NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Electric Vehicle Task Force (EVTF)

Scope Document
August 2024

Purpose

The growth of Electric Vehicles (EVs) is expected to dramatically change the composition of the load seen by the Bulk Power System (BPS). The EVTF shall promote collaboration between electric utilities and the EV automotive representatives such that the two can build a common nomenclature and develop recommended utility interconnection requirements (e.g., ride-through), procedures, and approaches to handle the growing adoption of EVs seen by the ERO Enterprise in a manner supportive to reliability of the BPS. The EVTF shall focus on the integration challenges and develop potential solutions to the engineering challenges faced by integration of this emerging load type.

Activities

The NERC EVTF will serve as an open stakeholder forum for EV and charging station OEMs as well as utilities to improve on utility knowledge of modern EV charging technology, improvement to the modelling of such technology, and build a common nomenclature to exchange impact and risk information between the electric utilities and automotive industry. This work is a follow up to the joint California Mobility Center (CMC) working group report focused on "dynamic behavior in response to grid disturbances." The report also considers other ways EVs can affect BPS reliability, and the EVTF is set to identify, validate, and prioritize those risks. To do this, the EVTF will focus on the following activities:

1. Promote utility and EV cross-sector collaboration to reach and establish a common nomenclature to describe the electrical impact of EV charging and discharging, and to develop recommended utility requirements or approaches to handle growing adoption of EVs.
2. Identify and prioritize a suite of risks that the EVTF deems critical to the reliable electrification of motor vehicles.
3. Foster a unified utility perspective on the identified and prioritized risks to manage the identified and prioritized risks.
4. Increase the technological understanding of modern EV charging and discharging behavior by BPS utilities and develop educational materials that can be used for a wide range of audiences to describe the potential emerging risks and possible solutions to address those risks.
5. Provide technical recommendations on the impact of higher penetration of EV charging and discharging behavior on the BPS, and the potential solutions to mitigate any identified issues.
6. Provide technical recommendations on the impact for EV charging and discharging behaviors and recommend appropriate modelling decisions to represent dynamic interchange between charging and discharging modes.

7. Develop recommendations for assessing EV charging and discharging impacts in other NERC program areas, including Resource Adequacy.
8. Deliver load model improvement, information, and benchmarking to the NERC Load Modeling Working Group (LMWG) for continual model improvement on load representation.
9. Coordinate with the Electric Power Research Institute's EV work, including EVs2Scale2030.[1]
10. Any other task assigned to it by the NERC Reliability and Security Technical Committee (RSTC).

Deliverables

The EVTF will develop the following items within its anticipated one to two year period:

1. A white paper that identifies potential BPS-level reliability risks. This paper plans to leverage the NERC *Framework to Address Known and Emerging Reliability and Security Risks*[2] to identify, validate, and prioritize the potential reliability risks related to motor vehicle electrification. Where applicable, the EVTF will identify areas where potential security risks require additional follow-up assessment by security professionals. This document will identify RSTC groups that could follow-up on this work.
2. A white paper that expands on the identified and prioritized risks in deliverable number 1 and derives potential mitigation solutions for the higher priority risks in the short term as well as potential mitigation solutions to be resolved outside of the EVTF. This paper is set to provide utilities a uniform voice to speak to potential system solutions to manage the integration of large amounts of EVs.
3. A technical report on the EV electrical states, disconnection modes, standard protective functions and type tests to validate the charging and discharging states. This document will identify the information available that transmission planners can use to integrate into their studies and leverage appropriate testing mechanisms for an attestation of known performance. This report will also document and identify various improvements to the aggregate representation of EV charging or discharging as well as a stand-alone representation if needed for larger capacities. This report may be used by LMWG or other industry groups to understand EV behavior.

EVTF will maintain its work plan and submit updates to the RSTC on the milestones for the above deliverables by Q4 2025.

Membership

The EVTF will include members and observers who have technical expertise in the following areas:

- Design of EV charging stations, charging points, or charging algorithms,
- Design of EV discharging behavior or algorithms,
- Electrical interface design of EVs or EV service equipment,
- Utility programs and interconnection studies for EV equipment,

[1] https://msites.epri.com/evs2scale2030
[2] *Framework to Address Known and Emerging Reliability and Security Risks.*

- Other interested parties, including entities affected by adoption at-scale of EVs or EV service equipment.

It is anticipated that these members will likely consist of Transmission Planners, Planning Coordinators, Reliability Coordinators, Balancing Authorities, and Distribution Providers in addition to consulting or engineering services staff to meet the technical expertise qualifiers above. Furthermore, this Task Force is expected to include representatives from the manufacturers of EVs and their charging systems.

The EVTF will contain open membership to complete the items on its work plan and include interested parties affected by the adoption EVs or EV service equipment at-scale. Members will select if they are representing the electrical industry, the automotive industry, or observing the open task force. These distinctions will be used in reaching consensus of the attending membership for decisions by the EVTF. The EVTF will consist of a chair and vice chair appointed by the RSTC leadership. Where feasible, officers shall be selected from individuals employed at entities within NERC membership sectors 1 through 12. NERC staff will be assigned as Coordinator(s). Decisions will be based on the consensus of the attending membership, led by the chair and staff coordinator(s). Any minority views can be documented as appropriate. The EVTF chair, vice chair, and the assigned NERC staff coordinator can develop groupings of the membership to easier facilitate work plan product development of its various deliverables.

Reporting & Duration

The EVTF will report to the NERC RSTC. The NERC Reliability and Security Technical Committee will approve EVTF work products. The EVTF will develop the deliverables in its work plan on its proposed one to two year timeline, with updates managed and approved by the NERC RSTC.

Meetings

The group is expected to have four hybrid or virtual meetings per year, supplemented with conference calls as needed, to facilitate the completion of work products.

Approved by the Reliability and Security Technical Committee on August 2, 2024