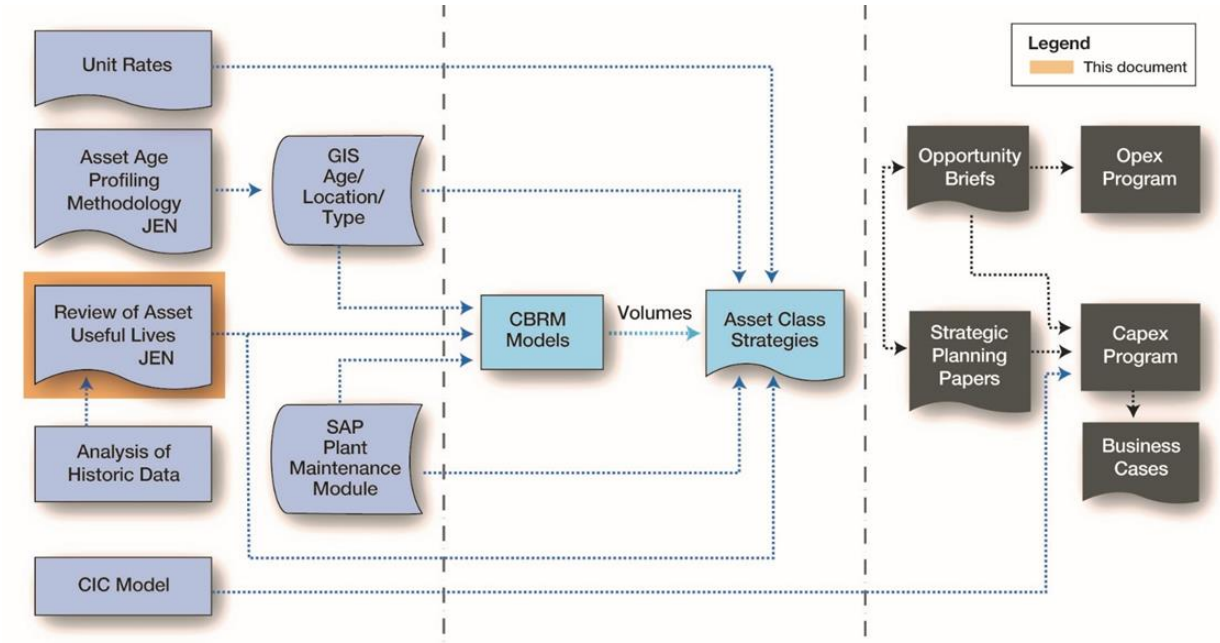
The scope of this document is to list the asset useful lives for the infrastructure assets installed on the Jemena Electricity Network (**JEN**).

# 2 PROCEDURE / PROCESS / DOCUMENT DETAILS

## 2.1 CBRM FRAMEWORK

Figure 1 shows how this document influences the Condition Based Risk Management (**CBRM**) framework. The framework outlines the inputs and analysis tools used to achieve the output documents that lead to the investment programs.

**Figure 1 Condition Based Risk Management (CBRM) Framework**




## 2.2 DEFINITION

### 2.2.1 ASSET USEFUL LIVES DEFINITION

Asset useful lives are an indication of when, on average, the network assets are likely to require replacement. The assignment of asset useful lives is an iterative process and the chosen asset useful lives should be derived from average replacement lives achieved in practice throughout the industry, manufacturer's recommendations, and theoretical technical examination. Asset useful lives will vary from utility to utility and country to country and are not absolute figures, asset lives can, for valid reasons, be changed during the life of the asset.

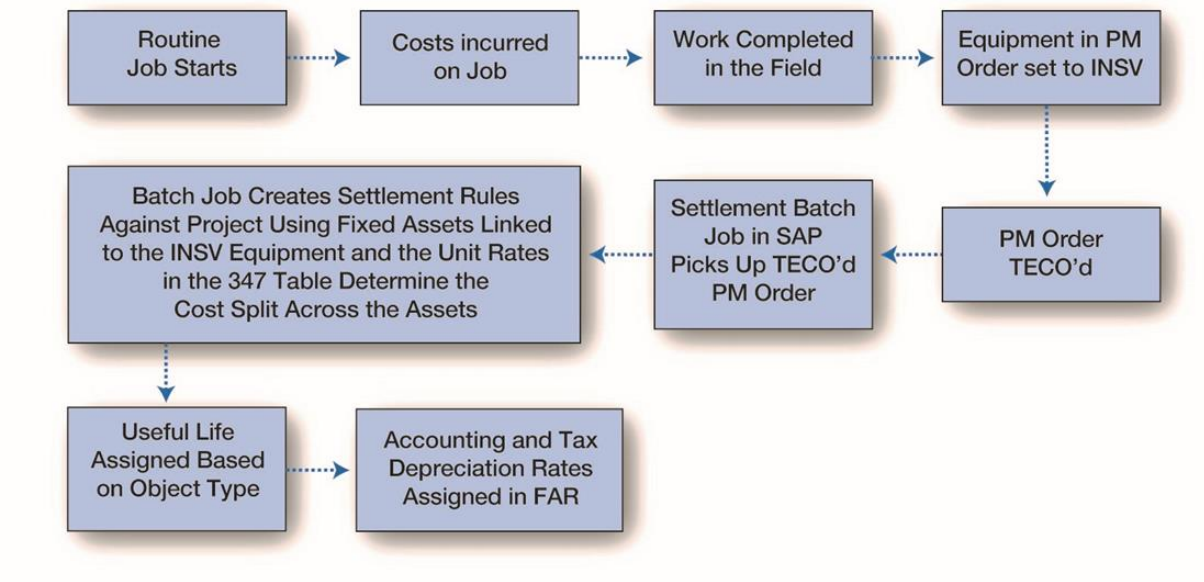
### 2.2.2 ASSET USEFUL LIVES IMPACT ON CURRENT MODEL OUTPUTS (CBRM)

Asset useful lives are assigned to each category of assets in the Condition Based Risk Management (**CBRM**) Model in order to provide a basis for asset replacement. The asset useful life is used as a starting point for forecasting asset replacement requirements and then a number of other factors such as condition of the assets, replacement policies, and risk to the network are incorporated to modify and achieve a more realistic replacement forecast.

The useful lives of network assets also have an impact on the fixed asset register via the 347 table in SAP. The 347 table acts as an interface between the Project System (**PS**) module of SAP and the Fixed Asset Register (**FAR**). Once settlement runs on a TECO'd PM Order, the 347 table determines the cost

split across the assets. Once the cost split is determined, the next step is the assignment of a useful life based on the Object Type selected in the installed equipment in the PM Order. The useful life data in the 347 table then determines the rate of depreciation to be applied to the asset. There are tax and accounting useful lives that cover off depreciation for both accounting and tax purposes. Figure 2 demonstrates this process.

**Figure 2 Application of the 347 Table on a Routine Project in SAP**




## 2.3 HISTORICAL REVIEWS OF ASSET USEFUL LIVES

In November 2001 a preliminary comparative analysis was undertaken of the asset useful lives as prescribed in the AGLE 2001 Electricity Distribution Pricing Review (**EDPR**) Submission, as recommended in a PB Power report and the asset useful lives applied in the SAP accounting books at the time.

This initial analysis led to further investigation and analysis of the asset useful lives in March 2002 and included a review of several reports. These reports were:

- the Agility Asset Management Plan Electricity report (dated 16 May 2001); and
- an extract from the 2001 Electricity Distribution Pricing Review (**EDPR**) Submission.

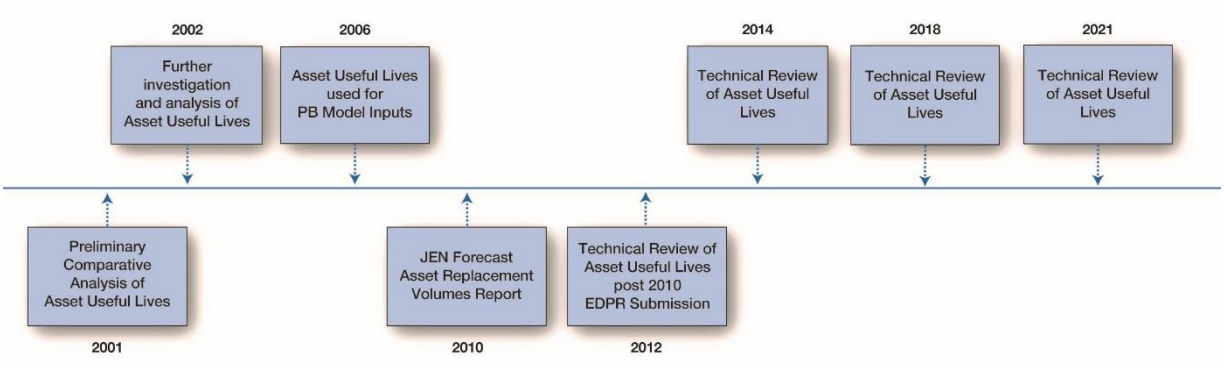
The scope was broadened in April 2002 to include several PB Power reports which detail asset useful lives for AGL:

- 2001 Distribution Price Review. Non Load related Capital Expenditure Report;
- 2001 Electricity Distribution Price Review. Final Analysis of Distributors EDPR 2001 Submissions; and
- A PB Power model showing the weighted average useful lives of assets

In 2006, the same modelling exercise was performed by PB Power. The model used during this analysis had been developed further since the 1999/2000 period.

Asset useful lives were used in the 2009 PB Asset Replacement Model to forecast future asset replacement requirement in EDPR, primarily for high volume, low value assets (such as poles and crossarms). PB provided a report “JEN Forecast Asset Replacement Volumes” in July 2010 that compared the asset useful lives used in the 2004 and 2009 EDPR submissions and concluded that the lives used were appropriate.

**Figure 3 Asset Useful Lives Process Timeline**




In 2012, a technical review of the asset useful lives was undertaken with reference to the condition, technological changes and performance of the assets. Subsequent reviews were undertaken in 2014, 2018 and 2021.

Jemena's Asset and Operations Electricity team undertook this review and recommended changes to the useful lives of the network assets. The asset useful lives are based on good industry practice and the specific Jemena experiences, and represent the lives of assets at which end-of-life replacement will be considered. For good industry practice, Jemena has referenced a number of reviews of asset useful lives: GHD review in May 2007 and PB review (as part of 2011-15 EDPR preparation) in July 2010 as well as discussions with AusNet Services in 2012.

In actual engineering practice, assets are replaced either (1) when their condition deteriorates to the extent requiring replacement; (2) after the asset has actually failed, or (3) replaced for other purposes such as third party work or reinforcement. The "actual replacement lives" can therefore vary considerably, and are best described in statistical terms (such as mean replacement lives and standard deviations). However, these statistic terms are only valid when there is a large population of such assets near the end of their lives. Jemena's Asset and Operations Electricity team allocates "asset useful lives" based on good industry practice and other relevant experiences. Assets are not replaced when they reach their "asset useful life". Rather the "asset useful lives" are used to trigger more intensive condition monitoring programs so that assets are replaced just prior to failure.

The legacy SAP system (ex-Agility) was configured to create assets at an aggregate level within asset classes. Asset useful lives were applied at the asset class level. For example, the asset class "High Voltage Poles and Pole tops" (**HVPP**) contained an aggregation of all types of HV poles and pole tops with a common useful life.

JSAP (Jemena SAP) was configured to record asset transactions at a more granular level. Project Completion Forms (**PCF**) for non-routine projects are used to support the master data creation. Routine projects continue to follow the aggregation process but are created at a more granular level, compared to the ex-Agility SAP e.g. pole tops are segregated from poles.

The granularity of assets to be recorded in the Fixed Asset Register (**FAR**) for non-routine projects is derived from the Electricity Industry Guideline No.14 relating to Provision of Services by Electricity Distributors and suitably modified in agreement with the engineers.

## 2.4 SUMMARY OF ASSET USEFUL LIVES

The following table compares the asset useful lives that have been used historically, extracted from various sources.

| SAP Asset Class | Asset Description | Current Useful life | Useful life per SAP (Ex-Agility)[1] | Historical Engineers Assessments[2] |
|---|---|---|---|---|
| | **Sub-transmission Poles and Pole Tops** | | 45-60 | 60 |
| 5005 | Sub-trans Poles (Wooden) | 54 | | |
| 5005 | Sub-trans Poles (Wooden Staked) | 80 | | |
| 5005 | Sub-trans Poles (Steel Towers) | 70 | | |
| 5005 | Sub-trans Poles (Concrete) | 70 | | |
| 5005 | Sub-trans Pole Tops (Wooden) | 45 | | |
| 5005 | Sub-trans Pole Tops (Steel) | 70 | | |
| | **HV Poles and Pole Tops** | | 45-60 | 50 |
| 5005 | HV Poles (Wooden) | 54 | | |
| 5005 | HV Poles (Wooden staked) | 80 | | |
| 5005 | HV Poles (Concrete) | 70 | | |
| 5005 | HV Poles (Steel) | 30 | | |
| 5005 | HV Pole Tops (Wooden) | 45 | | |
| 5005 | HV Pole Tops (Steel) | 70 | | |
| 5005 | HV Pole Tops (Steel) | 70 | | |
| 5005 | Insulator (set) | 30 | | |
| | **LV Poles and Pole Tops** | | 45-60 | 45 |
| 5005 | LV Poles (Wooden) | 54 | | |
| 5005 | LV Poles (Wooden Staked) | 80 | | |
| 5005 | LV Poles (Concrete) | 70 | | |
| 5005 | LV Poles (Steel) | 35 | | |
| 5005 | LV Pole Tops (Wooden) | 45 | | |
| | **Sub-transmission U/G Cable** | | 45 | 70 |
| 5009 | Sub-trans U/G Cable (Oil) | 70 | | |
| 5009 | Sub-trans U/G Cable (XLPE) | 40 | | |
| | **HV U/G Cable** | | 45 | 45 |
| 5034 | HV U/G Cable (XLPE) | 40 | | |
| 5034 | HV U/G Cable (Paper) | 70 | | |
| | **LV U/G Cable** | | 45 | 60 |

1 Refer to Energy Networks Asset Report – Review of Useful Lives (2002)
2 Refer to Energy Networks Asset Report – Review of Useful Lives (2002)

| SAP Asset Class | Asset Description | Current Useful life | Useful life per SAP (Ex-Agility)[1] | Historical Engineers Assessments[2] |
|---|---|---|---|---|
| 5044 | LV U/G Cable XLPE | 55 | | |
| 5044 | LV U/G Cable Paper | 70 | | |
| | **O/H Conductor** | | | |
| 5004 | Sub-transmission O/H Conductor | 65 | 45 | 60 |
| 5004 | Overhead Spreader | 65 | | |
| 5031 | HV O/H Conductor | 60 | 45 | 60 |
| 5031 | Vibration Damper | 60 | | |
| 5041 | LV O/H Conductor | 60 | 45 | 60 |
| | **Services** | | 40 | 40 |
| 5060 | Services (above ground) | 40 | | |
| 5061 | Services (underground) | 50 | | |
| 5043 | Distribution Box | 40 | | |
| 5043 | Distribution Surge Diverter | 40 | | |
| 5043 | Pillars | 50 | | 30 |
| 5043 | Pits | 40 | | 40 |
| | **Transformers** | | | |
| 5008 | Sub-transmission Transformers | 60 | 45 | 50 |
| 5020 | Active Voltage Controller | 15 | | |
| 5020 | Battery Energy Storage System (**BESS**) | 15 | | |
| 5020 | Capacitive Balancing Unit (**CBU**) | 15 | | |
| 5020 | CBU Control Box | 15 | | |
| 5020 | MPLS Chassis | 10 | | |
| 5020 | MPLS Card | 10 | | |
| 5020 | Operational Phone Network – OTN/ETN | 20 | | |
| 5020 | Operational Phone Network – Fixed Line | 10 | | |
| 5020 | Phase Switching Device | 15 | | |
| 5020 | Power Compensation Device | 15 | | |
| 5020 | Power Conversion System | 15 | | |
| 5020 | Timing Repeater | 10 | | |
| 5021 | Distribution Transformers | 50 | 40 | 45 |
| | **Switchgear** | | | |
| 5007 | Sub-transmission Switchyard Equipment | 50 | 45 | 60 |
| 5007 | Zone Substation Indoor CB | 50 | | |
| 5007 | Zone Substation Outdoor CB | 50 | | |
| 5033 | HV Switchgear and Protection | 50 | 15 | 35 |

| SAP Asset Class | Asset Description | Current Useful life | Useful life per SAP (Ex-Agility)[1] | Historical Engineers Assessments[2] |
|---|---|---|---|---|
| 5033 | Fault Indicator | 40 | | |
| 5033 | Zone Substation Surge Diverter | 50 | | |
| 5043 | LV Switchgear | 50 | 15 | 30 |
| | **Public Lighting** | | | |
| 5050 | Public Lighting Poles | 35 | 45 | 45 |
| 5050 | Sustainable Public Lighting Poles | 35 | | |
| 5080 | Street Lights[3] | 20 | 20 | 20 |
| 5080 | Security Beams | 30 | | |
| | **SCADA Network & Monitoring System** | | | |
| 5001 | Sub-transmission Control & Monitoring Equipment | 20 | 10 | 45 |
| 5002 | Sub-transmission Meters/Time switches | 15 | 25 | 20 |
| 5030 | HV Meters/Time switches | 15 | 25 | 20 |
| 5030 | LV Meters/Time switches | 15 | 25 | 40 |
| 5010 | Supervisory Cable | 50 | | |
| 5010 | Communication Equipment | 20 | | |
| 5020 | Distribution Control and Monitoring Equipment | 20 | 10 | 15 |
| 5001 | Relay (Electronic/Digital) | 20 | | |
| 5001 | Relay (Electro-mechanical) | 40 | | |
| 5020 | Radio Equipment | 15 | | |
| 5030 | Smart meters | 15 | 25 | 20 |
| 5001 | Zone Substation RTU | 20 | | |
| | **Zone Substation** | | | |
| 2500 | Zone Substation Engineering Workstation | 10 | | |
| 2500 | Zone Substation HMI Monitor | 4 | | |
| 5006 | Sub-transmission Reactive Plant | 40 | 45 | 45 |
| 1013 | Zone Substation Station Building | 70 | 50 | |
| 5007 | Zone Substation Outdoor Buses | 50 | | |
| 5008 | Zone Substation CT | 50 | | |
| 5008 | Zone Substation VT | 50 | | |
| 5006 | Natural Earthing Resistor | 40 | | |
| 5003 | Earth grid conductors | 70 | | |

[3] Street Lights with 20-years asset lives are applicable for new lights such as T5 and LED. For conventional street lights like MV80, the asset lives would be longer up to 30 years.

| SAP Asset Class | Asset Description | Current Useful life | Useful life per SAP (Ex-Agility)[1] | Historical Engineers Assessments[2] |
|---|---|---|---|---|
| 8000 | Air Conditioner | 5 | | |
| 8000 | Generator | 10 | | |
| 8000 | Pump | 5 | | |
| 8000 | Winch | 50 | | |
| 8000 | Oil Separation Pit | 50 | | |
| 8000 | Lifting equipment | 50 | | |

## 2.5 PROCESS TO DETERMINE ASSET USEFUL LIVES

This document defines the asset useful lives that are currently used by Jemena. In 2014, Jemena has undertaken an extensive review of the quality of the asset technical data (GIS asset data and SAP technical object data) in relation to the asset installation date. This has enabled the re-assessment of asset useful lives using installation dates with improved accuracy.

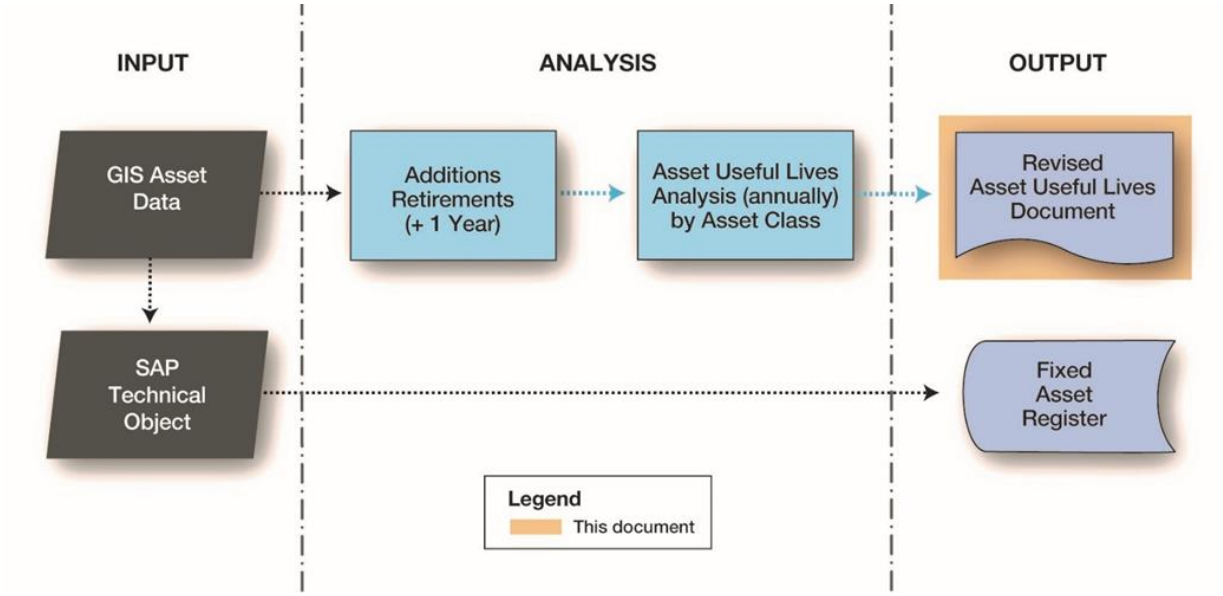
When the extensive review mentioned above was completed, all assets in GIS and SAP have been assigned with either installed date or estimated installed date and also removed date.

For the annual RIN C submission, where it is required to record economic life of an asset (mean and standard deviation) in the Age Profile template, the following inputs are required in order to calculate average age of asset useful lives for each asset category in the network:

- Asset installation date/estimated installed date
- Removed date
- A sample size large enough to make the calculation of Standard Deviation meaningful.

The calculated average asset age is the input of asset useful lives of this document. The Age Profile RIN is prepared annually and is a part of the RIN known as RIN C (Regulatory Information Notice for Category Analysis).

**Figure 4 Process to Determine Asset Useful Lives**




# 3 REFERENCES

## 3.1 INTERNAL

JEN Forecast Asset Replacement Volumes". PB Power. 1 July 2010

Useful Life Review – JEN Network Assets. Jemena. 10 November 2013

ELE GU 0005 Condition Based Risk Management (CBRM) Guideline

ELE PR 0011 Asset Age Profiling Methodology. 24 November 2014

## 3.2 EXTERNAL

2001 Distribution Price Review. Non Load related Capital Expenditure Report.

2001 Electricity Distribution Price Review. Final analysis of Distributors EDPR 2001 Submissions

2006 EDPR Replacement Capital Expenditure Modelling. PB Power. 26 November 2004

Energy Networks Asset Reports – Review of Useful Lives. Agility. 22 October 2002

Category Analysis Regulatory Information Notice. 9 December 2020

# 4 APPENDICES

## 4.1 APPENDIX A – EDPR ASSET LIVES COMPARISON

**Standard Asset Lives**

| Asset Lives for Materials | | EDPR11 | EDPR16 | EDPR21 |
|---|---|---|---|---|
| Wooden Pole | *Years* | 60 | 54 | 54 |
| Concrete Pole | *Years* | 80 | 70 | 70 |
| Steel Pole – HV | *Years* | 40 | 40 | 40 |
| Steel Pole - LV | *Years* | 30 | 35 | 35 |
| Steel Cross Arms (incl. Insulators) | *Years* | 70 | 70 | 70 |
| Wood Cross Arms (incl. Insulators) | *Years* | 70 | 45 | 45 |
| Bare Conductors (Al) | *Years* | 60 | 60 | 60 |
| Insulated Conductors - HV | *Years* | 35 | - | - |
| Insulated Conductors - LV | *Years* | 50 | 60 | 60 |
| Bare conductors (steel) | *Years* | 50 | 50 | 50 |
| Underground Cables and Cable head - HV, XLPE | *Years* | 40 | 40 | 40 |
| Underground Cables and Cable head - LV, XLPE | *Years* | 60 | 55 | 55 |
| Supervisory Cable - Fibre Optic | *Years* | 40 | 50 | 50 |
| Capacitor Banks | *Years* | 40 | 40 | 40 |
| Power Transformers - Zone Substation | *Years* | 55 | 55 | 55 |
| Power Transformers - Distribution | *Years* | 50 | 50 | 50 |
| NER | *Years* | 40 | 40 | 40 |
| Circuit Breakers - Indoor | *Years* | 50 | 50 | 50 |
| Circuit Breakers - Outdoor | *Years* | 45 | 50 | 50 |
| Zone Substation Batteries | *Years* | 15 | 15 | 15 |
| Zone Substation Battery Chargers | *Years* | 20 | 20 | 20 |
| Zone Substation Building | *Years* | 50 | 70 | 70 |
| HV Disconnectors / Isolators | *Years* | 55 | 40 | 40 |
| LV Disconnectors / Isolators | *Years* | 35 | 40 | 40 |
| Reclosers / Gas Switches | *Years* | 35 | 40 | 40 |
| Surge Diverters | *Years* | 25 | 25 | 25 |
| Fault Indicators | *Years* | 15 | 15 | 15 |
| Pillars / Pits | *Years* | 35 | 35 | 35 |
| Services (above-ground) | *Years* | 40 | 40 | 40 |
| Services (under-ground) | *Years* | 50 | 50 | 50 |
| Public lighting | *Years* | 20 | 20 | 20 |
| Relays - Digital / Microprocessor | *Years* | 20 | 20 | 20 |
| Relays - Electro-Mechanical | *Years* | 40 | 40 | 40 |
| SCADA - RTU | *Years* | 20 | 20 | 20 |
| Fence | *Years* | 50 | 50 | 50 |
| Ring Main Unit | *Years* | 35 | 35 | 35 |

On each regulatory submission, JEN submits various asset lives for assets listed in the table above for its tax and regulatory depreciation purposes. Variances could be found between the two regulatory periods for some asset lives. The variances could be shorter, longer or zero.

From EDPR 2011 to EDPR 2016, JEN has improved its asset data stored in its Works Management (**SAP**) and Geographical Information (**GIS**) systems significantly. For instance, all assets recorded in GIS and SAP now have installed date and estimated installed date. It is also now mandatory for all assets that are removed from the field to have a removed date recorded in GIS and SAP. This will facilitate improved analysis of an asset's useful life.

The adjustments to the useful lives shown in the table above are based on different reasons and justifications:

- The asset lives for the high volume asset classes such as wooden poles, concrete poles and wooden cross-arms (incl. insulators) have reduced for EDPR 2016. JEN was able to more accurately calculate the useful asset lives for these assets as a result of improved data quality relating to installation and removal dates.
- For insulated conductor – The useful asset life of HV insulated conductor is now zero due to the fact that JEN no longer installs HV ABC on its network.
- There are classifications of assets that JEN considers to be recent introductions to the network: insulated conductors – LV, supervisory cable – fibre optic, LV disconnectors / isolators, reclosers and gas switches. As JEN moves to the new regulatory period, JEN now has further experience in understanding the performance of these assets. These asset classes now have longer asset lives in EDPR 2016 compared to EDPR 2011.
- For underground cables and cable head – LV, XLPE; JEN has developed a documented failure history for LV underground cable in the network. This has enabled JEN to re-assess the asset life for LV underground cable and reduce the useful life for this asset class.
- For low volume asset classes such as outdoor circuit breakers JEN has a good understanding of the individual assets (due to the low volume) and therefore JEN has been able to accurately analyse the useful asset lives. Based on comprehensive maintenance records, assets such as outdoor circuit breakers outdoor now have a longer asset life than what was reported in EDPR 2011.
- Another low volume asset class, zone substation buildings have an increased asset life for EDPR 2016 compared with EDPR 2011. Better building designs and materials have extended the useful life.
- For specific asset such as HV disconnectors / isolator, initially JEN reported the asset life to be 55 years in EDPR 2011. However the useful life has been reduced to 40 years in EDPR 2016 due to issues identified regarding the performance of those assets.
- For steel pole – LV; JEN has decided to change the asset life from 30 years to 35 years in EDPR 2016 in order to be aligned with AER’s public lighting model.