**Constraint Analyzer Project**

**Data Collection:**

* **Location of all the files mentioned in this document:**
* **S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Code Files**

**File Number – 1:**

* File Name – ConstraintContingencyUniquePairCreation.py
* Purpose – This file is created to extract unique constraint-contingency pair from historical constraint data
* First run: Input File Used - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_DayAheadConstraintData\_2015-2018.xlsx , sheet = 2018 (**must read** - source of this file described in DataSource\_Documentation.doc file)

Output File Generated - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueConstraintContingencyPair\uniquePairList.xlsx (**Must read:** further processing on this file which is done manually is described in DataSource\_Documentation.doc file)

* Second run: For this run some changes were made in the code and thus the current code file reflects second run.

Input File Used - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_DayAheadConstraintData\_2015-2018.xlsx, all sheets are read one by one (**Must read:** source of this file described in DataSource\_Documentation.doc file)

Output File Generated - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueConstraintContingencyPair\uniquePairList2015-2018.xlsx (**Must read:** further processing on this file which is done manually is described in DataSource\_Documentation.doc file)

**File Number – 2:**

* File name – ConstraintContingencyMapping.py
* Purpose – this file is created to separate the mapped and unmapped Contingency-Monitored element pair, store them in a PowerWorld Format in an excel file
* First run: Only contains data for the year 2018

Input Files Used - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueConstraintContingencyPair\uniquePairList.xlsx (**Must read:** the final processed file – processing details given in DataSource\_Documentation.doc file)

Output File Generated - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\PowerWorldFormat.xlsx

* Second run: some changes are made in the code file for this run and current file reflects second run.

Input Files Used - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueConstraintContingencyPair\uniquePairList2015-2018.xlsx (**Must read:** the final processed file – processing details given in DataSource\_Documentation.doc file)

Output File Generated - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\PowerWorldFormat2015-2018.xlsx

**File number 1 and 2 should be executed in order to obtain results as output of file 1 is used as input by file 2.**

**File Number – 3:**

* File name – TransmissionOutagesMapping.py
* Purpose – this file is created to format the transmission outages file (input file) such that all the duplicate facilities are removed and ‘to’ column values are changed by removing all special characters and similarly, special characters are removed from auction mapping file’s (another sheet of input file) ‘op\_eqcode’ column as well to make the mapping easier i.e. the transmission lines can then be mapped in PowerWorld with their respective From Bus Number and To Bus Number.
* First run: For the year 2014

Input File – 1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2014-01-01\_to\_2014-12-31.xlsx , sheet name – 2014 (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2014-01-01\_to\_2014-12-31.xlsx , sheet name – AuctionMapping2019JUL (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

Output File - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2014.xlsx (**Must read:** further processing must be performed on this file which is explained in DataSource\_Documnetation.docx file)

* Second run: For the year 2015

Input File – 1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2015-01-01\_to\_2015-12-31.xlsx , sheet name – 2015 (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2015-01-01\_to\_2015-12-31.xlsx , sheet name – AuctionMapping2019JUL (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

Output File - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2015.xlsx (**Must read:** further processing must be performed on this file which is explained in DataSource\_Documnetation.docx file)

* Third run: For the year 2016

Input File – 1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2016-01-01\_to\_2016-12-31.xlsx , sheet name – 2016 (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2016-01-01\_to\_2016-12-31.xlsx , sheet name – AuctionMapping2019JUL (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

Output File - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2016.xlsx (**Must read:** further processing must be performed on this file which is explained in DataSource\_Documnetation.docx file)

* Fourth run: For the year 2017

Input File – 1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2017-01-01\_to\_2017-12-31.xlsx , sheet name – 2017 (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2017-01-01\_to\_2017-12-31.xlsx , sheet name – AuctionMapping2019JUL (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

Output File - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2017.xlsx (**Must read:** further processing must be performed on this file which is explained in DataSource\_Documnetation.docx file)

* Fifth run: For the year 2018

Input File – 1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2018-01-01\_to\_2018-12-31.xlsx , sheet name – 2018 (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2018-01-01\_to\_2018-12-31.xlsx , sheet name – AuctionMapping2019JUL (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

Output File - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2018.xlsx (**Must read:** further processing must be performed on this file which is explained in DataSource\_Documnetation.docx file)

* Sixth run: For the year 2019 (currently the code file reflects this run)

Input File – 1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2019-01-01\_to\_2019-12-31.xlsx , sheet name – 2019 (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\Outages + Constraint\ERCOT\_TransmissionOutage\_2019-01-01\_to\_2019-12-31.xlsx , sheet name – AuctionMapping2019JUL (**Must Read:** Preprocessing is required before giving it as input – how preprocessing is done is explained in DataSource\_Documnetation.docx file)

Output File - S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2019.xlsx (**Must read:** further processing must be performed on this file which is explained in DataSource\_Documnetation.docx file)

**File number – 4:**

* File name: UniqueTransmissionOutagesConcat.py
* Purpose: file is developed to create a super-list of transmission outages i.e. combine unique transmission outages of all years into one file which are mapped (data is only of line and transformer facilities)
* Input Files:

1. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2014.xlsx (**Must read:** final file with further processing done on it which is explained in DataSource\_Documentation.docx file)
2. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2015.xlsx (**Must read:** final file with further processing done on it which is explained in DataSource\_Documentation.docx file)
3. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2016.xlsx (**Must read:** final file with further processing done on it which is explained in DataSource\_Documentation.docx file)
4. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2017.xlsx (**Must read:** final file with further processing done on it which is explained in DataSource\_Documentation.docx file)
5. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2018.xlsx (**Must read:** final file with further processing done on it which is explained in DataSource\_Documentation.docx file)
6. S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2019.xlsx (**Must read:** final file with further processing done on it which is explained in DataSource\_Documentation.docx file)

* Output file: S:\asset ops\GO\_Group\Interns\2019\Anubha\Constraint Project\Data\UniqueTransmissionOutagesMapped2014-2019.xlsx where sheet1 consists of duplicate transmission outages and sheet2 consist of unique transmission outages.