Evaluating load shapes in the IRM study

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Background

- **ICS listed an evaluation of load shapes on the action items for NYSRC ICS Meeting #203 (1/3/2018)**
  - The evaluation was identified as a multi-year effort
- **The NYISO presented load shape materials at two additional meetings in 2018 (2/27 and 6/27)**
  - These presentations did not evaluate alternate methods, but provided additional background and identified potential research questions
- **ICS listed an evaluation of load shapes on the action items for NYSRC ICS Meeting #215 (1/2/2019)**
- **Some ICS stakeholders sought a higher prioritization and an expedited evaluation of load shapes**
  - Last meeting (2/26/2019), the NYISO summarized the limited ICS discussions in 2018 including that a specific research topic or method was not selected by the ICS for further evaluation
  - As a result, the load shape evaluation remains in the early stages of the multi-year effort, and requires the ICS and the ISO to identify the relevant questions and/or method to evaluate
- **The NYISO committed to return this ICS meeting with a more granular schedule for this multi-year effort**

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Load shapes – a brief history

- **Prior to 2013: IRM and LCR studies were conducted using a single load shape – the 2002 load shape**
- **2013: The NYSRC adopted multiple load shapes for the 2014 IRM**
  - http://nysrc.org/pdf/MeetingMaterial/ICSMeetingMaterial/ICS_Agenda%20149/Multiple%20Load%20Shape%20%206_19_13%20Final.pdf
  - Three load shapes were selected and assigned to load bins
    - 2006 load shape for the highest load bin
    - 2002 load shape for the second highest load bin
    - 2007 load shape for the third through seventh load bins
  - The NYISO and NYSRC balanced many factors when selecting the annual load shapes and assigning those load shapes to a given load bin, including
    - The possibility of creating load shapes that produce many LOLE events and set a relatively high IRM (possibly resulting in over-procurement) and
    - The possibility of creating load shapes that produce few LOLE events and set a relatively low IRM (possibly resulting in under-procurement and insufficient reliability)
  - The whitepaper recognized and considered the uncertainties (both from a data standpoint and from a forecasting standpoint) that exist when developing load shapes
- **2015: The IRM and LCR studies now count events in non-peak hours towards LOLE**

Schedule for evaluating load shapes

1. **Detailed review of existing load shape process**
   - Initial load shapes (e.g., 2002, 2006, 2007 load values, scaling method, load forecast uncertainty magnitude and probabilities (i.e., bins), and the assignment of load shapes to load bins
   - Presentations by NYISO to ICS from April 2019 through September 2019
2. **Identification of other processes that utilize load shapes**
   - Summary of neighboring control areas' approaches to load forecasting
     - Presentation by NYISO to ICS by August 2019
   - Summary of other NYISO processes that utilize load shapes
     - Presentation by NYISO to ICS by September 2019

Schedule for evaluating load shapes, cont'd

3. **Identify topics for evaluation (this item can run concurrent with the items of the previous slide)**
   - For example
     - How would scaling load shapes to match peak load (MW) and total energy (GWh) affect the IRM? Should load shapes with above forecast peak loads (i.e. LFU > 100%) be assigned above forecast energy?
     - How does the IRM change when the load shape process begins with alternate load shape (i.e., load shapes from years other than 2002, 2006, and 2007)?
     - Is the annual load duration curve (e.g., 'flat' versus 'peaky') correlated with the annual peak load (e.g., above forecast peak versus below forecast peak)?
     - Has the shape of annual load duration curves changed over time? Have zonal shapes diverged over time?
   - Additional items for consideration
     - What is the decision making framework? A focus on numerical precision? A focus on balancing qualitative and quantitative considerations?
     - Should the IRM load shape process be consistent with, or is there a basis to diverge from, other NYISO studies and processes that rely on load shapes?

<u>The above items are not an exhaustive list of potential topics for evaluation</u>

Schedule for evaluating load shapes, cont'd

4. **Perform tasks necessary to address topics of evaluation**
   - Conducted during January through May 2020, concurrent with other ICS action items
   - The set of necessary tasks, potential follow-up tasks, and ICS prioritization will determine whether additional time is necessary to complete this step
   - All steps below assume topics for evaluation are addressed by May 2020
5. **Identify potential load shape methodology updates**
   - May 2020
6. **Perform sensitivity study (or full Tan45) for the 2021 IRM**
   - Conducted in August/September 2020 concurrent with the other 2021 IRM sensitivities
7. **Publish final whitepaper and integrate updated load shape method into the 2022 IRM study**
   - May 2021 – November 2021

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Questions?

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