

Update: End-of-Life Program

Addressing Aging Infrastructure

End-of-Life Criteria

“End of Life” is defined as the point at which infrastructure is at risk of failure, and continued maintenance and/or refurbishment of the infrastructure is no longer a valid option to extend the life of the facilities.

End-of-Life Facilities

Lines with following equipment currently targeted for End-of-Life:

500kV COR-TEN® Structures

230kV COR-TEN® Structures

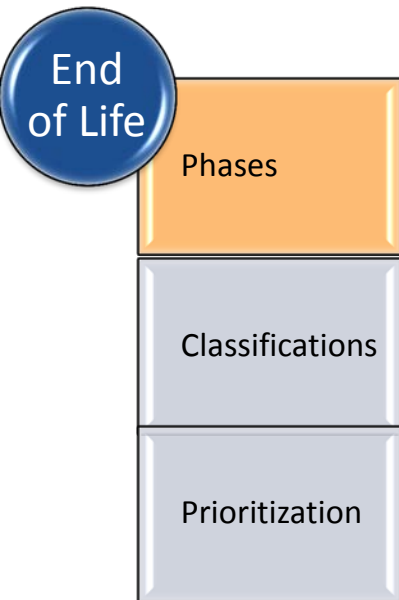
115kV COR-TEN® Structures

Wood Structures

3/8" Steel static wires

Fiber older than 30 years

Phases & Project Classifications

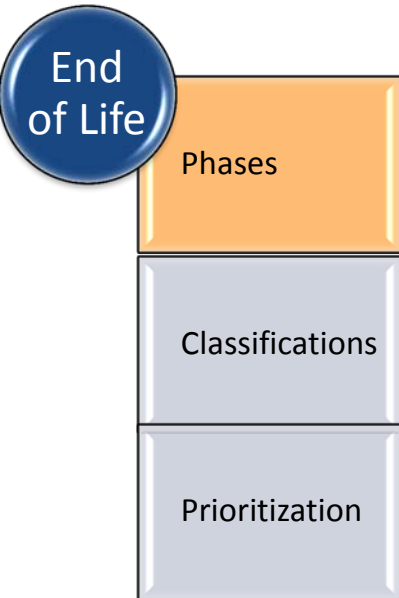


Phases represent End-of-Life facilities grouped by common facility type:

Phase	Phase Description
Phase 1	Original 500 kV “F series” COR-TEN® lattice tower (1960s)
Phase 2	115 kV wood pole structures and 3/8” steel static & 115kV COR-TEN®
Phase 3	Additional 115 kV and 230 kV wood pole structures and 3/8” steel static
Phase 4	230 kV “V&X series” COR-TEN® lattice towers (1960s)
Phase 5	500 kV “5 series” COR-TEN® lattice towers (1960s – 1980s)
Phase 6	230 kV “N series” COR-TEN® lattice towers (1960s – 1980s)
Phase 7	Driven by conditional assessments

Phases & Project Classifications

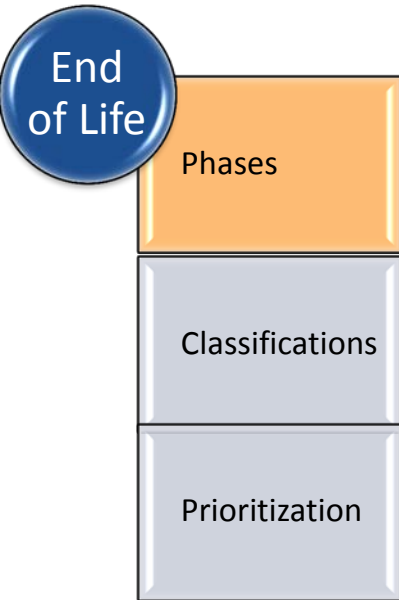
All of **Phase 2** facilities and most of the **Phase 1** facilities have been approved and are scheduled for construction



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Phase 1	Original 500 kV "F series" COR-TEN® lattice tower (1960s)
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Phase 3	Additional 115 kV and 230 kV wood pole structures and 3/8" steel static
Phase 4	230 kV "V&X series" COR-TEN® lattice towers (1960s)
Phase 5	500 kV "5 series" COR-TEN® lattice towers (1960s – 1980s)
Phase 6	230 kV "N series" COR-TEN® lattice towers (1960s – 1980s)
Phase 7	Driven by conditional assessments

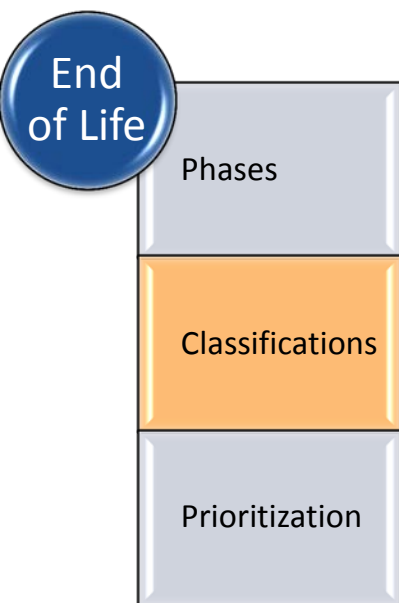
Phases & Project Classifications

The **Phase 3** and **Phase 4** facilities are currently under review. We are working to prioritize, plan construction target dates, and have line operations management validate proposals.



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Phase 7	Driven by conditional assessments

Phases & Project Classifications



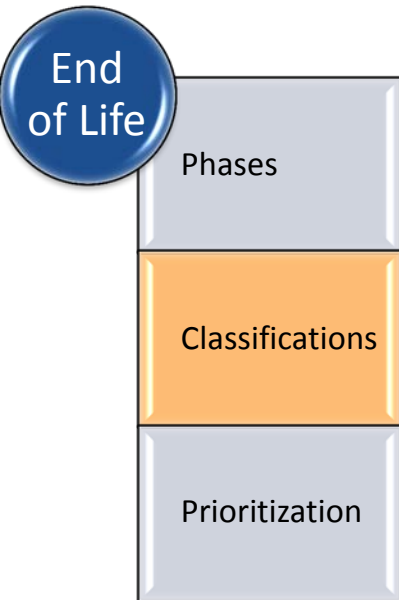
End-of-Life facilities are then **classified** according to the expected end-of-life time frame:

*Project Classification	Description
Immediate Need [<3yrs]	Lines that are at their end of life now or within 3 years
Short Term [3-5yrs]	Lines expected to reach their end of life in the 3 to 5 years horizon
Long Term [5-10 yrs]	Lines expected to reach their end of life in the 5 to 10 year horizon
Long Term [>10 yrs]	Lines expected to reach their End of Life beyond the 10 year horizon

***Note:** These do not represent construction target dates. These are estimates of when the facilities will reach their end-of-life.

Phases & Project Classifications

The following are example considerations when **prioritizing** the projects:



- Verify facility meets the End-of-Life criteria
 - *Facility is nearing, or has already passed, its end of life, and*
 - *Continued operation risks negatively impacting reliability of the transmission system*
- Customer importance line ranking
- Existing condition of lines – open work orders for pole replacements
- Condition assessment of lines validated between line operation manager regions
- Location of facilities for addressing emergency repairs if required
- Third party assessment for COR-TEN®

Phases & Project Classifications

Summary Table

Phase	Phase Description	*Project Classification	Expected End-of-Life
Phase 1	Original 500 kV “F series” COR-TEN® lattice tower (1960s)	Immediate Need	At their end of life now or within 3 years
Phase 2	115 kV wood pole structures and 3/8” steel static & 115kV COR-TEN®	Immediate Need	At their end of life now or within 3 years
Phase 3	Additional 115 kV and 230 kV wood pole structures and 3/8” steel static	Short Term	Expected to reach their end of life in the 3 to 5 years horizon
Phase 4	230 kV “V&X series” COR-TEN® lattice towers (1960s)	Short Term	Expected to reach their end of life in the 3 to 5 years horizon
Phase 5	500 kV “5 series” COR-TEN® lattice towers (1960s – 1980s)	Long Term [5-10]	Lines expected to reach their end of life beyond the 10 year horizon
Phase 6	230 kV “N series” COR-TEN® lattice towers (1960s – 1980s)	Long Term [>10]	Lines expected to reach their end of life beyond the 10 year horizon
Phase 7	Driven by conditional assessments	Short Term & Long Term [5-10]	Expected to reach their end of life in the 3 to 5 years horizon & beyond the 10 year horizon

*Note: These do not represent construction target dates. These are estimates of when the facilities will reach their end-of-life.