DISTRIBUTION AUTOMATION & SMART GRID INITIATIVES AT AMERICAN ELECTRIC POWER

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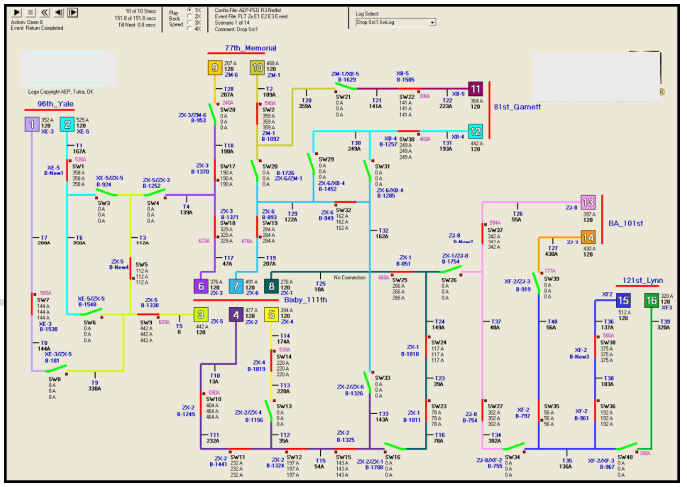
Atlanta, GA
January 12, 2009

AEP AMERICAN® ELECTRIC POWER

DA & Grid Management



Our vision

- Use communication and intelligence for:
  - circuit reconfiguration
  - capacitor optimization
  - monitoring and diagnostics of equipment
  - fault location identification

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Our status

- Technology evolving over several years
- Industry standards are being developed
- Actual deployment is still limited
  - less than 2% of our circuits

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Our Expected Benefits:

- Improve safety for field employees by using SCADA for switching remotely
- Improve reliability - automated circuit reconfiguration can improve circuit reliability by 30 – 50%
- Improve customer experience by notifying dispatchers of outages before a customer calls
- Improve energy efficiency by optimizing power factor and automatic notification when a capacitor bank is abnormal
- Permit transition to condition based maintenance with fewer inspections

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Our Current Activity

- Deployed several pilot projects to demonstrate the reliability benefits of Distribution Automation
- Have not deployed DA for energy efficiency improvements, yet
- Two planned projects with AMI interface

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Operating Company	No. of Projects
AEP Ohio	3
AEP Texas	10
APCo	2
I&M	8
KPCo	3
PSO	1
SWEPCo	8
Total AEP System	**35**

Eastern Area DA Projects

Operating Company	Voltage	Switch Mfg.	Control Type	Comm. Type	No. of Switches	No. of Circuits
AEP Ohio	13 kV	Undetermined	ENMAC	Utilinet	33	10
AEP Ohio	23 kV	G&W	SEL-651R	MDS	3	2
AEP Ohio	23 kV	Undetermined	Undetermined	None	3	2
AEP Ohio	23 kV	Undetermined	Undetermined	None	2	2
AEP Ohio	34.5 kV	S&C	IntelliTeam II	Utilinet	3	1
AEP Ohio	34.5 kV	Cooper	NovaTech Orion	Utilinet	5	1
AEP Ohio	34.5 kV	Cooper	NovaTech Orion	Utilinet	5	1
APCO	12 kV	S&C	IntelliTeam II	Utilinet	7	4
APCO	34.5 kV	S&C	IntelliTeam II	Utilinet	10	1
I & M	34.5 kV	ABB	PCD	None	3	2
I & M	34.5 kV	Undetermined	Undetermined	None	5	2
I & M	34.5 kV	Undetermined	Undetermined	Undetermined	25	7
I & M	12 kV	Cooper	Form 6 LS	None	4	3
I & M	12 kV	Cooper	Form 6 LS	None	3	2
I & M	12 kV	Cooper	Form 6 LS	None	2	2
I & M	12 kV	Cooper	Form 6 LS	None	4	2
I & M	12 kV	ABB	PCD	None	3	2
I & M	12 kV	Cooper	Form 6 LS	None	3	2
KPCo	12 kV	Cooper	IntelliTeam II	Undetermined	3	2
KPCo	34.5 kV	Cooper	IntelliTeam II	Utilinet	8	2
KPCo	34.5 kV	S&C	IntelliTeam II	Utilinet	8	3

Western Area DA Projects

Operating Company	Voltage	Switch Mfg.	Control Type	Comm Type	No. of Switches	No. of Circuits
AEP Texas	12 kV	S&C	IntelliTeam II	Utilinet	5	3
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	3	2
AEP Texas	12 kV	Nu*Lec	Nu*Lec	RF	2	2
PSO	13 kV	S&C	IntelliTeam II	Utilinet	40	16
SWEPCO	12 kV	S&C	IntelliTeam II	Utilinet	5	3
SWEPCO	12 kV	S&C	IntelliTeam II	Utilinet	3	2
SWEPCO	12 kV	S&C	IntelliTeam II	Utilinet	2	2
SWEPCO	12 kV	S&C	IntelliTeam II	Utilinet	2	2
SWEPCO	12/34 kV	S&C	IntelliTeam II	Utilinet	2	2
SWEPCO	34.5 kV	S&C	IntelliTeam II	Utilinet	17	5
SWEPCO	34.5 kV	S&C	IntelliTeam II	Utilinet	5	2
SWEPCO	34.5 kV	S&C	IntelliTeam II	Utilinet	2	2

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AMI Demonstration project

- First AEP project to demonstrate a technology deployment integrating:
  - customer involvement in controlling demand
  - automated meter
  - automated circuit reconfiguration
  - capacitor switching

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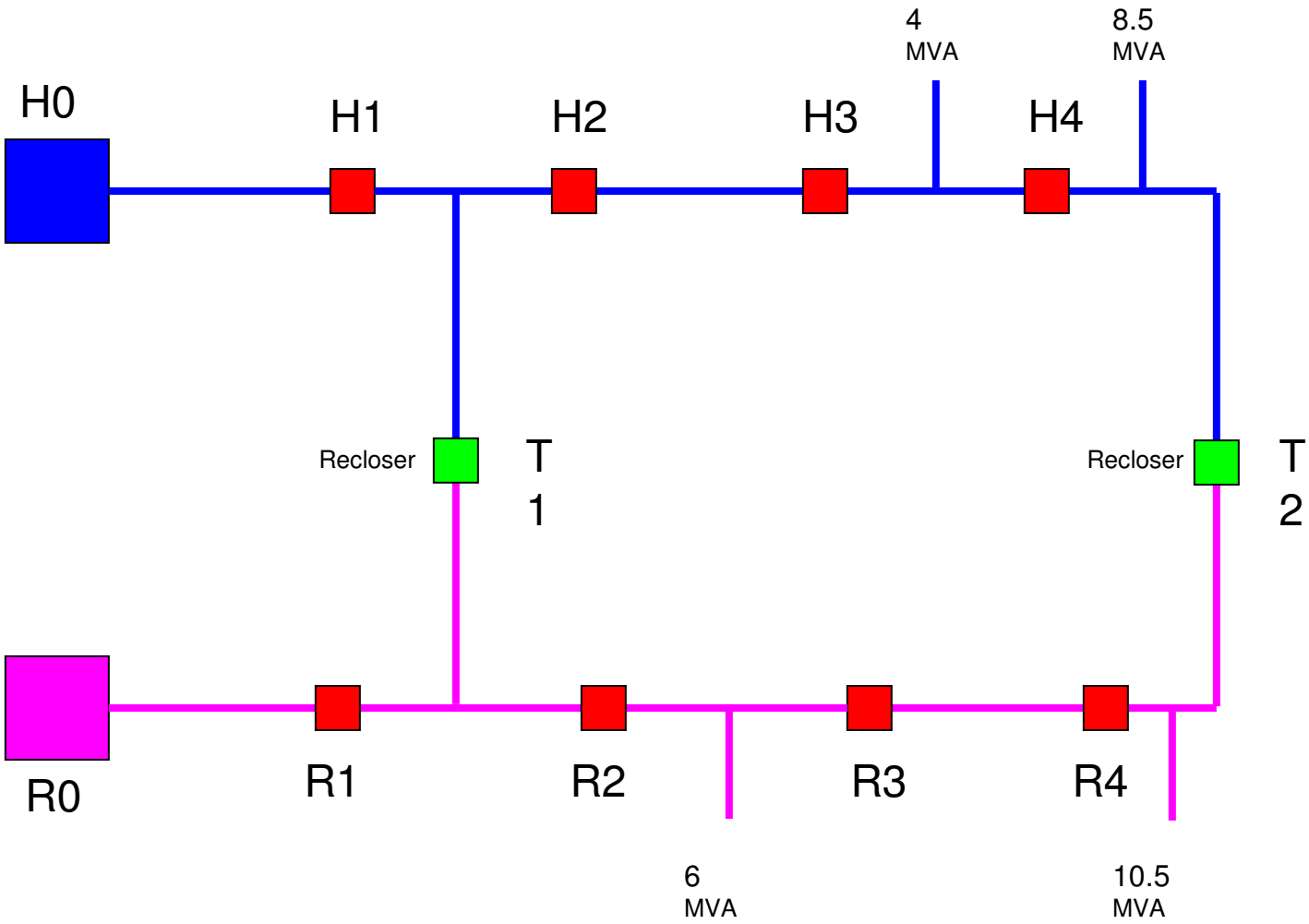
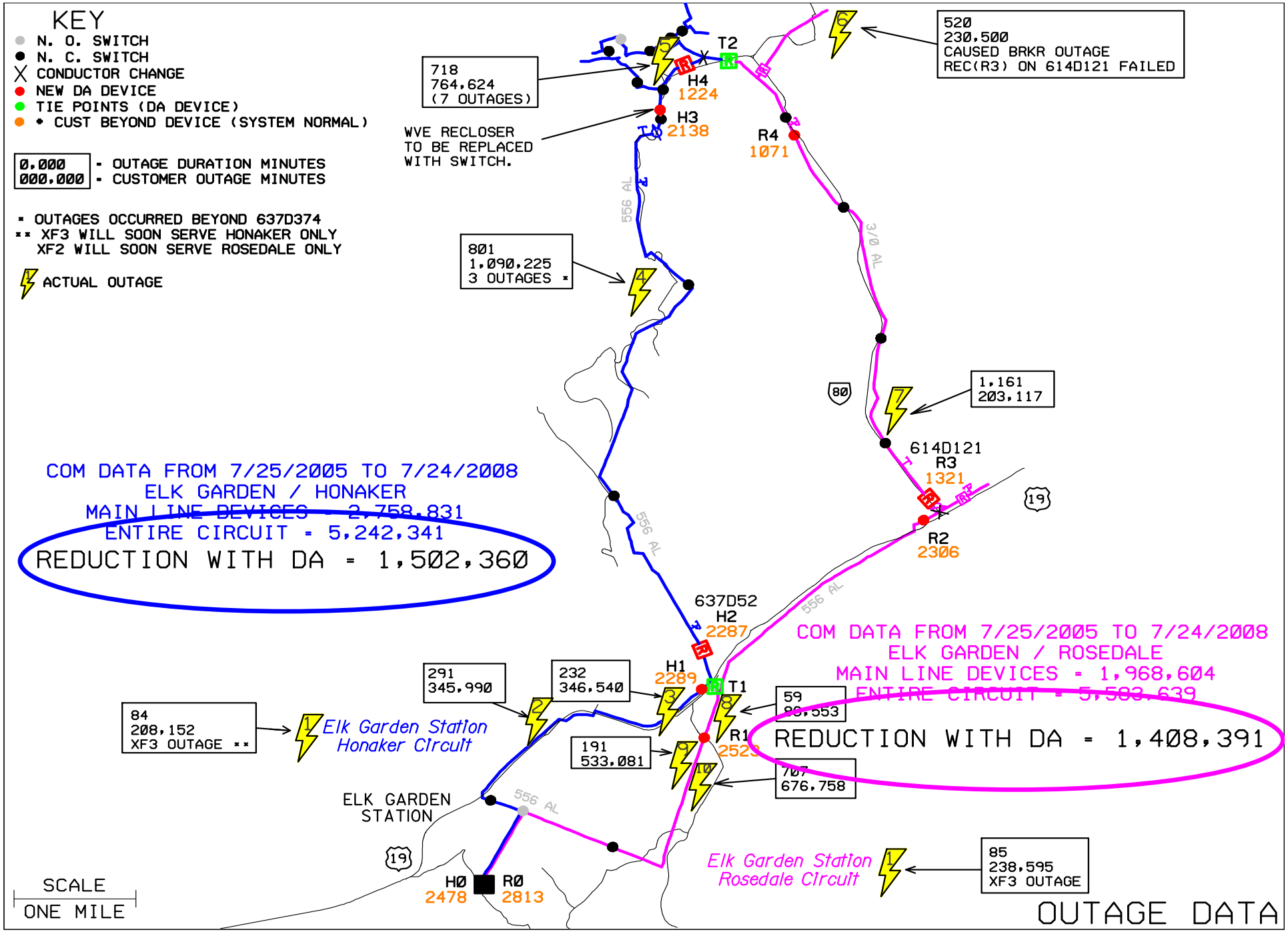
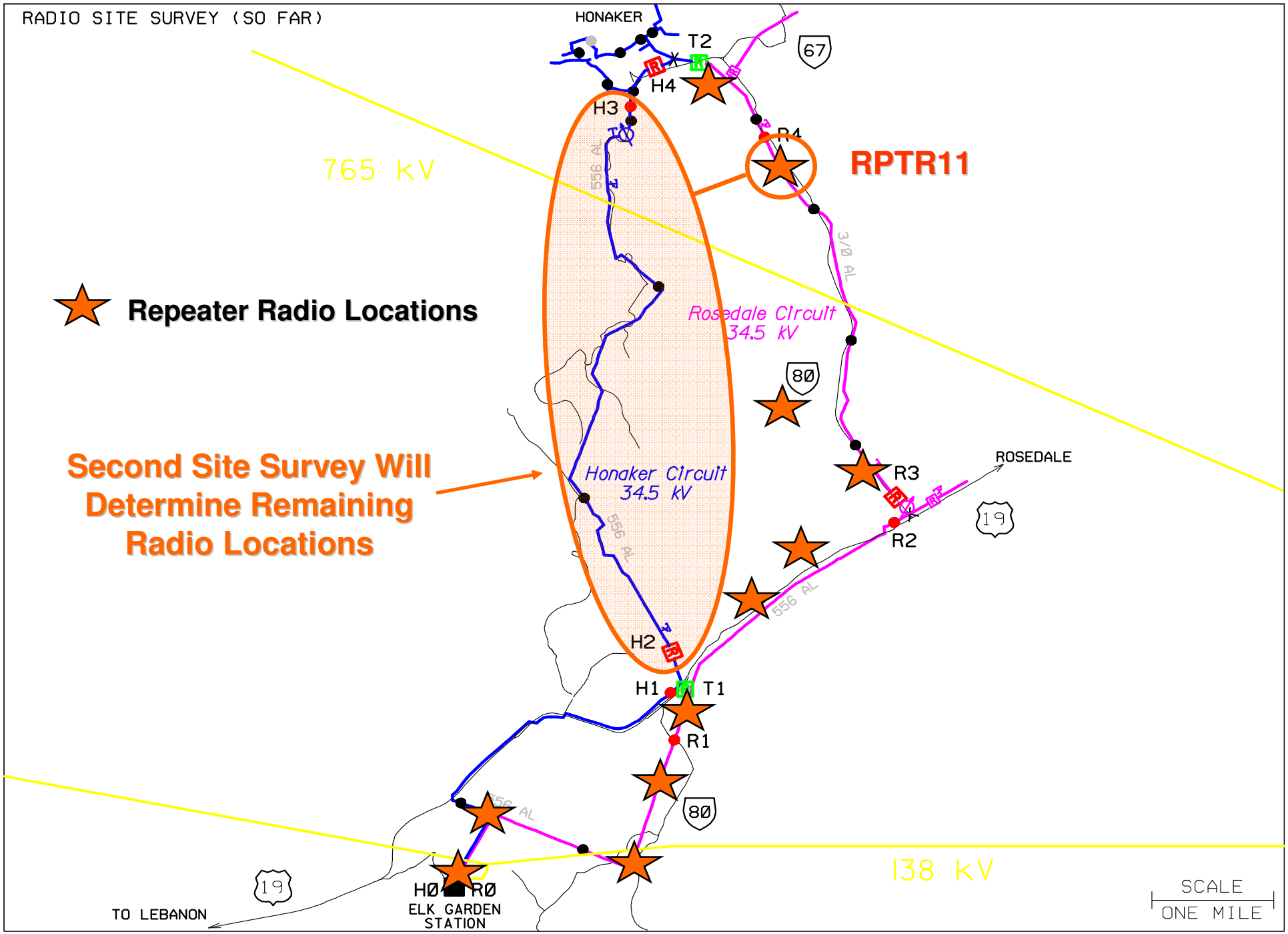
Structure an integrated team to support deployment of Grid Management

- Support Functions
  - strategic direction
  - scheme / vendor testing and approval
  - development of consistent metrics of benefits
  - assist with deployment choices and coordination of resources

DA & Grid Management Example




KEY
N. O. SWITCH
N. C. SWITCH
CONDUCTOR CHANGE
NEW DA DEVICE
TIE POINTS (DA DEVICE)
* CUST BEYOND DEVICE (SYSTEM NORMAL)
0.000 - OUTAGE DURATION MINUTES
000.000 - CUSTOMER OUTAGE MINUTES
* OUTAGES OCCURRED BEYOND 637D374
** XF3 WILL SOON SERVE HONAKER ONLY
XF2 WILL SOON SERVE ROSEDALE ONLY
ACTUAL OUTAGE
718
764,624
(7 OUTAGES)
WVE RECLOSER
TO BE REPLACED
WITH SWITCH.
520
230,500
CAUSED BRKR OUTAGE
REC(R3) ON 614D121 FAILED
801
1,090,225
3 OUTAGES *
1,161
203,117
84
208,152
XF3 OUTAGE **
291
345,990
232
346,540
191
533,081
59
707
676,758
85
238,595
XF3 OUTAGE
T2
H4
1224
H3
2138
R4
1071
614D121
R3
1321
R2
2306
637D52
H2
2287
H1
2289
T1
R1
2525
H0
2478
R0
2813
ELK GARDEN
STATION
556 AL
3/0 AL
80
19
Elk Garden Station
Honaker Circuit
Elk Garden Station
Rosedale Circuit
COM DATA FROM 7/25/2005 TO 7/24/2008
ELK GARDEN / HONAKER
MAIN LINE DEVICES - 2,758,831
ENTIRE CIRCUIT - 5,242,341
REDUCTION WITH DA = 1,502,360
COM DATA FROM 7/25/2005 TO 7/24/2008
ELK GARDEN / ROSEDALE
MAIN LINE DEVICES - 1,968,604
ENTIRE CIRCUIT - 5,503,639
REDUCTION WITH DA = 1,408,391
SCALE
ONE MILE
OUTAGE DATA


RADIO SITE SURVEY (SO FAR)
HONAKER
T2
H4
H3
67
R4
RPTR11
765 kV
556 AL
3/0 AL
Repeater Radio Locations
Rosedale Circuit
34.5 kV
80
Second Site Survey Will
Determine Remaining
Radio Locations
Honaker Circuit
34.5 kV
ROSEDALE
R3
R2
19
H2
H1
T1
R1
80
138 kV
TO LEBANON
19
HØ
RØ
ELK GARDEN
STATION
SCALE
ONE MILE

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NAS Battery Installation

DA & Grid Management
NAS Battery Installation

- Benefits
  - Peak Shaving
    - charge at light load, discharge during peak
  - Reliability
    - incorporate into Distribution Automation scheme

DA & Grid Management at American Electric Power