ISO Recommendation For Cost Regionalization in Flood Hazard Areas

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Purpose

- Discuss with the Planning Advisory Committee (PAC) the ISO recommended level for regional cost recovery under the Schedule 12 of the Open Access Transmission Tariff (OATT) in flood hazard areas, as defined on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM)

Background

- Previous recommendation for regional cost recovery in flood hazard areas was to construct to the 100 year flood level plus an additional one (1) foot
  - This was developed after consultation with the System Design Task Force and review of national information available including recommendations from FEMA and the American Society of Civil Engineers (ASCE)
- Events in the past several years have changed the thought process on designing for flood hazard areas
  - Large storms e.g., Sandy, Irma
  - Other weather related events
  - Redesign of Flood Maps and industry standards (ASCE 24/FEMA Guidance)

Recent experience

- Recently the transmission owners have brought projects forward to the PAC and RC where the construction in the flood hazard areas differs from previous approaches
  - United Illuminating Coastal Substation Flood Mitigation Study
  - Eversource Seafood Way Substation
  - More projects being proposed

Industry Outreach

- In order to understand how Transmission Owners in New England and other parts of the country are handling this issue, the ISO utilized the North American Transmission Forum to ask members how they handle the following situations:

"In designing transmission substations, do you have design requirements related to equipment elevation to address flooding concerns? If so:

- What elevation do you use? Example: the greater of FEMA 100 year plus 2 feet or 500 year.
- If the locations are in coastal areas do you use an adder for sea level rise? If so what is that adder and how was it determined.
- How is that elevation used? Is it used to specify the bottom of the lowest piece of equipment, or does it specify the bottom of any sensitive equipment. As an example, it may be acceptable for the bottom of the transformer to be wet, but the control cabinet cannot tolerate submersion. Therefore, the standard used in response to item 1 is used to specify the minimum elevation of the control cabinet."

Industry Outreached - Continued

- Responses varied
  - Some were very detailed
  - Some companies had no defined standards

- Common themes in the responses
  - Followed ASCE-24 and FEMA guidance
  - Design Flood Protection Level that is the higher of the 100 year flood level plus 2 feet or 500 year flood level (before sea level rise allowance for coastal locations)
  - Allowance for sea level rise, typically 1 foot

FEMA/ASCE Recommendations

- Per FEMA Technical Fact Sheet 1.6: The International Building Code (IBC) requires buildings be designed and constructed in accordance with ASCE-24
  - https://www.fema.gov/media-library-data/20130726-1537-20490-8057/fema499_1_6_rev.pdf
- FEMA deems ASCE 24 to meet or exceed the minimum National Flood Insurance Program requirements for buildings and structures
- Per ASCE-24-14 a Flood Design Class 4 structure must be elevated or protected to the 100-year flood level + 2 feet or the 500 year flood level, whichever is higher (see Appendix for Flood Class 4 Definition)
- In addition, FEMA recommends a minimum adder of 1ft for Sea Level Rise on top of the ASCE-24 level (i.e. higher of either the 100yr + 3ft, or 500yr+1ft).
  - https://www.fema.gov/media-library-data/1381405016896-8bdeadf634c366439c35568a588feb24/SandyRA5DesignAboveBFE_508_FINAL2.pdf

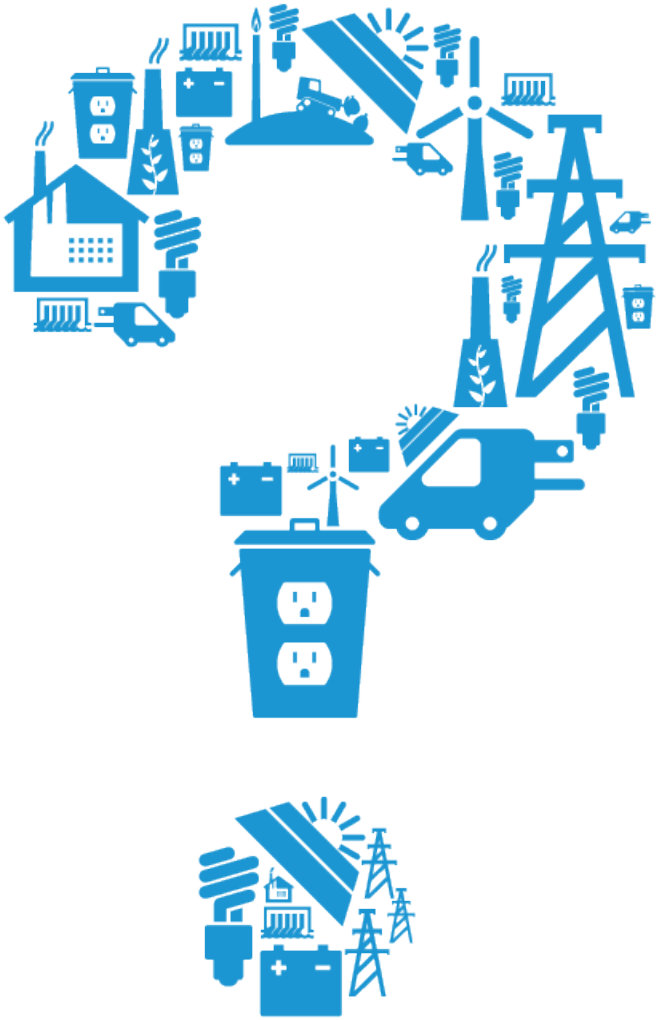
ISO Recommendation

- After reviewing FEMA guidance, new standards and industry data, the ISO is recommending a change to the previous recommendation for regional cost recovery to the following
  - Inland locations – defined as areas that have no chance for "wave action"
    - The higher of the 100 year flood level plus 2 feet or 500 year flood level
  - Coastal Locations
    - The higher of the 100 year flood level plus 2 feet or 500 year flood level
    - Plus an additional 1 foot added for sea level rise
- For existing equipment that needs to be raised the recommendation is to the bottom of sensitive equipment
  - Example: The control cabinet of a transformer would be at the elevation listed above while the lower end of the transformer would be below. The bottom of the transformer could be submerged in water
- For new construction the recommendation is to the bottom of the equipment being installed.
  - Example: The bottom of the transformer would be at the higher of the two values shown above
- For control houses the level shall be at the control house floor in all situations

Next Steps

- Please submit comments on the materials in this presentation to pacmatters@iso-ne.com by May 10, 2018
- Modifications will be made to Planning Procedure 4, "Procedure for Pool-Supported PTF Cost Review"
  - Reliability Committee review process anticipated to begin in June 2018

Questions



APPENDIX

Appendix - ASCE Flood Design Class 4 Definition

ASCE Flood Design Class 4 Definition

- **ASCE Flood Design Class 4**
  - Buildings and structures that contain essential facilities and services necessary for emergency response and recovery, or that pose a substantial risk to the community at large in the event of failure, disruption of function, or damage by flooding. Flood Design Class 4 includes (1) hospitals and health care facilities having surgery or emergency treatment facilities; (2) fire, rescue, ambulance, and police stations and emergency vehicle garages; (3) designated emergency shelters; (4) designated emergency preparedness, communication, and operation centers and other facilities required for emergency response; (5) power generating stations and other public utility facilities required in emergencies; (6) critical aviation facilities such as control towers, air traffic control centers, and hangars for aircraft used in emergency response; (7) ancillary structures such as communication towers, electrical substations, fuel or water storage tanks, or other structures necessary to allow continued functioning of a Flood Design Class 4 facility during and after an emergency; and (8) buildings and other structures (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, or hazardous waste) containing sufficient quantities of highly toxic substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released.