Interconnection Reform Task Force
PJM Solution Proposal Framework

Jason Connell
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Infrastructure Planning

Overview

- Framework was created by PJM staff and management over several sessions
- The framework borrows heavily from interconnection processes in other RTOs
- Proposed solution is still a work in progress as details still need to be further developed

Guiding Principles for PJM's Proposed Solution

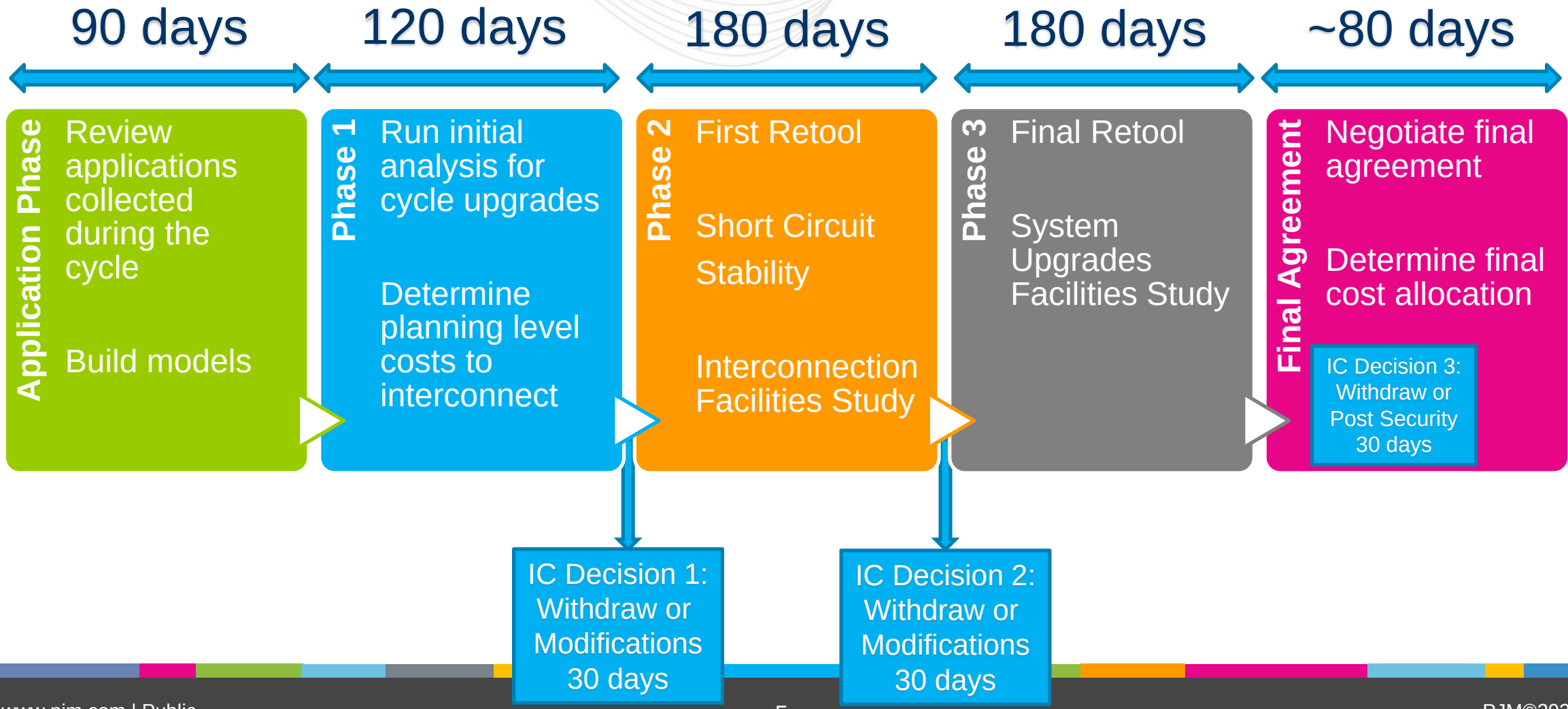
- Ideal timing not to exceed 2 years
- Cost and study construct should be cluster/cycle based and convert from first in/first out processing to first ready/first out processing
  - Readiness demonstrated by site control and financial milestones
- Subsequent cycle management should be assessed based on completion of a certain point in the prior cycle to minimize backlog
- Provide customers with more actionable information, earlier in the process
- Attempt to merge all other application types into new process
- State jurisdictional projects should first receive their interconnection agreement from the Transmission Owner / Distribution Provider prior to coming to PJM

Guiding Principles for PJM's Proposed Solution

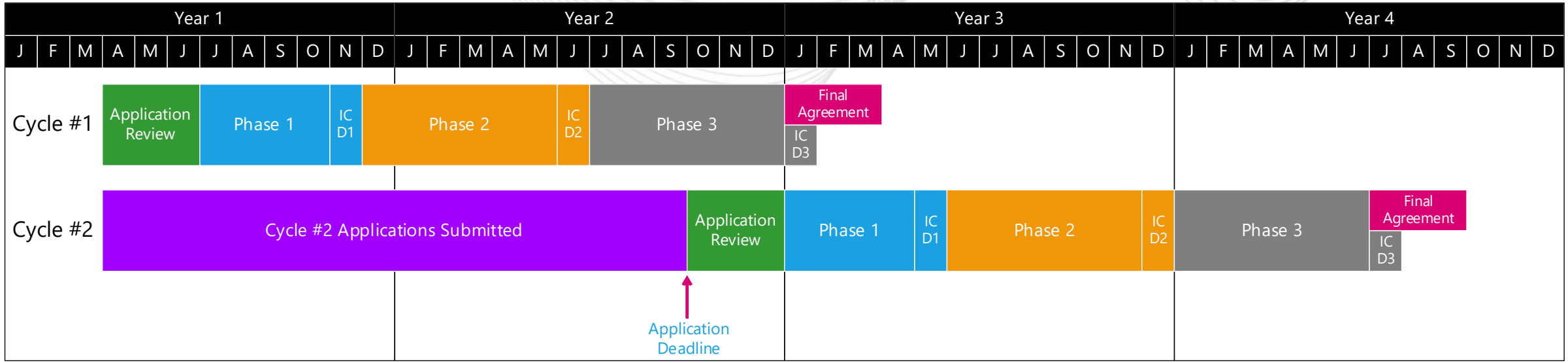
- Remove incremental financial rights for generators for simplification and due to removal of first-to-cause construct
- Remove other generation interconnection request forms (Attachments Y & BB) for simplification
- Remove or reduce scope of pre-application process
- Make project changes predictable from a process viewpoint and automatic to provide certainty to customers
- Allow off-ramps for generators proceeding through the process at various decision points

New Framework Overview

Total time per cycle – 710 days



New Framework Timeline Example



Subsequent Cycle Start

- Application deadline will be announced 60 days in advance.
- Only completed applications received by the Application Deadline will be considered for the upcoming Cycle.
- Applications will only be reviewed during the Application Review period.
- Phase 1 of Cycle #2 will only start after Phase 3 of the previous cycle has concluded AND all Application Review period activities have concluded.

Application Review Phase

- Single closing period for kicking off a cycle
- Allow a defined window to review all active applications from the open cycle
  - Do not review applications “mid-stream”
- Single application agreement with a unified study deposit and milestone payments
  - Typical data required + dynamic data up front
  - Shared facilities agreement required if connecting behind another POI
- Site control for generating site required and will be revisited throughout the process
- Single Point of Interconnection only

Phase 1 Details

- Analysis Provided
  - Summer Peak load flow
  - Light load season load flow
  - This analysis will be the equivalent of an Impact study analysis at full commercial probability and DC & AC
- Interconnection Facilities
  - Scope, cost, schedule – planning desk-side estimate
- System Upgrades
  - Scope, cost, schedule – planning desk-side estimate
  - Cost allocation
- Results provided as a single cycle format (e.g. spreadsheet)

IC Decision 1

- Reduce the output of the request (both MFO & CIR)
  - Numbers still to be finalized but considering any amount in this decision window
- Point of Interconnection finalized
  - Location along transmission line or
  - Substation breaker position
- Equipment changes
- Withdraw project
- Decide whether direct connection network upgrades will be subject to Option to Build
- Provide site control for customer Attachment Facilities to the Point of Interconnection
- Off ramp for projects that do not require a Facilities Study and do not contribute to the need for network upgrades

Phase 2 Details

- Analysis Provided
  - Retool load flow results
  - Short circuit study
  - Initial affected system study results (if needed)
  - Stability analysis

- Interconnection Facilities
  - Transmission Owner to perform Facilities study

- System Upgrades
  - Scope, cost, schedule, & cost allocation

IC Decision 2

- Reduce the output of the request (both MFO & CIR)
  - A smaller amount than what is allowed at IC Decision 1 (likely 10%-20%)
- Equipment changes under permissible technology changes
- Withdraw project
- Off-ramp for projects that only have interconnection facilities and do not contribute to the need for network upgrades. They can proceed directly to a final agreement

Phase 3 Details

- Analysis Provided
  - Final retool of all Phase 2 analyses
  - Final affected system study (if needed)
- Interconnection Facilities
  - Target back-feed dates
- System Upgrades
  - Final cost allocation
  - Transmission Owner Facilities study
- Agreement Related
  - Draft ISA/CSA
  - Security calculation

IC Decision 3

- Withdraw project
- Post security for upgrade cost allocation and indicate the project will proceed to a final agreement.
- Developer to provide site control (generation site and attachment facilities) for review again.

Final Agreement Phase Details

- Negotiate final agreement details including milestones, construction schedule, site control review, and Transmission Owner input
- True-up final security as required for projects that may have withdrawn during IC Decision 3
- Perform any remaining retool necessary to ensure system upgrades are still needed
- No ability to suspend a project - construction delays will be handled with milestone extensions for issues outside of the developer's control
- 15 business days to execute once tendered

Affected System Studies Education & Cost Allocation

Ed Franks
Sr. Lead Engineer
Interconnection Analysis

PJM Affected Systems

- Affected Systems that PJM coordinates with:
  - NYISO
  - MISO
  - LG&E
  - TVA
  - Duke Energy Progress

Affected Systems Coordination – Present Process

Feasibility Phase: PJM runs an affected system DFAX-based screen and sends a list of PJM queue projects to potential affected systems for their review.

Impact Study Phase: PJM coordinates with affected systems to determine which PJM queue projects require affected system studies. Include affected system results with Impact Study if available.

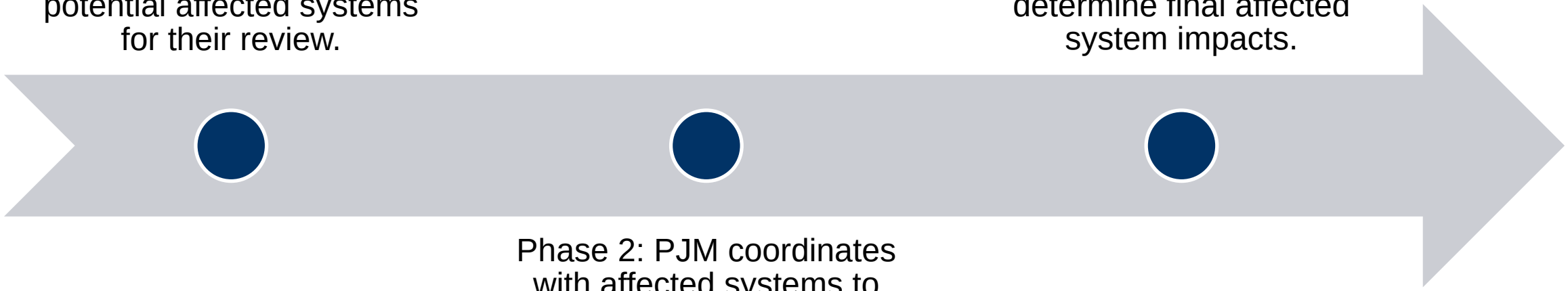
Facilities Study Phase: PJM coordinates with affected systems to determine final affected system impacts.

Affected Systems Coordination – Proposed Revised Process

Phase 1: PJM runs affected system screen and sends a list of PJM queue projects to potential affected systems for their review.

Phase 2: PJM coordinates with affected systems to determine which PJM queue projects require affected system studies. Include affected system results in Phase 2 if applicable.

Phase 3: PJM coordinates with affected systems to determine final affected system impacts.



Affected Systems Challenges

- Some affected systems require an Affected System Study Agreement be executed with PJM IC before an affected system study will be performed. If IC delays initiating the Affected System Study Agreement with the affected system, it can cause delays in obtaining affected system results.

- PJM requests affected system results to align with PJM interconnection process timeline. The affected systems may have other internal priorities/schedules which can cause delays in obtaining affected system results.

- Consider options if no final affected system results are available when completing Phase 3 and drafting final agreements.

Cost Allocation – Present Process Example

- Cost for a required system upgrade is allocated among the queue projects which contribute to the need for the system upgrade.
- Cost is proportional to the MW contribution from each queue project.
- Cost allocation starts with the “driver” or “first to cause” project. No minimum thresholds apply for the first to cause project.
- Subsequently queued projects who contribute to the constraint and need for upgrade are allocated cost. (See Manual 14A, Att. B.3 for full cost allocation details/thresholds).
  - Minimum thresholds: Add at least 1% loading; Also meet either 5% DFAX OR 5% loading increase
- Less than $5M: cost allocation remains in the queue cycle (e.g. “Z1” Queue) which drives the need for the upgrade.
- Greater than $5M: cost allocation can extend into subsequently queued cycles (e.g. “Z1” and “Z2” Queues).
  - Contributors will be allocated costs if their New Service Queue Close Date occurs less than 5 years following the execution of the first ISA or UCSA which identifies the need for the Network Upgrade.

Queue	MW contribution	Percentage of Cost	$ cost ($ 8.0 M)
Z1-200	10	25.00%	2.0000
Z1-208	10	25.00%	2.0000
Z2-287	20	50.00%	4.0000

Queue	MW contribution	Percentage of Cost	$ Cost ($ 4.0 M)
Z1-200	10	50.00%	2.00
Z1-208	10	50.00%	2.00

Cost Allocation – Proposed Revised Process Example

- Cost for a required system upgrade is allocated among the queue projects which contribute to the need for the system upgrade.
- Cost is proportional to the MW contribution from each queue project.
- Re-evaluate minimum thresholds and update as appropriate
- No queue priority within a queue cycle – all contributing queue projects are subject to cost allocation.
- Cost allocation remains in the queue cycle which drives the need for the upgrade.

Queue Cycle 1	MW contribution	Percentage of Cost	$ Cost ($ 4.0 M)
Project A	10	25.00%	1.00
Project B	30	75.00%	3.00

Cost Allocation – Challenges

- The present process can provide a lack of cost certainty due to the number of prior queue cycles still under study. As prior queued customers move through the process and potentially withdraw from the Queue, first to cause projects can change and be pushed out to different queue positions and different queue cycles.
  - Cost certainty should be improved with new proposed process compared to present process. Should not have upgrade needs shifting to later queued cycles as much.
  - Starting the next cycle when the previous cycle is near complete will minimize this potential cost shifting between cycles.

- A first to cause project or cycle is not always able to be identified due to different cases/models being used for different queue cycles. A constraint/overload can exist in queue cycle ‘B’ basecase (before projects in cycle B are considered), but is not a constraint/overload in the prior queue cycle ‘A’ case. The constraint may also not be identified as an RTEP violation/baseline upgrade.

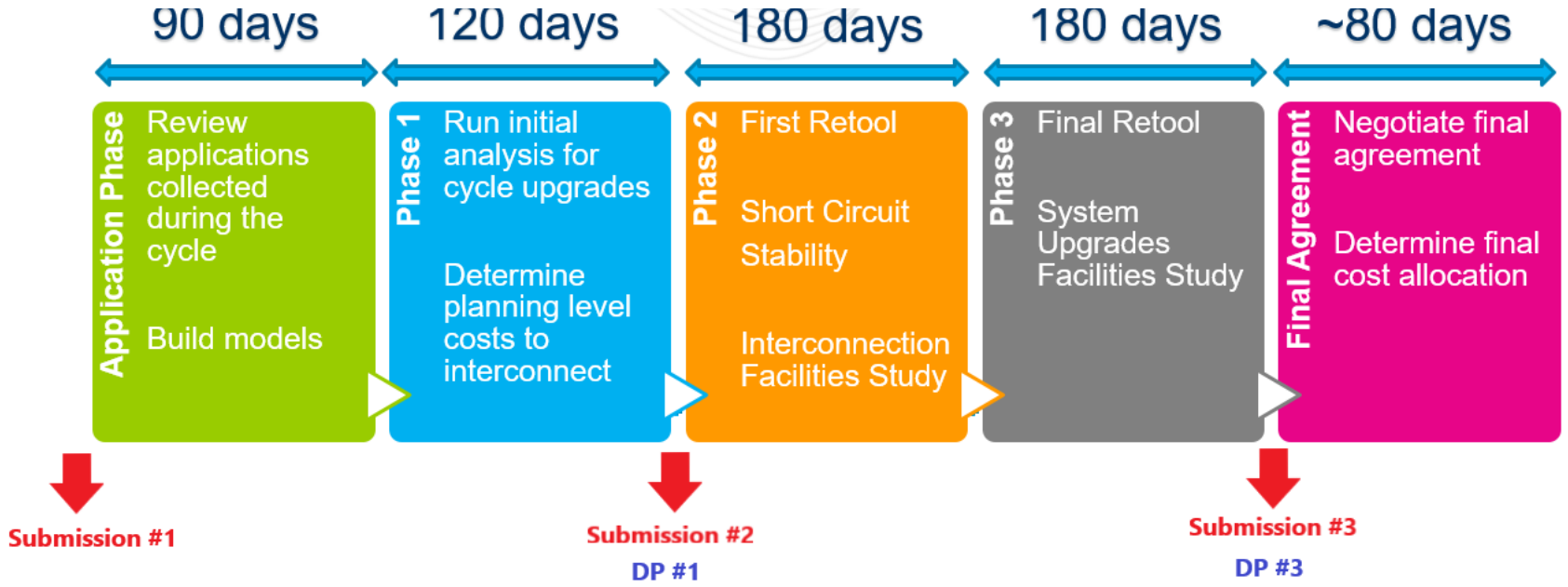
- Consider clearly defining how to allocate underlying system constraints/upgrades identified by the TOs per TO local planning criteria and not the PJM Deliverability criteria.

Site Control Proposal

Lisa Krizenoskas
Sr. Lead Engineer
Interconnection Projects

Site Control: Current versus Proposed

Site Control	PJM Current	PJM Proposed Reform
Timing	Initial application only	**Submission 1:** Initial application. (90 days prior to Phase 1). **Submission 2:** At Decision Point 1. (Prior to Phase 2). **Submission 3:** At Decision Point 3. (Prior to Agreement Phase).



Site Control: Current versus Proposed

Site Control	PJM Current	PJM Proposed Reform
Form of Evidence	Lease/deed/option to lease or purchase generating site. (No MOUs or LOIs)	**Submission 1:** Lease/deed/option to lease or purchase generating site + site plan including location of collector station, gen tie, interconnection facilities to POI. **Submission 2:** Continued control of generating site + full site control for interconnection facilities and network upgrades to POI + same site plan. **Submission 3:** Continued control of same generating site + continued full site control for same interconnection facilities to POI + same site plan.
Term	3 years large gen 2 years small gen	**Submission 1:** 1 Year **Submission 2:** +1 Year (both gen site and interconnection facilities and network upgrades to POI) **Submission 3:** Term to date past COD (both gen site and interconnection facilities and network upgrades to POI)

Site Control: Current versus Proposed

Site Control	PJM Current	PJM Proposed Reform
Exclusivity	Exclusivity evidence required in lease/option to lease/deed (can't sublease)/option to purchase	No changes from current
Acreage requirements	Not specified	Will provide acreage requirements for various fuel types
Same site control?	Must show site plan with location of multiple projects	• Identification of other projects sharing site (same owner) • Proposed space utilization by all projects (same owner)
Supplemental	Site control + Officer Certification	Site control + Attestation (new template form, signed by landowner)
Changes to site?	Not specifically addressed	No changes permitted

Study and Readiness Deposit Proposal

Jason Shoemaker
Manager
Interconnection Projects

Concepts and Guiding Principles

- Propose to increase the amount of financial commitment commensurate with study results
- One mechanism used for projects to demonstrate their readiness
- Adverse study results test provides off ramp where there are significant cost increases between phases

Deposit Definitions

- Study Deposit
  - Covers the study costs
  - Fully refundable minus actual study costs
  - Due one time at the beginning of the study process

- Readiness Deposit (RD)
  - Funds committed based upon study results
  - Not used to fund studies
  - Refunds subject to study phase and adverse study results test
  - RDs determined at the time they are due; not to be refunded or reduced based upon later project reductions or cost allocation changes
  - Maximum of three RDs due at the project decision points

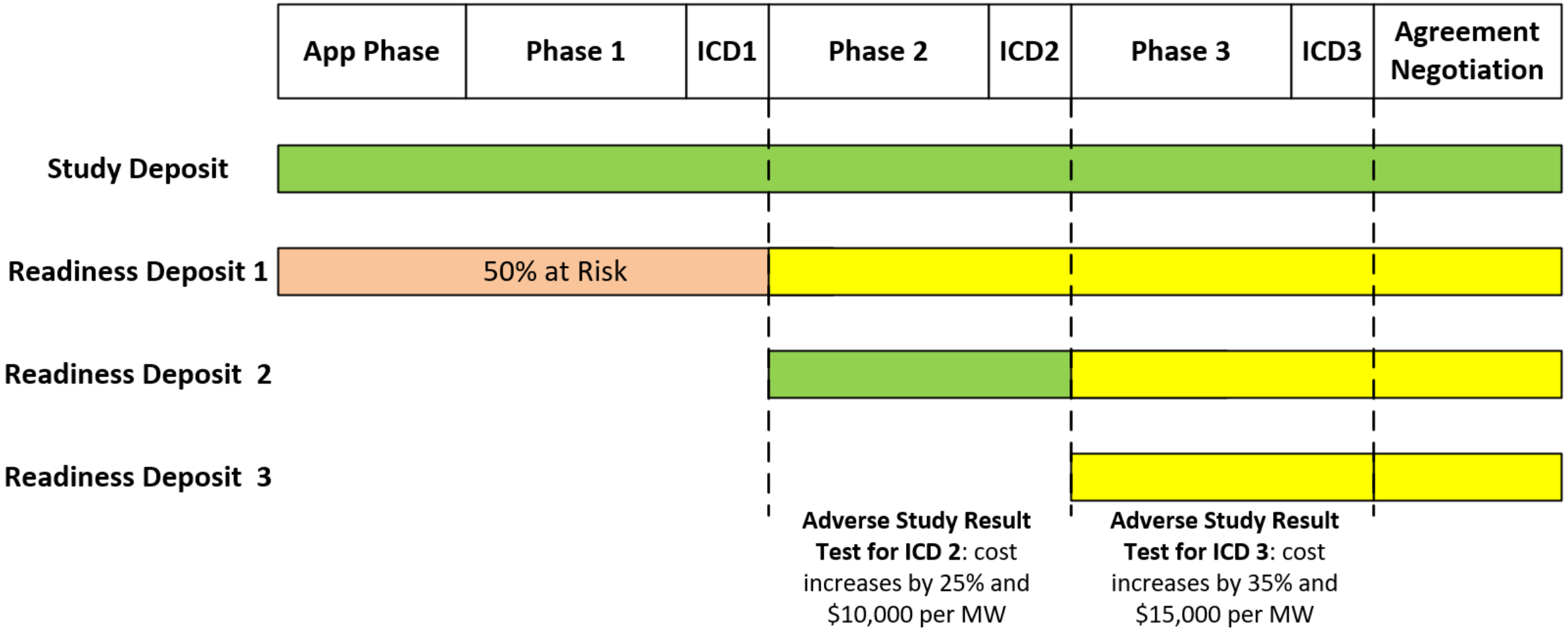
Deposit Calculations

- Study Deposit

Project Size	Study Deposit
0 - 20MW	$75,000
> 20 – 50MW	$200,000
> 50 – 100MW	$250,000
> 100 – 250MW	$300,000
> 250 – 750MW	$350,000
> 750MW	$400,000

- Readiness Deposits
  - RD1 = $4,000 per MW
  - RD2 = (10% of cost allocation towards required Network Upgrades) – RD1
  - RD3 = (20% of cost allocation towards required Network Upgrades) – RD1 – RD2

Study and Readiness Deposit Timeline



Treatment of Readiness Payments due to Adverse Study Results

- At IC Decision 2
  - Increase in Network Upgrade costs allocated to the project of 25% or greater **and** more than $10,000 per MW from phase 1 study results

- At IC Decision 3
  - Increase in Network Upgrade costs allocated to the project of 35% or greater **and** more than $25,000 per MW from phase 2 study results

Process Transition Options

Jason Connell
Director
Infrastructure Planning

Process Transition Options

- Primary questions
  - When to transition to the new process?
  - What to do with requests that have already been submitted?
- Options
  - Can run from one extreme to another: from starting over fresh to delaying the new process until all current requests under the existing rules are completed (currently 2000+ requests)
  - Is a hybrid option where the new rules apply to existing requests palatable?

Contact

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