Comment of ITC Holdings Corp.

Department of Energy – Request for Information

Codes, Standards, Specifications, and Other Guidance for Enhancing the Resilience of Electric Infrastructure Systems Against Severe Weather Events

ITC Holdings Corp. appreciates the opportunity to respond to the Department of Energy's inquiry on codes, standards, and specifications for enhancing the resilience of electric infrastructure systems against severe weather events. As an independent owner and operator of more than 16,000 circuit miles of electric transmission infrastructure across seven states, ITC is solely focused on managing its transmission systems to ensure reliable and cost-effective electric service to our customers. ITC applauds DOE's continued focus on the critical issue of extreme weather resilience.

Given the geographic breadth of our service territories, ITC must consider and prepare for a wide range of adverse weather conditions, including severe flooding, ice, wind, and snow, all of which have increased in frequency and severity in recent years. While we are fully committed to resilient design, the primary focus of this inquiry, we also recognize that electric infrastructure cannot be made fully resilient through any single program or set of design codes. Instead, resilience must be pursued through a multi-faceted commitment to enhanced design standards, proactive system maintenance, aging infrastructure replacement, and long-term system planning that prioritizes enhanced transfer capability and critical path redundancy. Ultimately, the most cost-effective pathway to long-term resilience results from proactive system investment in which long-term benefits, and potential for cost avoidance, far outweigh short-term costs.

In recognition of the need for a comprehensive and holistic resilience strategy, ITC's comments focus on best practices (and, where possible, specific criteria) across a range of categories, including 1) system design; 2) vegetation management; 3) asset management, and 4) system planning. ITC's comments also identify regulatory barriers, where they exist, to achieving a comprehensive resilience strategy in these areas.

Lastly, ITC notes that we are fully committed to *cost-effective* resilience. We recognize that the strategies proposed herein often impose some level of short-term costs that are borne by electric customers. However, we must also recognize that the issue of resilience is no longer theoretical. As the recent wildfires in California have demonstrated, the threat is very real. Left unaddressed, system vulnerabilities can quickly result in significant disruption and, in some cases, ruinous public costs – costs which dwarf initial investments in preparation and prevention. It is therefore crucial for state and federal regulators to adopt a proactive stance towards encouraging investments in enhanced resilience. Given the new environment of enhanced risk, well-considered resilience planning, proactive asset management, and enhanced design is of the utmost importance to our nation's economic health and national security.

System Design

As noted above, appropriate system design is a key element in an integrated resilience strategy. Investments in enhanced design can offer significant resilience benefits, including prevention of future outages under extreme conditions, decreased lifecycle maintenance costs, and reduced likelihood that infrastructure will need to be replaced before the end of its useful life.

As a baseline, ITC designs its transmission systems according to the NESC and ASCE7 codes. ITC also uses RUS Bulletin 1724E-200, a document produced by Rural Utilities Service. As a threshold design standard, the NESC code provides certain required weather criterion based on geographical location and generic historical weather patterns. However, designing for weather resilience by just applying the NESC code presents challenges, as weather guidelines are not frequently updated and ultimately offer only minimal preparedness. For example, per the NESC codes, most of ITC Midwest's (IA, MN, IL, MO) footprint should be designed to sustain 0.75" ice loading with 40 mph wind speed. However, in the last 15 years ITC Midwest experienced at least three ice storms with icing in excess of 2".

In addition, the NESC code describes transmission line design in a state where assets are fully intact (i.e. all conductors and structures installed). However, in practice utilities should consider situations such as loads during construction or during failures when one or more wires or structures break. In addition, storm stop structures should be installed at pre-determined intervals and sufficient inventory should be maintained to restore at least a full section between storm stop structures. In addition, the Extra High Voltage (EHV) backbone system (345 kV and above) should be designed with standards higher than the minimum code due to higher impact and long-lead replacement times for this infrastructure.

In general, the NESC standards should be treated as minimum guidance. To achieve acceptable resilience, the system should be designed using the utility's experience with historical and expected weather patterns. Ultimately, incorporating resilience-based design practices that go above and beyond code will minimize system damage and outages during sever weather events. In today's extreme weather environment, the short-term costs of such investments are far outweighed by the benefits they provide in the form of insurance value and avoided long-term costs.

Despite the need for upfront investments in resilience, regulatory and policy barriers continue to exist regarding such practices. RTOs or state/federal regulators often object to the cost of building above standards, when, as a matter of policy, building above standards per actual weather requirements should be considered a prudent expenditure upon an open and transparent review. RTO planning authorities should also support investments that go above and beyond minimum code at the discretion of the utility, as justified by historical and expected weather patterns. Finally, regulators should consider reforming policies that promote least-cost design solutions, such as competitive bidding processes under FERC Order 1000.

Vegetation Management

Vegetation Management is another core element of a comprehensive strategy to enhance resilience, as in conditions of extreme ice, snow, or wind, falling vegetation can pose a direct threat to system reliability. In some cases (such as the 2003 blackout), a vegetation-caused outage can result in system-wide impacts that impose extreme costs on customers and the economy.

To minimize such risks, ITC engages in a range of best practices for vegetation management. These include: (1) reclaiming corridor Right-of-Way (ROW) to the maximum allowable easement rights, (2) conducting active aerial and ground patrols to ensure wire zones are free from potential obstructions from vegetation, (3) conducting proactive removal of incompatible species within the wire zone, and (4) promoting use of low-growing compatible species within the corridor. Policymakers should also look for opportunities to provide utilities with new avenues to achieve acquisition of additional easements/ROW where historical ROWs are less than current standards.

Of course, such practices must be aided and supported through support and partnership between utilities, states, and localities. In addition, federal incentives can play a role in supporting enhanced vegetation management. In FERC's recent Notice of Inquiry into incentives policy, various parties, including ITC, proposed that enhanced vegetation management activities, such as those outlined above, should be re-classified as a capital expense. This would incentivize utilities across the country to engage in the most up-to-date, comprehensive practices regarding vegetation management.

Asset Management

One of the most important strategies for enhancing resilience is to replace and rebuild aging infrastructure. In ITC's case, rebuilds have proven to be effective during storm conditions. For example, on March 8, 2017, a massive windstorm in Michigan caused power outage for more than a million people. However, ITC experienced minimum transmission line outages and no customer load loss due to transmission outages. In February 2019, another windstorm impacted Michigan, causing over 100,000 people to lose power, yet ITC only had one transmission outage and no customer load loss due to transmission outages. This higher level of resilience was achieved due to rebuilding aging infrastructure and systematic maintenance practices deployed by ITC. In these cases, upfront investment in resilience resulted in real and substantial benefits to our customers.

To effectively manage and replace existing assets that could pose a resilience threat, ITC implements proactive programs to inspect and test infrastructure to drive replacement of aged equipment. In addition, ITC has identified systemic failure modes within classes of equipment and actively mitigates or replaces such equipment. As a matter of policy, state and federal regulators should support the use of these factors to drive aggressive replacement of aging infrastructure that could pose a threat. Further, in instances where equipment doesn't meet current design standards for expected weather, policymakers should normalize the evaluation of these factors as an option to invest into the system.

System Planning and Operations

While resilience is closely related to a traditional conception of reliability, it is also fundamentally unique because it seeks to achieve a different end state – namely, a power grid that can withstand or quickly recover from low-frequency, high-impact events, and one in which key system vulnerabilities have been considered and mitigated. Efforts to proactively plan the transmission grid to be more resilient will therefore require consideration of a unique set of parameters and criteria.

ITC believes that resilience must now be expressly considered as a transmission planning driver, to be studied and incorporated within any regional and interregional RTO planning process. Further, ITC believes that transmission owners should be afforded flexibility to propose local investments which may include rebuilds of aging infrastructure, projects that increase local transfer capability, or projects which emerge from enhanced local planning criteria designed to bolster resilience. Such investments should receive the presumption of prudency after an open and transparent stakeholder review. In addition to the broad incorporation of resilience into local and regional planning, ITC offers the following short-term enhancements to transmission planning processes.

First, there is an opportunity to enhance local reliability planning to support greater resilience by ensuring there is alignment between planning and operating scenarios. Currently, the transmission system is planned to withstand the loss of any two elements, which allows for reliable operation of the system with the removal of any one piece of equipment for maintenance. However, there are times when the system is operated so that the loss of any two circuits on the same towers will not cause reliability issues. This indicates a mismatch between planning and operations criteria. To remedy this, policymakers and utilities should consider planning the system for the loss of any single mode contingency (line, transformer, generator, double circuit tower line, bus fault, etc.), plus the loss of any other single mode contingency.

Second, resilience can be enhanced by proactively planning the system to increase flexibility and transfer capability into restricted generation zones. Currently, regional planning at RTOs/ISOs does not recognize the ability of transmission to increase transfer capability, which can provide substantial benefits including avoided generation costs and enhanced resilience during adverse events (for example, transfer capability proved to be particularly valuable during the polar vortex of 2019). To enhance the ability of the transmission system to respond to severe weather that effects wide geographic regions, transmission planning must be revised to fully value the ability of transmission to increase system flexibility. Reforming the planning process to fully value resilience and system flexibility will require policy leadership from FERC and RTOs/ISOs, as well as buy-in from a range of stakeholders including state regulatory authorities to support needed cost allocation policies that reflect resilience benefits.

Finally, ITC offers the following example of proactive planning to address resilience issues. ITC has studied the usage of proven technology and equipment to improve Michigan’s Capacity Import Limit (CIL), which measures how much generation capacity can be imported into the Lower Peninsula through our transmission connections with Ohio and Indiana. To increase the CIL, ITC proposed a modern solution based on proven technology — Static Var Compensators (SVC). The proposed SVCs will not only allow for additional capacity to be imported, but also provide an operational tool to ensure voltage stability for a diverse set of system conditions. As a result, more power can be transmitted reliably through the system over existing lines from a variety of generation sources when additional imports are needed for recovering the system from any catastrophic events, including those that are weather-related.