



TVA Regenesys[®] Flow Battery Demonstration

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Evaluation of Utility Scale System

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TVA Regenesys[®] Flow Battery Demonstration





TVA Regenesys[®] Flow Battery Demonstration

Description

- **120 MWh Regenesys[®] electrical energy storage system**
- **Peak Shaving – 12 MW for 10 hours**
- **Reliability – will maintain 24 MWh capacity to support 6MW critical load for 4 hours**
- **TVA power plant, in Columbus, MS**



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Objective

- Reduce need to add power lines
- Less environmental impact than new power plant
- Improve system reliability and PQ



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- **Developed for large scale utility applications**
- **Large storage capacity**
- **Inexpensive electrolyte materials**
- **Well-developed production system**
- **Supports goals of National Energy Policy**



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Monitoring Objectives

- **Manage the Data Collection**
- **Conduct the Data Analysis**
- **Conduct the Economic Analysis**
- **Dissemination of Data**



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Modes of Testing

- **UPS**
- **Load Sharing**
- **Peak Shaving**
- **Arbitrage**
- **Power Conditioning (Customer Point)**
- **Ancillary Power (Grid Support)**



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Data Collection

- Wh (AC and DC) lifetime accumulation
- State-of-Charge
- Station and System power
- DC Current
- Thermal Loading
- Duty cycle count
- Power factor monitoring
- Electrolyte management system loading
- Water usage
- Charge/Discharge rates



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Status

- **On-hold**
- **Over all Schedule**
 - Phase I – Cold Commissioning
 - Phase II – Hot Commissioning
 - Phase III – Demonstration
- **Monitoring Kickoff meeting**
- **Evaluating existing DAS**



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What is TVA expecting to learn...

- **ID the value streams**
- **ID limitations/ constraints**
- **availability and reliability**
- **overall plant efficiency**



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What is TVA expecting to learn...

- **degradation by repeating identical tests**
- **energy storage in standard market design**
- **augment renewable resources**
- **when/where to deploy**

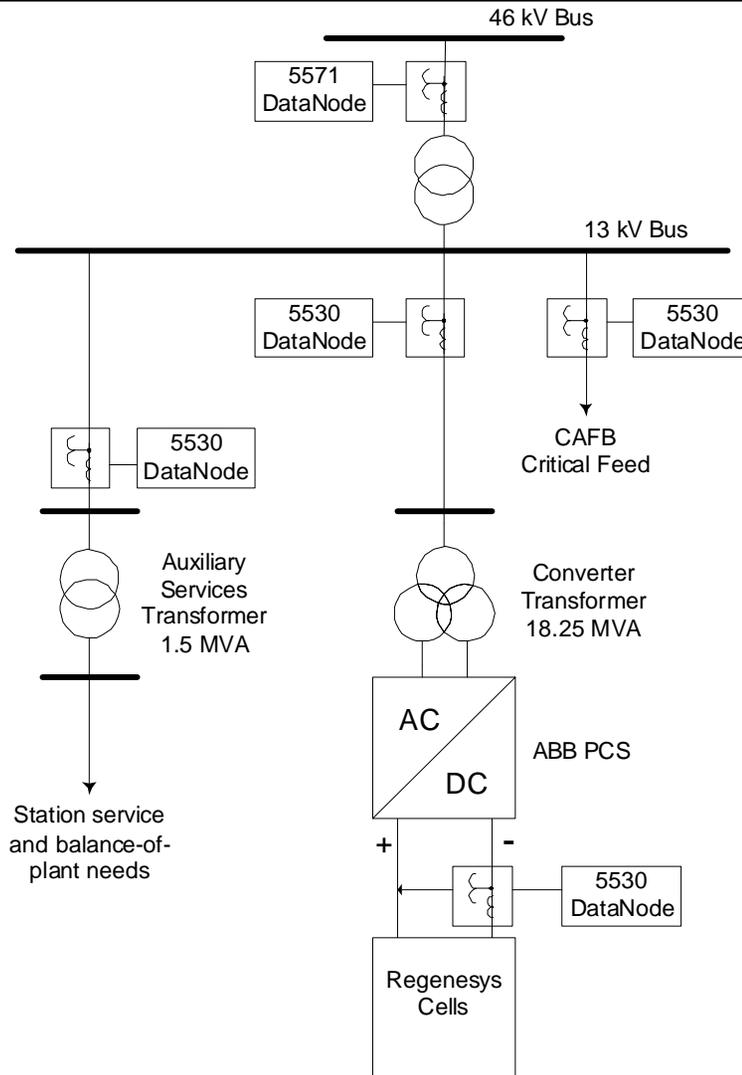


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Goals of the monitoring project ...

- **Black box power storage system**
- **Facility impact on power system operation, line loading, capacity**
- **Facility impact on power system quality and reliability**
- **Extrapolate project results to future plants**

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PQ and DC Metering Points

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**1st FI Electrolyte Piping
February 2003**

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Cell piping
Feb. 2003



Regenesys™ XL Module

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Regenesys[™] Module String

