New Service Request Study Process Education

and Identification of Potential Process Issues to be Discussed

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Resources

- PJM Tariff – Parts IV and VI
  http://www.pjm.com/~/media/documents/agreements/tariff.ashx

- PJM Manual 14A
  http://www.pjm.com/~/media/documents/manuals/m14a.ashx

- PJM Manual 14E
  http://www.pjm.com/~/media/documents/manuals/m14e.ashx

Applications

- Types of applications:
  - Attachment N – new generation and uprates to existing generation
  - Attachment S – merchant transmission requests
  - Attachment Y – new generation, less than 2 MW synchronous, 5 MW inverter and not seeking Capacity Interconnection Rights (CIRs)
  - Attachment BB – inverter based generation no larger than 10kW
  - Attachment EE – ARR request
  - Attachment FF – Long term firm request

Queue Timelines (current)

Queue window	May 1st – October 31st	November 1st – April 30th
Feasibility Study	December 1st – February 28th	June 1st – August 31st
Review and SISA	30 days after issuance of report	
Impact Study (120 days)	June 1st – September 29th	December 1st – March 30(31)
Review and FSA	30 days after issuance of report	
Facility Study	7 months after issuance of report (30 days for FSA + 6 months for study)	
Review and ISA/CSA or WMPA	ISA & WMPA: 60 days after issuance of report CSA: 90 days after issuance of report	

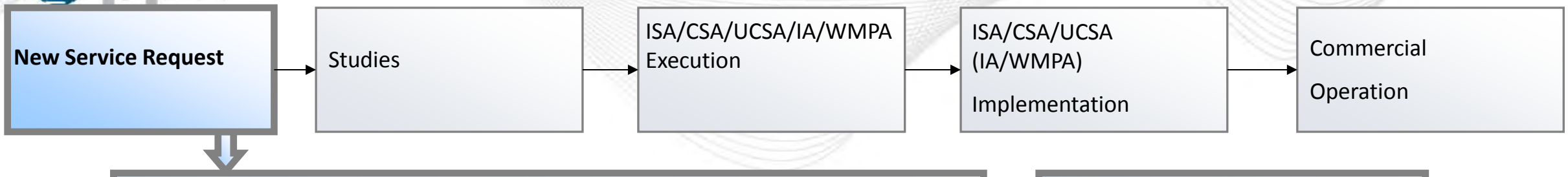
Queue Timelines (New – if approved)

Queue window	April 1st – September 30th	October 1st – March 31st
Feasibility Study	November 1st – January 31st	May 1st – July 31st
Review and SISA	30 days after issuance of report	
Impact Study (120 days)	May 1st –August 29th	November 1st – March 1st
Review and FSA	30 days after issuance of report	
Facility Study	7 months after issuance of report (30 days for FSA + 6 months for study)	
Review and ISA/CSA or WMPA	ISA & WMPA: 60 days after issuance of report CSA: 90 days after issuance of report	

Queue Process Overview

- **Projects may drop out of the queue at any time**
- **Project size may be reduced but not increased**

Queue Process Overview



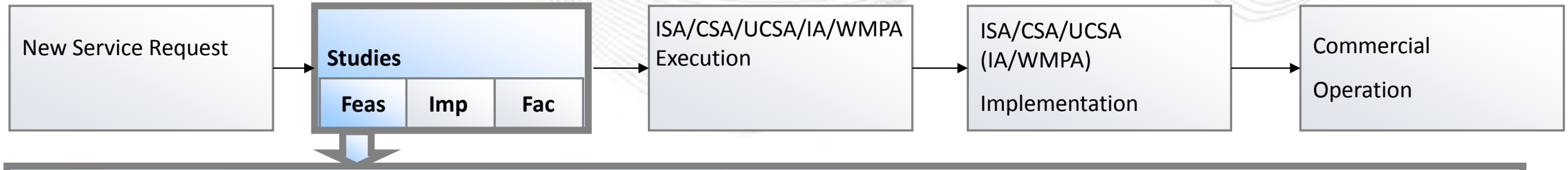
OATT Attachment N, Y, BB, S, EE

- N – Generation
- Y – Generation (<= 2 MW, <=5MW)
- BB – Generation (< 10kW, inverter based)
- S – Merchant Transmission
- EE – Upgrade Request

Required Information

- Location
- Project Size
- Ownership (site control for generation requests)
- Equipment Configuration
- Planned In-Service Date
- Deposit
- Data

Transmission service requests are received through OASIS and are then communicated to System Planning for inclusion in the New Services Queue with remainder of the New Service Requests



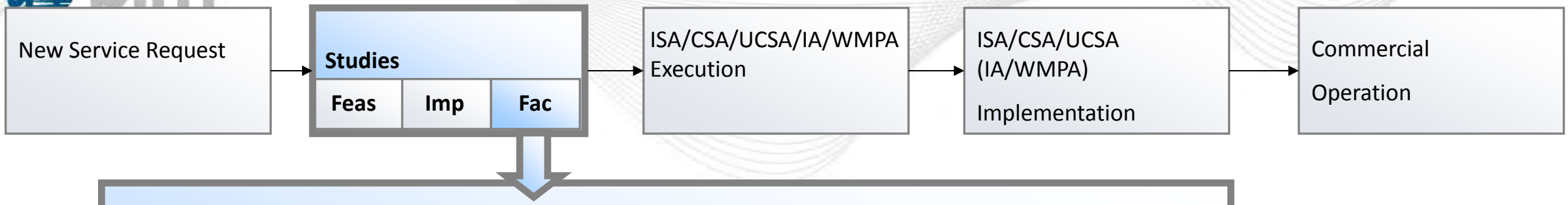
Feasibility Study (Long Term Firm - Initial Study ; Not performed for Upgrade Requests)

- Required
  - Deposit based on request receipt timing and MW/MVA size
  - Site control for generation requests
  - In-service date within 7 years of entering queue (exceptions allowed)
- Study Completion
  - Target approximately 120 Days after close of queue
- Study By
  - PJM and TO (Contractor under direction of TO)
- Results
  - Attachment Facilities Needed for Interconnection
  - Gen & Load Deliverability Analysis
    - Identify Transmission Overloads and Required Upgrades (Costs and Construction Schedule Estimates for primary POI)
    - Identify overloads associated with secondary POI (no cost or schedule estimates)
  - Short Circuit Analysis

Queue Process Overview

Impact Study (Start of analysis for Upgrade Requests)

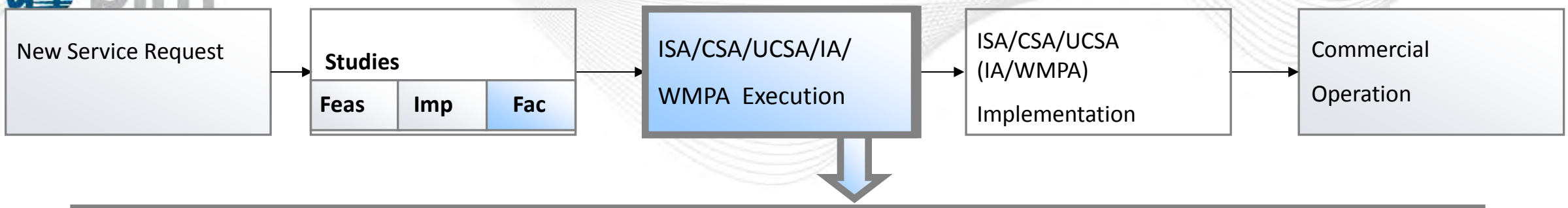
- Required
  - Deposit based on MW/MVA size
  - Initial Air Permit Application (N/A for solar/wind projects)
  - Ownership (site control for Transmission Interconnection Requests)
- Study Completion
  - Target 120 days after start of queue study or execution of Impact Study Agreement
- Study By
  - PJM and TO (Contractor under direction of TO)
  - Affected Systems
- Results
  - Gen & Load Deliverability Analysis
    - Identify Transmission Overloads and Required Upgrades (Single POI)
  - Stability Analysis
  - Short Circuit Analysis
  - Cost Estimates and Allocations



Facilities Study (Initial Engineering Review)

- Conduct governed by procedures as set forth in Attachment D of Manual M-14A
- Required
  - Deposit based on MW/MVA size
- Completion
  - 6 Months (estimated)
- Study By
  - TO (or Contractor under direction of TO)
  - Affected System study
- Results
  - Conceptual Design (Detailed Design as appropriate) for:
    - Attachment Facilities
    - Network Upgrades
  - Cost Estimates
  - Preliminary Engineering and Construction Schedule
- Potential for Impact Study re-tool
- Additional studies as required by type of technology being connected

Queue Process Overview



Type of Interconnection Agreement used is based on FERC jurisdictional

determination

- Interconnection Services Agreement (ISA) used if project is FERC jurisdictional
- Wholesale Market Participant Agreement (WMPA) used if not FERC jurisdictional
    - Will require additional 2 party Interconnection Agreement between Developer and TO
- Interconnection Construction Service Agreement (CSA) identifies terms, conditions, and coordinates construction activities for Attachment Facilities and Network Upgrades
- Upgrade Construction Service Agreement (UCSA) identifies terms, conditions, and coordinates construction activities for Network Upgrades

Feasibility Study

- High level, initial evaluation of project
- Customer can select a primary and secondary Point of Interconnection (POI)
- Estimates are desk-side level estimates (no field evaluation)
- Customers have 30 days to evaluate results and sign a System Impact Study Agreement (SISA)

- Refinement of Feasibility Study results
- Customer must select a single POI (if two were evaluated in the Feasibility Study)
- Analysis incorporates any changes that occurred since the Feasibility Study analysis was performed
- Estimates are still desk-side
- Customers have 30 days to evaluate results and sign a Facility Study Agreement (FSA)

Facility Study

- Transmission Owner has majority of work
- PJM analysis required only if work is deferred from the System Impact Study phase
- Field review may be performed if required by Transmission Owner

Agreements

- Interconnection Service Agreement (ISA) for any generator or merchant transmission facility connecting to a FERC-jurisdictional facility

- Wholesale Market Participation Agreement (WMPA) for any generation project connecting to a state-jurisdictional facility

- Upgrade Construction Service Agreement (UCSA) for transmission upgrade requests

- Small projects (≤ 20 MW)

- Perform all work for Feasibility and System Impact Study and issue report by the deadline for the Feasibility Study

Initial Study
(Transmission Service Studies)

- High level, initial evaluation of project
- Customers receive indications of impacts to the system
  - No reinforcements, costs, or time to construct
- Customers have 30 days to evaluate results and sign a System Impact Study Agreement (SISA)

Alternate Queue

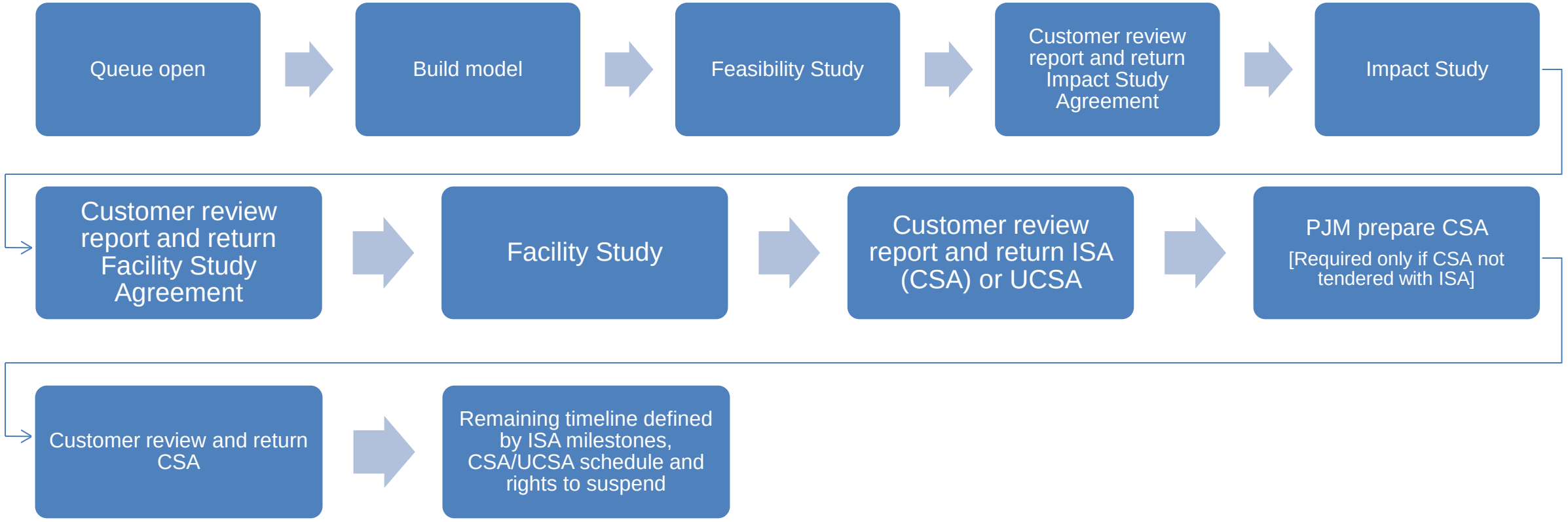
- Developed as a means to remove small project analysis interactions with larger project analysis
- PJM makes determination of Alternate Queue during Feasibility Study load flow analysis
- Alternate Queue projects will not be studied by PJM beyond the initial screening
- Transmission Owners will complete remaining studies required for the project to be consistent with Feasibility, Impact, and Facility Study analysis

- Criteria
  - project cannot be connected to a PJM monitored transmission facility as defined in PJM Manual M-03
  - project cannot be an uprate or addition to an existing facility
  - project distribution factor for any PJM monitored transmission facility may not exceed 5 percent and the MW impact of the project cannot be greater than 1 percent of the element rating
  - project may not connect to the same Point of Interconnection as any other project
  - aggregate impact of all projects connecting on any individual radial connection to a PJM monitored transmission facility shall not exceed 1 percent of line rating

Upgrade Request studies

- Customer provides MW quantity with source-sink
- Determine impacted flowgates through analysis of markets based case
- Determine impacted facilities by comparing markets based case results to queue case
- Work with transmission owners to provide system impact study
  - Much less time to review impacts and design reinforcements without feasibility study

New Service Queue Process Overview (Allows for multiple reviews of impacts)



Next Steps

- Schedule next meeting of PC sub group in order to discuss possible path forward?
- Return item(s) to PC for expanded reviews?
- Other thoughts?

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