NASPI PMU Registry

Ritchie Carroll

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Austin, Texas

What is the Registry?

The NASPI PMU Registry is the source of meta data on synchrophasor devices and the measurements (or signals) that is collects throughout in North America.

- **Where is the measurement taken?**
- **What is the measurement?**
- **Who owns it?**
- **To what PDC (or Gateway) do I go to get the data?**

PMU Registry Objectives

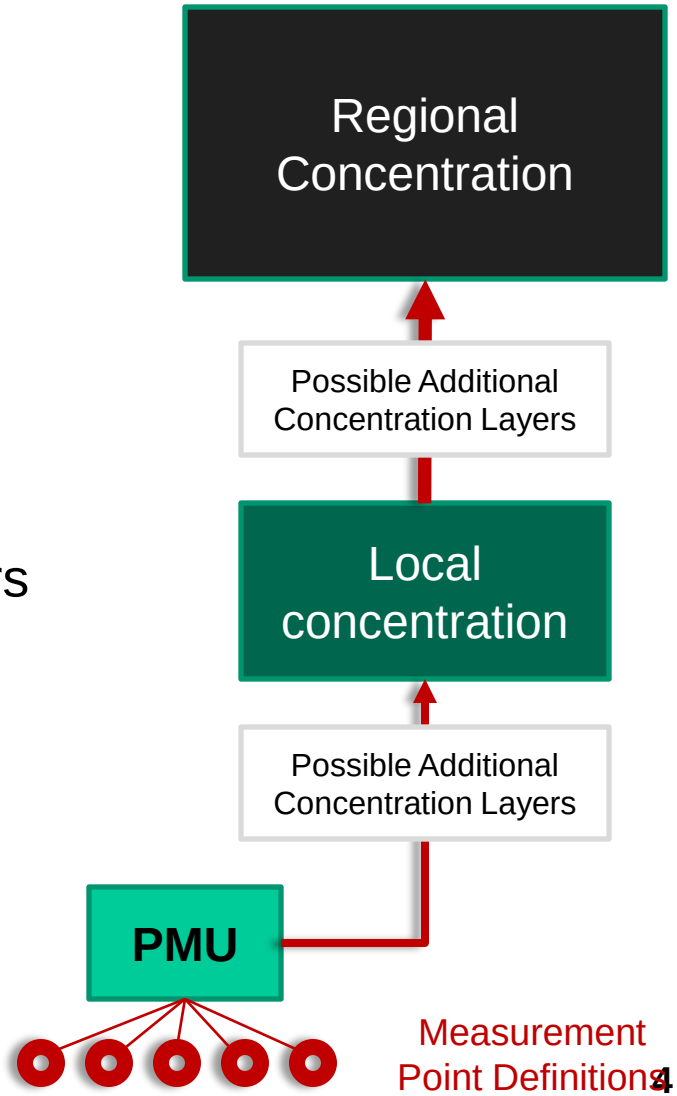
- To be the one-point stop for information on PMUs in North America (vis-à-vis NERC ISN data definitions)
- To establish uniform naming conventions for PMUs and their measurement descriptors to facilitate the exchange of PMU data for analysis and display
- To set the stage for NASPInet to provide a "measurement point (or signal) name server".
- To support federal SGIG and industry investments in PMUs through collection and tracking of data on PMU equipment

The registry software is being developed by NERC to serve all PMU owners across North America

PMU Registry Data Overview

- Simple Data Hierarchy
  - Regional concentration (Concentration for external users)
  - Local concentration (if present)
  - PMU
  - Measurement Descriptors
- Allows for multiple layers of data concentration and documents up to 2 layers
- Allows PMUs that do not provide data to external users to be a part of the registry
- Creates standard names for PMUs and measurement descriptors.

The registry only holds meta data.



Setting the stage for NASPInet

- **To publish a signal on NASPInet, a entity must:**
  - Have a NASPInet Phasor Gateway
  - Register the measurement (signal) with the NASPInet infrastructure.
  - Configure the Phasor Gateway to designate the authorized receiving Gateways (this configuration can be “all”) for this signal.
- **To subscribe to a signal on NASPInet, an entity must:**
  - Have a NASPInet Phasor Gateway
  - Discover the measurement (signal) needed through the NASPInet infrastructure
  - Request authorization to receive this signal from the publishing Phasor Gateway owner.

PMU Owner Data

- The owner is typically the transmission owner, but can be any entity.
- Registry will use standard company names and abbreviations

Data Elements

- Company
- Company Abbreviation
- Contact Name(s)

Access / Authorization Data

- **User Permission Roles** (includes XML services)
  - Company Viewer
  - Company Editor
  - Company Administrator (Manages company users)
  - Regional Viewer
  - Regional Administrator (Manages regional viewers)
  - Global Viewer
  - System Administrator (Manages company and regional administrators)

PMU Data

PMU / PDC

- Standard Name
- Physical Location
- Device Info – Vendor, Protocol
- Operational Status

Measurement Descriptors

- Standard Name
- Phase Measured
- Units
- Reasonability Limits

Network Element

- Standard Name
- Electrical One-Line Location

PMU/PDC - Physical Location

- Interconnection
- NERC Region
- Regional PDC (optional)
- Location Name (Substation)
- Station ID or short name
- Lat / Long
- Time Zone
- SGIG Funding Info

PMU/PDC - Device Info

- Standard Device Name / ID [system generated]
  (Company Abbv – Station Short Name – Count)
- Company Device Name
- Device Type
- Vendor
- Model
- Protocol
- Sampling Rate
- Device Status
- Comments / Description

Device Status States

•Planned (planned date)
•Installed

•Regionally
Operational (in-service date)

•Out-of-Service/Retired

Measurement Descriptors

- Measurement Point Name / ID [system generated]
  (Company Abbv – Station Short Name – Device Count – Signal Type – [Count])
- Measurement Type (phasor*, frequency, change in frequency, analog, calculated analog, binary, measurement system status.)
- Phase (+, -, 0, A, B, C)
- Engineering Units
- Scaling Factors (mx + b)
- Reasonability Limits (high / low)

**Phasors can be in polar form (magnitude and angle) or rectangular form and always generate a pair of master registry IDs.*

Network Element Monitored

- Registry Network Element ID [system generated]
  (an ID for each line name for a company)
- Line / Bus Name
- Regional Line/Bus unique ID
  (e.g., MMWG / SDX ID in the east)
- Local Line/Bus ID
  (an ID with meaning to company)
- Extra Line/Bus ID
- Nominal kV

PMU Registry Application Features

- Web based with performance optimized for data display and filtering
- System secured to protect data and to limit data operability to only a company or a region
- Ability to extract bulk data from the registry as XML files
- Daily data backups are archived
- All changes are logged

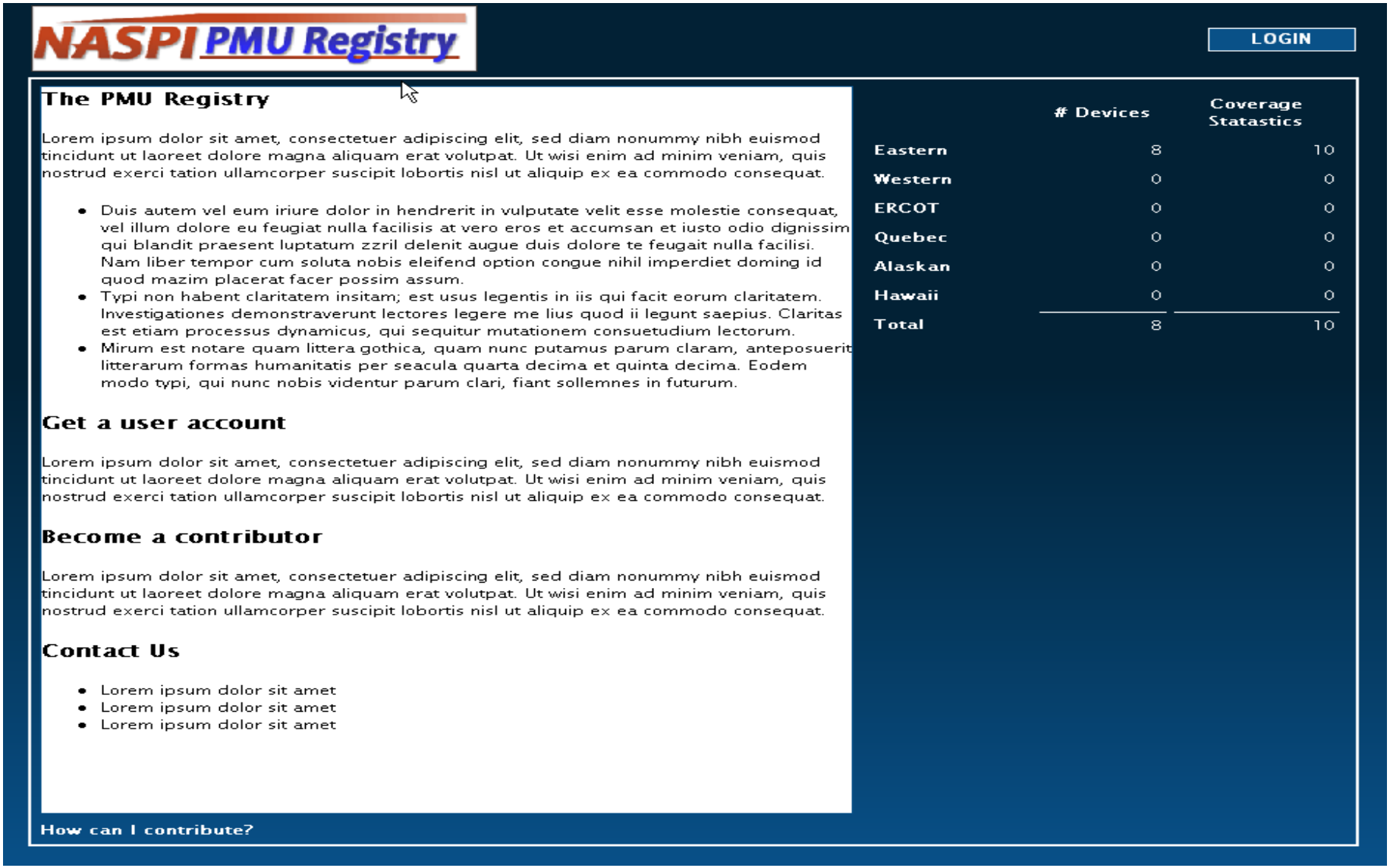
For users …

- Use of “PMU connection tester” allows automated uploads to the PMU registry
- Multiple views and filters to allow navigation to the data of interest – including geographical-based navigation.
- Data integrity improved through liberal use of drop down dialogs

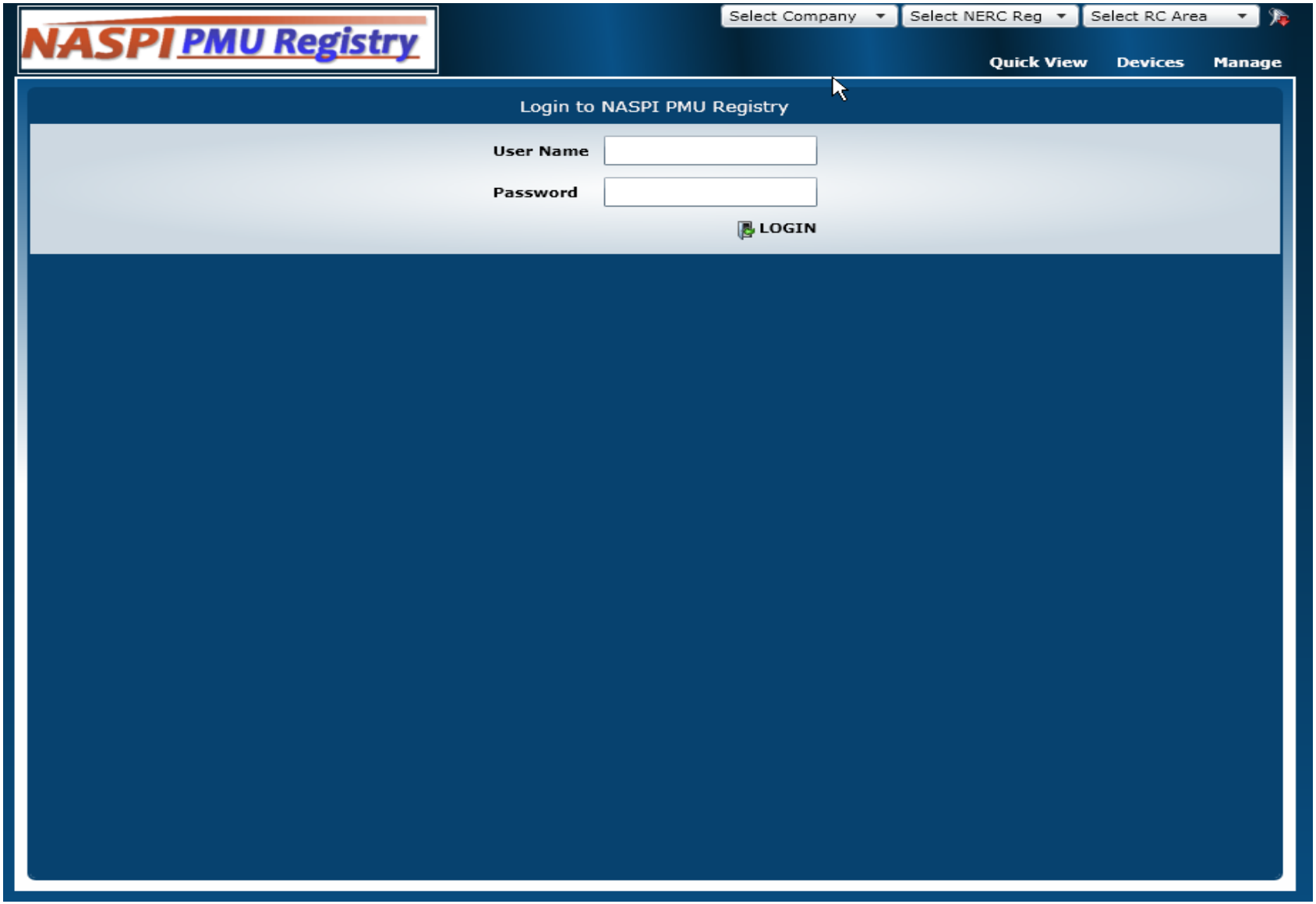
Registry Application Status / Schedule

- **October 2009** - Registry commissioned at NASPI meeting
- **December 2009** - Beta version released for limited review / comment
- **February 2010** – Beta version release for broad review / comment
- **April 2010** – Pre-production release
- **May 2010** – Production release Version 1.0

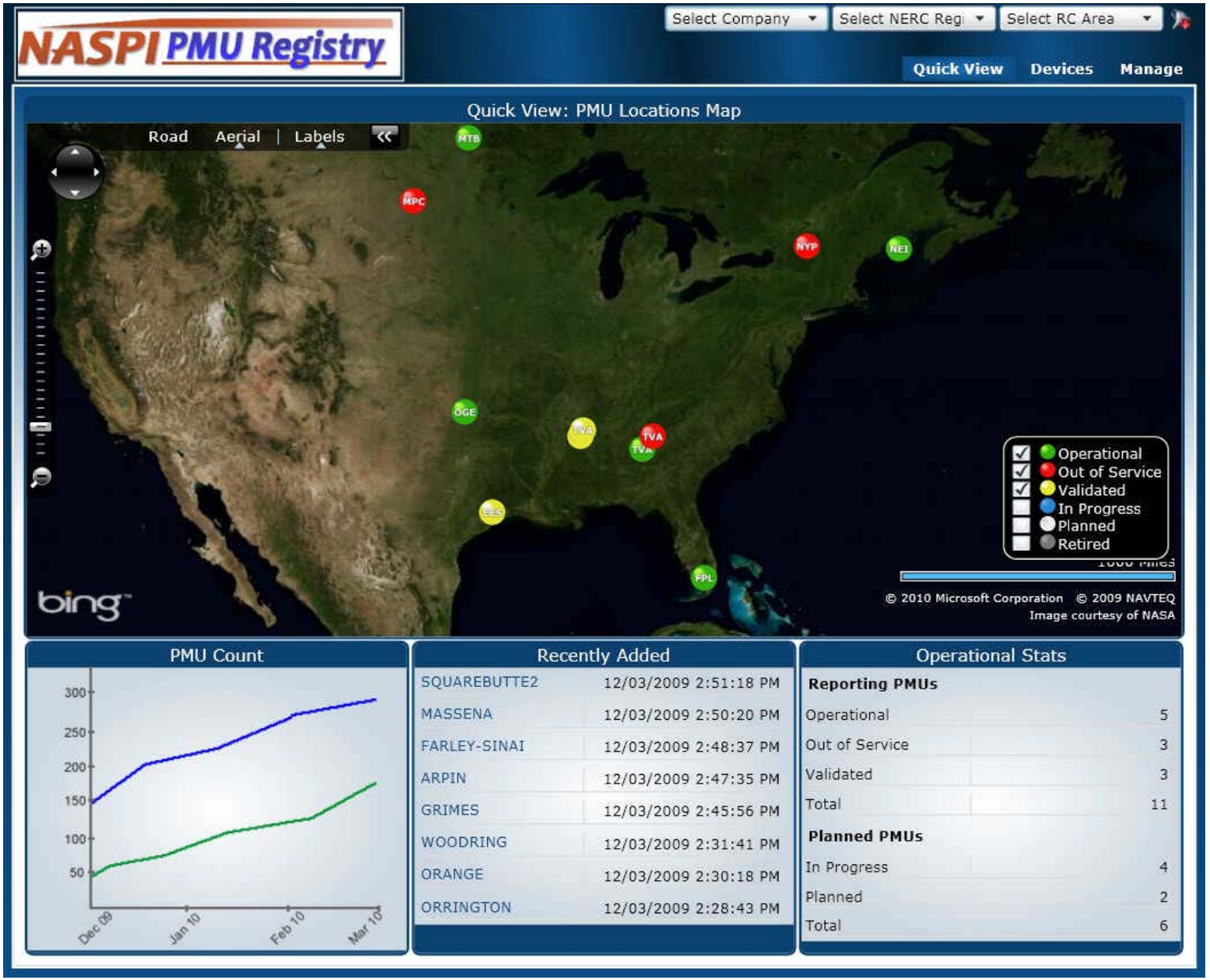
Public Splash Screen Provides Summary and “how to contribute”



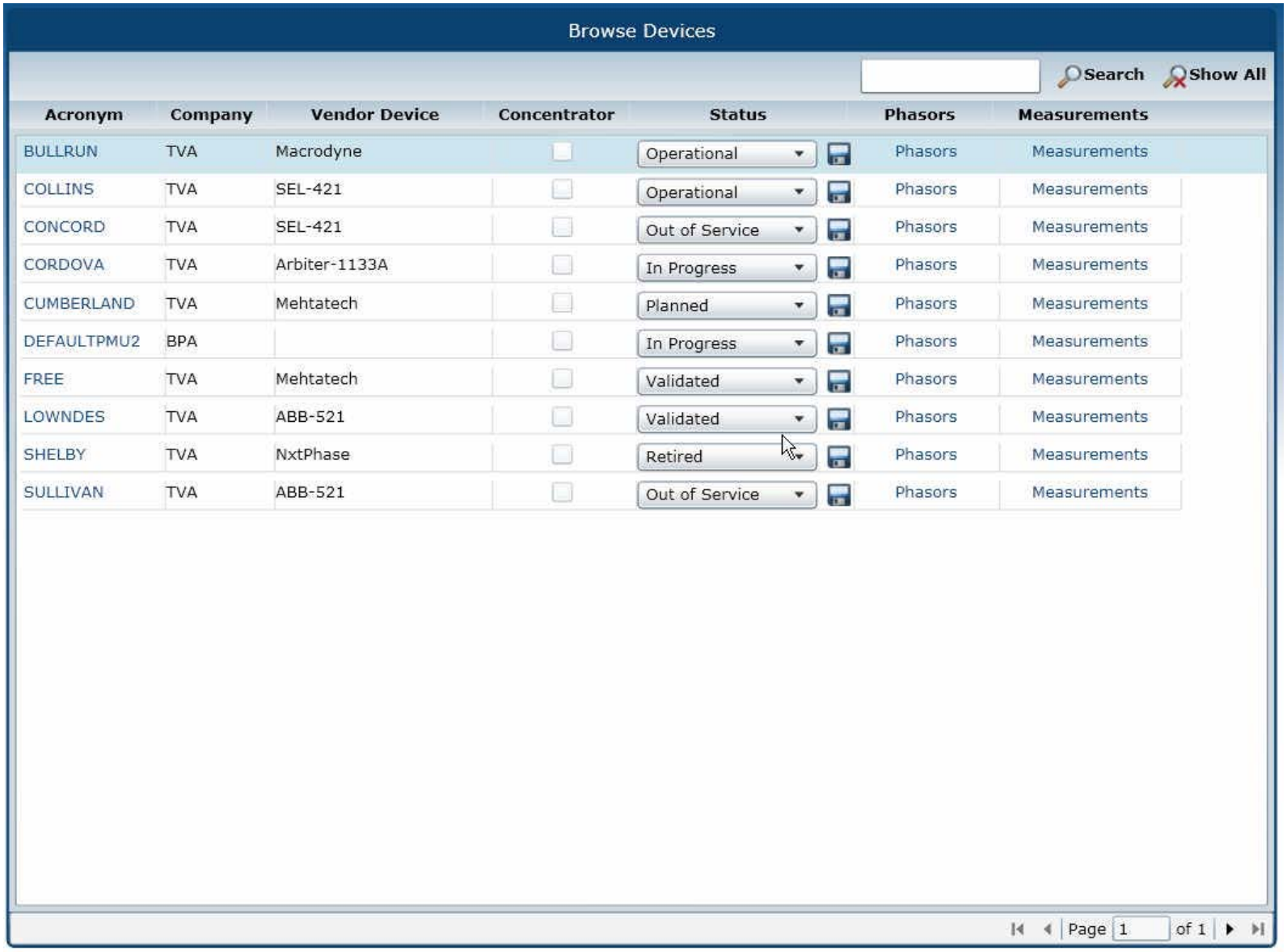
Logon for Access



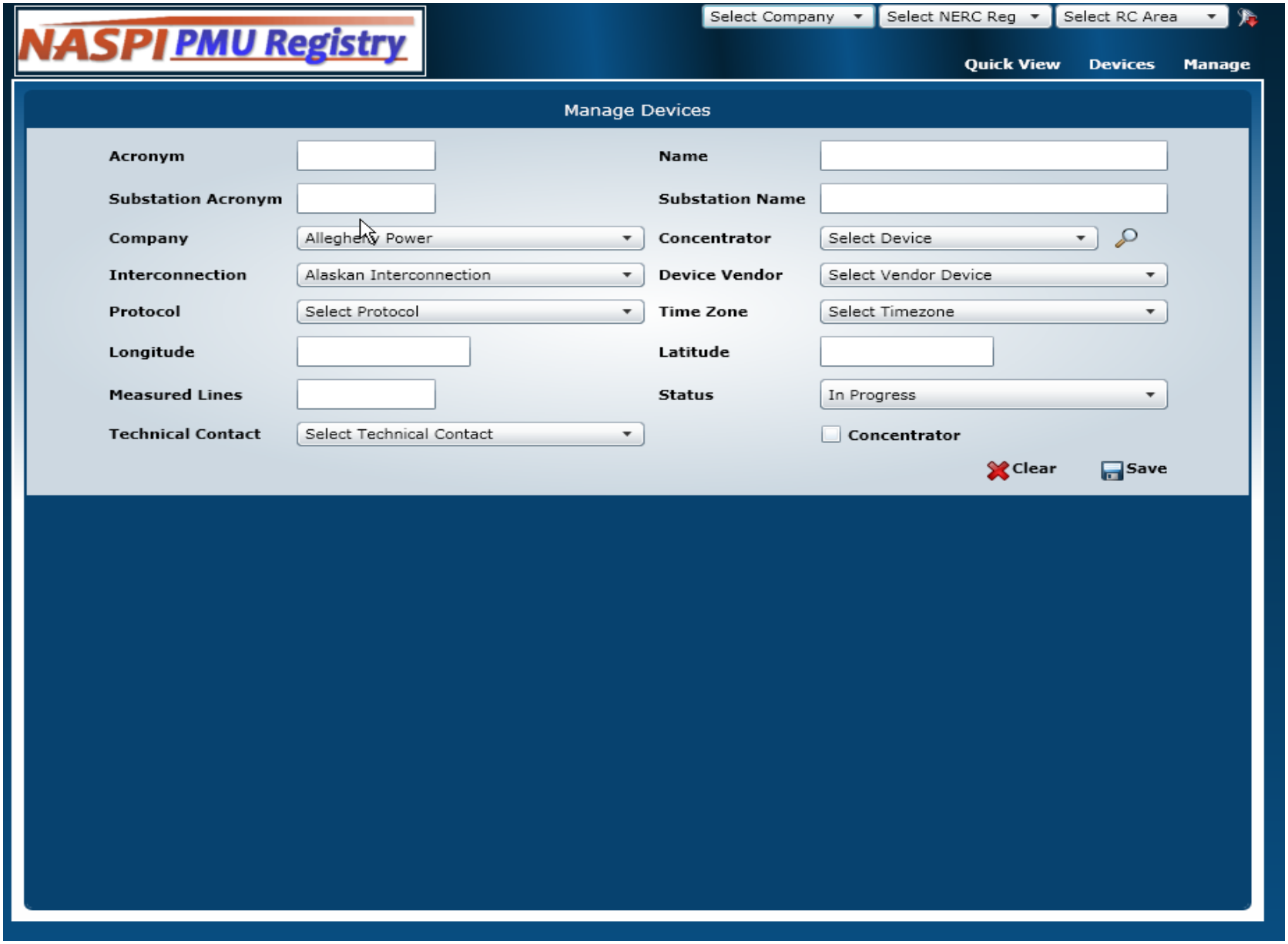
Overview / User Homepage



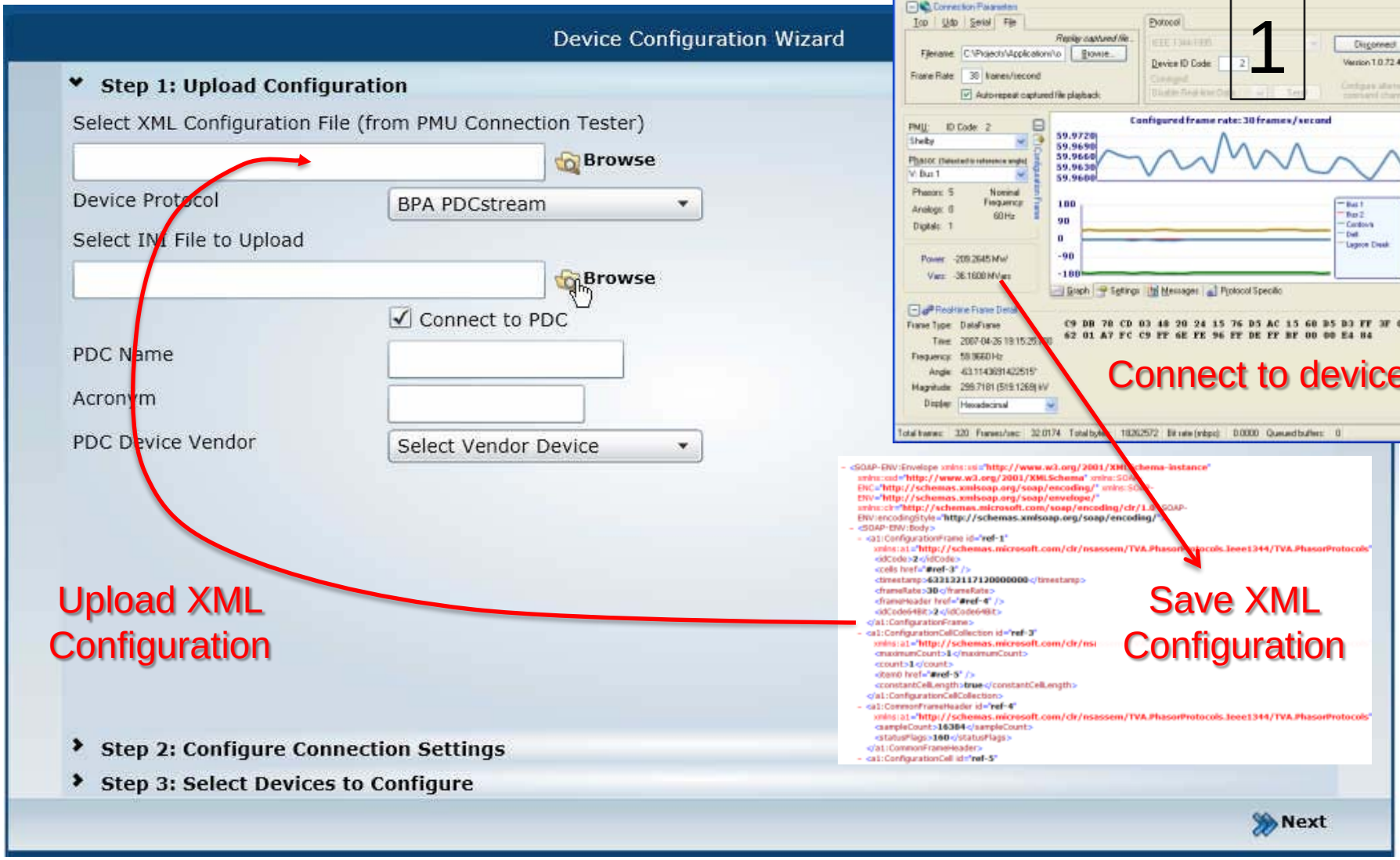
Browse Devices (PMUs)



Enter Device (PMU) Configuration Data



Wizard to upload Device (PMU) Configuration Data



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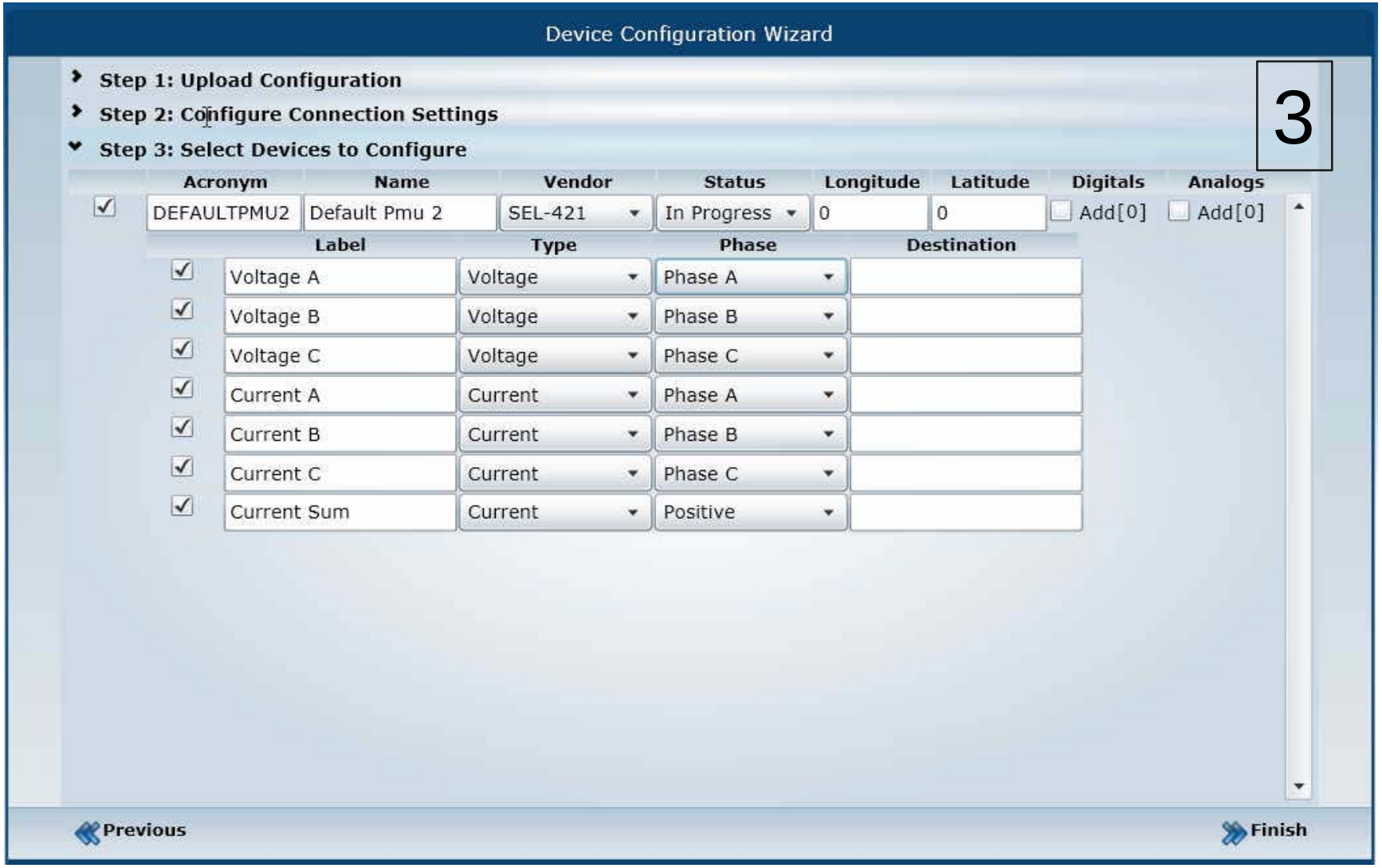
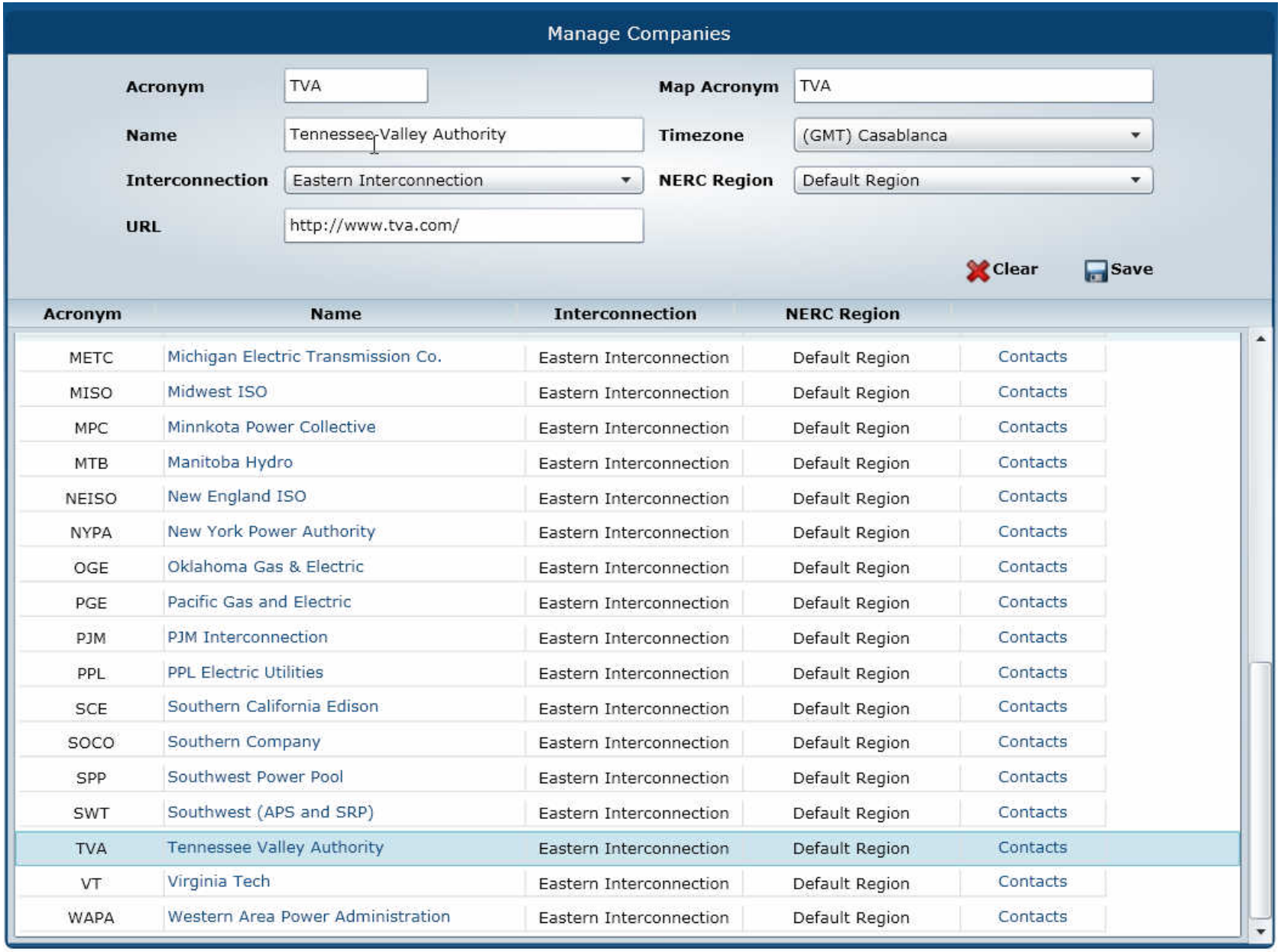
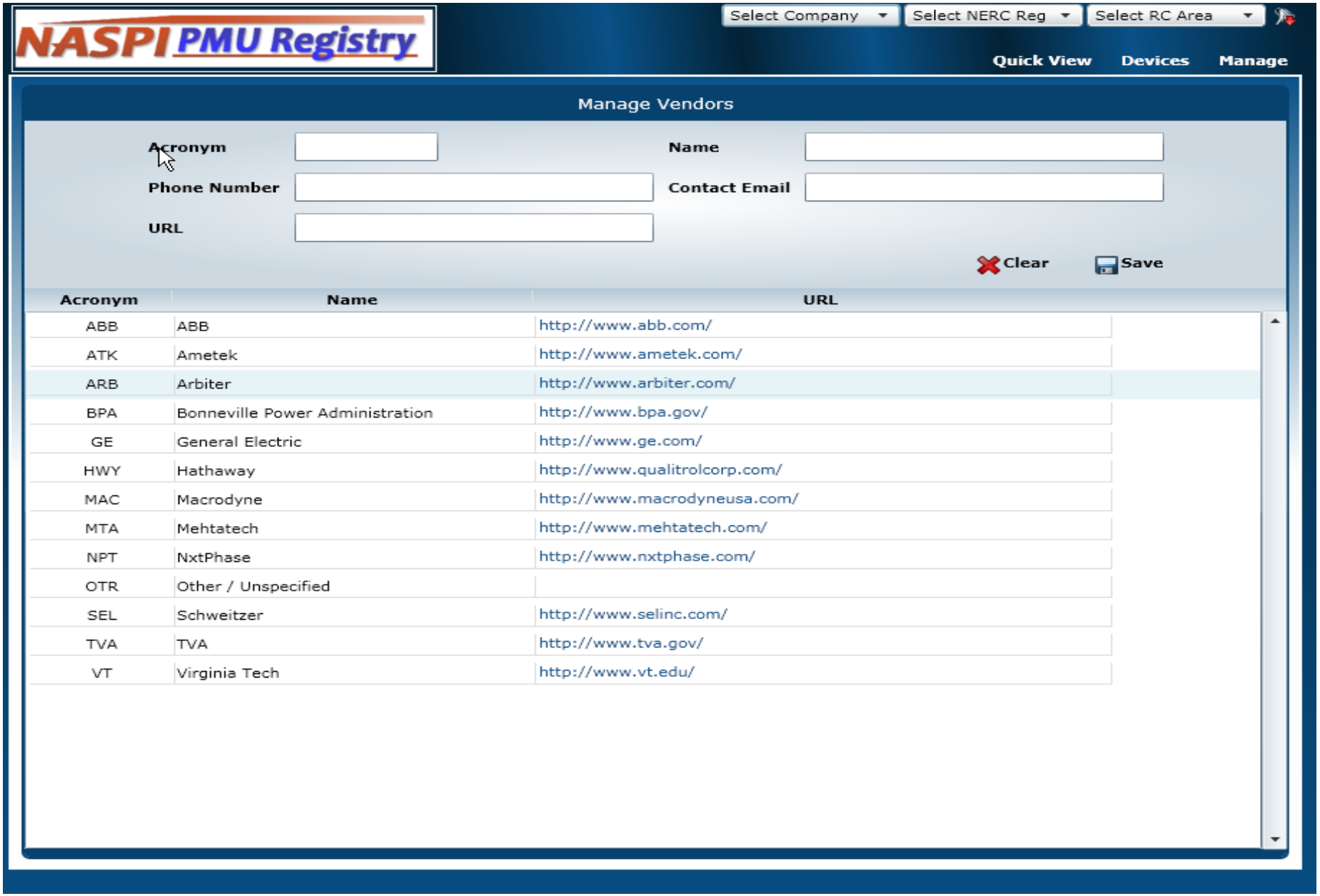


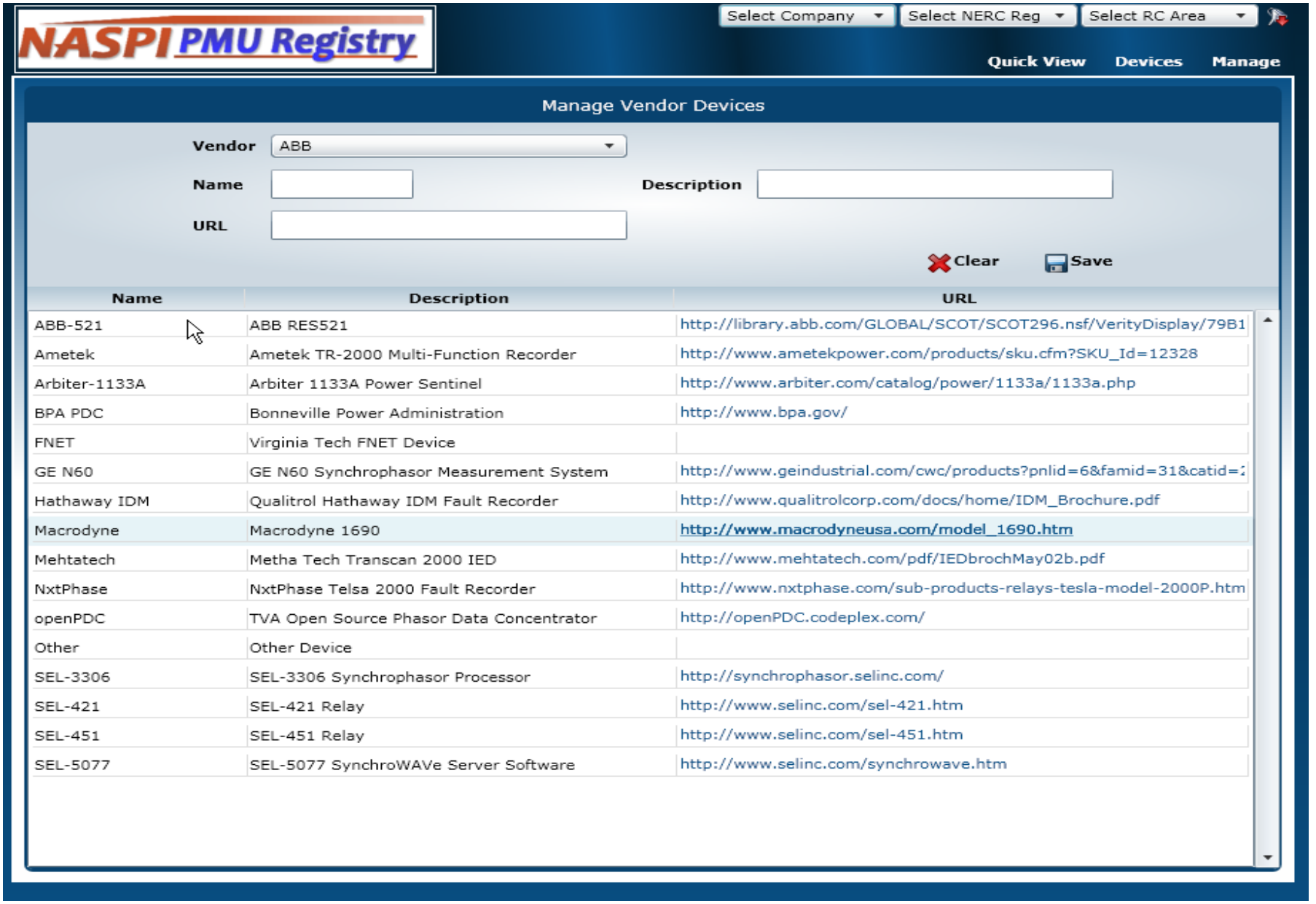
Manage Companies



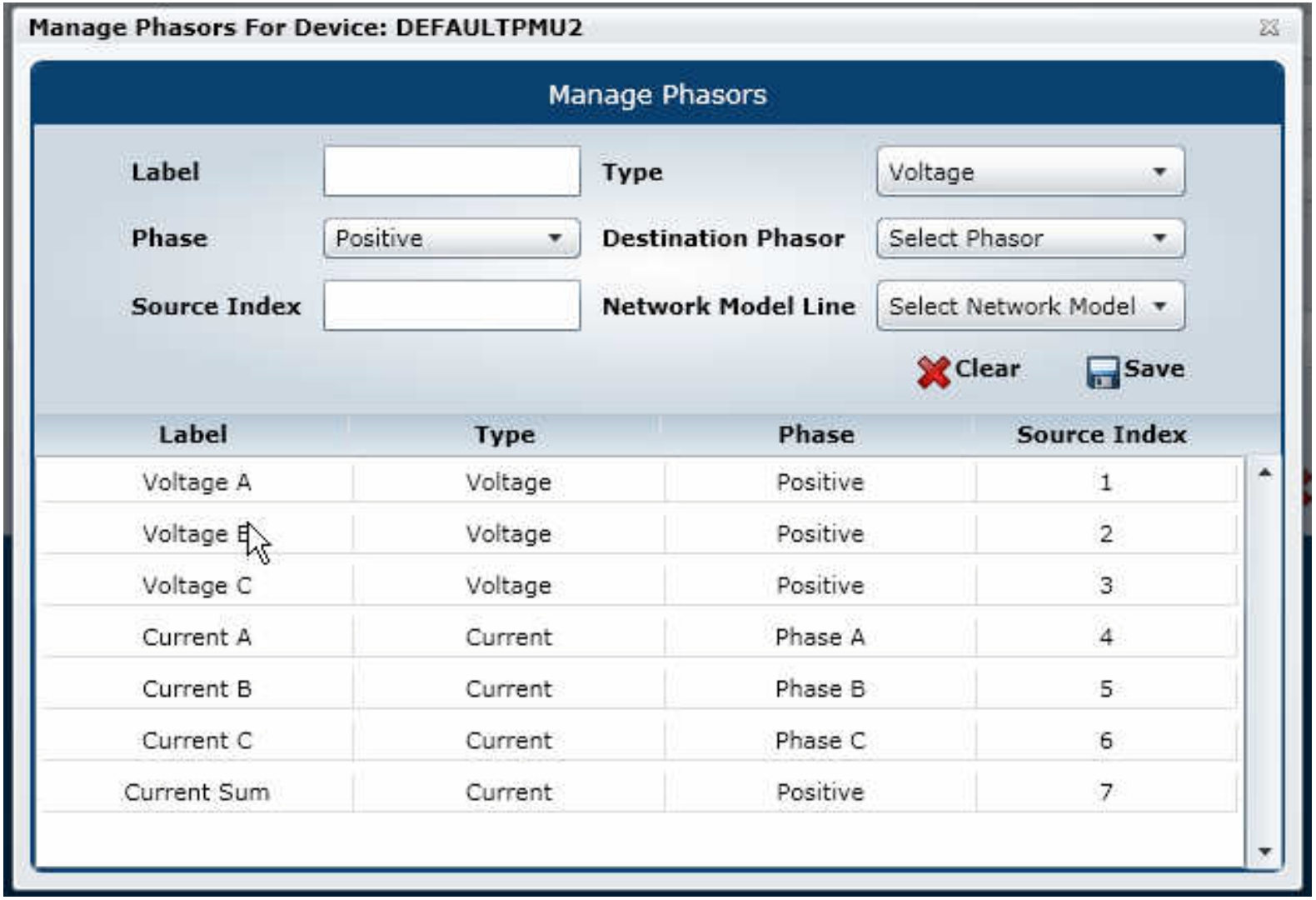
Manage Vendors



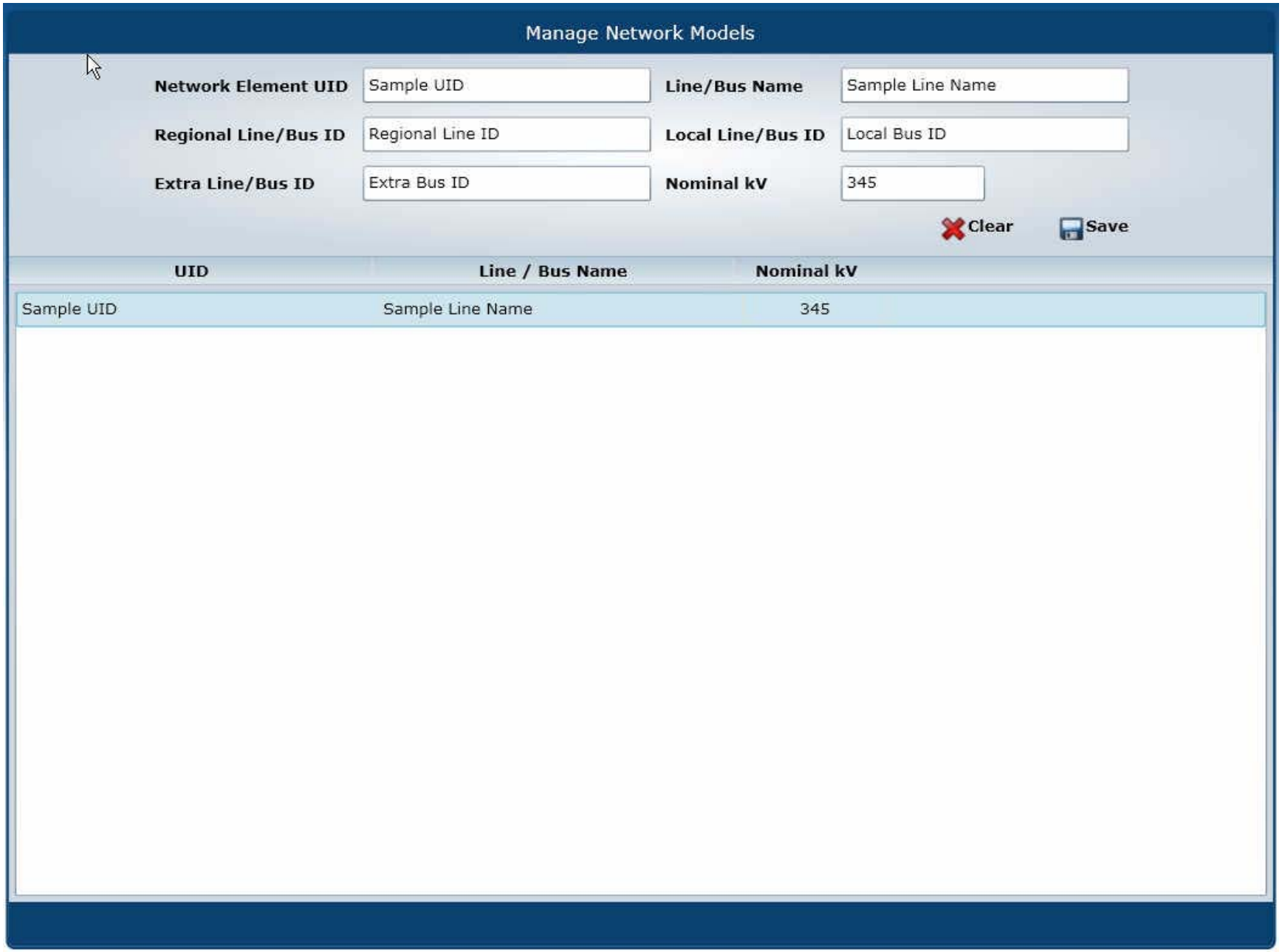
Manage Vendor Devices



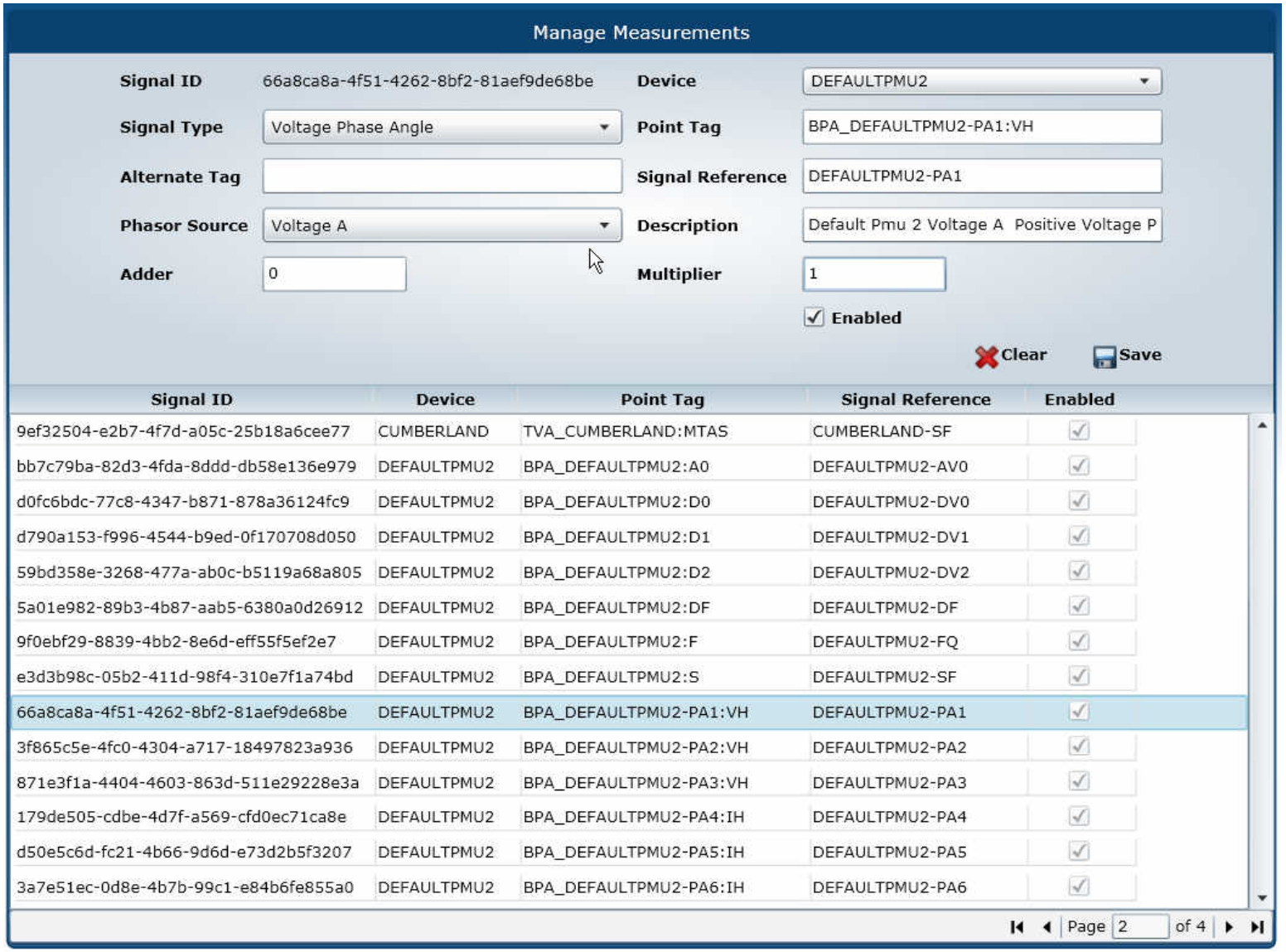
Describe Measurements for Devices



Manage Network Location Data



Browse / Edit Measurement Configuration Data



Now we need your comments !

Please contact me for testing:

jrcarrol@tva.gov