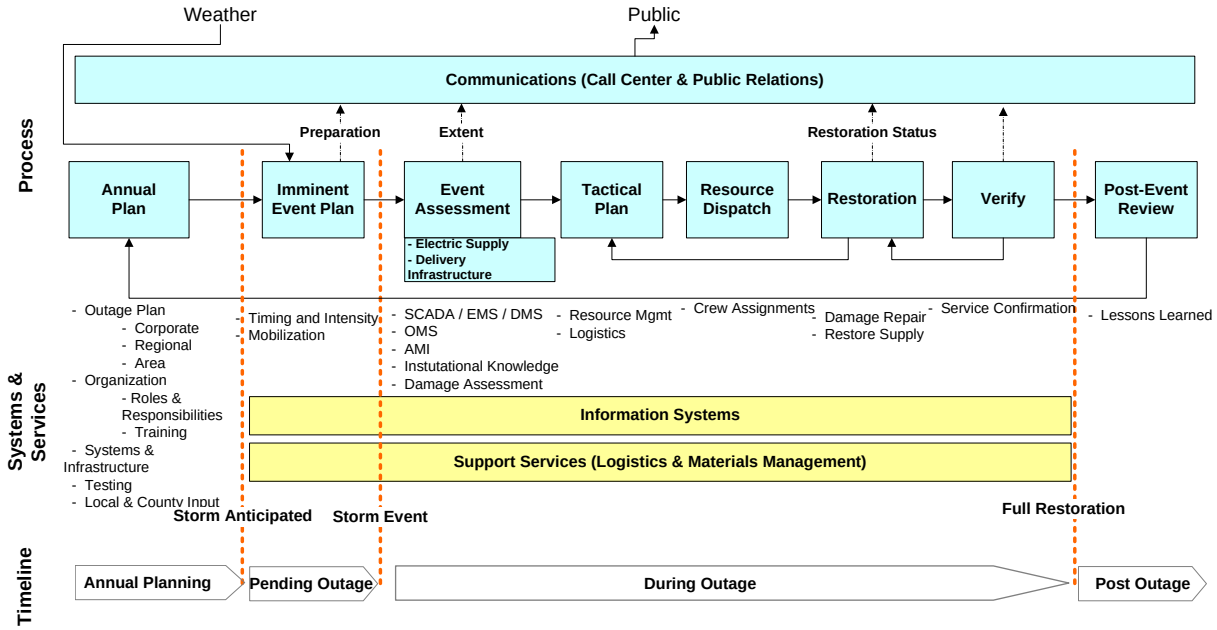

Exhibit 6-1: Outage Management Process

6.1.2 The Annual Plan

The leading restoration plans outline a utility's strategy and framework for managing all activities associated with a coordinated restoration effort after a significant storm, earthquake, or other natural disaster. Specifically, the plan defines:

- The high level strategy to prepare for and execute restoration activities,
- The personnel resources required to effectively conduct the restoration,
- The delegation of authority and responsibility for major elements of the storm restoration effort,
- The processes used to direct and manage the restoration efforts,
- The information tools required to process all the storm and restoration data into usable management information,
- The definition of storm strength and potential damage,
- The company's restoration strategic approach to a particular level of storm,

- The approach to determining the initial level of damage,
- The process for conducting a detailed analysis of storm damage to support restoration activities,
- The independent process for forensic analysis of storm related failures,
- The company's approach and channels used to obtain additional crews to support the restoration effort,
- The company's triggers for mobilizing and demobilizing the work force,
- The process for managing and prioritizing critical customers,
- The communications plan for informing the public and government agencies of the extent of the damage and, more importantly, the expected restoration time, and
- The tools required for managing logistics and sourcing additional repair resources to match the level of damage.

6.1.3 Organization (Roles and Responsibilities)

Essential to the timely restoration of service is a well-defined emergency restoration organization that defines:

- Critical management positions with their attendant qualifications, responsibilities and authorities,
- Clear assignment of responsibility for the strategic and tactical elements of the restoration effort,
- Policies to govern the restoration effort,
- Processes for managing, directing and implementing restoration activities,
- Clearly defined functions which support the processes,
- Prioritization of restoration activities down to the service level categories,
- Required skills for critical positions,
- Required training and its frequency,

- Resource call out lists, and
- Critical checklists used as reminders for each position identified.

6.1.4 Plan Execution (including event plan, assessment, tactical plan, dispatch, restoration, verification, communications, and support services).

This section defines how the utility will conduct the restoration efforts, including:

- Weather forecasting and the determination of the level of storm for early and continuing customer communications,
- Emergency Operations Center (EOC) mobilization and demobilization,
- Service or operations center mobilization and demobilization,
- Crew and material staging area mobilization to adequately permit managing ten times the normal number of crews,
- Logistics (sleeping accommodations, meals, laundry, vehicle fueling, etc.) mobilization,
- Initial “first cut” of damage level for determining initial restoration goals and the number of crews required,
- Detailed damage assessment,
- Work prioritization based on severity of damage,
- Area tactical plan,
- Resource dispatching,
- Management of the physical T&D facilities restoration,
- Progress reporting,
- Customer communications through multiple channels,
- Coordination with governmental agencies at the local, state and federal levels,

- Forensic evaluation of the failed system components,
- Post storm review, and
- Coordination with public agencies.

6.1.5 Systems and Services

Underpinning the entire effort from event initiation through post event review is the integration of critical support systems including:

- The customer information system used to capture and communicate specific outage data at the customer level,
- Customer contact applications and enablers: Integrated Voice Response Unit (IVRU) and web,
- An outage management system (OMS) designed to map individual customer outages to a physical representation of the distribution system. This will provide critical information on the size and nature of the event,
- A supervisory control and data acquisition (SCADA) system, providing information on the state of the transmission and distribution (T&D) systems and, in some cases, allowing physical control of critical T&D components,
- A workforce management system (WFM) that facilitates the movement and tracking of materials and personnel,
- A mobile workforce management system (MWF) to provide mobile, automated dispatch and work ticket capability for field forces,
- A resource monitoring tool to manage the additional foreign and contract crews,
- The advanced metering infrastructure (AMI) facilitates meter reading and the determination of whether a customer is receiving power,
- An energy management system (EMS) used for load flows and management of switching orders and clearances, and
- An outage dashboard that updates all parties including executive management on the restoration progress.

7. Emergency Restoration – Annual Plan

The ability to respond to any type of emergency begins with capability planning. In the electric utility industry, system damage due to weather or other natural causes is the most common emergency. The ability to respond efficiently and effectively to widespread system outages is a direct result of comprehensive planning and training for such an event.

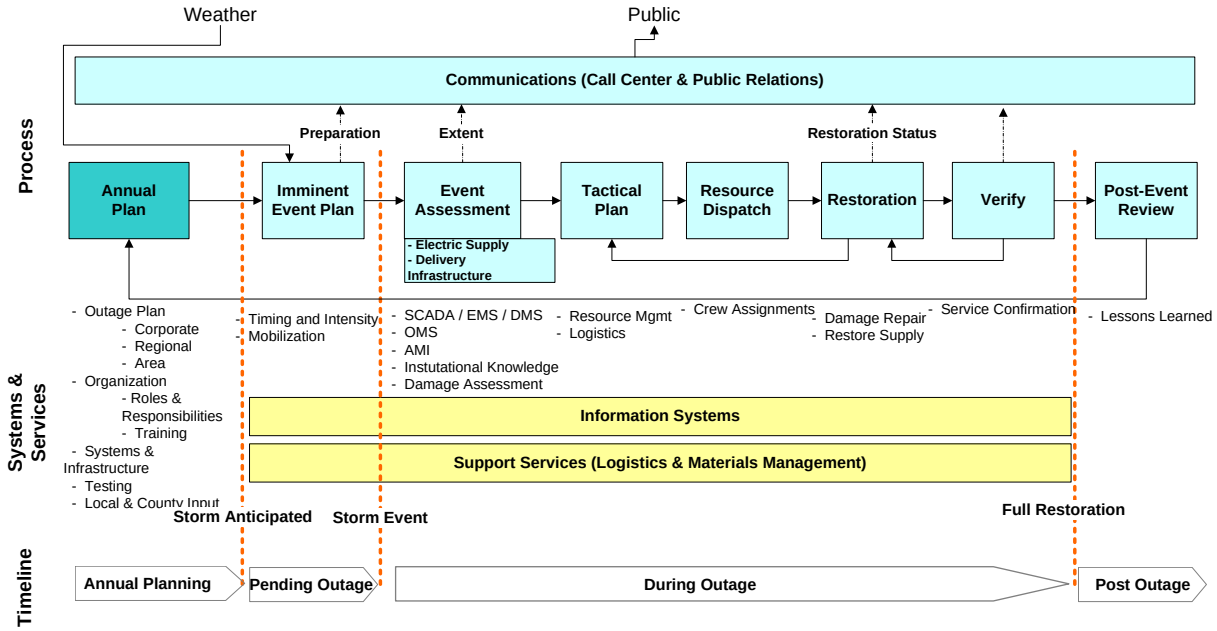

Exhibit 7-1: Outage Management Process – Annual Plan

7.1 Industry Practices

Throughout the electric utility industry, companies routinely review and update emergency response plans on an annual basis. Generally, the responsibility for managing these plans is assigned to a specific person or group located in the T&D operations function. Depending upon the type of emergencies to be handled, annual planning may involve detailed personnel training and drills with emergency simulations. Annual planning by leading utilities includes the review and incorporation of improvements resulting from previous event experience, also from the experience of other companies learned through various industry committees and working groups.

7.2 AmerenUE Practices

Consistent with industry leading practices, AmerenUE modifies and updates the EERP on at least an annual cycle. Lessons learned from events during the previous year, as well as potential improvements from other drivers, are incorporated as improvements into the EERP. Updates can emanate from either the Asset Management's Engineering Services or Distribution Operations. However, the owner of the plan is the Distribution Operations department.

The responsibility for maintaining and implementing the plan resides with the Manager of Distribution Operations. Unlike some other utilities, who have a separate group to maintain, conduct debriefs and update the restoration plan. The Distribution Operations organization maintains the plan and is responsible for ensuring its implementation during major restoration efforts. During an actual emergency, the organization will set the restoration strategy and determine the resource requirements. All restoration information are reviewed and approved within this group to ensure a consistent public.

The EERP works well for Level I and II storms, but the plan did not perform to AmerenUE's expectations during the major storms of July and December of 2006. The following six conclusions were reached with respect to the overall plan:

- The AmerenUE EERP provides a consistent approach for responding to any emergency,
- AmerenUE's EERP plan is consistent with industry leading practices, but will benefit from several enhancements designed to address severe storms.
- AmerenUE's EERP organization is consistent with leading practices found in the electric utility industry,
- AmerenUE adapted to the unique challenges of the major events very well,
- Training and job aids are critical components of an emergency restoration plan and AmerenUE has incorporated these tools into the EERP for many of the positions, and
- AmerenUE's approach of using the OAS system to guide the repairs is effective for Levels I and II, but becomes questionable in Level III events.

7.3 Conclusions

7.3.1 The AmerenUE EERP provides a uniform approach for responding to any T&D emergency.

The intent of the EERP is to define consistent emergency procedures for the company, which should translate to an appearance of consistency and uniformity to the public. As written, the plan clearly defines the roles and responsibilities of personnel and leaves specific actions to the individuals. The plan implies the following specific guiding principles for all AmerenUE actions:

- Return all customers' service as soon as possible (For Levels I and II there is a 72 hour goal),
- Ensure employee and public safety, and
- Maintain environmental stewardship.

The primary role of Emergency Operation Center (EOC) is to support and coordinate overall restoration activity in the Divisions. The EOC is responsible for ensuring that the Divisions have the resources and materials to affect a uniform restoration of service across the Missouri system. The Divisions have their subordinate plans, which are tactical in nature. Those interviewed for this review generally felt that the primary division of responsibilities performed well in both the July and December events.

7.3.2 AmerenUE's EERP plan is consistent with industry leading practices, but will benefit from several enhancements designed to address severe storms.

AmerenUE's plan benefits from many years of constant refinement. However, these refinements were based on Level I and II storms. The following seven findings address more severe storms:

- The current storm levels should be expanded with clear definitions for the severe storm levels,
- AmerenUE's goal of completing all restoration work within 72 hours is commendable, but this goal will likely be unattainable with wide-spread major damage,

- Critical ancillary elements of the overall EERP are not fully integrated into the master plan,
- Division level plans which make up the tactical component of the overall EERP can be inconsistent in their content or ties to the overall EERP,
- AmerenUE currently does not provide for a forensic failure analysis as part of its plan,
- AmerenUE's plan did not include a means for unburdening the system dispatchers, which in turn created some delays in executing work while crews waited for WPA clearances, and
- AmerenUE's EERP does not include checklists for before, during or after the emergency.

7.3.2.1 The current storm levels should be expanded with clear definitions for the severe storm levels.

The leading practice within the industry is to categorize events and tailor the appropriate response for each category. Generally, there are at least three levels of emergency conditions defined using any combination of the following descriptors:

- Weather and wind types,
- Number of customers without service,
- The amount of time estimated to restore all customers,
- Estimated level of damage,
- Whether the problem is isolated to one area or is it system wide, and
- Need to bring in outside crews to support the restoration.

Exhibit 7-2 shows the determinants that several leading utilities use to define the restoration effort. The most common determinant is the type of weather, followed closely by the type of winds. The other determinants are more sporadically applied.

Determinant	Northeastern	Southeastern	Southern	Western	AmerenUE
Type Weather	♦	♦	♦	♦	
Type Winds	♦		♦	♦	
Projected Customers out	♦				
Estimated Restoration time	♦				
Estimated System Damage	♦			♦	
Operating Areas Involved		♦[9]			♦
Type & Location of Crews		♦[10]			♦
LEVELS	5	4	5[11]	3	3

Exhibit 7-2: Determinants Applied to Emergency Definitions and Event Levels[12]

The AmerenUE approach tends to rely on the operating areas involved along with the number of crews. These two determinants are considered as "after the fact", in part because AmerenUE does not have the luxury of a long lead-time for approaching weather that many of the coastal utilities have.

Exhibit 7-3 shows one company's approach to defining specific categories. In each category, management has gone to great lengths to define clearly the weather conditions that apply including the impact to their service territory in the form of customers impacted and project restoration time. This level of specificity, allows them to make more informed judgments about what is likely to happen so that appropriate restoration decisions and actions can be planned.

[9] For transmission
[10] For transmission
[11] Consistent with the five categories of Hurricanes
[12] KEMA Storm Benchmarking Data Base and Analysis

Storm Category & Resource Requirements	Typical Weather Conditions	Projected Number Customers Affected	Estimated Restoration Time
1 - Upgraded (Regional resources)	• Thunderstorms, rain and moving fronts • Moderate sustained winds • Moderate frequent gusts • Condition is short to mid term • Light to moderate damage to electric	Up to 7,000	8-12 Hours
2 - Serious (Other Company Resources)	• Heavy thunderstorms, rain • Strong sustained winds • Strong frequent gusts • Condition exists for several hours • Heavy damage to electric system • Heavy, wet snow	Up to 15,000	12-24 Hours
3 - Serious (Foreign Resources)	• Severe thunderstorms, Extremely heavy rains • Strong sustained winds • Severe frequent gusts • Condition 12-18 hours or longer • Extensive damage to electric system • Heavy, wet snow	Up to 40,000	1-2 Days
4 – Full Scale	• Nor'easter type storms, heavy rains • Strong sustained winds • Severe frequent gusts • Tropical storms • Condition exists for 6-12 hour	40,000-60,000	2-3 Days
5 – Full Scale Coastal Storm	• Hurricanes Category 1-2 • 25-50% Damage to distribution system • Condition exists for 12 hours	60,000-80,000	≤ 1 week
	• Hurricane Category 3-5 • >50% Damage to distribution system • Condition exists for >12 hours	>100,000	> 1 week

Exhibit 7-3: Leading Practice for Storm Definition[13]

[13] From a Northeast Utility's Storm Plan

AmerenUE's approach to defining storm levels centers on after the fact determinants; affected areas and to a lesser degree, the resources required. AmerenUE has the following three storm levels at present:

- "Level I Storm – typically this type of storm damage can be handled by the affected Division's local resources and possibly the partial resources of an adjacent Division."
- "Level II Storm (Major Storm) – This restoration effort will involve the AmerenUE EOC and it is expected that the customers can be restored using AmerenUE employees and contractor employees currently on the AmerenUE property."
- "Level III Storm (Major Storm) – This restoration effort will involve the AmerenUE EOC. For damage of this magnitude, it expected that the customers would be restored using AmerenUE employees, on property contractor crews, off property contractor crews and Mutual aid partners if needed. This storm may also involve use of the Extensive Damage Recovery method (See Section Six)."[14]

While AmerenUE's definition of areas (Divisions) affected is reasonable, the definitions around resources can be interpreted in several different ways. Again, this set of definitions was determined by the nature of the storms and the lack of advance warning afforded the company.

Before the events of July and December 2006, Levels II and III were considered major storms. In fact, Levels II and III are reasonably small to moderate storms that cause isolated or generally localized damage to the T&D system. These storms' restorations are in 72 hours or less. The 72 hour restoration goal set by management is reasonable.

The level of damage is described by the estimated resources required to complete the restoration within management's goal. Level III storms can be described as a catchall for all other storms requiring the use of more resources than are generally on the property.

[14] Ameren EERP dated 5-1-06, Page 5

7.3.2.2 AmerenUE's goal of completing all restoration work within 72 hours is commendable, but this goal will likely be unattainable with wide-spread major damage.

KEMA has not come across many utilities that have established restoration goals in advance of a storm event. This puts AmerenUE on the leading edge of storm recovery practices. This goal has served AmerenUE well in its Level I and II storm recovery events. For Level III events, it has proven to be challenging.

Since Level III encompasses all other storm conditions, including the type of events that occurred during July 2006, December 2006 and January 2007, having a preset restoration goal is difficult. In these unique events, management would be better served having the senior EOC management team set the goal after there is a preliminary assessment of the magnitude of the damage.

7.3.2.3 Critical ancillary elements of the overall EERP are present, but not fully integrated into the master plan.

A leading practice identified by KEMA is to have all the critical elements of a plan tied together in the master plan. This affords management a complete view of the restoration effort required to restore the system, coordinate with other governmental agencies and communications with the public. Specifically, these plans contain the following restoration elements:

- Organization,
- Position descriptions with qualifications and training requirements,
- Strategy,
- Critical checklists,
- Process maps or descriptions,
- Description of IT system tools,
- Call out rosters,

- Critical Customers,
- Critical local, state and federal contacts,
- Communications plan,
- Mutual aid contacts,
- Contractor rosters,
- Staging areas and layouts,
- Lodging, laundry, crew transport (between staging areas and sleeping accommodations) and food services contacts and arrangements,
- Vehicle support, and
- Portable generator sourcing, etc.

An individual generally maintains these plans, or more likely a dedicated group, as is the case in several recent utilities KEMA reviewed. KEMA is not implying here that this individual or group is solely responsible for developing the elements, but that they are responsible for assembling the master document and ensuring the necessary updates are completed. This ensures that restoration knowledge management is fully documented. In some states like New York, the entire plan is filed annually with the State Commission.

AmerenUE has all these elements, but they are not assembled into a coherent master plan. Generally, all these elements have worked well at AmerenUE with exceptions covered in other areas of the audit review. Further, some of these elements, e.g. the vehicle fueling, discussed later, are not documented.

7.3.2.4 Division level plans that make up the tactical component of the overall EERP can be inconsistent in their content or ties to the overall EERP.

Division level plans make up the tactical component of the overall EERP and are therefore the critical link between the field activity

and the EOC. Generally, the Division plans are not consistent in their content or ties to the overall EERP. Exhibit 7-4 compares the plans provided to KEMA.

PLAN COMPONENT	Gateway	Boone Trails	Gravois Valley
Plan purpose	X	X	X
Activation criteria	X	X	X
Define senior mgmt roles	P[15]	X[16]	P
Define subordinate roles		X[17]	
Staffing requirements	X	X[18]	
Damage assessment process defined	X		X
Staging well defined	X	X[19]	X
Material requirements	X	X	X
Logistics parameters	X	X	X
Mgmt callout roster	X	X	X
Field Checker callout roster	X	X	X
Hotel, caterer & restaurant contact information	X	X	X
Fuel source contacts	X		X
Other support contact information	X		X
Critical customer list			
Local government officials/services contacts			
Substation & feeder lists		X[20]	
Substation & feeder priority lists			
Customers with self generation			
Key checklists		X	
List of potential crew squad leaders		X	

Exhibit 7-4: Comparison of Divisional Emergency Response Plans

As seen in Exhibit 7-4, the plans contain the majority of information necessary to call out personnel and acquire needed outside logistics support. What was noticeably absent from the plans included:

- Critical customer lists and contact information,
- Local government officials and services contacts, although the EOC maintains a contact list,

[15] P in Exhibit 7-4 stands for Partially complete KEMA's opinion
[16] From Ameren's Boone Trails Plan – Uses automated tool for contact information
[17] From Ameren's Boone Trails Plan – Uses automated tool for contact information
[18] From Ameren's Boone Trials Plan – Identifies the process to be applied
[19] From Ameren's Boone Trails Plan – Includes specific contact information and aerial photos
[20] From Ameren's Boone Trails Plan – Includes customer count by feeder and service center responsibility

- Substation and feeder priority lists, although one plan included a list of both with the number of customers, and
- A list of customers with some level of self-generation.

Maintaining some of these lists can be quite an undertaking, but doing so will aid management in setting priorities that are more effective.

There were several other elements covered by some Divisions and not by others. The information contained in these plans is critical local knowledge. This knowledge can aid management in better focusing its response to a significant outage with assurance that it has not forgotten any important element.

7.3.2.5 AmerenUE currently does not provide for a forensic failure analysis as part of its plan.

A recent addition to emergency restoration plans is the need for a forensic failure analysis process and team. This was first developed in the Southeastern utilities to determine the nature of the failures and how best to minimize them in future storm events. In Florida, where utilities face hurricanes annually, the State Commission is requiring all regulated utilities to have a process incorporated into their plans.

AmerenUE currently does not provide for a forensic failure analysis as part of its plan. As a result, KEMA was only able to accomplish a high-level review of the failures that occurred on the system. Had a process and team been in place, KEMA could have provided more information leading to an overall comprehensive system hardening strategy.

7.3.2.6 AmerenUE's plan did not include a means for unburdening the system dispatchers, which in turn created some delays in executing work, while crews waited for WPA clearances.

When utilities are required to bring in multiples of their normal crew complement there is bound to be some congestion. Specifically, this congestion occurs around the system dispatchers, whose responsibility is to issue clearances and switching orders. Clearances

are the front line of safety protection for the crews and public. All utilities take the clearance process very seriously and provide specialized training to their system dispatchers who are generally the only authorized agents to grant clearances. Switching impacts the state of the system, i.e., how energy is moved across the system and is an integral part of the restoration process.

The leading practice in utilities that regularly experience major outages -- leaving over fifty percent of their customers without service for long periods -- is to divide the management of the restoration into smaller more manageable areas. This can be accomplished by assigning feeders or substations to specific individuals who have full control of the state of the substation and feeders assigned. In one southern coastal utility, they incorporated a very formal process for assigning the control of a substation and its feeders to a local manager. The process has very clear instructions on how to conduct hand-offs in either direction with a formal paper trail. That local manager then controls all the restoration and switching activities on his assigned feeders.

At the time of the 2006 storms, management had not previously experienced this level of system destruction, but responded very quickly by expanding its work force five-fold. This huge increase in the number of crews put a burden on the system dispatchers and tools they use to issue clearances. This situation delayed many crews in beginning their work, as they had to wait for clearances to be granted. Ameren did activate a new Functional Agent program in an ad hoc fashion during the July storms, albeit on a limited scale.

7.3.2.7 AmerenUE's EERP does not include checklists for before, during or after the emergency.

Checklists, whether manual or technology-based, are essential to confirming that an emergency response role has been properly executed. Leading practices indicate that emergency restoration plans should include checklists for all jobs to serve as reminders of each position's responsibilities.

Emergency response role employees are asked to perform unusual tasks on short notice during periods of potential stress. A role-

specific checklist ensures the employee completes all expected tasks, obtains all information needed, and provides proper feedback to customers and other stakeholders.[21]

7.3.3 AmerenUE's EERP organization is consistent with leading practices found in the electric utility industry.

The leading practice in the electric utility industry is to have a formal emergency restoration organization defined with the key positions fully identified and their respective roles, responsibilities and authorities defined. This organization is designed to go into effect as soon as certain threshold conditions are met. At that point, key positions are staffed within a short period and the call out for the critical skills begins.

Generally, the Emergency Operations Center (EOC) leads these organizations. Some utilities have begun to adopt the Incident Command Structure (ICS), created by the federal government. The ICS differs from the EOC in that for any size event there is an Incident Commander while the EOC is generally reserved for the larger or more complex events. Both of these approaches are effective.

An effective emergency organization will have the following elements clearly defined:

- Command structure,
- Critical positions,
- Master personnel roster with backups identified,
- A formal process communicating critical restoration information,
- Mobilization and demobilization triggers,
- A group to develop the restoration strategy,
- A group(s) to manage and direct the physical restoration efforts,
- Personnel assigned to managing:
  - Staging resources,

[21] Review of EERP

- Accommodations to rest crews,
- Feeding crews,
- Guiding foreign crews,

- Checklists for each position identified in the plan delineating their responsibilities,
- Personnel and support systems dedicated to providing timely information to the various stakeholders, and
- Liaisons identified to work with government agencies and other first responder organizations.

AmerenUE has a well-developed restoration organization. There are primarily two levels, the EOC and the Divisions. The EOC is the strategic and leadership group for the restoration effort and is co-located with the Electric System Operations at AmerenUE's headquarters.

The AmerenUE EOC is the nerve center of the operation where the restoration strategy is set and additional resources are identified and contacted. The EOC is responsible, through the communications organization, for crafting the messages given to the stakeholders. Specifically, the EOC defines the media message content. The one exception is the automatic updating of restoration statistics to AmerenUE's Outage website.

Exhibit 7-5 shows the AmerenUE EERP organization. The EOC personnel are responsible for interpreting the EERP to adapt to changing conditions during the event. The boxes to the right show the key department managers who have a significant role in storm restoration.

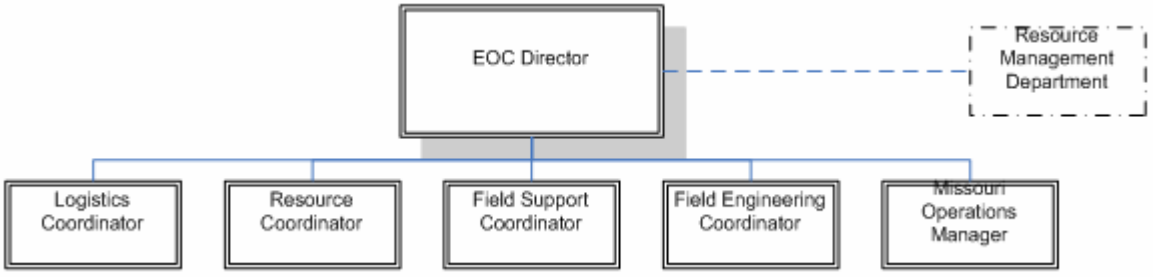

Exhibit 7-5: EERP Emergency Organization

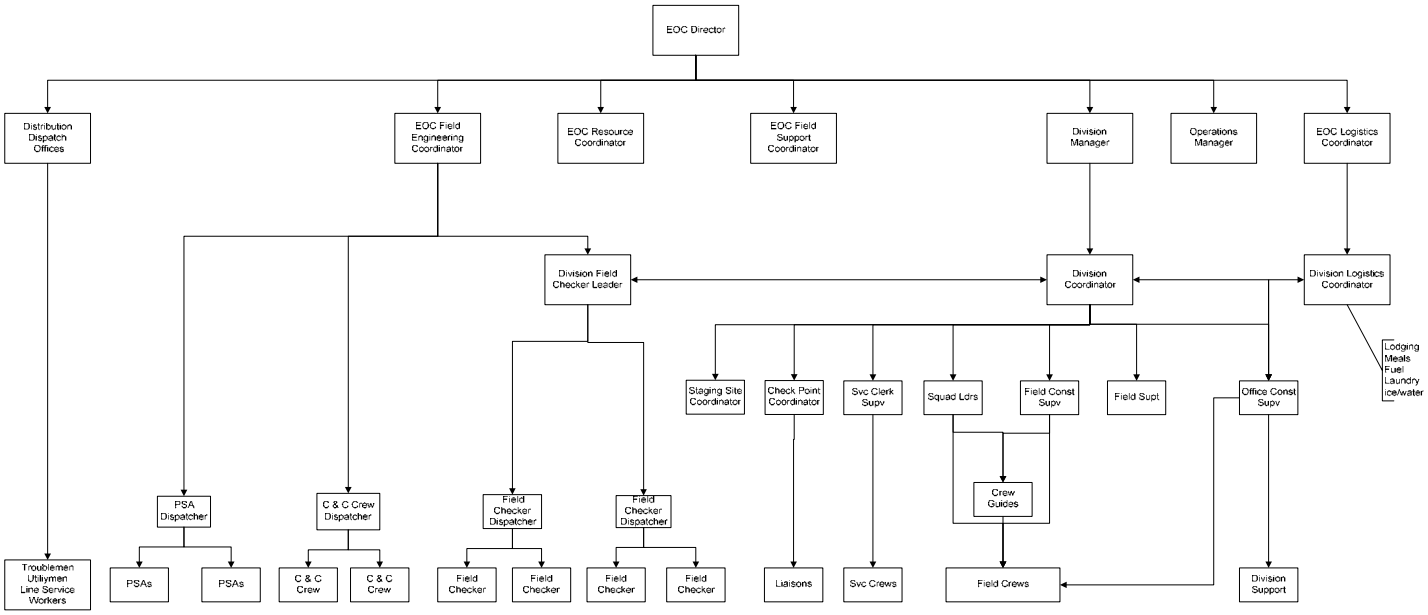

Exhibit 7-6: Depiction of both the EOC and Division Functions

The EERP provides position descriptions, but not the training or prerequisite qualifications requirements for the positions shown in Exhibit 7-5 and Exhibit 7-6. While the qualifications are not delineated in the plan, management has successfully matched the right people with the right roles for the critical EERP positions.

7.3.4 AmerenUE adapted to the unique challenges of the major events very well.

Critical to any utility's successful restoration effort is the ability of the personnel and management team to adapt to the situation presented to them.

AmerenUE did an excellent job of identifying EERP's shortcomings and overcoming each with a modification to the plan or process. Several examples include:

- Both storms hit with little notice, but AmerenUE was able to field resources numbering 3800 and 4400 or about five times the normal resources working on AmerenUE's property,

- The increased logistical effort to house this many crews when many of the hotels were already full,
- AmerenUE's well developed relationship with the Missouri Department of Transportation which allowed the movement of unprecedented numbers of foreign and contract crews through neighboring states rapidly, and
- As areas were completed, the resources were quickly moved to support other areas where the progress was slower.

7.3.4.1 During the storm, effectiveness of Division management was impacted by the magnitude of the damage in their area of responsibility, but each Division quickly adjusted its respective plan.

In today's electric utilities, KEMA sees fewer Area Operations (Division) Offices staffed by fewer people while covering a larger territory. During normal operations, this is a cost effective structure; however, during severe storms it will stretch the best of the operating organizations as system damage is highly dispersed.

Some utilities will further divide their operating centers into smaller units to provide more local control over smaller areas. This approach ensures that smaller communities are not forgotten during a restoration effort and permits the required focused attention.

KEMA did see evidence that the Divisions generally functioned well in their storm roles. As stated earlier, one Division Manager opted to invoke Section Six of the EERP. Other Division Managers would have preferred to have faster notification of arriving foreign crews to expedite work assignments. As the crews came to AmerenUE they were assigned to Divisions, but the Field checkers had not provided enough information to produce the needed work packages as they were still evaluating the damage.

7.3.5 Training and job aids are critical components of an emergency restoration plan; AmerenUE has incorporated these tools into the EERP for many of the positions.

The majority of utilities provide training to assigned emergency response personnel. This training can take many different forms, including but not limited

to classroom, tabletop, and field exercises. A significant number of utilities capture these costs in their annual budgeting and accounting processes.

KEMA concurs with this leading practice for training, but also recommends the addition of a formal system of training evaluation. To ensure that training is effective, participation is measured and analyzed while the skills to be acquired and/or maintained are tested during and after the emergency response role training.

Because emergency response roles may be different from normal assignments, training is important. Because emergency response roles are assumed on short notice and with limited time for preparation, checklists, supporting technology, and other tools and aids should be available for employees.

AmerenUE does provide training for several functions including the Field Checker and the new post storm Functional Agent. The Field Checker is the front line position for identifying and reporting the extent and nature of the damage. The Functional Agent is a new position designed to take control of a substation or feeder and manage all the work including the Workman's Protection Assurance (WPA).

7.3.5.1 AmerenUE has a formal Field Checker (Damage Assessor) training program, but should have provided more qualified Field checkers to handle an event of this magnitude.

Well-qualified damage assessors are critical to any storm plan and restoration efforts. A qualified and knowledgeable damage assessor can establish a more efficient and effective restoration process. These individuals provide critical information regarding the specific nature of primary failure that allows crew dispatchers to send the right type of crews and materials to hasten the repair. The practice of using trained damage assessors is considered a leading practice in the utility industry.

Training programs are designed to provide the damage assessor with required tools to adequately describe the damage. Then appropriate crews and materials can be assigned for repairs. At leading utilities, damage assessors are pre-selected based on their knowledge of the system and geography. Many utilities budget for the training, which is often mandatory.

AmerenUE's damage assessors are known as Field checkers. The majority of Field checkers reside in the Division Field Engineering functions and are eminently qualified to perform this vital function. The backup for the Division Field Engineers comes from the St. Louis Corporate headquarters' engineering function. These additional personnel have varying qualifications and levels of proficiencies and therefore require the most training.

The training program covers the following topics:[22]

- Establishing the scope of a storm (short-lived or multi-day event) during the first six to 12 hours,
- Setting an initial target of 24 hours for a complete assessment,
- Setting work and environmental expectations for the Field checkers,
- Defining proper damage assessment practices and procedures,
- Explaining the damage assessment process,
- Reviewing use and terminology of overhead circuit maps,

[22] Source: Review and analysis of Company documents

- Reviewing the potential safety issues (downed live wires) and how to deal with them in the field, and
- Reviewing general types of T&D equipment and structures.

There is no formal or informal means for evaluating how well the attendees learned the skills put forth in the class. Further, basic skill requirements for the Field checkers do not appear to be formally defined in any document.

7.3.5.2 AmerenUE does not measure the effort devoted to emergency response planning and training.

Unless training time and its costs are budgeted, other "measured" priorities will take precedence. Without proper training, restoration efficiency may be adversely impacted and will incur higher costs. Training is not budgeted at AmerenUE and instead charged to overhead accounts, which can diminish training.

7.3.6 AmerenUE's approach to using the Outage Analysis System (OAS) to guide the repairs, works well for Level I and II storms, but becomes questionable in Level III events.

Many of the leading utilities who regularly face storm events and normal outages have installed Outage Analysis Systems (OAS). OAS supports management in the following ways:

- Prioritizes the work according to parameters set by the utility,
- Defines the extent of a particular line/service outage,
- Finds the closest available crew,
- Determines the number of customers impacted, and
- Estimates the restoration time and other functions.

The AmerenUE system was developed over ten years ago with periodic fine-tuning over the years. AmerenUE has fully integrated SCADA and its CellNet automated meter reading tools into the solution. Further, it has tied its outputs to its Outage website that gives its customers a very granular look down to the Zip Code level.

OAS has performed well in the Level I and II events, and probably some smaller Level III events. However, its application in the type of restoration situations brought about by the storms experienced in July and December 2006 is questionable. There are several reasons for this conclusion:

- Depending on the nature of the failures and where they occur, relative to the substation and customers, it is possible to get double counts of customers affected,
- Any restoration times calculated by OAS will need to be field updated once the full extent of the damage is known on a particular feeder, and
- The prioritization of work may not be optimal as the crews can be required to incur more windshield time as they move around an area performing the prioritized restoration work instead of finishing a feeder or lateral. KEMA did not attempt to quantify this number but did receive comments from Division management.

Fortunately, the EERP provides an alternative for this situation (Section Six, Extensive Damage Recovery) in the plan. In the event of a significant level of damage, management will switch its restoration strategy to one that dedicates a crew(s) to work a specific feeder from the substation out. Many utilities adopt this particular practice when faced with the kind of damage produced in the July and December 2006 storms.

Management did not fully apply this alternate strategy across the system during these storms. However, it was employed in one of the hardest hit Divisions to more effectively address its restoration.

7.4 Recommendations

7.4.1 Redefine the existing storm level classifications to include at least one additional level.

Levels I and II are reasonable. Divide the existing Level III into a Levels III and IV. The division between Level III and IV should focus on the overall estimated restoration time required. For example:

- Level III would be for severe storms where less than 200 feeders are locked out and less than 225,000 customers are out with an estimated repair time

less than 8 days. Further, the numbers are greater than what is expected for a Level II event.

- Level IV would be for severe storms where there are over 200 feeders out and over 225,000 customers out with an estimated repair time of over 10 days.

7.4.2 Integrate all subordinate emergency plans into the master EERP.

EERP will include the following plans and components to ensure best practices for major storms are captured for future use. For example:

- Emergency Communications Plan,
- Support Logistics Plan (Lodging, Feeding and transportation for crews),
- Standardized content and formal inclusion of all divisional emergency response plans to align with the master EERP,
- Define the work process and storm triggers for mobilizing and demobilizing the Functional Agents role,
- Fuel requirement calculations and determination for the number fuel tankers necessary to support the expanded fleet,
- Coordination with the Missouri Department of Transportation (MODOT) to obtain emergency declarations under emergency conditions permitting contract and mutual aid vehicles to cross state borders unimpeded,
- Document all workflows and responsibilities for the major storm restoration processes,
- Identification of receiving staging areas located along major thoroughfares located at AmerenUE's service territory perimeter,
- Checklists for each position identified in the EERP for before, during, and after work activities,
- A fully defined process for conducting an initial damage assessment during the first hours of a Level III and IV event,

- Define and execute training requirements with evaluation criteria for Field checkers and Functional Agents, and
- Definition of the timing and content for scheduled storm drills.

7.4.3 Institute a formal Forensic Analysis process to run concurrently with damage assessment.

To ensure that AmerenUE has maintained its T&D systems appropriately, there should be a formal Forensic Analysis process that can be deployed during a major restoration effort. The purpose is to evaluate the nature of the failures to determine if AmerenUE could have mitigated the failure through design or maintenance activities. Specifically, AmerenUE should:

- Develop a formal forensic analysis process that captures system failures during Level III and IV events,
- Develop a methodology to select a statistically valid sample for a specific Level III and IV event,
- Decide whether to conduct forensic analysis with in-house resources or by third parties.
  - If in-house, develop a detailed process for analysis and the accompanying data capture tools and training programs, and
  - If contracting for the service:
    - Develop a set of criteria to qualify contractors,
    - Select a contractor using AmerenUE's accepted bidding process,
    - Prepare a formal contract with specific performance criteria, and
    - Conduct joint exercises to ensure both AmerenUE and the contractor are prepared.

7.4.4 Expand Section Six of the EERP to include the development of self-administered work islands during Level III and IV storms.

Section Six is the only section within the EERP that addresses how the restoration should proceed in the event of a severe Level III restoration. It is

critical that this section outline in some level of detail how to identify the most damaged areas and the process for restoring the effected areas in the most orderly fashion.

As a result of implementing this recommendation the role of OAS will change. In Level III and IV restoration efforts, the initial focus will be on repairing feeders and laterals from the substation in those areas where the damage is extensive. The following eight activities must be covered at a minimum:

- Define the concept and role of self-administered work islands,
- Determine the level of damage (poles and spans down) using the initial damage assessment,
- Estimate and obtain the required resources by crew type,
- Identify clear triggers for self-administered work islands,
- Determine the need for Functional Agents,
- Develop a formal process for transferring clearance control to a decentralized certified functional agent ensuring clarity in the transfer of accountability,
- Codify the role of Divisions in managing and supervising all in-house, contract, and mutual aid crews working within a division, and
- Reinforce the roles and responsibilities of safety supervisors with respect to self-administered work islands.

While KEMA is recommending this be included in the EERP, we understand that it will likely be implemented by the Divisions.

8. Emergency Restoration – Imminent Event Plan

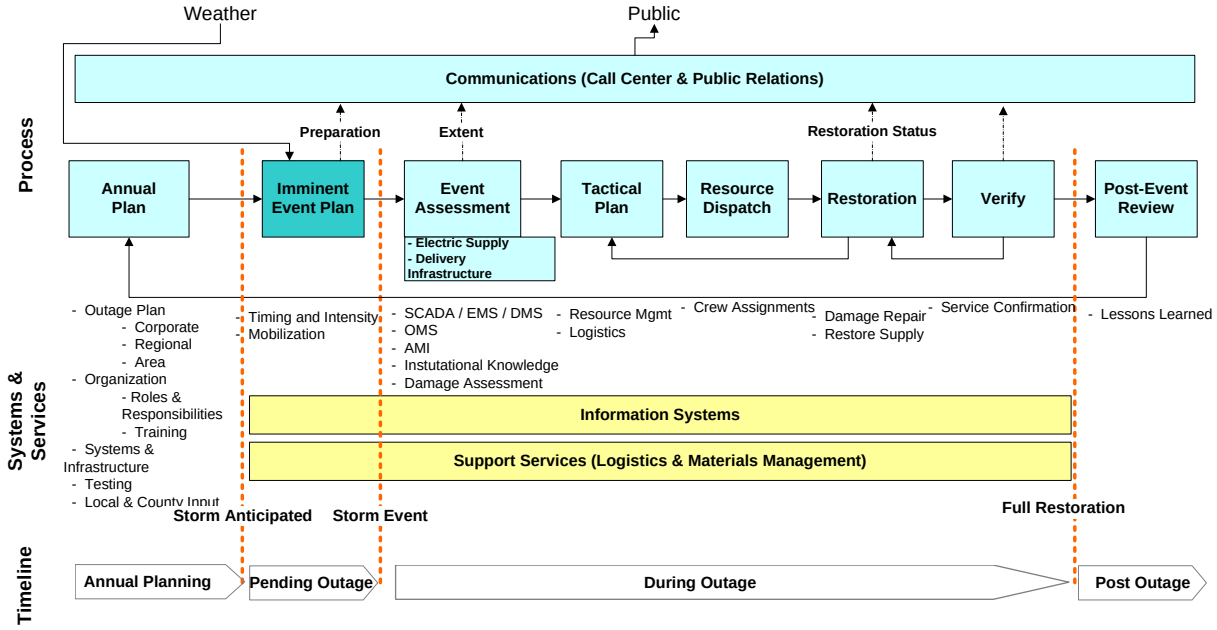

Exhibit 8-1: Outage Management Process – Imminent Event Plan

8.1 Industry Practices

Throughout the electric utility industry, companies have plans in place that detail when and to what extent that company's emergency response plan goes into effect. The first stage of the plan is, most often, the advance planning and mobilization that occur in anticipation of a specific event. The best example of this action is found in companies exposed to tropical storms and hurricanes where significant advanced warning allows for mobilization on an escalating scale. As part of any emergency response plan there must be detailed information on the various stages of planning, mobilization, and the "triggers" for those stages. This early planning and mobilization is tailored to the company and the specific exposure it experiences. Whether the company is in an area of exposure for hurricanes, tornadoes, earthquakes, sub-tropical storms, ice, or wind will determine what the specific plans and triggers should be.

8.2 AmerenUE Practices

Like other utilities, AmerenUE's practice in this area is driven by the amount of advance notice the company has of impending severe weather. AmerenUE, in its 2006 storms,

received no advanced warning as the weather service indicated that the July storms would miss AmerenUE's territory. In addition, for the ice storm of 2006, the weather service indicated that the majority of the storm activity would pass to the north of AmerenUE. AmerenUE opens the EOC once an event begins so the amount of specific event planning is minimal. However, within the EERP there are provisions for ongoing readiness for emergency response.

8.3 Conclusions

8.3.1 AmerenUE's severe weather events did not offer the luxury of advance warning to permit pre-mobilization.

This is a crucial point to understand. Unlike many Southeastern or Pacific Northwestern utilities that get several days warning that a storm is on the way, AmerenUE does not. As a result, AmerenUE has to be prepared to initiate its EERP on extremely short notice.

8.3.1.1 The nature of the July Windstorm(s) offered no opportunity for advance warning and consequently AmerenUE was not in a position to pre-mobilize divisional or corporate resources.

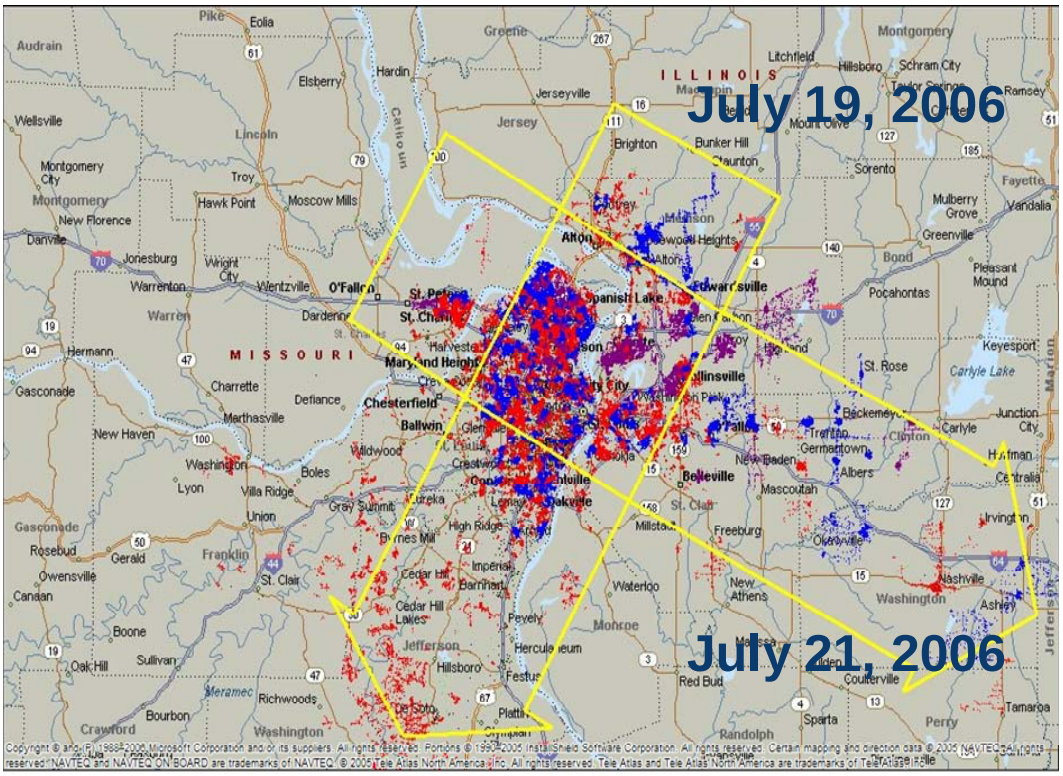

Exhibit 8-2: July Windstorm Paths

The major events in July were both windstorms occurring with no warning and with sudden onset. As Exhibit 8-1 indicates, the initial windstorm on July 19, 2006 blew from the northwest with damage focused in and around the St. Louis metro area. The second wind storm event on July 21, 2006 blew from the northeast also with sudden onset and no warning. Some major events can be predicted to a certain degree. Examples include a progressing winter storm front or the build up and approach of a hurricane. The nature of the two July events with their sudden onset did not offer AmerenUE any warning to the impending event, and consequently, AmerenUE was not able to mobilize for the restoration response in advance.[23]

8.3.1.2 AmerenUE had advance warning of the impending December and January ice storms. Divisions were placed on alert and due to the geographically dispersed weather front, AmerenUE made the prudent decision to stage internal resources within divisional boundaries.

The nature of the December and January ice storms offered AmerenUE some advance warning of the impending major event. AmerenUE alerted divisional and first responder resources to mobilize for the upcoming restoration event. Due to the large geographic extent of the weather front, AmerenUE prudently did not re-assign district resources to neighboring divisions until the extent of the damage could be ascertained.[24]

8.3.2 AmerenUE follows industry-leading practice of monitoring weather services for impending weather conditions.

It is a well accepted practice within the industry for dispatch offices and emergency operations centers to subscribe to national weather services to receive as much advance notification of an impending weather event as possible. The AmerenUE Distribution Dispatch Offices (DDO) adopts this practice and uses a service called Weather Sentry to monitor (National Oceanic Atmospheric Administration, NOAA) weather data for weather forecasts and lightning strikes.

[23] Ameren OAS analysis, Press Releases
[24] KEMA Interview MK08, Ameren Press Release

Based on this information the DDO observes the development of pending severe weather and alerts divisions and the EOC management appropriately.[25]

8.3.3 AmerenUE is enhancing its storm prediction capability by pursuing an initiative to improve localized weather monitoring during the pre and initial hours of a major event.

AmerenUE has recognized that its storm damage prediction capability is a weakness in its storm restoration process. Currently, AmerenUE's information source is from the national weather service that provides an overview assessment of pending weather trends. This type of information is not sufficiently granular to predict localized damage impacts. AmerenUE is addressing this situation by discussing opportunities with vendors to enhance damage prediction abilities. The initial concept is to deploy additional weather-monitoring stations throughout AmerenUE's service territory, providing a finer reporting granularity to better assess actual weather conditions. The ambition of this initiative is to enable predictive modeling of the potential system damage in the first hours of a major event.[26]

8.3.4 AmerenUE's practice of using a specific group to call in contractors is a leading industry practice.

Leading edge utilities will generally begin lining up additional resources in advance of a pending storm. As soon as there is a high probability that a storm will strike, utilities begin the process of acquiring resources. AmerenUE, in both of these storms, had little to no warning, but the AmerenUE process for this is well defined and worked extremely well.

In order to better manage and control external resources, AmerenUE has elected to accomplish this through its Energy Delivery Technical Service's Resource Management organization. The requirements for outside resource assistance are estimated by the EOC Director, the Resource Manager, and other managers. The Resource Manager's team then begins the process of lining up resources from various contracting companies. Another group calls in mutual aid (other utility companies) crews.

The EOC management determines in which affected areas to deploy the crews. As crews arrive they are immediately directed to the appropriate Division's

[25] KEMA Interview MK16
[26] KEMA Interview MK19

staging area for safety and operations orientation, followed by their initial assignment.

AmerenUE differs in the process at this point by assigning foreign crews to a dispatcher to guide and direct their work activities for the duration of the restoration. KEMA believes this to be a valuable industry leading practice. These AmerenUE resources are part of the Energy Delivery Technical Service's Resource Management organization and not the Divisions' resources. For the most part this process worked very well.

8.4 Recommendations

8.4.1 Continue with AmerenUE's plan to deploy additional weather recording site and develop improved forecasting of potential damage capability.

AmerenUE is in the process of obtaining additional weather sites for its Missouri territory. These additional sites, along with a better weather modeling tool, will help to predict damage and its severity. KEMA concurs with AmerenUE on the following four activities:

- Identify the number and location of additional weather stations to provide a more granular view of actual weather progression,
- Developing and testing a model that will reasonably predict the potential damage created by a weather event,
- Integrate the prediction model's results to AmerenUE's new storm categories for early triggering of storm classifications and potential restoration resource needs, and
- Provide a means for back casting actual versus predicted weather results for continual model refinements.

8.4.2 Continue with AmerenUE's practice for notifying, mobilizing, and managing foreign and mutual aid resources.

AmerenUE has honed its ability to obtain crews on short notice and provide field management when the foreign crews are deployed. KEMA believes that this continuum of obtaining and managing foreign crews is a leading practice and should be continued. An improvement is to provide better notification of when

the crews are to be arriving in the Divisions. During Level III and IV restoration efforts, the notification issue should pose less of a problem since the crews are assigned to working either a feeder or a set of feeders associated with a specific substation as opposed to working specific Outage tickets.

9. Emergency Restoration – Event Assessment

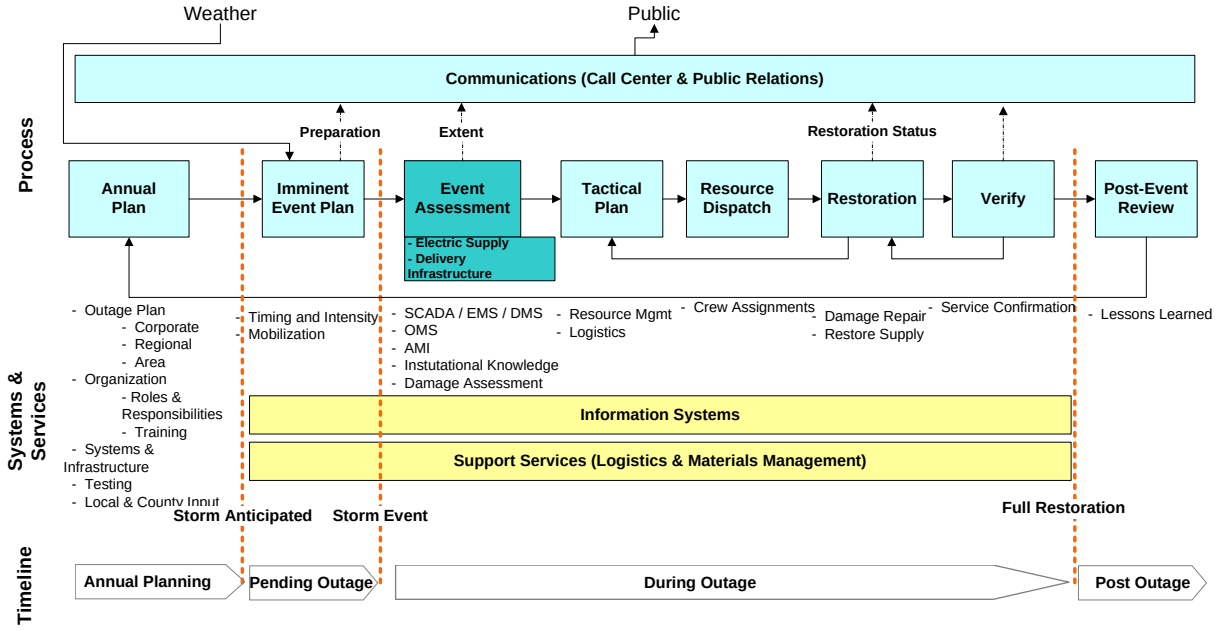

Exhibit 9-1: Outage Management Process – Event Assessment

9.1 Industry Practices

Quickly and accurately assessing damage from a major event varies widely throughout the industry. Those companies on the leading edge of this process are equipped with technology that enables earlier decision making on what areas need the most attention, in terms of on-site assessment and overall extent of damage. In all companies any technology used to facilitate this process is a tool to assist the early focus of the physical assessment. Technology deployed to field assessors permits building of a database containing the number of sites requiring repair, materials and labor estimates, and restoration estimates. In utilities employing outage management systems, the information from this technology will provide EOC management with a more robust and a more clear understanding of the level of damage. Throughout the industry however, this is largely a labor intensive process that requires smooth processes and focused responses in order to provide early information for effective decisions on resource allocation.

9.2 AmerenUE Practices

AmerenUE uses four primary business tools to assess the magnitude of the major event. They are:

- SCADA and EMS system observations at the Distribution Dispatch Office (DDO),
- OAS which logs all customer calls,
- Field damage assessments, and to a limited degree,
- CellNet's Automated Meter Reading information.

AmerenUE's Electric Emergency Restoration Plan (EERP) defines responsibilities for assessing field damage during major events. These responsibilities include:

- Conducting an initial high level damage assessment, and a
- Detailed field damage assessment.

High-level damage assessments are coordinated and dispatched at the divisional level. It is at the division's discretion as to when to conduct a high-level damage assessment prior to initiating detailed damage assessments.[27] Section 4.2 of the EERP provides a general description of a high-level damage assessment but lacks any real specificity. The KEMA team did not find any evidence that a high-level field damage assessment process was routinely conducted in areas that exhibited Level III damage. One rural region used helicopter patrols to conduct a quick assessment of the system damage. The rural nature of the terrain dictated the use of an aerial assessment. This aerial inspection approach is not practical in urban areas or areas where the foliage canopy obscures the visual inspection of the system.[28]

AmerenUE conducted detailed damage assessments in all affected regions according to the process outlined in Exhibit 9-2.[29]

[27] Electric Emergency Restoration Plan
[28] KEMA Interview RG, BS
[29] KEMA Interviews MK06, MK17

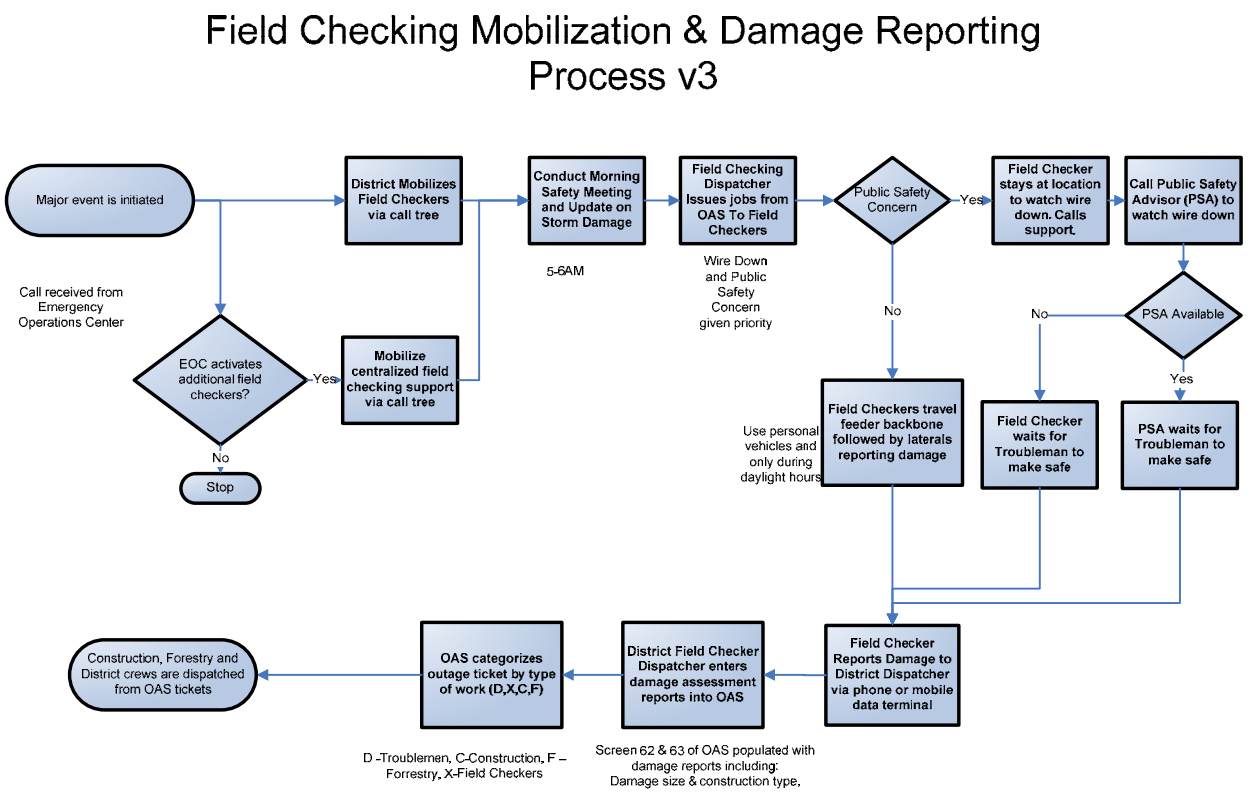

Exhibit 9-2: Field Damage Assessment Mobilization and Reporting

Mobilization of Division and supplemental field checking resources occurs through established call-out trees.

The field checker dispatcher prioritizes the OAS trouble tickets and dispatches field checkers to locations reported in the system. Field checkers use their personal vehicles to inspect system damage and generally conduct damage assessments according to the following priorities:

- Largest customer outage areas,
- Wire down reports, and
- Trouble tickets closest to the substation, followed by inspection of feeder laterals and finally secondaries.

Field checkers report system damage via cell phone to the field checking dispatcher, who in turn, enters the information into the OAS system. The information collected in the field includes:

- A description of the magnitude of damage (single pole down vs. multiple span),
- Front/back lot construction,
- Type of construction including pole height, cross-arm design, conductor type, and
- A tree on line.

Field checkers place the highest priority on public safety concerns, especially wire down reports. At a wire down location, Field checkers prevent the public from entering the hazardous area. The Field Checker will request an AmerenUE Public Safety Advisor (PSA), through the PSA Dispatcher, to relieve the Field Checker or until either a troubleman or Cut and Clear crew can confirm the area is de-energized.

The field checking process is active during daylight hours. Due to safety implications, AmerenUE does not conduct field checking during the night period.[30] The July windstorm event started in the early evening; field checking of system damage did not initiate until the following morning.

Field checking generally continued for the duration of the major event. Once all the major damage on feeder backbones and laterals is identified, field checkers will transition to assessing damage on secondaries and service connections. When field checkers assess damage on secondaries and service drops it is a routine practice to hang a door tag informing the customer of AmerenUE's responsibility for electric service restoration and the actions the customer should take to restore cable or phone service, or to repair customer owned electric facilities such as weather heads. See Exhibit 9-3 for examples of door tags.[31]

[30] KEMA Interviews MK03, MK06, MK17
[31] KEMA Interview MK05

Exhibit 9-3: Door Tag Hangers

9.3 Conclusions

9.3.1 The EOC appropriately uses the SCADA and EMS systems as the primary tool to determine the initial scope and magnitude of the event.

It is common practice in the industry to have a SCADA system installed. The SCADA, abbreviation for Supervisory Control and Data Acquisition, is a system that allows the remote monitoring and control of key electrical equipment at substation locations throughout the system. SCADA systems, initially installed in transmission substation facilities, have been installed in many distribution substations providing indication and control of distribution substation equipment in the past 30 years. SCADA applications at the distribution level generally will only indicate that a feeder is energized or de-energized and generally does not provide any insight as to the state of the feeder outside the substation fence.

DDO through SCADA receives the first indication of the magnitude of a major event. AmerenUE SCADA system is robustly deployed with most distribution substations in the St. Louis metro area providing indication of the system power flows. In rural areas, the SCADA system is less extensive. In these areas, there is limited indication of system power flows and remote switching of feeders. As feeders trip off-line, SCADA registers these events in seconds and displays the

results in OAS. In more remote areas where SCADA does not provide an indication of distribution feeder status, AmerenUE relies on customer calls to determine the loss of service. During the July, December, and January events, the DDO received the first report of the extent of disruption to the power grid from the SCADA system.[32] This initial SCADA information is the primary source of information for the EOC in determining the extent and magnitude of the system disruption at the onset of the event.

9.3.2 AmerenUE's technology and processes for event assessments perform well to estimate restoration times for Level I and II events, but do not scale well for Level III events.

A common occurrence found by KEMA is the inability of emergency restoration plans and technology to scale effectively to address severe restoration efforts, unless the utility has had experience with extreme weather, similar to what Southeastern utilities experience with Hurricanes.

9.3.2.1 AmerenUE does not perform a formalized high-level statistical damage assessment process to estimate initial storm damage during Level III events. Instead, AmerenUE relies on its institutional knowledge of historical Level I and II events to make an intuitive decision to mobilize contract and mutual aid resources.

Leading industry practice during Level III events is to conduct a high-level assessment during the first six to eight hours after the initiation of the event. Leading utilities conduct an initial statistical assessment of the affected areas. The assessment process begins by driving the damaged system starting at the Substation (feeder header) and following the feeder along its path. This statistical assessment is designed to provide rough counts of downed lines, broken poles, and downed trees to the EOC. There is no attempt by damage assessors assigned to this statistical assessment to capture details of any single event; that is done later. This statistical assessment is critical information for the EOC to determine resource requirements and is needed to estimate the duration of the restoration effort.[33]

KEMA's interviews revealed that during Level III events there is no formal statistical damage assessment process for assessing high level

[32] KEMA Interview MK16
[33] KEMA Interview MK14

system damage, estimating area wide restoration times, and consequently, crew requirements during the first six hours of the restoration effort.

AmerenUE does not have a formal model to predict the order-of-magnitude of expected system damage associated with impending weather conditions. Additionally, KEMA could not identify a formalized process for early estimation of restoration times. Consequently, the EOC relies on its experience gained from historical events and real-time SCADA and EMS information to make an initial estimate of the events magnitude. Management has not experienced storms of these magnitudes in the past and as such relied on their experiences of Level I and II events to make the call that more resources would be required than ever before to effectively deal with them. It is not until damage assessment reports are received from the field that AmerenUE was able to compile a comprehensive assessment of the extent of system damage and make an educated estimate of restoration times.[34] This process took up to a week to complete in some of the hardest hit areas.

Without the aid of an initial high-level statistical estimate of system damage, it is difficult for management to accurately quantify resource requirements other than taking the position of "obtaining every possible resource that is available." This can hamper the ability of Corporate Communications to provide the public with early order of magnitude assessment of the storm. AmerenUE's senior management had set a blanket target of 72 hours for the restoration of outage events. Without the input from a high-level damage assessment process AmerenUE could only ascertain from the number of customers out, the number of devices predicted out by the Outage Analysis System, and the number of feeders locked out by SCADA that the July events would require significantly more restoration time.[35] However, AmerenUE did much better projecting the December storm restoration time. The implications of this inability are reviewed in Section 13.3 of this report.

[34] KEMA Interview MK16, Ameren Electric Emergency Restoration Plan
[35] KEMA Interviews RG01, MK19

The EOC management would like to see the adoption of 24-hour coverage for a high-level statistical field damage assessment during the early hours of a major event to improve AmerenUE's ability to determine the level of the restoration resources that need to be mobilized.[36]

9.3.2.2 AmerenUE's detailed damage assessment process is effective at identifying system damage, which scaled well during the Level III events, but lacked consistency in the specificity needed for restoration crew dispatchers to efficiently deploy crews.

Damage assessment is critical to any storm restoration program. The purpose of damage assessment is to provide management with a clear picture of the level of damage to the T&D assets. This information has two primary objectives:

- Provide a detailed analysis of what needs to be repaired at each site, and
- Provide a prioritized pipeline of detailed work orders keeping restoration crews engaged from the outset of the major event.

Estimation of crew resources implicitly suggests an estimate of restoration time but, during Level III outages, no documentation or confirmation of that restoration estimate is made until crews are on site.[37] Additionally, the OAS system logic for estimating restoration is not designed to handle the volume of extensive damage experienced during Level III events.

Since 2005, AmerenUE has trained a significant number of additional field checking and public safety advisor resources to supplement the divisional field checking resources.[38] Currently there are approximately 200 trained field checkers and public safety advisors. The supplemental field checking work force comes from centralized engineering functions, while the public safety advisors are drawn mostly from administrative staff ranks. The role of the public safety advisor is to secure wires down sites until crews can make the area safe or effect repairs.

[36] KEMA Interview MK19
[37] KEMA Interview MK19
[38] KEMA Interview MK14, Field Checker Training Syllabus & Video

AmerenUE provides daylong training for this supplemental staff in the following areas:[39]

- Field Checker training,
- Public Safety Advisor training, and
- OAS refresher training.

The syllabus is comprehensive and covers the following topics:

- A review of field checking / Public Safety Advisor roles and responsibilities,
- Overview of the electric system configuration and protective devices,
- Safety issues covering safe field checking practices, minimum approach distances, and other safety topics, and
- A testing component to ensure adequate knowledge transfer.

However, a lack of formalized procedures and standardized checklists across the AmerenUE service territory introduced inconsistencies into the reporting of system damage. The primary purpose of field damage assessments is to ensure that restoration crews are dispatched efficiently and effectively with appropriate material and equipment complements. Restoration crew dispatchers are handicapped by the lack of specificity in damage assessment information entered into the OAS system reducing the efficiency of the restoration effort.[40]

Exhibit 9-4 shows an example of AmerenUE's distribution system in Clayton highlighting a back-lot system design prevalent in this area.

[39] Syllabus documents for Field Checker Training & Video, Public Safety Advisor Training
[40] KEMA Interview MK08

Exhibit 9-4: Example of Back-lot System Design

A lack of specific information from the field damage assessment could potentially lead to restoration resources arriving on site without the appropriate equipment to be able to access the system and effect repairs.

To assist in streamlining the field checking process, AmerenUE has issued mobile data terminals to supplemental field checkers.[41] These hardened laptops provide field connectivity to AmerenUE's OAS permitting direct field entry of damage assessments into the system. AmerenUE will continue to provide backup using other forms of communication in the event of cell tower outages. KEMA believes this is a distinct advantage and a leading practice as it shortens the time for damage data analysis.

9.3.3 Restoration crews provide direct feedback of an estimated repair time, however, this completion time may not be the same as a restoration time during large-scale events.

When an assigned crew reaches the work site, they perform a quick analysis of what must be repaired and the time needed to complete the repairs. This

[41] KEMA Interview MK01, MK17

information is radioed back to the construction dispatcher in order to refine the OAS estimate of restoration time. However, during Level III events the estimated restoration times provided by the OAS is not as useful in determining a restoration of service time during major events as there may be additional system damage both up and down stream side of the feeder preventing restoration of service.

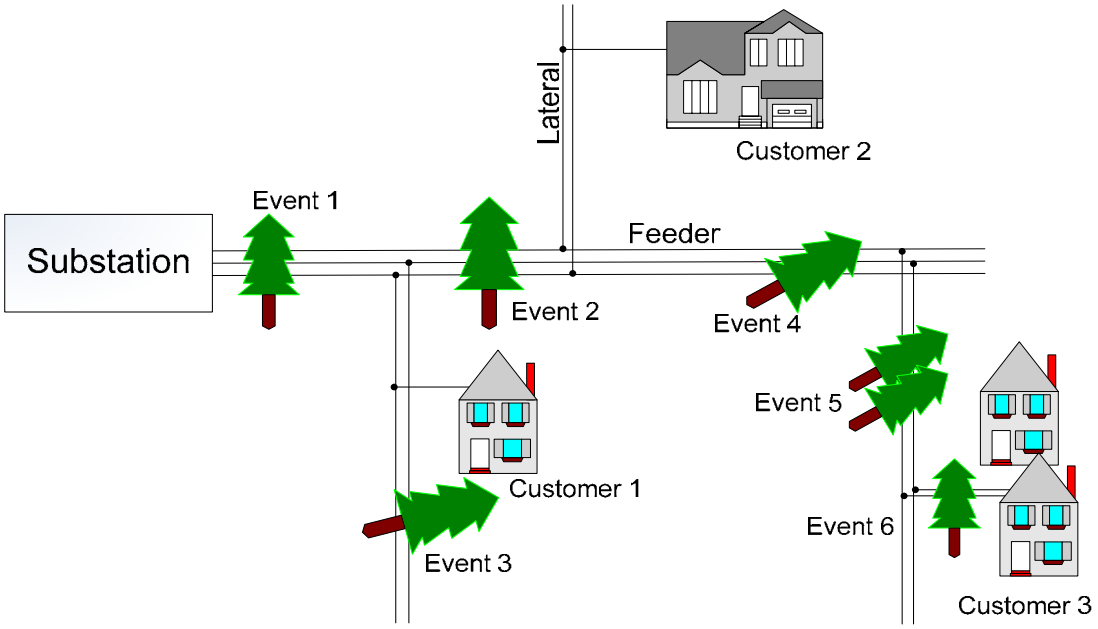

Exhibit 9-5: Outage Event Example

Exhibit 9-5 shows KEMA's reasoning for not equating restoration time with repair time. In this diagram, six emergency events (indicated by tree symbols) are identified on the feeder, its laterals, and services. Customer 1 may be associated with Event 1 in the OAS. When Event 1 is repaired, Customer 1 is returned to service. In this case, restoration time equates to repair given by the crew. Customer 2 may also be associated with Event 1, but because of a second feeder event, the restoration time would be the total time needed to repair for Events 1 and 2. The restoration time for Customer 3 will be the total time needed to repair events 1, 2, 4, 5 and 6. Compounding Customer 3's time is that its repairs cross from the feeder to the lateral and then the service; this means the actual repair time will be far greater than the simple sum previously stated. Repairs are done to Feeder (Event 1, 2 and 4), then the laterals (Event 5) and finally, the secondaries (Event 6).

9.3.4 AmerenUE's adoption of a Public Safety Advisor position is a leading practice.

The PSA is a unique position to AmerenUE and a new leading practice. The role of this individual is to safeguard the public once a downed electric power line is identified. This frees the Field checkers to continue their damage reporting which drives the creation of work assignments in OAS.

In addition to the PSA AmerenUE has assigned Cut and Clear crews to the PSAs and the PSA Dispatcher. The Cut and Clear crews are responsible for cutting any downed power wire that could be a hazard. This relieves the PSA, police officer or firemen from having to guard a hazardous wire down situation for long periods of time. The Cut and Clear crews are outlining troublemen who are assigned to cover this critical safety work. Local troublemen are not used for this, as they are performing switching and other high order restoration line work.

9.4 Recommendations

9.4.1 Develop, design, and implement an initial damage assessment methodology to be conducted during the first six hours of the event that provides the proper determination of the storm classification, estimated required restoration resources, and initial restoration time estimates appropriate for public communication.

The leading practice in the industry is to implement an initial damage assessment to gain a reasonable understanding of the level of damage to the system immediately after the storm subsides. This assessment needs to be completed quickly so foreign crews (both contractor and utility crews) can be called in as soon as possible. KEMA suggests that feeder lockouts be the first indicator of severity and should be used to determine where the initial damage assessment should be conducted.

The required tasks include:

- Conceptualize the initial damage assessment process,
- Define the available inputs and required information outputs for the initial assessment,

- Define the work processes, roles and responsibilities, information flows, and methodologies to predict:
  - Proper classification of the storm event,
  - Macro estimate of resource requirements, and
  - Initial estimates of restoration time.
- Back cast the assessment algorithm to ensure reasonable accuracy and continued refinement,
- Develop work aids, tools, etc.,
- Integrate the initial damage assessment into existing processes, and
- Provide training to appropriate personnel.

9.4.2 Expand the use of the leading practice of using Public Safety Advisors (PSA) and Cut and Clear crews permitting Field checkers to focus on damage assessment while simultaneously ensuring the public is safeguarded from electric.

KEMA believes that AmerenUE could increase the number of trained PSAs to support the potential safety hazards. This would involve identifying new candidates and providing the required training. Depending on the extent of damage, AmerenUE may elect to create additional Cut and Clear crews to support the PSAs.

10. Emergency Restoration – Execution

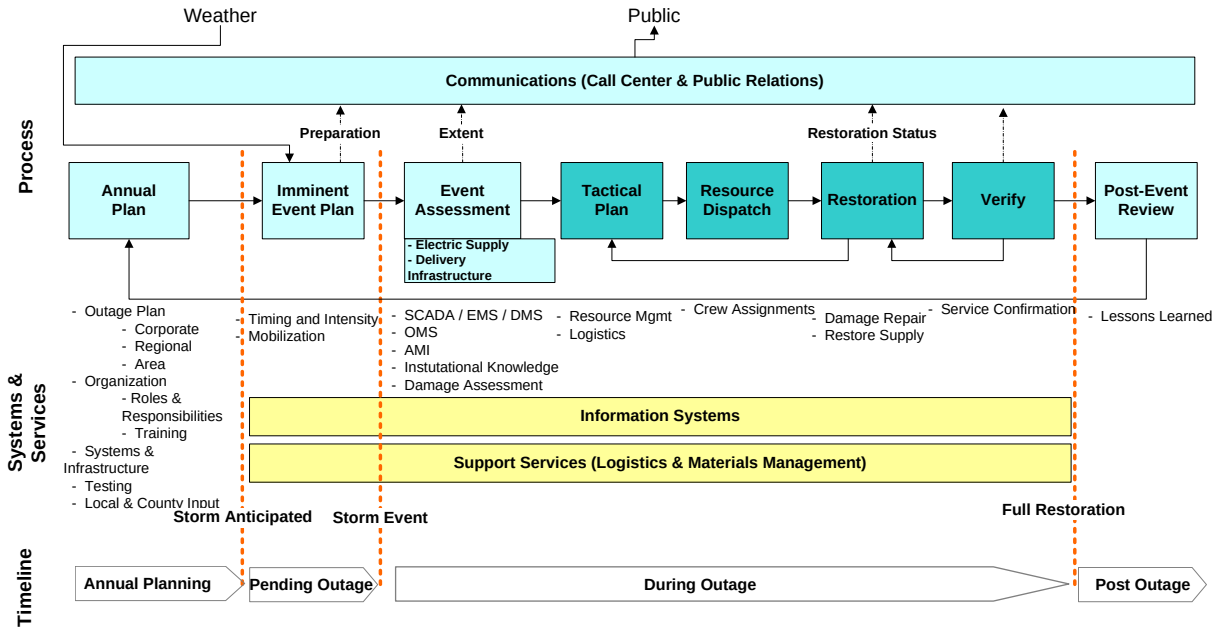

Exhibit 10-1: Outage Management Process - Execution

10.1 Industry Practices

Reliable utility services (electric, gas and water) are essential to maintain our standard of living and provide the infrastructure for our advanced economy. Utility employees recognize their "public service" role and generally exhibit a strong sense of duty, timeliness, compassion, and teamwork, which supports reliability. These attributes form the "utility culture". Consistently, the utility industry has seen increased levels of performance from its employees during the most adverse times and situations, such as outage events.

In addition to strong employee dedication to the "public service" role, effective execution of major event restoration requires the ability to quickly mobilize large numbers of resources, efficiently dispatch resources, and manage material disbursements and provide logistical support for the army of individuals involved in the restoration effort.

Industry leading practices include the ability to quickly re-assign employees from day-to-day responsibilities into a major event mode, have employees well rehearsed in their

storm restoration roles, and efficiently choreograph restoration activities under challenging conditions.

10.2 AmerenUE Practices

AmerenUE employees exhibited a strong public service attitude in the execution of storm restoration duties. Even though the July windstorm event was the largest major event in the company's history and was followed by December and January Level III ice storms, employees went "above and beyond" in supporting the restoration efforts.

AmerenUE quickly accessed and mobilized in-house, contract and mutual aid resources.

Even though there were limited storm drills conducted in the last 18 months, AmerenUE efficiently re-assigned day-to-day employee responsibilities to support the storm restoration effort.

10.3 Conclusions

10.3.1 AmerenUE employees consistently demonstrated tremendous dedication and regularly went 'above-and-beyond' during the restoration efforts even after working three major events within six months.

The examples of many employees working well above expectations during the restoration are too numerous to catalog within this report. In fact, AmerenUE had the support of over 200 employee volunteers with logistics during the restoration effort and over 4,000 employees were either directly or indirectly involved.[42] During KEMA's review process, there was never any suggestion that AmerenUE employees lacked dedication to the restoration effort.

RESOURCE MANAGEMENT

10.3.2 The EOC's twice-daily conference calls were valued, facilitated a clear understanding of the restoration work, aided the movement of crews, yet did not support concise reporting of outage statistics for the purpose of external communications.

The leading industry practice is to have a central communications exercise multiple times a day to update all internal parties on the restoration effort.

[42] KEMA Interview MK12

Further, it allows storm managers to adjust crew numbers in the field to affect a uniform recovery effort.

During these exercises it is critical to ensure the right information is being presented.

10.3.2.1 The EOC effectively coordinated the macro level deployment of resources fulfilling its strategy of equalizing the restoration effort across the affected divisions.

The leading practice by utilities faced with this level of restoration is to bring the system backbone and laterals back as quickly and uniformly as possible across their system. This returns the greatest number of customers to full service quickly while ensuring that no one area is favored over another for restoration.

AmerenUE's Emergency Operations Center (EOC) followed this leading practice by coordinating the macro level assignments of resources to the affected divisional areas. The EOC's resource deployment strategy operated under the guiding principles of:

- Restore the last customers' service at the same time, and
- Minimize the geographic movement of the restoration crews to reduce non-productive travel (Windshield) time.

During the restoration effort, the EOC staff was able to effectively support divisional resources special requests for logistical support. As just one of numerous examples, the EOC tackled a special request for a divisional request for a boat.[43]

The EOC focused exclusively on working the storm restoration effort and was not sidetracked with requests to restore high profile customers.[44]

The EOC minimized the impact on restoration productivity by re-assigning restoration resources at the end of the working day.[45]

[43] KEMA Interview MK19
[44] KEMA Interview HS13
[45] KEMA Interview MK19

10.3.2.2 The EOC's reporting of restoration magnitude and progress lacked rigor in providing a dashboard of outage statistics and assigned restoration resources limiting the ability to create status reports for internal and external stakeholders.

All interviewees valued the EOC's twice-daily conference calls. These calls facilitated the communication and macro level coordination of the current restoration status, supported tactical divisional needs, system wide damage assessment reporting and resource allocation. In addition, OAS provides a number of useful screens that provide much of the relevant information.

However, feedback to KEMA indicated that the July storms internal restoration message emanating from the EOC lacked consistency especially during the late stages of the restoration effort. No minutes or notes of the meetings were taken. Inquiries of the EOC from Corporate Communications, and the media as to the expected restoration time, were not readily forthcoming.[46] AmerenUE did improve during the December storm restoration.

A leading practice observed by KEMA in this area is for the EOC to prepare a short but consistent storm restoration report. This enhanced dashboard report would include customer outage statistics and the level of assigned in-house, contract, and mutual aid restoration resources and any known estimated restoration times by geographic area. This information is in bold type and is accompanied by a conspicuous date and time stamp for reporting to outside entities. Utilities adopting this practice will issue the dashboard approximately twice a day at fixed times and is the de-facto overview information needed for updating internal resources as well as for crafting media and public communication messages.

[46] KEMA Interview MK12, MK05