

# **COALITION STAKEHOLDER PACKAGE**

## **PJM IPRTF Solution**

September 20, 2021

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# Executive Summary

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Transitional Serial was developed to:

- Provides “transitional equity”. Allow ICs the opportunity between serial network funding (“Transitional Serial”) or cluster network funding.
- Avoids “contamination” ... ICs with no network upgrades won’t be forced into a cluster where they may have to fund network upgrades.
- There will be “broken PPAs” without an equitable process.
- Clean projects (no network upgrades) would likely choose the Transitional Serial.



# Introduction

- Several companies worked together to develop a framework for a Transitional Serial and revised PJM Cluster Process.
- Transitional Serial is a bridge between the Traditional Serial and Cluster Process.
- Interconnection Customer (IC) reserves the right to be studied under the Transitional Serial or Cluster Process.



# Transitional Serial

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- New process built on the rules of the current (Traditional Serial) with certain new requirements that are like those in the Cluster Process.
  - Study Deposit
  - Readiness Deposits
  - Site Control Requirements
  - Affected System performance at decision points (if applicable)
- The above deposits and site control requirements could cause immature projects to withdraw.
- **Suspension of milestone dates limited to one year.**



# Transitional Serial

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## At FERC Approval Date

1. All ICs with tendered ISAs or ISAs tendered by PJM within 10 Business Days after FERC Approval Date can remain in the Traditional Serial.
2. All ICs in the AH1 queue or earlier can choose 1) Transitional Serial or 2) Cluster Process.
3. ICs that don't meet the new deposit and site control requirements are withdrawn.



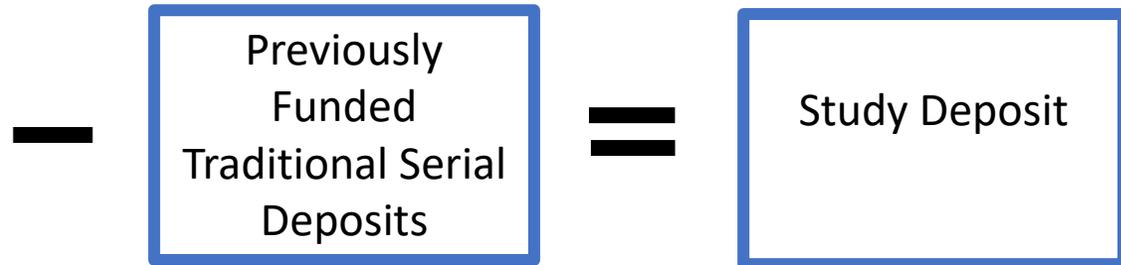
# Common Design Elements



# Study Deposits – Transitional Serial & Cluster Process

- Study Deposit (SD)
  - Covers the study costs
  - Refundable less actual study costs
  - Due one time after FERC Approval Date

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



# Readiness Deposits – Transitional Serial & Cluster Process

- Readiness Deposit (RD)

- Funds committed based upon study results
- Not used to fund studies
- Refunds subject to study phase and adverse test results
- RDs determined at the time they are due; not to be funded or reduced or reduced based upon later project reductions or cost allocations.
- Allocated Upgrades = Allocated Network Upgrades (NU)

Transitional Serial	
Phase	Readiness Deposit
Feasibility	RD1 = \$4000/MW
System Impact	RD1 = \$4000/MW or 0*
Facility	RD3 = 20% of Allocated Upgrades – RD1

Cluster Process	
Phase	Readiness Deposit
Application	RD1 = \$4000/MW or 0*
Phase 2	RD2 = 10% of Allocated Upgrades – RD1
Phase 3	RD3 = 20% of Allocated Upgrades – RD2 - RD1

\* If RD1 was previously provided, no additional deposit is required.



# Site Control



# Site Control: Form of Evidence Transitional Serial & Cluster Process

Transitional Serial (Application) or Cluster Process (Submission #1 –Application)	
Full Site Control for:	Site Plan Showing:
Generating Facility: Deed/Lease/Option	Generating Site, Interconnection Facility, Interconnection Switchyard (if required)
Transitional Serial (Facility Study) or Cluster Process (Submission #2 – Decision Point 2)	
Full Site Control for:	Site Plan Showing:
Generating Facility: Deed/Lease/Option Interconnection Facilities: Deed/Lease/Option/ROW Interconnection Switchyard: Deed/Lease/Option	Generating Site Interconnection Facilities Interconnection Switchyard (if required)
Transitional Serial (ISA) or Cluster Process (Submission #3 – Decision Point 3)	
Full Site Control for:	Site Plan Showing:
Generating Facility: Deed/Lease/Option Interconnection Facilities: Deed/Lease/option/ROW Interconnection Switchyard: Deed/Lease/Option	Generating Site Interconnection Facilities Interconnection Switchyard (if required)



# Site Control: Term & Officer Certification Transitional Serial & Cluster Process

Transitional Serial (Application) or Cluster Process (Submission #1 –Application)	
Full Site Control	Term Requirement for Site Control & Officer Certification
Generating Facility: Deed/Lease/Option	Transitional Serial: Term 3 years from the date at which the Queue Window closed. Cluster: Term 2 years from Application Deadline
Transitional Serial (Facility Study) or Cluster Process (Submission #2 – Decision Point 2)	
Full Site Control	Term Requirement for Site Control & Officer Certification
Generating Facility: Deed/Lease/Option Interconnection Facilities: Deed/Lease/Option/ROW Interconnection Switchyard: Deed/Lease/Option	Transitional Serial: Term 1 year from the start of the Facility Study. Cluster: Term 1 year from the end of Phase 2
Transitional Serial (ISA) or Cluster Process (Submission #3 – Decision Point 3)	
Full Site Control for:	Term Requirement for Site Control & Officer Certification
Generating Facility: Deed/Lease/Option Interconnection Facilities: Deed/Lease/Option/ROW Interconnection Switchyard: Deed/Lease/Option	Transitional Serial: Term 4 years from end of Facility Study Cluster: Term 4 years from end of Phase 3.*

\*Note: If 100% of site control is not obtained by end of Facility Study or Decision Point 3, then the IC must show concrete evidence acceptable to PJM they are in negotiations to achieve 100% of all site control for a period of at least 4 years from the end of the Facility Study or Phase 3. PJM will add a condition precedent in the ISA Tariff template requiring that within 180 days of the effective date of the ISA, 100% site control be acquired for at least 4 years from the last day of Phase 3. If 100% of site control is not obtained within 180 days of the effective date of the ISA, then the project will automatically be deemed terminated and will be withdrawn from the Interconnection Process.



# More on Site Control: Transitional Serial & Cluster Process

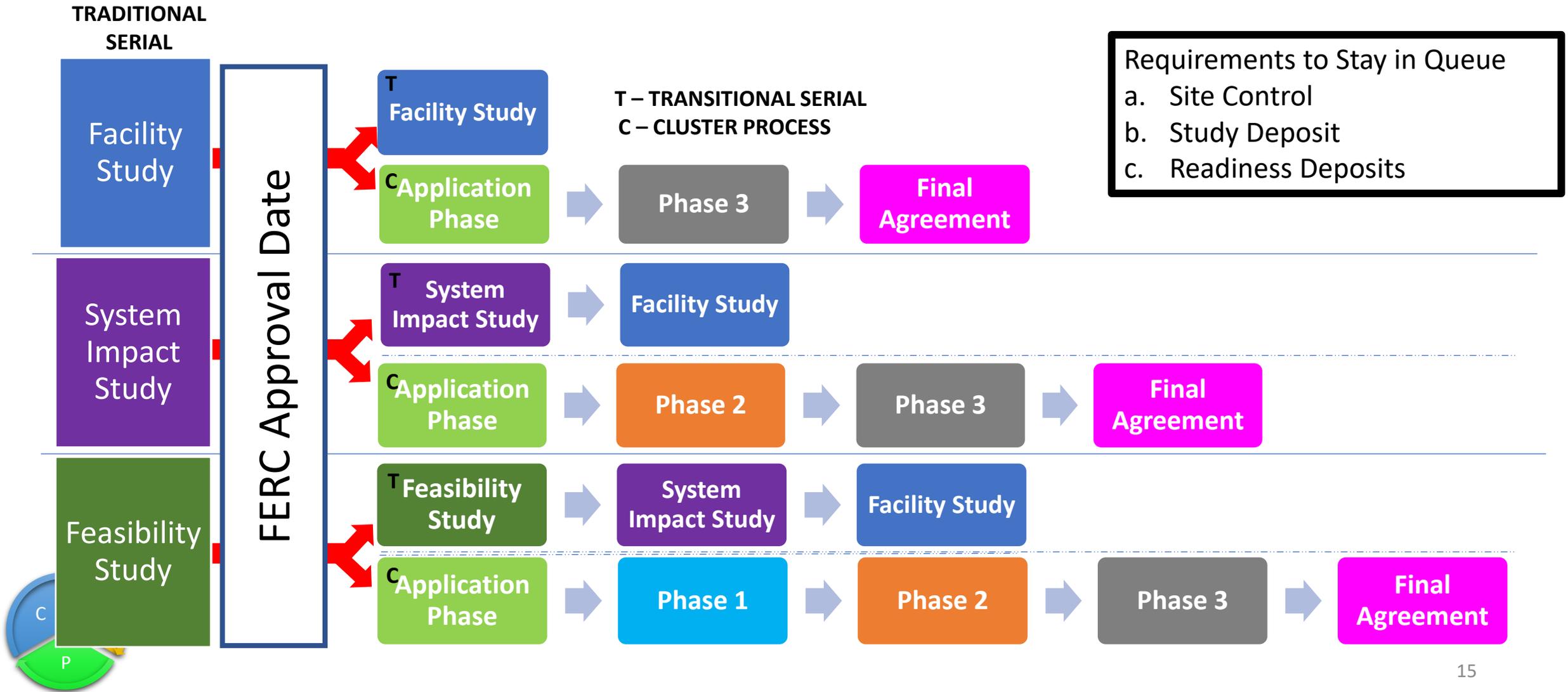
Site Control	More on Site Control	
Exclusivity	Exclusivity evidence required in deed/lease/option	
Acreage Requirement	Solar: 5 acres/MW	Synchronous Generator: 10 acres/MW
	Wind: 30 acres/MW	PE Stamped Site Plan will be accepted
	Battery Storage: 0.1 Acres/MW	
Site Sharing	Identification of other projects share site (same owner) Proposed space utilization by all projects (same owner)	
Officer Certification	Site control + Officer Certification	
Changes to Site	Permitted if conditions exist on original location which could not have been discovered at Application Phase - eg geotech, environmental.	



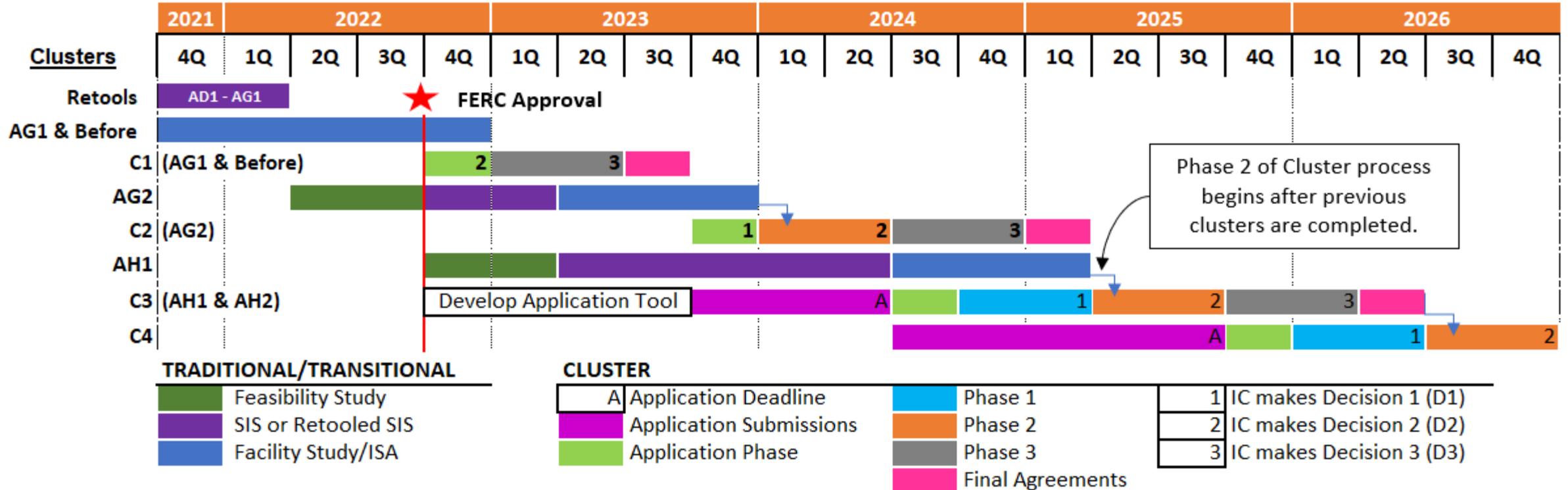
# Options after FERC Approval



# Options after FERC Approval Date



# Interconnection Schedule



Regardless of process, facility studies per each Point of Interconnection are completed individually. Traditional Serial allows projects to move forward when each facility study is completed instead of waiting for the facility studies for the entire cluster to be completed.



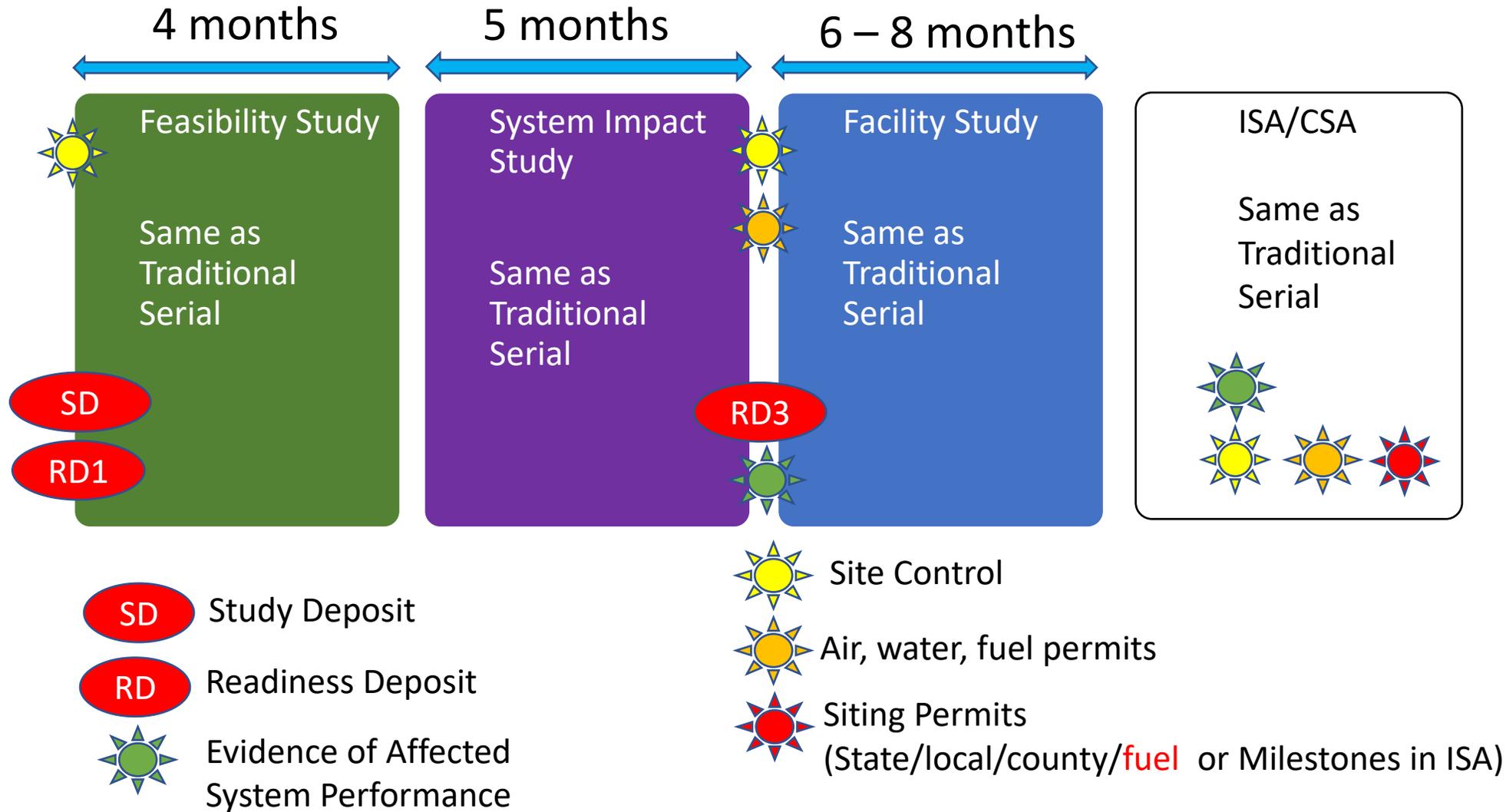
# Queue Priority

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- Clean projects move forward first
- The following is the priority for the clusters:
  1. AG1 & Before (in queue order) in Transitional Serial
  2. AG1 & Before in one combined Cluster Process
  3. AG2 (in queue order) in Transitional Serial
  4. AG2 in Cluster Process
  5. AH1 (in queue order) in Transitional Serial
  6. AH1 & AH2 in Cluster Process



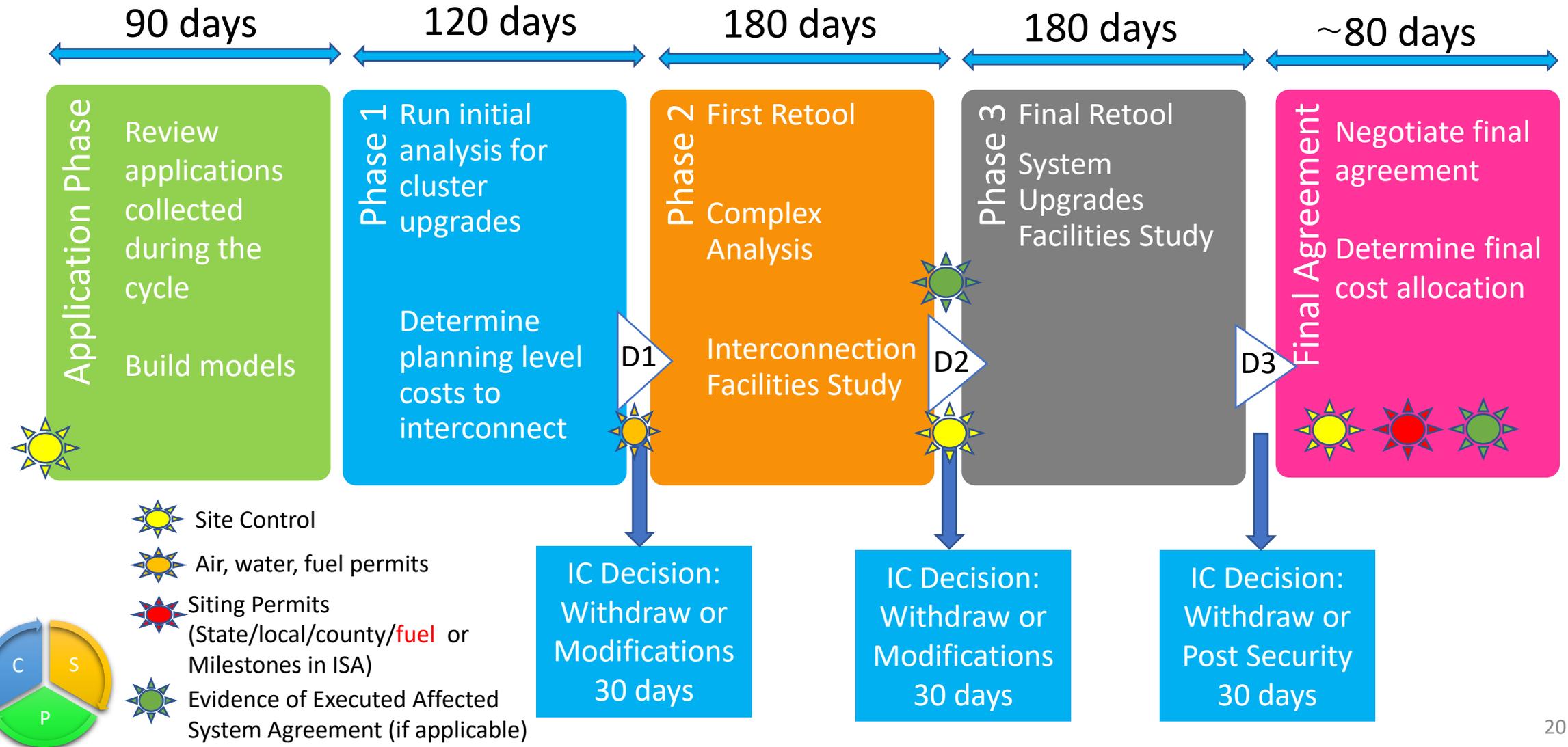
# Transitional Serial



# Cluster Process Details



# Cluster Process



# Cluster Process – 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
- **Affected System**
  - **PJM identifies potential adverse impacts to affected systems and ICs that may contribute.**
- Results provided as a single cycle format (e.g. spreadsheet)



# Cluster Process – IC Decision 1 (D1)

## Changes Permitted:

- Reduce the output of the request (both MFO & CIR)
  - Up to 100% of requested MFO and/or CIR value
- Point of Interconnection finalized
  - Location along transmission line or
  - Substation breaker position
- Equipment changes
- Withdraw project

## Customer Requirements:

- Decide whether direct connection network upgrades will be subject to Option to Build
- RD2 = (10% of the allocation of NU) - RD1
- Provide evidence of air, water and fuel permits (if applicable)

Off-ramp for projects that do not require a Facilities Study and do not contribute to network upgrades.



# Cluster Process – 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
- **Affected Systems**
  - IC initiates **Affected System Study Agreement** (when applicable).



# Cluster Process – IC Decision 2 (D2)

- Changes Permitted:
  - Reduce the output of the request (both MFO & CIR)
    - 20% of the amount studied for Phase 2
  - Equipment changes under permissible technology changes
  - Withdraw Project
- Customer Requirements:
  - RD3 = (20% of the allocation of NU)
  - Enter into Affected System Agreement (if applicable)
  - Provide Site Control Information
- Off-ramp for projects that only have interconnection and do not contribute to the need for network upgrades. They can proceed directly to final agreement.



# Cluster Process – 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
- **Affected Systems**
  - IC seeks finalized Affected System Study with workscope, cost and schedule.



# Cluster Process – IC Decision 3 (D3)

- Changes Permitted:
  - Withdraw project
- Customer Requirements:
  - Post security for NU cost allocation and indicated the project will proceed to a final agreement.
- Developer to provide Site Control Information
- Provide evidence of necessary state, county, local and fuel permits or milestones will be created for the final agreement
- IC provides evidence that Affected System Study has been completed. (if applicable).



# Cluster Process – Final Agreement Phase Details

- Negotiate final agreement details including milestones, construction schedule, site control review, and Transmission Owner input within 60 calendar days.
- 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.
- Project can suspend milestones for up to one year in total. Suspension periods are measurable and transparent while workscope changes are not.
- 15 Business Days to execute once tendered.



# **Study and Readiness Deposit Fees at Risk**

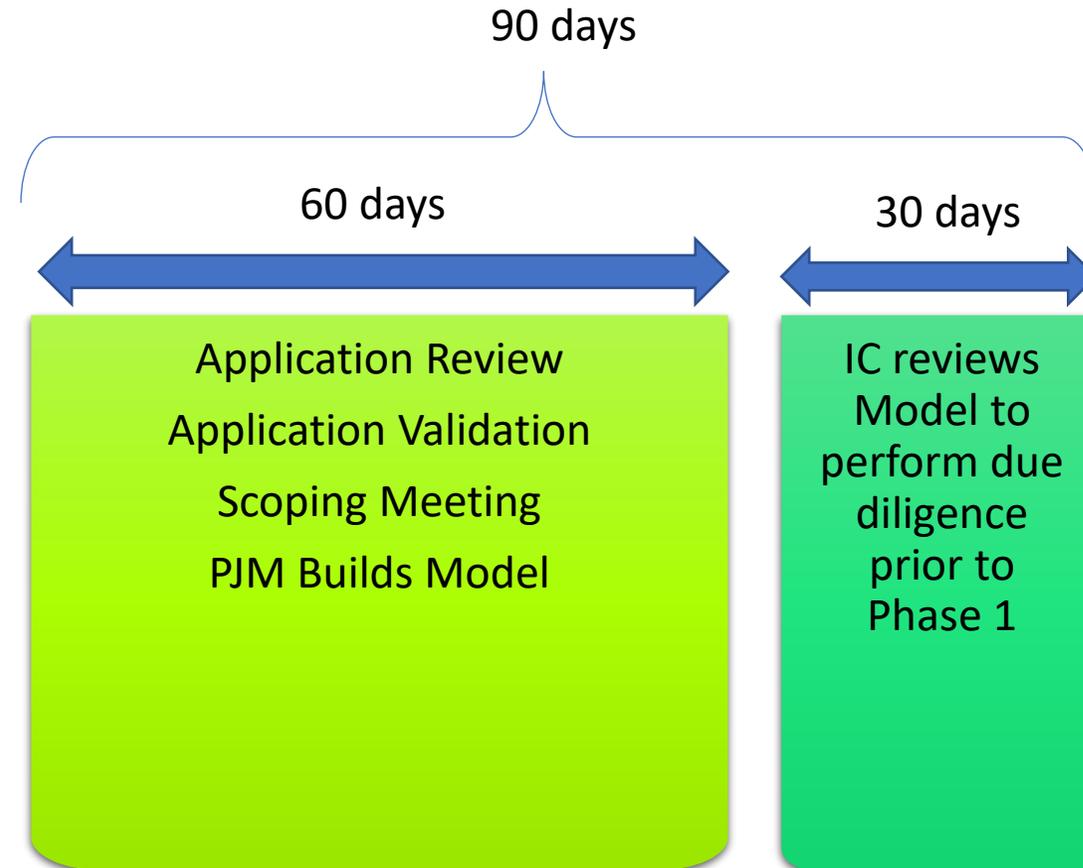


# Cluster Process - Application Phase

## Application Requirements

- Study Deposit (SD)
- Readiness Deposit (RD)
- Site Control
- Single Point of Interconnection

Application  
Submitted



IF IC withdraws, SD less actual cost is refunded.

IF IC withdraws, 100% of RD is refunded.



# Adverse Study Results – Transitional Serial & Cluster Process

- TRANSITION PROCESS

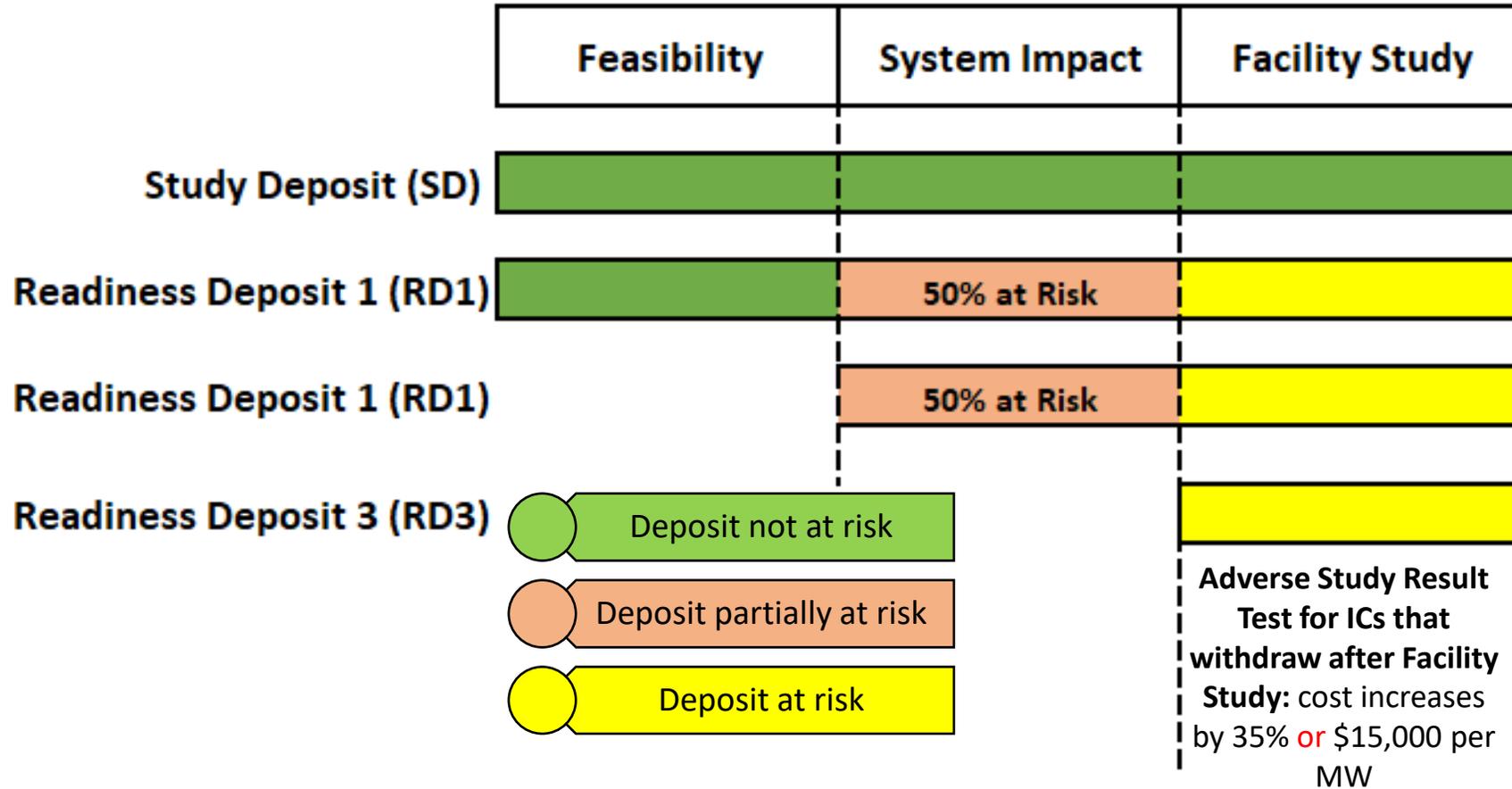
- Prior to the execution of an ISA, if Network Upgrades (NU) & Affected System Upgrades (ASU) cost increases by 35% or \$15,000/MW-MFO from results of System Impact Study (SIS) or Affected System Study, RD3 is refunded 100% if IC withdraws.

- CLUSTER PROCESS

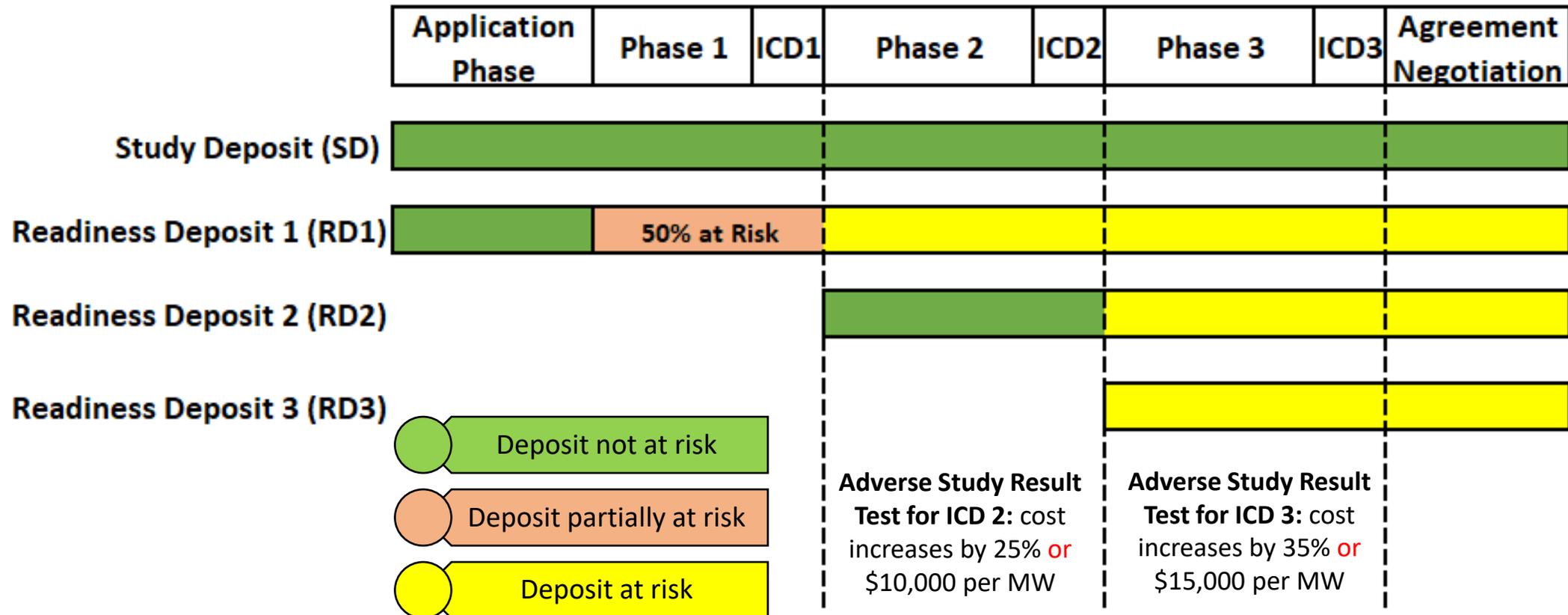
- At the end of Phase 2, when IC Decision (D2) is made – If NU & ASU cost increase by 25% or \$10,000/MW-MFO from results of Phase 1 or Affected System Study, RD2 is refunded 100% if IC withdraws.
- At end of Phase 3, when IC Decision (D3) is made – If NU & ASU cost increases by 35% or \$15,000/MW-MFO, RD3 is refunded 100% if IC withdraws.



# Transitional Serial – Study and Upgrade Deposit Timeline



# Cluster Process – Study and Upgrade Deposit Timeline



# Other Terms



# Need for Inter-queue Cluster Funding

- Large NUs are surfacing.
- High Allocated costs per IC can cause cascading withdraws and Dead Zones where renewables have best access to land.
- Completes funding of NUs that started in the Serial processes.
- Without inter-queue funding, later queued ICs can benefit for “free”.
- Allocating costs of super large NUs may be beyond the scope of the IPRTF.

ProjectId : n5609  
 Description : Rebuild 41.13 miles of 500 kV Line 576 from Midlothian to North Anna with 3-1351.5 125C ACSR.  
 Type : FAC  
 Total Cost : \$127,503,000  
 Time Estimate : 48-60 Months  
 Ratings : 4816.0/4816.0/5539.0

Queue	MW	Cost %	Cost \$
AC2-141	77.46	2.87%	\$3,654,134
AD1-025	41.93	1.55%	\$1,978,025
AD1-076	137.77	5.10%	\$6,499,226
AD1-151	41.9	1.55%	\$1,976,610
AE1-068	169.18	6.26%	\$7,980,976
AE1-069	135.34	5.01%	\$6,384,592
AE1-072	47.39	1.75%	\$2,235,456
AE1-173	274.68	10.16%	\$12,957,882
AE1-248	44.9	1.66%	\$2,118,133
AE2-031	99.14	3.67%	\$4,676,876
AE2-033	44.23	1.64%	\$2,086,527
AE2-051	52.79	1.95%	\$2,490,340
AE2-094	103.32	3.82%	\$4,874,066
AE2-122	254.67	9.42%	\$12,013,921
AE2-123	254.67	9.42%	\$12,013,921
AE2-124	254.69	9.42%	\$12,014,864
AE2-147	46.24	1.71%	\$2,181,347
AE2-156	28.76	1.06%	\$1,356,738
AE2-270	40.32	1.49%	\$1,902,074
AE2-313	60.53	2.24%	\$2,855,470
AF1-123	75.3	2.79%	\$3,552,237
AF1-124	75.3	2.79%	\$3,552,237
AF1-125	75.3	2.79%	\$3,552,237
AF1-128	63.09	2.33%	\$2,976,237
AF1-236	120.33	4.45%	\$5,676,503
AF2-042	83.57	3.09%	\$3,942,370

Traditional Process  
 Example shows NU cost of \$127 M is allocated to ICs in six different clusters.

Source: AF2-042 System Impact Study dated July, 2021.



# Cost Allocation for Network Upgrades

Design Component	Traditional & Transition Process	Cluster Process
Drivers	IC that is first to cause the need for the NU.	First Cluster to cause the need for the NU.
Threshold	Based on DFAX and MW contribution to the NU for those first to cause and higher (100% and above).	Based on DFAX and MW contribution to the NU for all projects
Inter-queue <sup>1</sup>	NU that is less than \$5 million is allocated to first to cause and subsequently queued projects in cluster. NU that cost more than \$5 million are allocated to first to cost cause and subsequently queued projects with a queue closing date 5 years after agreement that funds the NU is executed.	NU that is less than [\$5] million is allocated to cluster that causes the need for the upgrade. NU that cost more than [\$5] million are allocated to first cluster to cause the need for the upgrade and subsequently queued clusters with a queue closing date 5 years after agreement that funds the NU is executed.
Security/Funding	First to cause the need for the NU provides 100% of the cost of the NU at execution of ISA. Subsequently queued ICs will provide their pro-rata share of security when executing ISA and/or their payment when invoiced. Security for first to cause may be reduced.	ICs in Cluster provide their pro-rata share of NU at the execution of the ISA. Subsequently queued Clusters will pride their pro-rata share of security when executing ISA and/or their payment when invoiced.
Intersection with other system upgrades	Allowed if a baseline or supplemental obviates the need for a NU. Those upgrades become contingent facilities.	Allowed if a baseline or supplemental obviates the need for a NU. Those upgrades become contingent facilities.



<sup>1</sup>PJM's proposal does not allow of Inter-queue NU funding.

# Informational Needs

- Pre-application materials provided to ICs need to be more robust.
  - Ability to obtain accurate location, name and size of *transmission lines* from GIS coordinates.
  - Alternatively, consider a POI self check tool like MISO.
- Web-site Information – Updated Monthly
  - Provide List of currently known ASU and status of funding & schedule.
  - Provide List of ICs that are claiming CIRs from retired generators.
- Affected System Coordination
  - One stop location for related web-site links to find rules regarding Affected Systems per adjacent neighbor. i.e. What tariff/business rules govern the process, etc.?



# Appendix



# Contact Information

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# Acronyms

Acronyms	Name	Acronyms	Name
AD1, AD2, AE1, AE2, AF1, AF2, AG1, AG2, AH1, AH2, +	Traditional Process (Clusters)	IPRTF	Interconnection Process Reform Task Force
AS	Affected System	ISA	Interconnection Service Agreement
ASU	Affected System Upgrade	MFO	Maximum Facility Output
C1, C2, C3 +	Clusters (Cluster Process)	NU	Network Upgrade
CIR	Capacity Injection Rights	NU1, NU2, NU3	Network Upgrade Deposits
CSA	Construction Service Agreement	PD	Performance Deposit
CSP	Coalition Solution Package	POI	Point of Interconnection
D1, D2, D3	Decision Points (Cluster Process)	SD	Study Deposit
FERC	Federal Interconnection Regulatory Commission	SISA	System Impact Study Agreement
FSA	Facility Study Agreement	SIS	System Impact Study
IC	Interconnection Customer	TO	Transmission Owner

