System Requirements Specification (SRS)

Revision History

Date	Version	Status	Description	Author
11/21/2016	1.0	Initial Draft	Transmission Cost Information Center	Julia Spatafore, Jason Quevada Dana Hiser

- **Table of Contents**

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- **Objective**

1.1 Purpose of the System Requirements Document

Instructions: This is a statement of the application functional and operational requirements. It serves as an agreement between the developer and the customer for whom the system is being developed. The developers agree to provide the capabilities specified. The client agrees to find the product satisfactory if it provides the capabilities specified in the SRS.

The completed Transmission Cost Information Center (TCIC) will meet the following:

- Create an associated "calculator" worksheet that will incorporate all of the "actual" data in the cost allocation worksheet and the "projected" transmission replacement project costs and "projected" in-service and needed-by dates

- To the greatest extent possible – automate data extraction, transformation and loading into the new calculator web-page to minimize re-work and potential sources of error

- Design sliders and user filters to allow users to select duration of the analysis

- Design sliders and filters to allow users to select a confidence range or percentage of timely project completions and energizations

- Design a "projected" cost result for the user selected time duration and confidence percentage.

- Projected result(s) (plural if for more than one year or planning cycle) shall be compared to current actual transmission cost to provide direction and magnitude of change

- Will not be a mechanism for rate forecasts/projections

- **Overview**

1.2 Purpose

Instructions: In this section, provide the purpose this application is intended to serve. Describe the business objectives, business processes, and the cost-benefit analysis that this application supports.

In order to provide more clarity and transparency surrounding transmission costs, the Transmission Replacement Processes Senior Task Force (TRPSTF) requested that PJM look into creating a Transmission Cost Information Center (TCIC).

1.3 Scope

Instructions: Give a description of the intended scope of the system.

All of the required information/date is publically available on pjm.com, and the idea is to consolidate the information into the TCIC for a better and more convenient user experience.

1.4 Benefit

Instructions: Provide what benefits this application brings to PJM.

PJM members and stakeholders have expressed the desire for increased transparency surrounding transmission costs, and PJM aims to assist by creating the TCIC.

1.5 Capabilities

Instructions: Describe the capabilities the application must provide in business terms.–

- *Do not describe how the application provides that capability.*
- *Do not describe such design considerations as computer hardware, operating system, and database design unless they are constraints*
- *Is this business functionality unique to this application?*

Below are the desired capabilities:

- Capability to review "projected" transmission costs in specified TO zone
- Capability to further filter the data by selecting the duration of analysis
- Ability for user to select a confidence range or percentage of timely project completion/energization
- Provide clarification of companies that have a formula or stated rate
- Provide clarification of companies that have leading and lagging formula rates

1.6 System Description

Instructions: In this section, provide an overview of the physical system if known.
Give an estimate of the size and complexity of the system in terms of number of user types, number of locations, interfaces, data capacity in business terms, numbers of major processes, etc.
Summarize the conditions that created the need for the new system (or capability).
Include any relevant background, such as the number of sites that are using the system.
Identify other legacy or new systems with which this system interfaces.

The data is currently being hosted on the PJM.com Web servers and is hosted from a SQL database. The data will just be put in a more user-friendly format for members so we assume the same servers and database will host the new components as well.

- **Assumptions and Constraints**

1.7 Assumptions

Instructions: State the assumptions associated with development of the system, where assumptions are defined as future situations, beyond the control of the project, whose outcomes influence the success of a project. The following are examples of assumptions:

- *Availability of a hardware/software platform*
- *Developments in technology*

Below are the assumptions:

- Stated and/or formula rates updates/changes
- Continued updates to linked information/data on pjm.com
- Hosted on the same servers and database as current data.

1.8 Constraints

Instructions: State the constraints associated with the system and data, where constraints are defined as conditions outside the control of the project that limit the design alternatives. This section should also provide details as to the rationale.

- Flexibility of application within pjm.com
- Stated and/or formula rates updates/changes
- Continued updates to linked information/data on pjm.com
- Ability to choose and filter the user's desired dataset
- **Interface Requirements and Impacts**

1.9 Hardware Interfaces

Instructions: Define any hardware interfaces that are to be supported by the system, including logical structure, storage, physical addresses, and expected behavior. Describe the impact of the data requirements and storage on hardware. Consider impact to interface.

none

1.10 Software Interfaces

Instructions: Define any software interfaces that are to be supported by the system, including logical design and expected behavior. Describe the impact of the data requirements on software.

none

1.11 Application Interfaces

Instructions: Name the applications with which the subject application must interface. State the following for each such application:

- **PJM.com**

- **Attachment H Network Integration Transmission Service (NITS):** http://www.pjm.com/markets-and-operations/billing-settlements-and-credit/formula-rates.aspx
- **Transmission Enhancement Charge (TEC):** http://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx
- **Schedule 12 – Appendix (page 662 in OATT):** http://www.pjm.com/media/documents/merged-tariffs/oatt.pdf
- **Transmission Construction Status:** http://www.pjm.com/planning/rtep-upgrades-status/construct-status.aspx
- **PJM TEAC Meetings and Meeting Materials:** http://www.pjm.com/committees-and-groups/committees/teac.aspx
- **PJM Cost Allocation Filings:** http://www.pjm.com/library/filing-order.aspx
- **Cost Allocation Worksheet/Webpage:** http://www.pjm.com/planning/rtep-upgrades-status/cost-allocation-view.aspx

1.12 Network Interfaces

Instructions: Describe any communications interfaces to other systems or devices, such as local area networks and firewalls. Describe the impact of the data requirements network infrastructure. Consider impact to interface

none

1.13 Organization Interfaces

Describe the impact of the data requirements on the user and developer organization.

Will need at least one developer and one tester who have experience with PJM.com and it's intricacies with the Planning Database. In addition to those users, we should also have input from Creative Services, Member Services, External Communication, and the WebDev team. We should also pilot this to some members before opening it to all members.

1.14 Retention

Instructions: Describe the length of time the data must be retained. For example, "Information about an application for naturalization shall be retained in immediately accessible form for 3 years after receipt of the application". Consider data retention requirements in terms of the following:

- *historic retention to include the collection of data to be retained and its format, storage medium, and time parameters*

- *periodic report data (retention period after generation of reports and retention period of periodic reports after summary reports are generated)*
- *summary reports data (retention period after generation)*

Planning Data on PJM.com is not removed after a certain period of time and that will remain for this project.

1.15 Data Storage

Estimate the data storage and processing requirements in terms of size and number of records.

Estimated to be similar to the Cost Allocation webpage on pjm.com.

1.16 Frequency of Update and Processing

State the expected frequency of data element change and the expected frequency of processing input data elements. If the input arrives in a random manner, specify both the average frequency and some measure of the variance.

The dataset is expected to require updates in synch with the Cost Allocation webpage. Additionally, whenever TOs update their formula rates.

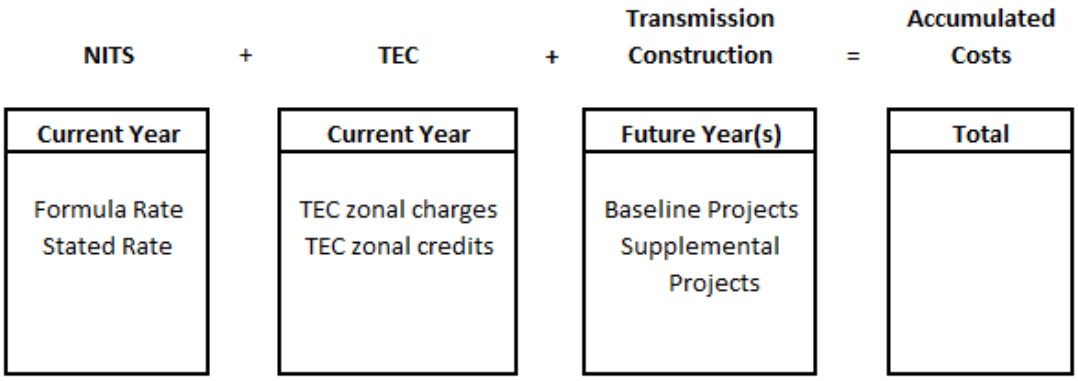
1.17 Data Flows

Instructions: Text or data flow diagrams that are needed to further explain the functional requirements or the operation of the system.

PJM Transmission Cost Information Center

Transmission Cost Component Process

(Source: Public data available through PJM)



Note: Zonal updates of NITS and TEC costs are done in accordance with the timing of the annual update for each TO.

1.18 Data Classification

State the consequences of the following breaches of security in the subject application:

All data used will be publically available from pjm.com. Any security concerns would be the same concerns shared with any PJM.com feature.

1.19 Inputs

Instructions: This section describes the input interfaces including what each data input is, what the source is, what the target is, what the transfer mechanism is, and what the trigger that causes data to be sent is. Describe the data requirements by providing data entities, their decomposition, and their definitions. The data requirements describe the business data needed by the application system. Data requirements do not describe the physical database and they are not at the level of identifying field names. Data (attributes) input to and output (including reports) from processes

- *High-level logic used inside the processes to manipulate data (do not state "how")*
- *Accesses to stored data*

Entity / Element Name	Source of Input (business process,	Frequency of input from source	Is source internal to PJM or external?	Does source interface directly with system?	Description of interfacing or transmitting source

	operator, or workstation)				
Stated Rates	Workstation	How often is this updated?	Internal	Yes	Uploaded by a PJM.com employee at a periodic basis
Baseline Upgrades	Process	Varies	Both	Yes	System Upgrades are identified and added on an as-needed basis. Information can come directly from PJM or from a member.

1.19.1 Medium and Device

Instructions: Describe, in detail, the format of data to be input to the proposed system. Descriptions may be narrative or in the form of data record layouts and screen formats, as appropriate. This may include the identity of each device by name, including a brief description, and the process used to transmit the data.

Identify the medium and hardware intended for entering each data element into the system. In situations in which only specific workstations are to be legitimate entry points, so specify. For instance, CIP workstations

none

1.20 Outputs

Instructions: This section describes the output interfaces including what each data input is, what the source is, what the target is, what the transfer mechanism is if a particular one is required, and what the trigger that causes data to be sent is.

none

1.20.1 Medium and Device

Instructions: Identify the medium and hardware device intended for presenting output data to the recipient. Specify in what medium the recipient is to receive the data. If the output is to be passed to some other automated system, the specifics of the medium should be described.

Output would be provided on pjm.com, excel sheet, or whatever means that is suggested by IT and approved by TRPSTF. Output would be manually consumed by members and non-members accessing pjm.com/planning

1.21 Recipients

Instructions: Identify the consumers or systems that will be receiving the output data.

Members and non-members who visit PJM.com/Planning

1.22 Collection

Instructions: Describe procedures that will be used to collect data, including the format of the input data. Describe how data will be transmitted by the system.

Data is stored within a SQL database and is processed via other means. No new data will be collected or shown as a result of this new feature, this is simply a way to organize and display the data.

1.23 Error Handling

Instructions: Describe the process for handling inaccurate or incomplete data.

If the user provides incomplete/incorrect data as part of assumptions, then provide an error message. To prevent this, use asterisk to show required fields.

1.24 Ownership & Responsibilities

Instructions: Describe the division/ department that will be responsible for managing the data

The responsibility of development and maintenance will be owned by the Planning Applications department (within the ITS division). The data will be provided by multiple departments within the Planning Division.

1.25 Data Access

Instructions: The Data Access Section describes the need to control access to the data. This includes controlling who may view and alter application data.

Publically available to all pjm.com users

Instructions: List the functional requirements of the application or system. Functional requirements describe what the system should do. Distinguish preferences from requirements. Requirements are based on business needs. Preferences are not. If, for example, the user expresses a desire for sub-second response but does not have a business-related reason for needing it, that desire is a preference.

Please include a Process Flow Diagram

Please see above. Requirements are still being defined.

- **Non-Functional Requirements**

Instructions: Non-functional requirements cover all the remaining requirements which are not covered by the functional requirements. They specify criteria that judge the operation of a system, rather than specific behaviors, for example:

Distinguish preferences from requirements. Requirements are based on business needs. Preferences are not. If, for example, the user expresses a desire for sub-second response but does not have a business-related reason for needing it, that desire is a preference.

Requirements are still being defined.

1.26 Reliability

Instructions: Reliability is the probability that the system will be able to process all work correctly and completely without being aborted. Reliability is evaluated as follows:
State the following in this section:
What damage can result from failure of this system? From this feature specifically, nothing but failure of the overall system could be detrimental to a member or non-member since the data should be available at all times.

- *Complete or partial loss of the ability to perform a mission-critical function*
- *Loss of revenue*
- *Loss of employee productivity*

What is the minimum acceptable level of reliability? Same as pjm.com

1.27 Availability

Instructions: System availability is the time when the application must be available for use. Required system availability is used in determining when maintenance may be performed. Include the times when usage is expected to be at its peak. These are times when system unavailability is least acceptable.

The system should be available at all times but will likely be accessed mostly during business hours.

1.28 Performance

Instructions: Describe the requirements for the following:

- *Response time for queries and updates*
- *Throughput*
- *Expected rate of user activity (for example, number of transactions per hour, day, or month)*
- *<< List the required capacities and expected volumes of data in business terms. For example, state the number of cases about which the application will have to store data. For example, "The system shall be able to process a projected volume of 600 applications for naturalization per month." State capacities in terms of the business. Do not state capacities in terms of system memory requirements or disk space.*

Same as pjm.com

1.29 Supportability

Instructions: Supportability is the ability of the application to be updated by the vendor and any 3pp that are used.

All development would be done in house and should be supported as needed.

1.30 Scalability

Instructions: The measure of a system's ability to increase or decrease in performance and cost in response to changes in application and system processing demands. Examples would include how well a hardware system performs when the number of users is increased, or how well a database withstands growing numbers of queries

This would match pjm.com

1.31 Usability

Instructions: Usability is the term used to describe how easy (or difficult) is the application to use? Are many steps required for the user to obtain the desired output?

Application doesn't currently exist, the end product should have links to appropriate information/data and instructions on how to use the "calculator".

1.32 Maintainability

Instructions: Maintainability is the term used to describe how well the application can be maintained. Is PJM or a vendor responsible for routine maintenance or trouble shooting a problem? What diagnostic tools are available?

PJM's Planning Applications department will be responsible for maintenance and feature additions. The data will be updated by the Planning division departments as it applies.

1.33 Flexibility

Instructions: Flexibility is the term used to describe how well will the system respond to changes in business processes or rules, how much effort is needed to modify the system

The system is internally developed; any changes will also be internally developed and tested as needed. Level of effort would rely on the work being done at that time.

1.34 Interoperability

Instructions: Interoperability is the ability for a system or application from one vendor to work with one from another vendor.

Not applicable – this will be an internally developed system

1.35 Manageability

Instructions: Manageability is the term used to describe how efficiently and easily a software system can be monitored and maintained to keep the system performing, secure, and running smoothly. How will the system be managed? Does it interfaces to PJM's management system or have a standalone system.

Same as PJM.com

1.36 Extensibility

Instructions: Describe future growth of the system. Consideration. It is a systemic measure of the ability to extend a system and the level of effort required to implement the extension.

- Leverage the existing Planning Division Cost Allocation Worksheet and webpage
- Consider and implement in design the types of filters and drill downs that may alter the result of the calculator to meet a user's needs (e.g. by Muni, Coop, Zone, Merchant, all but Muni, all but Coop, All but Merchant, etc.)

1.37 Portability

Instructions: Do you want the application to be available on multiple OS's, development frameworks, or databases?

This is a web based tool and should be available in the same framework as the existing PJM.com features

1.37.1 Recoverability

Instructions: Recoverability is the ability to restore function and data in the event of a failure. In the event the application is unavailable to users (down) because of a system failure, how soon after the failure is detected must function be restored and how soon does it need to restored?

- **References**

Instructions: List the appropriate reference documents. List the documents that are sources or references for this SRS. Include meeting summaries, white paper analyses, and SDLC deliverables, as well as any other documents that preceded this SRS and provided information for the development of it. Also reference any documents that provided information on the relevant FNS version or business plan >>

none

Cera #	Document Name	Description

- **Approvals**

Name	Role	Date of Approval email