EDS
DRAFT Resource Registration Guide for Transitioning to the Nodal Market
v0.06

Revision History

Date	Version	Description	Author
10/10/2007	0.03	Draft for Internal Review	D. Showalter
10/10/2007	0.04	Second draft for Internal Review	D. Showalter
10/10/2007	0.05	Draft for Posting	D. Showalter
10/11/2007	0.06	Revised Draft for Posting	D. Showalter

Table of Contents

1.0 Summary of Resource Registration Guide

This document is a guide to completing Resource Asset Registration with ERCOT in accordance with Section 16 of the ERCOT protocols. The Resource Asset Registration Form (RARF) is the next generation of the existing zonal Generation Asset Registration Form (GARF) and replacing the Load Asset Registration Form (LARF). Historically, the GARF, along with other documents, has been used for Resource Entities (RE) to provide information necessary to setup a Resource within ERCOT's systems, including registration, market operations, power operations, and commercial operations.

As ERCOT is preparing for the nodal market, the nodal RARF has been designed to collect as much information as possible from a resource in a single document. The RARF effort currently underway has two key objectives:

Objective 1 – Obtain new nodal data elements and confirm existing modeling data on file

In moving to a nodal market, there are new requirements regarding the amount of data required of Resources and TSP/DSPs to ensure ERCOT has the most accurate network model, as well as an accurate representation of the capabilities and constraints of Resources.

Rather than releasing an incremental nodal GARF to only add new nodal data elements, it was determined that full Resource registration would be a critical part of contributing to the success of the nodal market.

A new Network Model Management System (NMMS) is being brought online in coordination with multiple other systems for the nodal market in effectively evaluating and dispatching ERCOT resources.

The Market Management System (MMS) also has additional requirements for resource parameters to transition to complete resource specific dispatch. This is especially relevant for the complete dispatch to combined cycle resources. The RARF document is the means for resource owners to provide initial resource parameters in accordance with Section 3 of the Nodal Market Protocols for which a subset of these parameters may subsequently be updated by the resource's QSE via an API/XML interface.

Objective 2 – Consolidation of Forms

Historically there have been multiple forms to register a resource:

- Interconnection Request/Procedure
- Generation Data Form Spreadsheet
- Generation Asset Registration Form (GARF)
- Dynamic/PTI Model Forms
- Surveys for Client Relations/Alternative Fuel/Combined Cycle/Modeling information

Although the RARF will not create a single form, ERCOT is consolidating as many forms as possible into a single electronic format to serve as a common point of communication for information on Resources.

The current version of the RARF being released reflects the combination of:

- Zonal GARF and applicable addenda
- Generation Data Form Spreadsheet
- Combined Cycle Survey
- Portions of the Alternative Fuel Survey
- Additional network model data requests

Upon obtaining the RARFs from Resource Entities, ERCOT plans to keep the RARFs in a central repository so the files can be tracked and easily accessed by all ERCOT departments, as well as communicated back to the Resource Entity upon request.

2.0 Structure of Resource Asset Registration Form (RARF)

2.1 Tabs

To minimize data entry and the number of forms, the RARF is contains eight major sections:

1. Instruction Tab – contains general direction on completion and submitting RARF
2. Glossary Tab – contains details of definitions for the data elements being requested in the RARF
3. General Information Tab – contains general information about the physical address and site of the Resource(s) being registered in the RARF.
4. Generation Tab – form to be completed only by conventional Generation Resources that are not Load, Wind, Combined Cycle, or Block Load Transfer
5. Combined-Cycle Tab – form for Generation Resources that are interconnected by sharing a common steam turbine(s), which are specially modeled in ERCOT systems to reflect the interdependencies of dispatching the units as a logical train.
6. Wind Tab – form for Generation Resources registering Wind Turbines/Farms
7. Load Resources – form for registering Load Resources (both Controllable and non-Controllable Load Resources)
8. Block Load Transfers – not available in this version as the Block Load Transfers (BLT) are not being re-registered for nodal, but the BLT registration form will be part of the RARF.

For each Resource site, the RE will need to submit a RARF. One RARF should contain all the Generation Resources for each site. Additional RARFs are needed if there are more than 3 Combined Cycle Trains or 18 Generators at a single site. Please note the worksheet limit for Load Resources is 12 and is grouped by Resource Entity.

ERCOT programmatically imports the data from the RARFs to a repository, so modifying the rows/columns (including insertion and deletion of the rows) can result in data import errors. Please do not modify the format of the sheets.

2.2 Colors

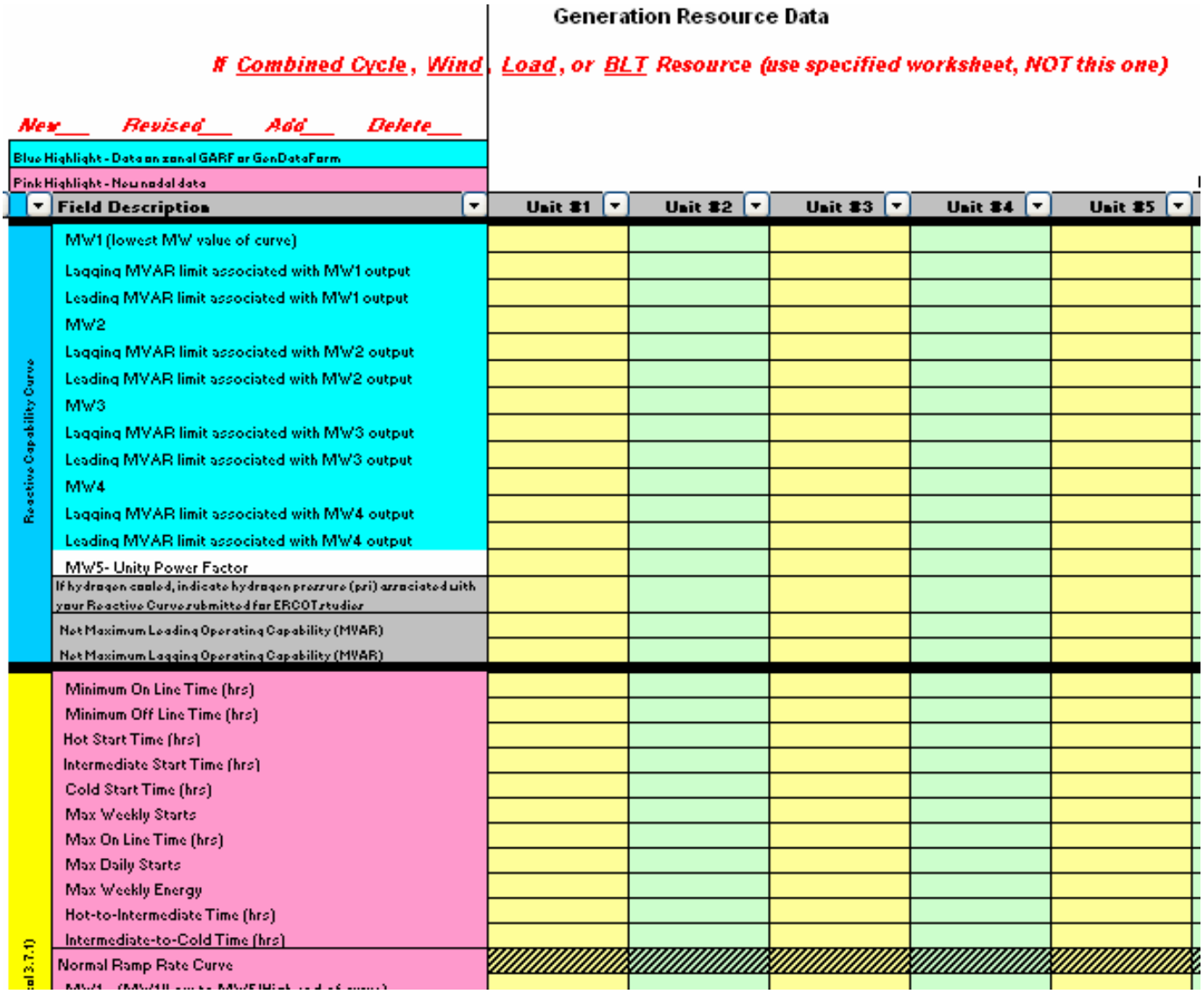
There are many colors used in the RARF, most of which are just to highlight different sections or tabs. However, there are some key definitions to the data requests. Figure 2-1, below, is a snapshot that shows the colors.

- Field descriptions highlighted in PINK reflect new data that is needed for the nodal market.
- Field descriptions highlighted in BLUE identify data elements that have previously been asked for on the GARF or LARF. To assist the RE in filling these fields out, ERCOT distributed the zonal GARF and LARF with the first RARF request.

- Field descriptions highlighted in GRAY reflect planning and dynamics data that is not due with the November 9, 2007 submittal, but will need to be submitted prior to December 31, 2007. ERCOT will send a request for this data in November.

- Field descriptions that are not colored are requests for data that is needed but cannot be directly tied to the old GARF, but are needed by ERCOT. This data may have been submitted on another Zonal form, such as the Generation Forms spreadsheet.

Figure 2-1: Snapshot of a RARF highlighting the colors



2.3 Quick Find

ERCOT has included fields to assist the RE in determining the data needed and the submittal date associated with the data. The left column of each Resource spreadsheet (B) contains a subset of data needed by ERCOT by due date. Figure 2-2 shows a snapshot of this feature.

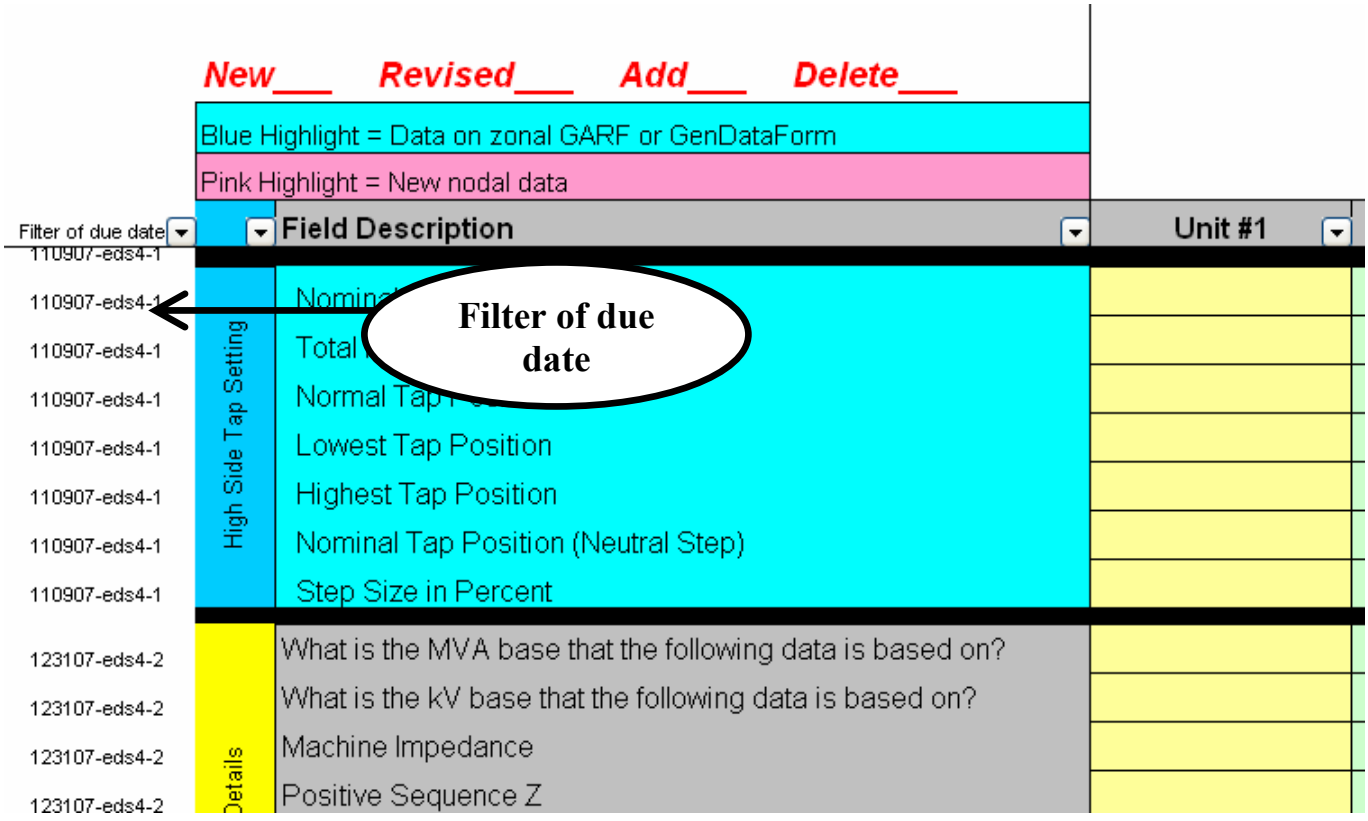
Filter of due date	Due to ERCOT
090407-eds3-1	Please ensure all data is filled out.
110907-eds4-1	Please submit this information before November 9, 2007.
123107-eds4-2	Please submit this information before December 31, 2007. ERCOT will request this data in November.

The best way to check the data by due date is to use the "find" feature of Excel (Ctrl F). Enter the date or the EDS string that you are interested in.

For your information, there are two hidden columns –one contains information that ERCOT uses to map the data to our database, and the other is empty. Also, the worksheets are locked.

If you do not see the "Filter of due date" column, please contact your account manager for assistance.

Figure 2-2: Snapshot of a RARF highlighting "Filter of due date" field



2.4 Glossary

For questions about what ERCOT is asking for, the RARF contains a glossary tab. It is still a draft, but it provides a list of requested fields and a corresponding definition/explanation of the requested information for most fields in the workbook. The glossary has been improved to contain a column that identifies the tab the data is being requested on (i.e. Generation, Combined Cycle, Wind, or Load). The glossary is also separated by sections which correspond to the sections on the different tabs, see Figure 2-3. A snapshot of the glossary is provided in Figure 2-4.

Figure 2-3: Snapshot of a RARF to show sections

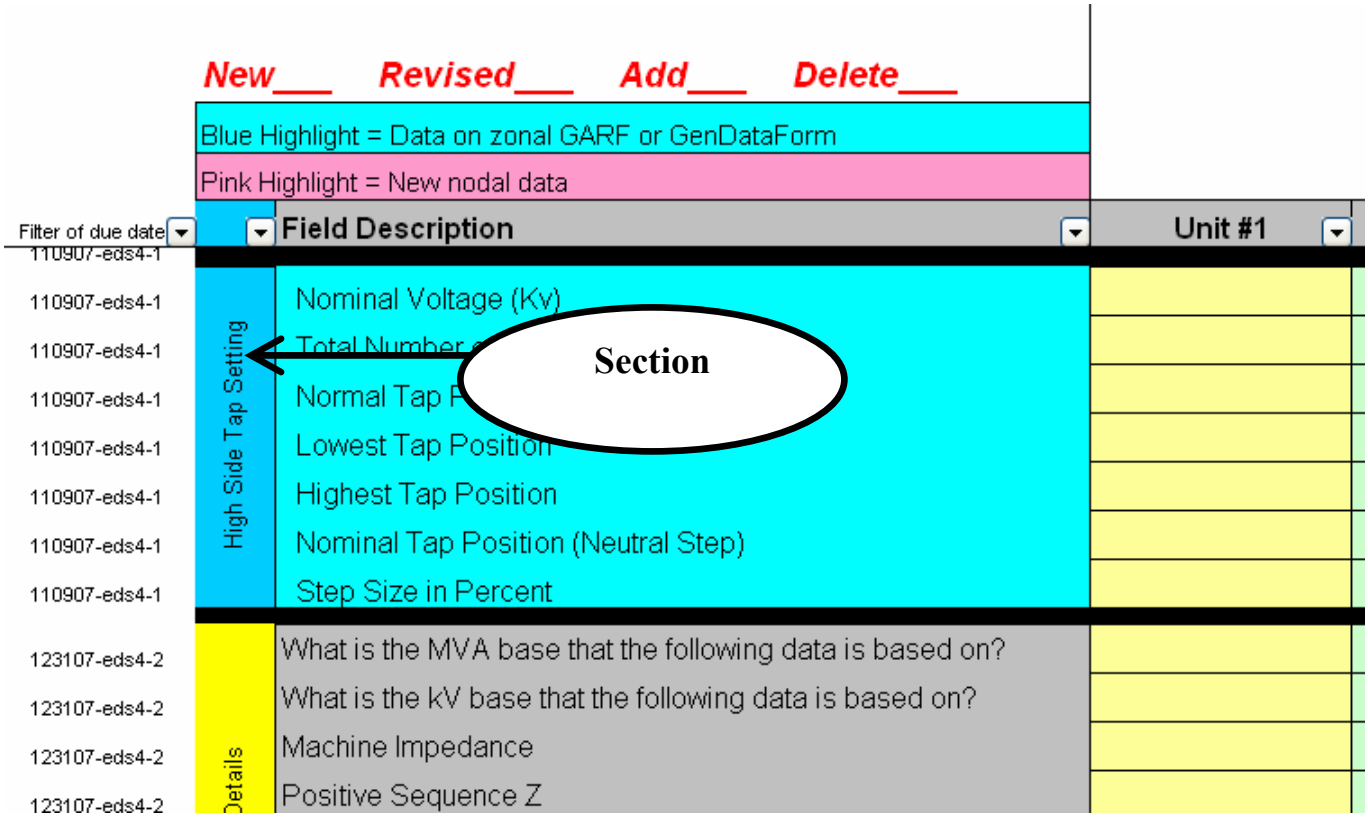
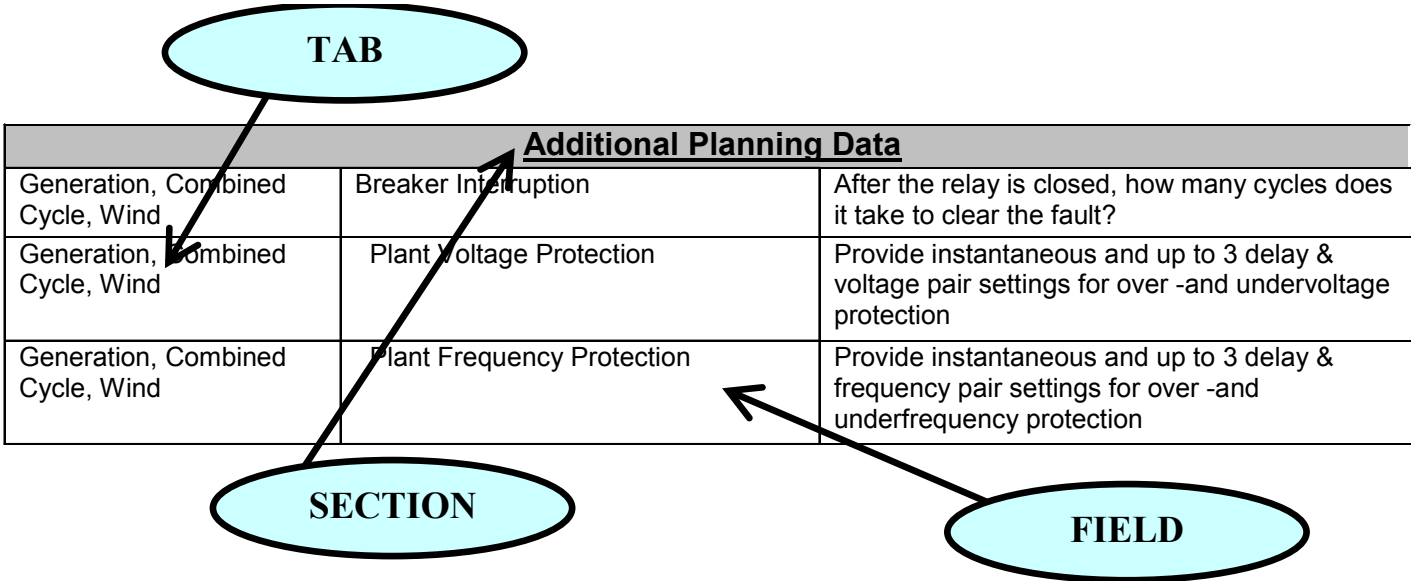


Figure 2-4: Snapshot of a RARF Glossary



Additional Planning Data		
Generation, Combined Cycle, Wind	Breaker Interruption	After the relay is closed, how many cycles does it take to clear the fault?
Generation, Combined Cycle, Wind	Plant Voltage Protection	Provide instantaneous and up to 3 delay & voltage pair settings for over -and undervoltage protection
Generation, Combined Cycle, Wind	Plant Frequency Protection	Provide instantaneous and up to 3 delay & frequency pair settings for over -and underfrequency protection

2.5 Plan for November 9 Submittal

The next iteration of the RARF is due on November 9. All fields marked with EDS 3 or EDS 4 should be complete and included with this submittal. As an option, Resources can submit the rest of the data at this time. Otherwise, the remaining data, which is needed for modeling and planning purposes, will be requested in November and due to ERCOT by December 31.

ERCOT is keeping all the submitted data plus corrections made during testing. This information will be returned to the Resource Entity. All Resources that have kept up with submittals and testing will have a pre-populated RARF to review and submit a certified RARF through the Service Request process in 2008.

3.0 General Information Tab

This tab is designed to contain the site-specific information. All REs are to complete this tab to ensure correct site data is applied to specific units. Items such as Station Code are determined by ERCOT in order to align with ERCOT systems.

Load Resources only need to fill out the Resource Entity, Authorized Rep, and Primary Contact as shown in Figure 3-1. The rest of the site information is located on the Load Resources tab.

Figure 3-1: Snapshot of RE and contact information section of General Information tab

Date Form Completed:	
Resource Entity Submitting Form:	
Resource Entity DUNS #:	

Authorized Representative	
Signature:	Not applicable for this version
Printed Name:	
Title:	
Phone Number:	
E-mail Address:	
Fax Number:	

Primary Contact	
Printed Name:	
Title:	
Phone Number:	
E-mail Address:	
Fax Number:	

All Generation Resources need to fill out all areas on this tab, shown above in Figure 3-1 and below in Figure 3-2.

Figure 3-2: Snapshot of Site Info off of General Information tab

Site Info (For Load Resources and Block Load Transfers, skip this section as this is repeated in individual entries on worksheet)	
Resource Site Name:	
Resource Site Code:	
Street Address:	
City:	
State:	
County:	
Site In-Service Date:	
Site Stop Service Date:	
Congestion Management Zone for 2003:	
Resource owned by NOIE? (Y/N):	
Is Resource behind a NOIE Settlement Meter Point? (Y,N):	
TDSP Providing Service To Resource:	
TDSP DUNS Number:	
ESI-ID (if answer to row 54 above is "No"):	
ERCOT Read (Y or N):	
Number of EPS Primary meters:	
Gen. Load Splitting (Y or N):	

4.0 Generation Resources Tab for Conventional Generation

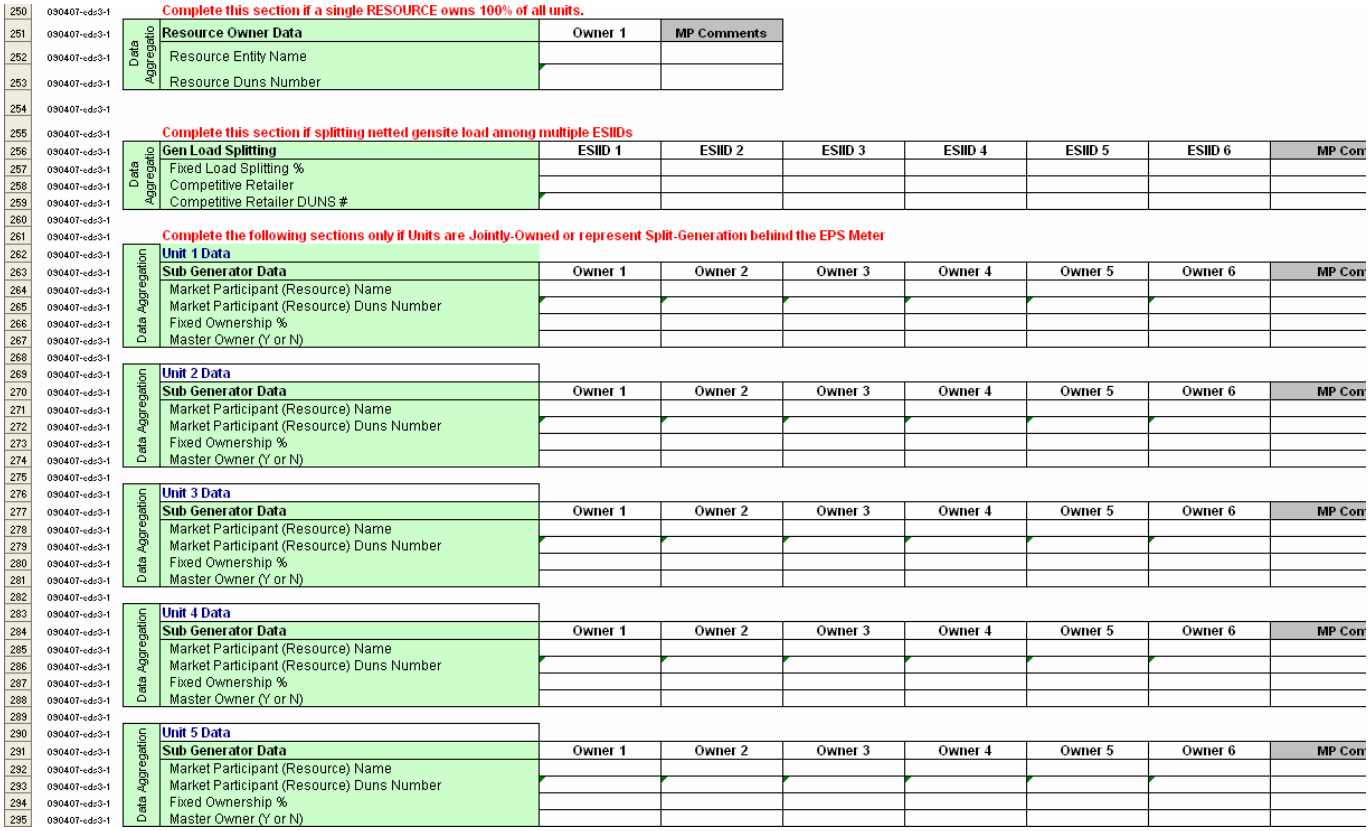
Generation Resource Entities with conventional generation (i.e. not Combined Cycle or Wind) should select the "Generation 1-6" tab and fill out all fields. The Gen 7-12 and Gen 13-18 tabs are only included if there are more than 6 conventional generation units at one site. Combined-Cycle and Wind resources should not use the Conventional Generation tab, but should instead use either the Combined-Cycle or Wind tabs, respectively.

Figure 4-1: Snapshot of Generator Unit Information section of Generation tab

		Field Description	Unit #1	Unit #2	Unit #3	Unit #4	Unit #5	Unit #6	MP
		Pink Highlight = New nodal data						If you have more than 6 units,	
Filter of doc dat		Field Description	Unit #1	Unit #2	Unit #3	Unit #4	Unit #5	Unit #6	MP
030407-cds3-1	Generator Unit Information	Unit Name							
030407-cds3-1		Unit Code/Mnemonic							
030407-cds3-1		Unit Start Date							
110307-cds4-1		Unit End Date							
030407-cds3-1		Physical Unit Type							
110307-cds4-1		Primary Fuel Type							
110307-cds4-1		Secondary Fuel Type							
110307-cds4-1		Fuel Transportation Type							
110307-cds4-1		Renewable (Y/N)							
110307-cds4-1		Renewable/Offset							
030407-cds3-1		Resource Category							
030407-cds3-1		High Reasonability Limit (Max Net MW level)							
030407-cds3-1		Low Reasonability Limit (Min Net MW level)							
030407-cds3-1		High Reasonability Ramp Rate Limit (Max ramp MW/min)							
030407-cds3-1		Low Reasonability Ramp Rate Limit (Min ramp MW/min)							
030407-cds3-1		Qualifying Facility (Yes or No?)							
110307-cds4-1		Seasonal Net Max Sustainable MW Rating- Spring							
110307-cds4-1		Seasonal Net Min Sustainable MW Rating- Spring							
110307-cds4-1		Seasonal Net Max Emergency MW Rating- Spring							
110307-cds4-1		Seasonal Net Min Emergency MW Rating- Spring							
110307-cds4-1		Seasonal Net Max Sustainable MW Rating- Summer							
110307-cds4-1		Seasonal Net Min Sustainable MW Rating- Summer							
110307-cds4-1		Seasonal Net Max Emergency MW Rating- Summer							
110307-cds4-1		Seasonal Net Min Emergency MW Rating- Summer							
110307-cds4-1		Seasonal Net Max Sustainable MW Rating- Fall							
110307-cds4-1		Seasonal Net Min Sustainable MW Rating- Fall							
110307-cds4-1		Seasonal Net Max Emergency MW Rating- Fall							
110307-cds4-1		Seasonal Net Min Emergency MW Rating- Fall							
110307-cds4-1		Seasonal Net Max Sustainable MW Rating- Winter							
110307-cds4-1		Seasonal Net Min Sustainable MW Rating- Winter							
110307-cds4-1		Seasonal Net Max Emergency MW Rating- Winter							
110307-cds4-1		Seasonal Net Min Emergency MW Rating- Winter							
030407-cds3-1		Name Plate Rating (MVA)							
110307-cds4-1		Rating (MW)							
110307-cds4-1		Rating (MVA)							
110307-cds4-1		Unit kV							

Ownership information should also be complete. This section is found at the bottom of the Generation tab.

Figure 4-2: Snapshot of Ownership section of the Generation tab.



Complete this section if a single RESOURCE owns 100% of all units.

Data Aggregatio	Resource Owner Data	Owner 1	MP Comments
	Resource Entity Name		
	Resource Duns Number		

Complete this section if splitting netted gensite load among multiple ESIIDs

Data Aggregatio	Gen Load Splitting	ESIID 1	ESIID 2	ESIID 3	ESIID 4	ESIID 5	ESIID 6	MP Con
	Fixed Load Splitting %							
	Competitive Retailer							
	Competitive Retailer DUNS #							

Complete the following sections only if Units are Jointly-Owned or represent Split-Generation behind the EPS Meter

Unit 1 Data

Data Aggregation	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Con
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Unit 2 Data

Data Aggregation	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Con
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Unit 3 Data

Data Aggregation	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Con
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Unit 4 Data

Data Aggregation	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Con
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Unit 5 Data

Data Aggregation	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Con
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

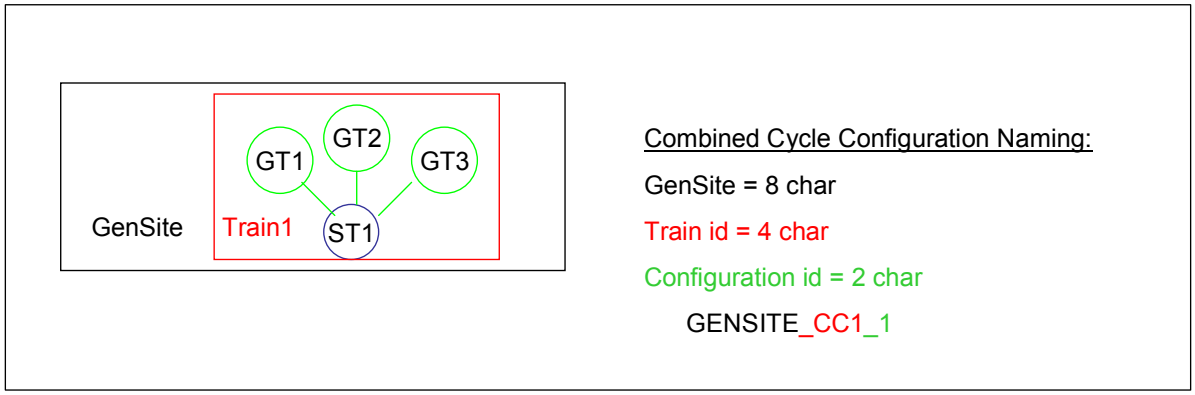
5.0 Combined Cycle Resources Tab

Generation Resource Entities with combined cycle generation units should select the "Combined Cycle Train 1" tab and fill out all fields. If there are multiple trains, then a separate tab (CC Train 2, CC Train 3) needs to be completed for each train. If there are more than three trains at one site, please submit an additional RARF.

In the Nodal system, combined-cycle resources will not be registered in ERCOT systems as jointly owned/split generation. These resources will be modeled either as individual units with multiple owners or combined-cycle with one owner.

A combined cycle train included Generation Resources that are interconnected by sharing a common steam turbine(s). These resources are specially modeled in ERCOT systems to reflect the interdependencies of dispatching the units as a logical train. Naming of the units, trains, and configurations will be done by ERCOT. The general naming convention is shown in figure 5-1.

Figure 5-1: CC Train and Configuration Naming



Combined Cycle (CC) resources can submit different configurations on the RARF. Currently, the CC configuration limit is set by the number of units in the train. A CC train with 3 units would be able to submit 3 operating configurations. For more information on Combined Cycles, please reference the CC whitepaper *White Paper - Combined Cycle v1.0,* located at http://nodal.ercot.com/readiness/rq/documents/index.html.

Instead of duct burners or other optional CC augmentations being modeled as a separate unit, limits on the RARF should include these options and should address reductions to these limits in the Current Operating Plan (COP). In the RARF, ERCOT needs to know if these optional features exist, so they are Y/N questions. See Figure 5-2 for CC train information. The names are assigned by ERCOT in accordance with ERCOT systems.

Figure 5-2: Combined Cycle

Field Description	CombCycle Train	MP Comments
Name of Combined Cycle Train		
Mnemonic for Combined Cycle Train		
Unit Start Date		
Unit End Date		
Fuel Transportation Type		
Resource Category		
Qualifying Facility (Y/N)?		
Is train augmented with Duct Burner(s)?		
Is train augmented with Evap Cooler(s)?		
Is train augmented with Chiller(s)?		
Other augmentation (place in comments)?		

Figure 5-3 shows the configuration section for a CC unit. This unit has three combustion turbines and one steam turbine. Looking at the first section in this example, Configuration 1 shows all units operational. Configuration 2 shows three units operational (with one alternate). Configuration 3 shows two units (and one alternate) operational. The second section in Figure 5-3 shows potential transitions from one configuration to another.

Figure 5-3: Snapshot of Combined Cycle Configuration

	B	C	D	F	G	H	I	
8			Blue Highlight = Data on zonal GARF or GenDataForm					
9			Pink Highlight = New nodal data					
10			**Use table below to identify which units will be associated with each registered configuration for the Combined Cycle Train**					
11	EDS Display		Place X in matrix on right to flag units to be in configuration, and "A" if unit can be alternate unit for configuration (more detail in comment tag)	CC Unit Type	Configuration 1	Configuration 2	Configuration 3	Config
12	030407-eds3-1		ERC_ERC_G1	**CT**	X	**A**	**A**	
13	030407-eds3-1		ERC_ERC_G2	**CT**	X	X	X	
14	030407-eds3-1		ERC_ERC_G3	**CT**	X	X	X	
15	030407-eds3-1		ERC_ERC_G4	**CA**	X	X		
16	030407-eds3-1		Unit #5					
17	030407-eds3-1		Unit #6					
18	030407-eds3-1		Unit #7					
19	030407-eds3-1		Unit #8					
20	030407-eds3-1							
21	030407-eds3-1		**Use table below to identify which configuration can transition to another configuration for the Combined Cycle Train**					
22	030407-eds3-1		From configuration in this column, to next configuration Use X in matrix to mark allowable transitions	To Offline	To Configuration 1	To Configuration 2	To Configuration 3	Cont
23	030407-eds3-1		From Offline					
24	030407-eds3-1		From Configuration 1			X	X	
25	030407-eds3-1		From Configuration 2		X		X	
26	030407-eds3-1		From Configuration 3		X	X		
27	030407-eds3-1		From Configuration 4		X	X	X	
28	030407-eds3-1		From Configuration 5					
29	030407-eds3-1		From Configuration 6					
30	030407-eds3-1		From Configuration 7					
31	030407-eds3-1		From Configuration 8					

Each unit of a CC train needs to have its individual unit parameters entered into the RARF. Samples of these are shown in Figure 5-4. Data such as seasonal ratings and ramp rates are also needed for each configuration to the right of the unit data.

Figure 5-4: Snapshot of Combined Cycle Unit Data

		Field Description	Unit #1	Unit #2	Unit #3	Unit #4	Unit #5	Unit #6	Unit #7	Unit #8	Config 1	Confi
	Generator Unit Information	Unit Name	ERC_G1	ERC_G2	ERC_G3	ERC_G4						
		Unit Code/Mnemonic	ERC_ERC_G1	ERC_ERC_G2	ERC_ERC_G3	ERC_ERC_G4						
		Unit Start Date	3/1/1982	3/1/1982	3/1/2005	3/1/1982						
		Unit End Date										
		Physical Unit Type	CT	CT	CT	CA						
		Primary Fuel Type	MTE	MTE		STM						
		Secondary Fuel Type	X	X	NA	NA						
		High Reasonability Limit (Max Net MW level)	85	85	100	90					250	200
		Low Reasonability Limit (Min Net MW level)	30	30	15	30					0	0
		High Reasonability Ramp Rate Limit (Max ramp MW/min)	4	4	4	4					10	8
		Low Reasonability Ramp Rate Limit (Min ramp MW/min)	0	0	0	0					0	0
		Seasonal Net Max Sustainable MW Rating- Spring										
		Seasonal Net Min Sustainable MW Rating- Spring										
		Seasonal Net Max Emergency MW Rating- Spring										
		Seasonal Net Min Emergency MW Rating- Spring										
		Seasonal Net Max Sustainable MW Rating- Summer										
		Seasonal Net Min Sustainable MW Rating- Summer										
		Seasonal Net Max Emergency MW Rating- Summer										
		Seasonal Net Min Emergency MW Rating- Summer										
		Seasonal Net Max Sustainable MW Rating- Fall										
		Seasonal Net Min Sustainable MW Rating- Fall										
		Seasonal Net Max Emergency MW Rating- Fall										
		Seasonal Net Min Emergency MW Rating- Fall										
		Seasonal Net Max Sustainable MW Rating- Winter										
		Seasonal Net Min Sustainable MW Rating- Winter										
		Seasonal Net Max Emergency MW Rating- Winter										
		Seasonal Net Min Emergency MW Rating- Winter										
		Name Plate Rating (MVA)	115.75	115.75	90.875	96						
		Rating (MW)	74	74	89.17	80						
		Rating (MVAR)	30	30	55.71	30						
		Unit KV										
	GenForm.xls)	Private Network (Y or N)	Y	Y	Y	Y						
		Average Amount of Self-Serve private load (MW)	235	235	235	235						
		Expected Typical Private Network Net Interchange (MW)										
		Private Network Gross Unit Capability (MVAR)										
		If Unit trips, does Load trip?	N	N	N	N						

6.0 Wind Resources Tab

Wind Generation Resources should select the "Wind" tab and fill out all fields. If there are more than six units, please submit an additional RARF.

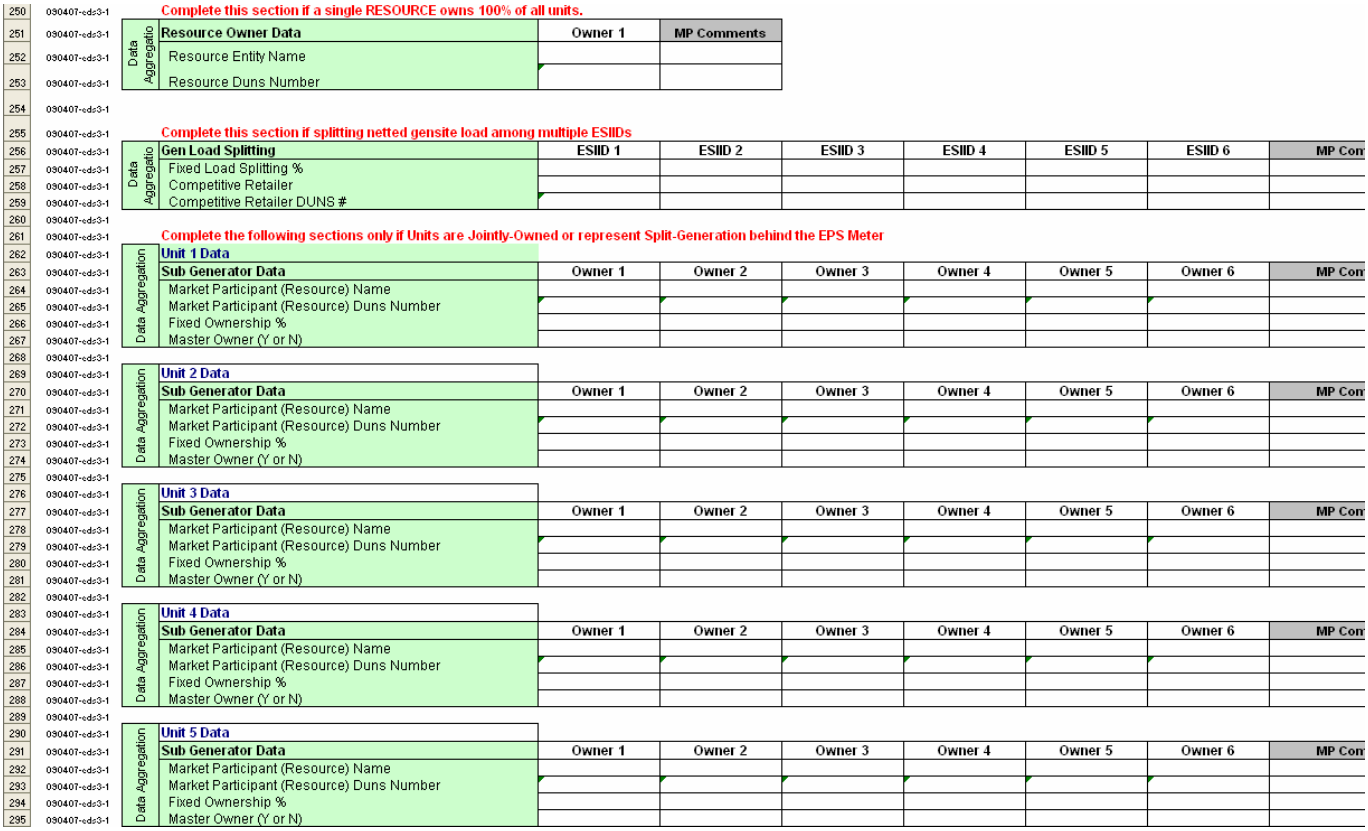
Figure 6-1: Snapshot of Generation Unit Information of the Wind tab

Generator Unit Information

Field Description	Unit #1	Unit #2	Unit #3
Unit Name			
Unit Code			
Unit Start Date			
Unit End Date			
Physical Unit Type			
Renewable (Y/N)			
Renewable/Offset			
Resource Category			
High Reasonability Limit (Max MW level)			
Low Reasonability Limit (Min MW level)			
High Reasonability Ramp Rate Limit (Max ramp MW/min)			
Low Reasonability Ramp Rate Limit (Min ramp MW/min)			
Latitude of center of Wind Farm (decimal degrees)			
Longitude of center of Wind Farm (decimal degrees)			
Total Number of Turbines			
Please provide # Turbines by Equipment Type			
Group 1- Type of Turbines (Manufacturer/Model)			
Group 1- Number of this type of Turbine			
Group 2- Type of Turbines (Manufacturer/Model)			
Group 2- Number of this type of Turbine			
Group 3- Type of Turbines (Manufacturer/Model)			
Group 3- Number of this type of Turbine			
Group 4- Type of Turbines (Manufacturer/Model)			
Group 4- Number of this type of Turbine			
Group 5- Type of Turbines (Manufacturer/Model)			
Group 5- Number of this type of Turbine			
Average Height above ground of Turbine Hub (meters)			
Latitude of Meteorological Tower (decimal degrees)			
Longitude of Meteorological Tower (decimal degrees)			
Height of Meteorological Tower Instrumentation (meters)			
Include Manufacturer's Curve (Capability Curve)			
Eligible for McCamey Flowgate Rights (MCFRIs)?			
Qualifying Facility (Yes or No?)			
Seasonal Net Max Sustainable MW Rating- Spring			
Seasonal Net Min Sustainable MW Rating- Spring			
Seasonal Net Max Emergency MW Rating- Spring			
Seasonal Net Min Emergency MW Rating- Spring			
Seasonal Net Max Sustainable MW Rating- Summer			
Seasonal Net Min Sustainable MW Rating- Summer			
Seasonal Net Max Emergency MW Rating- Summer			
Seasonal Net Min Emergency MW Rating- Summer			
Seasonal Net Max Sustainable MW Rating- Fall			
Seasonal Net Min Sustainable MW Rating- Fall			
Seasonal Net Max Emergency MW Rating- Fall			
Seasonal Net Min Emergency MW Rating- Fall			
Seasonal Net Max Sustainable MW Rating- Winter			
Seasonal Net Min Sustainable MW Rating- Winter			
Seasonal Net Max Emergency MW Rating- Winter			
Seasonal Net Min Emergency MW Rating- Winter			

Ownership information should also be complete. This section is found at the bottom of the wind tab.

Figure 6-2: Snapshot of Ownership section of the Generation tab.



Complete this section if a single RESOURCE owns 100% of all units.

Data Aggregation	Resource Owner Data	Owner 1	MP Comments
	Resource Entity Name		
	Resource Duns Number		

Complete this section if splitting netted gensite load among multiple ESIIDs

Data Aggregation	Gen Load Splitting	ESIID 1	ESIID 2	ESIID 3	ESIID 4	ESIID 5	ESIID 6	MP Com
	Fixed Load Splitting %							
	Competitive Retailer							
	Competitive Retailer DUNS #							

Complete the following sections only if Units are Jointly-Owned or represent Split-Generation behind the EPS Meter

Data Aggregation	Unit 1 Data							
	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Com
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Data Aggregation	Unit 2 Data							
	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Com
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Data Aggregation	Unit 3 Data							
	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Com
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Data Aggregation	Unit 4 Data							
	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Com
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

Data Aggregation	Unit 5 Data							
	Sub Generator Data	Owner 1	Owner 2	Owner 3	Owner 4	Owner 5	Owner 6	MP Com
	Market Participant (Resource) Name							
	Market Participant (Resource) Duns Number							
	Fixed Ownership %							
	Master Owner (Y or N)							

7.0 Load Resources Tab

Resource Entities with Load Resources should select the "Load Resources" tab and fill out all fields. If there are more than 12 load points, please submit an additional RARF.

Figure 7-1: Snapshot of Load Resource tab

Generator Unit Information

Field Description	Unit #1	Unit #2	Unit #3
Unit Name			
Unit Code			
Unit Start Date			
Unit End Date			
Physical Unit Type			
Renewable (Y/N)			
Renewable/Offset			
Resource Category			
High Reasonability Limit (Max MW level)			
Low Reasonability Limit (Min MW level)			
High Reasonability Ramp Rate Limit (Max ramp MW/min)			
Low Reasonability Ramp Rate Limit (Min ramp MW/min)			
Latitude of center of Wind Farm (decimal degrees)			
Longitude of center of Wind Farm (decimal degrees)			
Total Number of Turbines			
Please provide # Turbines by Equipment Type			
Group 1- Type of Turbines (Manufacturer/Model)			
Group 1- Number of this type of Turbine			
Group 2- Type of Turbines (Manufacturer/Model)			
Group 2- Number of this type of Turbine			
Group 3- Type of Turbines (Manufacturer/Model)			
Group 3- Number of this type of Turbine			
Group 4- Type of Turbines (Manufacturer/Model)			
Group 4- Number of this type of Turbine			
Group 5- Type of Turbines (Manufacturer/Model)			
Group 5- Number of this type of Turbine			
Average Height above ground of Turbine Hub (meters)			
Latitude of Meteorological Tower (decimal degrees)			
Longitude of Meteorological Tower (decimal degrees)			
Height of Meteorological Tower Instrumentation (meters)			
Include Manufacturer's Curve (Capability Curve)			
Eligible for McCamey Flowgate Rights (MCFRIs)?			
Qualifying Facility (Yes or No?)			
Seasonal Net Max Sustainable MW Rating- Spring			
Seasonal Net Min Sustainable MW Rating- Spring			
Seasonal Net Max Emergency MW Rating- Spring			
Seasonal Net Min Emergency MW Rating- Spring			
Seasonal Net Max Sustainable MW Rating- Summer			
Seasonal Net Min Sustainable MW Rating- Summer			
Seasonal Net Max Emergency MW Rating- Summer			
Seasonal Net Min Emergency MW Rating- Summer			
Seasonal Net Max Sustainable MW Rating- Fall			
Seasonal Net Min Sustainable MW Rating- Fall			
Seasonal Net Max Emergency MW Rating- Fall			
Seasonal Net Min Emergency MW Rating- Fall			
Seasonal Net Max Sustainable MW Rating- Winter			
Seasonal Net Min Sustainable MW Rating- Winter			
Seasonal Net Max Emergency MW Rating- Winter			
Seasonal Net Min Emergency MW Rating- Winter			

8.0 Private Networks

Private Use Networks that are not running in a combined cycle configuration shall register individual units rather than aggregating those units. To register individual units, the "Generation X-X" tabs should be utilized. For Private-Use Networks that are CC, the Combined Cyle-Train1/2/3 tabs should be used.

Additional data is required of Private Networks – most of which is due in December. See Figure 8-1 for a snapshot of the particular Private Network information that is needed in addition to the Generation and/or Combined Cycle tabs. ERCOT will be working with Private Networks to ensure the units are defined appropriately.

Figure 8-1: Information for Private Networks Only

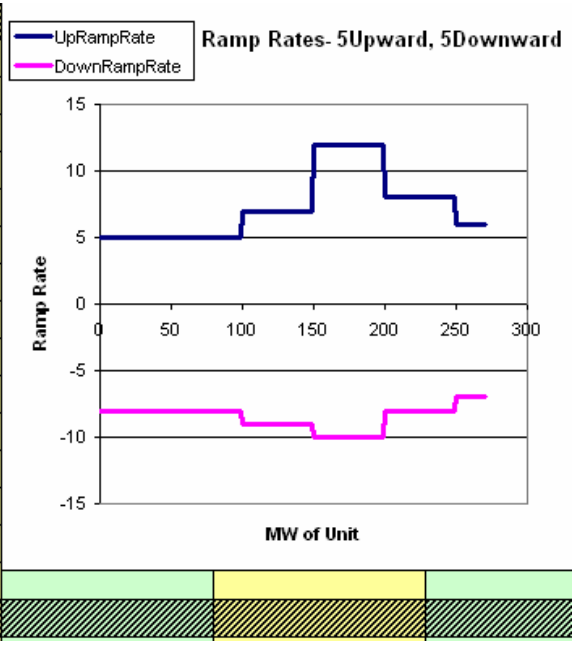
Private Network Section (previously on GenForm.)	
	Private Network (Y or N)
	Average Amount of Self-Serve private load (MW)
	Expected Typical Private Network Net Interchange (MW)
	Private Network Gross Unit Capability (MW)
	If Unit trips, does Load trip?
	If yes, approximate MW of Load that will trip?
	Load Characteristics:
	--Large Motor, percent of total MW load
	-Small Motor, percent of total MW load
	-Resistive (Heating) Load, percent of total MW load
	-Discharge Lighting, percent of total MW load
	-Other, percent of total MW load
	--Large Motor, percent of total MVAR load
	-Small Motor, percent of total MVAR load
	-Resistive (Heating) Load, percent of total MVAR load
	-Discharge Lighting, percent of total MVAR load
	-Other, percent of total MVAR load

9.0 Ramp Rates

Ramp rates are initially submitted in the RARF. QSEs will be able to update the ramp rates in Market Management System (MMS). These ramp rates will be in the up and down directions and passed from MMS to Energy Management System (EMS) to be used in the Resource Limit Calculator (RLC). Please note these ramp rates are treated as step functions rather than being interpolated into a curve. All ramp rate values, including downward rates, should be entered in the RARF as positive values.

Figure 9-1: Ramp Rate Example

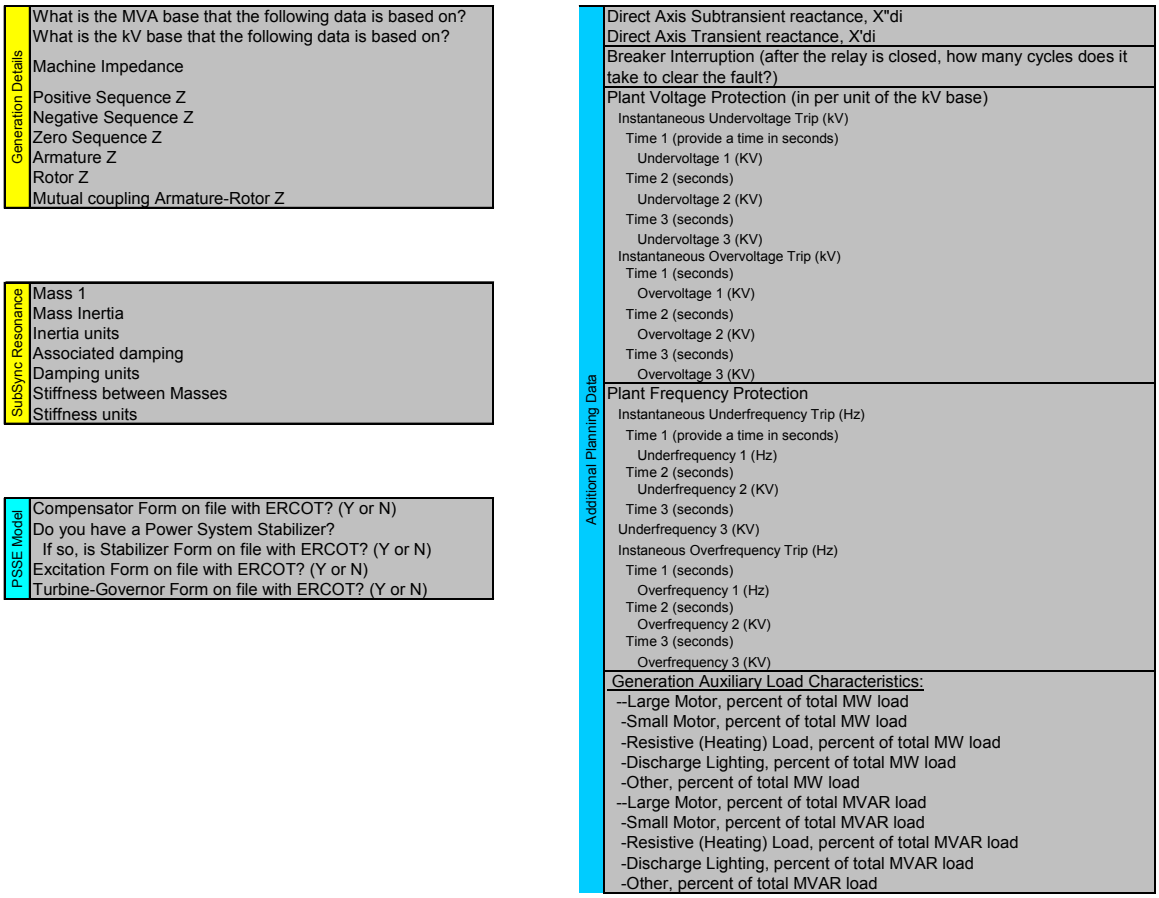
Normal Ramp Rate Curve	
MW1 (MW1/Low to MW5/High end of curve)	50
Upward RampRate1 (MW/minute)	5
Downward RampRate1 (MW/minute)	8
MW2	100
Upward RampRate2 (MW/minute)	7
Downward RampRate2 (MW/minute)	9
MW3	150
Upward RampRate3 (MW/minute)	12
Downward RampRate3 (MW/minute)	10
MW4	200
Upward RampRate4 (MW/minute)	8
Downward RampRate4 (MW/minute)	8
MW5	250
Upward RampRate5 (MW/minute)	6
Downward RampRate5 (MW/minute)	7
Emergency Ramp Rate Curve	



10.0 Planning and Modeling Data

For all Generation Resource, ERCOT is requesting additional planning data in gray to be submitted by December 31, 2007. ERCOT has included all known data requirements in the current RARF. Additional data may be requested, most likely as an addendum. All data will be submitted to the RE in a final form in 2008 for final review and to be signed by the Authorized Representative.

Figure 10-1: Some of the additional planning data



11.0 Appendix

11.1 FAQ

What are the High/Low Reasonability Limits?

- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value per Nodal Protocol 3.7.1. This value is used to validate data submitted to ERCOT (Alarms, ICCP, COP)

For private network, what are the High/Low Reasonability Limits?

- The Highest and Lowest amount of power that could be injected into the ERCOT grid from that unit, depending on unit capabilities and swing of the industrial load behind the fence

How will market participants submit data in the current operating plan (COP) against what is registered?

- Registration data in the RARF will be used within the Market Management System (MMS) to establish and enforce the resource name and reasonability limits. The data submitted by the QSE within the COP will need to be aligned with the naming of the resource and within the reasonability limits provided by the resource entity in the RARF, specifically the high/low reasonability limits.

Where will the transformer names be found/listed/available on the RARF?

- Existing REs should have and use the transformer names on their current GARF. The primary intent is that the name adheres to the naming conventions specified for that field in the GARF (and the RARF). For new REs, the transformer name results can be obtained by one of several methods:

    - The transmission operator dictates the name
    - The RE determines the name
    - The transmission and distribution service provider (TDSP) and RE work together to determine a name

Should a co-generation site use the "Combined Cycle" tab on the RARF?

- Yes, if the co-generation resource is currently registered as a Resource Category of Combined Cycle then the resource will need to be represented on the 'Combined Cycle' tab of the nodal resource asset registration form (RARF).

For nodal purposes are resource entities required to submit an updated Resource Asset Registration Form (RARF) for mothballed generation resources?

- For transitioning to the Nodal market, ERCOT will require Resource Entities to submit an updated Resource Asset Registration Form (RARF) for all Resources, including Mothballed Generation Resources.

What is a "Qualifying Facility"?

- Per ERCOT Protocol Section 2, a Qualifying Facility (QF) is defined as a qualifying cogeneration facility or qualifying small power production facility under regulatory qualification criteria as defined in PURPA, 16 USC 796 (18) (B) and 796 (17) (C).

Will combined cycle resources have to fill out any fields on the "Generation" tab?

- No. The intent is for "Generation", "Combined Cycle", and "Wind" and "Load Resource" tabs to be stand-alone registration documents.

It appears that the form asks for the input of MW loads and the ramp rate between any two loads. If that is correct, why is there the same number of loads as ramps on the form? Shouldn't there be one less ramp?

- REs can provide up to 5 points (pairs) of up ramp rates and down ramp rates for each MW value. Each point represents a ramp rate value that extends horizontally to the next MW point where it stair-steps to the next MW value. The very first and very last ramp rates will extend to zero and infinity.

We have broken the ramp rates for some of our units into five pieces. Would we then need six loads? Should I insert another row for the sixth load?

- ERCOT systems will only accept 5 pairs. Please do not insert or delete rows or columns from the RARF.

Does ERCOT want the ramp rate for conditions of a zero wind speed (zero generation) to the highest wind speed on the manufacturer's curve (nameplate capacity)?

- ERCOT desires the highest possible ramp rate from the resource under any circumstances in order to be able to validate data (not used for dispatch).

What is the definition of Low Reasonability Ramp Rate Limit (Min ramp MW/min)?

- ERCOT needs the max downward possible ramp rate from the resource under any circumstances in order to be able to validate data (not used for dispatch).

Does ERCOT want the Manufacturer's power curve added as a separate tab to this document?

- Please include Capability Curve as a separate document.

Does the "Low Reasonability Limit" exclude the period of time when a unit is coming on line and getting to minimum load? Just before a unit synchronizes, it could be at negative load, and it could be below minimal operational load for some time beyond that.

- The Low Reasonability Limit should reflect the lowest limit after it is synchronized.

Does "Private Network" exclude auxiliary/house power in generating stations?

- No. Please include all auxiliary/house power.

On the 'General Information' Tab, can you clarify the question “Is Resource behind a NOIE Settlement Meter Point?”? We have EPS Meters for our generators and we are a NOIE, so we should respond in the affirmative?

- Yes, intent of the question is to confirm the RE has EPS Meters for NOIE generator(s).

For the "Normal Ramp Rate Curve" on the "Combined Cycle" tab, does ERCOT expect to see the ramp rate from LSL to HSL or the ramp rate in the start-up period?

- ERCOT desires the ramp rate curve at Low Reasonability Limit (LRL) to the High Reasonability Limit (HRL).

Can you reference the Nodal Protocols where it gives combined cycle units the opportunity to register as a single resource?

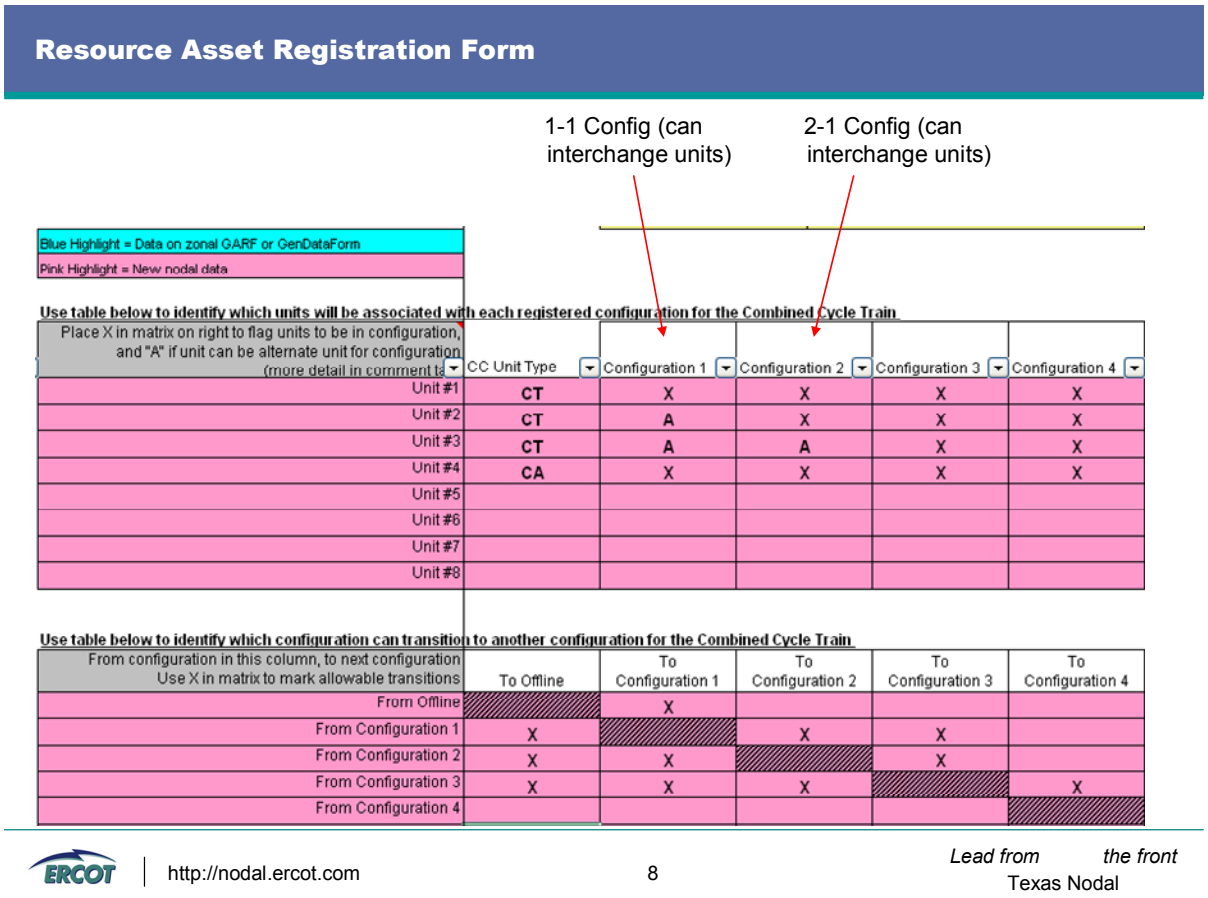
- There is no protocol reference stating a CC must register as a CC or otherwise. The definition in Protocol Section 2 defines a Combined-Cycle Configuration to be “Any combination in which a combined-cycle power block can be operated as a separate Resource. Each possible configuration operated as a separate Resource has a distinct set of operating parameters, physical constraints, and Energy Offer Curve.” The CC owner has the option of registering the CC site as combined cycle or as separate units. However, registering the CC as a train will improve modeling and dispatch.

For Ramp Rate Curves, the ramp rate varies in different operational scenarios, such as winter, summer etc. What does "Normal" mean?

- ERCOT desires the ramp rate curve at Low Sustainable Limit (LSL) to the High Sustainable Limit (HSL).

11.2 Combined Cycle Configuration Example

Instructions: Place X in matrix on right to flag units to be in configuration, and "A" if unit can be alternate unit for configuration. Alternate units must be of the same Unit Type as one of the selected "X" units.



Alternate Unit Example: CC1 – Limited Flexibility of Train

In the form below the alternate designation "A" has been used to indicate that specific units can be substituted for others. However, configurations 1, 2, and 3 all result in the same configuration since the alternate unit can substitute for any other GT units. The ST can never be an "A" as there is no other unit of the same type on this train. Note – for clarity purposes, this example does not use actual RARF unit types.

	CC Unit Type	Configuration 1	Configuration 2	Configuration 3	Configuration 4	Configuration 5
Plant_GT1	**GT**	**X**	**X**	**A**	**X**	
Plant_GT2	**GT**	**X**	**A**	**X**	**X**	
Plant_GT3	**GT**	**A**	**X**	**X**	**X**	
Plant_ST1	**ST**	**X**	**X**	**X**	**X**	
Unit 5						

This information translates to the following:

CC Name	Config	Unit 1	Unit 2	Unit 3	Unit 4
Plant_CC1_1	1	Plant_GT1	Plant_GT2	Plant_ST1	
Plant_CC1_1	1 (alt)	Plant_GT1	Plant_GT3	Plant_ST1	
Plant_CC1_1	1 (alt)	Plant_GT2	Plant_GT3	Plant_ST1	
Plant_CC1_2	2	Plant_GT1	Plant_GT3	Plant_ST1	
Plant_CC1_2	2 (alt)	Plant_GT1	Plant_GT2	Plant_ST1	
Plant_CC1_2	2 (alt)	Plant_GT2	Plant_GT3	Plant_ST1	
Plant_CC1_3	3	Plant_GT2	Plant_GT3	Plant_ST1	
Plant_CC1_3	3 (alt)	Plant_GT1	Plant_GT3	Plant_ST1	
Plant_CC1_3	3 (alt)	Plant_GT1	Plant_GT2	Plant_ST1	
Plant_CC1_4	4	Plant_GT1	Plant_GT2	Plant_GT3	Plant_ST1

When Train 1, Configuration 2 is in use (Plant_CC1_2), there will be three units in service – two gas turbines and one steam. If Train 1, Configuration 4 is in use (Plant_CC1_4), all four units will be in service. In this case, Configuration 1, 2, and 3 are essentially the same.

Alternate Unit Example: CC1 – Broad Flexibility of Train

Since the number of configurations that can be used is limited to the number of physical units, the first example will limit the flexibility of the unit. A better use of alternatives is outlined below. This allows many more combinations out of the four configurations allowed for these four units.

	CC Unit Type	Configuration 1	Configuration 2	Configuration 3	Configuration 4	Configuration 5
Plant_GT1	**GT**	**X**	**X**	**X**	**X**	
Plant_GT2	**GT**	**A**	**X**	**X**	**X**	
Plant_GT3	**GT**	**A**	**A**	**X**	**X**	
Plant_ST1	**ST**	**X**	**X**	**X**		
Unit 5						

This information translates to the following:

CC Name	Config	Unit 1	Unit 2	Unit 3	Unit 4
Plant_CC1_1	1	Plant_GT1	Plant_ST1		
Plant_CC1_1	1 (alt)	Plant_GT2	Plant_ST1		
Plant_CC1_1	1 (alt)	Plant_GT3	Plant_ST1		
Plant_CC1_2	2	Plant_GT1	Plant_GT3	Plant_ST1	
Plant_CC1_2	2 (alt)	Plant_GT1	Plant_GT2	Plant_ST1	
Plant_CC1_2	2 (alt)	Plant_GT2	Plant_GT3	Plant_ST1	
Plant_CC1_3	3	Plant_GT1	Plant_GT2	Plant_GT3	Plant_ST1
Plant_CC1_4	4	Plant_GT1	Plant_GT2	Plant_GT3	

This combination of configurations gives the Resource the ability to operate two, three, or four units.

11.3 Additional Information

The following documents are available through the Registration and Qualification area of the Readiness Center on the ERCOT Nodal website at http://nodal.ercot.com/readiness/rq/documents/index.html.

- Private Use Network Example
- White Paper - Combined Cycle v1.0
- White Paper - Split Generation Resource Modeling v1.0

11.4 Glossary

Glossary		
Tab	**Term**	**Definition**
General Information - All Resources		
General Information	Resource Site Name	Resource site or main facility name (i.e. CEDAR BAYOU PLANT)
General Information	Resource Site Code	Code for Resource Site (i.e. Cedar Bayou Plant it is CBY)
General Information	Resource Entity Name	Enter the name of the Resource Entity who represents the load. This must be the same entity name that filed as a Resource Entity on the Standard Form Agreement. The Protocols require that a Load Acting as a Resource must complete and submit an Application
General Information	Resource Entity DUNS	Enter the DUNs number for the Entity listed above.
General Information	Authorized Representative	Enter the requested information for the person identified as the Authorized Representative.
General Information	Primary Contact	Enter the personal information for the person identified as the Primary Contact person.
General Information	Congestion Management Zone for 2003:	For reporting purposes only to support the Projected System Adequacy Reporting requirements of PUCT project 31972, reflected in Protocols Section 3.2 Analysis of Resource Adequacy.
Generator Unit Information		
Generation, Combined Cycle, Wind	Unit Name	Code for name of generator unit (i.e. Cedar Bayou Plant Gen 1 is "CBYG1")
Generation, Combined Cycle, Wind	Unit Code	Concatenated mnemonic of Resource Site Code and Unit name (i.e. CBY_CBYG1)
Generation, Combined Cycle, Wind	Unit Start Date	In-Service Date in MM/DD/YYYY. If full date is not known, enter the year YYYY.
Generation, Combined Cycle, Wind	Unit End Date	Retirement Date in YYYY format. Leave blank if unknown.
Generation, Combined Cycle, Wind	Physical Unit Type	CA -- Combined cycle steam part (includes steam part of integrated coal gasification combined cycle) CC -- Combined cycle total unit (use only for plants/generators that are in planning stage, for which specific generator details cannot be provided) CE -- Compressed air energy storage CS -- Combined cycle single shaft (combustion turbine and steam turbine share a single generator) CT -- Combined cycle combustion turbine part (includes comb. turbine part of integrated coal gasification combined cycle) FC -- Fuel Cell GT -- Combustion (gas) turbine (includes jet engine design) HY -- Hydraulic turbine (includes turbines associated with delivery of water by pipeline IC -- Internal combustion (diesel, piston) engine NA -- Unknown at this time (planned units only) OT -- Other PS -- Hydraulic Turbine - Reversible (pumped storage) PV -- Photovoltaic ST -- Steam Turbine including nuclear, geothermal and solar. Does not include combined cycle. WT -- Wind Turbine

Generation, Combined Cycle	Primary Fuel Type	AB -- Agriculture Byproducts (bagasse, straw, energy crops) BFG -- Blast-Furnace Gas BIT -- Bituminous Coal BL -- Black liquor DFO -- Distillate Fuel Oil (diesel, No1 fuel oil, No 2 fuel oil, No 4 fuel oil) GEO -- Geothermal JF -- Jet Fuel KER -- Kerosene LFG -- Landfill Gas LIG -- Lignite MSW -- Municipal Solid Waste (refuse) NA -- Not Applicable NG -- Natural Gas NUC -- Nuclear (uranium, plutonium, thorium) OBG -- Other - Biomass Gas (methane, digester gas) OBL -- Other - Biomass Liquids (ethanol, fish oil, waste alcohol, other gases) OBS -- Other - Biomass Solids (animal manure/waster, medical waste, paper pellets, paper derived fuel) OG -- Other - Gas (butane, coal processes, coke-oven coal, methanol, refinery gas) OO -- Other - Oil (butane, crude, liquid byproducts, oil waste, propane) OTH -- Other (batteries, chemicals, hydrogen pitch sulfur, misc technologies) PC -- Petroleum Coke PG -- Propane RFO -- Residual Fuel Oil (No 5 and No 6 fuel oil) SLW -- Sludge Waste SUB -- Sub-bituminous Coal SUN -- Solar (photovoltaic, thermal) TDF -- Tires WAT -- Water (conventional, pumped storage) WDL -- Wood/Wood Waste - Liquids (red liquor, sludge wood spent sulfite liquor, other liquors) WDS -- Wood/Wood Waste - Solids (peat, railroad ties, utility poles, wood chips, other solids) WH -- Waste heat WND -- Wind WOC -- Waste / Other Coal
Generation, Combined Cycle	Secondary Fuel Type	Same data entry elements as primary fuel type, but for secondary or start-up fuel.
Generation, Combined Cycle	Fuel Transportation Type	CV -- Conveyor PL -- Pipeline RR -- Railroad TK -- Truck NA -- Not Applicable
Generation, Combined Cycle, Wind	Renewable/Offset	RN -- Renewable OS -- Renewable Offset NA -- Not Applicable A REC offset represents one MWH of renewable energy from an existing facility that may be used in place of a REC to meet renewable energy requirement. See Substantive Rule 25.173(c) (10). Is the unit a certified renewable energy credit generator or a certified offset generator? See Protocol Section 14.9.
Generation, Combined Cycle, Wind	Resource Category	Nuclear Hydro Coal and Lignite Combined Cycle ≤ 90 MW* Combined Cycle > 90 MW* Gas Steam - Supercritical Boiler Gas Steam - Reheat Boiler Gas Steam - Non-reheat or Boiler without air-preheater Simple Cycle ≤ 90 MW Simple Cycle > 90 MW Diesel Renewable

Generation, Combined Cycle, Wind	High Reasonability Limit (Max Net MW level)	New Nodal field per protocol 3.7.1- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value.
Generation, Combined Cycle, Wind	Low Reasonability Limit (Min Net MW level)	New Nodal field per protocol 3.7.1- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value. This value should be when the unit is synchronized, not zero.
Generation, Combined Cycle, Wind	High Reasonability Ramp Rate Limit (Max ramp MW/min)	New Nodal field- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value.
Generation, Combined Cycle, Wind	Low Reasonability Ramp Rate Limit (Min ramp MW/min)	New Nodal field- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value.
Generation, Combined Cycle, Wind	Qualifying Facility (Yes or No?)	Per PURA
Generation, Combined Cycle, Wind	Seasonal Net Max Sustainable MW Rating	Seasonal - Spring, Summer, Fall, Winter
Generation, Combined Cycle, Wind	Seasonal Net Min Sustainable MW Rating	Seasonal - Spring, Summer, Fall, Winter
Generation, Combined Cycle, Wind	Seasonal Net Max Emergency MW Rating	Seasonal - Spring, Summer, Fall, Winter
Generation, Combined Cycle, Wind	Seasonal Net Min Emergency MW Rating	Seasonal - Spring, Summer, Fall, Winter
Generation, Combined Cycle, Wind	Name Plate Rating (MVA)	Name Plate MVA Rating of this unit at its rated Power Factor.
Generation, Combined Cycle, Wind	Rated Power Factor	Maximum rated MW at rated Power Factor at Unit Reactive Limit- defined as the maximum quantity of Reactive Power that a Generation Resource is capable of providing at a 0.95 power factor at its maximum real power capability.
Generation, Combined Cycle, Wind	Rating (MW)	Maximum rated MW at rated Power Factor at Unit Reactive Limit- defined as the maximum quantity of Reactive Power that a Generation Resource is capable of providing at a 0.95 power factor at its maximum real power capability.
Generation, Combined Cycle, Wind	Rating (MVAR)	Maximum MVAR at rated Power Factor
Generation, Combined Cycle, Wind	Unit KV	Terminal voltage of unit
	Additional Wind Resource Data	
Wind	Latitude of center of Wind Farm (decimal degrees)	New Nodal field- used for Wind Generation Forecasting
Wind	Longitude of center of Wind Farm (decimal degrees)	New Nodal field- used for Wind Generation Forecasting
Wind	Number of Turbines	Total number of turbines
Wind	Type of Turbines (Manufacturer/Model)	New Nodal field- used for Wind Generation Forecasting - Include number of each type of turbine
Wind	Average Height above ground of Turbine Hub (meters)	New Nodal field- used for Wind Generation Forecasting
Wind	Latitude of Meteorological Tower (decimal degrees)	New Nodal field- used for Wind Generation Forecasting
Wind	Longitude of Meteorological Tower (decimal degrees)	New Nodal field- used for Wind Generation Forecasting
Wind	Height of Meteorological Tower Instrumentation (meters)	New Nodal field- used for Wind Generation Forecasting
Wind	Include Manufacturer's Curve (Capability Curve)	New Nodal field- used for Wind Generation Forecasting
Wind	Eligible for McCamey Flowgate Rights (MCFRIs)?	New Nodal Field- see Section 7.7 for Cong. Mgmt. in McCamey Area for details
Wind	Conversion constant from Gross to Net MW (if applicable)	
	Additional Combined Cycle Data	
Combined Cycle	Name of Combined Cycle Train	Provided by ERCOT
Combined Cycle	Mnemonic for	Provided by ERCOT

	Combined Cycle Train	
Generator Details		
Generation, Combined Cycle, Wind	What is the MVA base that the following data is based on?	
Generation, Combined Cycle, Wind	What is the kV base that the following data is based on?	
Generation, Combined Cycle, Wind	Machine Impedances	Resistance and reactance in per unit of the machine base identified in this section.
Additional Planning Data		
Generation, Combined Cycle, Wind	Direct Axis Subtransient reactance, X"di	Per Unit on Machine MVA base. The reactance which is determined from the ratio of an initial reduced voltage open circuit condition and the currents from the three-phase fault at the machine terminals at the rated frequency. The initial open circuit voltage is adjusted so the rated current is obtained. The impedance is determined from the currents during the first few cycles.
Generation, Combined Cycle, Wind	Direct Axis Transient reactance, X'di	Per Unit on Machine MVA base. The reactance which is determined from the ratio of an initial reduced voltage open circuit condition and the currents from the three-phase fault at the machine terminals at the rated frequency. The initial open circuit voltage is adjusted so the rated current is obtained. The initial high decrement currents during the first few cycles are neglected.
Generation, Combined Cycle, Wind	Breaker Interruption	After the relay is closed, how many cycles does it take to clear the fault?
Generation, Combined Cycle, Wind	Plant Voltage Protection	Provide instantaneous and up to 3 delay & voltage pair settings for over- and undervoltage protection
Generation, Combined Cycle, Wind	Plant Frequency Protection	Provide instantaneous and up to 3 delay & frequency pair settings for over- and underfrequency protection
	Generation Auxiliary Load Characteristics:	
Generation, Combined Cycle, Wind	--Large Motor, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle, Wind	-Small Motor, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle, Wind	-Resistive (Heating) Load, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle, Wind	-Discharge Lighting, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle, Wind	-Other, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle, Wind	--Large Motor, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle, Wind	-Small Motor, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle, Wind	-Resistive (Heating) Load, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle, Wind	-Discharge Lighting, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle, Wind	-Other, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Private Use Network (PUN) Information		
Generation, Combined Cycle	Private Network (defined in comment) (Y or N)	Private Use Network Definition: An electric network connected to the ERCOT Transmission Grid that contains load that is not directly metered by ERCOT (i.e., load that is typically netted with internal generation).
Generation, Combined Cycle	Average Amount of Self-Serve private load (MW)	Amount of the generator output used for self serve and not available for the grid. Please indicate if this self-serve private load amount is per unit or per plant.
Generation, Combined Cycle	Expected Typical Private Network Net Interchange (MW)	For private networks, the net interchange shall be provided along with gross MW and Mar per generating unit.
Generation, Combined Cycle	Telemetry for PAN Net Interchange is provided (Y/N)	For private networks, the net interchange shall be provided along with gross MW and Mar per generating unit.
Generation, Combined	Private Network Gross	For private networks, the net interchange shall be provided along with gross MW and

Cycle	Unit Capability (MW)	Mar per generating unit.
	PUN LOAD CHARACTERISTICS:	
Generation, Combined Cycle	Large Motor, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle	Small Motor, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle	Resistive (Heating) Load, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle	Discharge Lighting, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle	Other, percent of total MW load	Enter % of total MW load per load type.
Generation, Combined Cycle	Large Motor, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle	Small Motor, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle	Resistive (Heating) Load, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle	Discharge Lighting, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
Generation, Combined Cycle	Other, percent of total MVAR load	Enter % of total MVAR load per load type. If the % of total MVAR load is not known, please enter know power factor of load type (ex: 0.90 pf lag)
	Reactive Capability Curve	
Generation, Combined Cycle, Wind	MW1-4	Reactive curve - point on curve of MW output for this unit
Generation, Combined Cycle, Wind	Lagging MVAR limit associated with MW1 output	Unit's Lagging reactive power output capability associated with its MW1 output, in MVAR.
Generation, Combined Cycle, Wind	Leading MVAR limit associated with MW1 output	Unit's Lagging reactive power output capability associated with its MW1 output, in MVAR.
	Generation Resource Parameters	
Generation, Combined Cycle, Wind	Minimum On Line Time (hrs)	Field was previously called Minimum Up Time on zonal GARF
Generation, Combined Cycle, Wind	Minimum Off Line Time (hrs)	Field was previously called Minimum Down Time on Zonal GARF.
Generation, Combined Cycle, Wind	Cold Start Time (hrs)	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Max Weekly Starts	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Max On Line Time (hrs)	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Max Daily Starts	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Max Weekly Energy	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Hot-to-Intermediate Time (hrs)	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Intermediate-to-Cold Time (hrs)	New nodal value from Protocols 3.7.1- Resource Parameter Criteria
Generation, Combined Cycle, Wind	Normal Ramp Rate Curve (see comment detail)	Normal Ramp Rate curve in protocols is for curve to span from Low Sustainable Limit to High Sustainable Limit. Since HSL/LSL subject to daily changes, recommend extending curve to High/Low Reasonability Limits for registration purposes.
Generation, Combined Cycle, Wind	Upward MW1-5 (MW1/Low to MW5/High end of curve)	Reflected in ERCOT systems as steps. Curve is not interpolated between points.
Generation, Combined Cycle, Wind	MW1 (MW1/Low to MW5/High end of curve)	Ramp Rate curve is a pairing (MW Output vs. Ramp Rate), so enter MW value here
Generation, Combined Cycle, Wind	Upward RampRate1 (MW/minute)	Enter Rate at which resource can increase MW output in MW/minute for the given output level.
Generation, Combined	Downward	Enter Rate at which resource can decrease MW output in MW/minute for the given

Cycle, Wind	RampRate1 (MW/minute)	output level.
Generation, Combined Cycle, Wind	Emergency Ramp Rate Curve (see comment detail)	Emergency Ramp Rate curve in protocols is for curve to span from Low Emergency Limit to High Emergency Limit. Since HEL/LEL subject to daily changes, recommend extending curve to High/Low Reasonability Limits for registration purposes. Reflected in ERCOT systems as steps. Curve is not interpolated between points.
Transformer Data for Network Model		
Generation, Combined Cycle, Wind	Step-Up Transformer Name (all data in 100MVA base) (if multiple transformer, attach supporting data)	Name of Transformer. Additional information: In ERCOT Operation Model: 1. All transformers are modeled as two-winding transformers with high and low side taps, one of which may have tap changing under load. 2. Three-winding transformers must be described as 'three two-winding' transformers with a common point. The common point is modeled as a fictitious busbar with a nominal voltage of 1 kV. 3. General procedure for calculating the impedances used for the 'three two-winding' transformers is a delta-to-star transformation. The exact method depends on the form of the data for the three-winding transformer.
Generation, Combined Cycle, Wind	Provide kV Base	
Generation, Combined Cycle, Wind	High Voltage Limit (no-load tap)	Voltage of the high side (transmission or secondary side) of this step up transformer.
Generation, Combined Cycle, Wind	Low Voltage Limit (no-load tap)	Voltage of the low side (generator or primary side) of this step up transformer.
Generation, Combined Cycle, Wind	Series Resistance	Per ANSI/IEEE Std: Impedance is the ratio of the phasor equivalent of a steady-state sine-wave voltage or voltage-like quantity (driving force) to the phasor equivalent of a steady-state sine-wave current or current-like quantity (response). The real part of the impedance is the resistance. The imaginary part is the reactance. All are measured in Ohms.
Generation, Combined Cycle, Wind	Series Reactance	
Generation, Combined Cycle, Wind	Shunt Magnetizing Conductance	Per ANSI/IEEE Std: Admittance is the reciprocal of impedance. Admittance is ratio of the phasor equivalent of a steady-state sine-wave current or current-like quantity (response) to the phasor equivalent of the corresponding voltage or voltage-like quantity (driving force). The real part is the conductance and the imaginary part is the susceptance. All are measured in mhos (reciprocal ohms).
Generation, Combined Cycle, Wind	Shunt Magnetizing Susceptance	
Generation, Combined Cycle, Wind	Normal Rating MVA	Per ERCOT Operating Guides, Section 3: Normal Rating or Continuous Rating: Represents the continuous MVA rating of a Transmission Facility (including substation terminal equipment in series with a conductor or transformer) at the applicable ambient temperature. The Transmission Facility can operate at this rating indefinitely without damage, or violation of National Electrical Safety Code (NESC) clearances.
Generation, Combined Cycle, Wind	Emergency Rating MVA	Per ERCOT Operating Guides, Section 3: Emergency Rating: Represents the two (2) hour MVA rating of a Transmission Facility (including substation terminal equipment in series with a conductor or transformer) at the applicable ambient temperature. The Transmission Facility can operate at this rating for two (2) hours without violation of NESC clearances or equipment failure.
Generation, Combined Cycle, Wind	Loadshed Rating MVA	Per Operating Guides, Section 3:Loadshed Rating or Fifteen Minute Rating: Represents the fifteen (15) minute MVA rating of a Transmission Facility (including substation terminal equipment in series with a conductor or transformer) at the applicable ambient temperature and with a step increase from a prior loading of ninety percent (90%) of the Continuous Rating. The Transmission Facility can operate at this rating for fifteen (15) minutes, assuming its pre-contingency loading was ninety percent (90%) of the Continuous Rating limit at the applicable ambient temperature, without violation of NESC clearances or equipment failure. This rating takes advantage of the time delay associated with heating of a conductor or transformer following a sudden increase in current.
Generation, Combined Cycle, Wind	LTC (Y/N)	Is this a LTC transformer? Per ANSI/IEEE Std: LTC (or load-tap-changing transformer) is defined as a transformer used to vary the voltage, or the phase angle, or both, of a regulated circuit in steps by means of a device that connects different taps of tapped winding(s) without interrupting the load. In the LTC section - only fill out the LTC details for the side that has the LTC (Low/Primary/Generator side or High/Secondary/Transmission side).
Generation, Combined Cycle, Wind	Tap Positions	How many taps does this transformer has on this side?
Generation, Combined Cycle, Wind	Normal Tap Position	The normal tap position on this side of this transformer.
Generation, Combined Cycle, Wind	Lowest Tap Position	The lowest tap position for this transformer on this side.
Generation, Combined Cycle, Wind	Highest Tap Position	The highest tap position for this transformer on this side.
Generation, Combined Cycle, Wind	Nominal Tap Position (Neutral Step)	The nominal or neutral tap position of this transformer on this side. This tap position is associated with the nominal voltage on this side of this transformer. This position corresponds to 1.0 p.u. of the transformer's tap ratio
Generation, Combined Cycle, Wind	Nominal Voltage (Kava)	The nominal or neutral voltage on this side of this transformer, in Kilovolts

SSR Data		
Generation, Combined Cycle	Mass Identifier	Identification of the masses- HP, IP, LP1, LP2, EXC, etc.
Generation, Combined Cycle	Mass Inertia	H-value. The inertia constant of each mass, either in MW, MVA, or lbm.ft²
Generation, Combined Cycle	Inertia units	MW, MVA, or lbm.ft²
Generation, Combined Cycle	Associated damping	The damping associated with each mass either in p.u. torque/p.u. speed deviation, or lbf.ft.sec/rad
Generation, Combined Cycle	Damping units	p.u. torque/p.u. speed or lbf.ft.sec/rad
Generation, Combined Cycle	Stiffness between Masses	The stiffness (spring constant) between each two mass, either in p.u. torque/rad, or lbf.ft/rad (Coupling)
Generation, Combined Cycle	Stiffness units	p.u. torque/rad or lbf.ft/rad
PSSE Model		
Generation, Combined Cycle, Wind	Compensator Form (Y or N)	These referenced forms are posted at (http://www.ercot.com/gridinfo/generation/index.html), and if already on file at ERCOT do not need to be re-completed for the transition to nodal. These are needed by ERCOT to meet NERC Compliance. ERCOT has adopted PTI's PSSE program as its standard. Indicate in the cells below whether the completion of these forms has been submitted to ERCOT or not. ERCOT will work with to complete and submit these forms.
Generation, Combined Cycle, Wind	Excitation Form on file with ERCOT? (Y or N)	
Generation, Combined Cycle, Wind	Stabilizer Form on file with ERCOT? (Y or N)	
Generation, Combined Cycle, Wind	Turbine-Governor Form on file with ERCOT? (Y or N)	
Resource Ownership Data		
Generation, Combined Cycle, Wind	Resource Entity Name	If single owner, Owner 1 is only field necessary. If multiple owners, all owners must be identified in this row.
Generation, Combined Cycle, Wind	Resource Duns Number	Entity that is registered with ERCOT: 1). Power Generation Company registered with the PUCT. 2.) Resource entity not required to register with the PUCT.
Generation, Wind	Gen Load Splitting	Complete only if Units are Jointly-Owned or represent Split-Generation behind the EPS Meter
Generation, Wind	Fixed Load Splitting %	Total must equal 100%
Generation, Combined Cycle, Wind	Competitive Retailer	A municipally-owned utility, generation and transmission cooperative (G&T), or distribution cooperative that offers customer choice in the restructured competitive electric power market in Texas or a retail electric provider (REP).
Generation, Combined Cycle, Wind	Competitive Retailer DUNS #	The Data Universal Numbering System, abbreviated as DUNS or D-U-N-S is a system developed and regulated by Dun & Bradstreet (D&B) which assigns a unique numeric identifier to a single business entity. This numeric identifier is then referred to as a DUNS
Generation, Wind	Market Participant (Resource) Name	If single owner, Owner 1 is only field necessary. If multiple owners, all owners must be identified in this row.
Generation, Wind	Market Participant (Resource) Duns Number	Entity that is registered with ERCOT: 1). Power Generation Company registered with the PUCT. 2.) Resource entity not required to register with the PUCT.
Generation, Wind	Fixed Ownership %	Total for each unit must equal 100%
Generation, Wind	Master Owner (Y or N)	A single owner must be identified so the associated QSE can provide generation splitting signals. There must be a single Master PGC/QSE per Generation Site.
Load Resource Information		
Load	Name of End Use Customer	
Load	Common Name for Load Resource	Enter the common name of the load that will be acting as a resource. (i.e. South Gulf Refinery, etc.)
Load	Physical Street Address for point of Delivery (POD)	Enter the physical address of the load. Use the street address if known. Use Farm Road reference points or other identification if address is not specific.
Load	Name of City for Point of Delivery (POD)	Enter the name of the nearest Texas city or town.
Load	Is Load Netted From Generation at ERCOT Read Gensite? (Y/N)	Enter Y or N to indicate whether or not the load is netted from the generation at the ERCOT read Gensite.
Load	Is Load Behind a NOIE Settlement Meter Point? (Y/N)	Enter Y or N to indicate whether or not Load is Behind a NOIE Settlement Meter Point? (Y/N)
Load	Load Resource Type (CLR/UFR/Interruptible)	Enter the load type. There are currently 3 types of Loads that can act as Resources, which are: Controllable Load, Interruptible Load, and Underfrequency Relays.

Load	If CLR, will CLR be Dynamically Scheduling? (Y/N)	
Load	Dispatch Asset Code (provided by ERCOT)	Enter the Dispatch Asset Code (this code will be provided by ERCOT)
Load	Load Resource Effective Date	Enter the date the load was placed in service.
Load	Load Resource Expiration Date	Enter the date the load was removed from service.
Load	Substation Name for POD	Enter the name of the substation that supplies service to the Point of Delivery of the load.
Load	Substation Code for POD	Enter the TDSP substation code.
Load	ESIID Station Name	Enter the station name associated with the ESIID that will be utilized.
Load	ESIID Station Code	Enter the station code associated with the ESIID that will be utilized.
Load	Transmission Bus POD (PTI Bus No)	Enter the transmission bus location by bus number or by specifying the transmission line. (Luling to Gonzales 138KV, etc.)
Load	Voltage Level of Telemetered load(s)	Enter the voltage level of the load. Normally this will be between 2.4 and 138 KV.
Load	Meter Reading Entity (TDSP)	Enter who reads the meter.
Load	Meter Reading Entity Duns Number	Enter the DUNs number for the entity above.
Load	QSE Name	Enter the name of the Qualified Scheduling Entity who represents the load.
Load	QSE Duns Number	Enter the DUNs number for the entity above.
Load	ESI-ID assigned to meter	Enter the ESI-ID assigned to the load.
Load	Wholesale Delivery Point? (Y/N)	Enter "yes" or "no" if the point of delivery is a wholesale delivery point.
Load	Notice Requirements to Interrupt	Enter the pre-interruption notice requirement in minutes for the load and should correlate to the type of service they are registering as--UFR = Instantaneous; CLD = 10 min; ILD = 30 min
Load	High Set Under-frequency Relay Setting (Hz)	Enter the high set under-frequency relay setting. Loads acting as Resources that desire to bid into the Responsive Reserve Service market must have a high set under-frequency relay set at 59.7 Hz and be capable of operating in 20 cycles (1/3 second).
Load	Load Resource Control Device (Control Technology / Interruptible Switch / Circuit Breaker)	Enter the type of interrupting device.
Load	If CLR, ability to operate as a UFR type Resource? (Y/N)	
Load	ERCOT Load Zone	Enter the ERCOT Congestion Management Zone--West; North; Northeast; South; or Houston
Load	Maximum POD Total Load	Enter the maximum total load at the point of delivery.
Load	Summer (Interruptible MW)	Enter the summer interruptible load in MW.
Load	Winter (Interruptible MW)	Enter the winter interruptible load in MW.
Load	High Reasonability Limit (Max MW level)	New Nodal field per protocol 3.7.1- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value.
Load	Low Reasonability Limit (Min MW level)	New Nodal field per protocol 3.7.1- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value.
Load	CLR High Reasonability Ramp Rate Limit (Max ramp MW/min)	New Nodal field- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value. For CLR.
Load	CLR Low Reasonability Ramp Rate Limit (Min ramp MW/min)	New Nodal field- An "Out-of-Bounds" value chosen by RE and used by ERCOT to alarm/reject data exceeding the value. For CLR.
Load	Qualifying Facility (Y/N)?	Per PURA
Load	Private Use Network (Y/N)?	Private Use Network Definition: An electric network connected to the ERCOT Transmission Grid that contains load that is not directly metered by ERCOT (i.e., load that is typically netted with internal generation).
Load Resource Parameters		

	Non-CLR Resource Parameters	
Load	Minimum Interruption Time	
Load	Minimum Restoration Time	
Load	Max WEEKLY Deployments	
Load	Max Interruption Time	
Load	Max DAILY Deployments	
Load	Max Weekly Energy	
Load	Minimum Notice Time	
	CLR Resource Parameters	
Load	CLR Max Deployment Time	
Load	CLR Max Weekly Energy	
Load	CLR Normal Ramp Rate Curve (see comment detail)	Normal Ramp Rate curve in protocols is for curve to span from Low Sustainable Limit to High Sustainable Limit. Since HSL/LSL subject to daily changes, recommend extending curve to High/Low Reasonability Limits for registration purposes.
Load	Upward MW1-5 (MW1/Low to MW5/High end of curve)	Reflected in ERCOT systems as steps. Curve is not interpolated between points.
Load	MW1 (MW1/Low to MW5/High end of curve)	Ramp Rate curve is a pairing (MW Output vs. Ramp Rate), so enter MW value here
Load	Upward RampRate1 (MW/minute)	Enter Rate at which resource can increase MW output in MW/minute for the given output level.
Load	Downward RampRate1 (MW/minute)	Enter Rate at which resource can decrease MW output in MW/minute for the given output level.
Load	CLR Emergency Ramp Rate Curve (see comment detail)	Emergency Ramp Rate curve in protocols is for curve to span from Low Emergency Limit to High Emergency Limit. Since HEL/LEL subject to daily changes, recommend extending curve to High/Low Reasonability Limits for registration purposes. Reflected in ERCOT systems as steps. Curve is not interpolated between points.
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