

Innovative Tools to Streamline and Enhance Reliability Planning

Can You Relate?

- Providing safe, reliable energy is critical for electric utilities.
- Ability to do so is becoming increasingly difficult because of system vulnerabilities.



Unplanned outages result in 500,000 Americans spending at least two hours without electricity each day.

System Vulnerabilities

- Severe Weather Events
- Distributed generation sources
- Aging infrastructure



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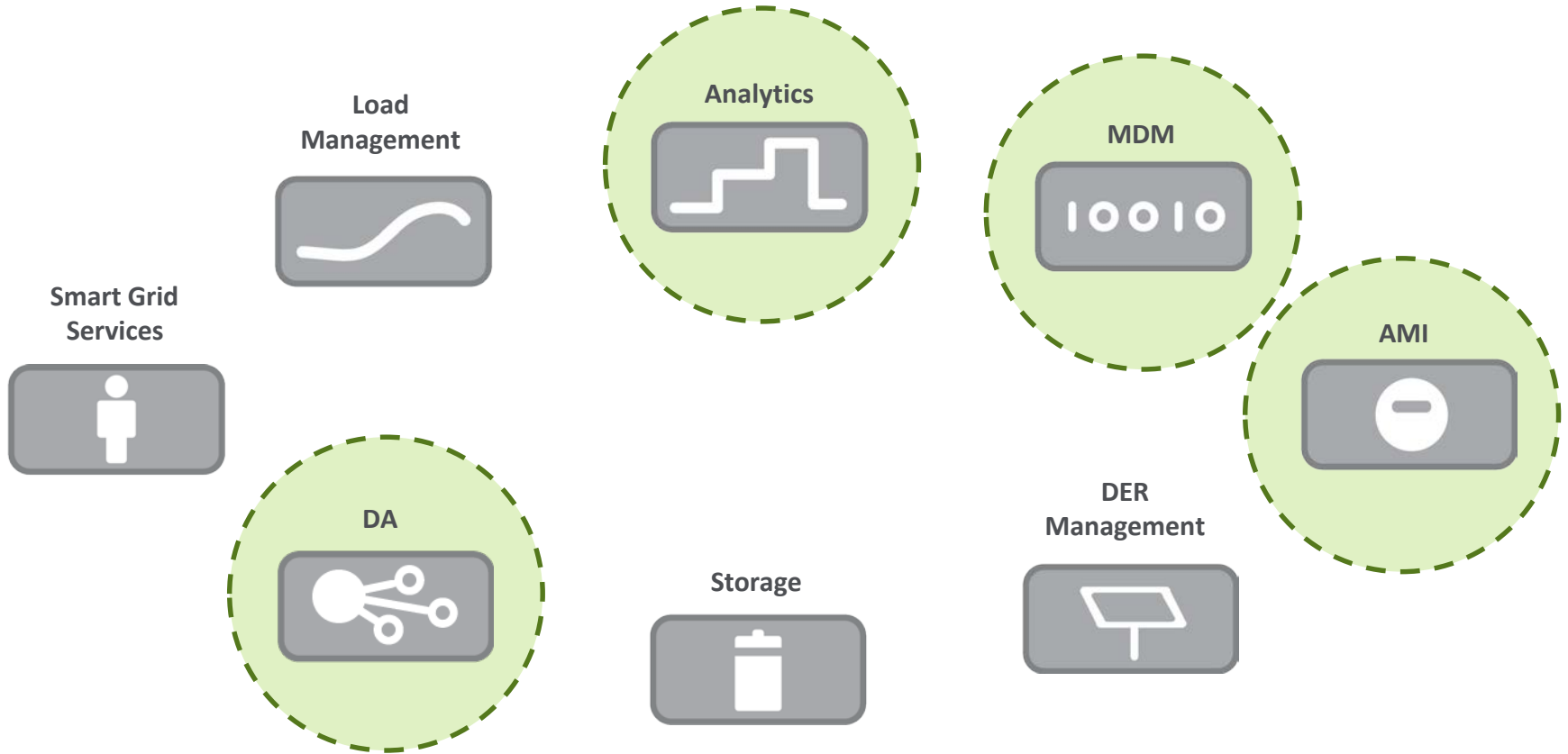
Need to...

- Meet regulator and customer expectations?
- Optimize Asset Maintenance and Replacement Strategies?

Landis+Gyr can help.

- Identify reliability issues before they occur
- Prioritize the reliability planning and investment process to optimize capital expenditures

Solutions and Systems for Reliability



Reliability Solutions for Real Results



Enhance predictive maintenance.

Optimize CapEx. Lower OpEx.

Reduce outage duration.

Improve customer satisfaction.

Visualize and Plan for Reliability

The screenshot displays the GRIDplan Reliability software interface with several key features highlighted by callouts:

- KPI's by Type:** A pie chart on the left side of the interface, titled "Customer Minutes", which breaks down outage causes into categories such as "Weather / Rain", "Voltage - F/L or H/L", "Tree Outside ROW - Down", "Weather / Flood", "Weather / Wind", "Weather / Ice", "Source Lost", "Fire", "Foreign Contact", "Animal / Squirrel", "Load", "Unknown", "Weather / Lightning", "Motor Vehicle", "Employee", "Animal/Bird", and "Equipment Failure".
- Outage Counts:** A line graph in the center titled "By Substation" and "By Feeder", showing the number of outages over time. The x-axis represents time in minutes (0 to 300), and the y-axis represents the number of outages (0 to 2,500).
- Outage Details:** A table on the right side of the interface providing detailed information for a specific outage. It includes fields for "Outage ID", "Penalty Cost", "Substation", "Feeder", "Device ID", "Year", and "Type". Below this, there are sections for "Feeder SAIDI", "Station SAIDI", "System SAIDI", "Penalty Cost", "Unserved kWh", and "Duration (Mins.)".
- Map:** A map in the background shows the geographical location of the outages, with various streets like "Silver Springs", "Wayne Ave", and "Ripley St" labeled.
- By Year:** A pie chart at the bottom center shows the distribution of outages across different years: 2009, 2010, 2011, 2012, and 2013.

- Optimal Improvement Recommendations
 - Undergrounding
 - Asset Replacement
 - Animal Guards
 - Vegetation Management
 - Tree Wires
 - Lightning Arrestors
 - Automated Sectionalizers and Switches



Visualize and Plan for Reliability



- Accurate, reliable plans for key stakeholders
- Forward-looking, multi-year benefit prediction
- Minimized resiliency costs
- Maximized capital investment value



Optimized Asset Maintenance & Investment Strategy

Filtering by Substation/Feeder

Google Map featuring Transformer Loading

Transformer Loading Profile

View Data by Year/Month/Day

Number of Transformers

Transformers w/Selected Loading Profile Characteristics

Transformer Loading Duration Curve

Transformer Loading Heat Map

Tables

Transformer	Feeder	Substation	A (kVA)	B (kVA)	C (kVA)	Flow (kVA)	Flow %
777435010870	Feeder 13	ABC	150.00	50.00	50.00	378.25	252.17
777436910070	Feeder 4	STATION_2	75.00	25.00	25.00	166.15	221.54
777435770770	Feeder 13	ABC	75.00	25.00	25.00	164.64	219.53
778435050600	Feeder 13	STATION_2	150.00	50.00	50.00	326.73	217.82
784439700070	Feeder 6	ABC	75.00	25.00	25.00	155.96	207.95
779435600180	Feeder 6	STATION_2	50.00	0.00	0.00	102.59	205.18
777435530360	Feeder 10	STATION_2	75.00	25.00	25.00	152.12	202.82

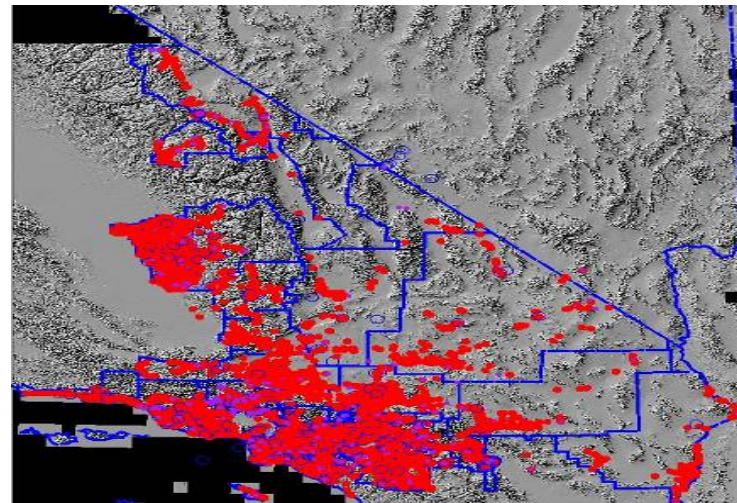
Optimized Asset Maintenance & Investment Strategy

- Properly size and manage transformers
- Identify lifetime costs of ownership and replacement
- **Zero** transformer outages in 2014 peak season



Landis+Gyr supports one of the largest Grid Management Programs in the U.S.

- Covering most of Southern California: Urban, suburban and rural territories
- Over 50K+ Network Nodes including:
 - 6K+ Switches and Reclosers
 - 9K+ Cap Bank Controllers
 - 10K+ C&I / Load Survey Meters
 - 20K+ Real Time Energy Management Meters
 - 3K+ Circuit Alarms and Fault Indicators



Reduced Outage Times with Advanced Sensing



S610 Line Sensor

- Pinpoint faults
- Reduce restoration times
- Identify potential outage trouble spots
- Identify two-way load flow
- Optimal count for sensor placement
- Optimize cost

Reduced Outage Times with Advanced Sensing

Map of Feeders:
Red = underground
Blue = overhead

List of Substations

Substation	Feeder	FCIs
All		15
DOVER		2
FERDALE		10
WALL_COVE		3

List of Feeders and suggested # of FCIs

Feeder	FCIs
All	25
7330	0
7331	0
7332	0
7333	3
7334	0
7335	0
7336	0
7337	0
7338	0
7339	0
7638	0
7639	3

Feeder Info from Utility

Feeder	FCIs
8812	7
7638	6
7333	3
7639	3
8810	3
8811	3
7330	0
7331	0
7332	0
7334	0

Feeder Parameters

Parameter	Value
Feeder:	7638
CAIDI (Minutes):	0.00
Time to Initiate Work Ticket (Minutes):	5.00
Time to Drive to Feeder (Minutes):	60.00
Time to Inspect Overhead Line (Minutes):	15.00
Time to Inspect Underground Line (Minutes):	90.00
Time to Fix Overhead Fault (Minutes):	300.00
Time to Fix Underground Fault (Minutes):	600.00
Overhead Fault Rate (Minutes):	0.30

Results

Feeder	Substation	Recommen...
7333	FERDALE	3
7638	DOVER	6
7639	DOVER	3
8810	WALL_COVE	3
8811	WALL_COVE	3
8812	WALL_COVE	7

Charts

CAIDI

Customer Outage Time

Operation and financial benefits charts for # of selected FCIs

Reliable.
Resilient.
Sustainable.
Future-ready.

Get there with Gridstream® solutions
from Landis+Gyr.

