Intelligent Reserve Deployment ("IRD"): Outstanding Issues and Options to Address

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December 19, 2022

- A review of the 2022 IRD proposal procedural history was reviewed at the November 14th SRDTF session.

  – Slide deck here: procedural history

- Propose and solicit enhancements to the current all-call approach that will **better align prices with actual emergency conditions.**

  – Proposals need to adhere to established Reliability objectives and applicable NERC Standards

- Discuss the concerns raised by FERC in the August 15th Order and options to potentially address these concerns

- IRD proposal is unjust and unreasonable as it fails to model **actual system conditions** and is likely to result in **artificially inflated prices**.

- Even when a contingency event is the result of the largest contingency, the IRD case might not be representative of actual system conditions if the contingency event occurs near a constraint or within a reserve sub-zone, because **IRD would model an RTO-level increase in load**

- The initial IRD proposal was designed as a single separate SCED case that would model the single largest contingency via an increased load bias input
  - The case would solve simultaneously with other SCED cases anticipating the loss of the largest contingency
  - A Spin Event is triggered with the approval of an IRD case
    - All-call notification sent to Resource Owners
- While it is not possible to predict an actual system loss, there are options to explore that may address FERC's concerns:
  - Automatic reruns of the pricing run during the LMP verification process
  - Solve Multiple IRD Cases with separate contingency MW values
  - Modification of existing proposal
  - Others?

One approach to price the actual system loss is to first approve the IRD case, as previously proposed, then "rerun" or recalculate the pricing run case with the actual system loss modeled referring to the original IRD case

- Benefits:
  – IRD core concept utilized
  – Final pricing reflects actual system loss
- Other Considerations
  – Transparency:
    - **Initial pricing will not reflect final pricing**
    - **Final pricing will not be reflective of actual dispatch instructions**
    - **Additional differences between Dispatch and Pricing Run**
    - **Reruns required**

- Unit Loss occurs at 08:53:50
- IRD Case approved at 08:54:00
- Pricing run executes at 08:56:30

- **Real-time Market Operations Group updates pricing run with actual loss at 08:53:50 during verification process**

| **08:50** | **08:55** | **09:00** | **Next Business Day** |

- **RT SCED Executes for target time**
- **6 cases, including IRD solve in roughly ~2 minutes**

- **Target Time**

Another approach is to solve multiple IRD cases or scenarios that have separate contingency MW values modeled

- Benefits:
  – IRD core concept utilized
  – More flexibility for operator to approve an IRD case that more closely aligns with the actual system contingency
  – No reruns required
- Other Considerations
  – Actual amount of MW and location of loss not model/priced
  – Current infrastructure not sufficient to manage the additional scenarios

- **Unit Loss occurs at 08:53:50; contingency loss best represented by IRD Case 3**
- **IRD "3" Case approved at 08:54**
- **Pricing run executes at 08:56:30**

No rerun for IRD case approval

08:50	08:55	09:00	Next Business Day

- **RT SCED Executes for target time**
- **9 cases, including 3 IRD solve in roughly ~2 minutes**

- **Target Time**

- Solve 2 IRD cases (modeled against PJM reserve procurement of RTO and subzone) with a 900 MW reserve need, as defined by the EI NERC Balancing Contingency Event (BAL-002).
  - Scenario 1: IRD Case with 900 MW in RTO
  - Scenario 2: IRD Case with 900 MW in Active Subzone
- Benefits:
  - IRD core concept utilized
  - Flexibility for operator to determine where response is needed (RTO or Subzone)
  - Potentially address concerns raised in FERC order to not artificially inflate prices, but rather jump start the response for the reserve needs.
- Other Considerations:
  - Actual amount of MW and location of loss not model/priced initially
  - The 900 replacement MW IRD case will be used to 'kick-off' the spin event and start moving units to response to the emergency condition. This is similar to today's all-call with the benefit of still requiring resources to follow dispatch in their response.
  - Current infrastructure *may* be insufficient to manage the additional scenarios

- Unit Loss occurs at 08:53:50; contingency loss best represented by IRD Case 2
- IRD "2" Case approved at 08:54
- Pricing run executes at 08:56:30

No rerun for IRD case approval

08:50	08:55	09:00	Next Business Day

- RT SCED Executes for target time
- 7 cases, including 2 IRD solve in roughly ~2 minutes

- Target Time

- These are initial concepts offered for consideration – these are not PJM proposals at this time.

- PJM is interested in thoughts on these options as well as different ideas for discussion at our next session.

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