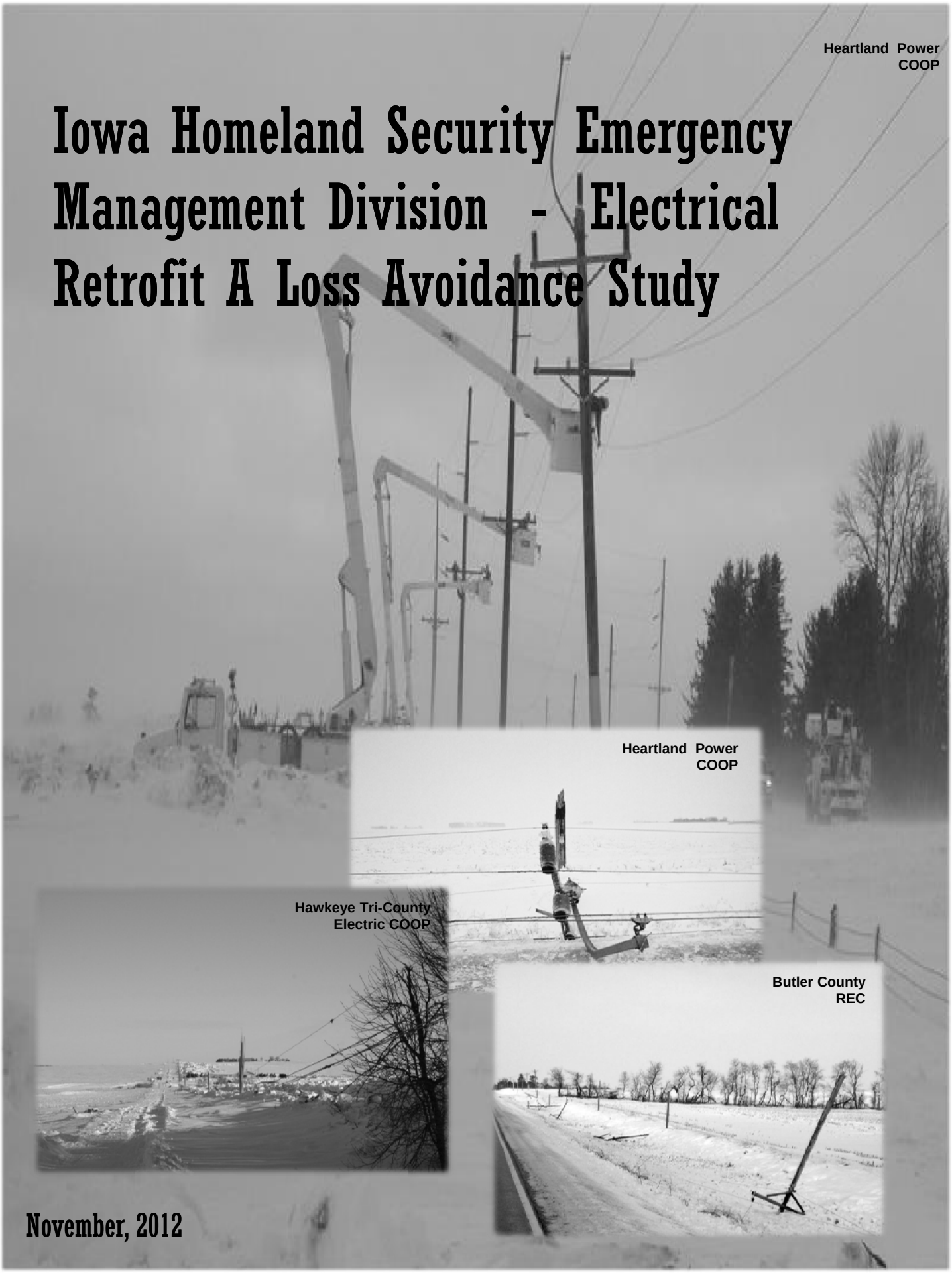
Iowa Homeland Security Emergency Management Division - Electrical Retrofit A Loss Avoidance Study



November, 2012

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Executive Summary

Since 2007, the state of Iowa has submitted to the Federal Emergency Management Agency (FEMA) 2,500 miles of electrical distribution and transmission lines for retrofit with Hazard Mitigation Grant Program (HMGP) funding. Additionally, the Public Assistance program in the state of Iowa has re-constructed over 4,000 miles of power lines to increased strength standards mandated by current code. These programs have effectively contributed to mitigate damages from wind and ice accretion on power lines by retrofitting lines with stronger conductor, stronger poles, and shorter spans to increase overall strength of the lines. The goal of this study is to evaluate the effectiveness of selected mitigation measures in reducing loss. These mitigation measures include retrofitting of electrical lines originally constructed to the National Electrical Safety Code (NESC) as Grade N lines, which required only enough strength to withstand the stresses of crews conducting regular maintenance, to stronger NESC Grade B Extra Stout construction specifications. These new load specifications also include the wind and ice loading specifications outlined in the American Society of Civil Engineers (ASCE) Publication "Minimum Design Loads for Buildings and Other Structures", more commonly referred to as ASCE 7-05, resulting in improved resistance to wind and ice accretion.

This loss avoidance report contains two studies conducted to evaluate the effectiveness of mitigation projects for Rural Electric Cooperatives (REC) in the state of Iowa. Appendix A contains a map of Iowa's electrical cooperatives service territories.

The first study includes a DR 1688 mitigation project of 8 retrofitted segments in the Hawkeye REC service territory, located in Northeastern Iowa. This REC experienced an Ice Storm in February of 2011, which caused $896,413 in damage and loss of service to cooperative lines for non mitigated electric lines in the cooperative's service area. The study was conducted using actual costs of construction and reported damages and consumer outages. The 8 retrofitted segments represent the first test of completed HMGP electric utility retrofit projects in the state of Iowa. Through one event in the first three months of the 50 year life of this project, the overall losses avoided total $137,015. When compared to the overall cost of construction for these segments of $474,375, the return on investment (ROI) totals 0.28 or over ¼ of the cost of the project.

The second study involves a Raccoon Valley REC mitigation project that was in development during the ice storm events that resulted in DR 1880 (declared 3-2-2010) in Western and Central Iowa. The majority of line segments identified for retrofit in this HMGP 1763 project application were extensively damaged in the DR 1880 event and subsequently became eligible for Public Assistance restoration. This study was conducted as an expected loss avoidance utilizing the electrical system failure methodology and actual damage data from Public Assistance storm restoration work on the originally proposed HMGP line sections. This evaluation demonstrates the potential for losses avoided had the electrical system experienced an equivalent storm while operating with lines constructed to the strength standards mandated by NESC Grade B level construction. Results of this analysis show $14,638,850 in actual damage and loss of service, compared to the calculated Grade B expected total damage and loss of service of $93,504 for the same system. When added to the estimated construction cost of $9,798,982, the ROI is 1.49.

Hawkeye REC Loss Avoidance Study

Summary

This study focuses on 20.93 miles of electrical line in 8 segments retrofitted to Grade B Extra Stout requirements prior to a storm event impacting the Hawkeye REC service territory in February 2011 (see Figure 1). Grade B construction is the strongest National Electrical Safety Code level and mandates stronger poles, cross arms, wire, and greater minimum mechanical load requirements for power lines. These requirements dictate a design strength level to withstand a 50 year recurrence interval wind and ice event. The project segments in this study were constructed as part of a DR 1688 HMGP retrofit and were the only such segments in the state to experience an Ice Storm as of this study. Mitigation efforts resulted in single event losses avoided totaling $137,015 in physical damage and loss of service. Over the lifetime of the project (established at 50 years based on manufacturer's product useful life of conductors, poles, and components), mitigated lines will surely be tested again to varying orders of storm magnitude, and promise to serve cooperative members reliably through all manner of weather events for years to come.

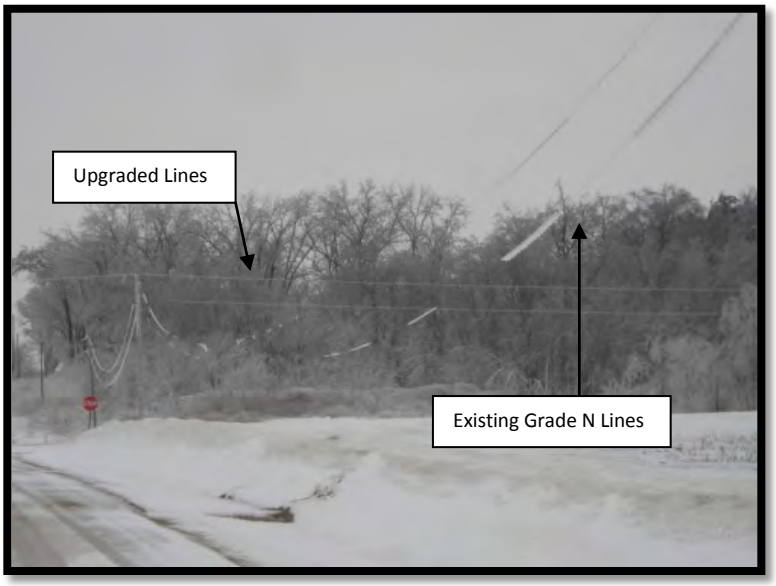


Figure 1: Photo of the February 20th, 2011 event. The lines in the background were reconstructed to NESC Grade C (Modern Code) specifications with the use of Public Assistance funds through DR-1688.

Damage Event Overview

Beginning on February 20th to the 21st, 2011, a winter weather system originating from the southwestern United States swept northeast bringing with it freezing rain, snow, and sustained winds between 20 and 25 mph with gusts up to 35 miles per hour. The precipitation for this storm totaled approximately a quarter of an inch of ice and up to 3 ½ inches of snow in parts of Mitchell, Howard, Winneshiek, Clayton, and Allamakee Counties in northeast Iowa. Based on damage caused by this storm when compared to other storms experienced by Hawkeye REC, this was a 6.6 year recurrence interval (RI) storm, or 15% chance annual occurrence.

As a result of the February 2011 storm, the cooperative sustained $134,293 in physical damage and response costs, and an average of 3 days loss of service to their members at a value of $126/person/day for $762,120 in loss of service. In total, this event caused $896,413 in physical damage and loss of service to their overhead distribution network. The areas damaged were mostly concentrated along the southern half of the cooperative's territory. Appendix B contains the map of the cooperative's

distribution system showing the locations of the damaged line from the February 2011 event and the lines that were evaluated in this study.

Methodology for Loss Avoidance Study

The lines selected for review in this study were constructed as part of a DR 1688 mitigation electric utility retrofit project in Hawkeye REC's service territory. The retrofitted segments are represented in blue in the attached map in Appendix B. Analysis of the single February 2011 - 6.6 RI event shows the mitigation projects have resulted in the avoidance of $137,015 of damages to retrofitted lines. Damages were analyzed for the REC in both Mitigation Present (MP_C) and Mitigation Absent (MP_A) scenarios and compared to determine overall cost effectiveness of the mitigation measures based on damages sustained and loss of service for both event scenarios.

Damage Analysis Overview

The majority of Hawkeye REC's lines were constructed in the late 1930's and early 1940's with an average build date of 1940. The cooperative has recorded 21 significant winter storm events through its history, which HSEMD used to compare the February 2011 damage and loss of service duration against to determine an event frequency. Due to lack of accurate weather data for the area, this was the most reliable measure of event impacts available.

Damages to electrical lines are caused by multiple sources: lightning strikes, car/equipment accidents, and tornadoes/microburst thunderstorms. Because of the relatively frequent and localized nature of these events, REC's do not count these as "storm damages" so damages of this type were not counted. By far the most damage occurs through ice accretion and wind stresses on the lines which is represented by the damages collected by this cooperative and identified as "storm damages".

For the purposes of this loss avoidance study it was assumed that lines identified by Hawkeye REC as damaged during the February 2011 event were uniform in strength at the time of the event. These lines were reported to be constructed prior to the implementation of modern code standards. Data for the overall system outages was gathered by Hawkeye REC's remote outage monitoring system and was used to establish the average consumer outage.

As these projects are fairly recent, the cost of construction and the losses avoided remained un-inflated when determining the net present value of benefits or costs for the purposes of this study. Therefore, the only calculations necessary to conduct this loss avoidance study occurred in the losses avoided category under the MP_A scenario. This included physical damages and loss of service using the current standard values for service loss as set forth in the version 4.5 Benefit-Cost analysis software provided by FEMA.

Costs were calculated using an average of the as-built per-mile construction cost for the Hawkeye REC project. The per-mile average system wide cost was multiplied by the total miles constructed to determine the segment cost. These costs were incurred as part of the project construction through the latter part of 2010 and into February of 2011 and were left un-inflated due to their recent nature.

The basic assumptions used with regards to the MP_A scenario for this loss avoidance study were based on the following data:

1. The study lines experienced the same wind and ice loadings as the un-mitigated lines in the REC's system. Appendix B contains a map showing the location of the study lines, the damaged lines, and the total reported precipitation for the February 2011 6.6 - RI storm.
2. Average physical damages per mile for the entire Hawkeye REC system were applied to the mitigated segments for Damage ($). Average damage = $261.42/mile
3. Average system loss of service time for the entire Hawkeye REC system of 3 days was applied to the customers served by the mitigated segments for Loss of Service ($). Loss of Service = $219/person/day based on FEMA BCA software version 4.5 standard loss of service values
4. Benefits were applied to the number of customers attached directly to the study lines.

Mitigated Damages, Hawkeye REC February 2011 Ice Event					
Segment	Length	Customers	Damage ($)	Loss of Service ($)	Total MP_A
A18	3.13	53	$827.63	$34,821	$35,648.63
A20-1	2.52	25	$666.34	$16,425	$17,091.34
A23-1	1.76	15	$465.38	$9,855	$10,320.38
A25-1	1.47	25	$388.70	$16,425	$16,813.70
A27	1.02	20	$269.71	$13,140	$13,409.71
A27-1	5.15	30	$1,361.76	$19,710	$21,071.76
A28	1.01	15	$267.06	$9,855	$10,122.06
A30	2.69	18	$711.29	$11,826	$12,537.29
Totals	**18.75**	**201**	**$4957.87**	**$132,057**	**$137,014.87**

Table 1: Calculated Damages for the MP_A Scenario

The mitigation project present or MP_C scenario evaluates the performance of the mitigation measure in the indicated based on damage and loss of service. To evaluate the February 2011 – 6.6 RI event HSEMD used the actual recorded damages and service losses from Hawkeye REC for the mitigated segments. The basic assumptions used with regards to the MP_C scenario for this loss avoidance study were based on the following data:

1. Line segment populations did not change between the submittal of the grant application for DR-1688 and the event of February 2011.
2. Loss of service values were the same as the values used in the MP_A scenario

Using these assumptions and the actual damage and loss of service amounts gathered by the cooperative, damages sustained during the February, 2011 – 6.6 RI event were calculated.

Segment	Length	Customers	Damage ($)	Loss of Service ($)	Total MP_C
A18	3.13	53	$0	$0	$0
A20-1	2.52	25	$0	$0	$0
A23-1	1.76	15	$0	$0	$0
A25-1	1.47	25	$0	$0	$0
A27	1.02	20	$0	$0	$0
A27-1	5.15	30	$0	$0	$0
A28	1.01	15	$0	$0	$0
A30	2.69	18	$0	$0	$0
Totals	**18.75**	**201**	**$0**	**$0**	**$0**

Table 2: Actual Recorded Damages and Outages the 2011 Event

As there were no damages or loss of service to REC members served by the mitigated lines, the MP_C damages totaled $0. To calculate the Loss Avoidance Ratio (L_R) or Return on Investment (ROI), the total project cost for the mitigation project was added to the reported MP_C values and compared to the MP_A damages using the following formula: $MP_A/MP_C = L_R$

Return on Investment

The return on investment for the complete project segments was calculated using the methodology described above. Below are the calculated losses avoided for the 2011 event:

Segment	MP_A	MP_C	ROI (L_R)
A18	$35,649	$79,189	$79,189/$35,649 = .4502
A20-1	$17,091	$63,756	$63,756/$17,091 = .2681
A23-1	$10,320	$44,528	$44,528/$10,320 = .2318
A25-1	$16,814	$37,191	$37,191/$16,814 = .4521
A27	$13,410	$25,806	$25,806/$13,410 = .5196
A27-1	$21,072	$130,295	$130,295/$21,072 = .1617
A28	$10,122	$25,553	$25,553/$10,122 = .3961
A30	$12,537	$68,057	$68,057/$12,537 = .1842
Totals	**$137,015**	**$474,375**	**$137,015/$474,375 = .2888**

Table 3: Calculated Losses Avoided for the 2011 Event

Overall losses avoided equal $137,015 over a compared project total of $474,375 for a return on investment of 0.29 for this small scale 6.6 year event. This is equivalent to $0.29 of return on the dollar for this particular storm. At the time of the ice storm, these lines had been in service for three months. The expected useful service life for overhead electrical power lines is 50 years or 600 months, translating to a project that was in the first 0.005% of its useful life. The complete segments sustained no damage as a result of this event, and recouped over ¼ of the total investment in one minor ice storm. Hawkeye REC can expect many more events during this lifetime, and with the mitigation in place can expect the lights to remain on during this type of storm and more severe events than this.

Discussion

This analysis was conducted on a first test of a project utilizing HMGP funding to reconstruct power lines. The losses avoided by the project, while small, represent successful implementation of mitigation as no service losses or damage were experienced as a result of the 2011 storm. The 2011 storm is calculated to have a 15% chance of occurring in any given year, and it is not un-common to see stronger ice storms than this during Iowa winters. If the cooperative were to experience only this storm every 6.6 years, the resulting avoided losses would total $1,037,991 for a benefit/cost ratio of 2.19.

Because of a lack of specific weather data for the cooperative's service territory for the 2011 event, HSEMD used historical loss of service data to calculate the magnitude of the 2011 storm event. Historical event data was complied by Hawkeye REC from newsletters and accounting records dating back to 1940. These records compiled the entire system damages and outages, thus not being line specific. All damages were assumed to be system wide based on the total system miles of line at the time of the 2011 event (2083 miles). These totals were then compared to the miles damaged during the 2011 event (513.71 miles) and the total number of customers affected (3,118) when entered into the FEMA Benefit Cost Analysis version 4.5 software (BCA) as historical events.

To ensure that all events were equivalent in current (2011) dollars, the standard value of electrical power of $126/person/day was used in conjunction with the standard value for potable water, set at $93/person/day, for a total loss of service value of $219/person/day. This value was used because the territory that Hawkeye REC serves does not have a rural water system so REC customer's relied on the electrical service provided by the cooperative to power their wells.

The BCA software calculated the recurrence intervals of the damages. This provided an objective basis to compare the 2011 event against all other recorded events for the Hawkeye System, allowing a comparison regardless of the lack of actual weather data. The resulting recurrence interval for the 2011 event was a 6.6 - year RI storm magnitude which translates to approximately 15% chance of this type of damage occurring in any given year on the Hawkeye system.

This analysis was generalized based on the entire cooperative service territory, and member outages were calculated using a total outage time divided by the number of members affected. This method was the only method available to attain the outage data necessary to conduct the BCA because of the way electrical systems record their outages. System damages are recorded in a similar manner, with the entire system cost being recorded and damages attributed by dividing the overall damages over the miles affected.

Raccoon Valley REC Loss Avoidance Study

Summary

This study takes an expected damage approach to mitigation using components from a project that was under development by HSEMD for Raccoon Valley REC, this project was later scaled back considerably due to the Presidential disaster declaration DR 1880. HSEMD initiated the Raccoon Valley REC study following the ice storm events that occurred in Western and West Central Iowa in December of 2009 and January of 2010. These severe winter storms in December of 2009 and January of 2010 resulted in two Presidential Disaster declarations: DR 1877 and DR 1880 respectively. Prior to these disasters, HSEMD began to assemble a number of applications for the Hazard Mitigation Grant Program involving Rural Electric Cooperatives. Because of this effort, much of the preliminary documentation regarding the state of these cooperative's systems had already been gathered and was in the process of being vetted and evaluated for eventual submittal to FEMA for HMGP funding consideration. Evaluation of the effectiveness of electrical mitigation was based off of this information.

Event Overview

The ice storm event of late January 2010 that resulted in FEMA declaration DR 1880 was a phenomenon of converging, opposing air masses that produced a multitude of weather events combining into an extensive icing event over western Iowa. Beginning January 19th, areas of the state experienced ice accretion of between ¾" to 1" and locally heavier amounts. On January 22nd winds increased causing stress to already heavily iced tree limbs and electrical lines causing some 1000 miles of line failure (collapse/service loss). Further damages were caused by snow and high winds on January 25th.

The ice storm event of January 2010 caused approximately 60,000 outages over a period beginning January 19th and ending January 27th. The totals for Raccoon Valley REC include 2,748 customers with 207,910 hours of outage, for an average of 76.66 hours per customer for this storm. The majority of the damage was confined to the western part of the state of Iowa. Sac, Carroll, Audubon, Calhoun, Cass, and Crawford counties received a state emergency declaration on the 22nd due to damages caused by ice accretion and compounded by high winds. The impacts of the combination of ice and wind culminated in the failure of approximately 2,250 poles and 1,000 miles of line.

Methodology for Loss Avoidance Study

Unlike the Hawkeye REC study, there was no available damage comparison for the January 2010 storm in the Raccoon Valley service territory. Because of this, the methods used in the 2008 FEMA electrical loss avoidance study were utilized to determine an expected damage reduction if the existing system had been constructed to current NESC code at the time of the January 2010 event. This study uses data from an HMGP application that was under review by FEMA at the time of the ice storm.

Project Description

The HMGP project originally submitted by Raccoon Valley REC proposed to retrofit 63.8 miles of single phase, 2 miles of V phase, and 90 miles of three phase projects for a total of 155.8 miles of power lines.

The scope of work included constructing lines to Grade B standards with heavier poles and stronger conductor, as well as reducing the spans between poles. The original proposal served 5,493 people, 13 public facilities and 18 critical service facilities at a cost of $11,996,896.

Event Impacts

The ice storm of January 2010 caused an estimated $53,000,000 in damages to Raccoon Valley REC alone. Because of this, Raccoon Valley REC reduced the HMGP application amount for their project from 155.8 miles of single, V, and three phase power lines to 10 miles of three phase lines and reducing the overall cost from $11,996,896 to $1,055,000. All other proposed lines qualified for Public Assistance reconstruction and are being reconstructed to NESC Grade C – Modern codes and standards. The lines removed from the original HMGP application are the focus of this loss avoidance study.

Calculation of Event Impacts

The calculation of event impacts can be viewed in Appendix D, *Electrical Systems Failure Calculations*. Explanations for the columns totaling the damages, losses, and losses avoided are explained below. The letter designations below correspond to the labeled columns in Appendix D. The methodology for calculating the event impacts is as follows:

A. To determine the precipitation amount, the January 19th, 2010 storm event precipitation total was mapped, and the original project maps were overlaid. The locations of the original projects were noted and the average of the nearest recorded precipitation levels was noted. This was recorded as the Liquid Precipitation Volume.
B. Because the volume of ice is greater than that of liquid water, the recorded liquid precipitation was multiplied by a factor of 1.08 to account for the .92 density of ice versus water. Recorded winds, both sustained as well as gusts were taken from the cooperative reporting weather station in Carroll Iowa with an average wind speed of 31.277 knots (36 mph). These values were used to determine the accretion level of the ice in the event. The accretion level was determined using the "back of the envelope" method described in the *American Lifelines Alliance* report "Extreme Ice Thicknesses from Freezing Rain". The formula is: $t = 0.35P\sqrt{(1 + (\frac{V}{Vo})^2)}$ where t = ice thickness, P = total depth of the freezing rain, V = wind velocity and Vo = 10. The calculations for this are included in the '2010 Storm Radial Ice Equivalent' column.
C. The radial ice equivalent was then used to interpolate the equivalent expected recurrence interval using the table calculated by the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) and interpolated by FEMA for use in the Electrical System Failure (ESF) module of the Benefit Cost Analysis software v 3.0. MP_C Expected Damages were then calculated by adding the expected system damage and loss of service values for the indicated populations from the original application and interpolated based on the recurrence intervals determined using the methodology above. As this method of damage calculation was developed for use with the version 3 BCA software, the standard economic values of $188/person/day for electricity, and $68/person/day for the loss of potable water for those on rural wells were utilized.
D. MP_A Data (Mitigation Project Absent) was gathered from submitted project worksheets under the Public Assistance program for disaster DR 1880. Three projects: 4.01, 8.03, and 9.05 were

removed from consideration in this study due to lack of accurate cost information from project worksheets. MP_A Loss of service data was calculated using the average outage time per customer (2,748 meters affected for a total of 207,910 hours, or an average of 76.66 hours per customer) as reported by the REC. This number was then multiplied by the number of customer's identified in the original project, and multiplied by the identified loss of service value ($188 per person/per day for electrical power only, and $256 per person/per day for electrical loss and water loss).

Outcome

Project (by Substation)	MP_A	MP_C	MP_A/MP_C
1	$901,483.90	$512,592.00	1.76
2	$3,472,961.01	$2,134,892.16	1.76
3	$1,230,752.33	$898,993.96	1.37
4	$1,663,823.13	$886,241.10	1.88
5	$899,443.42	$740,071.89	1.22
7	$144,575.39	$149,767.29	0.97
8	$2,712,217.00	$2,001,074.28	1.36
9	$2,586,447.45	$1,611,934.58	1.60
10	$634,049.57	$602,977.74	1.05
11	$486,600.47	$369,764.56	1.32
Totals	**$14,732,353.67**	**$9,908,309.56**	**1.49**

Using the above methodology, the total damage for the REC for these events (MP_A in the spreadsheet) is $14,732,354. The total expected physical damages and loss of service the REC would have sustained had the project been completed (MP_C) is $20,001 and the estimated cost for the project segments totaled $9,798,982 for a total expected post-mitigation cost of $9,818,983. Had the entire project been undertaken, the total investment would have been offset by the actual damages (losses avoided) by a factor of 1.49.

Discussion

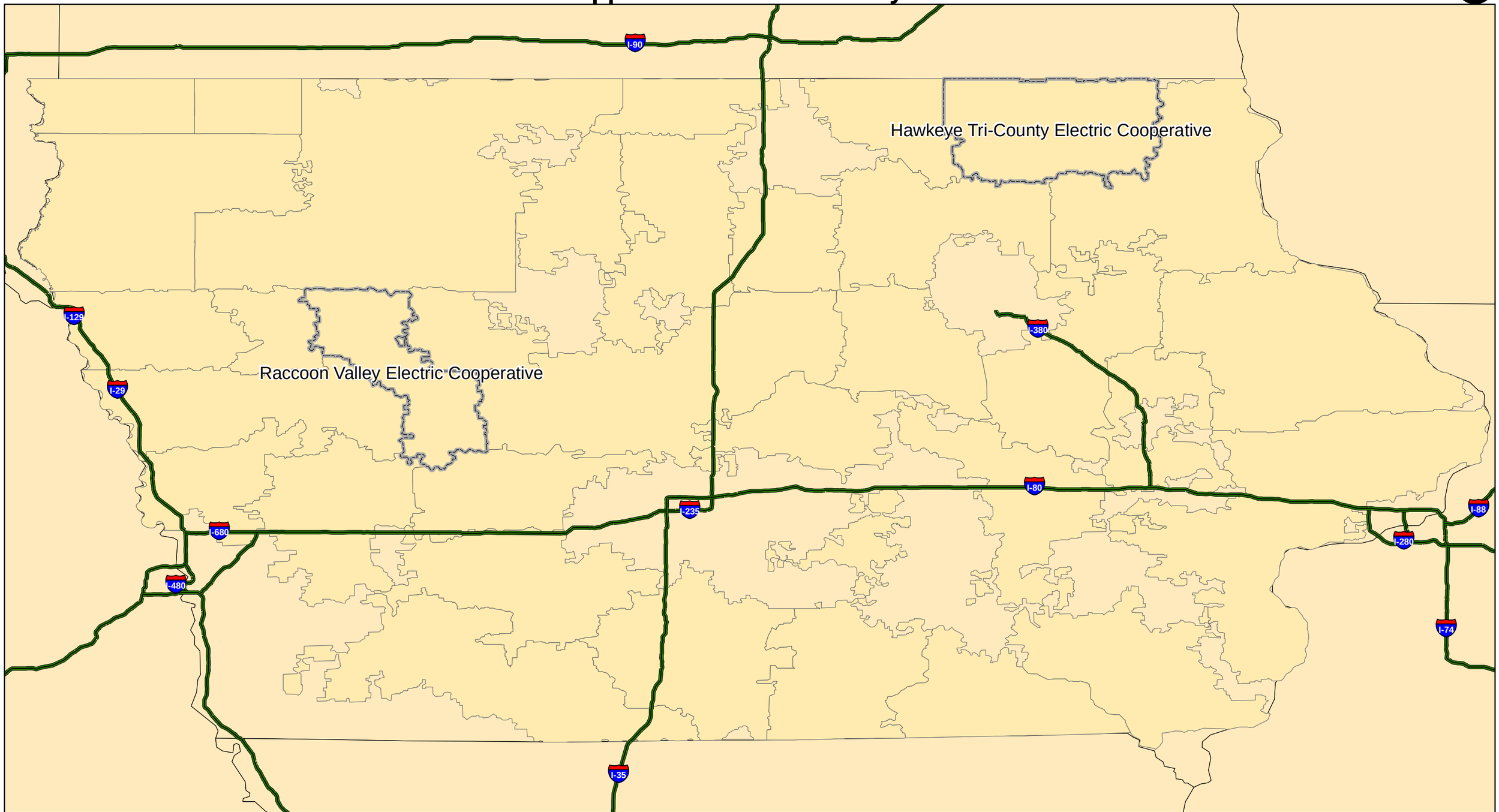
This loss avoidance study more closely follows the methodology set forth in the 2008 FEMA electrical loss avoidance study and uses the same calculations developed for that study to evaluate the potential for avoided losses. While this is a calculation based on atmospheric and engineering data, the real world situation as proved by the previous study bears witness to the results of this study. Both studies clearly illustrate that when proper codes are developed and enforced, the majority of physical damage and service losses can be avoided.

Conclusion

The loss of electrical service, particularly during the winter months, represents a significant threat to life, health, and safety of citizens in the State of Iowa. Through the effective use of the Hazard Mitigation

Grant Program and Public Assistance program, Iowa Homeland Security Emergency Management has partnered with many stakeholders to reduce damages and loss of service to electric utility systems. Effective mitigation measures, exemplified by the projects currently underway in the State of Iowa, will lead to more resistant and resilient infrastructure, reducing the risk to life safety and property to the citizens of the state. These two cases represent a small portion of the work being conducted throughout the state to mitigate vulnerable systems.

Appendix A: REC Territory



Legend

- Interstate Highway
- REC Territory

0 5 10 20 30 40 Miles

1:1,756,424

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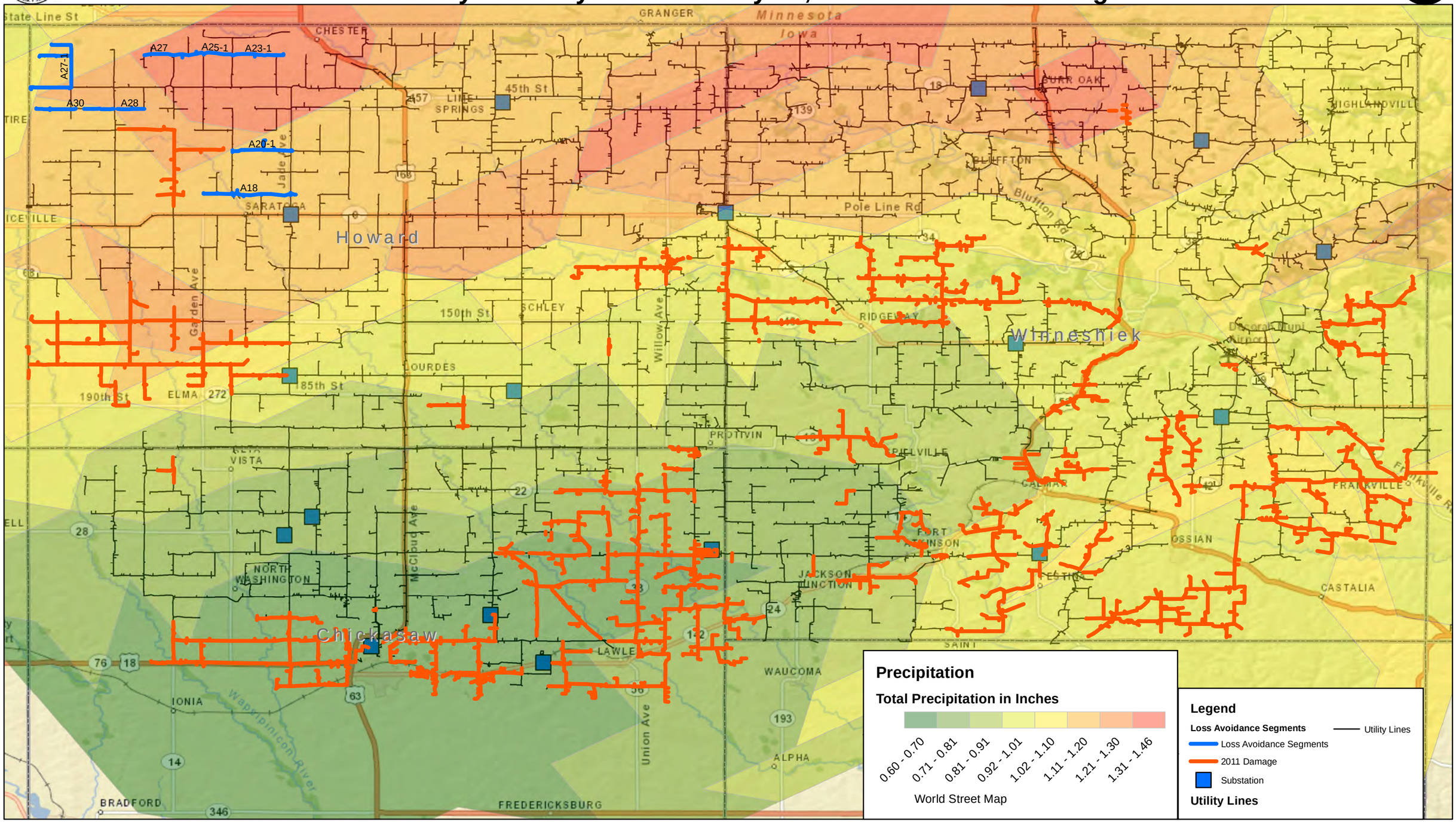
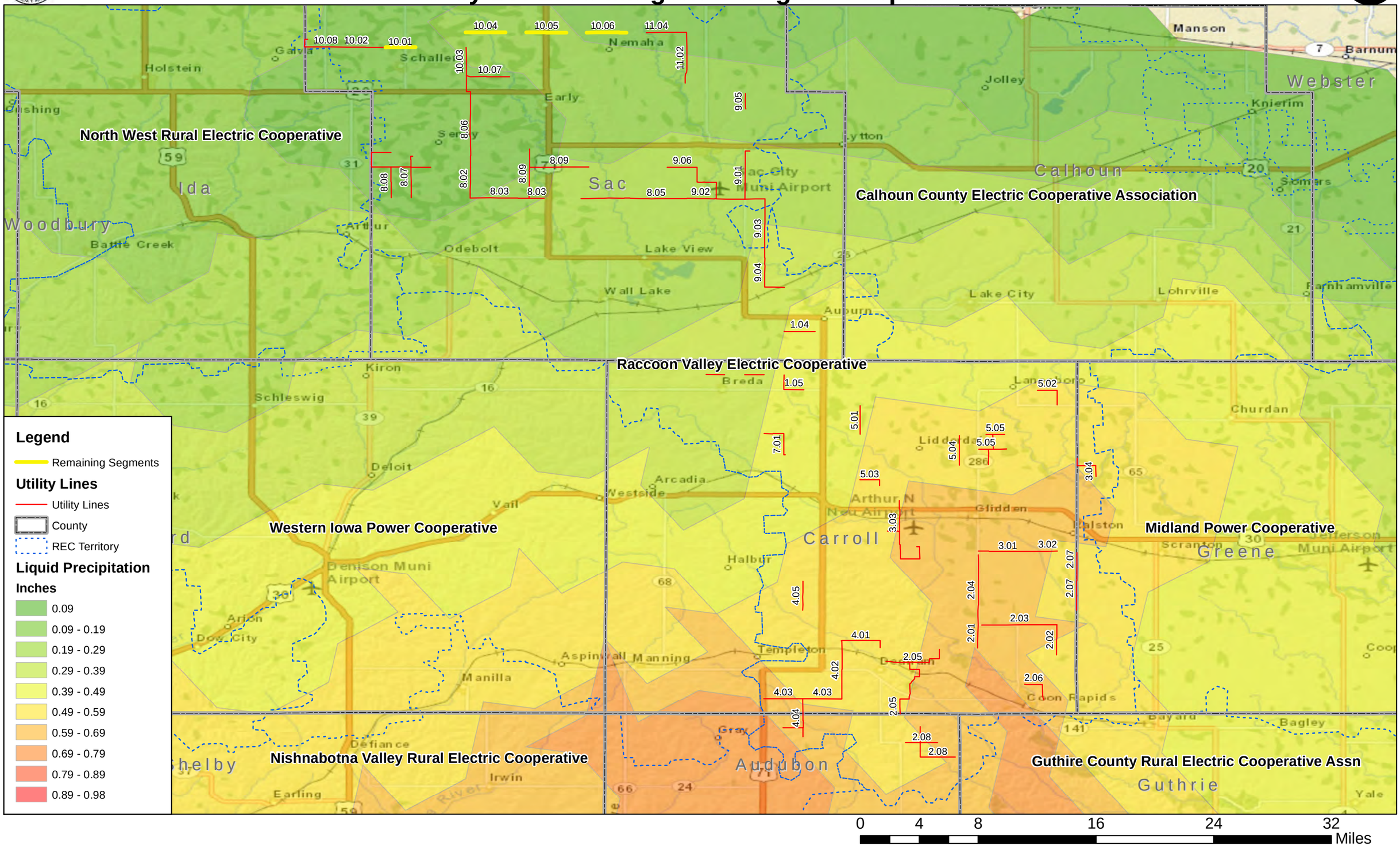
Appendix A: REC Territory
HSEMD Recovery Bureau

Appendix B
Hawkeye REC System February 21, 2011 Storm and Damage



1 in = 4 miles

Appendix C
Raccoon Valley DR-1763 Mitigation Original Proposal and Storm



Appendix D - Storm Event Calculations
Raccoon Valley REC Loss Avoidance Study

									A	B			C				D				
	MP_A System Design				(Proposed) Mitigation Project Design					Storm Event Information									Formula y2=((x2-x1)(y3-y1)/(x3-x1))+y1 where y2 is the referenced value		
Project	MP_A System Grade	Setting	Tree Cover	Loss of Service Value	Pole Equivalent Improved by Project	Population Affected by Project	Project Cost (MP_C)	Project Length (miles)	Liquid Precipitation Volume	Ice Volume	2010 Storm Radial Ice Equivalent	Ice Mass	Interpolated Recurrance Interval	Expected Loss Damage $	Expected Economic Loss $	2010 Event MP_C Expected Damages	Mitigation Project Absent MP_A	Loss of Service MP_{A*}	MP_C - MP_A	Original Conductor Type	Original Conductor Diamater (in)
1.02	N	Rural	1-4 spans per mile	$ 188	18	310	$105,500.00	1.0	0.4	0.432	0.31133986	143.08575	5.472493978	$12.58	$326.06	$338.65	$93,409.66	$186,156.03	-$173,727.05	#2 ACSR	0.325
1.03	N	Rural	1-4 spans per mile	$ 188	18	310	$105,500.00	1.0	0.37	0.3996	0.28798937	127.9644	4.672437263	$11.23	$290.94	$302.16	$93,409.66	$186,156.03	-$173,763.53	#2 ACSR	0.325
1.04	N	Rural	1-4 spans per mile	$ 188	27	42.5	$89,250.00	1.5	0.45	0.486	0.35025734	95.827759	7.094055725	$12.87	$591.25	$604.11	$105,558.00	$25,521.39	-$41,225.28	8A CWC	0.1285
1.05	N	Rural	1-4 spans per mile	$ 188	36	36	$211,000.00	2.0	0.46	0.4968	0.35804083	205.20905	7.418368074	$31.47	$65.61	$97.08	$189,655.00	$21,618.12	-$176.04	1/0 ACSR	0.398
2.01	N	Rural	1-4 spans per mile	$ 256	27	322.5	$158,250.00	1.5	0.75	0.81	0.58376223	423.33516	23.64685242	$100.13	$3,533.48	$3,633.61	$99,031.56	$263,710.40	-$200,858.35	#2 ACSR	0.325
2.02	N	Rural	1-4 spans per mile	$ 256	36	487.5	$211,000.00	2.0	0.625	0.675	0.48646852	211.23553	15.53904368	$99.02	$3,494.22	$3,593.23	$190,588.96	$398,632.00	-$374,627.73	6A CWC	0.162
2.03	N	Rural	1-4 spans per mile	$ 256	72	445	$286,140.00	4.0	0.69	0.7452	0.53706125	358.84831	19.75510422	$158.60	$8,254.21	$8,412.81	$369,967.00	$363,879.47	-$439,293.66	#2 ACSR	0.325
2.04	N	Rural	1-4 spans per mile	$ 256	90	345	$530,950.00	5.0	0.645	0.6966	0.50203552	249.54067	16.83629308	$261.33	$9,222.38	$9,483.72	$471,587.00	$282,108.80	-$213,262.08	4A CWC	0.2043
2.05	N	Rural	1-4 spans per mile	$ 256	99	75	$327,250.00	5.5	0.645	0.6966	0.50203552	208.09088	16.83629308	$162.13	$10,144.62	$10,306.75	$363,910.00	$61,328.00	-$87,681.25	8A CWC	0.1285
2.06	N	Rural	1-4 spans per mile	$ 256	45	52.5	$148,750.00	2.5	0.7	0.756	0.54484475	252.43165	20.40372892	$84.39	$928.23	$1,012.62	$102,184.00	$42,929.60	$4,649.02	8A CWC	0.1285
2.07	N	Rural	1-4 spans per mile	$ 256	54	55	$178,500.00	3.0	0.575	0.621	0.44755104	176.61676	12.29592019	$69.63	$4,357.17	$4,426.80	$153,758.00	$44,973.87	-$15,805.07	6A CWC	0.162
2.08	N	Rural	1-4 spans per mile	$ 188	101	32.5	$245,868.00	5.6	0.625	0.675	0.48646852	211.23553	15.53904368	$115.38	$7,199.24	$7,314.62	$244,856.00	$19,516.36	-$11,189.74	6A CWC	0.162
3.01	N	Rural	1-4 spans per mile	$ 256	54	182.5	$316,500.00	3.0	0.615	0.6642	0.47868503	203.93889	14.89041898	$144.38	$5,095.28	$5,239.66	$280,278.00	$149,231.47	-$107,769.81	6A CWC	0.162
3.02	N	Rural	1-4 spans per mile	$ 256	18	160	$89,450.00	1.0	0.616	0.66528	0.47946338	204.65997	14.95528145	$40.92	$1,703.29	$1,744.22	$81,936.00	$130,833.07	-$121,574.85	6A CWC	0.162
3.03	N	Rural	1-4 spans per mile	$ 188	99	100	$327,250.00	5.5	0.61	0.6588	0.47479328	200.36183	14.56610663	$147.15	$6,761.73	$6,908.88	$360,806.00	$60,050.33	-$86,697.46	6A CWC	0.162
3.04	N	Rural	1-4 spans per mile	$ 256	45	70	$148,750.00	2.5	0.565	0.6102	0.43976755	154.1902	11.64729549	$49.57	$3,101.63	$3,151.20	$110,378.00	$57,239.47	-$15,716.27	8A CWC	0.1285
4.02	N	Rural	1-4 spans per mile	$ 188	72	392.5	$286,140.00	4.0	0.575	0.621	0.44755104	256.07681	12.29592019	$111.63	$4,266.39	$4,378.02	$372,769.74	$235,697.56	-$317,949.28	#2 ACSR	0.325
4.03	N	Rural	1-4 spans per mile	$ 188	72	562.5	$286,140.00	4.0	0.69	0.7452	0.53706125	263.49624	19.75510422	$158.60	$6,061.69	$6,220.29	$369,966.96	$337,783.13	-$415,389.80	6A CWC	0.162
4.04	N	Rural	1-4 spans per mile	$ 188	54	265	$178,500.00	3.0	0.695	0.7506	0.540953	267.87763	20.07941657	$100.10	$4,599.89	$4,700.00	$109,896.00	$159,133.38	-$85,829.39	6A CWC	0.162
4.05	N	Rural	1-4 spans per mile	$ 188	36	32.5	$119,000.00	2.0	0.543	0.58644	0.42264385	141.38795	10.22032115	$24.77	$1,138.04	$1,162.80	$59,060.00	$19,516.36	$41,586.45	8A CWC	0.1285
5.01	N	Rural	1-4 spans per mile	$ 188	36	57.5	$143,070.00	2.0	0.503	0.54324	0.39150987	203.95934	8.812911177	$24.40	$932.70	$957.10	$185,917.74	$34,528.94	-$76,419.58	#2 ACSR	0.325
5.02	N	Rural	1-4 spans per mile	$ 256	36	95	$119,000.00	2.0	0.546	0.58968	0.4249789	143.08529	10.41490856	$26.80	$1,676.71	$1,703.51	$97,364.00	$77,682.13	-$54,342.63	8A CWC	0.1285
5.03	N	Rural	1-4 spans per mile	$ 188	32	60	$107,100.00	1.8	0.595	0.6426	0.46311804	173.01232	13.59316958	$44.78	$2,090.27	$2,135.05	$94,472.00	$36,030.20	-$21,267.15	8A CWC	0.1285
5.04	N	Rural	1-4 spans per mile	$ 256	36	27.5	$119,000.00	2.0	0.59	0.6372	0.45922629	169.76295	13.26885723	$50.40	$3,153.43	$3,203.83	$115,198.00	$22,486.93	-$15,481.10	8A CWC	0.1285
5.05	N	Rural	1-4 spans per mile	$ 256	72	32.5	$238,000.00	4.0	0.575	0.621	0.44755104	176.61676	12.29592019	$92.85	$5,809.56	$5,902.40	$209,188.00	$26,575.47	$8,138.93	6A CWC	0.162
7.01	N	Rural	1-4 spans per mile	$ 188	45	42.5	$148,750.00	2.5	0.453	0.48924	0.35259239	109.9627	7.19134943	$21.67	$995.62	$1,017.29	$119,054.00	$25,521.39	$5,191.90	6A CWC	0.162
8.01	N	Rural	1-4 spans per mile	$ 256	9	390	$35,768.00	0.5	0.13	0.1404	0.10118545	56.455854	1	$1.37	$71.48	$72.86	$44,778.00	$318,905.60	-$327,842.74	3/0 ACSR	0.502
8.02	N	Rural	1-4 spans per mile	$ 256	27	257.5	$107,303.00	1.5	0.086	0.09288	0.06693807	36.927913	1	$4.12	$214.45	$218.57	$132,833.00	$210,559.47	-$235,870.90	3/0 ACSR	0.502
8.05	N	Rural	1-4 spans per mile	$ 256	99	390	$393,443.00	5.5	0.25	0.27	0.19458741	114.42423	2.125111173	$24.76	$1,288.71	$1,313.48	$35,385.00	$318,905.60	$40,465.88	3/0 ACSR	0.502
8.06	N	Rural	1-4 spans per mile	$ 256	90	257.5	$527,500.00	5.0	0.077	0.08316	0.05993292	21.45068	1	$20.26	$714.83	$735.08	$447,775.00	$210,559.47	-$130,099.38	#2 ACSR	0.325
8.07	N	Rural	1-4 spans per mile	$ 256	90	62.5	$297,500.00	5.0	0.085	0.0918	0.06615972	6.138118	1	$11.42	$714.83	$726.25	$252,086.00	$51,106.67	-$4,966.42	3-#12 ACSR	0.0808
8.08	N	Rural	1-4 spans per mile	$ 256	90	42.5	$297,500.00	5.0	0.08	0.0864	0.06226797	8.978358	1	$11.42	$714.83	$726.25	$279,560.00	$34,752.53	-$16,086.28	8A CWC	0.1285
8.09	N	Rural	1-4 spans per mile	$ 256	58	62.5	$337,600.00	3.2	0.22	0.2376	0.17123692	66.086738	1.731956007	$10.43	$657.36	$667.79	$323,904.00	$51,106.67	-$36,742.87	#2 ACSR	0.325
9.01	N	Rural	1-4 spans per mile	$ 256	54	387.5	$214,605.00	3.0	0.25	0.27	0.19458741	92.38143	2.125111173	$13.51	$702.93	$716.44	$313,277.00	$316,861.33	-$414,816.89	1/0 ACSR	0.398
9.02	N	Rural	1-4 spans per mile	$ 256	54	387.5	$214,605.00	3.0	0.265	0.2862	0.20626265	98.975762	2.443526934	$14.67	$763.63	$778.30	$142,941.78	$316,861.33	-$244,419.81	1/0 ACSR	0.398
9.03	N	Rural	1-4 spans per mile	$ 256	90	142.5	$527,500.00	5.0	0.305	0.3294	0.23739664	56.462577	3.292635631	$43.71	$1,542.48	$1,586.19	$655,850.52	$116,523.20	-$243,287.53	6A CWC	0.162
9.04	N	Rural	1-4 spans per mile	$ 256	54	142.5	$316,500.00	3.0	0.365	0.3942	0.28409762	104.5038	4.566298676	$33.11	$1,168.28	$1,201.38	$277,475.22	$116,523.20	-$76,297.04	#4 ACSR	0.257
9.06	N	Rural	1-4 spans per mile	$ 256	101	92.5	$333,200.00	5.6	0.235	0.2538	0.18291217	71.416436	1.898745215	$19.50	$1,222.76	$1,242.26	$254,496.00	$75,637.87	$4,308.40	8A CWC	0.325
10.03	N	Rural	1-4 spans per mile	$ 256	54	131	$316,500.00	3.0	0.085	0.0918	0.06615972	23.735903	1	$12.15	$171.56	$183.71	$298,963.20	$107,119.57	-$89,399.06	#2 ACSR	0.325
10.07	N	Rural	1-4 spans per mile	$ 256	36	37.5	$119,000.00	2.0	0.1	0.108	0.07783496	11.407851	1	$4.57	$285.93	$290.50	$103,630.00	$30,664.00	-$15,003.50	8A CWC	0.1285
10.08	N	Rural	1-4 spans per mile	$ 256	50	45	$166,600.00	2.8	0.1	0.108	0.07783496	11.407851	1	$6.40	$397.13	$403.52	$56,876.00	$36,796.80	$73,330.72	8A CWC	0.1285
11.02	N	Rural	1-4 spans per mile	$ 256	45	185	$263,750.00	2.5	0.125	0.135	0.0972937	43.181216	1	$10.13	$357.41	$367.54	$130,675.00	$151,275.73	-$17,833.19	1/0 ACSR	0.398
11.03	N	Rural	1-4 spans per mile	$ 256	18	185	$105,500.00	1.0	0.066	0.07128	0.05137108	22.417674	1	$4.05	$142.97	$147.02	$53,374.00	$151,275.73	-$99,002.72	1/0 ACSR	0.398
43					**Proposed Mitigation Cost:**		$9,798,982.00	130.5						**Sum MPC + Project Cost**		$9,908,309.56	$8,848,079.00	$5,884,274.67	Absolute Difference:		$4,824,044.11
					Cost per Mile to build		$75,087.98							**Total Losses Avoided**		$4,824,044.11	**Sum MP_A**	$14,732,353.67			
*Information provided by the cooperative.					Cost per Mile in damage		$112,891.60							(MP_A-MP_C)				Cost Effectiveness:			**1.49**
																		(Total Cost/Losses Avoided)			

(y)	(x)	
Return Period (years)	**Radial Ice Thickness (inches)**	
Iowa	**Iowa(main)**	**Mn Border**
1	0.12	0.16
2	0.19	0.25
5	0.3	0.4
10	0.42	0.56
12.5	0.45	0.6
25	0.6	0.8
50	0.75	1
100	0.94	1.25
200	1.13	1.5
400	1.35	1.8
500	1.5	2

Radial Ice (in.)	Tree = 0	Tree = 1	Tree = 2	Tree = 3
		Grade N		
0	0	0	0	0
0.25	0.00125	0.0025	0.00375	0.005
0.5	0.00375	0.0075	0.01125	0.015
1	0.01375	0.0275	0.04125	0.055
3	0.08042	0.16084	0.24126	0.32168
		Grade C		
0	0	0	0	0
0.25	0.00013	0.00026	0.00039	0.00052
0.5	0.00038	0.00076	0.00114	0.00152
1	0.00163	0.00326	0.00489	0.00652
3	0.0083	0.0166	0.0249	0.0332
0	0	0	0	0
0.25	0.00004	0.00008	0.00012	0.00016
0.5	0.00012	0.00024	0.00036	0.00048
1	0.00054	0.00108	0.00162	0.00216
3	0.00276	0.00552	0.00828	0.01104

Return Period (years)	Radial Ice (inches)	Type N Poles and Line			
		Tree = 0	Tree = 1	Tree = 2	Tree = 3
1	0.12	0.0006	0.0012	0.0018	0.0024
2	0.19	0.00095	0.0019	0.00285	0.0038
5	0.3	0.00175	0.0035	0.00525	0.007
10	0.42	0.00295	0.0059	0.00885	0.0118
25	0.6	0.00575	0.0115	0.01725	0.023
50	0.75	0.00875	0.0175	0.02625	0.035
100	0.94	0.01255	0.0251	0.03765	0.0502
200	1.13	0.018084	0.036167	0.054251	0.072334
500	1.5	0.030418	0.060835	0.091253	0.12167

Return Period (years)	Radial Ice (inches)	Type N Poles and Line			
		Tree = 0	Tree = 1	Tree = 2	Tree = 3
1	0.16	0.0008	0.0016	0.0024	0.0032
2	0.25	0.00125	0.0025	0.00375	0.005
5	0.4	0.00275	0.0055	0.00825	0.011
10	0.56	0.00495	0.0099	0.01485	0.0198
25	0.8	0.00975	0.0195	0.02925	0.039
50	1	0.01375	0.0275	0.04125	0.055
100	1.25	0.022084	0.044168	0.066251	0.088335
200	1.5	0.030418	0.060835	0.091253	0.12167
500	2	0.047085	0.09417	0.141255	0.18834

Return Period (years)	Radial Ice (inches)	Type C Poles and Line			
		Tree = 0	Tree = 1	Tree = 2	Tree = 3
2	0.19	9.88E-05	0.000198	0.000296	0.000395
5	0.3	0.00018	0.00036	0.00054	0.00072
10	0.42	0.0003	0.0006	0.0009	0.0012
25	0.6	0.00063	0.00126	0.00189	0.00252
50	0.75	0.001005	0.00201	0.003015	0.00402
100	0.94	0.00148	0.00296	0.00444	0.00592
200	1.13	0.002064	0.004127	0.006191	0.008254
500	1.5	0.003298	0.006595	0.009893	0.01319

Return Period (years)	Radial Ice (inches)	Type C Poles and Line			
		Tree = 0	Tree = 1	Tree = 2	Tree = 3
2	0.25	0.00013	0.00026	0.00039	0.00052
5	0.4	0.00028	0.00056	0.00084	0.00112
10	0.56	0.00053	0.00106	0.00159	0.00212
25	0.8	0.00113	0.00226	0.00339	0.00452
50	1	0.00163	0.00326	0.00489	0.00652
100	1.25	0.002464	0.004928	0.007391	0.009855
200	1.5	0.003298	0.006595	0.009893	0.01319
500	2	0.004965	0.00993	0.014895	0.01986

Return Period (years)	Radial Ice (inches)	Type B Poles and Line			
		Tree = 0	Tree = 1	Tree = 2	Tree = 3
2	0.19	3.04E-05	6.08E-05	9.12E-05	0.000122
5	0.3	0.000056	0.000112	0.000168	0.000224
10	0.42	9.44E-05	0.000189	0.000283	0.000378
25	0.6	0.000204	0.000408	0.000612	0.000816
50	0.75	0.00033	0.00066	0.00099	0.00132
100	0.94	0.00049	0.000979	0.001469	0.001958
200	1.13	0.000684	0.001369	0.002053	0.002737
500	1.5	0.001095	0.00219	0.003285	0.00438

Return Period (years)	Radial Ice (inches)	Type B Poles and Line			
		Tree = 0	Tree = 1	Tree = 2	Tree = 3
2	0.25	0.00004	0.00008	0.00012	0.00016
5	0.4	0.000088	0.000176	0.000264	0.000352
10	0.56	0.00017	0.000341	0.000511	0.000682
25	0.8	0.000372	0.000744	0.001116	0.001488
50	1	0.00054	0.00108	0.00162	0.00216
100	1.25	0.000818	0.001635	0.002453	0.00327
200	1.5	0.001095	0.00219	0.003285	0.00438
500	2	0.00165	0.0033	0.00495	0.0066

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 1.02

Project Cost: $ 105,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 310

18 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.465
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0216	0.0006912	$ 126.60	$ 4.05	0.320544	0.010257	0.051701	0.0018015	$ 3,013.11	$ 104.99
2	0.19	0.0019	0.0000608	0.0342	0.0010944	$ 200.45	$ 6.41	0.507528	0.016241	0.081859	0.0028523	$ 4,770.76	$ 166.23
5	0.3	0.0035	0.000112	0.063	0.002016	$ 369.25	$ 11.82	0.93492	0.029917	0.150794	0.0052543	$ 8,788.25	$ 306.22
10	0.42	0.0059	0.0001888	0.1062	0.0033984	$ 622.45	$ 19.92	1.576008	0.050432	0.254195	0.0088573	$ 14,814.48	$ 516.20
25	0.6	0.0115	0.000408	0.207	0.007344	$ 1,213.25	$ 43.04	3.07188	0.108985	0.495465	0.0191407	$ 28,875.67	$ 1,115.52
50	0.75	0.0175	0.00066	0.315	0.01188	$ 1,846.25	$ 69.63	4.6746	0.176299	0.753968	0.0309629	$ 43,941.24	$ 1,804.52
100	0.94	0.0251	0.0009792	0.4518	0.0176256	$ 2,648.05	$ 103.31	6.704712	0.261564	1.081405	0.0468753	$ 63,024.29	$ 2,731.89
200	1.13	0.0361671	0.0013686	0.6510078	0.0246348	$ 3,815.63	$ 144.39	9.660956	0.36558	1.644786	0.0655162	$ 95,858.15	$ 3,818.28
500	1.5	0.060835	0.00219	1.09503	0.03942	$ 6,418.09	$ 231.05	16.25025	0.584993	1.383309	0.1048374	$ 80,619.27	$ 6,109.92

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 1.03

Project Cost: $ 105,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 310

18 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.465
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0216	0.0006912	$ 126.60	$ 4.05	0.320544	0.010257	0.051701	0.0018015	$ 3,013.11	$ 104.99
2	0.19	0.0019	0.0000608	0.0342	0.0010944	$ 200.45	$ 6.41	0.507528	0.016241	0.081859	0.0028523	$ 4,770.76	$ 166.23
5	0.3	0.0035	0.000112	0.063	0.002016	$ 369.25	$ 11.82	0.93492	0.029917	0.150794	0.0052543	$ 8,788.25	$ 306.22
10	0.42	0.0059	0.0001888	0.1062	0.0033984	$ 622.45	$ 19.92	1.576008	0.050432	0.254195	0.0088573	$ 14,814.48	$ 516.20
25	0.6	0.0115	0.000408	0.207	0.007344	$ 1,213.25	$ 43.04	3.07188	0.108985	0.495465	0.0191407	$ 28,875.67	$ 1,115.52
50	0.75	0.0175	0.00066	0.315	0.01188	$ 1,846.25	$ 69.63	4.6746	0.176299	0.753968	0.0309629	$ 43,941.24	$ 1,804.52
100	0.94	0.0251	0.0009792	0.4518	0.0176256	$ 2,648.05	$ 103.31	6.704712	0.261564	1.081405	0.0468753	$ 63,024.29	$ 2,731.89
200	1.13	0.0361671	0.0013686	0.6510078	0.0246348	$ 3,815.63	$ 144.39	9.660956	0.36558	1.644786	0.0655162	$ 95,858.15	$ 3,818.28
500	1.5	0.060835	0.00219	1.09503	0.03942	$ 6,418.09	$ 231.05	16.25025	0.584993	1.383309	0.1048374	$ 80,619.27	$ 6,109.92

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 1.04

Project Cost: $ 89,250.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 42.5

27 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.06375
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0324	0.0010368	$ 107.10	$ 3.43	0.480816	0.015386	0.565666	0.0197103	$ 4,519.67	$ 157.49
2	0.19	0.0019	0.0000608	0.0513	0.0016416	$ 169.58	$ 5.43	0.761292	0.024361	0.895638	0.031208	$ 7,156.14	$ 249.35
5	0.3	0.0035	0.000112	0.0945	0.003024	$ 312.38	$ 10.00	1.40238	0.044876	1.649859	0.0574884	$ 13,182.37	$ 459.33
10	0.42	0.0059	0.0001888	0.1593	0.0050976	$ 526.58	$ 16.85	2.364012	0.075648	1.390595	0.096909	$ 11,110.86	$ 774.30
25	0.6	0.0115	0.000408	0.3105	0.011016	$ 1,026.38	$ 36.41	4.60782	0.163477	2.710482	0.2094221	$ 21,656.75	$ 1,673.28
50	0.75	0.0175	0.00066	0.4725	0.01782	$ 1,561.88	$ 58.91	7.0119	0.264449	4.124647	0.338771	$ 32,955.93	$ 2,706.78
100	0.94	0.0251	0.0009792	0.6777	0.0264384	$ 2,240.18	$ 87.39	10.05707	0.392346	3.943948	0.5128704	$ 31,512.15	$ 4,097.83
200	1.13	0.0361671	0.0013686	0.9765117	0.0369522	$ 3,227.91	$ 122.15	14.49143	0.548371	5.998633	0.7168244	$ 47,929.07	$ 5,727.43
500	1.5	0.060835	0.00219	1.642545	0.05913	$ 5,429.52	$ 195.46	24.37537	0.877489	10.09002	1.1470447	$ 80,619.27	$ 9,164.89

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 1.05

Project Cost: $ 211,000.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 447.5

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.67125
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 253.20	$ 8.10	0.641088	0.020515	0.07163	0.0024959	$ 6,026.23	$ 209.98
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 400.90	$ 12.83	1.015056	0.032482	0.113414	0.0039519	$ 9,541.53	$ 332.47
5	0.3	0.0035	0.000112	0.126	0.004032	$ 738.50	$ 23.63	1.86984	0.059835	0.208921	0.0072797	$ 17,576.50	$ 612.44
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 1,244.90	$ 39.84	3.152016	0.100865	0.352181	0.0122715	$ 29,628.95	$ 1,032.40
25	0.6	0.0115	0.000408	0.414	0.014688	$ 2,426.50	$ 86.09	6.14376	0.21797	0.686454	0.026519	$ 57,751.34	$ 2,231.04
50	0.75	0.0175	0.00066	0.63	0.02376	$ 3,692.50	$ 139.26	9.3492	0.352598	1.044603	0.0428984	$ 87,882.48	$ 3,609.04
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 5,296.10	$ 206.61	13.40942	0.523128	1.49826	0.0649445	$ 126,048.59	$ 5,463.78
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 7,631.26	$ 288.77	19.32191	0.731161	1.139405	0.0907711	$ 95,858.15	$ 7,636.57
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 12,836.19	$ 462.09	32.50049	1.169986	1.91654	0.1452496	$ 161,238.54	$ 12,219.85

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.01

Project Cost: $ 158,250.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 322.5

27 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.48375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0324	0.0010368	$ 189.90	$ 6.08	0.480816	0.015386	0.074545	0.0025975	$ 6,154.44	$ 214.45
2	0.19	0.0019	0.0000608	0.0513	0.0016416	$ 300.68	$ 9.62	0.761292	0.024361	0.11803	0.0041127	$ 9,744.54	$ 339.54
5	0.3	0.0035	0.000112	0.0945	0.003024	$ 553.88	$ 17.72	1.40238	0.044876	0.217423	0.007576	$ 17,950.46	$ 625.47
10	0.42	0.0059	0.0001888	0.1593	0.0050976	$ 933.68	$ 29.88	2.364012	0.075648	0.366513	0.012771	$ 30,259.35	$ 1,054.37
25	0.6	0.0115	0.000408	0.3105	0.011016	$ 1,819.88	$ 64.57	4.60782	0.163477	0.714391	0.0275983	$ 58,980.10	$ 2,278.51
50	0.75	0.0175	0.00066	0.4725	0.01782	$ 2,769.38	$ 104.45	7.0119	0.264449	1.087116	0.0446442	$ 89,752.32	$ 3,685.83
100	0.94	0.0251	0.0009792	0.6777	0.0264384	$ 3,972.08	$ 154.96	10.05707	0.392346	1.559235	0.0675876	$ 128,730.47	$ 5,580.03
200	1.13	0.0361671	0.0013686	0.9765117	0.0369522	$ 5,723.44	$ 216.58	14.49143	0.548371	1.185776	0.0944652	$ 97,897.68	$ 7,799.05
500	1.5	0.060835	0.00219	1.642545	0.05913	$ 9,627.14	$ 346.57	24.37537	0.877489	1.994539	0.1511609	$ 164,669.15	$ 12,479.85

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.02

Project Cost: $ 211,000.00

Region: 1

1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 487.5

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.73125
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 253.20	$ 8.10	0.641088	0.020515	0.065753	0.0022911	$ 8,205.93	$ 285.93
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 400.90	$ 12.83	1.015056	0.032482	0.104108	0.0036276	$ 12,992.72	$ 452.72
5	0.3	0.0035	0.000112	0.126	0.004032	$ 738.50	$ 23.63	1.86984	0.059835	0.191778	0.0066824	$ 23,933.95	$ 833.97
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 1,244.90	$ 39.84	3.152016	0.100865	0.323284	0.0112646	$ 40,345.80	$ 1,405.83
25	0.6	0.0115	0.000408	0.414	0.014688	$ 2,426.50	$ 86.09	6.14376	0.21797	0.630129	0.0243431	$ 78,640.13	$ 3,038.02
50	0.75	0.0175	0.00066	0.63	0.02376	$ 3,692.50	$ 139.26	9.3492	0.352598	0.958892	0.0393785	$ 119,669.76	$ 4,914.44
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 5,296.10	$ 206.61	13.40942	0.523128	1.375326	0.0596157	$ 171,640.63	$ 7,440.04
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 7,631.26	$ 288.77	19.32191	0.731161	1.045915	0.0833232	$ 130,530.25	$ 10,398.73
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 12,836.19	$ 462.09	32.50049	1.169986	1.759286	0.1333317	$ 219,558.87	$ 16,639.80

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.03

Project Cost: $ 286,140.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 445

72 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.166667

# of Linemen: 0.6675
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0864	0.0027648	$ 343.37	$ 10.99	1.282176	0.04103	0.144065	0.0050199	$ 16,411.85	$ 571.86
2	0.19	0.0019	0.0000608	0.1368	0.0043776	$ 543.67	$ 17.40	2.030112	0.064964	0.228102	0.0079481	$ 25,985.43	$ 905.45
5	0.3	0.0035	0.000112	0.252	0.008064	$ 1,001.49	$ 32.05	3.73968	0.11967	0.420189	0.0146412	$ 47,867.90	$ 1,667.93
10	0.42	0.0059	0.0001888	0.4248	0.0135936	$ 1,688.23	$ 54.02	6.304032	0.201729	0.708318	0.024681	$ 80,691.61	$ 2,811.65
25	0.6	0.0115	0.000408	0.828	0.029376	$ 3,290.61	$ 116.75	12.28752	0.43594	1.38062	0.053336	$ 157,280.26	$ 6,076.03
50	0.75	0.0175	0.00066	1.26	0.04752	$ 5,007.45	$ 188.85	18.6984	0.705197	1.050472	0.0862788	$ 119,669.76	$ 9,828.88
100	0.94	0.0251	0.0009792	1.8072	0.0705024	$ 7,182.11	$ 280.19	26.81885	1.046256	1.506677	0.1306187	$ 171,640.63	$ 14,880.08
200	1.13	0.0361671	0.0013686	2.6040312	0.0985392	$ 10,348.85	$ 391.61	38.64382	1.462322	2.291612	0.182562	$ 261,060.49	$ 20,797.46
500	1.5	0.060835	0.00219	4.38012	0.15768	$ 17,407.33	$ 626.65	65.00098	2.339971	3.854615	0.2921312	$ 439,117.74	$ 33,279.59

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.04

Project Cost: $ 527,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 345

90 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.5175
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.108	0.003456	$ 633.00	$ 20.26	1.60272	0.051287	0.232278	0.0080936	$ 20,514.82	$ 714.83
2	0.19	0.0019	0.0000608	0.171	0.005472	$ 1,002.25	$ 32.07	2.53764	0.081204	0.367774	0.0128149	$ 32,481.79	$ 1,131.81
5	0.3	0.0035	0.000112	0.315	0.01008	$ 1,846.25	$ 59.08	4.6746	0.149587	0.677478	0.0236064	$ 59,834.88	$ 2,084.91
10	0.42	0.0059	0.0001888	0.531	0.016992	$ 3,112.25	$ 99.59	7.88004	0.252161	1.142035	0.0397936	$ 100,864.51	$ 3,514.57
25	0.6	0.0115	0.000408	1.035	0.03672	$ 6,066.25	$ 215.22	15.3594	0.544925	1.113	0.0859946	$ 98,300.16	$ 7,595.04
50	0.75	0.0175	0.00066	1.575	0.0594	$ 9,231.25	$ 348.15	23.373	0.881496	1.693696	0.1391089	$ 149,587.20	$ 12,286.10
100	0.94	0.0251	0.0009792	2.259	0.088128	$ 13,240.25	$ 516.53	33.52356	1.30782	2.429243	0.210599	$ 214,550.78	$ 18,600.10
200	1.13	0.0361671	0.0013686	3.255039	0.123174	$ 19,078.15	$ 721.94	48.30478	1.827902	3.69481	0.2943482	$ 326,325.62	$ 25,996.83
500	1.5	0.060835	0.00219	5.47515	0.1971	$ 32,090.46	$ 1,155.23	81.25123	2.924964	4.143246	0.4710087	$ 365,931.45	$ 41,599.49

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.05

Project Cost: $ 327,250.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 75

99 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.1125
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.1188	0.0038016	$ 392.70	$ 12.57	1.762992	0.056416	1.175328	0.0409537	$ 22,566.30	$ 786.31
2	0.19	0.0019	0.0000608	0.1881	0.0060192	$ 621.78	$ 19.90	2.791404	0.089325	0.930468	0.0648433	$ 17,864.99	$ 1,244.99
5	0.3	0.0035	0.000112	0.3465	0.011088	$ 1,145.38	$ 36.65	5.14206	0.164546	1.71402	0.1194481	$ 32,909.18	$ 2,293.40
10	0.42	0.0059	0.0001888	0.5841	0.0186912	$ 1,930.78	$ 61.78	8.668044	0.277377	2.889348	0.2013555	$ 55,475.48	$ 3,866.02
25	0.6	0.0115	0.000408	1.1385	0.040392	$ 3,763.38	$ 133.52	16.89534	0.599417	3.75452	0.4351325	$ 72,086.78	$ 8,354.54
50	0.75	0.0175	0.00066	1.7325	0.06534	$ 5,726.88	$ 215.99	25.7103	0.969646	5.7134	0.7038909	$ 109,697.28	$ 13,514.70
100	0.94	0.0251	0.0009792	2.4849	0.0969408	$ 8,213.98	$ 320.44	36.87592	1.438601	8.194648	1.0656307	$ 157,337.24	$ 20,460.11
200	1.13	0.0361671	0.0013686	3.5805429	0.1354914	$ 11,835.68	$ 447.87	53.13526	2.010692	12.46383	1.4894018	$ 239,305.45	$ 28,596.51
500	1.5	0.060835	0.00219	6.022665	0.21681	$ 19,908.25	$ 716.68	89.37635	3.21746	20.96482	1.191652	$ 402,524.59	$ 22,879.72

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.06

Project Cost: $ 148,750.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 52.5

45 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.07875
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.054	0.001728	$ 178.50	$ 5.71	0.80136	0.025644	0.7632	0.0265933	$ 10,257.41	$ 357.41
2	0.19	0.0019	0.0000608	0.0855	0.002736	$ 282.63	$ 9.04	1.26882	0.040602	1.2084	0.042106	$ 16,240.90	$ 565.90
5	0.3	0.0035	0.000112	0.1575	0.00504	$ 520.63	$ 16.66	2.3373	0.074794	1.113	0.0775637	$ 14,958.72	$ 1,042.46
10	0.42	0.0059	0.0001888	0.2655	0.008496	$ 877.63	$ 28.08	3.94002	0.126081	1.8762	0.1307503	$ 25,216.13	$ 1,757.28
25	0.6	0.0115	0.000408	0.5175	0.01836	$ 1,710.63	$ 60.69	7.6797	0.272462	3.657	0.2825536	$ 49,150.08	$ 3,797.52
50	0.75	0.0175	0.00066	0.7875	0.0297	$ 2,603.13	$ 98.18	11.6865	0.440748	3.71	0.457072	$ 49,862.40	$ 6,143.05
100	0.94	0.0251	0.0009792	1.1295	0.044064	$ 3,733.63	$ 145.66	16.76178	0.65391	5.3212	0.691968	$ 71,516.93	$ 9,300.05
200	1.13	0.0361671	0.0013686	1.6275195	0.061587	$ 5,379.86	$ 203.58	24.15239	0.913951	8.093393	0.967144	$ 108,775.21	$ 12,998.42
500	1.5	0.060835	0.00219	2.737575	0.09855	$ 9,049.21	$ 325.76	40.62561	1.462482	13.61352	1.5476	$ 182,965.72	$ 20,799.74

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.07

Project Cost: $ 178,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 55

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.0825
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 214.20	$ 6.85	0.961632	0.030772	0.874211	0.0304614	$ 12,308.89	$ 428.90
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 339.15	$ 10.85	1.522584	0.048723	1.384167	0.0482305	$ 19,489.08	$ 679.09
5	0.3	0.0035	0.000112	0.189	0.006048	$ 624.75	$ 19.99	2.80476	0.089752	1.274891	0.0888457	$ 17,950.46	$ 1,250.95
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,053.15	$ 33.70	4.728024	0.151297	2.149102	0.1497685	$ 30,259.35	$ 2,108.74
25	0.6	0.0115	0.000408	0.621	0.022032	$ 2,052.75	$ 72.83	9.21564	0.326955	4.188927	0.3236523	$ 58,980.10	$ 4,557.02
50	0.75	0.0175	0.00066	0.945	0.03564	$ 3,123.75	$ 117.81	14.0238	0.528898	4.249636	0.5235552	$ 59,834.88	$ 7,371.66
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 4,480.35	$ 174.79	20.11414	0.784692	6.095193	0.7926179	$ 85,820.31	$ 11,160.06
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 6,455.83	$ 244.30	28.98287	1.096741	9.270614	1.1078195	$ 130,530.25	$ 15,598.10
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 10,859.05	$ 390.92	48.75074	1.754978	15.59367	1.7727055	$ 219,558.87	$ 24,959.69

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 2.08

Project Cost: $ 245,868.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 32.5

101 # of Poles
(using 18 poles per mile)

Cost per Pole: 2434.336634

# of Linemen: 0.04875
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.1212	0.0038784	$ 295.04	$ 9.44	1.798608	0.057555	1.383545	0.0964177	$ 8,453.46	$ 589.11
2	0.19	0.0019	0.0000608	0.1919	0.0061408	$ 467.15	$ 14.95	2.847796	0.091129	2.190612	0.1526613	$ 13,384.64	$ 932.76
5	0.3	0.0035	0.000112	0.3535	0.011312	$ 860.54	$ 27.54	5.24594	0.16787	4.035338	0.2812183	$ 24,655.92	$ 1,718.24
10	0.42	0.0059	0.0001888	0.5959	0.0190688	$ 1,450.62	$ 46.42	8.843156	0.282981	4.534952	0.4740536	$ 27,708.56	$ 2,896.47
25	0.6	0.0115	0.000408	1.1615	0.041208	$ 2,827.48	$ 100.31	17.23666	0.611527	8.839313	1.0244379	$ 54,008.20	$ 6,259.32
50	0.75	0.0175	0.00066	1.7675	0.06666	$ 4,302.69	$ 162.27	26.2297	0.989234	13.45113	1.657179	$ 82,186.39	$ 10,125.36
100	0.94	0.0251	0.0009792	2.5351	0.0988992	$ 6,171.29	$ 240.75	37.62088	1.467664	19.29276	1.2544138	$ 117,878.77	$ 7,664.47
200	1.13	0.0361671	0.0013686	3.6528771	0.1382286	$ 8,892.33	$ 336.49	54.2087	2.051312	29.34374	1.7532585	$ 179,290.24	$ 10,712.41
500	1.5	0.060835	0.00219	6.144335	0.22119	$ 14,957.38	$ 538.45	91.18193	3.28246	49.35774	2.805521	$ 301,575.80	$ 17,141.73

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 3.01

Project Cost: $ 316,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 182.5

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.27375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 379.80	$ 12.15	0.961632	0.030772	0.263461	0.0091801	$ 12,308.89	$ 428.90
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 601.35	$ 19.24	1.522584	0.048723	0.417146	0.0145352	$ 19,489.08	$ 679.09
5	0.3	0.0035	0.000112	0.189	0.006048	$ 1,107.75	$ 35.45	2.80476	0.089752	0.768427	0.0267754	$ 35,900.93	$ 1,250.95
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,867.35	$ 59.76	4.728024	0.151297	1.295349	0.0451357	$ 60,518.71	$ 2,108.74
25	0.6	0.0115	0.000408	0.621	0.022032	$ 3,639.75	$ 129.13	9.21564	0.326955	1.262416	0.0975391	$ 58,980.10	$ 4,557.02
50	0.75	0.0175	0.00066	0.945	0.03564	$ 5,538.75	$ 208.89	14.0238	0.528898	1.921068	0.1577838	$ 89,752.32	$ 7,371.66
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 7,944.15	$ 309.92	20.11414	0.784692	2.755361	0.2388711	$ 128,730.47	$ 11,160.06
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 11,446.89	$ 433.16	28.98287	1.096741	4.190826	0.3338634	$ 195,795.37	$ 15,598.10
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 19,254.28	$ 693.14	48.75074	1.754978	4.699462	0.53424	$ 219,558.87	$ 24,959.69

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 3.02

Project Cost: $ 89,450.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 160

18 # of Poles
(using 18 poles per mile)

Cost per Pole: 4969.444444

# of Linemen: 0.24
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0216	0.0006912	$ 107.34	$ 3.43	0.320544	0.010257	0.10017	0.0034904	$ 4,102.96	$ 142.97
2	0.19	0.0019	0.0000608	0.0342	0.0010944	$ 169.96	$ 5.44	0.507528	0.016241	0.158603	0.0055264	$ 6,496.36	$ 226.36
5	0.3	0.0035	0.000112	0.063	0.002016	$ 313.08	$ 10.02	0.93492	0.029917	0.292163	0.0101802	$ 11,966.98	$ 416.98
10	0.42	0.0059	0.0001888	0.1062	0.0033984	$ 527.76	$ 16.89	1.576008	0.050432	0.492503	0.017161	$ 20,172.90	$ 702.91
25	0.6	0.0115	0.000408	0.207	0.007344	$ 1,028.68	$ 36.50	3.07188	0.108985	0.959963	0.0370852	$ 39,320.06	$ 1,519.01
50	0.75	0.0175	0.00066	0.315	0.01188	$ 1,565.38	$ 59.04	4.6746	0.176299	1.460813	0.0599907	$ 59,834.88	$ 2,457.22
100	0.94	0.0251	0.0009792	0.4518	0.0176256	$ 2,245.20	$ 87.59	6.704712	0.261564	1.047611	0.0908208	$ 42,910.16	$ 3,720.02
200	1.13	0.0361671	0.0013686	0.6510078	0.0246348	$ 3,235.15	$ 122.42	9.660956	0.36558	1.593387	0.1269377	$ 65,265.12	$ 5,199.37
500	1.5	0.060835	0.00219	1.09503	0.03942	$ 5,441.69	$ 195.90	16.25025	0.584993	2.680162	0.2031225	$ 109,779.43	$ 8,319.90

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 3.03

Project Cost: $ 327,250.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 100

99 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.15
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.1188	0.0038016	$ 392.70	$ 12.57	1.762992	0.056416	0.881496	0.0307152	$ 16,572.12	$ 577.45
2	0.19	0.0019	0.0000608	0.1881	0.0060192	$ 621.78	$ 19.90	2.791404	0.089325	1.395702	0.0486325	$ 26,239.20	$ 914.29
5	0.3	0.0035	0.000112	0.3465	0.011088	$ 1,145.38	$ 36.65	5.14206	0.164546	1.285515	0.0895861	$ 24,167.68	$ 1,684.22
10	0.42	0.0059	0.0001888	0.5841	0.0186912	$ 1,930.78	$ 61.78	8.668044	0.277377	2.167011	0.1510166	$ 40,739.81	$ 2,839.11
25	0.6	0.0115	0.000408	1.1385	0.040392	$ 3,763.38	$ 133.52	16.89534	0.599417	4.223835	0.3263494	$ 79,408.10	$ 6,135.37
50	0.75	0.0175	0.00066	1.7325	0.06534	$ 5,726.88	$ 215.99	25.7103	0.969646	4.28505	0.5279182	$ 80,558.94	$ 9,924.86
100	0.94	0.0251	0.0009792	2.4849	0.0969408	$ 8,213.98	$ 320.44	36.87592	1.438601	6.145986	0.799223	$ 115,544.54	$ 15,025.39
200	1.13	0.0361671	0.0013686	3.5805429	0.1354914	$ 11,835.68	$ 447.87	53.13526	2.010692	9.347869	1.1170513	$ 175,739.94	$ 21,000.56
500	1.5	0.060835	0.00219	6.022665	0.21681	$ 19,908.25	$ 716.68	89.37635	3.21746	15.72362	1.787478	$ 295,604.00	$ 33,604.59

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 3.04

Project Cost: $ 148,750.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 70

45 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.105
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.054	0.001728	$ 178.50	$ 5.71	0.80136	0.025644	0.5724	0.019945	$ 10,257.41	$ 357.41
2	0.19	0.0019	0.0000608	0.0855	0.002736	$ 282.63	$ 9.04	1.26882	0.040602	0.9063	0.0315795	$ 16,240.90	$ 565.90
5	0.3	0.0035	0.000112	0.1575	0.00504	$ 520.63	$ 16.66	2.3373	0.074794	1.6695	0.0581728	$ 29,917.44	$ 1,042.46
10	0.42	0.0059	0.0001888	0.2655	0.008496	$ 877.63	$ 28.08	3.94002	0.126081	1.40715	0.0980627	$ 25,216.13	$ 1,757.28
25	0.6	0.0115	0.000408	0.5175	0.01836	$ 1,710.63	$ 60.69	7.6797	0.272462	2.74275	0.2119152	$ 49,150.08	$ 3,797.52
50	0.75	0.0175	0.00066	0.7875	0.0297	$ 2,603.13	$ 98.18	11.6865	0.440748	4.17375	0.342804	$ 74,793.60	$ 6,143.05
100	0.94	0.0251	0.0009792	1.1295	0.044064	$ 3,733.63	$ 145.66	16.76178	0.65391	3.9909	0.518976	$ 71,516.93	$ 9,300.05
200	1.13	0.0361671	0.0013686	1.6275195	0.061587	$ 5,379.86	$ 203.58	24.15239	0.913951	6.070045	0.725358	$ 108,775.21	$ 12,998.42
500	1.5	0.060835	0.00219	2.737575	0.09855	$ 9,049.21	$ 325.76	40.62561	1.462482	10.21014	1.1607	$ 182,965.72	$ 20,799.74

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 4.02

Project Cost: $ 286,140.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 392.5

72 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.166667

# of Linemen: 0.58875
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0864	0.0027648	$ 343.37	$ 10.99	1.282176	0.04103	0.163335	0.0056913	$ 12,052.45	$ 419.96
2	0.19	0.0019	0.0000608	0.1368	0.0043776	$ 543.67	$ 17.40	2.030112	0.064964	0.258613	0.0090112	$ 19,083.05	$ 664.94
5	0.3	0.0035	0.000112	0.252	0.008064	$ 1,001.49	$ 32.05	3.73968	0.11967	0.476392	0.0165996	$ 35,152.99	$ 1,224.89
10	0.42	0.0059	0.0001888	0.4248	0.0135936	$ 1,688.23	$ 54.02	6.304032	0.201729	0.803061	0.0279822	$ 59,257.90	$ 2,064.81
25	0.6	0.0115	0.000408	0.828	0.029376	$ 3,290.61	$ 116.75	12.28752	0.43594	1.565289	0.0604701	$ 115,502.69	$ 4,462.09
50	0.75	0.0175	0.00066	1.26	0.04752	$ 5,007.45	$ 188.85	18.6984	0.705197	1.190981	0.0978192	$ 87,882.48	$ 7,218.08
100	0.94	0.0251	0.0009792	1.8072	0.0705024	$ 7,182.11	$ 280.19	26.81885	1.046256	1.708207	0.14809	$ 126,048.59	$ 10,927.56
200	1.13	0.0361671	0.0013686	2.6040312	0.0985392	$ 10,348.85	$ 391.61	38.64382	1.462322	2.598134	0.2069811	$ 191,716.30	$ 15,273.14
500	1.5	0.060835	0.00219	4.38012	0.15768	$ 17,407.33	$ 626.65	65.00098	2.339971	4.3702	0.3312061	$ 322,477.09	$ 24,439.70

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 4.03

Project Cost: $ 286,140.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 562.5

72 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.166667

# of Linemen: 0.84375
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0864	0.0027648	$ 343.37	$ 10.99	1.282176	0.04103	0.113971	0.0039713	$ 12,052.45	$ 419.96
2	0.19	0.0019	0.0000608	0.1368	0.0043776	$ 543.67	$ 17.40	2.030112	0.064964	0.180454	0.0062878	$ 19,083.05	$ 664.94
5	0.3	0.0035	0.000112	0.252	0.008064	$ 1,001.49	$ 32.05	3.73968	0.11967	0.332416	0.0115829	$ 35,152.99	$ 1,224.89
10	0.42	0.0059	0.0001888	0.4248	0.0135936	$ 1,688.23	$ 54.02	6.304032	0.201729	0.560358	0.0195254	$ 59,257.90	$ 2,064.81
25	0.6	0.0115	0.000408	0.828	0.029376	$ 3,290.61	$ 116.75	12.28752	0.43594	1.092224	0.0421947	$ 115,502.69	$ 4,462.09
50	0.75	0.0175	0.00066	1.26	0.04752	$ 5,007.45	$ 188.85	18.6984	0.705197	1.66208	0.0682561	$ 175,764.96	$ 7,218.08
100	0.94	0.0251	0.0009792	1.8072	0.0705024	$ 7,182.11	$ 280.19	26.81885	1.046256	1.191949	0.1033339	$ 126,048.59	$ 10,927.56
200	1.13	0.0361671	0.0013686	2.6040312	0.0985392	$ 10,348.85	$ 391.61	38.64382	1.462322	1.81292	0.1444268	$ 191,716.30	$ 15,273.14
500	1.5	0.060835	0.00219	4.38012	0.15768	$ 17,407.33	$ 626.65	65.00098	2.339971	3.049429	0.2311083	$ 322,477.09	$ 24,439.70

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 4.04

Project Cost: $ 178,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 265

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.3975
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 214.20	$ 6.85	0.961632	0.030772	0.18144	0.0063222	$ 9,039.34	$ 314.97
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 339.15	$ 10.85	1.522584	0.048723	0.28728	0.0100101	$ 14,312.29	$ 498.70
5	0.3	0.0035	0.000112	0.189	0.006048	$ 624.75	$ 19.99	2.80476	0.089752	0.5292	0.0184397	$ 26,364.74	$ 918.66
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,053.15	$ 33.70	4.728024	0.151297	0.89208	0.031084	$ 44,443.43	$ 1,548.61
25	0.6	0.0115	0.000408	0.621	0.022032	$ 2,052.75	$ 72.83	9.21564	0.326955	1.7388	0.0671731	$ 86,627.02	$ 3,346.56
50	0.75	0.0175	0.00066	0.945	0.03564	$ 3,123.75	$ 117.81	14.0238	0.528898	1.323	0.1086624	$ 65,911.86	$ 5,413.56
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 4,480.35	$ 174.79	20.11414	0.784692	1.89756	0.1645056	$ 94,536.44	$ 8,195.67
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 6,455.83	$ 244.30	28.98287	1.096741	2.886135	0.2299248	$ 143,787.22	$ 11,454.85
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 10,859.05	$ 390.92	48.75074	1.754978	3.236422	0.36792	$ 161,238.54	$ 18,329.77

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 4.05

Project Cost: $ 119,000.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 32.5

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.04875
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 142.80	$ 4.57	0.641088	0.020515	0.986289	0.0343667	$ 6,026.23	$ 209.98
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 226.10	$ 7.24	1.015056	0.032482	1.561625	0.0544139	$ 9,541.53	$ 332.47
5	0.3	0.0035	0.000112	0.126	0.004032	$ 416.50	$ 13.33	1.86984	0.059835	1.438338	0.1002362	$ 8,788.25	$ 612.44
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 702.10	$ 22.47	3.152016	0.100865	2.424628	0.1689696	$ 14,814.48	$ 1,032.40
25	0.6	0.0115	0.000408	0.414	0.014688	$ 1,368.50	$ 48.55	6.14376	0.21797	3.150646	0.3651462	$ 19,250.45	$ 2,231.04
50	0.75	0.0175	0.00066	0.63	0.02376	$ 2,082.50	$ 78.54	9.3492	0.352598	4.794462	0.5906777	$ 29,294.16	$ 3,609.04
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 2,986.90	$ 116.52	13.40942	0.523128	6.876628	0.8942356	$ 42,016.20	$ 5,463.78
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 4,303.88	$ 162.86	19.32191	0.731161	10.45915	1.2498476	$ 63,905.43	$ 7,636.57
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 7,239.37	$ 260.61	32.50049	1.169986	17.59286	1.9999754	$ 107,492.36	$ 12,219.85

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 5.01

Project Cost: $ 143,070.00

Region: 1

1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 57.5

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.166667

# of Linemen: 0.08625
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 171.68	$ 5.49	0.641088	0.020515	0.557468	0.0194247	$ 6,026.23	$ 209.98
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 271.83	$ 8.70	1.015056	0.032482	0.882657	0.0307557	$ 9,541.53	$ 332.47
5	0.3	0.0035	0.000112	0.126	0.004032	$ 500.75	$ 16.02	1.86984	0.059835	1.625948	0.0566552	$ 17,576.50	$ 612.44
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 844.11	$ 27.01	3.152016	0.100865	1.370442	0.0955046	$ 14,814.48	$ 1,032.40
25	0.6	0.0115	0.000408	0.414	0.014688	$ 1,645.31	$ 58.37	6.14376	0.21797	2.6712	0.206387	$ 28,875.67	$ 2,231.04
50	0.75	0.0175	0.00066	0.63	0.02376	$ 2,503.73	$ 94.43	9.3492	0.352598	4.06487	0.3338613	$ 43,941.24	$ 3,609.04
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 3,591.06	$ 140.09	13.40942	0.523128	3.88679	0.5054375	$ 42,016.20	$ 5,463.78
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 5,174.43	$ 195.81	19.32191	0.731161	5.911696	0.7064356	$ 63,905.43	$ 7,636.57
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 8,703.66	$ 313.32	32.50049	1.169986	9.943789	1.1304209	$ 107,492.36	$ 12,219.85

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 5.02

Project Cost: $ 119,000.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 95

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.1425
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 142.80	$ 4.57	0.641088	0.020515	0.337415	0.011757	$ 8,205.93	$ 285.93
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 226.10	$ 7.24	1.015056	0.032482	0.53424	0.0186153	$ 12,992.72	$ 452.72
5	0.3	0.0035	0.000112	0.126	0.004032	$ 416.50	$ 13.33	1.86984	0.059835	0.984126	0.0342913	$ 23,933.95	$ 833.97
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 702.10	$ 22.47	3.152016	0.100865	1.658956	0.0578054	$ 40,345.80	$ 1,405.83
25	0.6	0.0115	0.000408	0.414	0.014688	$ 1,368.50	$ 48.55	6.14376	0.21797	1.616779	0.1249184	$ 39,320.06	$ 3,038.02
50	0.75	0.0175	0.00066	0.63	0.02376	$ 2,082.50	$ 78.54	9.3492	0.352598	2.460316	0.2020739	$ 59,834.88	$ 4,914.44
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 2,986.90	$ 116.52	13.40942	0.523128	3.528796	0.3059227	$ 85,820.31	$ 7,440.04
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 4,303.88	$ 162.86	19.32191	0.731161	3.578132	0.4275795	$ 87,020.16	$ 10,398.73
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 7,239.37	$ 260.61	32.50049	1.169986	6.018609	0.6842021	$ 146,372.58	$ 16,639.80

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 5.03

Project Cost: $ 104,125.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 60

32 # of Poles
(using 18 poles per mile)

Cost per Pole: 3253.90625

# of Linemen: 0.09
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0384	0.0012288	$ 124.95	$ 4.00	0.569856	0.018235	0.47488	0.0165469	$ 5,356.65	$ 186.65
2	0.19	0.0019	0.0000608	0.0608	0.0019456	$ 197.84	$ 6.33	0.902272	0.028873	0.751893	0.0261993	$ 8,481.36	$ 295.53
5	0.3	0.0035	0.000112	0.112	0.003584	$ 364.44	$ 11.66	1.66208	0.053187	1.385067	0.0482619	$ 15,623.55	$ 544.39
10	0.42	0.0059	0.0001888	0.1888	0.0060416	$ 614.34	$ 19.66	2.801792	0.089657	1.167413	0.0813557	$ 13,168.42	$ 917.69
25	0.6	0.0115	0.000408	0.368	0.013056	$ 1,197.44	$ 42.48	5.46112	0.193751	2.275467	0.1758111	$ 25,667.26	$ 1,983.15
50	0.75	0.0175	0.00066	0.56	0.02112	$ 1,822.19	$ 68.72	8.3104	0.313421	3.462667	0.2844004	$ 39,058.88	$ 3,208.04
100	0.94	0.0251	0.0009792	0.8032	0.0313344	$ 2,613.54	$ 101.96	11.91949	0.465002	3.310969	0.4305579	$ 37,347.73	$ 4,856.69
200	1.13	0.0361671	0.0013686	1.1573472	0.0437952	$ 3,765.90	$ 142.51	17.17503	0.649921	5.035889	0.6017785	$ 56,804.83	$ 6,788.06
500	1.5	0.060835	0.00219	1.94672	0.07008	$ 6,334.44	$ 228.03	28.88932	1.039987	8.470635	0.9629511	$ 95,548.77	$ 10,862.09

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 5.04

Project Cost: $ 119,000.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 27.5

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.04125
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 142.80	$ 4.57	0.641088	0.020515	1.165615	0.0406152	$ 8,205.93	$ 285.93
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 226.10	$ 7.24	1.015056	0.032482	0.922778	0.0643074	$ 6,496.36	$ 452.72
5	0.3	0.0035	0.000112	0.126	0.004032	$ 416.50	$ 13.33	1.86984	0.059835	1.699855	0.118461	$ 11,966.98	$ 833.97
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 702.10	$ 22.47	3.152016	0.100865	2.865469	0.1996914	$ 20,172.90	$ 1,405.83
25	0.6	0.0115	0.000408	0.414	0.014688	$ 1,368.50	$ 48.55	6.14376	0.21797	3.723491	0.4315364	$ 26,213.38	$ 3,038.02
50	0.75	0.0175	0.00066	0.63	0.02376	$ 2,082.50	$ 78.54	9.3492	0.352598	5.666182	0.6980736	$ 39,889.92	$ 4,914.44
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 2,986.90	$ 116.52	13.40942	0.523128	8.126924	1.0568239	$ 57,213.54	$ 7,440.04
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 4,303.88	$ 162.86	19.32191	0.731161	12.36082	1.4770927	$ 87,020.16	$ 10,398.73
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 7,239.37	$ 260.61	32.50049	1.169986	20.79156	1.1818036	$ 146,372.58	$ 8,319.90

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 5.05

Project Cost: $ 238,000.00

Region: 1

1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 32.5

72 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.04875
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0864	0.0027648	$ 285.60	$ 9.14	1.282176	0.04103	0.986289	0.0687334	$ 8,205.93	$ 571.86
2	0.19	0.0019	0.0000608	0.1368	0.0043776	$ 452.20	$ 14.47	2.030112	0.064964	1.561625	0.1088279	$ 12,992.72	$ 905.45
5	0.3	0.0035	0.000112	0.252	0.008064	$ 833.00	$ 26.66	3.73968	0.11967	2.876677	0.2004724	$ 23,933.95	$ 1,667.93
10	0.42	0.0059	0.0001888	0.4248	0.0135936	$ 1,404.20	$ 44.93	6.304032	0.201729	3.232837	0.3379392	$ 26,897.20	$ 2,811.65
25	0.6	0.0115	0.000408	0.828	0.029376	$ 2,737.00	$ 97.10	12.28752	0.43594	6.301292	0.7302924	$ 52,426.75	$ 6,076.03
50	0.75	0.0175	0.00066	1.26	0.04752	$ 4,165.00	$ 157.08	18.6984	0.705197	9.588923	1.1813553	$ 79,779.84	$ 9,828.88
100	0.94	0.0251	0.0009792	1.8072	0.0705024	$ 5,973.80	$ 233.05	26.81885	1.046256	13.75326	1.7884711	$ 114,427.08	$ 14,880.08
200	1.13	0.0361671	0.0013686	2.6040312	0.0985392	$ 8,607.77	$ 325.73	38.64382	1.462322	20.91831	1.2498476	$ 174,040.33	$ 10,398.73
500	1.5	0.060835	0.00219	4.38012	0.15768	$ 14,478.73	$ 521.22	65.00098	2.339971	35.18572	1.9999754	$ 292,745.16	$ 16,639.80

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 7.01

Project Cost: $ 148,750.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 42.5

45 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.06375
(default calc, but may be changed)

Value of Service: $ 188.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.054	0.001728	$ 178.50	$ 5.71	0.80136	0.025644	0.942776	0.0328505	$ 7,532.78	$ 262.48
2	0.19	0.0019	0.0000608	0.0855	0.002736	$ 282.63	$ 9.04	1.26882	0.040602	1.492729	0.0520133	$ 11,926.91	$ 415.59
5	0.3	0.0035	0.000112	0.1575	0.00504	$ 520.63	$ 16.66	2.3373	0.074794	1.374882	0.095814	$ 10,985.31	$ 765.55
10	0.42	0.0059	0.0001888	0.2655	0.008496	$ 877.63	$ 28.08	3.94002	0.126081	2.317659	0.1615151	$ 18,518.09	$ 1,290.51
25	0.6	0.0115	0.000408	0.5175	0.01836	$ 1,710.63	$ 60.69	7.6797	0.272462	3.011647	0.3490368	$ 24,063.06	$ 2,788.80
50	0.75	0.0175	0.00066	0.7875	0.0297	$ 2,603.13	$ 98.18	11.6865	0.440748	4.582941	0.5646184	$ 36,617.70	$ 4,511.30
100	0.94	0.0251	0.0009792	1.1295	0.044064	$ 3,733.63	$ 145.66	16.76178	0.65391	6.573247	0.854784	$ 52,520.24	$ 6,829.72
200	1.13	0.0361671	0.0013686	1.6275195	0.061587	$ 5,379.86	$ 203.58	24.15239	0.913951	9.997721	1.1947073	$ 79,881.79	$ 9,545.71
500	1.5	0.060835	0.00219	2.737575	0.09855	$ 9,049.21	$ 325.76	40.62561	1.462482	16.8167	1.9117412	$ 134,365.45	$ 15,274.81

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.01

Project Cost: $ 35,768.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 390

9 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.222222

# of Linemen: 0.585
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0108	0.0003456	$ 42.92	$ 1.37	0.160272	0.005129	0.020548	0.000716	$ 2,051.48	$ 71.48
2	0.19	0.0019	0.0000608	0.0171	0.0005472	$ 67.96	$ 2.17	0.253764	0.00812	0.032534	0.0011336	$ 3,248.18	$ 113.18
5	0.3	0.0035	0.000112	0.0315	0.001008	$ 125.19	$ 4.01	0.46746	0.014959	0.059931	0.0020883	$ 5,983.49	$ 208.49
10	0.42	0.0059	0.0001888	0.0531	0.0016992	$ 211.03	$ 6.75	0.788004	0.025216	0.101026	0.0035202	$ 10,086.45	$ 351.46
25	0.6	0.0115	0.000408	0.1035	0.003672	$ 411.33	$ 14.59	1.53594	0.054492	0.196915	0.0076072	$ 19,660.03	$ 759.50
50	0.75	0.0175	0.00066	0.1575	0.00594	$ 625.94	$ 23.61	2.3373	0.08815	0.299654	0.0123058	$ 29,917.44	$ 1,228.61
100	0.94	0.0251	0.0009792	0.2259	0.0088128	$ 897.78	$ 35.02	3.352356	0.130782	0.429789	0.0186299	$ 42,910.16	$ 1,860.01
200	1.13	0.0361671	0.0013686	0.3255039	0.0123174	$ 1,293.62	$ 48.95	4.830478	0.18279	0.653697	0.0260385	$ 65,265.12	$ 2,599.68
500	1.5	0.060835	0.00219	0.547515	0.01971	$ 2,175.95	$ 78.33	8.125123	0.292496	1.099554	0.0416662	$ 109,779.43	$ 4,159.95

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.02

Project Cost: $ 107,303.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 257.5

27 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.185185

# of Linemen: 0.38625
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0324	0.0010368	$ 128.76	$ 4.12	0.480816	0.015386	0.093362	0.0032532	$ 6,154.44	$ 214.45
2	0.19	0.0019	0.0000608	0.0513	0.0016416	$ 203.88	$ 6.52	0.761292	0.024361	0.147824	0.0051508	$ 9,744.54	$ 339.54
5	0.3	0.0035	0.000112	0.0945	0.003024	$ 375.56	$ 12.02	1.40238	0.044876	0.272307	0.0094884	$ 17,950.46	$ 625.47
10	0.42	0.0059	0.0001888	0.1593	0.0050976	$ 633.09	$ 20.26	2.364012	0.075648	0.459031	0.0159947	$ 30,259.35	$ 1,054.37
25	0.6	0.0115	0.000408	0.3105	0.011016	$ 1,233.98	$ 43.78	4.60782	0.163477	0.894722	0.0345648	$ 58,980.10	$ 2,278.51
50	0.75	0.0175	0.00066	0.4725	0.01782	$ 1,877.80	$ 70.82	7.0119	0.264449	1.361534	0.0559137	$ 89,752.32	$ 3,685.83
100	0.94	0.0251	0.0009792	0.6777	0.0264384	$ 2,693.31	$ 105.07	10.05707	0.392346	0.976414	0.0846485	$ 64,365.24	$ 5,580.03
200	1.13	0.0361671	0.0013686	0.9765117	0.0369522	$ 3,880.84	$ 146.85	14.49143	0.548371	1.485098	0.1183108	$ 97,897.68	$ 7,799.05
500	1.5	0.060835	0.00219	1.642545	0.05913	$ 6,527.78	$ 234.99	24.37537	0.877489	2.498015	0.1893181	$ 164,669.15	$ 12,479.85

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.05

Project Cost: $ 393,443.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 390

99 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.171717

# of Linemen: 0.585
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.1188	0.0038016	$ 472.13	$ 15.11	1.762992	0.056416	0.226025	0.0078757	$ 22,566.30	$ 786.31
2	0.19	0.0019	0.0000608	0.1881	0.0060192	$ 747.54	$ 23.92	2.791404	0.089325	0.357872	0.0124699	$ 35,729.97	$ 1,244.99
5	0.3	0.0035	0.000112	0.3465	0.011088	$ 1,377.05	$ 44.07	5.14206	0.164546	0.659238	0.0229708	$ 65,818.37	$ 2,293.40
10	0.42	0.0059	0.0001888	0.5841	0.0186912	$ 2,321.31	$ 74.28	8.668044	0.277377	1.111288	0.0387222	$ 110,950.96	$ 3,866.02
25	0.6	0.0115	0.000408	1.1385	0.040392	$ 4,524.59	$ 160.52	16.89534	0.599417	1.083035	0.0836793	$ 108,130.18	$ 8,354.54
50	0.75	0.0175	0.00066	1.7325	0.06534	$ 6,885.25	$ 259.67	25.7103	0.969646	1.648096	0.1353636	$ 164,545.92	$ 13,514.70
100	0.94	0.0251	0.0009792	2.4849	0.0969408	$ 9,875.42	$ 385.26	36.87592	1.438601	2.363841	0.204929	$ 236,005.86	$ 20,460.11
200	1.13	0.0361671	0.0013686	3.5805429	0.1354914	$ 14,229.69	$ 538.47	53.13526	2.010692	3.595334	0.2864234	$ 358,958.18	$ 28,596.51
500	1.5	0.060835	0.00219	6.022665	0.21681	$ 23,935.10	$ 861.64	89.37635	3.21746	4.031697	0.4583277	$ 402,524.59	$ 45,759.44

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.06

Project Cost: $ 527,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 257.5

90 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.38625
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.108	0.003456	$ 633.00	$ 20.26	1.60272	0.051287	0.311208	0.0108439	$ 20,514.82	$ 714.83
2	0.19	0.0019	0.0000608	0.171	0.005472	$ 1,002.25	$ 32.07	2.53764	0.081204	0.492746	0.0171694	$ 32,481.79	$ 1,131.81
5	0.3	0.0035	0.000112	0.315	0.01008	$ 1,846.25	$ 59.08	4.6746	0.149587	0.907689	0.0316279	$ 59,834.88	$ 2,084.91
10	0.42	0.0059	0.0001888	0.531	0.016992	$ 3,112.25	$ 99.59	7.88004	0.252161	1.530105	0.0533157	$ 100,864.51	$ 3,514.57
25	0.6	0.0115	0.000408	1.035	0.03672	$ 6,066.25	$ 215.22	15.3594	0.544925	1.491204	0.115216	$ 98,300.16	$ 7,595.04
50	0.75	0.0175	0.00066	1.575	0.0594	$ 9,231.25	$ 348.15	23.373	0.881496	2.269223	0.1863789	$ 149,587.20	$ 12,286.10
100	0.94	0.0251	0.0009792	2.259	0.088128	$ 13,240.25	$ 516.53	33.52356	1.30782	3.254715	0.2821617	$ 214,550.78	$ 18,600.10
200	1.13	0.0361671	0.0013686	3.255039	0.123174	$ 19,078.15	$ 721.94	48.30478	1.827902	3.300219	0.3943694	$ 217,550.41	$ 25,996.83
500	1.5	0.060835	0.00219	5.47515	0.1971	$ 32,090.46	$ 1,155.23	81.25123	2.924964	5.551145	0.6310602	$ 365,931.45	$ 41,599.49

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.07

Project Cost: $ 297,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 62.5

90 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.09375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.108	0.003456	$ 357.00	$ 11.42	1.60272	0.051287	1.282176	0.0446767	$ 20,514.82	$ 714.83
2	0.19	0.0019	0.0000608	0.171	0.005472	$ 565.25	$ 18.09	2.53764	0.081204	1.015056	0.0707381	$ 16,240.90	$ 1,131.81
5	0.3	0.0035	0.000112	0.315	0.01008	$ 1,041.25	$ 33.32	4.6746	0.149587	1.86984	0.1303071	$ 29,917.44	$ 2,084.91
10	0.42	0.0059	0.0001888	0.531	0.016992	$ 1,755.25	$ 56.17	7.88004	0.252161	3.152016	0.2196605	$ 50,432.26	$ 3,514.57
25	0.6	0.0115	0.000408	1.035	0.03672	$ 3,421.25	$ 121.38	15.3594	0.544925	4.09584	0.47469	$ 65,533.44	$ 7,595.04
50	0.75	0.0175	0.00066	1.575	0.0594	$ 5,206.25	$ 196.35	23.373	0.881496	6.2328	0.767881	$ 99,724.80	$ 12,286.10
100	0.94	0.0251	0.0009792	2.259	0.088128	$ 7,467.25	$ 291.31	33.52356	1.30782	8.939616	1.1625062	$ 143,033.86	$ 18,600.10
200	1.13	0.0361671	0.0013686	3.255039	0.123174	$ 10,759.71	$ 407.16	48.30478	1.827902	13.5969	1.6248019	$ 217,550.41	$ 25,996.83
500	1.5	0.060835	0.00219	5.47515	0.1971	$ 18,098.41	$ 651.53	81.25123	2.924964	22.87072	1.299984	$ 365,931.45	$ 20,799.74

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.08

Project Cost: $ 297,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 42.5

90 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.06375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.108	0.003456	$ 357.00	$ 11.42	1.60272	0.051287	0.942776	0.065701	$ 10,257.41	$ 714.83
2	0.19	0.0019	0.0000608	0.171	0.005472	$ 565.25	$ 18.09	2.53764	0.081204	1.492729	0.1040267	$ 16,240.90	$ 1,131.81
5	0.3	0.0035	0.000112	0.315	0.01008	$ 1,041.25	$ 33.32	4.6746	0.149587	2.749765	0.191628	$ 29,917.44	$ 2,084.91
10	0.42	0.0059	0.0001888	0.531	0.016992	$ 1,755.25	$ 56.17	7.88004	0.252161	3.090212	0.3230301	$ 33,621.50	$ 3,514.57
25	0.6	0.0115	0.000408	1.035	0.03672	$ 3,421.25	$ 121.38	15.3594	0.544925	6.023294	0.6980736	$ 65,533.44	$ 7,595.04
50	0.75	0.0175	0.00066	1.575	0.0594	$ 5,206.25	$ 196.35	23.373	0.881496	9.165882	1.1292367	$ 99,724.80	$ 12,286.10
100	0.94	0.0251	0.0009792	2.259	0.088128	$ 7,467.25	$ 291.31	33.52356	1.30782	13.14649	1.709568	$ 143,033.86	$ 18,600.10
200	1.13	0.0361671	0.0013686	3.255039	0.123174	$ 10,759.71	$ 407.16	48.30478	1.827902	19.99544	1.1947073	$ 217,550.41	$ 12,998.42
500	1.5	0.060835	0.00219	5.47515	0.1971	$ 18,098.41	$ 651.53	81.25123	2.924964	33.63341	1.9117412	$ 365,931.45	$ 20,799.74

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 8.09

Project Cost: $ 190,400.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 62.5

58 # of Poles
(using 18 poles per mile)

Cost per Pole: 3282.758621

# of Linemen: 0.09375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0696	0.0022272	$ 228.48	$ 7.31	1.032864	0.033052	0.826291	0.0287917	$ 13,220.66	$ 460.67
2	0.19	0.0019	0.0000608	0.1102	0.0035264	$ 361.76	$ 11.58	1.635368	0.052332	1.308294	0.0455868	$ 20,932.71	$ 729.39
5	0.3	0.0035	0.000112	0.203	0.006496	$ 666.40	$ 21.32	3.01252	0.096401	1.205008	0.0839757	$ 19,280.13	$ 1,343.61
10	0.42	0.0059	0.0001888	0.3422	0.0109504	$ 1,123.36	$ 35.95	5.078248	0.162504	2.031299	0.141559	$ 32,500.79	$ 2,264.94
25	0.6	0.0115	0.000408	0.667	0.023664	$ 2,189.60	$ 77.68	9.89828	0.351174	3.959312	0.3059114	$ 63,348.99	$ 4,894.58
50	0.75	0.0175	0.00066	1.015	0.03828	$ 3,332.00	$ 125.66	15.0626	0.568075	4.016693	0.4948566	$ 64,267.09	$ 7,917.71
100	0.94	0.0251	0.0009792	1.4558	0.0567936	$ 4,779.04	$ 186.44	21.60407	0.842817	5.761086	0.7491707	$ 92,177.37	$ 11,986.73
200	1.13	0.0361671	0.0013686	2.0976918	0.0793788	$ 6,886.22	$ 260.58	31.12975	1.177981	8.762447	1.0470946	$ 140,199.15	$ 16,753.51
500	1.5	0.060835	0.00219	3.52843	0.12702	$ 11,582.98	$ 416.98	52.3619	1.884977	14.73891	1.6755349	$ 235,822.49	$ 26,808.56

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 9.01

Project Cost: $ 214,605.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 387.5

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.166667

# of Linemen: 0.58125
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 257.53	$ 8.24	0.961632	0.030772	0.124082	0.0043236	$ 12,308.89	$ 428.90
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 407.75	$ 13.05	1.522584	0.048723	0.196462	0.0068456	$ 19,489.08	$ 679.09
5	0.3	0.0035	0.000112	0.189	0.006048	$ 751.12	$ 24.04	2.80476	0.089752	0.361905	0.0126104	$ 35,900.93	$ 1,250.95
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,266.17	$ 40.52	4.728024	0.151297	0.610068	0.0212575	$ 60,518.71	$ 2,108.74
25	0.6	0.0115	0.000408	0.621	0.022032	$ 2,467.96	$ 87.56	9.21564	0.326955	1.189115	0.0459377	$ 117,960.19	$ 4,557.02
50	0.75	0.0175	0.00066	0.945	0.03564	$ 3,755.59	$ 141.64	14.0238	0.528898	0.904761	0.0743111	$ 89,752.32	$ 7,371.66
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 5,386.59	$ 210.14	20.11414	0.784692	1.297686	0.1125006	$ 128,730.47	$ 11,160.06
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 7,761.64	$ 293.71	28.98287	1.096741	1.973744	0.1572389	$ 195,795.37	$ 15,598.10
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 13,055.50	$ 469.98	48.75074	1.754978	3.319943	0.2516098	$ 329,338.30	$ 24,959.69

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 9.02

Project Cost: $ 214,605.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 387.5

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 3974.166667

# of Linemen: 0.58125
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 257.53	$ 8.24	0.961632	0.030772	0.124082	0.0043236	$ 12,308.89	$ 428.90
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 407.75	$ 13.05	1.522584	0.048723	0.196462	0.0068456	$ 19,489.08	$ 679.09
5	0.3	0.0035	0.000112	0.189	0.006048	$ 751.12	$ 24.04	2.80476	0.089752	0.361905	0.0126104	$ 35,900.93	$ 1,250.95
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,266.17	$ 40.52	4.728024	0.151297	0.610068	0.0212575	$ 60,518.71	$ 2,108.74
25	0.6	0.0115	0.000408	0.621	0.022032	$ 2,467.96	$ 87.56	9.21564	0.326955	1.189115	0.0459377	$ 117,960.19	$ 4,557.02
50	0.75	0.0175	0.00066	0.945	0.03564	$ 3,755.59	$ 141.64	14.0238	0.528898	0.904761	0.0743111	$ 89,752.32	$ 7,371.66
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 5,386.59	$ 210.14	20.11414	0.784692	1.297686	0.1125006	$ 128,730.47	$ 11,160.06
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 7,761.64	$ 293.71	28.98287	1.096741	1.973744	0.1572389	$ 195,795.37	$ 15,598.10
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 13,055.50	$ 469.98	48.75074	1.754978	3.319943	0.2516098	$ 329,338.30	$ 24,959.69

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 9.03

Project Cost: $ 527,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 142.5

90 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.21375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.108	0.003456	$ 633.00	$ 20.26	1.60272	0.051287	0.562358	0.019595	$ 20,514.82	$ 714.83
2	0.19	0.0019	0.0000608	0.171	0.005472	$ 1,002.25	$ 32.07	2.53764	0.081204	0.8904	0.0310255	$ 32,481.79	$ 1,131.81
5	0.3	0.0035	0.000112	0.315	0.01008	$ 1,846.25	$ 59.08	4.6746	0.149587	1.640211	0.0571522	$ 59,834.88	$ 2,084.91
10	0.42	0.0059	0.0001888	0.531	0.016992	$ 3,112.25	$ 99.59	7.88004	0.252161	1.382463	0.0963423	$ 50,432.26	$ 3,514.57
25	0.6	0.0115	0.000408	1.035	0.03672	$ 6,066.25	$ 215.22	15.3594	0.544925	2.694632	0.2081974	$ 98,300.16	$ 7,595.04
50	0.75	0.0175	0.00066	1.575	0.0594	$ 9,231.25	$ 348.15	23.373	0.881496	4.100526	0.3367899	$ 149,587.20	$ 12,286.10
100	0.94	0.0251	0.0009792	2.259	0.088128	$ 13,240.25	$ 516.53	33.52356	1.30782	3.920884	0.5098712	$ 143,033.86	$ 18,600.10
200	1.13	0.0361671	0.0013686	3.255039	0.123174	$ 19,078.15	$ 721.94	48.30478	1.827902	5.963553	0.7126324	$ 217,550.41	$ 25,996.83
500	1.5	0.060835	0.00219	5.47515	0.1971	$ 32,090.46	$ 1,155.23	81.25123	2.924964	10.03102	1.1403368	$ 365,931.45	$ 41,599.49

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 9.04

Project Cost: $ 316,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 142.5

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.21375
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 379.80	$ 12.15	0.961632	0.030772	0.337415	0.011757	$ 12,308.89	$ 428.90
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 601.35	$ 19.24	1.522584	0.048723	0.53424	0.0186153	$ 19,489.08	$ 679.09
5	0.3	0.0035	0.000112	0.189	0.006048	$ 1,107.75	$ 35.45	2.80476	0.089752	0.984126	0.0342913	$ 35,900.93	$ 1,250.95
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,867.35	$ 59.76	4.728024	0.151297	1.658956	0.0578054	$ 60,518.71	$ 2,108.74
25	0.6	0.0115	0.000408	0.621	0.022032	$ 3,639.75	$ 129.13	9.21564	0.326955	1.616779	0.1249184	$ 58,980.10	$ 4,557.02
50	0.75	0.0175	0.00066	0.945	0.03564	$ 5,538.75	$ 208.89	14.0238	0.528898	2.460316	0.2020739	$ 89,752.32	$ 7,371.66
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 7,944.15	$ 309.92	20.11414	0.784692	3.528796	0.3059227	$ 128,730.47	$ 11,160.06
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 11,446.89	$ 433.16	28.98287	1.096741	3.578132	0.4275795	$ 130,530.25	$ 15,598.10
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 19,254.28	$ 693.14	48.75074	1.754978	6.018609	0.6842021	$ 219,558.87	$ 24,959.69

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 9.06

Project Cost: $ 333,200.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 92.5

101 # of Poles
(using 18 poles per mile)

Cost per Pole: 3299.009901

# of Linemen: 0.13875
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.1212	0.0038784	$ 399.84	$ 12.79	1.798608	0.057555	0.972221	0.0338765	$ 23,022.18	$ 802.20
2	0.19	0.0019	0.0000608	0.1919	0.0061408	$ 633.08	$ 20.26	2.847796	0.091129	1.539349	0.0536378	$ 36,451.79	$ 1,270.14
5	0.3	0.0035	0.000112	0.3535	0.011312	$ 1,166.20	$ 37.32	5.24594	0.16787	1.417822	0.0988064	$ 33,574.02	$ 2,339.74
10	0.42	0.0059	0.0001888	0.5959	0.0190688	$ 1,965.88	$ 62.91	8.843156	0.282981	2.390042	0.1665594	$ 56,596.20	$ 3,944.13
25	0.6	0.0115	0.000408	1.1615	0.041208	$ 3,831.80	$ 135.95	17.23666	0.611527	3.105705	0.3599376	$ 73,543.08	$ 8,523.32
50	0.75	0.0175	0.00066	1.7675	0.06666	$ 5,831.00	$ 219.91	26.2297	0.989234	4.726072	0.5822521	$ 111,913.39	$ 13,787.73
100	0.94	0.0251	0.0009792	2.5351	0.0988992	$ 8,363.32	$ 326.27	37.62088	1.467664	6.778538	0.88148	$ 160,515.77	$ 20,873.45
200	1.13	0.0361671	0.0013686	3.6528771	0.1382286	$ 12,050.88	$ 456.02	54.2087	2.051312	10.30996	1.2320195	$ 244,139.91	$ 29,174.22
500	1.5	0.060835	0.00219	6.144335	0.22119	$ 20,270.22	$ 729.71	91.18193	3.28246	17.34191	1.9714472	$ 410,656.40	$ 46,683.87

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 10.03

Project Cost: $ 316,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 327.5

54 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.49125
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0648	0.0020736	$ 379.80	$ 12.15	0.961632	0.030772	0.146814	0.0051157	$ 12,308.89	$ 428.90
2	0.19	0.0019	0.0000608	0.1026	0.0032832	$ 601.35	$ 19.24	1.522584	0.048723	0.232456	0.0080998	$ 19,489.08	$ 679.09
5	0.3	0.0035	0.000112	0.189	0.006048	$ 1,107.75	$ 35.45	2.80476	0.089752	0.428208	0.0149207	$ 35,900.93	$ 1,250.95
10	0.42	0.0059	0.0001888	0.3186	0.0101952	$ 1,867.35	$ 59.76	4.728024	0.151297	0.721836	0.025152	$ 60,518.71	$ 2,108.74
25	0.6	0.0115	0.000408	0.621	0.022032	$ 3,639.75	$ 129.13	9.21564	0.326955	1.406968	0.0543538	$ 117,960.19	$ 4,557.02
50	0.75	0.0175	0.00066	0.945	0.03564	$ 5,538.75	$ 208.89	14.0238	0.528898	1.070519	0.0879253	$ 89,752.32	$ 7,371.66
100	0.94	0.0251	0.0009792	1.3554	0.0528768	$ 7,944.15	$ 309.92	20.11414	0.784692	1.53543	0.1331114	$ 128,730.47	$ 11,160.06
200	1.13	0.0361671	0.0013686	1.9530234	0.0739044	$ 11,446.89	$ 433.16	28.98287	1.096741	2.335346	0.186046	$ 195,795.37	$ 15,598.10
500	1.5	0.060835	0.00219	3.28509	0.11826	$ 19,254.28	$ 693.14	48.75074	1.754978	3.928176	0.2977063	$ 329,338.30	$ 24,959.69

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 10.07

Project Cost: $ 119,000.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 37.5

36 # of Poles
(using 18 poles per mile)

Cost per Pole: 3305.555556

# of Linemen: 0.05625
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
		Pre - Mit	Post - Mit	Before	After	Before	After	Before	After	Before	After	Before	After
	Radial Ice	N	B	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0432	0.0013824	$ 142.80	$ 4.57	0.641088	0.020515	0.854784	0.0297845	$ 8,205.93	$ 285.93
2	0.19	0.0019	0.0000608	0.0684	0.0021888	$ 226.10	$ 7.24	1.015056	0.032482	1.353408	0.0471587	$ 12,992.72	$ 452.72
5	0.3	0.0035	0.000112	0.126	0.004032	$ 416.50	$ 13.33	1.86984	0.059835	1.24656	0.0868714	$ 11,966.98	$ 833.97
10	0.42	0.0059	0.0001888	0.2124	0.0067968	$ 702.10	$ 22.47	3.152016	0.100865	2.101344	0.1464403	$ 20,172.90	$ 1,405.83
25	0.6	0.0115	0.000408	0.414	0.014688	$ 1,368.50	$ 48.55	6.14376	0.21797	4.09584	0.31646	$ 39,320.06	$ 3,038.02
50	0.75	0.0175	0.00066	0.63	0.02376	$ 2,082.50	$ 78.54	9.3492	0.352598	4.1552	0.5119206	$ 39,889.92	$ 4,914.44
100	0.94	0.0251	0.0009792	0.9036	0.0352512	$ 2,986.90	$ 116.52	13.40942	0.523128	5.959744	0.7750042	$ 57,213.54	$ 7,440.04
200	1.13	0.0361671	0.0013686	1.3020156	0.0492696	$ 4,303.88	$ 162.86	19.32191	0.731161	9.0646	1.0832013	$ 87,020.16	$ 10,398.73
500	1.5	0.060835	0.00219	2.19006	0.07884	$ 7,239.37	$ 260.61	32.50049	1.169986	15.24714	1.733312	$ 146,372.58	$ 16,639.80

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 10.08

Project Cost: $ 166,600.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: N (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 45

50 # of Poles
(using 18 poles per mile)

Cost per Pole: 3332

# of Linemen: 0.0675
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.06	0.00192	$ 199.92	$ 6.40	0.8904	0.028493	0.989333	0.0344728	$ 11,397.12	$ 397.13
2	0.19	0.0019	0.0000608	0.095	0.00304	$ 316.54	$ 10.13	1.4098	0.045114	1.566444	0.0545819	$ 18,045.44	$ 628.78
5	0.3	0.0035	0.000112	0.175	0.0056	$ 583.10	$ 18.66	2.597	0.083104	1.442778	0.1005456	$ 16,620.80	$ 1,158.29
10	0.42	0.0059	0.0001888	0.295	0.00944	$ 982.94	$ 31.45	4.3778	0.14009	2.432111	0.1694911	$ 28,017.92	$ 1,952.54
25	0.6	0.0115	0.000408	0.575	0.0204	$ 1,915.90	$ 67.97	8.533	0.302736	3.16037	0.3662732	$ 36,407.47	$ 4,219.47
50	0.75	0.0175	0.00066	0.875	0.033	$ 2,915.50	$ 109.96	12.985	0.48972	4.809259	0.5925007	$ 55,402.67	$ 6,825.61
100	0.94	0.0251	0.0009792	1.255	0.04896	$ 4,181.66	$ 163.13	18.6242	0.726566	6.897852	0.8969956	$ 79,463.25	$ 10,333.39
200	1.13	0.0361671	0.0013686	1.808355	0.06843	$ 6,025.44	$ 228.01	26.83599	1.015501	10.49144	1.2537052	$ 120,861.34	$ 14,442.68
500	1.5	0.060835	0.00219	3.04175	0.1095	$ 10,135.11	$ 364.85	45.13957	1.62498	17.64716	1.0030741	$ 203,295.25	$ 11,555.41

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 11.02

Project Cost: $ 263,750.00

Region: 1

1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1

Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 185

45 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.2775
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.054	0.001728	$ 316.50	$ 10.13	0.80136	0.025644	0.216584	0.0075467	$ 10,257.41	$ 357.41
2	0.19	0.0019	0.0000608	0.0855	0.002736	$ 501.13	$ 16.04	1.26882	0.040602	0.342924	0.011949	$ 16,240.90	$ 565.90
5	0.3	0.0035	0.000112	0.1575	0.00504	$ 923.13	$ 29.54	2.3373	0.074794	0.631703	0.0220113	$ 29,917.44	$ 1,042.46
10	0.42	0.0059	0.0001888	0.2655	0.008496	$ 1,556.13	$ 49.80	3.94002	0.126081	1.06487	0.0371048	$ 50,432.26	$ 1,757.28
25	0.6	0.0115	0.000408	0.5175	0.01836	$ 3,033.13	$ 107.61	7.6797	0.272462	1.037797	0.0801841	$ 49,150.08	$ 3,797.52
50	0.75	0.0175	0.00066	0.7875	0.0297	$ 4,615.63	$ 174.08	11.6865	0.440748	1.579257	0.1297096	$ 74,793.60	$ 6,143.05
100	0.94	0.0251	0.0009792	1.1295	0.044064	$ 6,620.13	$ 258.26	16.76178	0.65391	2.265105	0.1963693	$ 107,275.39	$ 9,300.05
200	1.13	0.0361671	0.0013686	1.6275195	0.061587	$ 9,539.07	$ 360.97	24.15239	0.913951	3.445161	0.2744598	$ 163,162.81	$ 12,998.42
500	1.5	0.060835	0.00219	2.737575	0.09855	$ 16,045.23	$ 577.61	40.62561	1.462482	3.863297	0.4391838	$ 182,965.72	$ 20,799.74

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)

Iowa Cost of Repair and Loss of Function Calculation

Project Name: Raccoon Valley Elec Coop
Project Number: 11.03

Project Cost: $ 105,500.00

Region: 1
1 = Iowa (main)
2 = MN Border

Urban/Rural Area: R (R or U)
Transmission/Distribution Lines: D (T or D)
Redundant or NonRedundant System: R (R or N)

Select Pre- Mitigation Type Pole Type and Tree Value: N 1
Select Post- Mitigation Type Pole Type and Tree Value: B 1

0 = >10' at all locations
1 = < 10' for 1-4 spans per mile
2 = < 10' for 5-10 spans per mile
3 = < 10' for 11-20 spans per mile

N = Min Pre 1972
C = Modern Code
B = Extra Stout (above C)

Population: 185

18 # of Poles
(using 18 poles per mile)

Cost per Pole: 5861.111111

# of Linemen: 0.2775
(default calc, but may be changed)

Value of Service: $ 256.00

		Type Pole & Tree Value		Probable # of Pole Failures		$ Cost per Return Period		Hours to Repair		Days Lost		Economic Loss	
	Radial Ice	Pre - Mit N	Post - Mit B	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Return Period	(in)	1	1										
1	0.12	0.0012	0.0000384	0.0216	0.0006912	$ 126.60	$ 4.05	0.320544	0.010257	0.086634	0.0030187	$ 4,102.96	$ 142.97
2	0.19	0.0019	0.0000608	0.0342	0.0010944	$ 200.45	$ 6.41	0.507528	0.016241	0.13717	0.0047796	$ 6,496.36	$ 226.36
5	0.3	0.0035	0.000112	0.063	0.002016	$ 369.25	$ 11.82	0.93492	0.029917	0.252681	0.0088045	$ 11,966.98	$ 416.98
10	0.42	0.0059	0.0001888	0.1062	0.0033984	$ 622.45	$ 19.92	1.576008	0.050432	0.425948	0.0148419	$ 20,172.90	$ 702.91
25	0.6	0.0115	0.000408	0.207	0.007344	$ 1,213.25	$ 43.04	3.07188	0.108985	0.830238	0.0320737	$ 39,320.06	$ 1,519.01
50	0.75	0.0175	0.00066	0.315	0.01188	$ 1,846.25	$ 69.63	4.6746	0.176299	1.263405	0.0518838	$ 59,834.88	$ 2,457.22
100	0.94	0.0251	0.0009792	0.4518	0.0176256	$ 2,648.05	$ 103.31	6.704712	0.261564	0.906042	0.0785477	$ 42,910.16	$ 3,720.02
200	1.13	0.0361671	0.0013686	0.6510078	0.0246348	$ 3,815.63	$ 144.39	9.660956	0.36558	1.378064	0.1097839	$ 65,265.12	$ 5,199.37
500	1.5	0.060835	0.00219	1.09503	0.03942	$ 6,418.09	$ 231.05	16.25025	0.584993	2.317978	0.1756735	$ 109,779.43	$ 8,319.90

(Column A of Limited Data Module)

(Loss of Function Days of Limited Data Module)