

# T-D Interconnections: Best Value Planning White Paper

## Updated April 2023

### 1. Purpose

This paper defines the process and criteria that together constitute joint best value planning (BVP) between ATC and its customers. BVP completed as a joint effort between ATC and its customers is essential to ensuring the most appropriate solution selection and implementation for ATC's customers, the electric grid and other impacted stakeholders.

### 2. Background

According to Attachment FFATCLLC of the Midcontinent Independent System Operator, Inc. Open Access Transmission, Energy and Operating Reserve Markets Tariff ("Tariff"), ATC has an obligation to a party that requests a distribution interconnect to engage in BVP. This document discusses roles and responsibilities among ATC and its customers in satisfying this obligation.

### 3. Reference

ATC Load Interconnection Guide, current version found on [ATC's Customer Engagement, Connecting to the Grid page](#) [ATC Business Practices](#)

### 4. Definitions

**Best Value Planning (BVP):** Through the use of this coordinated joint planning process, the intent is to select an electrical solution (best value solution) that meets performance criteria, while minimizing overall rate impact to end-use customers, in a manner that addresses the concerns of the impacted stakeholders.

**T-D Interconnections:** Transmission to distribution connections on the transmission grid.

**Local Distribution Company (LDC):** An entity receiving transmission service from the ATC transmission system at a nominal voltage level  $\geq 50$  kV.

**End-use customer:** The retail or wholesale customer served by the LDC.

**Initiator:** The LDC that begins the planning process in order to meet its system needs. For network projects this will be ATC.

**Load Interconnection Request Form (LIRF):** Form available on ATC's Customer Engagement, [Connecting to the Grid page](#) to be completed by the LDC when a new or changed interconnection is expected.

**DER Request Form (DERRF):** Form available on ATC's Customer Engagement, [Connecting to the GRID page](#) to be completed by the LDC when a DERRF interconnection is expected.

**Load Interconnection Queue:** Located on the ATC Connecting to the Grid webpage as a reference for LIRFs/DERRFs submitted and deemed complete, listing pertinent project information.

### 5. Process

The BVP process and steps can be seen in Appendix A: Best Value Planning Process Map. This process will be used to evaluate all new or modified distribution interconnection requests. Modifications may be made to the process to accommodate the need of the request.

### *5.1. Applicability*

The BVP process shall be initiated for all project types discussed below. However, the level of assessment will differ based on project type (as described below in Section 5.2 and Appendix C). Types of LDC load interconnection projects requiring BVP include:

1. A new LDC substation interconnecting to the ATC transmission system
2. Adding or replacing LDC substation transformer interconnected to the ATC transmission system
3. LDC substation expansion or rebuild that may change common facilities agreement ([see applicable Joint Use Substations business practice](#))
4. Change in LDC substation high-side interrupting/isolating device
5. Addition or removal of capacitor banks
6. Addition, removal, or modification of distributed energy resource (DER)
7. Addition of unforecasted load

### *5.2. Initiation and Evaluation*

The BVP Process will be initiated with the submittal of a LIRF/DERRF, notifying ATC of a future LDC – initiated project that may affect ATC facilities. If there is question as to whether a LIRF/DERRF is needed, ATC Planning or Interconnection Solutions should be contacted. Once a LIRF/DERRF is submitted ATC will evaluate completeness of the form. If complete, ATC will route internally to start the identification of the impact on the ATC transmission system, determining the type of BVP necessary for the proposed project (see Section 6 and Appendix C). Process steps to be completed after a completeness determination is made can be seen in Appendix A.

While the BVP process does not formally start until a LIRF/DERRF is submitted and complete, the LDC's are encouraged to engage in planner-to-planner discussions and project-specific conceptual planning meetings as early as practical to assist in the development of alternative solutions for any electrical system project that may have significant impact on other electrical utilities in the study area. Early discussion is especially important where LDC-initiated projects may require a significant lead time to put into service. Joint planning discussions are facilitated by several vehicles of communication between ATC and its customers (see 5.3 below). The BVP process requires the LDC to demonstrate the need driver and justification of the transmission project. A LDC distribution report is required when an ATC BVP Scoping Report is developed (see Appendix B).

ATC maintains the load interconnection queue as a reference to facilitate mutual understanding between ATC's capabilities and its customer needs. Since it is advantageous to manage all stakeholders' expectations clearly and consistently as early as possible in the planning effort, ATC can include projects (even potential LIRF/DERRF) in the queue as early as desired; however, only projects with a complete LIRF/DERRF will be published to the public queue and are those projects that ATC will take action on.

### 5.3. Communication

Cooperative BVP requires frequent and open communication between ATC and the LDC from the earliest stages of project conception to formalization of the selected best value solution. Such joint planning will be most effective by making the best use of the following communication mechanisms and tools:

1. Meetings as listed in the BVP Process Map in Appendix A (scoping discussions, team meetings during transmission analysis, etc.)
2. Personal ATC planner to LDC planner discussions
3. Quarterly planning meetings between ATC and each of its shareholder customers
4. Planning dialogue meetings among ATC and its shareholder customers
5. ATC's 10-year assessment, published semi-annually
6. ATC's load interconnection queue posted to [ATC's Customer Engagement, Connecting to the Grid page](#).

### 5.4. Completion

The culmination of a joint BVP will typically be BVP documentation— depending on the BVP assessment type (see Section 6 and Appendix C).

A BVP scoping report will provide details of the distribution and transmission analysis performed and the distribution and transmission alternatives that were studied. The report will be reviewed and signed by both parties and is essential for preparing any necessary internal approvals and/or regulatory submittals. It will form the basis for continued detailed scope development and could result in Project Commitment Agreement (PCA)<sup>1</sup> between the LDC and ATC in order to implement the project. The report will ultimately represent an agreed upon best value solution with sufficient details necessary to enable the affected party to make appropriate budget provisions in order to ultimately meet the initiator's projected in-service date. Information provided in the LDC distribution report will be incorporated into the BVP scoping report. A guide for information that should be included in the LDC report can be seen in Appendix B.

If a full BVP scoping report is not required, ATC will work with the LDC to develop the appropriate project documentation which may consist of a Capital Work Letter (CWL), a Minimal Capital Work Letter, a No Capital Work Letter, a Project Commitment Agreement (PCA), or a Facilities Construction Agreement (FCA). The agreed upon project documentation sets forth for both parties the scope of construction activities and the proposed construction schedule<sup>2</sup> in order to construct the facilities necessary to interconnect the new load or modify the existing load interconnection facilities.

## 6. Best Value Planning Assessment Type and Criteria

The BVP assessment type will vary for each proposed project depending on the needs identified and the possible solutions identified to address those needs. The Best Value Planning Assessment Type Table in Appendix C is meant to be used as

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<sup>1</sup> A PCA may be required if the project is considered economic development, is third party driven, results in high ATC capital spend and/or has an aggressive in-service date.

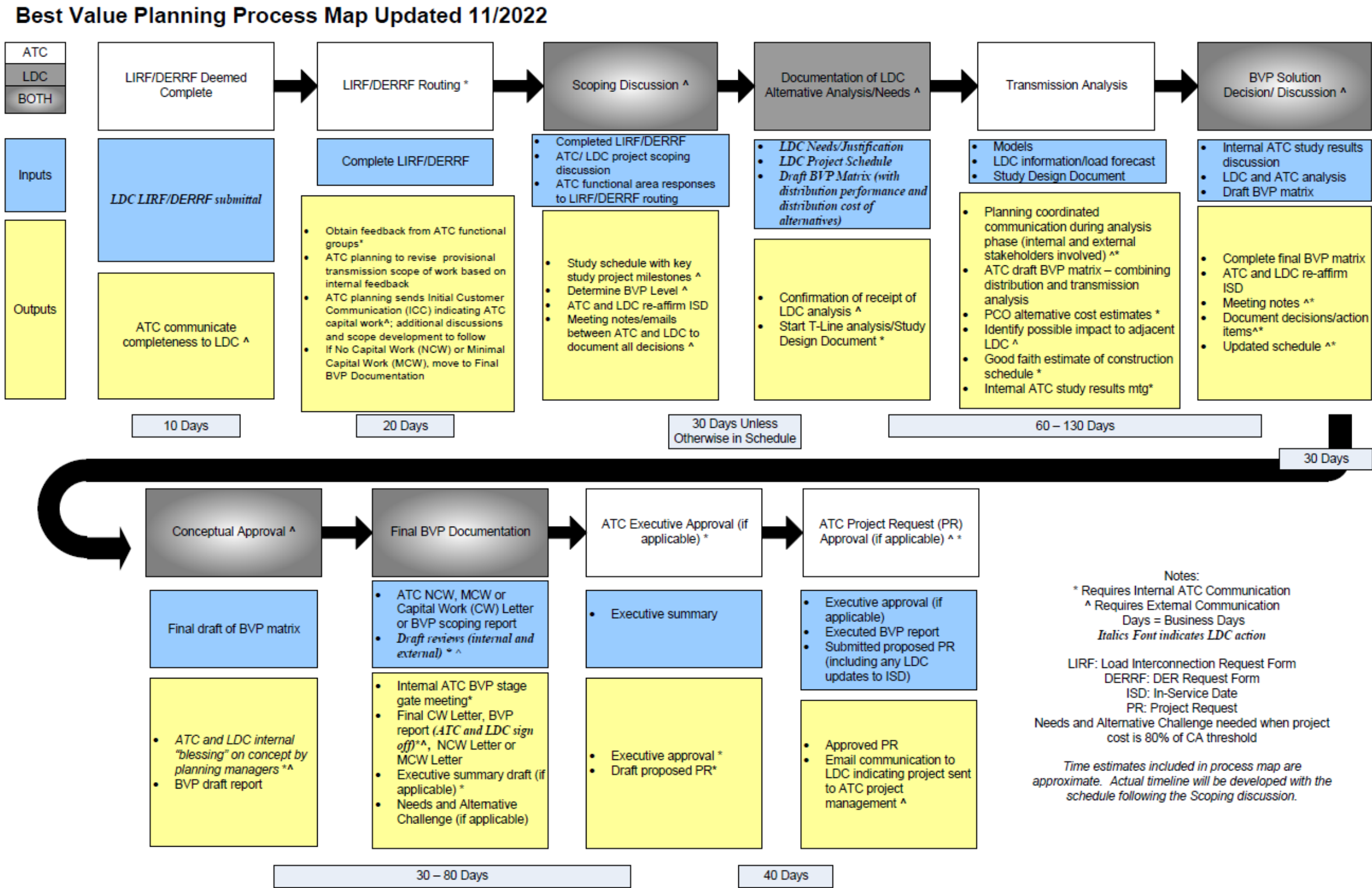
<sup>2</sup> Only the BVP report, PCA and FCA contain proposed construction schedules.

a guide as to the extent of analysis and documentation which is needed within each BVP assessment type.

All interconnection projects must adhere to the ATC planning criteria. The current ATC planning criteria can be found on the [ATC 10 Year Plan site, under Planning Criteria, Assessment Practices and Tools](#).

Distribution system planning and performance criteria are governed by applicable state statutes. Reliability indices are often used for distribution utility corporate targets and are an acceptable system performance metrics to use in BVP. If additional LDC planning and/or operational criteria are used in LDC decision making, it should also be included in BVP.

## Appendix A Best Value Planning Process Map



## **Appendix B**

### **LDC BVP Report Guide (to be incorporated into the ATC BVP scoping report)**

#### **Introduction and Background**

Describe the distribution electrical system and how the system serves the study area. Other general comments can be added in this section, such as relevant historical information, load growth rates and recent developments, nature of the area electrical load demands, etc. Maps of the distribution system and tables/graphs for load growth and reliability are desired to tell the background of the area.

#### **Project Need**

- System normal (intact) conditions—
  - Describe LDC planning criteria violations (voltage, capacity and/or reliability) throughout the planning horizon
  - Discussion on load growth, type of customers and economic impacts
  - A table or a diagram can be included showing the in-tact system with voltages and element loadings
- System Contingency Conditions
  - Describe LDC planning criteria violations (voltage, capacity and/or reliability) throughout the planning horizon and the cause of the system problems:
    - Contingency type (lines, transformers, etc.)
    - Area with load at risk under contingency
- System Concerns—other reliability issues such as:
  - Extraordinary needs. For example, “Area loads require more secure power supplies due to severe cost impacts for long term outages.” OR “Area residents face extreme conditions when this outage occurs, because there are no bridging capabilities on the distribution system.”
  - Relevant outage statistics on poor performing lines or substations
  - Electrical system maintenance needs
  - Other reliability issues

#### **Project Alternatives**

A project alternative is defined as a solution that will solve all area concerns in the area (ranking at a minimum of Poor in the BVP Matrix as seen below). Any distribution alternatives that were analyzed but didn't solve the area concerns should be included as a “dismissed option”. The project alternative section should include the following:

- Description of each alternative considered
- Performance discussion and/or tabular evaluation of each alternative
- Cost estimates for each alternative distribution costs (ATC will provide the transmission costs)
- Cost comparison of each alternative (same year dollars – typically requested in-service year)

- Discussion on options that have been dismissed

It is recommended that one distribution only alternative is included with a transmission/distribution alternative – even if the distribution only alternative is not likely to be constructed. This is important for comparison purposes to show the need of transmission additions/upgrades. A distribution alternative could also include distribution upgrades to defer a new substation. In this case the alternative will include the costs of the distribution upgrades and the cost of the new substation.

**Approximate location of new substation**

If applicable, provide information of the following concerning a new (or Greenfield) substation site:

- If more than one substation location was considered, discuss what is the preferred site, why and why were others not preferred
- Process in which the land will be acquired (for example, it is acquired, it has an offer to purchase, needs permits, haven’t started acquiring yet, etc)
- How much land you intend or have purchased?
- A map of the area

**BVP Matrix**

A BVP matrix including all alternatives including the distribution performance of each alternative should be included for each proposed project with BVP level greater than 1. The LDC is responsible for completing the Distribution System Performance and Financial Performance (for any distribution costs or credits) sections.

The Planning Problem/Descriptions listed in the first column are just suggestions; change according to specific problems within the study area. For example, if there is a substation transformer loading problem, the Planning Problem/Description would be listed as Substation X transformer overloaded during loss of Substation Y. Likewise, a voltage example would be Feeder 2 is below 114 V during the loss of Substation Y.

ATC will complete the Transmission System Performance section and related transmission system costs.

Planning Problem/Description	Alternative 1 (name)	Alternative 2 (name)	Alternative 3 (name)	Comments
<b>Distribution System Performance</b>				
Normal Capacity				
Normal Voltage Support				
Contingency Capacity				
Contingency Voltage Support				
Contingency Loss of a Substation/transformer				
Contingency Loss of a Distribution Feeder				
Outage Frequency/Exposure				

Fault Current Impacts on Distribution Facilities due to Transmission System Changes/outages				
Motor Starting Capabilities				
Overcurrent Protection/Coordination Capabilities				
Real Estate Risk (Substation or Feeder ROW)				
Constructability				
Distribution Underbuild Impact				
<i>(Any other project specific concerns)</i>				
<i>(Any other project specific concerns)</i>				
<i>(Any other project specific concerns)</i>				
<i>(Any other project specific concerns)</i>				
<b>Transmission System Performance</b>				
Normal Voltage				
Normal Loading				
Contingency Voltage				
Contingency Loading				
Real Estate Risks				
Constructability				
New Transmission Line (miles)				
Environmental Impacts				
Flexibility for Additional Load Growth				
Regulatory Impacts				
<b>Financial Performance (In 20__ dollars)</b>				
Total Loss Savings				
ATC Capital Cost				
Distribution Capital Cost				
Total Capital Cost				
Key to Ratings +++ Excellent ++ Good + Acceptable				



<i>- Marginal -- Poor --- Unacceptable</i> <i>N/A Not Applicable to the Alternative</i>
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**Conclusion / Recommendation**

Conclusion and recommendation should be stated here. A final summary of the reasons for choosing the preferred alternative can also be given here.

## Appendix C

### Best Value Planning Level Table

<b>BVP Assessment Type*</b>	<b>Explanation**</b>	<b>LDC Information (minimum)</b>	<b>Transmission Analysis</b>	<b>ATC Documentation</b>
NCW	No ATC Capital Work and no transmission analysis	Completed LIRF/DERRF	No planning analysis – internal ATC routing only	NCW letter stating assessment completed
MCW	Minimal ATC Capital Work and no transmission analysis	Completed LIRF/DERRF	No planning analysis – internal ATC routing only	MCW letter stating assessment completed
Alternative Assessment	May include a transmission alternative interconnecting load to the transmission line currently serving the local load or assessment of multiple substation configurations	Completed LIRF/DERRF and LDC distribution assessment (as listed in guidelines in Appendix B)	Potential for planning analysis of alternatives including a difference analysis (compared to the base case model) including a selective list of NERC TPL contingencies and possibly different transmission system network and load configurations – amount determined by engineering judgment and team meetings	Letter stating assessment completed or BVP Scoping Report – describing the pertinent assumptions and assessment that was performed
System Study	ATC Executive approval needed or ATC Needs and Alternatives stage gate is needed (ATC project cost of 80% of the CA threshold) or multiple transmission alternatives. If applicable – ATC to file a Certificate of Authority (CA) or Certificate of Public Convenience and Necessity (CPCN) with the PSCW	Completed LIRF/DERRF and LDC distribution assessment (as listed in guidelines in Appendix B) with at least one viable distribution alternative (see Project Alternatives in Appendix B)	Modeling analysis for at least two alternatives including a difference analysis (compared to the base case model) including the complete list of NERC TPL contingencies with different transmission system network and load configurations. Modeling will encompass at least a 10-year planning horizon	BVP Scoping Report and if applicable - support for CPCN or CA filing documentation

\*BVP assessment type and high-level schedule will be developed after Scoping Meeting with Customer as seen in Appendix B

\*\*These are typical explanations of BVP types however any given project may change during BVP if the scope of work changes