

421 West Main Street
Post Office Box 634
Frankfort, KY 40602-0634
[502] 223-3477
[502] 223-4124 Fax
www.stites.com

April 1, 2009

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Mark R. Overstreet
(502) 209-1219
(502) 223-4387 FAX
moverstreet@stites.com

HAND DELIVERED

Reggie Chaney
Director of Engineering
Public Service Commission of Kentucky
211 Sower Boulevard
Frankfort, Kentucky 40601

**RE: Kentucky Power Company's Annual Reliability Report and Distribution
Vegetation Management Plan**

Dear Mr. Chaney:

Enclosed please find Kentucky Power Company's filing in response to the Commission's October 26, 2006 Order in Case No. 2006-00494.

Please do not hesitate to contact me if you have any questions.

Very truly yours,


Mark R. Overstreet

cc: Persons on Attached Service List

16393:3:FRANKFORT

Allen Anderson
Manager
South Kentucky R.E.C.C.
P. O. Box 910
925-929 N. Main Street
Somerset, KY 42502-0910

Carol Hall Fraley
President & CEO
Grayson R.E.C.C.
109 Bagby Park
Grayson, KY 41143

Rick LoveKamp
Kentucky Utilities Company
220 West Main Street
P. O. Box 32010
Louisville, KY 40202

Lonnie E Bellar
E.ON U.S. Services, Inc.
220 West Main Street
Louisville, KY 40202

Ted Hampton
General Manager
Cumberland Valley Electric, Inc.
Highway 25E, P. O. Box 440
Gray, KY 40734

Debbie Martin
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY 40065

Daniel W Brewer
President And Ceo
Blue Grass Energy Cooperative Corp.
P. O. Box 990
1201 Lexington Road
Nicholasville, KY 40340-0990

Vince Heuser
Nolin R.E.C.C.
411 Ring Road
Elizabethtown, KY 42701-6767

Burns E Mercer
Manager
Meade County R.E.C.C.
P. O. Box 489
Brandenburg, KY 40108-0489

Jackie B Browning
General Manager
Farmers R.E.C.C.
504 South Broadway
P. O. Box 1298
Glasgow, KY 42141-1298

Larry Hicks
President and CEO
Salt River Electric Cooperative Corp.
111 West Brashear Avenue
P. O. Box 609
Bardstown, KY 40004

Barry L Myers
Manager
Taylor County R.E.C.C.
100 West Main Street
P. O. Box 100
Campbellsville, KY 42719

Sharon K Carson
Finance & Accounting Manager
Jackson Energy Cooperative
115 Jackson Energy Lane
McKee, KY 40447

Robert Hood
President & CEO
Owen Electric Cooperative, Inc.
8205 Highway 127 North
P. O. Box 400
Owenton, KY 40359

Sanford Novick
President and CEO
Kenergy Corp.
3111 Fairview Drive
P. O. Box 1389
Owensboro, KY 42302

Lawrence W Cook
Assistant Attorney General
Office of the Attorney General Utility & Rate
1024 Capital Center Drive
Suite 200
Frankfort, KY 40601-8204

Kerry K Howard
Manager, Finance and Administration
Licking Valley R.E.C.C.
P. O. Box 605
271 Main Street
West Liberty, KY 41472

G. Kelly Nuckols
President & Ceo
Jackson Purchase Energy Corporation
2900 Irvin Cobb Drive
P. O. Box 4030
Paducah, KY 42002-4030

Paul G Embs
Clark Energy Cooperative, Inc.
P. O. Box 748
2640 Ironworks Road
Winchester, KY 40392-0748

James L Jacobus
President/CEO
Inter-County Energy Cooperative Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY 40423-0087

Clayton O Oswald
Taylor, Keller & Dunaway & Tooms Attorneys At
1306 West Fifth Street
Post Office Box 905
London, KY 40743-0905

John J Finnigan
Associate General Counsel
Duke Energy Kentucky, Inc.
P. O. Box 960
139 East 4th Street
Cincinnati, OH 45201

Honorable Frank N King, Jr.
Attorney at Law
Dorsey, King, Gray, Norment & Hopgood
318 Second Street
Henderson, KY 42420

Anthony P Overbey
President & CEO
Fleming-Mason Energy Cooperative
P. O. Box 328
Flemingsburg, KY 41041

Honorable Mark R Overstreet
Attorney at Law
Stites & Harbison
421 West Main Street
P. O. Box 634
Frankfort, KY 40602-0634

Bobby D Sexton
President/General Manager
Big Sandy R.E.C.C.
504 11th Street
Paintsville, KY 41240-1422

Michael I Williams
Senior Vice President
Blue Grass Energy Cooperative Corp.
P. O. Box 990
1201 Lexington Road
Nicholasville, KY 40340-0990

Melissa D Yates
Attorney
Denton & Keuler, LLP
555 Jefferson Street
P. O. Box 929
Paducah, KY 42002-0929

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 1: CONTACT INFORMATION

UTILITY NAME	1.1	Kentucky Power Company
REPORT PREPARED BY	1.2	Everett G. Phillips
E-MAIL ADDRESS OF PREPARER	1.3	egphillips@aep.com
PHONE NUMBER OF PREPARER	1.4	606-929-1463

SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	2.1	2008
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SECTION 3: MAJOR EVENT DAYS

T_{MED}	3.1	26.306
FIRST DATE USED TO DETERMINE T_{MED}	3.2	1/1/2003
LAST DATE USED TO DETERMINE T_{MED}	3.3	12/31/2007
NUMBER OF MED IN REPORT YEAR	3.4	1

NOTE: Per IEEE 1366 T_{MED} should be calculated using the daily SAIDI values for the five prior years. If five years of data are not available, then utilities should use what is available until five years are accumulated.

SECTION 4: SYSTEM RELIABILITY RESULTS

Excluding MED

SAIDI	4.1	496.3
SAIFI	4.2	2.904
CAIDI	4.3	170.9

Including MED (Optional)

SAIDI	4.4	531.2
SAIFI	4.5	2.991
CAIDI	4.6	177.6

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Notes:

- 1) All duration indices (SAIDI, CAIDI) are to be reported in units of minutes.
 - 2) Reports are due on the first business day of April of each year
 - 3) Reports cover the calendar year ending in the December before the reports are due.
 - 4) IEEE 1366 (latest version) is used to define SAIDI, SAIFI, CAIDI, and T_{MED}
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KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 5: OUTAGE CAUSE CATEGORIES

Excluding MED

CAUSE CODE DESCRIPTION	SAIDI VALUE	CAUSE CODE DESCRIPTION	SAIFI VALUE
Veg Outside R/W	5.1.1 177.2	Veg Outside R/W	5.2.1 0.741
Equipment Failure	5.1.2 90.5	Equipment Failure	5.2.2 0.627
Veg Inside R/W	5.1.3 74.6	Veg Inside R/W	5.2.3 0.383
Station - Distribution	5.1.4 28.3	Scheduled	5.2.4 0.261
Scheduled	5.1.5 26.2	Station - Distribution	5.2.5 0.241
Vehicle Accident	5.1.6 22.4	Transmission	5.2.6 0.139
Transmission	5.1.7 19.0	Vehicle Accident	5.2.7 0.109
Weather - Unknown	5.1.8 15.8	Weather - Unknown	5.2.8 0.089
Unknown (Non-Weather)	5.1.9 7.7	Unknown (Non-Weather)	5.2.9 0.065
High Winds	5.1.10 7.1	Vandalism	5.2.10 0.046

SECTION 6: WORST PERFORMING CIRCUITS

CIRCUIT IDENTIFIER	SAIDI VALUE	MAJOR OUTAGE CATEGORY
3404002	6.1.1 3603.3	Weather - Lightning
3307302	6.1.2 2286.2	Tree Out of ROW
3000601	6.1.3 2099.4	Scheduled - Company
3310501	6.1.4 2016.4	Tree Out of ROW
3308603	6.1.5 1693.1	Tree Out of ROW
3309901	6.1.6 1620.1	Weather - Unknown
3309001	6.1.7 1509.4	Tree Out of ROW
3411801	6.1.8 1420.9	Weather - Unknown
3007904	6.1.9 1230.6	Tree Out of ROW
3303903	6.1.10 1225.6	Tree Out of ROW

CIRCUIT IDENTIFIER	SAIFI VALUE	MAJOR OUTAGE CATEGORY
3310501	6.2.1 9.615	Tree Out of ROW
3411801	6.2.2 8.944	Equipment Failure
3413402	6.2.3 7.827	Weather - Lightning
3411802	6.2.4 7.482	Equipment Failure
3311103	6.2.5 7.312	Vandalism
3307302	6.2.8 6.827	Tree Out of ROW
3202202	6.2.6 6.686	Equipment Failure
3201001	6.2.7 6.643	Scheduled - Company
3000601	6.2.9 6.533	Scheduled - Company
3404002	6.2.10 6.300	Tree Out of ROW

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

Additional pages may be attached as necessary

SECTION 7: VEGETATION MANAGEMENT PLAN REVIEW

See attachments:

- VM Plan Update - April 1, 2009
- 2008 VM Plan Summary
- 2009 VM Plan Summary

SECTION 8: UTILITY COMMENTS

System Reliability results for each of the past 5 years is attached separately:
System Reliability Summary - Kentucky Power - 2009

Worst Performing Circuit (WPC) analysis and plans are attached separately:
KPCo WPC Analysis and Plans - Ashland District for 2008
KPCo WPC Analysis and Plans - Hazard District for 2008
KPCo WPC Analysis and Plans - Pikeville District for 2008

Kentucky Power Company

Vegetation Management Plan Update

April 1, 2009

Kentucky Power Company manages vegetation along approximately 9,700 miles of distribution line within its service territory. Kentucky Power's distribution Vegetation Management Plan (VM Plan) integrates a blend of work methods to achieve long-term goals and address short-term corrective maintenance. The following activities are included in Kentucky Power's VM Plan: (1) tree pruning and removal, (2) manual, mechanical and chemical control of vegetation along right-of-ways, (3) pre and post inspections of required work, (4) tree replacement program, (5) public education, and (6) tree inventories, work management system and computerized functions.

The VM Plan is developed by Kentucky Power Forestry personnel by evaluating circuit reliability performance, maintenance histories, field analysis of Right-Of-Way (ROW) conditions, customer feedback, and input from field personnel. Local operations and engineering personnel are also consulted for their knowledge of circuit design, field observations, circuit performance, and local community issues. The VM Plan is intended to be flexible and can be modified throughout the year to adapt to changing environmental conditions and any developing vegetation-related reliability issues.

The 2008 Kentucky Power distribution VM Plan was implemented as planned without any major changes. However in 2008, the Eastern Kentucky weather patterns returned to more normal conditions following very dry and calm conditions in 2007. This resulted in increased tree growth rates for the year. We also experienced a great increase in the number of wind storms. With the increase in the vegetation volume and an increased amount of time devoted to service restoration activities, we did not achieve our targets for miles of line maintained and for total expenditures for the year. Maintenance was performed on 1,393 miles of line which was 80.4% of the goal. Our total expenditures for the 2008 program were 95.9% of the budgeted amount.

For 2009, there are no major changes in the activities and processes utilized in Kentucky Power's distribution VM Plan, which calls for maintaining 1,229 miles of line at a total expenditure of \$9,676,000.

(See attached summary tables for 2008 and 2009 numbers.)

2008 KENTUCKY POWER VEGETATION MANAGEMENT PLAN SUMMARY

AREA	PLANNED CUT MILES	ACTUAL CUT MILES	PLANNED AERIAL SAW MILES	ACTUAL AERIAL SAW MILES	PLANNED SPRAY MILES	ACTUAL SPRAY MILES	PLANNED SPRAY ACRES	ACTUAL SPRAY ACRES
HAZARD	273	437	27	16	339	339	1115	1115
PIKEVILLE	413	204	27	7	253	125	625	779
ASHLAND	311	126	15	31	75	108	241	326
TOTALS	997	767	69	54	667	572	1981	2220

AREA	FORESTRY CAPITAL FUNDING	FORESTRY CAPITAL EXPENDITURES	UNSCHEDULED REACTIVE O&M FUNDING	UNSCHEDULED REACTIVE O&M EXPENDITURES	SCHEDULED O&M FUNDING	SCHEDULED O&M EXPENDITURES	TOTAL O&M FUNDING	TOTAL O&M EXPENDITURES
HAZARD	\$ 907,225		\$ 221,500	\$ 165,921	\$ 2,292,625		\$ 2,514,125	
PIKEVILLE	\$ 979,093		\$ 426,975	\$ 152,384	\$ 2,533,630		\$ 2,960,605	
ASHLAND	\$ 794,117		\$ 150,000	\$ 293,076	\$ 1,970,606		\$ 2,120,606	
TOTALS	\$ 2,680,435	\$ 2,618,698	\$ 798,475	\$ 611,381	\$ 6,796,861	\$ 6,620,518	\$ 7,595,336	\$ 7,231,899

2009 KENTUCKY POWER DISTRIBUTION VEGETATION MANAGEMENT PLAN

AREA	PLANNED MILES	PLANNED SPRAY ACRES	UNSCHEDULED REACTIVE O&M FUNDING	SCHEDULED O&M FUNDING	TOTAL O&M FUNDING	FORESTRY CAPITAL FUNDING	TOTAL VMP FUNDING
HAZARD	484	863	\$ 191,947	\$ 2,139,834	\$ 2,331,781	\$ 891,407	\$ 3,223,188
PIKEVILLE	408	621	\$ 320,400	\$ 2,327,192	\$ 2,647,592	\$ 1,012,136	\$ 3,659,728
ASHLAND	337	493	\$ 150,000	\$ 1,870,627	\$ 2,020,627	\$ 772,457	\$ 2,793,084
TOTALS	1229	1977	\$ 662,347	\$ 6,337,653	\$ 7,000,000	\$ 2,676,000	\$ 9,676,000

Kentucky Power Company

5-Year System Performance

(Excluding Major Events as defined by IEEE Std 1366)

Calendar Year	SAIFI	CAIDI	SAIDI
2004	2.545	204.5	520.5
2005	2.574	159.5	410.4
2006	2.756	182.2	502.1
2007	2.276	146.9	334.2
2008	2.904	170.9	496.3

Kentucky Power Company

2008 WORST PERFORMING CIRCUITS

Analysis of Causes/Corrective Actions

Ashland District

Grahn Station – Pleasant Valley 12kV Circuit (3000601 – SAIDI # 3, SAIFI # 8)

About 60% of the Customers Interrupted (SAIFI) and Customer Minutes Interrupted (SAIDI) can be accounted for by Transmission - Vandalism and Transmission – Scheduled outages. On February 2, 2008 a vandal shot an insulator and conductor down on the 69 kV feeding the station. Crews went to open the 69 kV switch just outside of Grahn Station and found the switch to be defective. In order to get customers back on, loops were cut and customers were restored. The following weekend customers were outaged for the second time to make up loops. On June 14, 2008, loops were cut once again so the switch could be isolated. A new pole and switch were installed. The fourth outage was on July 11 to make up loops on the newly installed switch and pole.

No further action is required.

Busseyville Station – Torchlight 34.5kV Circuit (3007904 – SAIDI # 9)

Over 75% of the total Customer Minutes Interrupted were due to Tree Out of ROW and Vehicle Accident (Non-AEP). On August 11, 2008 a truck with its bed raised traveling along US 23 caught a telephone cable and broke 4 or 5 poles. This one episode caused approximately 35% of the total CMI for the entire year. Another 40% of the total Customer Minutes Interrupted was due to numerous Tree Out of ROW outages. Several areas have been targeted and dead pines have been removed over the past year. Along SR 581, eight to ten spans are in the process of being relocated to avoid further tree related issues. We will continue to review outage data and act accordingly.

Kentucky Power Company

2008 WORST PERFORMING CIRCUITS

Analysis of Causes/Corrective Actions

Hazard District

Haddix Station – Quicksand 34.5kV Circuit (3310501 – SAIFI #1, SAIDI #4)

This circuit has been at or near the top of our worst performing circuit list for several years. Last year's list had this circuit ranked at SAIFI#9 and SAIDI #10, so in spite of continued efforts to improve the reliability performance, the Haddix Quicksand Circuit indices worsened.

SAIFI 2007 vs. 2008 was 5.488 and 9.615 respectively and SAIDI 2007 vs. 2008 was 842.9 and 2016.4 respectively. Total customer minutes of interruptions (CMI) for 2007 vs. 2008 were 1,884,737 and 4,504,694 respectively.

Causes

The top four outage causes that contributed to 92% of the total CMI for 2008 were:

Tree out of ROW	=	1,812,937 minutes (40.2% of total CMI)
Equipment Failure	=	1,417,590 minutes (31.5% of total CMI)
Tree in ROW	=	596,333 minutes (13.2% of total CMI)
Scheduled	=	317,051 minutes (7.0% of total CMI)

Because of the size of this circuit (240 line miles – note this was reported as 259 miles in last year's report) and the number of customers served (over 2220) any outage on the feeder breaker of the first zone reclosers will result in a high number of customer minutes of interruption. In fact, during 2008, there were eight outages out of a total of 160 outages that accounted for 63% of the total CMI for the circuit.

These eight outages involved either the feeder breaker or first zone reclosers which affected a large number of customers and also had long durations which directly contributed to the increase in SAIFI and SAIDI. The details of these outages are below:

Date	Cause	Isolating Device	Total Duration (min)	Customers Affected	Total CMI
1/8/2008	Scheduled	Recloser	207	1032	213,624
1/29/2008	Tree in ROW	Feeder	239	2236	534,404
2/6/2008	Tree out ROW	Feeder	316	2236	365,683
6/3/2008	Tree out ROW	Recloser	472	727	266,671
7/9/2008	Tree out ROW	Recloser	660	569	360,381
7/27/2008	Equip (pole)	Recloser	539	1122	524,287
11/4/2008	Equip (pole)	Recloser	505	567	214,824
12/26/2008	Equip (insul)	Feeder	141	2220	313,020

Corrective Actions

After the feeder breaker outages in January and February, the breaker zone right of way was inspected and the width of the right of way was expanded. Also, a pine thicket that was responsible for the Tree in ROW outage was cleared. All circuit breaker zones have been worked to have the rights of way widened in selected areas. This program has been expanded in 2009 to begin similar work in downstream recloser zones that have large numbers of customers.

A detailed pole-by-pole inspection was completed in 2007 and the outage on Jan 8, 2008 was scheduled to make multiple simultaneous repairs to the circuit that could not be performed with the lines energized.

The insulator failure that caused the Dec. 26, 2008 outage belonged to a class of old polymer insulators that are experiencing an increasing number of failures. Over 250 insulators of this type were identified in the inspection and there will be outages scheduled in 2009 to replace the insulators along with other equipment.

It is possible in the future that an additional circuit feeder breaker and exit circuit be constructed so that the Haddix Quicksand Circuit could be divided into two circuits. That way, a feeder outage would affect fewer customers. This will depend on capital funding and priorities.

The concentrated cutout replacement program appears to have been a success, with only 12 cutout related outages that accounted for just 76,043 customer minutes of interruption. Of course, this is dependent on where the failure occurs on the circuit. The replacement program targeted the breaker zone and then the larger recloser protection zones.

Bulan Station – Ajax Dwarf 12kV Circuit (3307302 – SAIDI # 2, SAIFI # 5)

This circuit was not on either the SAIFI or SAIDI list in 2007. The predominant outage causes for this circuit were Tree out of ROW and Weather - High Winds, which accounted for 48.5% and 39% of the total CMI respectively for the circuit during the year. There were a total of 69 sustained outages on the circuit for the year with 28 for Tree out of ROW and only one for Weather - High Winds.

The Bulan Ajax Dwarf Circuit is composed of three main branches that split near the Bulan Station. One branch feeds towards Lost Creek, one branch feeds towards Dwarf and the other branch feeds towards Ajax. Each of these branches is protected by reclosers. The reason for the high SAIFI and SAIDI is that many of the Tree out of ROW outages affected either the feeder breaker or the reclosers protecting these main branches. The one Weather High Winds outage initially affected the feeder breaker.

These outages affected many customers and had long restoration times due to the significant damage caused by the fallen trees which typically break crossarms and poles. The one Weather High Winds outage damage included two broken poles at a mountain top to mountain top highway crossing. Bulldozers were used to access the work site and the poles had to be set manually. This one outage which affected the Lost Creek branch lasted over 44 hours. Many of the long outages caused by trees also affected the Lost Creek branch.

One Tree in ROW outage event on 7/11/2008 accounted for 69.3% of the total CMI for all Tree in ROW outages for the entire circuit. This was a very large pine tree that leaned into the conductors. The property owner would only allow the tree to be trimmed.

Below is a table summarizing the top ten outages on the circuit based on total CMI:

Date	Cause	Isolating Device	Total Duration (min)	Customers Affected	Total CMI
4/11/2008	High Winds	Feeder	2,661	1108	986,463
5/11/2008	Tree Out ROW	Recloser	783	340	248,000
8/27/2008	Tree Out ROW	Feeder	749	1103	216,685
12/10/2008	Tree Out ROW	Recloser	540	345	175,947
12/14/2008	Tree Out ROW	Recloser	457	434	161,486
7/11/2008	Tree In ROW	Recloser	954	358	133,284
6/16/2008	Tree Out ROW	Recloser	429	226	96,954
1/29/2008	Tree Out ROW	Recloser	428	208	89,024
1/30/2008	Tree Out ROW	Switch	644	88	56,672
12/14/2008	Tree Out ROW	Recloser	486	114	55,404

Corrective Actions

The Dwarf branch of the circuit has a circuit tie with the Beckham Hindman 34.5kV Circuit that can be used for partial restoration during outages via a large step-down transformer bank. The Lost Creek and Ajax branches are radial feeds with no circuit ties.

There is a project in progress to provide an alternate feed for the Lost Creek branch of the circuit. The Shamrock Shamrock 34.5kV Circuit crosses the Bulan Ajax Dwarf Circuit near the end of the Lost Creek branch. A step-down transformer bank with reclosers and voltage regulators has been installed to add a 12kV source. The part of the circuit that was involved in the Weather High Wind outage has been relocated to a lower elevation which makes the conductor more accessible and minimizes exposure to higher elevation winds.

In 2009, Vegetation Management has begun ROW reclearing along the Lost Creek and Dwarf branches of the circuit. Additional widening of the existing ROW will be performed in select locations, especially patches of pine trees, in an attempt to reduce the number of tree outages.

Also, relay recalibration will be performed to prevent feeder breaker lock outs for sustained faults beyond the main circuit branch reclosers.

Beckham Station – Hindman 34.5kV Circuit (3308401 – SAIFI # 10)

The Beckham Hindman Circuit is a large circuit with over 180 primary line miles and it serves almost 3500 customers. In the Hazard District, the Beckham Hindman Circuit ranks #1 for customers served and ranks second only to the Haddix Quicksand Circuit in primary line miles.

Because of the circuit's size and number of customers served, any outage involving the circuit feeder breaker or first zone reclosers will affect a large number of customers. The total CMI for this circuit in 2008 was 3,530,073. The three outages causes that contributed most to the total CMI were: Tree out of ROW, Equipment Failure and Scheduled with 1,670,258; 1,382,205; and 212,965 CMI respectively.

There were two outages that involved the feeder breaker. On 1/29/2008, a tree fell from outside the ROW and stripped the conductors from a three phase pole in the breaker zone. Even with partial restoration, this outage lasted for 12 hours and generated 1,175,406 CMI. This one outage accounted for 33.3% of the total CMI for this circuit in 2008. On 12/14/2008, a cutout failed in the breaker zone which resulted in an outage that lasted almost eight hours and generated 796,473 CMI. These two outages accounted for 55.1% of the total CMI for the circuit and a circuit SAIFI of 2.

Below is a table summarizing the top ten outages on the circuit based on total CMI:

Date	Cause	Isolating Device	Total Duration (min)	Customers Affected	Total CMI
1/29/2008	Tree Out of ROW	Feeder	721	3,493	1,175,406
12/14/2008	Equip (Cutout)	Feeder	465	3,487	796,473
3/7/2008	Equip (crossarm)	Recloser	306	1,180	219,561
6/28/2008	Tree Out of ROW	Recloser	276	520	143,520
12/19/2008	Equip (crossarm)	Recloser	176	1183	99,203
11/13/2008	Tree Out of ROW	Recloser	123	583	71,709
12/3/2008	Scheduled	Recloser	496	417	64,474
3/18/2008	Scheduled	Recloser	126	415	52,290
4/8/2008	Scheduled	Recloser	119	415	49,385
6/1/2008	Equip (crossarm)	Recloser	429	292	46,428

Corrective Actions

A large capital improvement project was begun in 2008 to establish the new Soft Shell 138/34.5kV Station. The purpose of this project was to relieve loading on the Beckham Station Transformer and the Beckham Hindman Circuit. Soft Shell Station was placed in service in late Dec. 2008. Over 1000 customers were transferred from the Beckham Hindman Circuit to the Soft Shell Leburn Circuit and over 500 customers were transferred to the Soft Shell Vest Circuit. These customers were transferred along with the associated primary circuits.

With these new circuits in service, the large Beckham Hindman Circuit has been divided into three circuits. Also, the new circuit ties will provide additional opportunities for partial restorations during outages. The smaller circuits should reduce SAIFI and the additional restoration capabilities should reduce CMI which would reduce SAIDI.

The feeder breaker zone will be reviewed by Vegetation Management to determine if there are any opportunities to expand the existing circuit ROW to attempt to reduce Tree out of ROW outages. Because this circuit has been one of the past worst performers, the existing ROW has been a focus of Vegetation Management. Tree in ROW outages contributed only 98,673 CMI or only 2.8% of the total CMI for the circuit in 2008.

The circuit three phase back bone will also be inspected in an attempt to identify any additional crossarms that may fail. The amount of scheduled outages in 2009 will be reduced because all the scheduled outages listed in the table above were required for construction of exit circuits associated with the new Soft Shell Station.

Collier Station – Smoot Creek 34.5kV Circuit (3308603 – SAIDI # 5)

The major outage categories for this circuit are Tree out of ROW, Vehicle Accidents and Equipment Failure with all three of these causes accounting for 92.4% of the total CMI for 2008. Within these three categories, there were five individual outages out of a total of seventy sustained outages that accounted for 82.5% of the total CMI for 2008.

These outages lasted from five hours to almost ten hours because of the extensive damages to the distribution facilities. The Tree out of R/W outages (two total) broke crossarms and poles and the Vehicle Accidents (two total) also included broken poles. The Equipment Failure (one outage) was due to a failure in the load tap changer of the main station power transformer and extensive distribution switching was required to restore service from other distribution sources.

The Collier Smoot Creek Circuit is a radial circuit with little opportunity for partial restoration from other circuits. Below is a table that summarizes each of the five outages:

Date	Cause	Isolating Device	Total Duration (min)	Customers Affected	Total CMI
2/19/2008	Vehicle	Recloser	337	663	211,146
4/12/2008	Tree out ROW	Recloser	587	369	154,139
5/5/2008	Vehicle	Recloser	381	685	260,985
7/31/2008	Tree out ROW	Recloser	485	672	312,920
8/4/2008	Equipment	Station	473	996	435,299

Corrective Actions

The station transformer failure was an unusual event and typically these do result in a long outage. Large coal mining operations curtailed their loads so that the residential customers could be restored from other sources until a mobile transformer was installed. This one outage accounted for 26.1% of the CMI for the year. The response would be similar should a transformer failure occur in the future. The station is equipped with structures in place to facilitate a mobile transformer installation.

To address Tree out of ROW outages, the company has expanded existing ROW where feasible, initially focusing on the feeder breaker zone. In 2009, we plan to address the ROW in the first recloser zones that feed large numbers of customers.

The 2/19/2008 outage was caused by a coal truck that ran off the highway striking and breaking a 60 foot main line pole with a three phase tap and a single phase tap. This outage took a long time to repair.

The 5/5/2008 outage was caused by an excavator that was installing a gas line. The excavator pushed a tree onto a three phase line on a hill side that was inaccessible to construction equipment, which resulted in another long outage.

These types of outages that occurred on the Collier Smoot Creek Circuit are difficult to predict. If not for the above five outages, this circuit would have experienced good reliability during the year.

Slemp Station – Defeated Creek 34.5kV Circuit (3309901 – SAIDI # 6)

The reason this circuit made the top ten worst performing circuits for SAIDI was one long outage that occurred on 5/11/2008. A storm with high winds hit the Hazard and Whitesburg Areas that day resulting in many outages. This circuit serves only 38 customer.

The majority of the main feeder consists of about 10 miles of subtransmission line that has been converted to distribution. Much of this line is inaccessible to normal vehicles and must be patrolled by ATV or helicopter. The circuit was patrolled in the afternoon and evening of 5/11/2008, but patrolling was halted due to darkness. The patrol resumed early the next morning and no damage was found and the circuit was restored to service.

This resulted in an outage of nearly 27 hours with 55,941 CMI. The 2008 SAIFI for this circuit including this outage was 2.086. Excluding the 5/11/2008 outage, the SAIFI and SAIDI for this circuit would be reduced to 1.087 and 21.8 respectively which would be superlative reliability performance.

Corrective Actions

The access roads and trails will be mapped so that 4WD and ATV patrols can be expedited. Depending on weather, a helicopter patrol is always an option. In fact, a helicopter patrol was to be arranged on 5/12/2008 if the circuit restoration attempt had been unsuccessful.

Jeff Station – Viper 12kV Circuit (3309001 – SAIDI # 7)

The primary cause for the poor performance of this circuit was one feeder breaker outage on 3/19/2008 caused by a large tree falling from outside the ROW which stripped the primary conductors off of four poles. These poles were located on a steep hillside that was inaccessible to bucket trucks which required all the restoration work to be performed manually. The Jeff Viper Circuit is a radial circuit and the damage was close to the station so that all customers remained out for over 13.5 hours.

Although this outage was classified as Tree out of ROW, this was related to highway construction work that is underway near the feeder circuit. Excavation work near the tree caused it to uproot and fall. Another feeder breaker outage on 6/13/2008 was also related to the highway construction work. A blast was set off near the lines that caused the conductors to wrap together which caused two phase conductors to burn down. That resulted in a 96 minute outage for the entire circuit.

The 2008 SAIFI and SAIDI for this circuit were 5.069 and 1509.36 respectively. With the two feeder outages excluded, the SAIFI and SAIDI would have been 3.058 and 589.6 respectively.

Corrective Actions

After the 3/19/2008 outage, the ROW near the line was inspected and additional trees that could fall into the conductors were removed. Also, the highway construction has progressed to a point that further excavation and blasting will be unlikely to affect the circuit.

Leslie Station – Hals Fork 34.5kV Circuit (3303903 – SAIDI # 10)

This circuit is a fairly large circuit with 74 primary circuit miles that serves over 1100 customers. Within the first few miles from Leslie Station, there are some normally open circuit ties with the Leslie Hyden 34.5kV Circuit; however, once the circuit passes through the City of Hyden, the circuit is entirely radial past the first circuit recloser.

The three major outage categories for this circuit were Tree out of ROW, Equipment Failure and Scheduled. In 2008, this circuit had a total of 60 outages that generated a total of 1,366,509 CMI. There were 12 Tree out of ROW outages that accounted for 631,240 CMI or 46.2% of the circuit total CMI. There were 10 Equipment Failure outages that accounted for 332,621 CMI or 24.3% of the circuit total CMI. There were 10 Scheduled outages that accounted for 249,180 CMI or 18.2% of the circuit total CMI.

On 5/20/2008 a large tree fell from outside the ROW onto the line and knocked down four spans of three phase line. This initially interrupted 776 customers of which 163 were restored after 217 minutes. The remaining 613 customers were restored after repairs were completed about six hours later. This one outage generated 380,490 CMI or 27.8% of the total CMI for the circuit.

The long outage on 1/24/2008 was caused when a 500kVA step-down transformer failed during single digit temperatures. The transformer was replaced which also failed due to load. Two 500kVA transformers connected in parallel were required to pick up the load.

The long outages on 6/26/2008 and 1/29/2008 both occurred late at night in remote mountainous terrain. Crews worked through the night to restore service.

Below is a table that shows the largest outages for the circuit during 2008 based on total CMI. These outages account for 86.2% of the total CMI and 70.4% of the annual SAIFI:

Date	Cause	Isolating Device	Total Duration (min)	Customers Affected	Total CMI
5/20/2008	Tree Out of ROW	Recloser	563	776	380,490
6/4/2008	Scheduled	Recloser	308	615	189,420
1/24/2008	Equip (Step-down)	Fuse	980	161	147,604
12/16/2008	Tree Out of ROW	Recloser	312	388	121,056
4/28/2008	Equip (crossarm)	Recloser	154	778	106,562
6/26/2008	Tree Out of ROW	Fuse	885	133	99,885
4/16/2008	Scheduled	Recloser	61	785	47,885
5/9/2008	Equip (cutout)	Recloser	156	603	42,594
1/29/2008	Tree In ROW	Recloser	617	69	42,573

Corrective Actions

The Leslie Hals Fork Circuit has been on the Hazard District worst performing circuit in the past. As such, a detailed inspection was conducted and circuit performance was analyzed to develop a multi-year plan to improve the circuit reliability.

The entire circuit ROW, including side taps was recleared. This effort has been a success because there were only 13 outages caused by Tree in ROW during the year which accounted for only 93,484 CMI or only 6.8% of the total CMI for the circuit.

The main feeder extending from the first circuit recloser was old #4 CU conductor on old poles and crossarms that had reached the end of their operational life. A capital improvement project was funded to completely rebuild several miles of this line with new #4/OAA conductor, poles and crossarms.

Both of the scheduled outages in the table above were required to transfer conductors during construction for the new lines.

The existing ROW was widened in selected areas as part of the capital improvement project as an attempt to minimize outages caused by trees falling into the lines from outside the ROW.

Kentucky Power Company

2008 WORST PERFORMING CIRCUITS

Analysis of Causes/Corrective Actions

Pikeville District

Johns Creek Station – Meta 34.5kV Circuit (3411801 – SAIFI # 2, SAIDI # 8)

Trees inside ROW caused 34% of the outages during 2008 for this circuit. Right of Way was checked and hotspot reclearing done in the 3rd zone during 2007. Additional ROW work has been planned for 2009 in two zones affecting 500 customers or more. Another 21% of the total outages are due to equipment failure. Fuse cutout failures and transformer failures account for half of these cases. This circuit will be investigated using the ICOM noise detection equipment and infrared/thermal imaging to try to pinpoint possible hardware problems through the second protection zone of the circuit. This circuit was targeted in recent years for cutout replacement and many have already been done. Two outages happened while Transmission had a mobile transformer in service inside the station during work to pinpoint a possible relay problem. That problem was corrected and the mobile transformer taken out of service. These two outages also affected the Raccoon circuit of Johns Creek Station.

Johns Creek Station-Raccoon 34.5kV Circuit (3411802 – SAIFI # 4)

Trees inside and outside ROW caused the majority of outages on this circuit (36% of the total). ROW within protection zones affecting 500 or more customers will be worked in 2009 to eliminate danger trees. This work will cover all of the circuit's main line. Equipment failure was next with 24% of the total. These included fuse cutouts, transformers and arrestors. This circuit will also be checked with the ICOM equipment to locate possible hardware problems. Action on this circuit has also included reclearing and hotspot work by the Forestry group over the past several years.

Lovely Station – Wolf Creek 34.5kV Circuit (3202202 – SAIFI # 6)

Trees inside and outside of ROW comprised 34% of the outages for this circuit. We have made use of scheduled outages on this circuit in 2008 to clear danger trees from the mainline. Ground spray was done on parts of this circuit in 2008. Equipment failure in the form of fuse cutout failures account for 12% of the outages. Insulators and transformers make up another 8% of the total. During 2009, this circuit will also be patrolled with the ICOM equipment to locate possible hardware failure sites. A fuse cutout replacement program will be started during 2009 on this circuit. A tie-line between this circuit and the Dewey-Inez circuit will be proposed as a way to reduce outage time for customers when an outage does happen. Initially this tie will be manually operated but later it could be incorporated into the Dewey-Inez automation system.

Garrett Station – Lackey 12kV Circuit (3413402 – SAIFI # 3)

Trees out of ROW make up 30% of the total outages here. This circuit was cleared in the past 3 years and hotspot work continues as needed. Equipment failure is the cause for 24% of the outages with almost half of that due to fuse cutout failures. This is another circuit that is a candidate for investigation with the noise detection equipment to look for future hardware failure locations. We do have work planned for fuse cutout replacement of known problem cutouts on this circuit for 2009. Weather, including two Transmission system outages due to lightning, made up 16 % of the outage causes. These same two outages affected Spring Fork Station.

Spring Fork Station – One Phase 12kV Circuit (3404002 – SAIDI # 1, SAIFI # 9)

Trees out of right of way and lightning were major causes for this circuit in 2008. This area was patrolled in 2008 to look for danger trees, hotspots, and defective hardware. The problem areas that were found were corrected on scheduled outages during the year and accounted for 14% of the 2008 total number. Another 14% of the total comes from aerial saw reclearing when the helicopter struck the primary conductor causing an outage. The small number of customers and remote location make it difficult to work when it comes to outages. It takes a servicer at least one hour of travel to get to it when there is an outage. If a crew is required to make repairs then additional outage time occurs as the crew is dispatched and travels to the site. This lengthens the outage duration for these customers.

Tom Watkins Station – Distribution 12kV Circuit (3201001 – SAIFI # 7)

This circuit was recleared in 2007-2008. Trees out of ROW make up 15% of the total number of outages. We have installed an additional recloser to reduce the station breaker zone exposure. Each major branch of this circuit now has its own protective device. Equipment failure makes up 30% of the total. Items within that category include fuse cutout failure, transformer, lightning arrestor and connector failure. This circuit will also be patrolled in 2009 with the noise detection equipment to look for hardware failure possibilities. Scheduled outages including 2 due to vandalism/copper theft within this station make up another 18% of all outages.