Asset Condition Process Guide - Update

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Overview

- The New England Transmission Owners (TOs) published the draft Asset Condition Process Guide on April 25, 2024
- Stakeholder comments were received on June 5, 2024
- On August 15, 2024, TOs published responses to stakeholder comments including identification of several areas where the TOs planned to make changes to the Guide
- Today's presentation covers the changes to the Guide
  - An updated Guide has been posted with the materials for today's meeting, including both clean and redlined versions
- TOs will also provide an update on next steps

Summary of Major Updates

- The following slides with redlines show the major changes made to the Asset Condition Process Guide as a result of feedback from stakeholders
- Major revisions/additions include:
  - Introduction of the “Base Alternative” as a minimum solution which addresses the identified asset condition problem
  - Addition of appendices containing details of the stakeholder review process for asset condition projects and uniform grading categories for transmission line structures
  - Additional of information regarding the decision-making process
- This presentation provides an overview of the major revisions and additions
  - See appendix for details on other minor updates in response to stakeholder feedback and additional NETO review

Updates – Executive Summary

- Revised to clarify that the guide was developed by the six larger Transmission Owners and is not intended to cover the processes used by smaller Participating Transmission Owners

> Committee (RC). This Guide is not intended to describe the processes used by the many smaller PTF owners across New England, which include municipal utilities and lighting plants, electric cooperatives, and smaller investor-owned utilities.

- Added cross-reference to appendix containing info on stakeholder presentations

> Appendix D provides additional details on the stakeholder transparency and review processes for asset condition projects, including the timing of presentations to the ISO-NE Planning Advisory Committee (PAC).

Updates – Section 2

- **Section 2.1.3**
  - Added language to acknowledge existence of legacy clauses in many codes and standards

2.1.3 Design

The Transmission Owners maintain and operate transmission systems comprised of facilities that vary significantly in age, with some installed 100 years ago. Transmission assets are designed and put in service based on industry and Transmission Owner standards and practices at the time of design and installation. However, transmission system design, common industry practice, and company practices have necessarily evolved over time~~.~~ and many standards and codes include legacy clauses. Full compliance with current versions of some standards and codes is typically required only during a major modification or replacement of a facility or component of a facility, though the specific requirements vary by standard or code. Each Transmission Owner must also remain in compliance with current NERC standards and regional standards set by NPCC and ISO-NE. ~~Each Transmission Owner must remain in compliance with current NERC standards and regional standards set by NPCC and ISO-NE. Assets also must be monitored to verify compliance with applicable safety codes.~~

Updates – Section 2

- **Section 2.9**
  - Clarified that initial scoping is focused on near-term asset condition needs
  - Added confirmation that an asset condition project will not be pursued if an issue can be resolved with minor maintenance or repairs

2.9 Initial Evaluation Results~~: Determination to Proceed to Initial Scoping~~

Based on the evaluation of the asset monitoring results and the various other factors described in this section, the Transmission Owner determines whether the identified asset condition issues warrant further examination to refine potential risks and to establish an initial scope for a potential asset condition project~~.~~ that needs to be developed in the near-term.

If, based on additional information developed as part on the decision-making process, it becomes clear that an asset condition project is not necessary and the identified asset condition issues can be resolved through other means such as minor maintenance, then the Transmission Owner will proceed with the maintenance in lieu of a larger asset condition project~~Transmission Owner will not proceed with the project~~.

Updates – Section 3

- **Section Overview and Section 3.1**
  - Added definition of Base Alternative
  - Clarified that initial scoping will always include a Base Alternative

Overview

The purpose of the initial scoping phase is to integrate the information collected during the asset monitoring phase (Section 1) and the ~~need~~needs identified in the initial evaluation (Section 2) to develop ~~an~~ initial solution ~~concept.~~concepts which will include a solution "Base Alternative" that addresses known asset condition needs in the most targeted manner possible, and potentially additional solutions that could potentially address the immediate and future needs more efficiently. The initial solution ~~concept allows~~concepts allow a preliminary project budget and schedule to be established to support additional design and evaluation during the Holistic ~~Scoping~~Evaluation step (Section 4). Once a project budget is established, the Transmission Owner will track the costs associated with the project and utilize internal controls to ensure that project costs are managed within the established budget.

schedule and budget based on the *likely* final solution. ~~Additional~~The Base Alternative will always be considered and presented both to the Transmission Owner's management and to the PAC, but consideration of additional factors ~~that~~ may lead to a different solution ultimately being selected as the preferred solution ~~are evaluated~~ during the Holistic Evaluation phase. The following summarize the

Updates – Section 3 (Cont'd)

- **Section Overview**
  - Added additional explanation of how internal budgets are managed to control costs, particularly on more complex projects

> For many projects, the preliminary project budget is sufficient to support the completion of initial scoping and holistic evaluation, leading to the recommendation of a preferred solution alternative. However, more complex projects may require higher development budgets to complete the holistic evaluation phase. For these projects, additional interim milestones and budget approvals may be used to manage project development costs. For example, a project that is expected to incur $2 million in development costs could be approved with an initial budget of $500,000 and subject to periodic review in order to obtain increased funding. These interim milestones and thresholds for periodic review are established on a case-by-case basis.

Updates – Section 3 (Cont'd)

Section 3.2

- Added information regarding internal review

3.2 Transmission Owner Internal Review

Depending on the expected complexity and cost of further developing the design for a project, key Transmission Owner management may be tasked to review the asset condition project at this initial stage. For example, the level of design necessary to complete the assessment of a potential full rebuild of a transmission line is more complex than the level of design needed for simply replacing transmission line structures, and may require additional levels of management review. This process ensures that a full range of appropriate factors, including cost effectiveness and system reliability, are considered when determining the need for an asset condition project.

Updates – Section 4

- **Section Overview**
  - Added additional description of the decision-making process for evaluating alternative solutions

Prior Version:

In the Holistic Evaluation stage, an asset condition project has received initial funding for development of a preferred solution and alternatives based on the asset condition need(s) identified in the Initial Evaluation (Section 2) and the preliminary solution developed during Initial Scoping (Section 3). This initial funding provides a budget for the project team to conduct an in-depth assessment of the potential asset condition project, examining various facets of the situation in order to identify and develop additional details regarding preferred and alternative solutions. These alternatives will typically be presented to a leadership team for selection and approval and, ultimately, leading to approval of a full budget and cost estimate for the project (refer to Section 5). This information will also allow for a comprehensive presentation of the project to stakeholders and states at the ISO-NE PAC for feedback.

Updated Version:

The Holistic Evaluation stage is the point in the planning process wherein preliminary solutions identified during initial scoping are subject to the comparative analyses described in this section. The goal of the Holistic Evaluation is simple: to identify preliminary preferred and alternative solutions that satisfy the identified asset condition needs, and potentially other identified or anticipated needs, most efficiently and cost-effectively. The process, however, is not simple as there are a variety of factors that must be considered that will vary by project. While sequentially this stage is shown as occurring in between Initial Scoping and Project Selection, some of the analysis used in the holistic evaluation is conducted during Initial Scoping as part of the initial identification of potential solutions.

The alternatives developed during the Holistic Evaluation will be presented to a Transmission Owner leadership team for selection and approval of a full budget and cost estimate for the project. This information will also allow for a comprehensive presentation of the proposed solution and alternatives to stakeholders and states at the ISO-NE PAC for feedback.

For readability, these changes are presented in a before-and-after format. Redlines are shown in the "Asset Condition Process Guide (redline)" file which is posted with the meeting materials

Updates – Section 4 (Cont'd)

- **Section 4.1**
  - Incorporated Base Alternative terminology
  - Added additional detail on the decision-making process

4.1 Approach to Holistic Evaluation

The holistic evaluation is an in-depth analysis that includes review of both qualitative and quantitative information, typically for multiple solution alternatives. ~~In most cases the~~ The holistic evaluation will consider a ~~solution alternative~~Base Alternative identified during initial scoping that addresses ~~known~~only the immediate asset condition needs in the most targeted manner possible, ~~as well as a~~and in most cases will also consider more comprehensive solution ~~alternative~~alternatives that ~~addresses~~address additional less-immediate known issues and ~~potential~~anticipated future ~~asset condition~~ needs in an efficient and cost-effective manner.

The goal of the holistic evaluation is to ~~determine which~~identify the most efficient and cost-effective solution that considers not only the immediate needs ~~will be addressed by an asset condition project, if~~, but also opportunities to address other needs when practical and ~~when~~ feasible~~, while also considering an asset's needs over its life span~~. The overarching objective is to minimize adverse effects on the system, environment, customers, and communities while maintaining cost-effectiveness. Qualitative and/or quantitative evaluations, including cost-benefit analysis, may be performed to assess multiple viable, cost-effective alternatives, including as required by regulatory processes. This process is necessarily iterative as there may be criteria for selection of the preferred alternative that conflict~~.~~ with each other. For example, the initial capital cost for a solution is a critical criterion for decision-making, but the solution with the lowest up front capital cost may be disadvantageous from a constructability or environmental perspective or may fail to take advantage of a broader scope that has a lower long-run lifecycle cost for customers.

Updates – Section 4 (Cont'd)

- **Section 4.1**
  - Clarified conditions under which only a Base Alternative would be considered

> Under some situations, the factors considered during the Holistic Evaluation phase may be simplified. For example, an asset condition issue that poses a significant risk to the public and/or to the reliability of the transmission system (e.g., an overhead transmission structure destabilized by third-party damage; failure of key equipment at a substation) will require a pro-active and immediate solution. Similarly, for some projects, typically those ~~that involve~~where the Base Alternative involves a straightforward direct replacement of a particular transmission component, ~~only~~ a single cost-effective solution may be ~~viable.~~ optimal if there is no larger alternative that is anticipated to have a lower life-cycle cost, better performance, or otherwise address a combination of asset condition needs in a more cost-effective manner. In such a case, an extensive comparative analysis of solution alternatives is unnecessary and a solution can be selected simply on the basis of viability and lowest overall cost.

Updates – Section 4 (Cont'd)

- **Section 4.3**
  - Expanded description of how the factors in Table 4-1 are used in the decision-making process

4.3 ~~Factors~~Key Evaluation Criteria and Other Criteria Considered

In performing the holistic evaluation of a potential asset condition project, the Transmission Owners consider ~~key distinguishing factors, ranging from lifecycle cost and asset health assessments to regulatory requirements. In addition, a variety of other factors are considered during the holistic evaluation of solutions for an asset condition issue. Table 4-1 provides a summary of the types of factors generally considered in the evaluation of alternative solutions; however, these factors will vary depending on the type and location of the asset condition issue. For example, the holistic evaluation of an asset condition issue involving the replacement of a 60-year-old transformer within an existing substation yard would typically not require the same type of detailed environmental and cultural resource analyses that would be involved in an examination of solutions for replacing legacy transmission structures along a 10-mile-long ROW characterized by wetlands, streams, and providing habitat for threatened and endangered species.~~a variety of criteria in determining the preferred alternative solution. These criteria are summarized in Table 4-1. This table distinguishes between "Key Evaluation Criteria," which commonly show distinctions between solution alternatives for typical asset condition projects and "Other Evaluation Criteria," which are also evaluated for asset condition projects when necessary but less frequently show distinction between solution alternatives.

Updates – Section 4 (Cont'd)

- **Section 4.3, Table 4-1**
  - Consolidated "Government and community goals" into "community goals" for clarity
  - Revised description of community concerns and provided additional information on how costs associated with project modifications are reviewed for potential localization

~~Governmental and community goals or concerns~~	• ~~Federal, state, and local policy goals are all considered in the holistic evaluation.~~ • ~~Known community concerns and goals are considered.~~ • ~~Take into consideration and minimize potential project impacts on vulnerable or marginalized communities (environmental justice/equity considerations).~~

~~Other Factors~~Community ~~goals or~~ concerns	• Known community concerns identified through outreach or past experience are considered, including considerations of potential project impacts on vulnerable or marginalized communities (environmental justice/equity considerations, though the specific regulations and approaches to incorporating these considerations vary by state). • Costs associated with engineering design choices and construction methods that exceed current engineering and design practices in the area in which a potential project will be constructed are identified as part of the submission of a Transmission Cost Allocation (TCA) Application to ISO-NE and the NEPOOL Reliability Committee and may be reviewed for potential Localized Costs by ISO-NE and the Reliability Committee under Schedule 12C to the Open Access Transmission Tariff.

Updates – Section 4 (Cont'd)

- **Section 4.3, Table 4-1**
  - Revised "Future-proofing" section to more clearly focus on equipment selection, including potential standardization and modernization
  - Additional revisions throughout Guide will be needed if a right-sizing process is developed

~~Future-Proofing~~Equipment Selection and Coordination with Other Projects	• Other project work that may affect or be affected by the asset condition work is considered when scoping potential solutions. • Evaluate alternatives, as applicable, to address risks of potential future environmental impacts (e.g., flooding, extreme weather). • Consider adaptable, flexible solutions to accommodate future technologies~~.~~ or the installation of future equipment. • ~~Evaluate options that allow for future growth and the addition of equipment as needs arise.~~ • ~~Evaluate equipment size with respect to potential future demand.~~ • Opportunities to ~~combine~~ address related asset condition needs ~~into unified scopes of work~~through combined or coordinated projects when doing so is more cost-efficient are considered for potential solutions. • Additional system capacity may be created as an incidental benefit of installing new equipment, but creating incremental capacity is not the primary driver of ~~an~~ asset condition projects

Updates – Section 4 (Cont'd)

- **Section 4.4**
  - Added further discussion of decision making process

4.4 Results of Holistic Evaluation

After the compiling the analytical information (as identified generally in Table 4-1), the Transmission Owner's personnel perform a comparative analysis of the solution alternatives, including the Base Alternative, that would resolve the initial asset condition need identified in Section 2. Such information typically includes a review of the need (with photographs of asset condition issues), high-level mapping, a review of the project scope, conceptual engineering, benefits, costs, and anticipated schedule. The comparative analysis considers both the costs and benefits of different solution alternatives, be both quantitative and qualitative, and considers the criteria shown in Table 4-1 that are relevant to the particular project. The cost analysis between alternatives considers the long-term cost impact on customers of each alternative and not just the initial capital cost.

The output from the holistic evaluation process consists of preliminary preferred and alternative solutions that are presented to the Transmission Owner's leadership for decision making. Figure 4-1 illustrates the ~~factors~~criteria typically considered in the holistic evaluation process ~~and distinguishes between "key distinguishing factors"~~, including , "Key Evaluation Criteria" as shown in Table 4-1 which frequently affect decision-making between different project alternatives and "other ~~factors~~criteria" which are typically evaluated but may be less ~~frequently affect~~critical to decision-making.

Updates – Section 5

- **Section Overview and Section 5.1**
  - Improved the description of decision-making process TOs' management review

Prior Version:

Overview

After the completion of the holistic evaluation, the Transmission Owner proceeds with its internal approval process to obtain management endorsement of the proposed solution and associated schedule and budget. The project is also presented to the PAC and any feedback received is addressed by the Transmission Owner.

5.1 Management Review and Selection of Preferred Alternative

The results of the holistic evaluation are presented to company management for review and selection of the preferred alternative, which may differ from the alternative presented by the project team. Each Transmission Owner has a different approach for management approval, with some project reviews and approvals vested in an official solution design or approval committee. There also may be different levels of approvals required based on the magnitude of the proposed investment. The preferred alternative for an asset condition project is typically selected by Transmission Owner management based on a review of the information developed (including any alternatives) in earlier steps.

Decision on asset condition project approval considers the suite of information developed in prior steps, including the factors listed in Table 4-1.

Updated Version:

Overview

After the completion of the holistic evaluation, the Transmission Owner proceeds with its internal approval process to obtain management endorsement of the proposed solution and associated schedule and budget. The project and evaluated alternatives are also presented to the PAC and any feedback received is addressed by the Transmission Owner.

5.1 Management Review and Selection of Preferred Alternative

The results of the holistic evaluation, including the Base Alternative and other analyzed alternatives, are presented to company management for review and selection of the preferred alternative, which may differ from the alternative presented by the project team. While the details of Each Transmission Owner's management approval processes vary, there is commonality in that each Transmission Owner's management approval process requires approvals at increasingly senior levels of their organizations depending on the complexity and financial impact.

The preferred alternative for an asset condition project is typically selected by Transmission Owner management based on a review of the information developed (including any alternatives) in earlier steps, including the evaluation criteria and other factors listed in Table 4-1.

For readability, these changes are presented in a before-and-after format. Redlines are shown in the "Asset Condition Process Guide (redline)" file which is posted with the meeting materials

Updates – Section 5 (Cont'd)

- **Section 5.1**
  - Added further clarify on the solution alternative decision-making process

While the level of importance of a particular factor will vary depending on the asset condition need and the proposed solution, the following factors, identified as "Key Evaluation Criteria" in Table 4-1, are key considerations for most asset condition projects:

- Asset criticality and ensuring that a project fully addresses the identified needs
- Cost, including striking an appropriate balance between upfront capital cost and additional costs over the longer-term
- Constructability of the proposed solution and real estate needs
- Siting and environmental permitting requirements
- ~~Government and community goals and concerns~~

The decision-making process includes a quantitative and qualitative comparison between the Base Alternative and other alternatives, including an assessment of the benefits and costs of each alternative evaluated.

Updates – Section 5 (Cont'd)

- **Section 5.2**
  - Added cross references to new appendices

~~The PAC Presentation Guidelines[6] developed by the Transmission Owners recommend that projects with an estimated cost of over $50 million be presented to the PAC at least six months prior to start of major construction, while projects less than $50 million be presented to the PAC at least three months prior to the commencement of construction. Any project may be presented to the PAC more than once and presentations may occur earlier in the project development process, if needed, to obtain regional stakeholder feedback. The PAC Presentation Guidelines also recommend that Transmission Owners seek and respond to written stakeholder feedback. These responses are made available to the PAC through posting to the ISO-NE website.~~

Appendix D to this Guide, "Stakeholder Review Process for Asset Condition Projects," sets forth the Transmission Owners' timing for stakeholder presentations, the process and timing for stakeholder feedback and questions, and Transmission Owner responses. Appendix E to this Guide, "PAC Presentation Content Guidelines," summarizes minimum content for asset condition project presentations to the PAC. Appendices D and E will be reviewed periodically and may be updated to reflect the needs of the stakeholder process for asset condition project review.

Additional modifications

- In addition to previously discussed updates, the TOs have made many other minor edits in response to stakeholder feedback and to improve the overall readability of the document
- These changes are included in this presentation as an appendix and are also shown in the redlines posted with the meeting materials

Future process enhancements

Future Process Enhancements

- Over the past few months, the TOs have received several suggestions that require additional consideration or additional work to implement
- Where possible, the TOs will implement or otherwise address these suggestions as part of periodic updates to the Asset Condition Process Guide and other deliverables
- The following slides document the additional items under consideration by the TOs

Tracking of Future Process Enhancements

- The TOs intend to address these items as part of a periodic update to the Asset Condition Process Guide in 2025
  - TOs will present results of our evaluation and any updates to the Asset Condition Process Guide to PAC

Suggestion	Source	TO Response
Investigate the possibility of uniform grades for additional line and substation equipment, similar to how have TOs have developed uniform grades for transmission line structures	NESCOE and MA AGO comments on draft Asset Condition Process Guide	• Evaluate during next periodic update to Asset Condition Process Guide
Review the timing of presentations to PAC to identify if earlier presentations for significant projects is appropriate	CT OCC comments on draft Asset Condition Process Guide	• Evaluate during next periodic update to Asset Condition Process Guide
Provide information on standard equipment types by company	MA AGO comments on draft Asset Condition Process Guide; PAC stakeholder comment	• Evaluate during next periodic update to Asset Condition Process Guide
Incorporation of right-sizing considerations	Various stakeholder comments	• Address when right-sizing process is developed

- The TOs intend to address these items as part of the annual update to the Asset Condition Project Forecast in 2025

Suggestion	Source	TO Response
Additional details, explanations, and formatting changes to Asset Condition Project Forecast	Stakeholder comments at September 18, 2024 PAC meeting	• Will be evaluated as part of 2025 update to forecast

Tracking of Future Process Enhancements (continued)

- The TOs intend to address these items on a rolling basis
- Additional slide templates will be developed and revised over time
  - To implement improvements as quickly as possible, TOs do not plan to present every template revision to the PAC
  - Instead, TOs will post templates to ISO-NE website and place them into use in TO Asset Condition project presentations immediately

Suggestion	Source	TO Response
Continue to review how to best communicate communication and technology related needs	MA AGO comments on draft Asset Condition Process Guide	• Incorporate into development of future slide templates
Additional slide templates for asset condition project presentations	TO discussion	• Incorporate into development of future slide templates
Standard templates for RC presentations	NESCOE comments	• Incorporate into development of future slide templates
Improvements to TO Asset Management page on ISO-NE website	ISO-NE suggestion	• Under development

Tracking of Future Process Enhancements (continued)

- The TOs intend to address these items with future presentations to the PAC

Suggestion	Source	TO Response
Provide more information on experience implementing Grid Enhancing Technologies in New England	MA AGO and RI DPUC comments on draft Asset Condition Process Guide; TO discussion	• TOs intend to provide a presentation at GETs deployment at a future PAC meeting

Tracking of Future Process Enhancements

- Items below have already been addressed

Suggestion	Source	TO Response
Add description of transmission line structure maintenance practices to Asset Condition Process Guide Appendix C	Stakeholder comment at September 18, 2024 PAC meeting	• Complete; Document revised
Clarify start of construction vs. start of Major Construction in Appendix E to Asset Condition Process Guide	Stakeholder comment at September 18, 2024 PAC meeting	• Complete; Document revised

Questions

Appendix: Additional Guide Changes

Additional Asset Condition Process Guide Changes – Executive Summary

- **Table ES-1**
  - Update name of Asset Condition Project Forecast, and add clarity regarding when a project will be included
  - Clarify that funding may be phased

Table ES-1: Summary of Asset Condition Project Process

Primary Step	Budgeting/Funding Processes	ISO-NE/NEPOOL Stakeholder Process
1. **Asset Monitoring –** Conduct field inspections and other analyses to determine transmission asset condition and identify potential need for asset modification (i.e., asset condition project)	General O&M	N/A
2. **Initial Evaluation** – An initial project budget is usually established during, or at the completion of, this step. Projects at this step ~~would typically appear on~~are added to the Transmission Owners' ~~five-year asset condition project forecast~~Asset Condition Project Forecast.	Initial project budget established; funding typically sufficient to cover holistic evaluation, but may be phased for more complex projects	Project added to ~~5-year asset condition project forecast~~Asset Condition Project Forecast
3. **Scoping -** Integrate the information collected during the asset monitoring phase and the need identified in the initial evaluation to develop an initial solution concept.		

Additional Asset Condition Process Guide Changes – Executive Summary

- **Executive Summary** – Purpose of the Guide, added regulators and ISO-NE

> - Define the combined Transmission Owners' general practices for transmission asset condition projects, thereby providing transparency, for the benefit of the public~~,~~ as well as regulators, ISO-NE, other involved agencies, and other stakeholders, regarding the overall approach used to justify, plan, permit, and cost-effectively implement such projects.

- **Executive Summary** – Clarified language regarding project coordination

> coordination and stakeholder outreach.[3] The projects are coordinated~~, when possible,~~ with other known non-asset condition driven power system needs identified by ISO-NE.

- **Table 1-1**
  - Updated infrared helicopter inspection frequency for Eversource and Versant

Infrared Helicopter Inspection	~~As needed~~Annual	Annual	Annual	Annual	~~As needed~~Annual	Annual

Additional Asset Condition Process Guide Changes – Section 1

- **Section 1.1.1**
  - Removed ultrasonic inspection from list

> - **Infrared Helicopter Inspection** – inspections conducted from the helicopter using attached Infrared (IR) cameras or equipment to look for "hot spots" on the line.
>
> - ~~**Ultrasonic – inspection method utilizing ultrasonic technology to detect defects in transmission components.**~~

- **Section 1.1.1.1**
  - Removed information that is duplicative of Appendix A

> **1.1.1.1. Wood Poles**
> Wood poles are visually inspected for any defects or deterioration, such as woodpecker or insect damage, rot, splits, cracks, bends or deformation, etc. Any defects or deterioration are typically photographed. In addition, if rot is present, the extent and location is noted. ~~American National Standards Institute (ANSI) standard ANSI O5.1 Section 5.2 defines prohibited defects in wood poles, while Section 5.3 defines permitted defects.~~

Additional Asset Condition Process Guide Changes – Section 1

- **Section 1.1.3**
  - Specified that Load Tap Changer is inspected in a transformer offline inspection

> • **Transformer Offline Inspection** – detailed inspection of a transformer that requires removing the transformer from service and getting access to the internals, including a review of load-tap changer equipment.

- **Table 1-3**
  - Added battery inspections

Battery Equipment	• Inspect condition of DC batteries and perform testing as required

- **Section 1.3**
  - Removed comment because the TO determines if equipment is obsolete, not the manufacturer

> **Equipment Obsolescence**. Although certain transmission system equipment has proven reliable over many years and has no defined asset condition issues, it may no longer be compatible with current technology on a Transmission Owner's system, ~~may be determined by the manufacturer to be outdated,~~ or may be identified as obsolete due to unavailability of parts or manufacturer support. The

Additional Asset Condition Process Guide Changes – Section 2

- **Section 2, Overview**
  - Clarification regarding determination of urgency

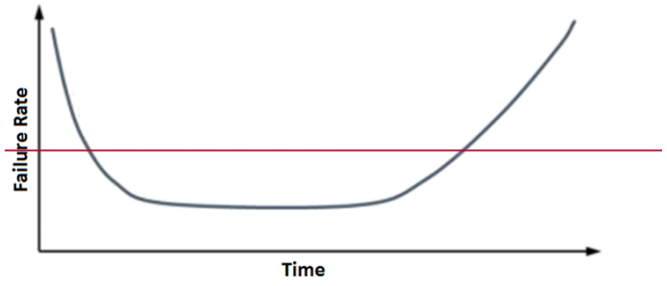
Overview

As asset inspection data is collected, Transmission Owner personnel review the information, along with other relevant data regarding the asset, such as maintenance history, obsolescence, etc. Data indicating problematic assets is compared to industry standards and guidelines, as well as company policies. The results of these analyses provide an initial evaluation regarding whether or not an asset condition project is required to address the identified issues and the urgency of the project. If so, the Transmission Owner conducts further investigations, proceeding with initial scoping and budgeting for the potential asset condition project.

- **Section 2.1.1**
  - Remove "bathtub curve" as it seemed to cause confusion rather than provide clarity

~~Figure 2-1 provides an example of the "bathtub curve", which gives a visual representation for the typical life of an asset.~~

~~Figure 2-1: Asset Life Bathtub Curve~~



Additional Asset Condition Process Guide Changes – Section 2

- **Table 2-1**
  - Removed phrase as environmental effects are discussed later in the table

Table 2-1: Common Factors in Asset Condition Impact Evaluation

Consequences of Deteriorated Asset Condition	Definition / Examples
Asset Cost Increases	Because of asset degradation, the total cost to maintain and operate equipment becomes inefficient ~~and/or results in unacceptable environmental or other impacts.~~

- **Section 2.6.4**
  - Added note on battery banks

Control house projects can be driven by a variety and combination of needs. The asset condition of the control house itself is a sometimes a consideration. Additional drivers such as fire safety and clean air monitoring considerations, the need to house additional or larger equipment~~,~~ (such as larger battery banks or backup battery banks), the need to provide improved reliability through wiring separation and other means and the need to meet regulatory obligations such as physical security protection may also determine the need for control house projects.

Additional Asset Condition Process Guide Changes – Section 2

- **Section 2.8**
  - Added notes pointing to Appendix C with the transmission line structure grading system

> to rank certain asset types~~.~~. Appendix C describes uniform grades used by all Transmission Owners for PAC presentations that involve transmission line structure replacements. Uniform grading of other transmission and/or substation elements for presentation purposes is being assessed for future inclusion in additional appendices. These asset health scores are used as part of the screening

> Transmission line asset condition indicators include such information as current and historical field inspection data, obsolescence issues, and known problems with particular manufacturers, models or vintages of equipment. For transmission line structure condition, each TO has developed a grading system to rate the condition of structures based on visual inspections. These grading systems are described in Appendix C, including a uniform grading system to be used in PAC presentations.

Additional Asset Condition Process Guide Changes – Section 3

- **Section 3.1**
  - Corrected typo

Typical initial solution development considerations for an overhead transmission line

- Is the number of deficient structures large enough that a project to ~~replacement~~replace them will likely require construction along most (or all) of the ROW?

  - Incorporated Base Alternative terminology

If an overhead transmission line is found to have limited asset condition issues, the initial solution concept will typically be targeted repairs to address those specific issues~~.~~ (i.e. the Base Alternative or a version thereof with minor scope additions). A targeted repair could include replacing only damaged or

If asset condition issues are widespread within the substation, the initial solution concept will typically be a more holistic project that encompasses the potential replacement of a variety of substation equipment. If the issues appear limited to a subset of substation equipment, the initial solution concept will typically be ~~a targeted replacement~~the Base Alternative.

Additional Asset Condition Process Guide Changes – Section 3

- **Section 3.1**
  - Added clarification that multiple standards/criteria may be applicable

Typical initial solution development considerations for substation equipment

- Are deficiencies widespread within the substation and not limited to particular pieces of equipment?
- Is deficient equipment located within the substation control house and, if so, does the control house have sufficient space to accommodate replacement of the equipment?
- Will replacing or repairing the equipment in-place present significant constructability challenges?
- Is the substation location suboptimal? For example, is it in a flood-prone location?
- Are there concerns with obsolescence and ability to obtain replacement parts?
- Does the substation comply with NPCC criteria and other relevant standards and regulations?

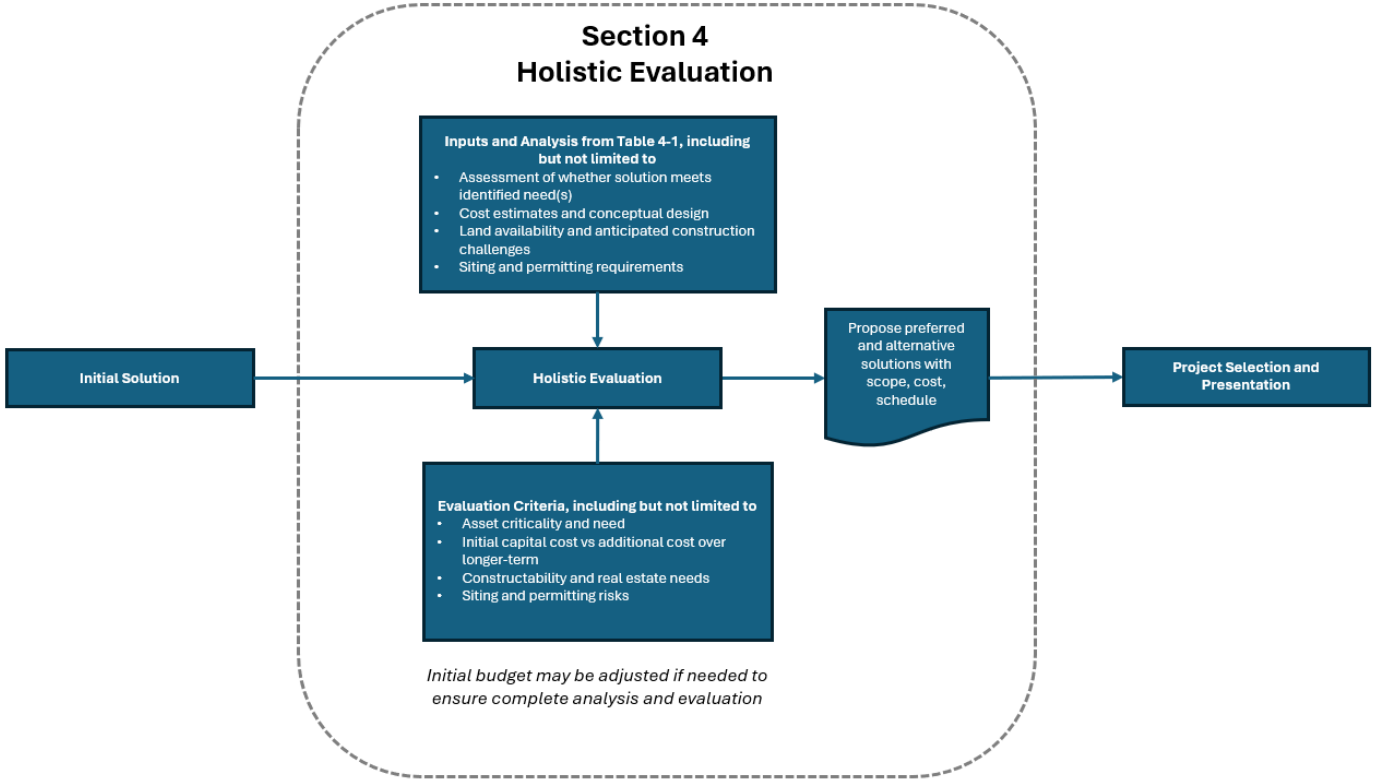
Additional Asset Condition Process Guide Changes – Section 4

- **Table 4-1**
  - Clarified Key Evaluation Criteria
  - Note that cost information should include future costs where possible

Information	Description
Key ~~Distinguishing Factors~~Evaluation Criteria *(Commonly affect solution selection for asset condition projects)*	
Asset Condition Need and Criticality	• Asset criticality and health assessments as described in Section 2 of this document are included in solutions to ensure that the selected solution addressed all identified critical asset condition needs. • Asset age is a key factor but is not determinative on its own.
Project Costs	• Initial cost estimates for potential solutions are developed for use in holistic evaluation. • The project team assesses the anticipated lifecycle costs of alternatives, including but not limited to, the avoided future cost of solving multiple needs with one project as opposed to solely solving the immediate need. • This criterion is critical for achieving the selection of a solution that minimizes costs to customers over time.

Additional Asset Condition Process Guide Changes – Section 4

- **Figure 4-1**
  - Revised boxes to align with Figure 4-1



Additional Asset Condition Process Guide Changes – Section 5

- **Section 5.2**
  - Clarified that an evaluation of solution alternatives will be included in presentations

> While Transmission Owner's presentation of an asset condition project to the PAC may occur at any point during a project's development, providing that the minimum requirements of the Transmission Planning Process Guide (TPPG) are met, the Transmission Owners typically present projects to PAC shortly after obtaining internal approvals of the preferred alternative and associated cost estimate, as described in Section 5.1. This allows stakeholders to review the full analysis supporting a proposed project, including estimated costs and evaluation of alternatives, while still allowing for modifications to be made to the project based on stakeholder feedback.

Additional Asset Condition Process Guide Changes – Section 5 & 6

- **Section 5.3**
  - Added more info on how stakeholder feedback is used

5.3 Consideration of External Feedback

As described above, Transmission Owners ~~may~~will respond to ~~stakeholder~~written feedback from PAC in writing, either in a memo, by making follow-up presentations to the PAC, or both.

Transmissions Owners use stakeholder feedback to validate the selection of a preferred solution or to modify the preferred solution, or proceed with an alternative solution, depending on the nature of the feedback received. If a project is modified or an alternative solution is selected, based on feedback from the PAC, the Transmission Owner would make a follow-up presentation to the PAC to explain the changes and provide an updated cost estimate.

- **Section 6.2.1**
  - Added more info on how stakeholder feedback is used

required. Feedback at this stage is typically addressed via meetings with the affected individuals and organizations, or via state siting or regulatory processes if the feedback is provided through such a process. In most cases, feedback can be addressed with minor changes to project designs or construction plans without any impact to the project budget.

Additional Asset Condition Process Guide Changes – Section 8

- **Section 8**
  - Added phrases to emphasize affordability

Section 8 Conclusion

Transmission asset condition management entails the ongoing efforts of dedicated personnel within each Transmission Owner's organization. The overarching objective of the asset condition process is to maintain the New England transmission system in a cost-effective efficient, safe, and environmentally sound manner and thereby to continue to provide reliable ~~and~~, resilient and affordable service to customers. Each asset condition project is the result of an iterative process, which reflects the full analysis of the need for the project, as well as the selection of the most appropriate alternative for resolving that need.

Overall, this approach to transmission asset condition management provides the most economical for consumers and efficient path to meet regional system reliability needs. Although the asset condition process differs slightly among the Transmission Owners, each transmission owner adopts a similar high-level approach to prudently maintaining their assets and thus assuring overall system reliability.

Additional Asset Condition Process Guide Changes –Appendix A

- **Appendix A**
  - Fixed error in appendix regarding standards

American National Standard Institute (ANSI)	
	ANSI Z535 – Safety Signs
	ANSI C37.32 – American National Standard for High Voltage Switches, Bus Supports, and Accessories Schedules of Preferred Ratings, Construction Guidelines and Specifications
~~American National Standards Institute (ANSI)~~	
	~~ANSI Z535 – Safety Signs~~
	~~ANSI C37.32 – American National Standard for High Voltage Switches, Bus Supports, and Accessories Schedules of Preferred Ratings, Construction Guidelines and Specifications~~ ANSI O5.1 Sections 5.2 and 5.3 address prohibited and permitted defects in wood poles