Report on

The Empire District Electric Company

Final Report of Storm Preparation and Restoration Effort

Case No. EO-2008-0215

Missouri Public Service Commission Staff

June 17, 2008

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Executive Summary

This report has been prepared in response to the Missouri Public Service Commission's (Commission) Order in Case No. EO-2008-0215, In the Matter of an Investigation of The Empire District Electric Company's Storm Preparation and Restoration Efforts. The Order directed the Staff of the Missouri Public Service Commission (Staff) to investigate the effectiveness of The Empire District Electric Company's (Company, Empire, or EDE) storm preparation and power restoration efforts regarding the ice storms Empire experienced in December 2007. All four investor-owned electric utilities were affected by December 2007 storms, including rural electric cooperatives and municipal electrical systems. Missouri's State Emergency Management Center (SEMA) was activated from December 9, 2007 through December 18, 2007.

Approximately 65,000 Empire customers lost power for some period of time during the storms, but the greatest impact occurred in and around Joplin, which has some of the greatest population densities for Empire's service territory. For comparison purposes, the January 2007 winter ice storm experienced in the Empire service territory affected approximately 85,000 customers. Empire's Web site states that it currently has 166,483 electric customers in four states, and the Commission's 2007 Annual Report shows that Empire had 144,045 Missouri customers.

Empire performed various tasks in preparation for the storm and by 10:00 a.m. on Sunday, December 9, 2007, all of the on-system contract crews had been activated and throughout the storm and outage utilized the resources of approximately 1,800 FTE (Full-Time Equivalent) personnel, including both internal and external utility resources. External personnel came from at least 8 different states.

Attachment A to this report is the Staff's January 8, 2008 letter to the Company, which addresses the Commission's orders in all four storm cases and requests Empire to provide specific information. The Staff held several meetings with various Empire personnel, held multiple conference calls with Empire and also held discussions with various city and county officials to review the utility's storm response from the perspective of various governmental bodies. One hundred-five (105) public comments that are in the Commission's electronic filing and information system (EFIS) for Case No. EO-2008-0215 were also reviewed by the Staff. A chart is included in this report that summarizes the types of matters addressed by the comments.

Commissioner Robert M. Clayton III submitted a concurring opinion in Case No. EO-2008-0215 to the order that initiated this report, which included a section titled "Need for an Investigation". Commissioner Clayton requested that Staff include responses to address a number of specific issues. The Company's response to each of those issues is included as an Attachment B to this report.

Weather Conditions and Severity of Storm

Due to the extent of damage and outages resulting from the December 2007 ice storms striking Missouri, Staff communicated with Dr. Patrick Guinan, Missouri State Climatologist, and researched National Oceanic and Atmospheric Association (NOAA)/National Weather Service (NWS) internet sites to gauge the December 2007 storms in a historical context.

Dr. Guinan, in the January 2008 issue of the Missouri Ruralist, stated:

> Several weeks ago Missouri experienced its second major ice storm in less than a year with a large part of the state cocooned in ice. The storm reached historical proportions over parts of northwestern Missouri, where some communities in Buchanan, Andrew, Holt, Atchison and Nodaway counties reported ice as thick as 1-inch on trees, power lines, vehicles and just about everything that was exposed to the elements.
>
> Winter storms that deposit a glaze of 0.75 to 1-inch of ice are rare and have about a 1 in 50 year recurrence interval for any given location in Missouri. Historical accounts of major ice storms of this magnitude in Missouri indicate the rarity of these events.

According to archived storm reports from the National Climatic Data Center, National Weather Service reports, and various press clippings, only a handful of storms of this magnitude have impacted Missouri.

During December 2007, Missouri faced three distinct storm events, striking separate areas of Missouri. Dr. Guinan's report helps place the storms in a historical perspective. A NOAA Technical Report, published in 2002, entitled "The Development of a U.S. Climatology of Extreme Ice Loads" confirms that a 1-inch accumulation is on average a once in 50-year occurrence for most of Missouri. Listed below is a summary of the weather conditions and the areas affected during the course of these storms (data was collected from NOAA's NWS website.

- December 8-10, 2007 storm – Storm impacted Missouri Ozarks, with ice accumulations across Joplin, Missouri; Accumulations of 1/4 to 1/2 inch with locally higher amounts. Nearly three quarters of an inch fell along the Interstate 44 corridor.

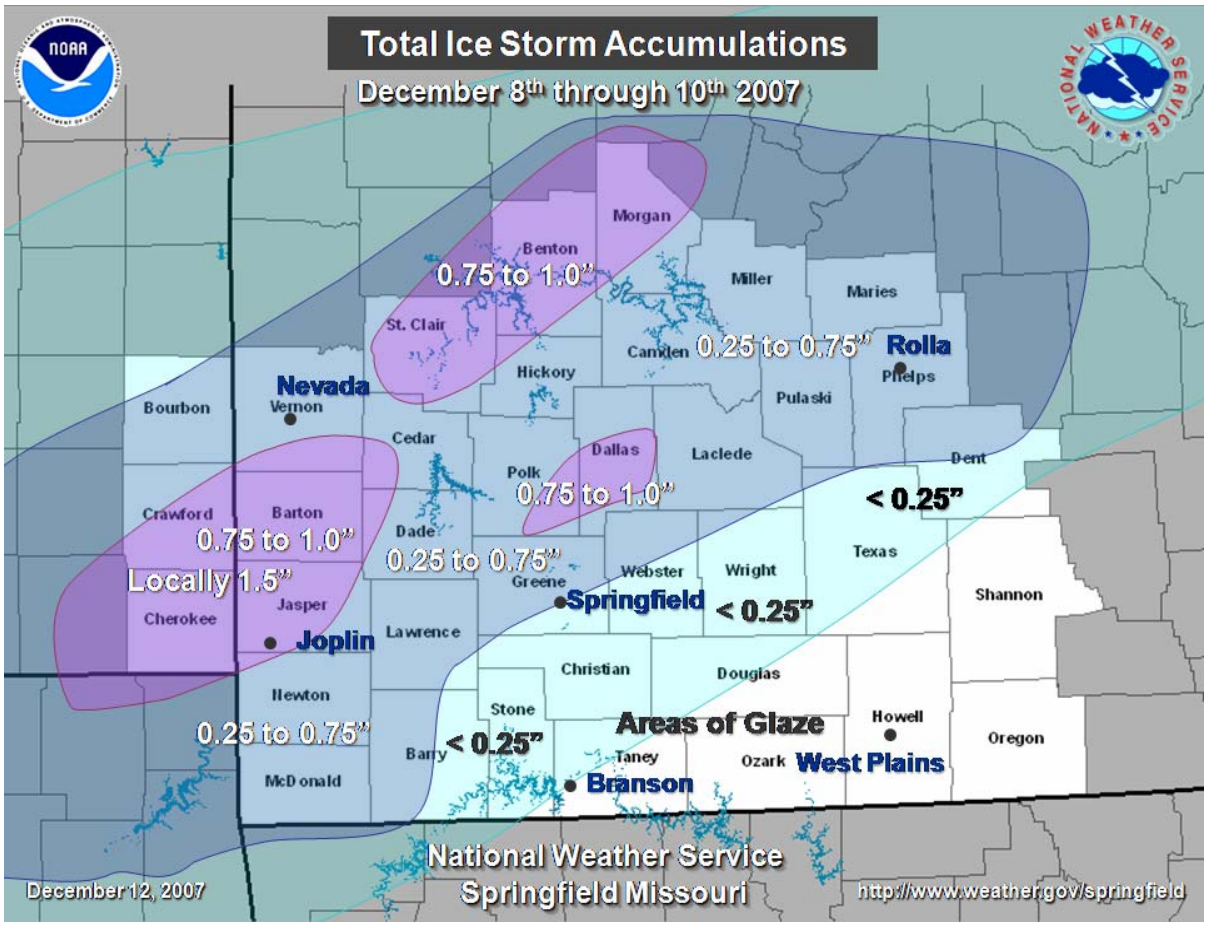
- December 8-12, 2007 storm – Conditions started building by later afternoon Saturday, December 8, 2007. Thunderstorms with freezing rain and sleet formed after midnight Saturday night. Areas affected were parts of Central and Northeast Missouri where thunderstorms produced up to 2 inches of sleet. The hardest hit portions of the area were the Jefferson City/Central Missouri area, and an area from Western Warren County, across Lincoln County to Pike County.

- December 10-11, 2007 storm - Precipitation rates increased quickly Monday evening, December 10, 2007, with ice rapidly accumulating on many surfaces, especially trees and power lines. Precipitation began to wind down in the evening of Tuesday, December 11, 2007. Conditions improved by Wednesday, December 12, 2007, as roads were treated and the thin sheet of ice dried off. Areas affected were along and north of the Missouri river extending into adjacent northeast Kansas. Ice accumulations of 3/4 inch were common, with isolated accumulations around 1 inch generally north of a line from Atchison, Kansas through Trenton, Missouri to Unionville, Missouri. Further south, temperatures warmed during the overnight, and by dawn hovered between 32 and 34 degrees. As a result, ice accumulations between ¼ inch and ½ inch were noted along the Interstate 70 corridor, with lesser amounts further south.

Maps and additional explanation from the National Weather Service are presented later in this report. These areas of severe ice correlate with the counties shown in the FEMA Disaster Declaration FEMA map, also presented subsequently in this report.

Historically, the data demonstrates that parts of Missouri have been affected by ice storms of varying magnitude every few years. However, the year 2007 was unusual in that Missouri was struck with two ice storms in back-to-back winters (January 12-14, 2007 and December 8-11, 2007). The more widespread December storm met the theoretical criteria for a once-in-50-year occurrence at numerous locations throughout the state. Attachment C to this report describes the historic ice storms that have impacted Missouri over the last century and a half (from "December 1848- December 2007), based on an ice thickness of at least 1/2 inch. The occurrence has not been ranked in terms of severity of damage or duration, but a few that have been categorized as being severe were in December 1924, December 1987 and January 12-14, 2007.

National Weather Service Report on December 2007 Ice Storms



Ice Storm Event Summary December 8 through 10, 2007

The second major ice storm of the year impacted much of the Missouri Ozarks and southeast Kansas from Saturday, December 8 to Monday, December 10, 2007.

Damaging ice accumulations of ¾ inch of an inch to 1 1/2 inches occurred from the Joplin, Missouri and Pittsburg, Kansas areas northeast to the Osceola and Versailles areas. These accumulations downed numerous trees, tree branches and power lines resulting in widespread power outages.

Lesser accumulations of 1/4 to 1/2 of an inch, with locally higher amounts near 3/4 inch, fell along the Interstate 44 corridor. This resulted in downed tree branches and scattered power outages.

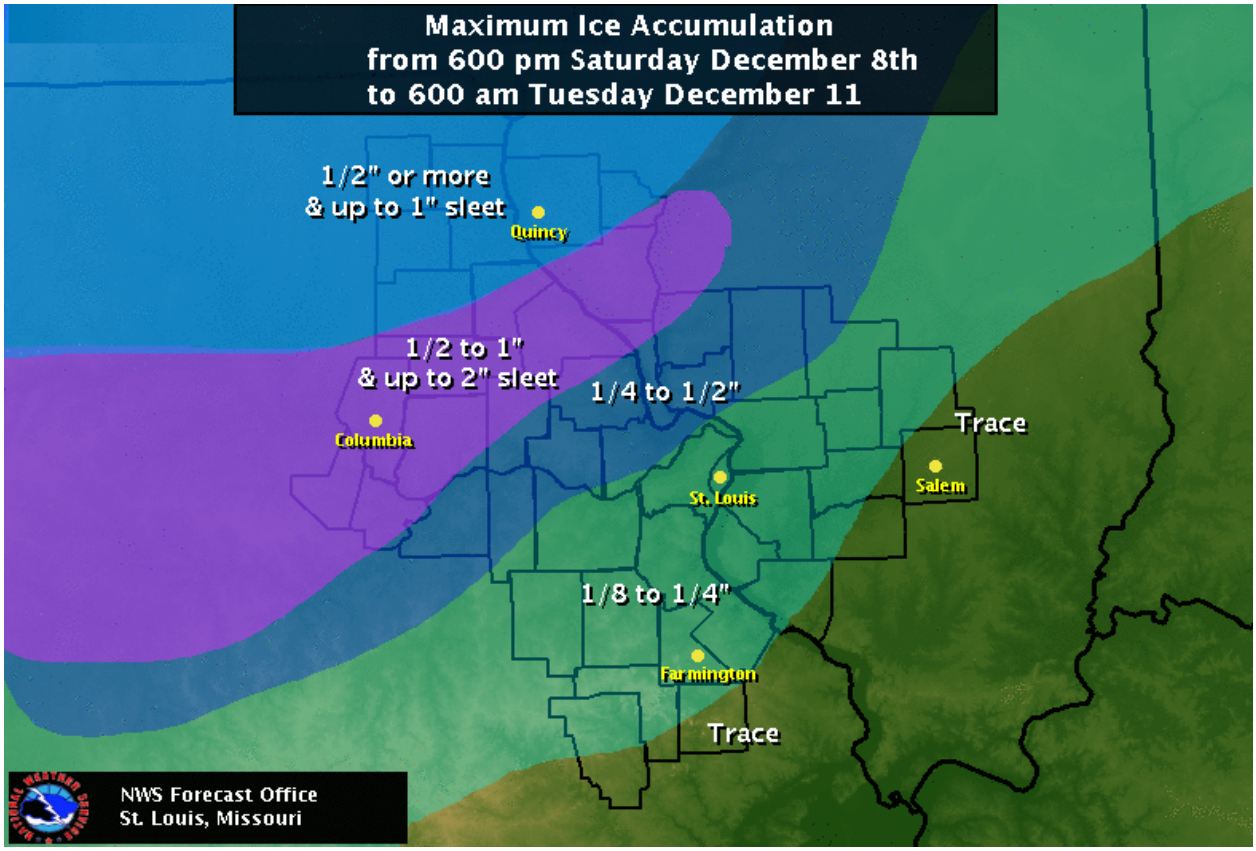
The table below provides ice accumulations for the December 8 through December 10 storm. Empire serves customers in all or part of the italicized counties.

Ice Storm Accumulation County Summary

County	Ice Accumulation
Kansas:	
Bourbon	0.25 to .050
Crawford	0.50 to 1.50
Cherokee	0.75 to 1.50
Missouri:	
Vernon	0.50 to 1.00
Barton	0.75 to 1.50
Jasper	0.75 to 1.50
Newton	0.25 to 0.75
McDonald	0.25 to 0.50
St. Clair	0.50 to 1.00
Cedar	0.50 to 1.00
Dade	0.25 to 0.75
Lawrence	0.25 to 0.50
Barry	0.10 to 0.50
Stone	0.10 to 0.25
Christian	0.10 to 0.25
Greene	0.25 to 0.75
Polk	0.25 to 0.75
Hickory	0.50 to 1.00
Benton	0.50 to 1.00
Morgan	0.75 to 1.00
Camden	0.25 to 0.75
Dallas	0.50 to 1.00
Webster	0.10 to 0.50
Taney	0.10 or less
Maries	0.25 to 0.75
Laclede	0.25 to 0.75
Wright	0.10 to 0.25
Douglas	0.10 to 0.25
Texas	0.10 to 0.25
Pulaski	0.25 to 0.75
Phelps	0.25 to 0.75
Dent	0.25 to 0.50
Shannon	0.10 or less

The December 8 - 12, 2007 Ice Storm

Ice and sleet accumulation map from around the area:



(Analysis by Fred Glass, Senior Forecaster WFO St. Louis)

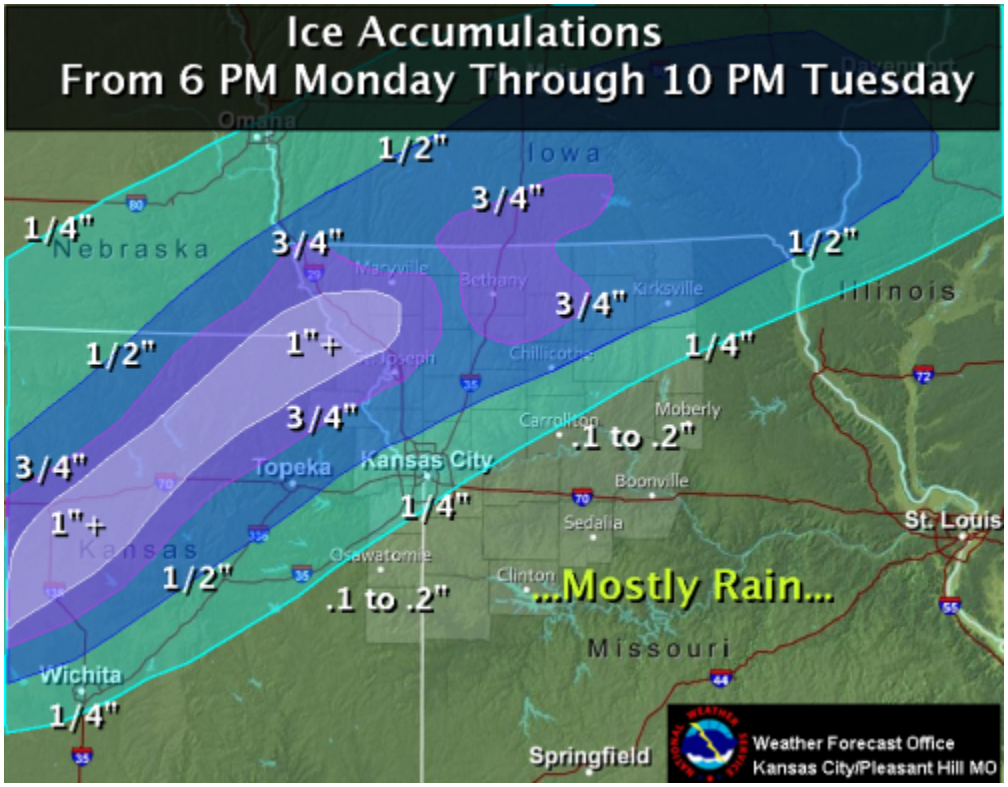
Discussion:

On Saturday, December 8, 2007, a strong, cold high pressure system moved from Canada into the Great Plains. This high pressure system brought some very cold air streaming into the Midwest and Great Plains regions. At 2:00 p.m. on Saturday December 8, 2007, temperatures ranged from the mid-30s in Southeast Missouri to the upper teens in Northeast Missouri. As this cold air was settling in across the Bi-State region, a low pressure system developed over the southern plains which drew copious amounts of Gulf moisture up and over the cold air which was locked in at the surface. Sub-freezing

temperatures across the northern 2/3 of the Bi-State Region combined with this overrunning warm and moist air provided the perfect setup for freezing rain.

Between Saturday evening and Tuesday morning, several waves of precipitation affected Missouri and Illinois, bringing up to an inch of freezing rain accumulation, as well as up to two inches of sleet in parts of Central and Northeast Missouri, which fell after midnight on Sunday morning.

December 10 - 11, 2007 Ice Storm



A slow moving storm system brought a long duration of freezing rain to a large portion of the nation's mid-section. After several rounds of minor snow and ice accumulations over the previous week, a major storm system produced one final blow, capping the region with significant ice accumulations. The event began early Monday evening and continued into the early evening hours on Tuesday. Very warm and moist air aloft was brought in ahead of a large storm system moving slowly out of the southwest United States. At the surface, Canadian high pressure which had been in firm control over much of the past week, helped keep temperatures near ground level in the upper 20s to

lower 30s. With surface temperatures at or below freezing, combined with a warm layer of air just above the surface, the precipitation fell in the form of freezing rain.

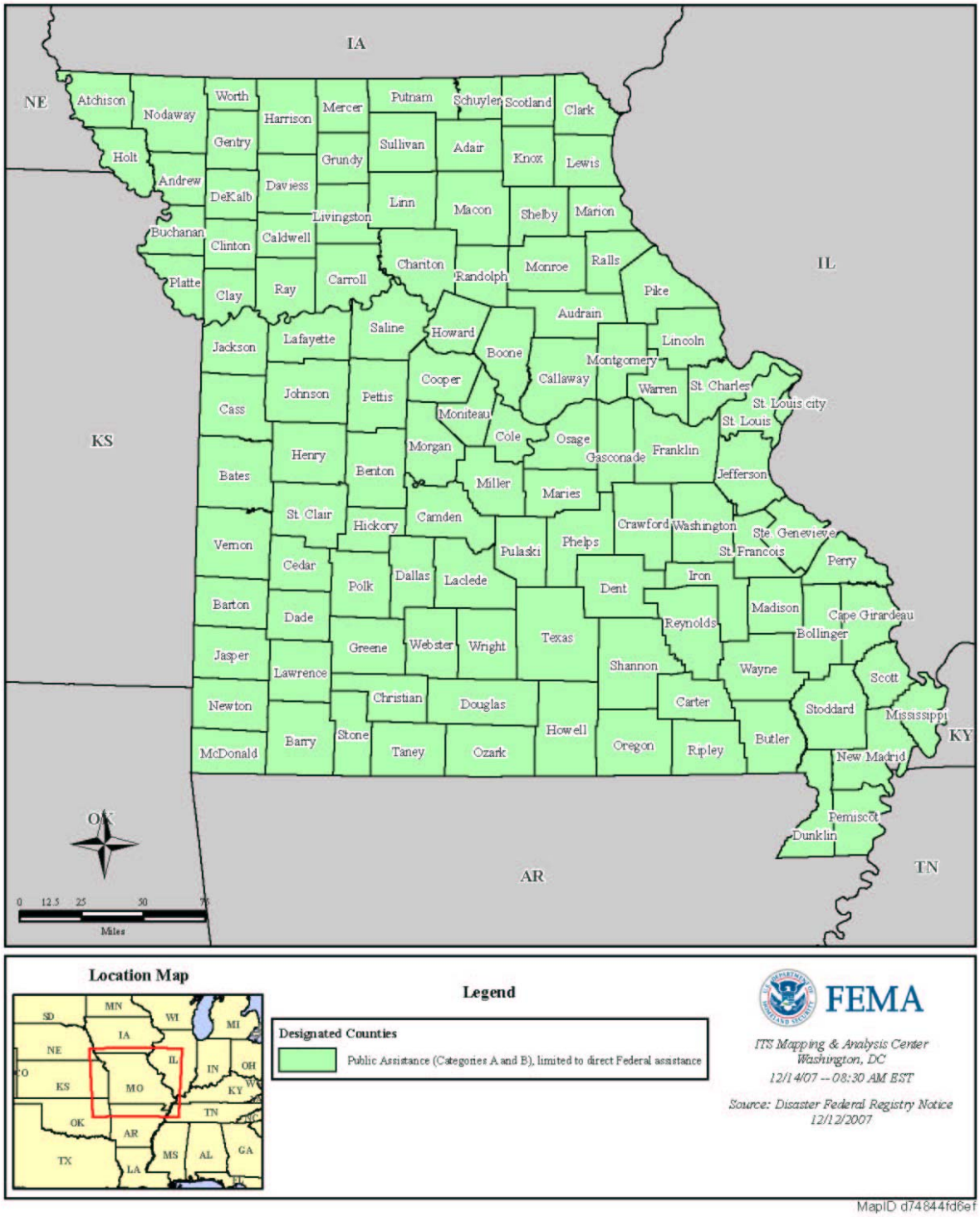
As precipitation rates increased quickly Monday evening, ice rapidly accumulated on many surfaces, especially trees and power lines. Locally, ice accumulation was particularly devastating along and north of the Missouri river, extending into adjacent northeast Kansas. Ice accumulations of 3/4 inch were common, with isolated accumulations around 1 inch generally north of a line from Atchison, Kansas through Trenton, Missouri to Unionville, Missouri. Further south, temperatures warmed during the overnight, and by dawn hovered between 32 and 34 degrees. As a result, ice accumulations between 1/4 inch and 1/2 inch were noted along the Interstate 70 corridor, with lesser amounts further south.

Area electricity providers are reporting widespread power outages across portions of eastern Kansas and northwest Missouri. The most hard-hit areas extended from near Manhattan, Kansas through St Joseph, Missouri, and into southwest Iowa, where estimates are that nearly 75% of customers remain without power. Specifically, in communities along and north of US Highway 36, and west of Interstate 35, numerous fallen larger tree branches and downed power lines were reported. As of 5 p.m. Tuesday, December 11, providers are estimating that over 165,000 Missouri residents were without electricity.

Precipitation began to wind down Tuesday evening. However, additional power outages and damage were caused as north winds of 15 to 20 mph buffeted northern Missouri through the late evening. As temperatures fell quickly back through the 20s, wet roadways quickly refroze, resulting in widespread black ice. Several multiple vehicle accidents were reported during the evening hours Monday along major interstate routes as travelers suddenly found wet roadways had turned to a thin sheet of ice. Conditions had largely improved by Wednesday morning as roads were treated and dried out.

While this storm did not affect any of Empire's customers, it did impact the resources available for Empire's use.

FEMA-3281-EM, Missouri
Emergency Declaration as of 12/12/2007



Storm Restoration Planning Process / Company Response

Staff has reviewed Empire's response to the December 2007 ice storm (December storm), including Empire's recognition of the severity of the storm and the outside help that was requested. This section will discuss Empire's planning that took place before the storm, Empire's participation in mutual assistance agreements and Empire's outside crew requests. Issues that arose during the Company's restoration operation will be discussed and the effectiveness of requests for outside assistance will be reviewed. A quick reference chart of the timeline of storm events and the Company's responses to those events is included as Attachment D.

The winter storm that affected Empire's service area started impacting customer service on Sunday, December 9, 2007. The storms affecting Empire's service territory ended by mid-day on Wednesday, December 12, 2007. Approximately 65,000 Empire customers were affected. For comparison purposes, the January 2007 winter ice storm experienced in the Empire service territory affected approximately 85,000 customers. All Missouri customers that could take service were restored by Wednesday, December 19.

Days before any ice accumulated, on Tuesday December 4, 2007, Empire began reviewing its readiness for the forecasted ice storm; it held a meeting to review its Power Outage Recovery Plan (PLAN); and reviewed line personnel availability. The Company also began exploring the availability of contractors and contacted its materials supplier. Additional meetings took place on the Thursday and Friday before the storm hit. Empire also alerted all of its employees to be ready to go into an emergency restoration mode. Staff is aware that the availability of outside support was limited because other areas of the mid-western United States had been affected by the winter storm.

Early in the morning on Sunday, December 9, 2007, ice had begun to accumulate and the first outages were experienced. The Company mobilized tree crews and electrical contractors, and the Company called for more assistance. By that evening, 48,000 customers were without service. By noon on Monday, when the Company was experiencing what turned out to be its peak outage period with over 65,000 customers without electrical service, the Company has stated that it had 500 linemen and 400 tree

trimmers working to restore power. Through mutual assistance calls Empire learned that significant outages were also being experienced in Oklahoma.

Empire tried through Monday evening to secure additional resources. The Company participated in the Midwest Mutual Assistance Group (MMAG) phone calls. Due to the magnitude of the storm, there were limited additional resources available from other utilities. Empire has stated that it was satisfied the regional mutual assistance resources were divided equally and thought it was treated fairly. The Company kept in contact with the City Utilities of Springfield and Empire ultimately obtained ten crews from City Utilities when it became clear that Springfield did not have as much ice accumulation. Empire has provided the following information about outside resources to Staff:

Resource	**Source**
60 FTE Linemen	Louisville, Kentucky
20 Contractors	Entergy Little Rock
400 Tree Trimmers	Asplundh
40 Tree Trimmers	West Tree Service
10 Line Crews	City Utilities of Springfield

A large number of contractors came from a significant distance to assist Empire. Line crews came from Sumter, South Carolina; Chattanooga, Tennessee; Arkansas; Kansas; and Kentucky. Tree trimmers came from Mississippi and Alabama. One crew that was originally destined for Empire was re-routed to Oklahoma by a substitute administrator for another electric company.

Empire did not call in as many contractors for the December storm as it had for the January 2007 ice storm for several reasons. First, there were fewer outages in the December storm. Second, there was a safety related incident during the January restoration effort when one of the contractors came into contact with an energized line. Empire had 1,500 additional people working during the January outage and over 300 of

its own employees working the lines and taking crews out to do their jobs. The Company felt that 1,500 additional people had taxed its abilities to conduct a safe restoration process. Third, the Company stated that in the December Storm there was an increased risk of an accident with crews in close proximity of each other working to restore service in urban areas like Joplin where it has loop feeds on the circuits.

Empire entered a supply chain alliance with Stuart Irby Company (Irby) in late 2006. This alliance worked well in both the January and December 2007 ice storms. Irby secured and began stocking a warehouse located in Empire's system in the late fall of 2006 and is set up to disburse to each of Empire's store rooms located in Baxter Springs, Joplin, Neosho, and Bolivar. Stores employees worked hand-in-hand with Irby and it functioned as a central warehouse. The head of the stores department was on the twice daily conference calls with other key Empire personnel.

When the second wave of the storm affected utilities to the north of Empire's service territory on Wednesday, December 12, 2007, several crews were called back to restore service at their home utilities. By Sunday, December 16, 2007, Empire began releasing crews. All customers that could take service were restored by Wednesday, December 19, 2007.

During the review process, Staff received a response to a question about actions taken by Empire since the December 2007 storm which is included in Staff's Report as Attachment E. This response describes the 10 teams of employees formed by Empire in mid-January 2008 to critically review actions taken and methods used during the December 2007 ice storm. The response also lists selected findings of the teams.

1. Recommendation: <u>Implement improvements to address the findings of the 10 employee teams where appropriate.</u>

In addition to Empire's own internal review, there is a benefit to Empire reviewing the storm experiences and outage restoration activities of other Missouri regulated electric utilities. These reports may contain practices and procedures that could be beneficial for future storm responses and general utility operations.

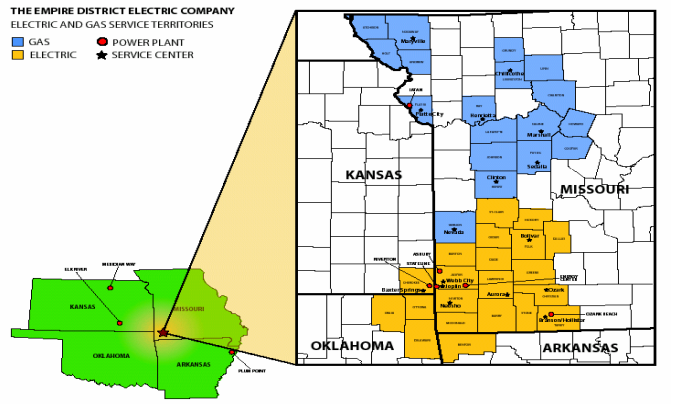
2. Recommendation: <u>Review and evaluate all other December 2007 Storm Investigation Staff Reports, including all findings and recommendations. Consider for implementation all practices, procedures and recommendations determined to be applicable and beneficial to future utility operations.</u>

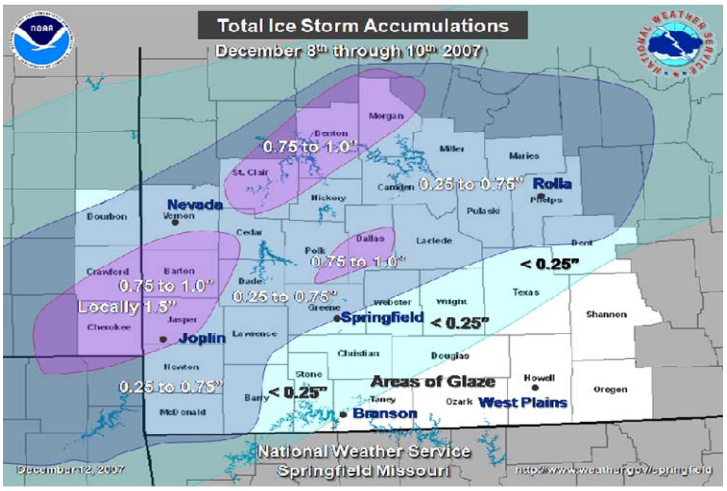
Since Staff was also reviewing the storm response for each of the investor-owned utilities in Missouri, Staff maintains that a workshop with Empire, the other investor-owned Missouri electric utilities, Staff and other interested parties would be beneficial.

3. Recommendation: <u>Participate in a Commission Staff sponsored storm restoration workshop to discuss this report and concurrent reports for the other utilities. One agenda item for that workshop should be discussion of a consistent methodology for development of future storm reports.</u>

<u>Outage Tracking and Field Dispatch Coordination</u>

The following maps show the general service territory of Empire and the ice accumulation during the winter storms of January and December of 2007:





During the December 2007 ice storm, Empire's service territory north of Joplin received about 1 ½" of ice. The December storm impacted areas that were not impacted in January, although some overlap (Joplin) occurred. The December storm did not cover as large a geographical area within Empire's service territory. Nearly the entire service area was impacted to some degree during the January ice storm, while the December storm hit more urban areas, such as Joplin, Webb City, and Carl Junction. Branson remained pretty much untouched by either storm. Reeds Springs also had minimal impact from the ice storms.

The following chart provides a quick glance comparison of the infrastructure repairs and other facts regarding the two ice storms:

Material	January 2007	December 2007
Poles	1,001	493
Crossarms	1,961	900
Conductor	161 miles	107 miles
Transformers	287	245
Insulators	6,905	1,860
Splices	31,918	33,912
69 kV Structures	22	15
69 kV Crossarms	295	118
Customers without electric service	Approx. 85,000	Approx. 65,000
Outside Assistance	1,565 FTE	1,150 FTE
Cost	$31 million	$18 million

Through the State Emergency Management Agency (SEMA) calls Staff learned that utilities had problems getting crews in to help due to road conditions. Missouri Department of Transportation assisted in getting crews where they needed to go. Road conditions improved during the restoration process as outdoor temperatures rose and sunshine melted the ice. However, thawing made off-road travel more difficult. In addition to the thawing, soft (soggy) soil conditions were made worse by additional rain and drizzle that fell during the restoration process.

The January 2007 outage lasted longer even though Empire had more help restoring service. Due to greater ice accumulation during the January 2007 storm, road conditions were hampered throughout most of the restoration process. In the January storm, some icicles measured 5 inches and stayed on the lines for a full 7 days.

During the December 2007 outage the ice accumulation was gone within a few days. Fewer poles were replaced during the December outage; however, a greater amount of service damage occurred, especially in older neighborhoods with large trees in Joplin.

Prioritization of Outage Repairs

Staff has reviewed the prioritization process used by Empire in the restoration effort. Empire's Power Outage Recovery Plan (PLAN) lists both objectives and priorities for the restoration effort. However, throughout the PLAN there are also several statements that follow the theme that is stated in the PLAN's Preface "the safety of Empire employees and of the public is the No. 1 priority". The following is the objectives and priorities listed in the PLAN:

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Priorities listed below are intended to achieve the following objectives:

1. Restore Service to as many customers as possible, and
2. Restore service in the shortest period of time.

PRIORITIES:

1. Eliminate all public hazards.
2. Establish at least one adequate transmission line source into each substation; starting with those substations feeding critical loads (such as hospitals, civil authority communication centers, water plants, sewer plants, television and radio stations, etc.).
3. Restore the main distribution feeders with the same priorities as No. 1 above.
4. Restore primary laterals.
5. Repair and/or replace services and secondary and re-energize distribution transformers.

Note: Make special effort to restore services to individuals with medical emergencies.

It becomes possible, as the restoration effort progresses, and as more manpower and equipment becomes available, to address two or more of these priorities simultaneously. Planning is essential to achieve this strategy and to maintain efficiency of personnel.

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Using this list of priorities and the information available regarding the extent of the outage, which is primarily accumulated in the Outage Management System (OMS), Empire assigned crews work orders for specific repairs at specific locations. However, Staff would point out that this process is dependent on good information. Information that comes from Empire personnel, customers and public officials is sometimes

conflicting, sometimes sketchy and sometimes just plain wrong. The utility has to balance the need for better information with the need to restore power as quickly as possible throughout the restoration process.

Call Center Operations

The Call Center serves as the primary method for customers to contact the Company to conduct a wide range of business. As the first point of contact, agents who staff the Call Center may have the greatest impact in forming the customers' opinions of the services provided by the Company. Customers most frequently contact a Call Center to initiate, transfer, or discontinue service; report emergencies and service outages; ask questions about their bills, and request payment arrangements.

Empire provides customers with a toll-free phone number to contact its Call Centers. Joplin area customers may also use the local number to contact Empire. All calls go to one of the two Company-operated Call Centers located in Joplin and Ozark, Missouri. Although there are two Call Centers, the operations between the two are seamless. Empire's Call Center in Joplin is operated 24/7, while the Call Center in Ozark is operated Monday through Friday from 7:00 a.m. to 7:30 p.m., with the exception of one day during the week (either a Tuesday, Wednesday, or Thursday since those tend to be the lesser-busy days) when the Call Center closes at 5:00 p.m. Empire also monitors 24/7 a dedicated phone line for police and fire department calls.

When the customer dials Empire's toll-free or local number, the call goes into the Nortel Symposium 4.5 call router. If an agent is available, the call goes directly to the agent. If no agents are available, the call goes to the Interactive Voice Response (IVR) unit where customers can choose from various options, including reporting an outage or emergency, accessing the automated phone directory, reviewing automated account information, and all other needs.

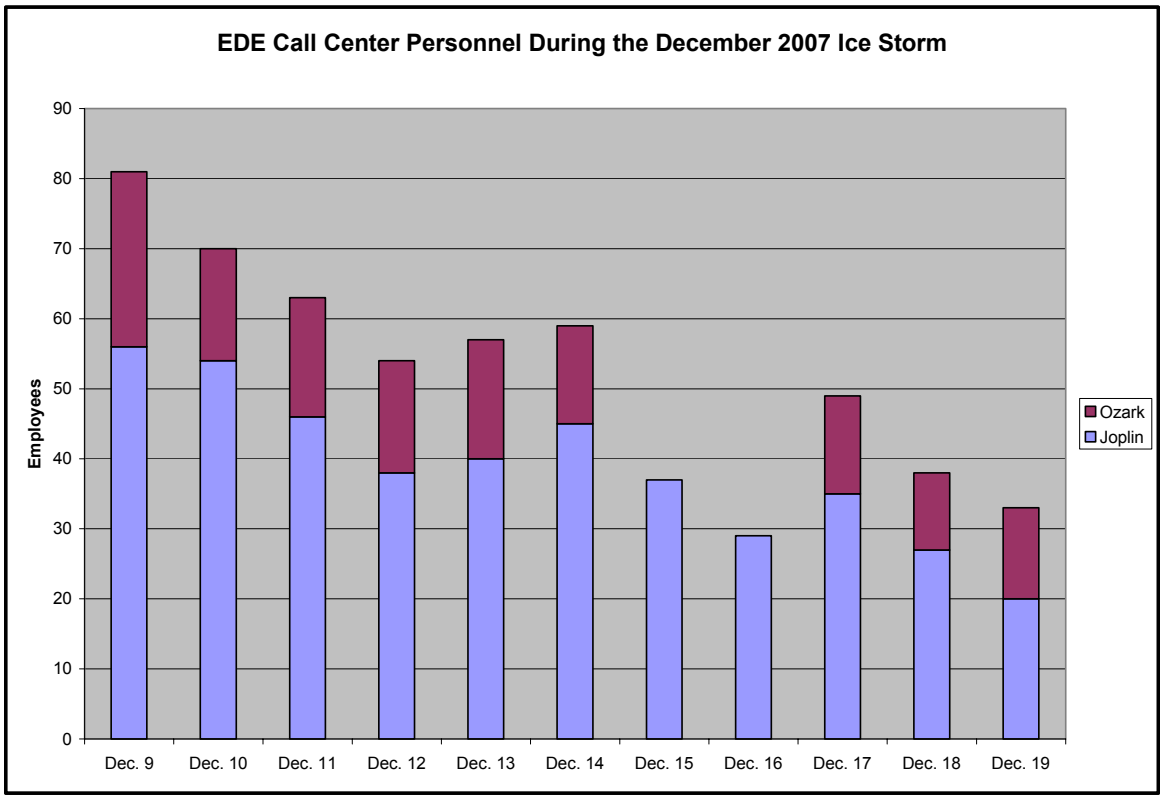
When the customer elects to report an outage or emergency, the customer is given four options. The customer is asked to select Option 1 if power or gas is off. When the

customer presses 1, the system verifies that the customer information system (CIS) is available. The system checks the customer information database (CID) for a match. If no match is found, it asks the customer to enter their 10-digit phone number, account number, or social security number. The number is verified in CIS, and if a match is found, the system speaks back the customer's name and asks if that name is correct. If it is correct and the database check is successful, an event is created in the outage management system (OMS). If the phone number is not verified in CIS, the call is routed to an agent.

Customer calls are routed directly to agents when customers choose any of the remaining options, including Option 2 for an emergency, Option 3 to report flashes, explosions, or blinking lights, or Option 4 for an outage or problem with fiber optic service.

Empire staffs its Call Centers based upon historical levels of calls at various times of the day, week, and month. The Joplin Call Center has 30 agents handling customer calls, one manager, and three support staff, while the Ozark Call Center has 13 agents handling customer calls, one manager, and one support staff. When a major outage occurs, the normal level of resources is unable to process the volume of calls that occur. During the December 2007 ice storm, some Call Center agents' hours were extended to 14 to 16 hour shifts. After 8:00 p.m., the Call Center generally staffed down as the volume of calls decreased. The Call Center staffed up again at 6:00 a.m. when call volume increased. During the restoration period, approximately 23 employees from other departments answered calls at times in the Call Center.

During the majority of the December storm outage, an average of approximately 36 agents in the Joplin Call Center and 13 agents in the Ozark Call Center were taking calls daily in staggered shifts. The following chart shows the number of Call Center agents who responded to calls per day in the Joplin and Ozark Call Centers.



Source: Information Request Response from Empire

More specifically, the following table shows the number of Call Center agents, broken into specific time periods, who responded to calls during the December outage. The exact times are not work shifts, but segmented to break the day into sections.

Call Center Personnel During the December 2007 Ice Storm Outage					
Date	Location	8am-8pm	8pm-12am	12am-8am	Total Agents
Dec. 9	Ozark	13	6	6	25
	Joplin	23	15	18	56
Dec. 10	Ozark	13	0	3	16
	Joplin	23	13	18	54
Dec. 11	Ozark	14	0	3	17
	Joplin	23	12	11	46
Dec. 12	Ozark	12	0	4	16
	Joplin	21	11	6	38
Dec. 13	Ozark	14	0	3	17
	Joplin	23	9	8	40
Dec. 14	Ozark	14	0	0	14
	Joplin	23	13	9	45
Dec. 15	Ozark	0	0	0	0
	Joplin	17	11	9	37
Dec. 16	Ozark	0	0	0	0
	Joplin	18	4	7	29
Dec. 17	Ozark	11	0	3	14
	Joplin	23	5	7	35
Dec. 18	Ozark	9	0	2	11
	Joplin	17	3	7	27
Dec. 19	Ozark	11	0	2	13
	Joplin	14	2	4	20
Dec. 20	Ozark	8	0	2	10
	Joplin	12	3	7	22
Dec. 21	Ozark	11	0	2	13
	Joplin	16	2	3	21

Source: Information Request Response from Empire

The following table illustrates the call volume received by the Company and handled by agents and the IVR during the period of December 9 through December 21, 2007.

The Empire District Electric Company Call Center Statistics for Sunday, Dec. 9 through Friday, Dec. 21, 2007					
Date	**Incoming Calls**	**Calls Answered Call Centers**	**Automated Outage Calls (IVR)**	**Other Calls Answered Through IVR**	**Calls Abandoned**
December 9	25,015	10,363	8,325	2,767	3,560
December 10	23,624	9,422	6,258	3,339	4,605
December 11	12,246	7,242	2,196	1,853	955
December 12	12,406	5,563	2,386	2,248	2,209
December 13	12,811	5,452	2,284	2,813	2,262
December 14	12,362	5,620	2,080	2,788	1,874
December 15	8,694	2,445	1,544	1,885	2,820
December 16	5,011	2,281	822	1,073	835
December 17	7,272	3,637	446	1,851	1,338
December 18	4,074	2,322	220	1,069	463
December 19	3,024	1,843	86	789	306
December 20	2,549	1,698	34	592	225
December 21	2,583	2,053	107	298	125
Totals	131,671	59,941	26,788	23,365	21,577

Source: Information provided by Empire in response to MoPSC Staff's Electric Outage Service Restoration Information Request

As shown in the above table, the Call Centers handled a total of 110,094 (59,941 + 26,788 + 23,365) calls over a 13-day period during the December outage restoration. The Company received fewer calls during the course of the December outage restoration as compared to the January 2007 ice storm outage, when it handled 139,775 calls during a 15-day period.

Empire has four T1 lines (circuits that handle 24 conversations simultaneously) for incoming calls. Empire previously had two T1 lines coming into the Call Center, but added two more T1s prior to acquiring the Aquila gas customers the latter part of August 2006. Three of the T1s (72 lines) are designated for long distance calls, and 8-12 of the remaining lines are designated for local incoming calls. Empire stated that since the December storm hit the heavier populated areas of Joplin and Webb City very hard, the

T1s may have been full due to a larger volume of calls at one time, resulting in customers hearing a busy signal or message that "all circuits are busy."

During the January 2007 outage, some of Empire's incoming ports spontaneously went to "unavailable." The IVR server had to be rebooted. When Empire checked with Nortel as to the cause, Nortel told them it was a known problem with the programming and provided Empire a patch to install. During the December 2007 outage, Empire did not experience this port unavailability.

Another concern during a major outage relates to the wait time experienced by the customer when trying to access the Company's phone lines to report the outage. Call Centers utilize a number of indicators to assist them in determining the level of its performance in providing service to the customer.

The two indicators most frequently used by companies are the Average Speed of Answer (ASA) and the Abandoned Call Rate (ACR). The ASA is defined as the customer's wait time before being able to report information to an agent. The ASA is noted in minutes and seconds. The ACR is the percentage of calls that are abandoned or terminated before the calls are answered. Often this is due to long wait times experienced by the customer. Empire calculates the ACR percentage by dividing the number of calls abandoned by the number of incoming calls.

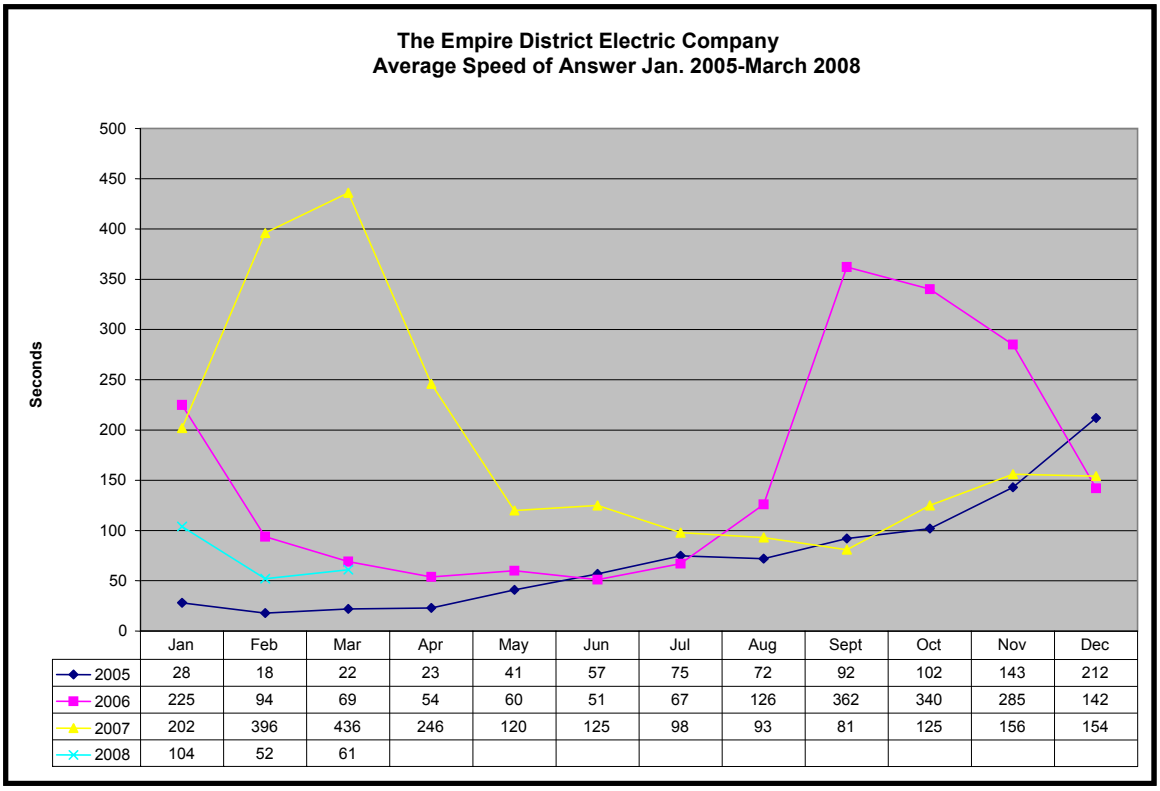
Empire's Call Center performance during the December 2007 ice storm restoration effort is shown in the following table:

Empire's ASA and ACR During the December 2007 Ice Storm Outage		
	Average Speed of Answer (Minutes:Seconds)	Abandoned Call Rate
December 9	2:01	14%
December 10	2:06	19%
December 11	1:20	8%
December 12	3:05	18%
December 13	3:27	18%
December 14	2:57	15%
December 15	4:14	32%
December 16	2:46	17%
December 17	3:01	18%
December 18	2:21	11%
December 19	1:59	10%
December 20	1:37	9%
December 21	0:35	5%
Average	2:25	15%

Source: Information provided by Empire in response to MoPSC Staff's Electric Outage Service Restoration Information Request

Information provided in the above table represents the performance of agents in both the Joplin and Ozark Call Centers during the outage. As shown above, the average ASA during the December outage was 2 minutes, 25 seconds, while the average ACR was 15%. During the January 2007 outage, the ASA was not calculated for specific days, but Empire reported that the ASA for the entire month of January 2007 was 3 minutes, 22 seconds. Empire's ACR averaged 22% during the 15-day January outage.

Although the ASA during the January and December 2007 ice storms was high, the ASA in the months after Empire began taking gas calls after acquiring the Aquila gas properties on August 28, 2006, and the winter months of 2007 was higher. Empire's monthly ASA from January 2005 through March 2008, as reported to the Staff as a result of the Stipulation and Agreement in Case No. ER-2004-0570, is shown in the following chart:



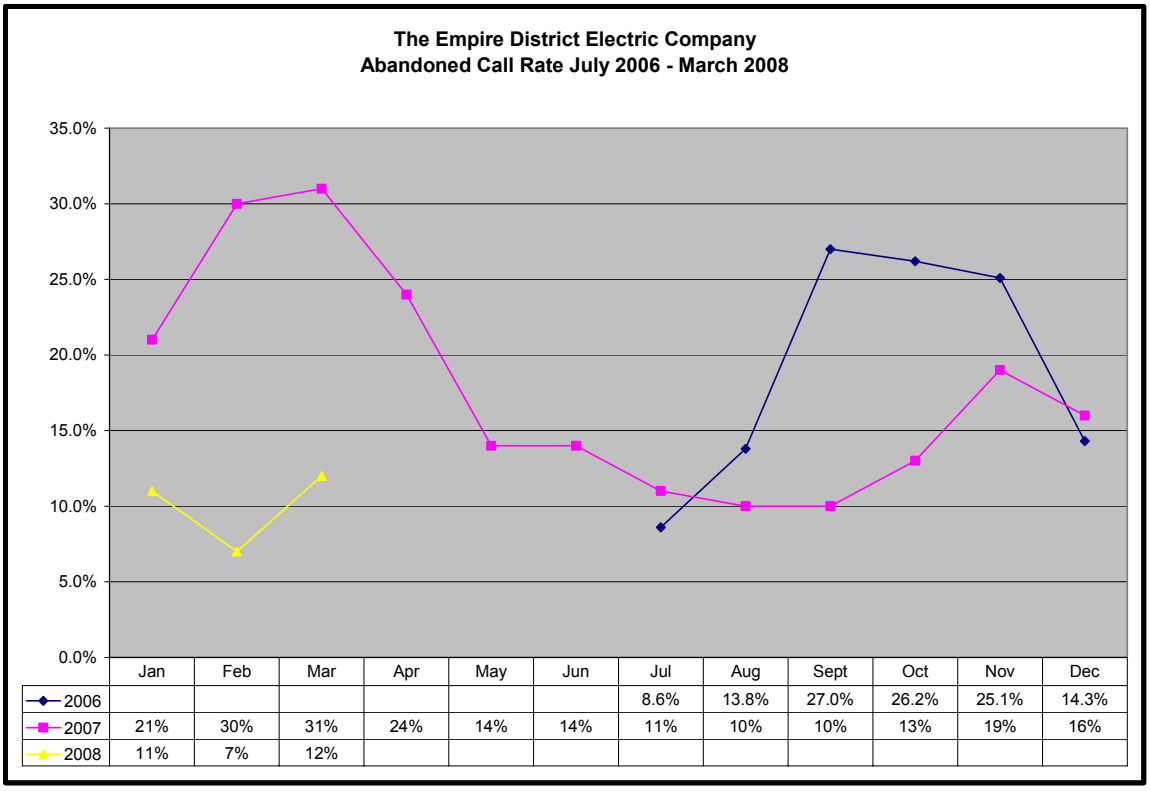
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2005	28	18	22	23	41	57	75	72	92	102	143	212
2006	225	94	69	54	60	51	67	126	362	340	285	142
2007	202	396	436	246	120	125	98	93	81	125	156	154
2008	104	52	61									

Source: Monthly Information Provided Quarterly by Empire

Empire noted in its statistical reports that the higher call volume during January through April 2007, was due to estimated meters, high bill complaints, a PGA charge, and power outages.

In September 2005, there were 62,621 incoming calls to Empire's Call Center. One year later in September 2006, shortly after acquiring approximately 43,100 Aquila gas customers, incoming calls to Empire's Call Center jumped to 90,163. By September 2007, incoming calls had returned to a more normal level of 61,613.

Prior to installation of Empire's IVR on June 15, 2006, callers unable to access Empire's Call Center heard a busy signal. Those calls were not counted as abandoned calls. The ACR from July 2006 through March 2008 is shown in the following chart:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2006							8.6%	13.8%	27.0%	26.2%	25.1%	14.3%
2007	21%	30%	31%	24%	14%	14%	11%	10%	10%	13%	19%	16%
2008	11%	7%	12%									

Source: Monthly Information Provided Quarterly by Empire

The above chart shows that the ACR was higher after Empire acquired the Aquila gas properties in August 2006 and during the winter months of 2007 than it was during the months of January and December 2007 when Empire experienced the ice storms.

Empire is currently working with SofTel Communications Corporation of Montreal (SofTel), a communications consulting company, to make changes to the call routing process to improve efficiency. Empire stated that its current IVR is more cumbersome for some customers than it needs to be. Empire plans to change the English/Spanish selection and improve its report capabilities. SofTel has provided recommendations to Empire. There is currently an issue with who owns the source code to the IVR system that is delaying the implementation of these recommendations. Empire continues to work with SofTel to improve its call routing efforts.

There are a number of ways that the ASA and ACR may be reduced. Routing all calls through an IVR unit would lower the number of calls that need to be answered by

Call Center agents, enabling agents to more quickly address other callers' issues that cannot be handled automatically. Many utilities offer IVR technology to all customer calls coming into its centers. Callers hear a consistent message each time they call and become familiar with the correct numbers to key in to access information or be routed to the correct personnel for assistance.

4. Recommendation: <u>Consider routing all calls through the IVR unit.</u>

Empire added a script to its phone system during the January outage concerning non-critical requests. The script stated as follows:

> Due to the large volume of electric outage calls caused by the devastating ice storm, Empire District requests that if customers are calling in for normal business transactions that they would call back in a few days. All of Empire's staff is assisting in the storm restoration effort. If you are reporting an electric or gas emergency or outage, please continue on the line. If you feel that your business call cannot wait a few days, please stay on the line and your call will be answered as soon as possible. Due to the large volume of calls, your wait time will be longer than normal. Thank you for your patience and understanding during this difficult time.

However, no script was added to the phone system during the December outage. Adding a script such as the one issued in January may help to lessen the number of non-emergency calls during the most critical call time, allowing more customers to report their outages.

5. Recommendation: <u>Evaluate utilizing a script during emergencies in front of the IVR unit informing customers that Empire is in a storm mode and requesting that non-outage calls be made in a few days.</u>

Callers are not currently informed of their progress while waiting in the queue. Adding hold messages for callers waiting in the queue may help to reassure callers that their call is still in line and they have not been forgotten, thereby reducing the ACR, as well as repeat calls when customers continue to hang up and call again.

6. Recommendation: <u>Evaluate adding hold messages at regular intervals to callers in the queue to inform them that they are still in the queue and their call will be answered as soon as possible.</u>

Empire handles all calls in-house and does not currently contract with any outside vendors to take overflow calls during periods of high volume calls or emergency situations. Assistance with overflow calls may reduce the number of abandoned calls or help those customers who have been unable to reach the Call Center. Empire evaluated a service such as this approximately two years ago, but determined at that time that the service was too costly. However, Empire plans to revisit this issue with Twenty-First Century Communications in the near future.

7. Recommendation: <u>Evaluate contracting with a vendor to take overflow outage calls during periods of high volume calls.</u>

When customers call to report an outage, the initial information provided creates an outage ticket with an event number in OMS. As customers call repeatedly to report their continued outage, the OMS recognizes that it is the same customer and does not create multiple outage tickets. When numerous customers from one area call, their information rolls into a larger outage ticket.

Empire built its OMS calculation for estimates of restoration time based on a Florida Power model, with the exception of the hurricane calculation. Empire stated that for approximately 99% of the time, the estimated restoration time calculations from the Florida Power model fit; however, in catastrophic situations, no calculation program is available. Empire's OMS gives estimated repair times based on four categories:

1. Outage occurs during normal business hours when weather is normal.
2. Outage occurs after hours/on weekends when weather is normal.
3. Outage occurs during normal business hours when weather is stormy.
4. Outage occurs after hours/on weekends when weather is stormy.

Empire defined "stormy" as thunderstorms – not ice storms. When a large storm hits, there is no estimate of restoration time provided.

As field crews restore service, the crews are able to close a job by entering the cause of the outage and hitting "send" from their mobile data terminals (MDTs) located in their trucks. The information is updated within a few moments in the OMS and interfaces with the CIS. A greater lag occurs in updating field information when contracted field crews are assisting in the restoration efforts, as their MDTs, if available, are not likely to be compatible with Empire's system. Call Center agents are able to check the CIS for status updates and assist customers who telephone the Call Center to report they are still out of service or out of service again. For these situations, the OMS will generate a new outage ticket if it detects that the outage has been closed.

Following restoration of outages due to thunderstorms, Empire will generally call one or two customers near the end of the line to verify that restoration is complete. However, during restoration efforts from the ice storms, Empire indicated that calls were not made to confirm restoration.

Empire formed 10 teams of employees in mid-January 2008 to critically review actions taken and methods used during the December 2007 ice storm. One of the agreed-to recommendations was to develop and implement policies/procedures to ensure that outages are closed quickly in the field. The Staff supports this recommendation and encourages Empire to pursue development and implementation of policies so outages are quickly closed in the field, enabling the Call Center to relay information to customers in a timely manner.

8. Recommendation: Develop and implement policies and procedures to ensure that outages are closed quickly in the field.

Web site

Empire started work on its new empiredistrict.com Web site in May 2007, and completed bringing it in-house on August 27, 2007. Prior to that date a company, Fast Freedom, hosted and maintained changes to Empire's Web site. Because Web site work is now done in-house, Empire is able to make updates and additions more quickly.

During the December outage, Empire added information to its Web site including a box on the front page noting the number of customers without service. The number of outages was manually updated at least twice daily, generally before the 9:00 a.m. and 3:00 p.m. SEMA calls. Since SEMA needs Missouri data only, Empire plans to research the OMS to determine if it has state-by-state breakdown capabilities. Empire stated that the outage number provided by the OMS is based on raw data, and it must be interpreted. Empire is making changes so information from OMS will be available to the Web site.

9. Recommendation: <u>Develop capabilities to report the number of outages by state on Empire's Web site.</u>

In addition to outage numbers, Empire added an explanation of the restoration process and priorities to the Web site, as well as a drawing of a meter base with notes as to the repair responsibility of the customer before service can be restored. In recent weeks, Empire has added more information to its Web site, including an outage map, storm outage tips for both summer and winter, preparing for outages, downed power lines safety tips, generator safety tips, and food safety. Empire's Web site had 12,478 visits during the December 9-21, 2007, outage. As a comparison, total Web site visits for the entire months of December 2007 through May 2008 are shown in the following table:

The Empire District Electric Company Web Site Visits	
Month/Year	Number of Visits
December 2007	18,395
January 2008	13,836
February 2008	14,184
March 2008	14,614
April 2008	14,713
May 2008	15,060

Source: Information Request Response From Empire

The above chart shows that Empire's Web site is being accessed a significant number of times each month.

Empire continues to tweak the outage map that it has recently introduced to the Web site. Empire is currently using various colors to designate the number ranges of

outages in its service territory. The program should be designed to ensure the map will not show more outages than the number of customers. The outage map is an informative tool for Empire's customers, as well as the news media.

10. Recommendation: <u>Continue to design and upgrade the outage map on Empire's Web site and provide customer outage information by state.</u>

<u>Customer Comments and Complaints</u>

The Commission's Electronic Filing and Information System (EFIS) received 105 public comments with multiple concerns from Empire customers. Staff has reviewed these public comments and categorized the customers' concerns into issues noted in the following table:

Number and Percent of Ice Storm Comments Per Category		
Case Number: EO-2008-0215		
Comment Type	Number of Concerns	Percent Per Comment Category
Positive Feedback	10	3.3%
Storm Outage Concern	5	1.6%
Infrastructure Maintenance	3	1.0%
Repeat Outages	21	6.8%
Storm Response	27	8.8%
Tree Trimming	59	19.2%
Tree Cleanup	11	3.6%
Repair Quality	9	2.9%
Credits	2	0.7%
Bill Amount	13	4.2%
Safety	8	2.6%
Bury Lines	5	1.6%
Call Center	42	13.7%
Medical Registry	0	0.0%
Estimated Restoration Time	33	10.7%
Web site	0	0.0%
Customer Communications	41	13.4%
Executive Management	18	5.9%
Total	307	100.0%

Source: Public Comments filed in the Commission's EFIS

The above table shows 307 concerns that include, but are not limited to, repeat outages, storm response, tree trimming and cleanup, quality of repairs, safety, Call Center issues, lack of estimated restoration times, customer communications, and executive management. Since Empire has approximately 144,045 customers, this translates to 2.13 concerns per 1,000 customers. Although tree trimming and infrastructure maintenance are covered in separate sections within this report, discussion of some public comments regarding these issues follows.

In their public comments, customers noted several instances where they received busy signals or a message stating "all circuits are busy" when they tried to contact the Call Center. In fact, a customer calling on the fifth day of the outage noted that he still received an "all circuits are busy" message. This message was not due to the IVR causing port unavailability as occurred in the January storm. Empire spoke with AT&T, its local provider, and it was determined that AT&T's central office had blocked some calls due to the possibility of the extremely high volume bringing down the entire system. In addition, when all of Empire's Call Center agents are on calls and the queue is full, customers attempting to contact the Call Center hear a "fast busy" signal. Staff's recommendation in an earlier section of this report that Empire evaluate contracting with a vendor to take overflow outage calls during periods of high volume calls may also help customers to report their outage.

11. Recommendation: Communicate with AT&T during and after large outages to reduce or eliminate blocked calls that lead to customers hearing the message "all circuits are busy."

Numerous public comments alleged that information gleaned from Empire's Call Center agents was not helpful. Customers expressed frustration due to a lack of estimated restoration time being provided, as most were told that service restoration would probably take several days.

As noted previously, Empire's OMS gives an estimated repair time based on the time of day and day of the week; however, when a large storm hits, estimates of restoration time are generally not provided. In striving for consistency of messages, press

releases were issued to the Call Center through e-mail as they were released to the media. The Director of the Call Center also sent restoration information via e-mail to the agents when he received it, but restoration information from the field may have been inadequate.

Empire generally tries to avoid giving estimated restoration times to customers during large outages. If Empire does estimate a restoration time, it tries to avoid being overly optimistic on those times so customers will not be disappointed if the power is not restored when promised. However, during the December outage, field staff, both Empire employees and contract crews, informed customers of expected restoration times and gave their opinions as to the causes of the outage. Empire stated this information was often incorrect and caused its customers and the Company much frustration and grief. In the future, Empire plans to clearly inform its employees, as well as its contractors, what their roles are – and are not – regarding causes of the outage and dissemination of restoration estimates.

The outage map that Empire has added to its Web site should at least provide customers with information as to outage areas, but it would not provide estimated restoration times. Although restoration times may not be available, Empire should convey to customers the magnitude of the outage and provide an actionable message regarding the need to take steps to meet their circumstances. Empire may provide information such as the location of emergency shelters.

12. Recommendation: Assign responsibility for coordinating communication efforts among Company personnel so that Company representatives and Call Center agents give consistent information to customers regarding the outage. Evaluate the benefits of providing an actionable message to customers through the IVR or when talking directly to customers.

Public comments contained 59 concerns regarding tree trimming issues, including a lack of trimming, as well as the manner in which trees were trimmed. One customer alleged that she had called Empire for several months to report a tree near the electric line. As she predicted, when the December 2007 ice storm hit, the tree came apart and fell on the line, severing power to the whole block. The customer was without power for

more than a week. The trees in question have since been trimmed and are no longer an issue. Empire stated that while it may have seemed to the customer that their trees were the only issue keeping them from having electrical service, the 12 kV circuit feeding that area was not energized due to damages. Empire stated that it has restructured its tree trimming methods to gain productivity and efficiency from its contract tree trimmers. Empire is focusing more on whole circuit trimming, and less on hot spot trimming. In the short term, some customers with tree concerns may be delayed, but Empire's plan is to trim the most possible with the resources at hand.

At least one other Missouri electric utility has instituted a communications process with customers to inform them of what the Company found in the field, e.g., the utility has looked at the tree, the corrective action that needs to be taken, and when the Company plans to perform this corrective action. A written commitment is signed by both the utility and the customer as to the action to be taken.

13. Recommendation: Evaluate implementing a process whereby the customer is notified when problem areas have been examined, if corrective action is required, and the timeframe when it will be completed.

Of the 105 public comments, 10 alleged rudeness on the part of some of the Call Center agents. Empire has the ability to record some calls to the Call Center, but only monitors a few on occasion. Recording all calls serves several purposes. Recorded calls can provide proof as to text of the message, as well as the tone, of both the Call Center agent and the customer. Evidence from recorded calls at some utilities has shown on numerous occasions that the rudeness was on the part of the customer, not necessarily the agent. Recorded calls can also be used as a training tool. A post-outage review of recorded calls may help Empire to determine the level of the quality of service that customers received during the outage. In addition, recording all calls may provide added motivation for agents to treat all customers with the utmost respect, even in a crisis situation.

14. Recommendation: Evaluate the process of recording all Call Center agents' calls and monitoring them on a frequent basis.

Empire noted that it has reviewed the public comments/complaints and attempted to follow up on those pertaining to ongoing safety concerns. In some cases, the follow-up required a site visit. Empire tried to reconstruct certain activities to ensure the activities were handled in accordance with its mission to be a respected supplier of energy and related services. Empire plans to use this information as examples for future employee training and help to improve customer communications.

Medical and Special Needs Customers

Empire has a medical and special needs customer registry; however, it is tailored to comply with the Commission's Chapter 13 rules regarding disconnection of service. Customers on the registry may be able to receive a 21-day extension to pay their bills due to a medical condition before their service is disconnected. Empire accepts a doctor's letter or a "Customer Request For Delay of Disconnection Because of Medical Condition" form with certification from a licensed physician or healthcare professional to extend the disconnection date. In addition, Call Center agents can trigger a special needs indicator on the customer's account and note comments such as medical equipment, medical conditions, or various special needs. This indicator moves with the customer.

Currently, Empire has approximately 2,000 accounts on its medical and special needs registry, representing a large variety of needs. Not all are life support situations. Registry accounts include wholesale and city accounts, as well as a customer under federal protection. The registry is not separated on a state-by-state basis.

Empire adds new accounts to the registry as needs arise, but does not delete accounts when the account no longer needs to be included on the registry. Staff found instances of deceased persons still being included on the registry. To be useful, the registry needs to be continuously updated. In addition, PSC Rule 4 CSR 240-13.055(1)(D)3. requires that registered elderly or disabled customers renew their registration with the utility annually. The Rule specifically states:

> (D) Registered elderly or disabled customer means a customer's household where at least one (1) member of the household has filed with the utility a form approved by the utility attesting to the fact that s/he:
>
> . . .
>
> 3. Has a formal award letter issued from the federal government of disability benefits. In order to retain his/her status as a registered elderly or disabled customer, each such customer must renew his/her registration with the utility annually. Such registration should take place by October 1 of each year following his/her initial registration;

Customers on the medical and special needs registry are noted on outage orders, but are not guaranteed priority of restoration. Empire utilizes the registry information when the situation allows, such as during small isolated outages. However, Empire stated that due to the nature and impact of large storms, it is rare that an isolated service belonging to someone with special needs can be restored before any others, but Empire indicated it makes every effort to quickly restore service to these customers.

Some customers at local public hearings for Empire's rate case (Case No. ER-2008-0093) expressed confusion as to the benefits of being on Empire's medical and special needs registry. Customers believed that they would receive priority in service restorations in all outages regardless of the magnitude of the outage. Empire does not routinely send informational letters to customers to remind them what exactly being on the registry means in the event of a large outage or to determine their continued need to be included on the registry. Empire should require customers to re-enroll yearly on its medical and special needs registry. When sending re-enrollment letters to those customers on the registry, Empire should request updated information and remind customers of the purpose for the registry. The Company may also take the opportunity to include storm preparation and safety tips in the mailing.

15. Recommendation: Contact customers on an annual basis regarding their continued participation on the medical and special needs registry. Include information on the purpose of the registry and its relationship to outage restoration. Consider including in the mailing storm preparation tips or other pertinent educational information regarding actions the customers should take regarding a large outage.

16. Recommendation: <u>Update the medical and special needs registry on a continual basis.</u>

Empire's Action to Support the Elderly (EASE) registration program, aimed initially at customers 60 years and older, also includes the disabled. Customers with an EASE designation are included in the medical and special needs registry. For those registered on the EASE program, Empire will adjust the payment due date to make it more convenient for the customers, waive late fees, waive deposits as long as timely payments are made, and send a copy of any delinquent notices issued on the account to a third party.

At the present time, Empire makes no outbound contact to customers on the medical and special needs registry or the EASE program to inform them of storm preparations they need to make, emergency shelter locations, or other pertinent information. In order to improve customer service and decrease the number of calls to the Call Center, Empire may consider an automated calling system or utilizing a Company employee knowledgeable about local resources to inform high risk customers of services available to them.

17. Recommendation: <u>Evaluate initiating automated calls to customers on the EASE program, as well as those deemed to be high risk on the medical and special needs registry, to inform them of storm preparations, emergency shelters, or other pertinent information.</u>

<u>Communications with Customers and City, County and State Officials</u>

Empire maintains a list of emergency contacts, including the MoPSC's Energy Department Staff, city and county officials – most generally mayors and city clerks, and the fire chief and emergency management officials in the larger towns within its service territory. The Director of Customer Service serves as Empire's primary contact for city, county, and state officials, while Empire's Communications Director serves as the primary contact to the general public. In some cases, other Empire employees may serve as contacts for assigned areas.

Empire always notifies Energy Department Staff when a large outage occurs and then provides information to Staff at least twice a day regarding the outage situation. Staff has always been able to contact someone at Empire when information is needed regardless of the time of day. Empire provides whatever information is requested whether it is the number of customers out in Missouri or a SEMA request regarding when a city's pumping station will get power.

The Manager of the Consumer Services Department of the MoPSC has an important need to know the status of utility outages, as such personnel may receive hundreds of calls and communications reporting outages and requesting service restoration information. Such personnel should be included on utility e-mail updates and conference call communications when practical.

18. Recommendation: Include the MoPSC Manager of Consumer Services regularly on service outage update communications and restoration progress.

Empire expressed having difficulty in contacting officials in some of the smaller towns within its service territory during the outages. Staff believes it would be more efficient for Empire to contact the smaller towns now to establish emergency contacts, along with backup contacts, and update this list at least twice a year. Alternate forms of communication such as telephone numbers for home and office, cell phone numbers, e-mail addresses, and possibly two-way radios should be maintained.

19. Recommendation: Establish a list of contacts, with backups, for the small communities in Empire's service territory and update this list at least every 6 months.

Empire made contacts with numerous city and state agencies, many on a daily or multiple times a day schedule during the outages. Fourteen news releases regarding the ice storm were issued from December 9-19, 2007. Empire provided information to the public including the telephone numbers to report an outage, shelter locations, downed power line safety, generator safety, winter safety, and meter base information, as well as the number of customers' service that had been restored.

Television news stories with Empire personnel were aired on local stations KSN, KODE, and/or KOAM. Empire believes the news media became allies with them in getting vital information to customers, as well as showing customers the faces of some of those responsible for restoration.

Empire also used the talk radio station, KZRG 1310, to share information with its customers. However, no radio talk shows were held where customers could call in with comments or questions. Such opportunities may have been of value to Empire customers. Battery-operated radios may be the customers' main information source Empire power outages, and radio talk shows concerning the outage and restoration information have proved to be beneficial in other Missouri areas.

20. Recommendation: Partner with local radio stations regarding participation in talk shows during a large outage, giving information as to the outage restoration process, safety tips, an explanation of the meter base and responsibilities of the Company and customers, as well as answer questions from the general public.

In an effort to assess the effectiveness of communications between Empire and officials engaged in the restoration process, Staff interviewed several city officials in Empire's service territory. Staff asked these officials if their communications with Empire were adequate and if they had recommendations for future outage restoration efforts. In general, communications among Empire and some city officials appeared to improve from the January 2007 outage to the December 2007 outage. While there were some positive assessments of Empire's response, opportunities for improvement exist, particularly in regard to being able to access the Company to report outages and receive information critical to the cities' emergency operations.

After the January 2007 outage, one city held discussions with Empire regarding improved access to the Company during outages. These discussions resulted in that city being provided a special phone number to access information, which improved communications during the December 2007 outage.

An Emergency Management Director expressed a need to know on a daily basis the specific areas that were without power, as well as locations where crews were

working. Customers often call their city officials after they have spoken with or been unable to reach Empire. Therefore, having daily information would allow the city to give customers more information.

Another city official stated that having an Empire employee specifically assigned to their area during the restoration process was helpful. After initially lining out restoration priorities for that city during the first hour on site, the Empire employee remained in contact with the city official, serving as a source of critical information.

It is essential that city and/or emergency operations managers be able to contact Empire during outages. Providing officials with a name and phone number of a special contact person at Empire may prove helpful to those in need.

21. Recommendation: Evaluate assigning a special Empire contact person in the event of emergencies to city or EOC officials in Empire's service territory.

During the December outage, Empire experienced many repeat calls from customers continuing to report their outages. One customer alleged that a Call Center agent told her to call several times a day until they got power back. Empire used press releases to remind customers who had reported their outage to "please be patient and know that their information is in the Empire system. Additional calls are not necessary and could prevent new outage customers from reaching Empire to report their information." In addition, when customers have finished reporting their outage through Empire's automated system, a recorded voice confirms, "Your outage has been entered and recorded. A lineman will be dispatched as soon as possible." However, some customers continued to repeatedly call.

Even though it is impossible to completely eliminate the repeat calls, more customer education pertaining to the outage reporting process may be helpful. Empire may want to consider educating the customer via bill inserts, information on its Web site, and with radio talk shows or telephone interviews. Empire should also remind its Call Center agents to communicate to customers that only one call is necessary to report an outage.

22. Recommendation: <u>Continue to educate customers and remind Call Center agents about Empire's outage reporting process. Include information explaining the reasons that repeat calls are not necessary.</u>

As previously mentioned, at the present time, Empire only calls one or two customers near the end of the line to confirm that service has been restored after thunderstorms, but calls are generally not made after significant ice storm outages. In order for crews to see that power has been restored, another Missouri utility urges customers to turn their porch lights on after a storm. The simple act of leaving a porch light on can serve as a signal to utility crews that electricity has been restored. Empire has discussed a "porch light on" program.

23. Recommendation: <u>Develop and publicize a program such as "porch light on" to inform customers to use this as a signal to utility crews that their power has been restored.</u>

<u>Vegetation Management</u>

In 2002, Empire began evaluating the possibility of making significant changes to its vegetation management practices. It surveyed other utilities for improvements. In 2003, Empire hired a degreed forester before the Northeast blackout occurred. It used a helicopter to apply herbicide to 200 miles of transmission lines. During the December ice storm, there were no outages along these lines. Empire also hired Environmental Consultants, Inc. (ECI) to do a study of tree problems and began investigating better ways to do tree trimming. ECI drew up plans to remove trees using a directional tree trimming methodology which allows trees to grow away from electric lines. During 2003, Empire signed a 3-year contract with Wright Tree Service. Tree trimming contractors are responsible for their own productivity since Empire pays them a set price. For comparison purposes, tree trimming budgets were as follows:

2002 = $2.5 million

2007 = $5.8 million, not including the ice storm work

Empire is planning to invest more money into its tree trimming budgets over time. Empire plans to continue what it is currently doing and increase its efforts. Currently, Empire's urban and rural areas are both on 10-year tree trimming cycles. It performs preventive maintenance every 10 years, and trim hot spot areas as needed. Empire believes that any type of vegetation management will have a positive impact since it has experienced less damage on trimmed areas during the recent storms.

Staff held discussions with Empire regarding the customer complaints involving tree trimming and vegetation management. After the January ice storm, Empire received many calls. It is the responsibility of the managers of the 8 service areas to have the lines looked at.

One city official reported that communications with Empire during the December outage were "hit and miss," as sometimes information was right on target, while other times information was not so good. One incident occurred where trimmers clearing lines in the aftermath of the storm dropped limbs and blocked drainage ditches, which caused numerous problems. When the Company was contacted regarding the limb problem, it was reported that Empire refused to have its tree service remove the limbs or move them from the drainage ditches. Once power was restored, officials tried to speak with Empire about giving more thought to improvements with the limb problem, but the city official stated that Empire did not seem interested in discussing the matter. This customer was less than satisfied with the response he received from Empire both during and after the outage.

The Commission's Electrical Corporation Vegetation Management Standards and Reporting Requirements, 4 CSR 240-23.030, will become effective on June 30, 2008. Staff maintains that revisions to current operating procedures will need to be made for the following sections of the Commission's Rule:

4 CSR 240-23.030(2) General Provisions
4 CSR 240-23.030(3) Maintenance Cycle
4 CSR 240-23.030(4) Technical Standards for Vegetation Management
4 CSR 240-23.030(5) Transmission Line Vegetation Management
4 CSR 240-23.030(6) Training, Record Keeping and Reporting

4 CSR 240-23.030(7) Public Notice of Planned Vegetation Management
4 CSR 240-23.030(8) Outreach Programs
4 CSR 240-23.030(9) Specific Requirements

24. Recommendation: Revise vegetation management procedures to incorporate the Commission's Electrical Corporation Vegetation Management Standards and Reporting Requirements, 4 CSR 240-23.030, which will become effective on June 30, 2008.

Infrastructure Maintenance

To the extent that data is available, Staff has evaluated the impact of infrastructure maintenance on storm damage and/or storm damage prevention. Staff also reviewed actions that Empire has taken to improve the reliability of its electrical transmission and distribution systems.

There seemed to be no direct correlation between failure of a line and the age of the line for transmission and distribution lines. Some old lines failed, some did not. Some new lines failed, others did not. Outages occurred regardless of the age of the infrastructure if the ice density was great and problems were scattered all over the system. Most failures were due to the weight of the ice on the lines. Galloping of the lines (i.e., wind causing fluctuations of power lines laden with ice) also contributed to failures.

Empire reported that there was quite a bit of damage in older neighborhoods that was due to old growth trees, not necessarily old infrastructure. In the January storm, some newer construction failed due to galloping.

Empire, like all utilities, had problems due to old trees which were not located in the right-of-way. Many of these trees were 60-70-80 feet tall. There were so many old trees down that public officials had to clear trees before the fire department could respond and the restoration effort could begin. A majority of back lot lines had trees with limbs hanging above overhead lines. Even much of Empire's new construction is back lot construction because residents do not want the power lines in front of their homes.

The Commission's Electrical Corporation Infrastructure Standards, 4 CSR 240-23.020, which will become effective on June 30, 2008, are also expected to result in revisions to Empire's current infrastructure procedures. Although portions of the Commission's Infrastructure Inspection Rule could be incorporated into existing procedures, Staff expects that Empire will likely develop a new standard to incorporate the Commission's Infrastructure Inspection Rule.

25. Recommendation: Revise operation procedures to incorporate the Commission's Electrical Corporation Infrastructure Standards, 4 CSR 240-23.020, which will become effective on June 30, 2008.

Summary of Recommendations

1. Recommendation: Implement improvements to address the findings of the 10 employee teams where appropriate.

2. Recommendation: Review and evaluate all other December 2007 Storm Investigation Staff Reports, including all findings and recommendations. Consider for implementation all practices, procedures and recommendations determined to be applicable and beneficial to future utility operations.

3. Recommendation: Participate in a Commission sponsored storm restoration workshop to discuss this report and concurrent reports for the other utilities. One agenda item for that workshop should be discussion of a consistent methodology for development of future storm reports.

4. Recommendation: Consider routing all calls through the IVR unit.

5. Recommendation: Evaluate utilizing a script during emergencies in front of the IVR unit informing customers that Empire is in a storm mode and requesting that non-outage calls be made in a few days.

6. Recommendation: Evaluate adding hold messages at regular intervals to callers in the queue to inform them that they are still in the queue and their call will be answered as soon as possible.

7. Recommendation: Evaluate contracting with a vendor to take overflow outage calls during periods of high volume calls.

8. Recommendation: Develop and implement policies and procedures to ensure that outages are closed quickly in the field.

9. Recommendation: Develop capabilities to report the number of outages by state on Empire's Web site.

10. Recommendation: Continue to design and upgrade the outage map on Empire's Web site and provide customer outage information by state.

11. Recommendation: Communicate with AT&T during and after large outages to reduce or eliminate blocked calls that lead to customers hearing the message "all circuits are busy."

12. Recommendation: Assign responsibility for coordinating communication efforts among Company personnel so that Company representatives and Call Center agents give consistent information to customers regarding the outage. Evaluate the benefits of providing an actionable message to customers through the IVR or when talking directly to customers.

13. Recommendation: Evaluate implementing a process whereby the customer is notified when problem areas have been examined, if corrective action is required, and the timeframe when it will be completed.

14. Recommendation: Evaluate the process of recording all Call Center agents' calls and monitoring them on a frequent basis.

15. Recommendation: Contact customers on an annual basis regarding their continued participation on the medical and special needs registry. Include information on the purpose of the registry and its relationship to outage restoration. Consider including in the mailing storm preparation tips or other pertinent educational information regarding actions the customers should take regarding a large outage.

16. Recommendation: Update the medical and special needs registry on a continual basis.

17. Recommendation: Evaluate initiating automated calls to customers on the EASE program, as well as those deemed to be high risk on the medical and special needs registry, to inform them of storm preparations, emergency shelters, or other pertinent information.

18. Recommendation: Include the MoPSC Manager of Consumer Services regularly on service outage update communications and restoration progress.

19. Recommendation: Establish a list of contacts, with backups, for the small communities in Empire's service territory and update this list at least every 6 months.

20. Recommendation: Partner with local radio stations regarding participation in talk shows during a large outage, giving information as to the outage restoration process, safety tips, an explanation of the meter base and responsibilities of the Company and customers, as well as answer questions from the general public.

21. Recommendation: Evaluate assigning a special Empire contact person in the event of emergencies to city or EOC officials in Empire's service territory.

22. Recommendation: Continue to educate customers and remind Call Center agents about Empire's outage reporting process. Include information explaining the reasons that repeat calls are not necessary.

23. Recommendation: Develop and publicize a program such as "porch light on" to inform customers to use this as a signal to utility crews that their power has been restored.

24. Recommendation: Revise vegetation management procedures to incorporate the Commission's Electrical Corporation Vegetation Management Standards and Reporting Requirements, 4 CSR 240-23.030, which will become effective on June 30, 2008.

25. Recommendation: Revise operation procedures to incorporate the Commission's Electrical Corporation Infrastructure Standards, 4 CSR 240-23.020, which will become effective on June 30, 2008.

Missouri Public Service Commission

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January 8, 2008

Mr. Mike Palmer
The Empire District Electric Company
P.O. Box 127
602 Joplin Street
Joplin, MO 64082

Dear Mr. Palmer:

The Commission recently opened cases and issued orders directing Staff to investigate the effectiveness of utilities' storm preparation and power restoration efforts for the December 2007 Ice Storms and report its findings and recommendations to the Commission (Case Numbers EO-2008-0215, EO-2008-0218, EO-2008-0219, and EO-2008-0220 for The Empire District Electric Company, Union Electric Company d/b/a AmerenUE, Kansas City Power & Light Company, and Aquila, Inc., respectively). The orders direct Staff to file an initial report regarding the results of its investigation no later than April 3, 2008. Staff anticipates filing an initial report by the date specified followed by additional reports as necessary at a later date. Staff will also consider scheduling a roundtable discussion (or similar forum) to review the results of these reports and analysis on a state-wide basis.

Since all investor-owned utilities in Missouri were affected, Staff is requesting the following information from each of the individual utilities by the dates listed.

A. Description of the event, including statistics related to number of customer outages, duration of outages, infrastructure affected, call center performance data that includes metrics considered by the utility to be most critical during the outage, use of internal and third parties to provide personnel and facilities, and any other relevant information. *Submit to Staff by January 25, 2008.*

B. Description of remedial actions taken by the utility to recover from the event, including resources utilized (manpower, material, financial expenditures, etc.), outage tracking, crew dispatching, restoration prioritization, customer communications, public official communications, special circumstances encountered, and any other relevant information. *Submit to Staff by February 15, 2008.*

C. Description of actions taken (since the December 2007 storms) and planned actions to be taken by the utility to prevent or mitigate the effects of future events such as the December 2007 ice storms, including policy/procedure modifications, communications enhancements, vegetation management, reliability monitoring, infrastructure modifications, and any other relevant information. This item should include a review of any previous corrective actions (due to similar events) taken prior to December 2007 and an analysis of the success of those actions relative to this event. *Submit to Staff by February 29, 2008.*

D. A complete copy of all procedures, policies, guidelines, plans, or other documents that existed prior to December 1, 2007, that were utilized during the December 2007 ice storm events, specifically

Attachment A

relating to Items A and B above. If the Company had a consolidated document such as a "Storm Restoration Plan", please provide it. *Submit to Staff by January 18, 2008.*

E. A complete copy of any revisions made since the storm, to any of the documents listed in item D. *Submit to Staff by January 18, 2008.*

F. A copy of all reports and other documentation provided to Company management regarding the Company's operations immediately prior to and during the storm restoration activities. *Submit to Staff by January 25, 2008.*

G. Copies of all documentation defining the Company's methodology and data collection process to generate statistics (e.g. customer outages, costs, etc.) related to the impact of the storm on the Company's operations and financial conditions. *Submit to Staff by February 15, 2008.*

Staff has designated storm investigation coordinators for each of the utilities. Please feel free to contact the appropriate person with any questions or comments.

Staff Lead	Lena Mantle	573-751-7520	lena.mantle@psc.mo.gov
Empire	Dan Beck	573-751-7522	dan.beck@psc.mo.gov
AmerenUE	Debbie Bernsen	573-751-7440	debbie.bernsen@psc.mo.gov
KCPL	Mike Taylor	573-526-5880	michael.taylor@psc.mo.gov
Aquila	Lisa Kremer	573-751-7441	lisa.kremer@psc.mo.gov

An outline of the proposed topics and activities that Staff is proposing to be utilized is attached for your information. Please let us know if you have any suggestions for additional topics or activities.

If you have any questions regarding this information, or can't meet the timelines listed, please provide a written explanation why the timeline can't be met and when the information will be available for Staff review. You may contact Lena Mantle at 573-751- 7520 or me at 573-751-7435.

Sincerely,

Wess Henderson
Executive Director

Attachment

cc: Blane Baker
Bob Berlin
Nathan Williams
James Swearengen
Renee Parsons
William Riggins
Thomas Byrne
Natelle Dietrich
Bob Schallenberg
Lena Mantle
Dan Beck
Lisa Kremer
Debbie Bernsen
Mike Taylor
Warren Wood

EMPIRE DISTRICT ELECTRIC COMPANY

Case No. EO-2008-0215

1. Analysis of the age, siting, durability and quality of the utility's infrastructure, including the placement of distribution lines in light of the ice storm outages of 2007.

Empire has not conducted this type of analysis however, while it is true that we had problems with some older facilities, there was also significant failure of newer poles, cross arms and wire due to the extreme weight of the ice loading. Some of the newer facilities had even been replaced during or after the previous January ice storm.

Siting of some facilities is dictated by the layout of cities and subdivisions. In the older areas of several of our communities like Joplin, Neosho or Webb City where we serve from back lot lines we are dealing with narrow easements or alleys and often old growth trees that may be as much as 70 ft tall and yet 30 to 40 ft off of the alley way or easement. Many of these trees are too far away to be trimmed but not too far to fall over into lines under extreme wind or icing conditions. Many areas that were built up during the 50s and 60s also have fences encroaching on the already narrow easements making any use of mechanized equipment impossible. Even when alley ways were available, access was limited due to the sheer amount of damage. Roads and alleys literally had to be cleared before reparations could begin and then the ice buildup caused a lack of traction for vehicles that also delayed repairs. These extreme conditions, as well as foreign crews not familiar with the area, also negatively impacted crew productivity.

2. Comprehensive compliance review of Commission Orders

Empire believes that we are compliant with all rules and orders.

3. An analysis of all assistance requested or offered and whether the utility accepted or denied the offers of assistance by other entities.

Empire is a member of the Midwest Mutual Assistance Group and participated in conference calls and followed established protocols. We accepted all available assistance, but due to the widespread nature of the incident and the prediction of significant ice accumulation on a much greater geographic area in the next several days, we were unable to secure resources from most neighboring utilities. We found it necessary to look beyond the normal sources for assistance, even to the extent of bringing crews from as far away as South Carolina. The competition for crews was such that crews which were already in route to Empire's service territory from Alabama were redirected to AEP's service territory in Oklahoma. Naturally, the farther we have to go for crews, the longer it takes to get them on site and working. (see attachments A for numbers of contract workers and associated companies)

4. An analysis of the Call Center Operations during the storm and any observations about customer service issues.

The call center used all their available employees as well as many other volunteers from other departments of the company. Due to the duration and amount of damage, it was not possible to always keep up with the volume of calls. Having said that, it should also be noted, that the telephone (AT&T) company was also having issues that exacerbated the problem. Our customers were getting messages that all the lines were busy and "fast busy signals" both indicative of telephone company problems that kept our customers from contacting us. We did use an automated system for accepting outage reports that was very helpful. In future incidents we will use more messaging capabilities. Determining ways of improving service and implementing them is an ongoing effort. We are continuing at this writing to evaluate alternative's to improve performance in the future.

5. An analysis of the utility's current tree trimming schedule and input on whether there is the need to amend the current program or consider alternative programs suggested through other Commission cases.

The new commission mandated vegetation rules, are in line with Empire's established trimming policies; however, the new initiatives will accelerate the positive results that we had already been realizing.

6. An evaluation of the communication, cooperation and assistance between the affected utilities, citizens and city, county and state officials:

Empire maintained daily communications with their local cities and other governmental groups. We had at least daily communications with state officials and also daily news releases. At this point, we have also made substantial improvements to our web site to further inform customers of the areas affected and the intensity of storms.

7. An analysis of why certain areas lost electrical service for such a prolonged amount of time:

We will always try to restore service to areas with the highest concentration of customers and emergency facilities first if possible. This leaves some of the rural areas without power longer. The vast amount of tree damage in urban areas made simple access problematic. Paths and even city streets had to be opened before work could commence. In rural areas, the additional precipitation that occurred during the restoration effort saturated the ground such that equipment had to be pulled to each work location. In a number of cases damage to transmission lines prevented restoration of service to large areas. While EDE did secure a vast number of workers during the course of the repairs, it initially takes time to ramp up, assess the damage and put a work plan in place. As widespread as the damage was, we feel that restoration was done as expeditiously as possible

8. Assessment of the coordination of the efforts to ensure that critical operations facilities such as hospitals, residential care facilities, police and fire department buildings had temporary electric needs satisfied until service from the grid could be restored.

Restoration of critical facilities is always a priority, however in a storm of this magnitude, the extent of the damage dictates the restoration time. In the case of our major health care facilities in Joplin, they are on dual feed circuits and also have their own emergency generation. Many of the residential care facilities are more dispersed and are in residential areas on laterals far from substations that may be difficult to restore. We have often suggested to these groups that they install at least minimal emergency generation, but few have.

9. An assessment of the interdependence among all PSC certificated utilities as well as with utilities not certificated by the PSC in the affected areas.

Empire did communicate with other PSC certificated utilities via the Midwest Mutual Assistance Group in efforts to acquire resources; however, neighboring utilities were not releasing crews due to the uncertainty of weather forecasts which were eventually justified. Empire was able to acquire contract utility resources which were released from City of Springfield, City of Columbia, and Barton County Electric Coop. to provide support to our efforts. Empire has always been a good neighbor and assisted when possible.

10. An analysis that includes a comparison of utility performance with other utilities that had significant outages during the same time period.

Empire does not have access to information necessary to perform a comparison to other utility's performance.

11. If damage was caused by vegetation, a detailed overview of the type and extent of damage caused by various scenarios including whether the vegetation was located in the easement of right of way, whether the vegetation fell from outside the right of way, whether the vegetation was diseased or particularly weak, whether the vegetation fell vertically from above the electrical conductors and whether the vegetation had been appropriately addressed prior to the storm in accordance with the utility's vegetation management plan. Further, what percentage of the damage would have been prevented by the utility strictly adhering to its vegetation plan? What percentage of the damage would have been prevented by the utility if strictly adhering to the vegetation management plan proposal attached to the Opinion?

No detailed analysis was performed to this extent. However, it was obvious from the damage to trees throughout the affected area that structural failures of trees were not due to disease or rot. These failures were a result of extreme loading. Many times a failure

of a tree was the result of an impact sustained during full or partial failure of an adjacent tree. We do believe that if we would have achieved a complete cycle of our current trimming policy, we would have reduced the recovery time. During the restoration, we made every effort to obtain significant clearance such that another event would have less of an impact.

12. If the damage was caused by infrastructure failure aside from vegetation contact, identify more detailed reasons how and why the infrastructure failed, i.e., age, design, etc., and what can be done to strengthen the infrastructure.

Infrastructure failed due to extreme ice loading which was significantly more than loading that the system is designed to withstand. One comparison used was to compare the weight on a pole to that of a Chevrolet Suburban sitting atop of that same pole. Clearly, that is beyond normal design criteria. Design is according to the NESC.

13. An analysis of the economic impact on customers who experienced a disruption of power during the ice storms.

We realize that our customers were impacted in many different ways – Some were only inconvenienced, while others lost food, income, and had extra expense in obtaining shelter away from their home. Many of Empire's employees who were working to restore service were among those affected. We strive to work with our communities to be sure that shelters are available and that sources of help are communicated to our customers by our employees whether by the call center, office employees or those in the field. These people are our friends and neighbors often times, and we at Empire do everything possible to see to it that they and we are not negatively impacted any more than is absolutely necessary. Beyond that, I know of no way to accurately assess the impact on our customers.

14. Any and all recommendations to improve utility response to weather related and day to day electric outages in the future.

Empire employees have done a review/evaluation (see attachment B) which has been provided to the MPSC to identify areas that we can improve our storm responses. Additionally, we have added web access and customer communications recently to improve our customer information.

Storm Start	Storm End	Extent	Description
	December, 1848	An article in the Columbia Daily Tribune, December 19, 1924: "In December, 1848, sleet occurred which had no parallel in the history of the county. Trees, even of the largest class, were almost literally stripped of branches, rendering the roads in many places impassable. Trees without number were borne to the ground and broken off by insupportable mass of ice upon them. Shade and ornamental trees were greatly damaged and many orchards were ruined."	
12/16/1924	12/19/1924	One of the worst ice storms to affect Missouri in terms of severity, duration, damage and loss occurred. Central and east central portions of the state were hit hardest and after the storm had subsided. Ice ruts, 6 inches deep, were in the roads and made driving next to impossible. There were also reports of livestock frozen in the fields. To this date, the 1924 ice storm is one of the most significant winter weather events to strike Missouri.	Three-fourths of Missouri was covered by a layer of ice that varied from one to six inches thick.
01/08/1930	01/11/1930	Ozark Plateau; Quotes extracted from Climatological Data, January 1930 report: In most of the Ozark Plateau there was considerable damage to trees and utility properties by ice, from rain freezing as it fell, for three to four days beginning about January 8.	
01/07/1937	01/08/1937	The ice glaze was the heaviest in many years in Missouri. About one half of the state was affected, and the effects were severe in a belt extending in a southwest direction from Clark, Lewis, and Marion Counties on the northeast border to the southwest border. A strip about 50 to 75 miles wide in this belt suffered the maximum damages, with ice 1 to 2 inches thick on wires and considerably thicker on ground surfaces.	Mixed with the ice sheet was a heavy fall of sleet, varying in amount from 1 to 6 inches and averaging about 3 inches in most of northern Missouri and the west-central counties.
1/9/1949	1/12/1949	West Texas and southeastern New Mexico through the panhandle and north Texas, northeast across central Oklahoma and the southeastern corner of Kansas into south-central Missouri	Ice storm of unusual proportions; worst in Midland's history; long distance phone circuits out across region; 2 to 3inch of ice

Storm Start	Storm End	Extent	Description
1/22/1949	2/4/1949	North Texas north across central and eastern Oklahoma, northwest Arkansas and southeast Kansas and northeast into central Missouri	Worst ice storm in company history for Dallas P+L; steel towers crumpled; winds to 35 mph on 1/30 slowed repairs; 2inch of ice on wires; some phone lines had not been repaired from previous storm
1/3/1950	1/6/1950	Eastern Arkansas, western Tennessee, into Missouri	2inch of ice and sleet; worst ice storm in 17 years in Memphis area; one of worst in history in eastern AR
2/13/1951	2/15/1951	Southcentral Texas northeast across eastern Oklahoma and western Arkansas, into Missouri	Communication almost paralyzed in AR; ice on wires 1.5inch in diameter in San Antonio area; worst ice storm in Palestine TX history; timber damage in MO and AR
1/1/1952	1/7/1952	Northeast South Plains, northeast across central Oklahoma and east across north Arkansas and south Missouri	Ice on wires 2inch in diameter with 6inch long icicles in MO
4/17/1953	4/19/1953	Northcentral Oklahoma, east into Missouri	Ice, wind and lightning damaged phone and power lines
12/7/1956	12/10/1956	Northeastern Oklahoma northeast into Missouri and on	Power and communication lines damaged
1/26/1957	1/28/1957	Central Arkansas northeast through southeast Missouri	Most severe ice storm in northeast AR in 20 years; both water and power out in some towns; one of worst in memory in southeast MO;
12/2/1973	12/7/1973	Southwest Kansas, northeast across southeast Nebraska and northwest Missouri, and into central Iowa	Power outages lasted up to 6 days; one of most severe ice storms of record in KS; worst ice in this century in southwest IA; communication towers damaged

Storm Start	Storm End	Extent	Description
12/6/1978	12/10/1978	Central to northeast Arkansas into extreme southeast Missouri	Trees and power and phone lines damaged in AR; worst ice storm in extreme southeast MO since the 1950s; outages lasted up to 1 week
12/29/1978	1/4/1979	Central Texas northeast across southeast Oklahoma, northwest Arkansas and into Missouri	Worst ice storm in 30 years in TX and AR--10 day long outages in some places; gusty winds following ice storm in MO
12/12/1979	12/14/1979	Central north Texas into southcentral Oklahoma; southeast Missouri	Trees and power lines damaged; galloping; gusty winds
3/18/1984	3/20/1984	Southwest Kansas northeast to northwest Missouri and southeast Nebraska	Up to 2inch thick ice--communication towers fell-- one of most damaging and widespread ice storms ever in KS; outages lasted up to 1 week; no water in rural districts
12/13/1987	12/17/1987	Northwest Arkansas and southwest Missouri	Higher elevations in Ozarks affected
12/24/1987	12/30/1987	West North Texas northeast across central Oklahoma, northwest Arkansas, and southeast Kansas, and northeast through Missouri	Up to 1inch thick ice in KS; in MO up to 2inch thick ice, outages lasted up to 6 days, worst winter storm since early 70s, and ice remained longer at higher elevations; up to 3inch thick ice in OK, communication tower down in Tulsa, worst ice storm in the experience of many
12/29/1990	1/2/1991	Arkansas, except south and east, into southwest Missouri	Most severe ice storm since Dec 1983 with outages lasting up to 8 days in AR

Storm Start	Storm End	Extent	Description
10/28/1991	11/11/1991	West North Texas across west central Oklahoma and east central Kansas, and southeast Nebraska and northwest Missouri and into Iowa and MN; south central South Dakota into south central North Dakota	In OK, extensive tree pruning limited damage to power lines; up to 2inch ice and windy in KS, TV tower down; up to 2inch ice in NE; 1.5inch ice and windy in ND, galloping; most costly ice storm in history in IA; up to 3inch of ice in MN
12/1/1991	12/4/1991	West North Texas northeast across central Oklahoma into southeast Missouri	Trees and power lines damaged
1/16/1994	1/22/1994	North Arkansas into southeast Missouri	Power outages lasted more than 1 day in some areas
11/13/1996	11/27/1996	Northwest Arkansas, northeast Oklahoma into south central Missouri and north; northeastern Nebraska, southeast South Dakota and into western Iowa; in cloud icing in western Montana.	Up to 3inch thick ice in SD, outages lasted up to 4 days
1/12/1997	1/15/1997	Eastern Gulf coast of Texas into western Gulf coast of Louisiana; Extreme southeast Missouri	Record ice storm in LA; up to 1inch thick ice in MO, windy, communication tower down
1/1/1999	1/6/1999	Northwest and northcentral Arkansas across southwest Missouri	More than 1inch thick ice in AR; in MO up to 2inch thick ice, outages lasted up to 6 days
01/29/2002	01/31/2002	A long-lived major ice and snow storm blasted much of northwest, northern and central Missouri. Ice accumulations of over an inch were observed from the Kansas City metropolitan area, east and north through Moberly Missouri. For the Kansas City area, the ice storm was ranked as the worst ever.	At one point 409,504 total customers were without electrical power in the CWA, with some residents without power up to two weeks.

Storm Start	Storm End	Extent	Description
01/12/2007	01/14/2007	Southwestern, south central and east central Missouri; mostly along I-44 corridor from Springfield to St. Louis. The January 12-14 Ice Storm had not been experienced since the December 1987 Ice Storm, in terms of power outages. Fourteen other counties along the I-44 corridor also reported at least an inch of ice. The ice accumulations resulted in widespread downed trees and power lines. Approximately 200,000 residences were without power.	Ice Storm left over 200,000 southwest Missourians without power and a landscape resembling a war zone. Officially at the National Weather Service office in Springfield, one and a half inches of ice accumulation was received. Communities across southeast Kansas into western Missouri also received 1 to 5 inches of a snow and sleet mixture.
12/08/2007	12/11/2007	Southwestern and portions of central and east central Missouri as well as northwestern Missouri	The storm reached historical proportions over parts of northwestern Missouri, where some communities in Buchanan, Andrew, Holt, Atchison and Nodaway counties reported ice as thick as 1 inch.

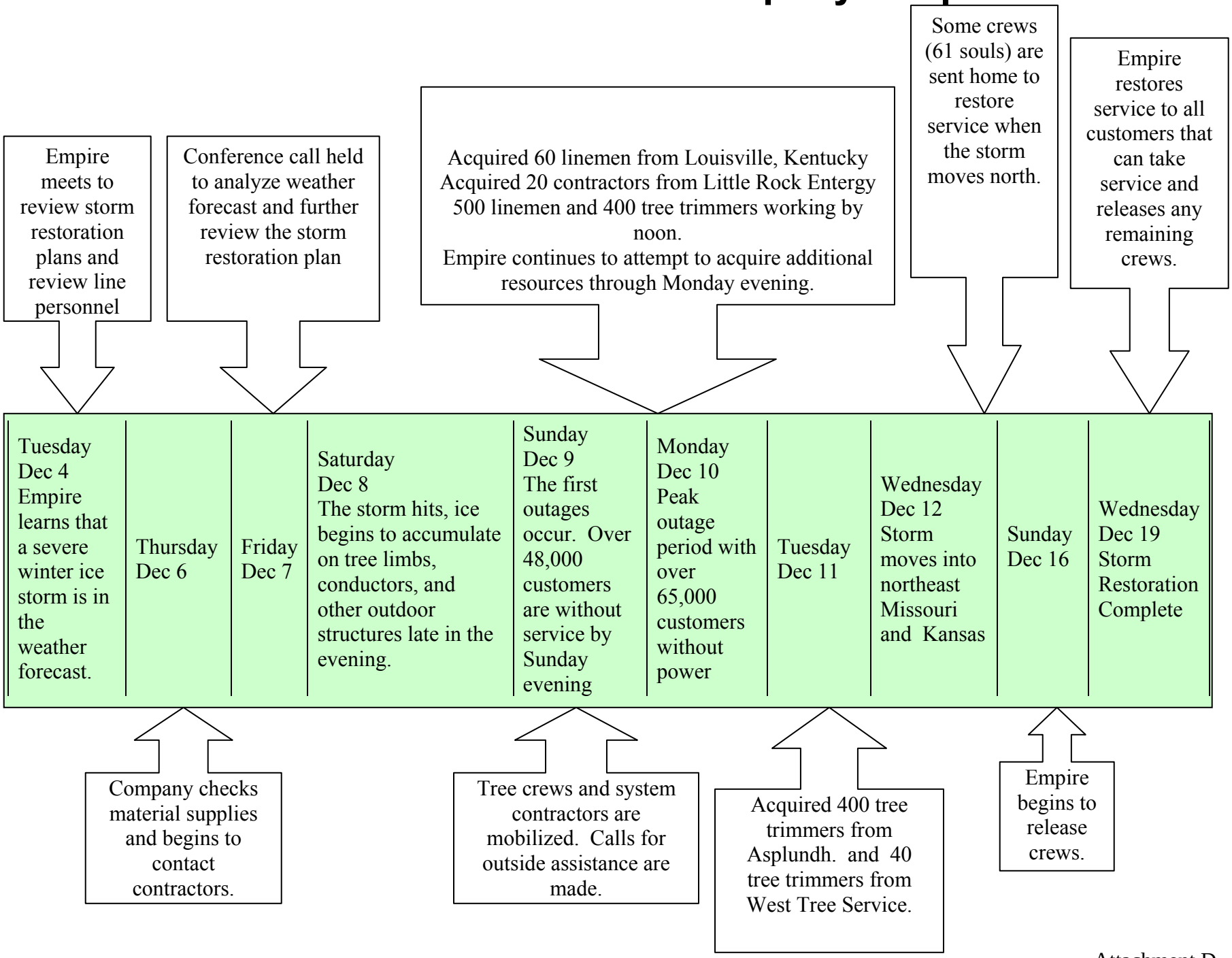
Source:

Data from 1848-1937: Dr. Guinan(Missouri State Climatologist) provided this information and he references it to a clipping from *Columbia Daily Tribune, December 19, 1924: Colonel William F. Switzler tells in his History of Boone County of a sleet storm* and an article that he wrote for Missouri Ruralist for which he extracted quotes from *Climatological Data, December 1924 report.*

Data from 1949-1999: American Life Alliance has gathered data on past ice storms from Storm Data(NOAA) and Climatological Data National Summary (US Weather Bureau) and news articles from cities in the affected region. The American Lifelines Alliance (ALA) is a public-private partnership project funded by the Federal Emergency Management Agency (FEMA) and managed by the National Institute of Building Sciences (NIBS), with the goal of reducing risks to lifelines from hazards.

Data for 2000- 2007: Event Archives and Significant weather records of NOAA's National Weather Service Weather Forecast Office.

December 2007 Ice Storm
Timeline of Events and the Company Response



Attachment D

April 21, 2008

December 2007 Ice Storm Process Review

In mid-January, Empire formed ten teams of employees to critically review the actions taken and the methods used during the December 2007 ice storm. It should be noted that this storm was extremely large and like the similar, but even larger, storm that occurred in January 2007 is not typical of the winter storms we normally experience every several years.

The review teams consisted primarily of various managers and supervisors, but also included selected non-management personnel. A listing, by team, of the personnel involved is attached. The charge given to each team was to review the response to a particular aspect(s) of the restoration and determine which parts went well and which areas could be improved. Each team submitted a draft report of their findings. Those observations and suggestions have been reviewed by the Directors of Commercial Operations as well as by Mike Palmer, Vice President of Commercial Operations.

One of the hallmarks of Empire District's approach to storm restoration is our "adapt and overcome" philosophy. This strategy has proven to be effective and is also somewhat of a necessity due to the limited size of our staff. Because of this, our Power Outage Recovery Plan (PLAN) is written in a somewhat general way. This review reinforced the idea to keep the plan flexible, but it also convinced us that we need to formalize some procedures and memorialize them in the PLAN.

Below is the list of primary findings of each of the ten teams with management responses in italics.

1) Restoration Management

- Update Power Outage Recovery Plan to include Outage Management System (OMS) use and procedures.

  Agreed. The OMS is a relatively new tool that has proven itself to be extremely valuable during restoration activities. We have used the OMS to great advantage, but its role needs to be memorialized in the PLAN.

- Train additional personnel to assist in the various roles required during major storms.

  Agreed. Some of these roles are: tree trimming crew leaders, line crew leaders, damage assessment, stores, OMS operators, communications liaisons. Also address line clearance handling/out tags/hold tags, etc.

- Assemble a recognized management team approach to be used by area managers during storms (e.g., Assessment Leader, OMS Operator, Vegetation Coordinator, Admin. Assist., Ass't Line Manager).

  Agreed. All plans must include line manager input and buy-in.

- Prepare handouts for the respective contractors noting tree trimming requirements, selected construction standards, contact information, standardized contact information for each contractor should be given to each area manager before the crew(s) arrive.

  Agreed. Also include maps and a list of communications do's/don'ts for conversing with customers, etc.

- Standardize the assessment methods and procedures to be done in each area.

  Agreed. See details in Assessment Team report.

- Consider purchasing GPS units for area managers and crew leaders.

  While this has some benefit, we don't believe it is worth the expense.

- Line clearance handling (review).

  Agreed. We need to review the safety manual's wording and include as part of our training. The OMS also has capabilities that can be used for this concern. Line managers must be central to this discussion.

- Develop training and drill/preparation schedules for various personnel/roles.

  Agreed. One suggestion was to include as part of Safety Tour meetings, etc.

2) Initial Preparedness & Damage Assessment

- Improve/Enhance maps and ensure proper distribution.

  Agreed. Additional street names, landmarks (lakes/waterways), etc. are being added as time permits.

- Adequately equipped and stocked storm trailer.

  Agreed. This is especially helpful in small storms.

- Document assessment methodology, techniques, implementation procedures, etc.

  Agreed. A group needs to be assembled to develop. Suggested team members: David Boren, Chris Schafer, Randy Penn (Leader), Lance, Garry, Jeff Brown, Shawn Pingleton.

- As appropriate, assessment personnel become crew leaders for tree trimming, etc. when assessment work is finished.

  Agreed.

- Local area construction designer should be used to assist the area manager.

  Agreed. Worked very well in Baxter, etc.

- Train appropriate individuals to recognize the various wire sizes and types.

  Agreed, but hard to do, especially if done infrequently.

- Document and train individuals on procedures to call for locates (necessary when installing a new pole).

  Agreed. Worked well having an SM&P employee to go with them.

- Provide formal, documented training of individuals used to perform, assessment, lead crews.

  Agreed. The team described (above) shall write the manual.

3) Outage Management System

- Evaluate redundant internet connection/provider(s).

  Agreed and is being done – now.

- Prepare on OMS manual.

  Agreed and has since been accomplished. Two manuals are presently available: I/Mobile (field) and Dispatcher manual.

- Train additional personnel to function as OMS operators (including as key OMS staff).

  Agreed. Chase Shelley and Mike Fobair have done some of this (Net Dispatcher) also consider Joe Wright or other IT personnel, but need to have an individual(s) trained to handle the Dispatcher function (Jeff Marshall (?), Glenn Blake, or ?

- Improve process so as to eliminate the SCADA system's potential to "confuse" the OMS.

Agreed. Will be handled by "turning off SCADA" in selected situations.

- Develop and implement policies/procedures to ensure that outages are closed quickly in the field (requires field support).

  Include in the update to the PLAN.

4) Call Center Operations

- Develop processes to enhance interdepartmental communications during storm restoration.

  Agreed. Part of the overall plan for "One Voice". Need a group to develop a process that supplies information to one area for review by officers and others as appropriate. Information is then made available for distribution. Suggested team: Amy Bass, Terry Oliver, Rick Wallace, Dan Carman, Marcia Sadler, Travis Jones.

- Consider the benefit of assigning an Empire contact for selected customers (large commercial, critical care facilities, hospitals, etc.)

  This is already in-place. The "special" customer list is being reviewed and the criteria for determining which "needs" qualify someone to be on the list is also being reviewed.

- Consider outside agent approach to improve the agents/calls ratio and to provide a quick response during all kinds of conditions.

  Various approaches are being reviewed to handle this problem.

- Investigate the possibilities of being able to flag or prioritize service orders or a comment section for special circumstances.

  We have the capability to do this now (and do); however, it is difficult to respond to these issues during large outages. This may be done during the smaller events. It may be possible to do this when you get down to the "service level" of the restoration.

- Have Corporate Communications assist in recording appropriate messages to use while customers are on hold, etc.

  Agreed.

5) Communications

- Additional field information needs to be supplied to Corporate Communications.

  Agreed. The team mentioned earlier should address.

- Additional emphasis needs to be given to the communication aspect of the restoration.

  Agreed.

- Need to ensure that all communiqués flow through Corporate Communications.

  Agreed.

- Corporate Communications needs to provide the Call Center new (updated) scripts at least once per day.

  Agreed. Perhaps twice per/day is better.

- Utilize "Turn Your Porch Lights ON" approach and inform the public of this practice in advance of emergencies and during the restoration.

  Agreed.

- Corporate Communications needs updates for the media at: 10AM, 3PM and 7PM.

  Agreed.

- Corporate Communications needs updates for the community and Agency contacts at: 7:30AM and 2:30 PM.

  Agreed. (This is for the State Emergency Management Assistance(SEMA) meetings.)

- Governmental Affairs personnel should be responsible for communicating with state and national government elected officials and their staffs. Must work closely with Community, Agency Contact and Corporate Communications.

  Agreed, except in instances where a local Empire employee has an established relationship.

- Need to develop an "Outage" section for the website that contains numerous items as described in the team's report.

  In-progress. Should be implemented by summer 2008.

6) Communication facilities & Other

- Obtain additional internet provider(s) (already in process).

In-progress.

- Discuss (in advance) with area cooperatives the impact of cutting our fiber lines and work out necessary agreements to prevent future of occurrences.

  Agreed.

- Designate "War Rooms" so that any special configurations for the corporate network of communications can already be in place for those locations prior to a crisis.

  Will continue to investigate.

- When weather (and/or other emergency conditions) exist that warrant, send out an internal communications to appropriate departments advising them to be on alert and make necessary and appropriate preparations.

  Will include language in the PLAN to address this item and other related issues.

- Consider placing all service center generators under a centrally managed maintenance agreement. Also, they should be sized to maintain heat, lights, computers and phones.

  Will consider.

- Need a "storm stock" of antennas and two-way radios.

  Agreed.

- Review external speaker settings on trucks. When set to automatically power both the internal and external speakers cell phones cannot be heard inside the trucks.

  Radio communications should take priority.

7) Contractor Performance

- "Workscope" documentation needs to be provided to potential contractors prior to using them. (Document to contain such information as: EDE expectations, safety practices, crew makeup, required equipment.).

  Agreed that this has some merit and will be considered to be sent to selected contractors.

- A storm organizational chart needs to be developed that lists the roles and individuals in those roles.

Contact information will be provided in the packets submitted to contractors. Storms are dynamic and it would be difficult to maintain an org chart as described.

- The appropriate ratio of tree trimming crews/line crews needs to be made.

  Agreed that the ratio is important; however, this is not always obvious early on.

- Line construction and Line clearing policies need to be developed and supplied to contractors.

  Will be included in the "packet" that will be developed and distributed.

- EDE support personnel (particularly those serving in non-traditional roles) need to receive proper advance training for their role.

  This will be accomplished via the training already discussed.

- Develop an "Information" packet containing items such as: General safety information, company guidelines for line clearing and line framing, maps (circuit and street), list of personnel contacts, roster template.

  Will be done. (Engineering will take care of.)

- Survey both line managers and contract crews concerning performance, methods, and other appropriate information.

  Was done during the past storm and will be done in the future. A form needs to be developed by this team and submitted for review.

8) Material

- Enhance communication from the field to the storeroom (didn't really cause any issues, but can always be improved).

  Agreed. Will be reviewed by the team assembled to investigate assessment improvements.

- Increase the amounts of commonly used material (e.g., insulinks and splices).

  Agreed. Stores group should investigate the items and quantities.

- The storm trailer was not ready for use – stock and make ready.

Agreed. Stores group should take care of this.

- Consider manned outside staging areas. Equip with generators, heat, portable restrooms, etc. Meals could also be distributed from these locations. Pod containers could be used as a storm trailer at these locations. This would also relieve congestion at the regular service centers.

  Difficult to pre-determine too many details on this; however, some preliminary work can be done by the Stores, T&D and Logistics personnel.

- Semi deliveries could/should be made at night to improve efficiencies.

  Agreed. Beneficial in many instances. Stores group should give this consideration.

- Rent a forklift or bobcat ASAP for those storerooms/facilities that do not have them normally available.

  Agreed. Stores should adapt this as appropriate.

- Increase/improve communications between outside storekeepers and Purchasing (especially at the start).

  Agreed. The assessment team that was discussed earlier can review this and work with the Stores group as appropriate.

- Develop a policy concerning what tools and safety material shall be supplied during storm situations.

  Agreed. Stores and T&D need to work together on this. Another way to help prevent this is to have the contractors assemble at another location remote from the service center and only send a representative(s) to the storeroom.

- Some deliveries must be made without the usual paper work.

  Agreed.

9) Logistics

- Evaluate the cost/benefits of using a logistics company such as Base Logistics verses performing that function in-house (Can use actual EDE costs versus the advertised cost of Base Logistics).

  Agreed. The Logistics Team (also include Sam McGarrah and Martin Penning) should do this investigation.

- Review/evaluate using Base Logistics (or some other company) to supply self-contained housing/food service only.

  Same as previous answer.

- Make sure all Empire owned vehicles are clearly marked as "Gas" or "Diesel".

  Agreed.

- Obtain personnel and vehicle information from all contractors at the time they are contracted (Necessary to obtain rooms, make emergency contacts, track vehicles for fueling purposes, etc).

  Agreed. Will be done via the "packet".

- Supply contractors with numerous pieces of information including fueling locations, instructions regarding marking vehicle as using either gas or diesel, laundering information, meal instructions.

  Agreed. Will be done via the "packet".

- Prepare an instruction letter for each foreman (English and Spanish).

  Agreed. Will be done via the "packet".

- Contact additional potential food suppliers (on/off system).

  Logistics Team needs to develop a procedure for doing this and include recommendations to ensure this is done.

- Ensure that an up to date list of available restaurants (that will direct bill) is made and kept current.

  Same as previous answer.

- Make advance contact with additional shuttle service providers (on/off system).

  Same as previous answer.

- Consider the possibility that shuttle contractors may also require fueling operation.

  Agreed.

- Ensure that adequate traffic control, fueling, security arrangements, etc are made and planned in advance.

  Agreed.

- Develop a list of summer/winter snacks (including drinks).

  Agreed. A standardized list, of a limited number of items, needs to be developed by the Logistics Team.

10) Safety & Security

- Daily safety message approach worked well and should be continued.

  Agreed.

- Seek ways to improve the logistics involved with getting the daily safety message to all affected parties.

  Agreed. Safety Supervisor (Danny Sluder) should make appropriate suggestions.

- EDE Safety & Environmental staff should enhance its involvement with contractor safety personnel.

  Agreed.

- Prepare a list of the requirements for private security guards and make advance contact with these companies to ensure proper communication of our needs.

  Agreed. This should be handled by Safety and Environmental along with Commercial Operations

- Provide additional training for EDE personnel on how to handle the public if a threatening/hostile situation develops.

  Agreed. This can be done via Safety Meeting.

<u>Review Summary and Next Steps</u>

In total, the response to this storm was very good and, although there are multiple areas in which we want to improve, the most important single area for improvement is that of Communications. We recognize that our customers want, and need, to know when their service will be restored. Unfortunately during extreme events this is especially hard to do. Historically a utility's major focus has been on the physical work itself, but we are

very aware of the increasing necessity to supply accurate and timely information to our customers. While the Outage Management System can be used to get an overall picture of the event; and, radio, television and the internet can be used to convey information, the information itself originates from the local areas. To this end, we intend to focus on enhancing information flow from the local area to corporate staff and ensuring that a single message is conveyed to the customer.

The next steps are to reassemble the facilitators of the various teams and present management's position on the respective suggestions. Following that the teams will be asked to perform complete the various additional tasks mentioned in their respective reports. The additional work by the various teams should be completed by August 1st and the necessary training by October 1st.

Teams and Personnel Involved

1. Restoration Management

David Boren - Facilitator	Bob Brown
Lance Burbridge	Bob Patterson
Garry Haralson	Dan Carman
Denny Frieze	Martin Penning

2. Initial Preparedness & Damage Assessment

Chris Schafer - Facilitator	Jim Barker
Chase Shelley	Bob Brown
Brent Baker	Sam McGarrah

3. Outage Management System

Glenn Blake – Facilitator	Wes Robertson
Garry Haralson	Rick Wallace
Jeff Marshall	

4. Call Center Operations

Marcia Sadler – Facilitator	Tina Gaines
Anna Lee Alumbaugh	Rick Wallace

5. Communications

Amy Bass – Facilitator	Terry Oliver
Julie Maus	Mike Gardner
Emily Stanley	

6. Communication Facilities & Other

Tina Gaines – Facilitator	Ivan Johnson
Payton White	Mike Hayward

7. Contractor Performance

John Donaldson – Facilitator	Joe Johnson
Scott Mackey	Josh Clements
Dan Carman	

8. Material

Randy Penn – Facilitator	Karen Garver
Bob Patterson	Steve Shull

9. Logistics

Rick Hendricks – Facilitator	Shawn Pingleton
Travis Jones	Diana Cowardin
Darrel Allison	Shawn Pingleton

10. Safety & Security

Danny Sluder –Facilitator	George Thullesen
Kavan Stull	