





Optimizing Asset Investments and Operations with Grid Network Model Management

An Overview of Ameren's Strategy, Implementation Progress and Plans

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Agenda



- Corporate Overview
- Strategy, Challenges & Opportunities
- Project History & Organization
- Architecture
- Roadmap
- Q&A

Corporate Overview





Ameren Businesses

Ameren Missouri

- Electric transmission, distribution, and generation business and a natural gas distribution business in Missouri
- Serves 1.2 million electric and 0.1 million gas customers
- 10,800 MW of total generation capability

Ameren Illinois Electric Distribution

- Electric distribution business in Illinois
- Serves 1.2 million electric customers

Ameren Illinois Natural Gas

- Natural gas distribution business in Illinois
- Serves 0.9 million gas customers

Ameren Transmission

- Electric transmission businesses of Ameren Illinois and ATXI regulated by FERC
- Ameren Illinois invests in local reliability projects
- ATXI invests in regionally beneficial projects

Grid of the Future Strategy



Provide digital capabilities for safely planning and operating the *evolving* grid to improve customer value, the co-worker experience, enable new products and services, and increase reliability and resiliency of the grid.

- Optimize the impact of distributed energy resources and enable a cleaner, more diverse generation portfolio driving lower carbon emissions
- Assimilate and leverage an exponential increase in meter, device, and sensor data in order to drive asset utilization, workforce utilization, and secure energy production insights
- Confidently model, view, and simulate digital representations of the grid (utilizing digital twins)

Key Challenges





Impact





Opportunities

Reduce labor and improve accuracy



A Single Reliable Source Of Truth For Grid Network Data

- 360-Degree view
- Quality
- Consistency
- Timeliness

Standards-based Network Model

- Flexibility for product/vendor evolution
- Reduced complexity (when supported by vendors)

Automation

- Reduce labor
- Quality

Maximize The Value Of Operations And Planning Applications

- Advanced functionality
- Higher accuracy
- Trust

Grid Network Model Management History





Grid Network Model Management Organization





Sponsors

Business (MO & IL)

Digital



External Advisors

Xtensible Solutions



Business & Digital

Operations Planning Protection Asset Management GIS Enterprise Integration Data Engineering and Governance Cyber Architecture Project Mgmt.



Equipment Catalog

Improve Data Quality

Business Challenge

- Silos of Equipment libraries
- Tribal knowledge
- Inconsistent electrical properties and results

Goal

- •Consolidate
- Vendor-agnostic format
- •Governance and process to maintain
- •Organizational ownership

How?

- Web app with CIMbased schema (CIM)
- Ingest current equipment libraries
- Rationalize and capture missing data
- Group multiple items into a single authoritative item
- Publish





Equipment Catalog

Improve Data Quality

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—	Overhead Line		 Ameren Catalog (4) 	600A_SB_13800V_GANGED	New	PARENT CATALOG	SB	SOLID BLADE	- Nominal Voltage (V)	
~~	Structure Only		 Ameren Catalog (4) 	1200A_LB_34500V_GANGED	New	PARENT CATALOG	LB	LOAD BREAK	34500	
,,,,,	Structure Only		 Ameren Catalog (4) 	900A_AUT_34500V_UNGANGED	New	PARENT CATALOG	AUT	AUTOMATED SWITCH	Rated Veltage (1)	
	Wire-Structure Combo		 Ameren Catalog (4) 	600A_SB_2400V_GANGED	New	PARENT CATALOG	SB	SOLID BLADE	50000	
			 Ameren Catalog (4) 	600A_MO_34500V_UNGANGED	New	PARENT CATALOG	MO	MOTOR OPERATED		
~~	Wire Only		 Ameren Catalog (4) 	400A_SC_4160V_GANGED	New	PARENT CATALOG	SC	SELF CONTAINED	Rated Current (A)	
			 Ameren Catalog (4) 	1200A_SB_14400V_UNGANGED	New	PARENT CATALOG	SB	SOLID BLADE	600	
			 Ameren Catalog (4) 	400A_SB_34500V_GANGED	New	PARENT CATALOG	SB	SOLID BLADE		
			 Ameren Catalog (2) 	200A_LB_34500V_UNGANGED	New	PARENT CATALOG	LB	LOAD BREAK	Breaking Capacity (A)	
		님	 Ameren Catalog (4) 	300A_SC_4160V_GANGED	New	PARENT CATALOG	SC	SELF CONTAINED		
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		님	Ameren Catalog (2)	200A SR 60000V CANGED	New		LB	LUAD BREAK		
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		님	Ameren Catalog (4)	140A CH 12000V CANCED	New		LB	LUAD BREAK	•	
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Network Model Management System

Conceptual Integration Architecture



Roadmap (2023-2024)





Summary



- Incremental approach
- Leverage standards
- Broad organizational engagement
- Network Model Management System
- Foundational for Grid of the Future

