

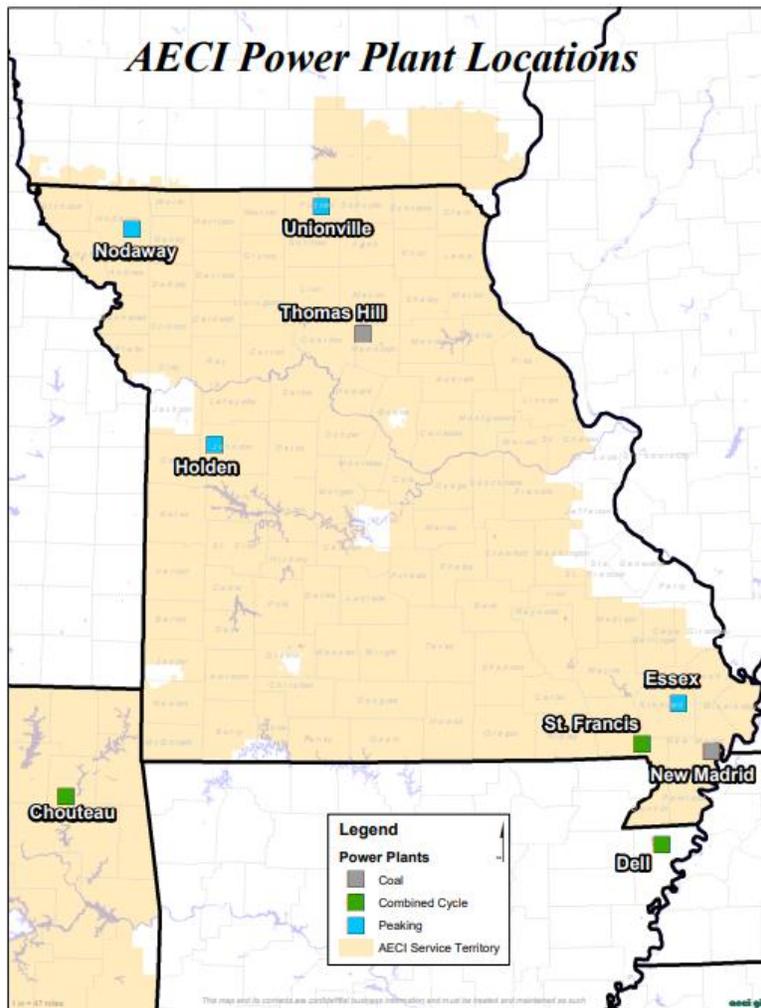
Contents: Associated Electric

- Section 1: Introduction..... 2
 - AECI Generation 3
- Section 2: Asset Inventory 7
- Section 3: Risk Assessment 9
 - A. Historical Hazards..... 11
 - Tornadoes..... 11
 - Severe Thunderstorms, High Wind, and Hail 13
 - Flood and Levee Failure 14
 - Severe Winter Weather 17
 - B. Non-historical Hazards..... 19
 - Wildfire 19
 - Earthquakes 20
 - Dam Failure 23
 - Drought 26
 - Severe Land Subsidence (Sinkholes)..... 26
 - C. Risk Assessment Summary 28
- Section 4: Mitigation Strategies 29
 - Previous Mitigation Efforts..... 29
 - Existing and Potential Resources 29
 - Review of Goals and Actions..... 29
- Section 5: Plan Implementation and Maintenance..... 34
 - Plan Incorporation..... 34
 - Local Planning Capabilities 34
 - Plan Maintenance 34
 - Continued Public Involvement Opportunities..... 35
- Appendix: A - Adoption Resolution 36
- Appendix: B - Documentation of Participation 38
- Appendix: C - Surveys..... 40
 - Data Survey..... 41
 - Goals and Actions Survey..... 49

Section 1: Introduction

Associated Electric Cooperative, Inc. (AECI) was established in 1961 to provide wholesale power generation and transmission to its member-owners. Associated is owned by and provides wholesale power to six regional generation and transmission cooperatives (G & T's). In turn, these six regional generation and transmission cooperatives are owned by and provide wholesale power to 51 local electric cooperative systems (distribution cooperatives) in Missouri, southeast Iowa and northeast Oklahoma. The organization provides power for more than 910,000 customers in three states. Associated is headquartered in Springfield, Missouri and operates on a not-for-profit cooperative basis. The organization employs approximately 760 people at three locations. It furnishes electric power and energy to its members pursuant to the all-requirements wholesale power contracts that extend through 2075. The wholesale power contracts require each member to purchase all its electric power and energy needs from Associated. Associated obtains the electric power and energy needed to serve its members from a combination of generation that Associated owns and operates; generation owned by others but operated and/or dispatched by Associated; and purchased power. Figure 1 shows the Missouri geographic boundaries of Associated. (Map source: Associated's website – www.aeci.org.)

Figure 1 *Service Area Map*



ASSOCIATED ELECTRIC COOPERATIVE, INC.

The cooperative is run by a 12-member board that is elected to serve and represent Associated's six owner generation and transmission cooperatives. Associated's vision is to be the lowest cost wholesale power supplier. Its mission is to provide an economical and reliable power supply and support services to its members. (Source: Associated's website - www.aeci.org .) Service boundaries for Associated include all the State of Missouri, with a significant portion of northeast Oklahoma and a portion of southern Iowa. The cooperative owns 717.7 miles of transmission line and 10 operating power generation facilities.

The 51 cooperatives that distribute power to an estimated 910,000 homes, farms and businesses, are part of a unique three-tiered system. The distribution cooperatives are the first tier. They own the G & Ts which form the second tier and are responsible for transmitting power from Associated to the distribution cooperatives. G & Ts work on a regional level as construction agents and own most transmission systems from 69-kilovolt to 161-kilovolt. At one time, the G & Ts not only transmitted the power to their member distribution cooperatives, they also generated or purchased power as well. (Source: Associated's website - www.aeci.org .)

The six G & Ts formed Associated in 1961 to take care of generation, power procurement, and high voltage transmission. They include Central Electric Power Cooperative, located in Jefferson City, MO; KAMO Power, located in Vinita, OK; M&A Electric Power Cooperative, located in Poplar Bluff, MO; Northeast Missouri Electric Power Cooperative, located in Palmyra, MO; N.W. Electric Power Cooperative, Inc., located in Cameron, MO; and Sho-Me Power Electric Cooperative, located in Marshfield, MO.

Associated and its six G & T owners have built and own an integrated transmission system that consists of 10,196 miles of high-voltage transmission line, as well as more than 904 related substations. The transmission system enables Associated to reliably serve members and transact power purchases and sales for the benefit of its owner systems. Associated has 233 transmission interconnections; 22 transmission interconnection agreements; and transacts business with investor-owned and municipal utilities, electric cooperatives, power marketing firms and regional transmission organizations.

AECI Generation

Baseload generation includes the New Madrid Power Plant in New Madrid, MO, a coal plant that includes two units of 600 MW for a total capacity of 1,200 MW of generation; and the Thomas Hill Energy Center in Clifton Hill, MO., a coal plant that includes three units of 180 MW, 303 MW, and 670 MW, for a total capacity of 1,153 MW. Table 1 lists all of Associated's power generation facilities, as well as location, type of power, number of units and total capacity. There have been no changes since 2010.

Table 1 *AECI Generation Facilities*

Generation Facilities	Location	Type of Power	Number of Units	Total Capacity
New Madrid Power Plant	New Madrid, MO	Coal	2	1,200 MW
Thomas Hill Energy Center	Clifton Hill, MO	Coal	3	1,153 MW
Chouteau I Power Plant	Pryor, OK	Natural Gas	2	522 MW
Chouteau II Power Plant	Pryor, OK	Natural Gas	2	540 MW
Dell Power Plant	Dell, AR	Natural Gas	2	580 MW

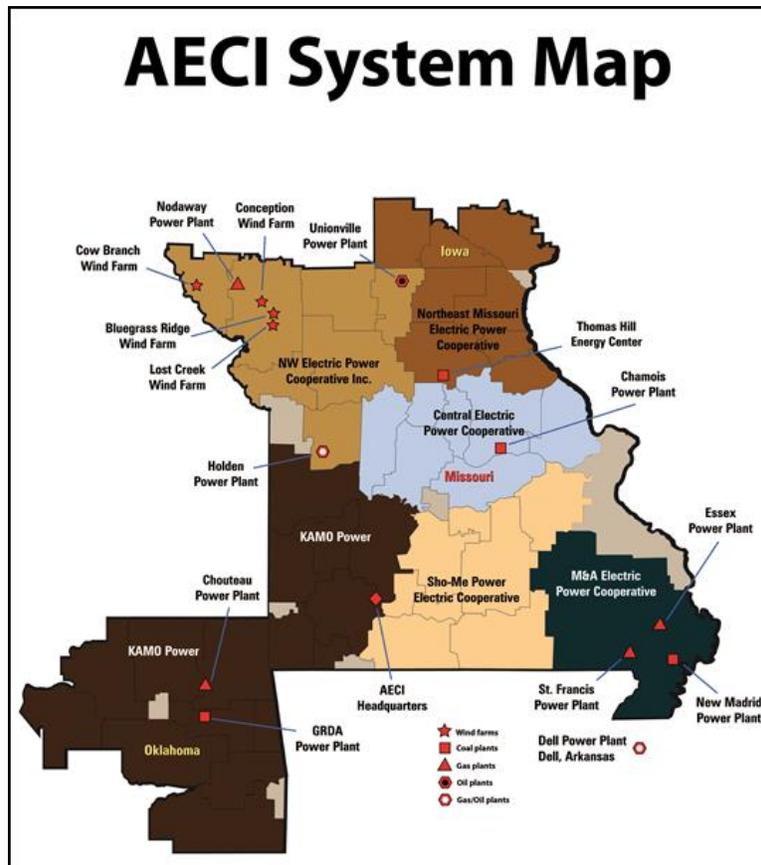
ASSOCIATED ELECTRIC COOPERATIVE, INC.

Generation Facilities	Location	Type of Power	Number of Units	Total Capacity
St. Francis Power Plant	Glennonville, MO	Natural Gas	2	501 MW
Essex Power Plant	Idalia, MO	Natural Gas	1	107 MW
Holden Power Plant	Holden, MO	Gas/Oil	3	321 MW
Nodaway Power Plant	Maryville, MO	Natural Gas	2	182 MW
Unionville Power Plant	Unionville, MO	Oil	2	45 MW

Source: AECI records

Intermediate generation includes the Chouteau I Power Plant, Pryor, OK, two combined-cycle gas-based units, for a total generating capacity of 522 MW and Chouteau II Power Plant, two combined-cycle gas-based units with a total generating capacity of 540 MW; Dell Power Plant, Dell, AR, two combined-cycle, gas-based units, for a total generating capacity of 580 MW; and the St. Francis Power Plant, Glennonville, MO, two combined cycle gas-based units, for a total capacity of 501 MW. Peaking generation includes the Essex Power Plant in Idalia, MO, a simple-cycle gas-based unit of 107 MW; the Holden Power Plant, three simple-cycle, dual fuel gas and oil units, for a total of capacity of 321 MW; the Nodaway Power Plant in Maryville, MO, two simple-cycle, gas-based units of total capacity of 182 MW; and Unionville Power Plant in Unionville, MO, two simple-cycle oil units for a total capacity of 45 MW. Figure 2 is a map of the entire AECI system, including the five G & T's, as well as the general location of all of Associated's facilities. (Map Source: AECI)

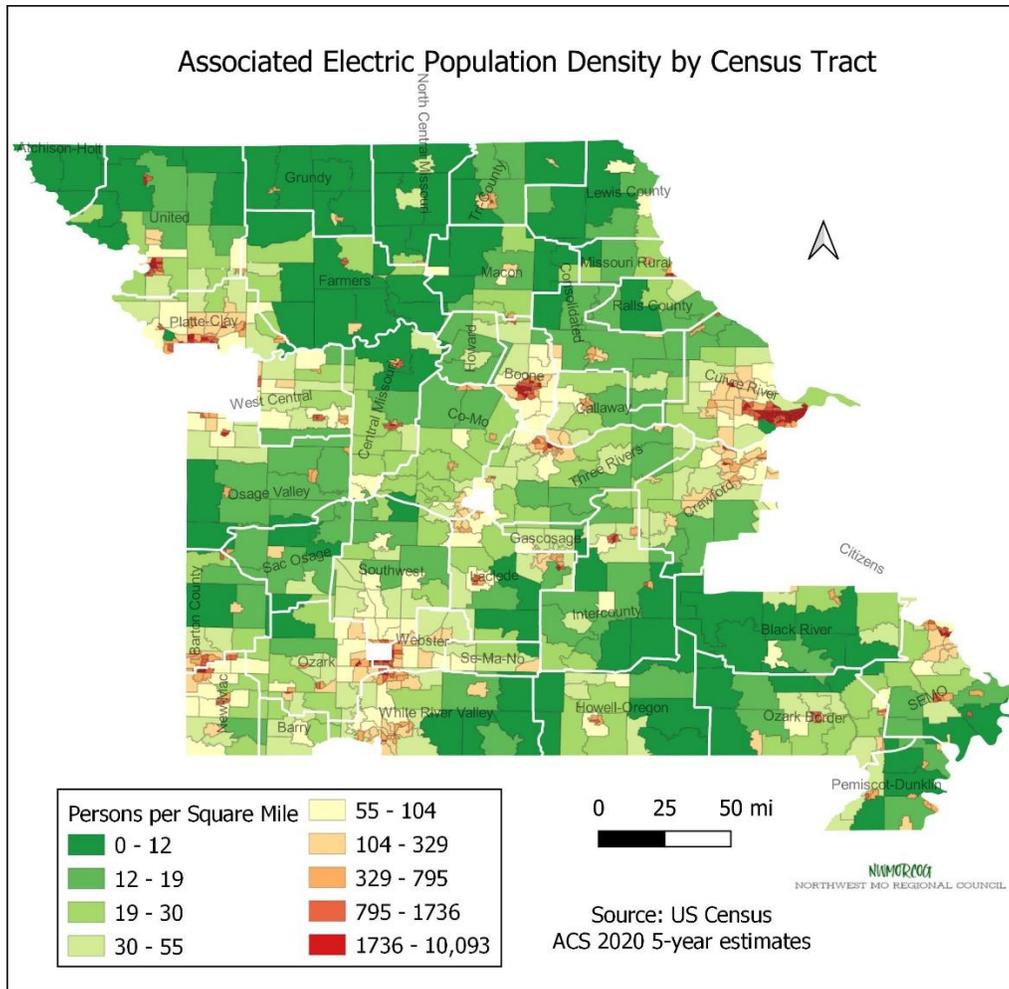
Figure 2 *Facilities Location Map*



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Of the estimated 1,928,800 customers served by Associated, an estimated 1,524,852 are in Missouri. Associated has a total generating capacity, including both owned facilities and contracted power of 5,700 MW. Peak loads over the past 10 years have varied from 3,905 MW and 5,549 MW during winter months, with a peak load of 4,538 during the summer. Annual total usage of Associated customers in 2021 was 20,661,802 MWh of service. Population density for the cooperative service area is depicted in Figure 3 (*Map source: U.S. Census 2020*).

Figure 3 *Population Density Map*



Critical Facilities

It is important in mitigation planning for the Electric Cooperatives to identify the critical facilities in each area and to be able to prioritize reconnection and back-up power needs. As the primary transmission system, Associated Electric does not serve any critical facilities directly.

Future Development

Associated reported (*the potential for the 2017 update*) future transmission plans include:

- Construction of a 345/161 kV substation in Southwest Missouri;

ASSOCIATED ELECTRIC COOPERATIVE, INC.

- The addition of a 345/161 kV transformer at AECI’s Morgan substation (*completed*)
- Central Missouri 345 kV line; (*in-progress*)
- Re-route of AECI 345 kV line near Jerome (Franks to Fletcher)

Associated provided the following capital projects information for this update to the plan:

Year/Date	Generation Facility	Location	Description of Work
2022 Spring	Dell Power Plant	Dell, AR	Inspections and repairs on all three turbines and generators.
2022 Spring	Thomas Hill Unit 1	Clifton Hill, MO	Turbine valve inspections and repairs; Boiler work-waterwalls, cyclone re-stud.
2022 Spring	Chouteau Block 2	Pryor, OK	Steam turbine rotor change out.
2022 Fall	Thomas Hill Unit 3	Clifton Hill, MO	New switchgear; Turbine valve inspection and repairs; Hot reheat inspection and repairs; New generator step up (GSU) transformer.
2022-2023	Unionville Power Plant	Unionville, MO	Re-commissioning of the plant. This plant is to be operational in 2023.
2022-2023	New Madrid Unit 2	New Madrid, MO	Digital controls upgrade, boiler work and turbine generator work.

Planning Process

Since the planning process is the same for each of the electric cooperative plans, the details of the planning process are presented in the Statewide Summary section of the plan.

Appendices

Three appendices are included at the end of each plan:

Appendix A contains the Adoption Resolution; a document signed by the Cooperative’s governing official showing that the Board of Directors has adopted the mitigation plan.

Appendix B contains the Documentation of Participation; copies of press releases, website postings and other public outreach that was made to request public comment.

Appendix C contains the Surveys; the Data Survey that is the source of data for the 2023 plan update; the Goals and Actions Survey is the updated review of the mitigation strategies.

Section 2: Asset Inventory

Associated Electric Cooperative, Inc. has a wide variety of assets by type. Real estate owned by the company includes office buildings, warehouses, garages, and other outbuildings throughout the service area. Associated owns 133 vehicles, which provide access to customers and infrastructure. Associated owns ten electric generation facilities as well as some transmission infrastructure. Because Associated does not provide distribution of power to customers, they own zero miles of distribution lines. Table 2 provides information concerning total asset valuation.

Table 2 *Associated Asset Inventory Valuation Summary*

Asset	Total Replacement Cost	Cost Breakdown 2021
Total AECI Assets	\$9,388,529,339	Buildings and vehicles- \$170,839,570
Total AECI Missouri-based Assets (excludes Chamois)	\$7,779,721,442 Total AECI Missouri-based Assets	Overhead assets (transmission lines - \$1,850,609,650 Substations - \$286,199,512
Power Generation Facilities	Total \$7,031,625,000 MO \$5,440,275,000	Cost Breakdown Range: \$22,500,000 - \$2,340,000,000 New Madrid Power Plant Thomas Hill Power Plant Unionville Power Plant Essex Power Plant Nodaway Power Plant St. Francis Power Plant Units 1 & 2 *Chouteau I Power Plant *Chouteau II Power Plant Holden Power Plant **Dell Power Plant
Substations	\$286,199,512	Cost Breakdown Range: \$1,267,664 - \$36,362,702 Atchison 69/34.5 Cow Branch Windmill Blackberry 345 kV Switching Station Brookline (Transformer) Clyde 69/34.5 at Conception Wind Farm Dell Plant Substation Enon (includes Transformer) Essex Plant Substation Fairport Fletcher with 345/161 kV Transformer Franks Gentry Gobbler Knob Holden Plant Substation Huben Jasper Kingdom City McCredie Morgan New Madrid Plant Substation New Madrid 500

ASSOCIATED ELECTRIC COOPERATIVE, INC.

Asset	Total Replacement Cost	Cost Breakdown 2021
		Palmyra Salem St. Francis Substation 161/345 kV Thomas Hill Plant Substation Winslow
2017 Transmission Lines – 716.70 miles	\$1,850,609,650	OH 69 kV lines (5.22 miles) - \$3,497,400 OH 161 kV lines (59.09 miles) – \$94,544,000 OH 345 kV lines (607.97 miles) - \$1,602,000,950 OH 500 kV lines (45.42 miles) – \$150,567,300
Mobile Equipment	\$30,540,595	Cost Breakdown Range: \$3,257,012- \$15,748,508 New Madrid Power Plant Thomas Hill Power Plant Thomas Hill Mine
Office Buildings	\$49,438,412	\$43,835,436 - Springfield/Headquarters \$3,146,713 - Back-Up Dispatch Control Center \$2,456,263 – Thomas Hill Mining Division Support Facility
Warehouses	\$86,563,280	
Coal Stockpiles	\$30,880,767	Cost Breakdown Range: \$12,849,428- \$18,031,339 Thomas Hill New Madrid
Source: Internal Associated Accounting and Insurance records, 2021 * Located in Oklahoma ** Located in Arkansas		

Section 3: Risk Assessment

Risk Assessment Methodology

The risk assessment methodology used in the following section was utilized for both the statewide aggregation as well as for each individual cooperative chapter. Section 4 of the Statewide Summary details this methodology. Some variation in the availability of data exists between the electric cooperatives as each utilizes a different system of recording the impact of natural disasters. Any differentiation from the process below is explained in the individual cooperative's chapter as necessary.

For the purpose of this risk assessment, the identified hazards for the Associated service area have been divided into two categories: **historical and non-historical hazards**. Based on the data collected for the update, the hazards have been reclassified to reflect the actual data available and those hazards with no data available have been reclassified as non-historical. This does not mean that a non-historical hazard will never cause damage; it just means there have been no impacts prior to this report. The potential still exists, but the probability of the occurrence is numerically near zero. For the analysis in this plan non-historical hazard probability is stated as less than one.

Historical Hazards are those hazards with a measurable previous impact upon the service area. Damage costs per event and a chronology of occurrences are available. The associated vulnerability assessments utilize the number of events and cost of each event to establish an average cost per incident. For Associated, hazards with historical data include tornadoes, severe thunderstorms/high wind/hail, flood/levee failure, and severe winter weather.

Non-Historical Hazards are hazards with no previous record of impact upon the local service area. As such, the associated vulnerability assessments for each of these hazards will have an occurrence probability of less than 1% in any given year, but the extent of damage will vary considerably. For Associated, hazards without historical data include wildfires, earthquakes, severe land subsidence, drought and dam failure.

Each hazard has a unique impact upon the service area, requiring each hazard to utilize a different valuation amount depending upon the level of impact. Non-historical hazards assume damage to all general assets. For Historical Hazards, assets were divided into two groups based upon historical impact which were utilized in the hazard damage analysis:

- Missouri overhead infrastructure assets, substations, power generation facilities and other buildings
 - Used for Tornado damage assessments
 - Valued at \$7,779,721,442
- Missouri overhead infrastructure assets and substations only
 - Used for:
 - Severe Thunderstorm / High Wind / Hail
 - Flood
 - Severe Winter Weather
 - Wildfire
 - Valued at \$7,608,881,872

Associated differs from other cooperatives because it does not directly serve residential, commercial, or industrial users. Instead, Associated's direct customers are the six G & T's across the state of Missouri.

ASSOCIATED ELECTRIC COOPERATIVE, INC.

Associated-owned facilities are generally 200 kV and above and/or switchyards at generating stations. Certainly, damage to Associated's facilities can affect the ability of other cooperatives to serve the end users, but for the purposes of this assessment, only the G & T members are used as direct customers of Associated. AECI has suffered outages in the past that could have resulted in several outages if not for the ability to import power from neighboring utilities. Customer outages may be created by not only AECI damaged facilities, but also damage to distribution lines, substations in the area, and whether there is a way to re-route power to supply the end customer. When hard data was not available, this assessment used data and estimates from the G & T members potentially impacted in the event of a hazard occurrence.

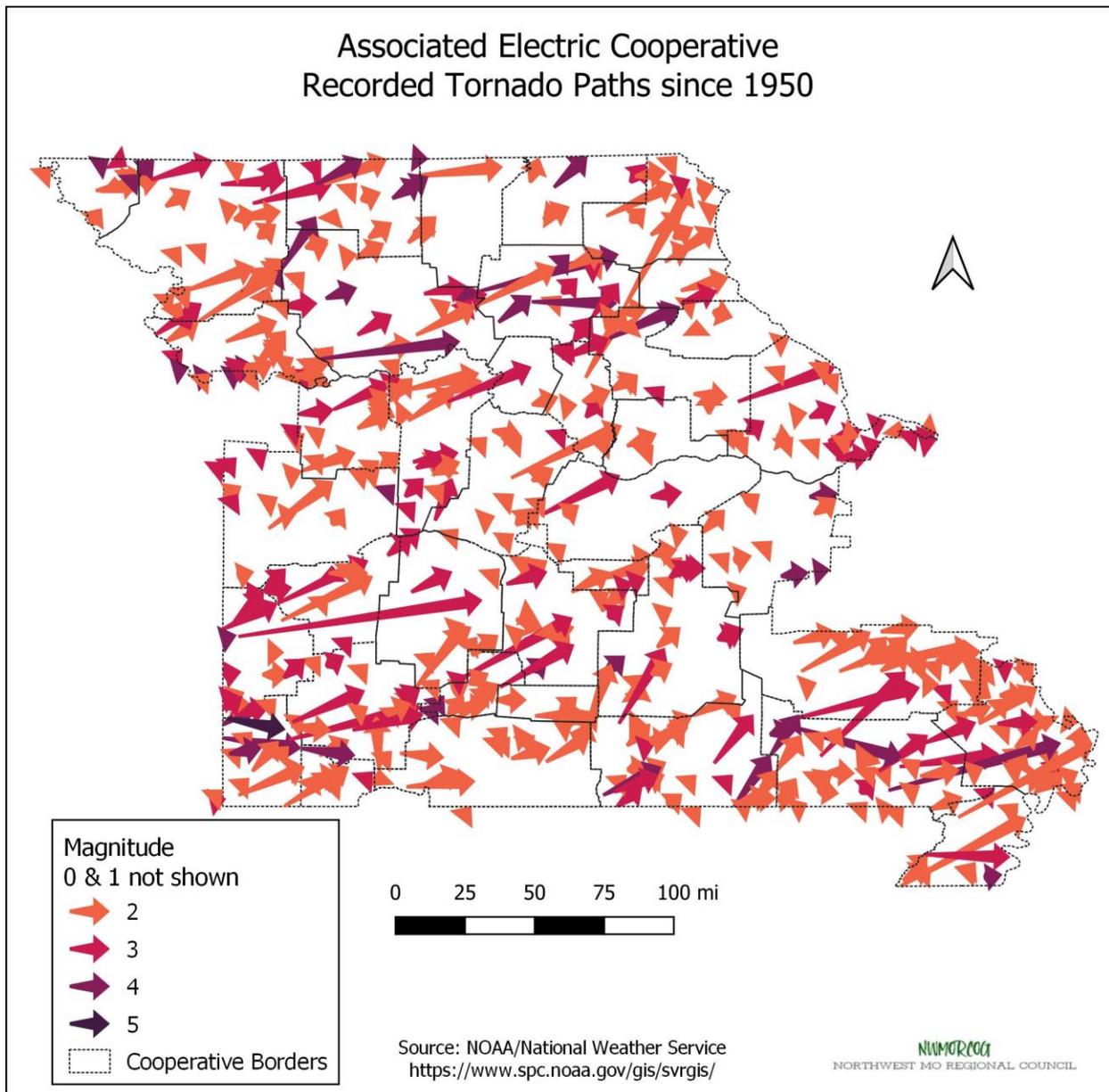
A. Historical Hazards

Tornadoes

Previous Occurrences

Since 1950, there have been 1,997 tornadoes reported in the service area of AECI within the state of Missouri. Figure 4 provides a pictorial representation of all recorded tornado touchdown sites and the recorded paths. (Data for map collected from National Oceanic and Atmospheric Administration, NOAA.)

Figure 4 *Tornado Map*



ASSOCIATED ELECTRIC COOPERATIVE, INC.

From 2002-2016, the service area of AECI’s six transmission members within the state of Missouri experienced a total of 905 tornadic events. In the same time period, there were 357 tornadoes reported within the 39 counties where Associated owns physical assets. The names of the Missouri Counties that were used in this assessment are Andrew, Atchison, Audrain, Barry, Boone, Butler, Callaway, Carter, Dade, Dallas, De Kalb, Dent, Dunklin, Gasconade, Gentry, Greene, Holt, Jasper, Jefferson, Johnson, Laclede, Lawrence, Marion, McDonald, Moniteau, New Madrid, Newton, Nodaway, Oregon, Osage, Pemiscot, Phelps, Polk, Pulaski, Randolph, Reynolds, Ripley, St. Charles and Stoddard. On December 10, 2021, NCEI reported that in Dunklin County, “the tornado damaged six metal electric transmission line towers. Five of the towers had their top sections collapse, and one tower completely collapsed. Several center pivot irrigation systems were overturned. Peak winds in Dunklin County were estimated at 140 mph.”

Probability of Future Occurrence and Vulnerability

For the 71-year period from 1950 through 2021, the average annual number of tornadoes is 28.1 for the Associated Electric boundaries, including 39 Missouri Counties that contain AECI assets. Including the devastating EF5 tornado that hit the Joplin area on May 22, 2011, the property damage estimates for the 39 counties totaled over \$3.2 billion for this time period. (Source: NOAA) Table 3 provides a summary of tornado event dates that resulted in damage to AECI assets. The table includes EF-scale ratings and damage cost estimates.

Table 3 Associated Tornadic Event Summary

Date of Event	EF Scale Rating	County-wide Damage NCEI Estimates	Associated Damage Claim to FEMA
4/2/2006	F3	(Pemiscot) \$60,000,000	\$6,713,921.37
1/7/2008	F2-F3	(Laclede) \$8,100,000	\$315,730.41
		(Phelps) \$110,000	
4/19-26/2011	EF0-EF1	(Stoddard) \$50,000	\$25,802.58
		(Butler) \$175,000	
12/10/2021	EF2, EF3, EF4	(Dunklin) \$1,500,000	\$12,747,837.00
		(Pemiscot) \$NA	\$100,000.00
Totals		\$69,935,000	\$19,903,291.36

Source: NOAA and internal Associated records

Probability of Future Occurrence and Vulnerability

Based upon the last twenty years of historical event records, tornadoes will cause average annual damages of \$995,165. This averaged amount accounts for less than 0.01% of Associated’s total overhead assets and building valuation of \$7,779,721,442.

Statewide, the estimated average annual number of outages due to tornadoes is 6,511 which is less than 1% of the estimated total statewide total of 679,829 meters of the participating cooperatives.

Problem Statement

Tornadoes are potentially such violent events that it is cost prohibitive to build an infrastructure that can withstand such powerful winds. Strategies could be developed or improved, if already in place, to ensure

ASSOCIATED ELECTRIC COOPERATIVE, INC.

that employees are warned of approaching storms when in the field. Procedures to restore power after outages should be reviewed regularly to ensure that power is restored to transmission cooperatives that provide service to critical facilities as quickly as possible.

Severe Thunderstorms, High Wind, and Hail

Previous Occurrences

From 2007-2016, within the 39 counties where Associated has assets, the state of Missouri has experienced 421 days of hail events and 415 days of thunderstorm/ high wind events. For this update, it was possible to look at the bounds of the Associated Electric Cooperative with GPS, finding 15,493 hail events and 14,400 thunderstorm/high wind events from 1955-2020.

Probability of Future Occurrence and Vulnerability

The average annual number is 234.7 days of hail events and 218.2 days of high wind events. Estimated material damages for these events were compiled by Associated staff.

Of the reported hail events that occurred over the past fifteen years, none resulted in damage to Associated assets, resulting in a less than 1% probability of damage from hail to the AECI system. Due to the type of infrastructure owned by Associated, hail is generally not considered a significant threat. Based upon historical records, the average hail event to affect the cooperative will cause little or no damage, resulting in less than 1% of Associated total asset valuation.

Table 4 provides information for thunderstorm/high wind events. Over the past fifteen years, AECI has had two storms that caused damage to 345 kV lines in Dallas and Reynolds counties. In this update, there was a storm in 2020 causing damage to AECI assets, totaling three damaging storms. This results in a 20% probability that in any given year, a thunderstorm/high wind occurrence will produce damage.

Table 4 *Associated Thunderstorm/High Wind Event Summary*

Event date	Damage estimates	Outages reported
5/8/09–5/16/09	\$136,125.27	1 G & T affected
6/23/2019	\$147,760.51	1 G&T affected
5/3-4/2020	\$114,278.26	No outages
Total	\$398,164.04	
Data provided based on internal Associated records which reflect cost from the referenced event year.		

Based upon historical records, very few thunderstorm/high wind events will cause damage to Associated’s assets-one event in the last fifteen years. The average annual damage due to a thunderstorm/high wind event is \$26,544. This averaged amount accounts for less than 0.01% of Associated’s overhead asset valuation of \$2,136,809,162.

One G & T had outages during recorded hail, thunderstorm, and high wind events that were a direct result of damage to AECI’s assets. With the ability to reroute supply to affected transmission member

ASSOCIATED ELECTRIC COOPERATIVE, INC.

cooperatives, it is difficult to estimate the number of meters that would be affected. For this assessment, it is projected that 1% (6,798) up to 5% (33,990) indirect meters may experience an outage due to a thunderstorm event in any given year.

Problem Statement

Associated Electric Cooperative should continue to upgrade its infrastructure and technology to minimize damage to its system from the effects of severe thunderstorms.

Flood and Levee Failure

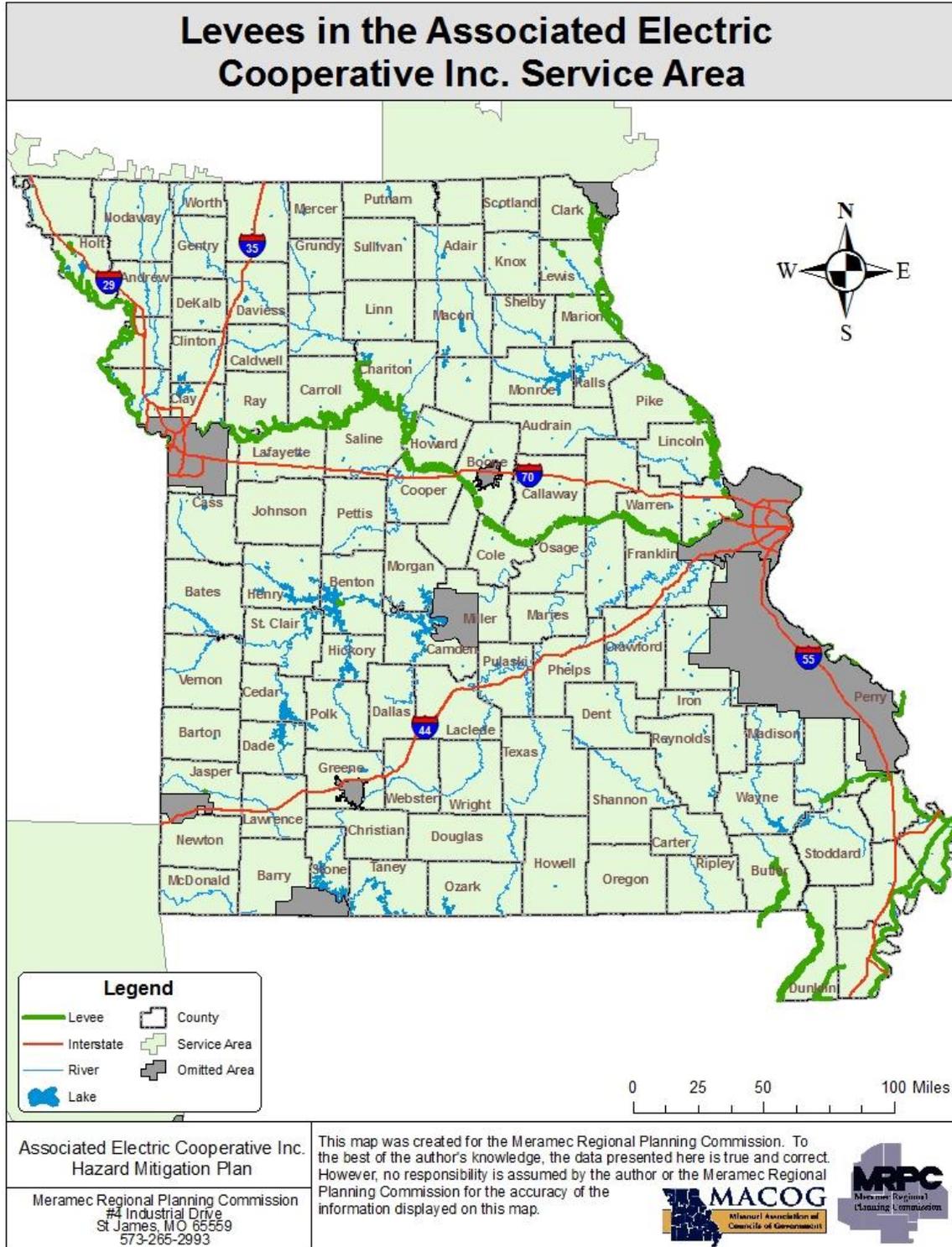
Flood and levee failure carry, perhaps, the greatest ongoing potential threat to the existing infrastructure of the Associated Electric Cooperative, Inc. Of the 39 counties where Associated has infrastructure located, several have extensive 100 year floodplain areas, particularly in the Bootheel region of the state where Associated has infrastructure located in New Madrid, Stoddard, Butler, and Pemiscot County. Figure 5 depicts the 100-year floodplain in relation to the cooperative's service area boundaries. Currently, inundation data for levee failure is lacking due to issues surrounding mapping, appropriate models, and its close association with flooding events.

Figure 5 *100 Year Floodplain Map*



Figure 6 provides the location of known state and federal levees within the cooperative's service boundaries.

Figure 6 *Levee Map*



Previous Occurrences

Since July 1, 2007, there have been 407 days of flooding events, including both flash and riverine flooding in the counties where AECI assets are located. To update this data, NCEI reported 1,724 flood events occurring during the past five years in the area. AECI did not report any additional damages or outages since the last update. Currently, data concerning levee failure damage cannot be separated from flood damage data.

Probability of Future Occurrence and Vulnerability

The average annual number of flood events is 344.8 across this region. Estimated material damages associated with each of these events were compiled by Associated staff. Table 5 summarizes flood event dates by month, damage cost estimates, and reported outages.

Table 5 Associated Flood Event Summary

Event date	Damage estimates	Outages reported
June 2008	\$834,337.52	No outages
April 2011	\$635,118.31	No outages
January 2016	\$329,123.01	No outages
April 2017	\$1,200,000.00	No outages
Total	\$4,198,578.84	No outages
Data provided based on internal Associated records which reflect data from the referenced event year.		

The probability of a flood event occurrence that damages AECI assets is 26.7% for any given year. Flood and levee failure events vary widely based upon numerous factors including, but not limited to, annual precipitation and extent of levee damage.

Based upon historical records from the past fifteen years, flood/levee failure events will cause average annual damages of \$279,905. This averaged amount accounts for less than 0.1% of Associated’s overhead assets valuation of \$2,136,809,162.

Because Associated was able to use mitigation measures to address flooding problems at its power generation facilities, no outages have occurred due to flooding events. An average of zero customers reported outages during recorded flooding events since 2007. When compared with the total number of customers served by Associated, it can be projected that less than 1 percent of all customers may report outages during any given flooding event.

Problem Statement

AECI should continue to reevaluate mitigation strategies as flooding events similar to the spring of 2017 appear to be the trend over the past fifteen years.

Severe Winter Weather

Previous Occurrences

ASSOCIATED ELECTRIC COOPERATIVE, INC.

From 2007-2016, the Missouri counties where Associated has infrastructure assets experienced 68 days of severe winter weather events, including blizzards, heavy snowfall and ice storms. To update this data, NCEI reported 456 winter weather events occurring during the past five years in the area. AECI did not report any additional damages or outages since the last update.

Probability of Future Occurrence and Vulnerability

The average annual number of severe winter weather events is 91.2. Estimated material damages associated with each of these events were compiled by Associated staff. Table 6 provides a summary of event dates, types, damage estimates, and reported outages.

Table 6 *Associated Severe Winter Weather Event Summary*

Event Date	Event Type	Damage Estimates	Outages reported
1/22/09–1/26/09	Ice storm	\$17,866,617.66	2 G & T's affected
Data provided based on internal Associated records which reflect cost from the referenced event year.			

The probability of a damaging storm is 6.7% in any given year for Associated Electric. Based upon these historical records, severe winter weather events will cause average annual damages of \$1,191,108. This averaged amount accounts for less than one percent of Associated Electric's total overhead valuation of \$2,136,809,162.

In the unlikely situation where the entire grid served by a transmission member-cooperative was to lose power due to an ice storm, it could affect 5% to 24% of the total indirect customers of AECI.

Problem Statement

The most effective mitigation against the interruption of service caused by ice storms is to have a robust system of switching and rerouting to avoid prolonged periods of outages.

B. Non-historical Hazards

Wildfire

Previous Occurrences

The incidence of wildfire in the Associated Electric Cooperative service area presents a unique risk assessment because it does occur with surprising frequency in the 39 counties where AECI has assets. Since January 2004, more than 17,000 wildfires have been reported in those 39 counties, an average annual of over 1,000 wildfires each year. However, AECI has not had any property damage related to wildfire. In most cases, the events are small and affect only a few acres of land. Table 7 summarizes the incidences of wildfire within these counties.

Table 7 *Wildfire Summary by County*

County	# of Wildfires, 2004-2016	Average Annual # of Wildfires	Total Acres Burned	Average Annual Acres Burned
Andrew	471	36	4,253	327
Atchison	208	16	1,808	139
Audrain	113	9	524	40
Barry	696	54	5,993	461
Boone	7	0	60	5
Butler	1,158	89	4,151	319
Callaway	589	45	3,997	307
Carter	113	9	6,249	481
Dade	506	39	4,505	347
Dallas	675	52	39,531	3,041
DeKalb	412	32	10,356	797
Dent	446	34	9,331	718
Dunklin	14	1	24	2
Gasconade	99	8	1,136	87
Gentry	212	16	6,857	527
Greene	936	72	4,875	375
Holt	137	11	829	64
Jasper	472	36	3,169	244
Jefferson	1,057	81	2,987	230
Johnson	754	58	3,778	291
Laclede	540	42	22,994	1,769
Lawrence	698	54	3,799	292
Marion	95	7	1,367	105
McDonald	260	20	2,803	216
Moniteau	375	29	2,665	205
New Madrid	98	8	167	13
Newton	1,759	135	7,222	556
Nodaway	479	37	6,963	536
Oregon	622	48	6,918	532
Osage	211	16	1,421	109

ASSOCIATED ELECTRIC COOPERATIVE, INC.

County	# of Wildfires, 2004-2016	Average Annual # of Wildfires	Total Acres Burned	Average Annual Acres Burned
Pemiscot	74	6	302	23
Phelps	362	28	3,519	271
Polk	599	46	4,909	378
Pulaski	463	36	1,649	127
Randolph	360	28	3,407	262
Reynolds	559	43	21,737	1672
Ripley	418	32	4,900	377
St. Charles	161	12	933	72
Stoddard	484	37	2,706	208
Totals	17,692	1,362	214,794	16,525
Source: Missouri State Hazard Mitigation Plan, 2018				

Probability of Future Occurrence and Vulnerability

The probability of a wildfire event in the Associated service area in any given year is 100% with an average annual for the 39 counties of 1,362 wildfires. So, for the purposes of this assessment, wildfire and its associated impacts cannot be eliminated from the realm of possibility.

The potential extent of damage caused by wildfire is difficult to determine. Like earthquakes and dam failure, wildfires have had no measurable impact upon the Associated service area. To date, 17,692 fires have burned a total of 214,794 acres. With an average annual of 16,525 acres burned in the service area, and the total area of the 39 counties at 15,506,560 acres; it is unlikely that infrastructure damage would exceed five percent based upon asset location and unlikeliness of an uncontrollable wildfire.

No G & T’s have reported outages during recorded wildfires between 2004 and 2021. When compared with the total number of customers served by Associated, it can be projected that less than 1 percent of all G & T’s may report outages during any given wildfire event.

Problem Statement

Further study will be required to create a model for damage assessments related to wildfire.

Earthquakes

Previous Occurrences

As Associated has facilities in 39 counties scattered throughout Missouri, these assets are vulnerable to multiple earthquake threats. In the northwest part of the state, where Associated has a power plant and wind farms, as well as substations and overhead lines, the closest source of earthquake risk is the Nemaha Fault. This fault line runs roughly from Oklahoma City, Oklahoma north to Lincoln, Nebraska. In 1993, the Nemaha Fault produced a discernable earthquake that was felt in the region, rating a 2.9 on the Richter Scale of Earthquake Intensity. Additional quakes took place February 11, 1995 (3.1 rating); July 16, 2004 (3.5 rating); March 23, 2003 (3.1 rating). Two more earthquakes that occurred more recently: an earthquake rating 3.6 was recorded on June 11, 2017, which was centered near the Missouri/Arkansas

border south of Springfield; and a 5.8 magnitude event with an epicenter near Pawnee, Oklahoma. Although a relatively quiet fault system, the Nemaha Fault has the potential to produce a damaging earthquake, which could impact the assets of Associated Electric Cooperative, Inc.

Considered a greater risk, Associated's assets are also subject to effects of the New Madrid Fault located in extreme southeast Missouri. According to many experts, the New Madrid Fault has the potential to produce the largest earthquakes in North America. Undoubtedly, this fault has the potential to affect the Associated service area in its entirety. However, of greater concern is the sizeable power generating assets that AECI has located in close proximity to the New Madrid Fault. Three power plants are located in the Missouri Bootheel region—Essex, St. Francis and New Madrid.

Other seismic zones that affect the state include the Wabash Valley Seismic Zone and the South Central Illinois Seismic Zone. The Wabash and Illinois seismic zones are not as active as the New Madrid Seismic Zone, but they are considered capable of producing earthquakes in the magnitude range of 6.0 to 6.8. They would likely have a greater impact on the St. Louis metropolitan area than an event occurring on the New Madrid Fault. In addition to these two faults, there have been several small, virtually undetectable earth movements in Missouri in recent history, which may or may not be attributed to the aforementioned fault lines or other, very small faults located nearby (*Data derived from the Missouri State Hazard Mitigation Plan, 2010 and 2013*).

Probability of Future Occurrence and Vulnerability

C.E.R.I. records demonstrate that the Nemaha fault would most likely have limited impact on Associated's assets, with no quakes to date exceeding a 5.5 magnitude. Its cascading effects have been largely restricted to more localized regions, but even then the damage caused has been minimal. By contrast, the New Madrid fault has the potential to cause damage throughout much of the state of Missouri, including the Associated service area. Scientists from the U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) at the University of Memphis have estimated the probability of a magnitude 6.0 or greater earthquake from the New Madrid Fault is 25-40 percent through the year 2053.

The 2013 Missouri State Hazard Mitigation Plan includes a scenario based on an earthquake event with a 2% probability of exceedance in 50 years. This worst-case scenario used a 7.7 magnitude in HAZUS-HM. The model incorporates the shaking potential from all faults in and around Missouri. The statewide ranking by loss ratio represents building and income losses due to the earthquake and is an indicator of the economic impacts an earthquake could have and how difficult it could be for a county to recover from the event. There are a total of 114 counties plus the city of St. Louis used in the overall rankings. This assessment looked at the 39 counties where Associated has assets located. The loss ratio is calculated by taking the sum of both structural and non-structural damage and dividing it by the total building inventory value within a county. The counties in the table are arranged by Loss Ratio Rank. Several of the counties where Associated has assets are included in the top 10.

Table 8 contains information regarding the predicted damages and loss ratio percentages and rankings. (*Data derived from the Missouri State Hazard Mitigation Plan, 2013.*)

ASSOCIATED ELECTRIC COOPERATIVE, INC.

Table 8 *Magnitude 7.6 New Madrid Earthquake Impact on AECI Assets by County*

County	Structural Damage (\$1000s)	Non-Structural Damage (\$1000s)	Loss Ratio (%)	Loss Ratio Rank
Pemiscot	234,091	857,572	76.15	1
New Madrid	259,079	911,720	74.58	2
Dunklin	280,842	963,581	49.92	5
Stoddard	263,232	919,758	45.69	6
Butler	222,353	781,152	27.25	8
Ripley	52,584	173,010	21.48	11
Carter	24,032	78,826	19.4	14
Reynolds	28,874	97,764	17.65	15
Oregon	30,093	93,317	14.64	19
Jefferson	494,116	1,600,916	10.21	23
Dent	29,514	88,659	8.55	25
Phelps	63,722	205,571	6.29	31
St. Charles	573,527	1,866,226	6.23	32
Pulaski	44,123	134,547	4.76	35
Gasconade	20,332	59,605	4.70	36
Laclede	28,940	82,834	3.86	41
Osage	13,465	40,069	3.75	42
Greene	192,009	603,517	2.85	49
Callaway	27,619	85,694	2.74	50
Dallas	8,428	25,109	2.59	52
Polk	12,612	38,574	2.04	54
Barry	16,091	47,971	2.03	55
Audrain	12,447	36,395	2.00	56
Boone	73,438	258,341	1.91	58
Moniteau	6,251	18,764	1.9	59
Lawrence	15,261	45,454	1.83	60
Marion	10,868	33,599	1.59	63
Dade	2,837	8,197	1.55	64
McDonald	5,234	15,693	1.40	68
Newton	16,964	49,616	1.32	72
Randolph	7,326	22,498	1.28	74
Jasper	32,303	96,853	1.19	76
Johnson	11,500	37,010	0.96	82
Holt	773	2,116	0.49	106
DeKalb	1,134	3,131	0.48	108
Andrew	1,969	5,496	0.47	109
Atchison	788	2,210	0.46	110
Nodaway	2,081	6,506	0.41	112
Gentry	722	1,886	0.40	113

As is evidenced in Table 8, the damage from an earthquake would vary widely across the Associated system. Assets located in the southeast part of the state could have significant damage, while those located in less vulnerable areas would likely suffer little or no damage. Power lines overhead and

ASSOCIATED ELECTRIC COOPERATIVE, INC.

underground could become disconnected or severed, and transformers and power generation facilities could be damaged. Though the probability of occurrence is very small, the potential extent of damage could significantly impact both the cooperative and its customers. As demonstrated in Table 8, there is a wide variety of associated impacts for the AECI service area could range from less than 10% damage to more than 50% depending upon location.

Based upon information from CERI, FEMA, and SEMA and using the standardized scale for Missouri REC's, it may be estimated that 10-50%, or one to three G&T's, could report outages related to an earthquake event of 7.7 magnitude. M & A Electric would be the most heavily impacted.

Problem Statement

Associated Electric Cooperative should strive to meet seismic design standards for power stations, electrical substation equipment and other overhead assets susceptible to damage from earthquake events.

Dam Failure

Like earthquakes, dam failures have had no measurable impact upon the Associated service area to date. According to Missouri DNR's Dam Safety Division, and documented in the Missouri State Hazard Mitigation Plan, there are over 5,000 known dams across the state and 679 dams that fall under state regulation. These are non-federal dams that are more than 35 feet in height.

Previous Occurrences

The Missouri State Hazard Mitigation plan states "For the 42-year period from 1975 to 2016 for which dam failure statistics are available, 19 dam failures and 68 incidents are recorded. According to this data, annual probability calculates to a 45 percent annual probability of a dam failure somewhere in the state and a 100 percent annual probability of dam incidents. It should be noted that historical dam failures and incidents include events from all hazard classes and all dams (whether regulated or un-regulated). Failures and incidents for regulated dams that have higher inspection frequencies should be less probable. The probability of future events is 45%."

Associated owns the dam at the Thomas Hill Reservoir which provides water to cool the Thomas Hill Energy Center. This dam is in Randolph County and is regulated by both state and federal agencies. Should a dam failure occur at the Thomas Hill Reservoir, it could have a catastrophic effect on that power generation facility and result in it shutting down. Except for Thomas Hill, none of Associated's other assets are in areas where dam failure would result in damage to or service interruption of service at its own facilities.

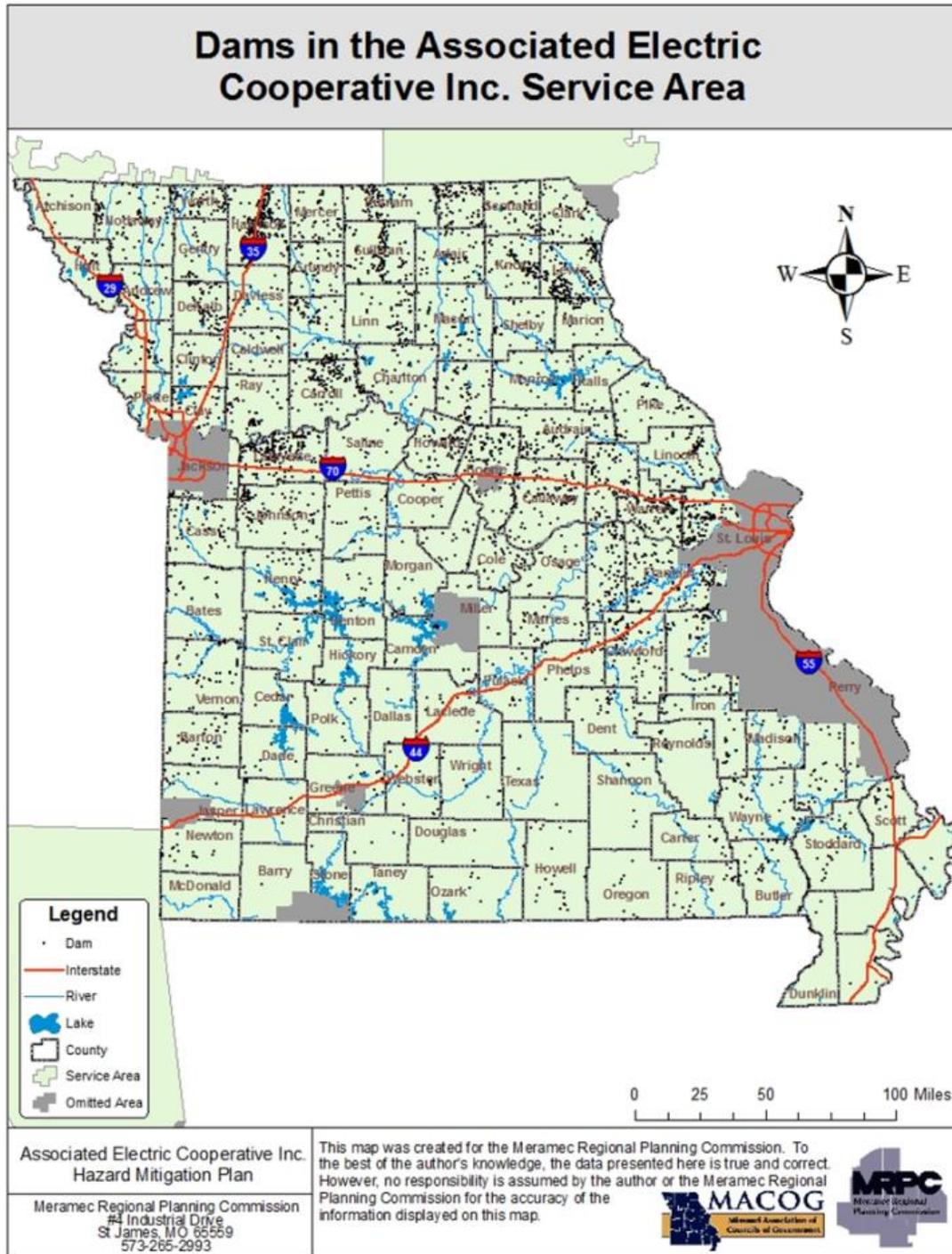
Probability of Future Occurrence and Vulnerability

However, for the purposes of this assessment, dam failure and its Associated impacts cannot be eliminated from the realm of possibility. In order to allow for a risk assessment, the probability of this event has been included as less than one percent.

AECI does extensive surveying of sites before the placement of assets to avoid inundation zones and other avoidable hazards. This assessment assumes a limited impact upon downstream electric distribution infrastructure of less than 10% for both infrastructure damage and service interruption.

Figure 7 shows the locations of all known dams located within Associated's service area.

Figure 7 *Dam Map*



ASSOCIATED ELECTRIC COOPERATIVE, INC.

Table 9 provides dam data by county of number and type of dam.

Table 9 *Number and Classification of Dams by County*

County	High Hazard Dams	Significant Hazard Dams	Low Hazard Dams
Andrew	9	0	19
Atchison	3	1	8
Boone	47	3	76
Audrain	22	6	59
Callaway	3	7	71
DeKalb	15	1	53
Dent	13	3	19
Gasconade	19	4	58
Gentry	4	1	17
Greene	10	2	5
Jefferson	102	9	27
Johnson	20	3	73
Laclede	7	0	11
Barry	0	0	1
Butler	9	0	18
Carter	6	0	8
Dade	0	1	10
Dallas	1	0	3
Dunklin	3	0	0
Holt	7	0	18
Jasper	4	0	9
Lawrence	0	0	7
Marion	4	0	43
Oregon	1	1	7
Pemiscot	0	0	3
Pulaski	0	0	12
McDonald	1	0	2
Moniteau	6	0	11
Newton	14	0	6
New Madrid	0	0	1
Nodaway	9	1	91
Osage	12	1	8
Phelps	12	1	17
Polk	1	2	10
Randolph	13	0	43
Reynolds	16	1	5
Ripley	7	5	15
St. Charles	49	8	62
Stoddard	11	0	17
TOTALS	460	61	923

Problem Statement

Further study concerning existing dams and the impact of their failure is required to make a more comprehensive assessment of potential damages and mitigation strategies to address this potential hazard.

Drought

Previous Occurrences

Although drought is not considered a hazard for most electric cooperatives, Associated is unique in that it owns and operates power generation facilities that rely upon natural sources of water for cooling purposes. If water levels dropped below the level of in-take pipes, it would affect the coop's ability to generate power. All of Associated's power generation facilities could be affected by long, sustained drought events. Fortunately, this has never occurred and so drought is considered a non-historical hazard but Associated has taken mitigation measures in case severe drought should ever occur in any of the six counties where Associated has power generation facilities. Associated has the ability to pump water into the power generation facilities with mobile pumps if water levels ever fall below the level of in-take pipes.

Missouri's average annual rainfall ranges from about 34 inches in the northwest to about 48 inches in the southeast. Even the driest areas of Missouri have enviable rainfall, compared to most western states. But lack of rainfall impacts certain parts of the state more than others because of alternate sources and usage patterns. Most of the southern portions of Missouri are less susceptible to problems caused by prolonged periods of non-rain, since there are abundant groundwater resources.

Probability of Future Occurrence and Vulnerability

Determining the potential extent of drought is currently impossible due to a lack of historical data. Further study concerning long-term drought and its impact on power generation is required to make a more comprehensive assessment of potential damage. Because drought is slow in its onset, sometimes lasting for months or years, it is assumed that Associated would have adequate time to acquire and/or move portable pumping systems to address the problem before it reached critical status. This assessment assumes a limited impact upon infrastructure of less than one percent, and less than one percent of service interruption.

Problem Statement

Associated Electric Cooperative needs to consider the effects of extended excessive heat spells and droughts in their hazard mitigation planning. High heat can lead to peak demands which must be considered, and extended droughts can affect water levels needed for power generation and cooling.

Severe Land Subsidence (Sinkholes)

Previous Occurrences

Land subsidence and sinkhole collapse are each potential hazards for the southern half of Missouri. A portion of AECE's service area includes regions which are susceptible to sinkholes by soil classification. Much of the southern half of Missouri has karst topography and areas conducive to the development of caves and potential sinkholes. Although there have not been any reported incidents of sinkholes collapsing and causing personal injury or damage to AECE property, it has occurred in Missouri.

Probability of Future Occurrence and Vulnerability

Determining the potential impact of land subsidence on Associated infrastructure is currently impossible due to a lack of historical data. Further study concerning land subsidence and its impact on power generation is required to make a more comprehensive assessment of potential damage. The fact that Associated does extensive engineering and environmental impact studies prior to construction of any facilities or infrastructure also reduces the potential threat of damage from land subsidence. If an incident of land subsidence occurred, it would be localized to a relatively small area which would further limit its impact on the cooperative. This assessment assumes a limited impact upon infrastructure of less than one percent, and less than one percent of service interruption.

Problem Statement

Land subsidence is not expected to be a concern if AECI continues to complete a thorough survey before the commencement of any new construction projects.

C. Risk Assessment Summary

Most of the historical hazards have had an impact on the electric cooperatives. Table 10 below shows the annual damages associated with each hazard for Associated. The table is ranked by the highest Average Annual Damages which is an indication of the vulnerability to each hazard.

Table 10 *Associated Hazard Risk Summary*

Hazard	Average Annual Damages
Severe Winter Weather	\$1,191,108
Tornadoes	\$995,165
Flood and Levee Failure	\$279,905
Severe Thunderstorms, and High Winds	\$26,544
Dam Failure	\$0
Drought	\$0
Earthquakes	\$0
Hail	\$0
Land Subsidence (Sinkholes)	\$0
Wildfire	\$0

The hazard of Hail along with each of the non-historical hazards Wildfire, Earthquakes, Drought, Sinkholes and Dam Failure has the potential for causing catastrophic damages in any given year. To date there have been zero damages to the assets of the Associated Electric Cooperative from these events. Nonetheless, this set of hazards should be considered in mitigation strategies because of the damage potential.

Section 4: Mitigation Strategies

Previous Mitigation Efforts

For organizations like Associated, mitigation is considered to be part of prudent business operations. In order to ensure the delivery of a quality product and minimize service interruptions, a number of mitigation strategies are continually utilized. Routine maintenance and upgrades to existing equipment are completed as part of daily tasks. Vegetation management is utilized to limit the cascading effects of natural hazards. Safety and reporting information are disseminated to the public through various types of media. Mutual aid agreements and partnerships create relationships which provide for future support in the event of a natural disaster.

Additionally, mitigation is considered prior to any expansion of service into special hazard areas. Before any transmission line is built, feasibility and environmental studies are conducted, and risk is considered in the choice of right-of-way. This process, completed by the Line Superintendent and contracted engineers, identifies, and addresses foreseeable hazards and safety issues before any new transmission lines are constructed. USDA-RUS specifications regarding operation and safety are utilized in every step of the process. Steps are taken to practically minimize the exposure of equipment to loss due to foreseeable hazards, particularly flooding.

Existing and Potential Resources

As stated above, mitigation is a key component of good business practices. Associated Electric Cooperative, Inc. includes mitigation strategies as part of regular work activities to ensure service with minimal interruptions. Funding for these activities is provided through the cooperative's normal budgetary process for maintenance.

In order to expand mitigation efforts beyond normal maintenance, it is likely that Associated will need to seek outside funding sources. These may include private, state, or federal programs which provide grant and loan funding. Upon passage of this plan, Associated will be eligible for funding through FEMA in the following categories:

- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program
- Pre-Disaster Mitigation Program
- 406 Stafford Act
- USDA Economic Development grants

Review of Goals and Actions

To focus on the mitigation actions for the 2023 update to this plan, it was decided to reach consensus on four goals that would address the needs of every cooperative member of AMEC and eliminate the objectives from previous updates. The AECI mitigation staff reviewed these goals and the actions from the previous update which addressed hazard mitigation issues. They evaluated each action to decide if it was completed, will be continued, or should be deleted. There also was the opportunity to add new actions.

ASSOCIATED ELECTRIC COOPERATIVE, INC.

The staff considered which type of actions will maximize benefits and minimize costs, how mitigation strategies will be implemented, and how the plan will be maintained and updated. Table 11 lists the goals as reviewed in the 2023 plan update.

Table 11 *Associated Goals 2023*

Identified Goals	Reassessment of the Goal
Goal 1: Protect the health and safety of the community.	Accept, as is
Goal 2: Reduce future losses due to natural hazard events.	Accept, as is
Goal 3: Improve emergency management capabilities and enhance partnerships.	Accept, as is
Goal 4: Continue to promote public awareness and education.	Accept, as is

Traditionally, the STAPLEE (Social, Technical, Administrative, Political, Legal, Environmental, and Economic) method is used to prioritize mitigation actions. These categories, however, do not necessarily align with the private sector in the same way they are applicable to governmental agencies. Several action items could be included with multiple goals, for example. As a result, the cooperatives chose to use a different method to prioritize their mitigation strategy.

The chosen method of reviewing the proposed and existing mitigation strategies was to perform a cost-benefit analysis of all mitigation actions. The analysis was based on past experiences of performing certain actions and the potential number of beneficiaries. The following matrix, Table 12, was used to rate each mitigation action. Cooperative staff was asked in the Goals and Actions Survey to review the cost-benefit rating and change if necessary.

Table 12 *Cost Benefit Matrix*

COST	BENEFIT		
	High	Medium	Low
High	7	4	1
Medium	8	5	2
Low	9	6	3

The following tables represent the completed review of current and potential mitigation strategies. Each strategy has assigned a cost benefit score assigned by the cooperative staff based on prior experience and professional opinions. Table 13 shows review the actions and the results of the cost-benefit analysis. The table has been updated through the Goals and Actions Survey that was sent to facilitate the staff update review. The Survey can be found in Appendix C. Staff members reviewed each item on the original tables and determined the status of the item.

ASSOCIATED ELECTRIC COOPERATIVE, INC.

Table 13 *Prioritized Mitigation Actions for Associated Electric Cooperative, Inc. – 2023*

Goal-Action #	Action Item	Status Update	Progress on Continued Actions	Hazards Addressed	Completion Date	Cost/ Benefit Score
1-1	<ul style="list-style-type: none"> Plant inverter upgrades: install larger, modern units to accommodate increasing load demand at New Madrid or any other AECI locations as necessary, excluding Thomas Hill. Ensure that all lines are made visible to aircraft. 	Continue (In-progress)	Earthen structures are maintained-ongoing effort; Erosion control, culvert repair and cleaning-ongoing effort; Plant inverter upgrades-dependent on additional funding; Ensure all line are made visible to aircraft-dependent on additional FEMA funding.	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Winter Weather	2027 or later	9
1-2	Utilize GIS technology to improve response time.	Continue (In-progress)	Dependent on additional FEMA funding.	All Hazards	2027 or later	5
2-1	Install/upgrade seismic protection at New Madrid and at other AECI locations (including substations) located in seismic risk areas, as needed. Thomas Hill is excluded.	Continue (Not started)	Dependent on additional FEMA funding.	Earthquakes Levee Failure	2027 or later	6
2-2	Start-up transformer (4 kV) crosstie: Install a tie between the unit standby busses at New Madrid or any other AECI locations as deemed necessary.	Continue (Not started)	Ongoing effort. Dependent on FEMA additional funding.	Earthquakes Flooding Thunderstorms Tornado Winter Weather	2027 or later	9
2-3	Install a back-up power feed or emergency generator to the Rotary Car Dumper (RCD) to power lights, air compressors, fire protection, etc. at New Madrid or any other AECI locations as deemed necessary. This excludes Thomas Hill.	Continue (Not started)	Dependent on additional FEMA funding.	Earthquakes Flooding Thunderstorms Tornado Winter Weather	2027 or later	6
2-4	Add 345 kV transmission lines at appropriate locations.	Continue (Not started)	Dependent on additional FEMA funding.	Earthquakes Flooding Thunderstorms Tornado Winter Weather	2027 or later	8
2-6	Construct additional pipeline for natural gas plants for resiliency of system	Continue (Not started)	Dependent on additional FEMA funding.	All Hazards	2027 or later	7

ASSOCIATED ELECTRIC COOPERATIVE, INC.

Goal-Action #	Action Item	Status Update	Progress on Continued Actions	Hazards Addressed	Completion Date	Cost/ Benefit Score
2-7	Re-route portion of the Franks to Fletcher 345 kV line located in flood plain on the Gasconade River to mitigate risk of future damages.	Continue (Not started)	Dependent on additional FEMA funding.	Flooding Levee Failure Thunderstorms	2027 or later	7
2-8	Purchase railcar to move critical spare transformers	Continue (Not started)	Dependent on additional FEMA funding.	Land Subsidence Thunderstorms Tornado Wildfire Winter Weather	2027 or later	7
3-1	Cooperate with local law enforcement and government officials to reduce the impact of power outages.	Continue (In-progress)	Ongoing effort.	All Hazards	Annually	9
3-2	Provide additions to and/or upgrades to satellite phones or other emergency communication devices at AECI locations.	Continue (In-progress)	Ongoing effort. Dependent on additional FEMA funding.	All Hazards	2025	6
4-1	Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, earthquakes, and wildfire upon the Associated service area through local, state, and federal agencies.	Continue (In-progress)	Ongoing effort.	Dam Failure Earthquakes Land Subsidence Levee Failure Tornado Wildfire	Annually	3

After review, there were no completed and removed from the Action Items list for the plan update. There were two actions deleted, which are listed in table below. All other actions are continued in this update. There are two new actions added to the 2023 plan as shown in Table 15.

Table 14 *Removed Actions for Associated Electric Cooperative, Inc.*

Action Items	Status Update	Explanation for Completed/Deleted Action
Provide black start capability at Thomas Hill Energy Center and any other AECI locations	Delete this action	This is no longer an action item due to black start capabilities already in place.
Expand coal storage at New Madrid Power Plant and Thomas Hill Power Plant	Delete this action	No longer deemed a needed project.

ASSOCIATED ELECTRIC COOPERATIVE, INC.

Table 15 *Prioritized Mitigation New Actions for Associated Electric Cooperative, Inc.*

Goal-Action #	Action Item	Status Update	Hazards Addressed by This Action	Completion Date	Cost/ Benefit Score
2-9	Transmission for additional generation outlet capacity, dependent on FEMA funding	NEW Not Started	Dam Failure Earthquakes Flooding /Levee Failure Land Subsidence Thunderstorms Tornado Winter Weather	2027 or later	7
2-10	Transmission improvements to mitigate for high impact low frequency events, dependent on FEMA funding.	NEW Not Started	Dam Failure Earthquakes Flooding /Levee Failure Land Subsidence Thunderstorms Tornado Winter Weather	2027 or later	7

Section 5: Plan Implementation and Maintenance

Plan Incorporation

The goals and actions of the previous section identify both ongoing efforts at mitigation and potential methods for expanding efforts. The updated plan has been reviewed and adopted by the Board of Directors as part of the company's operations policy. This mitigation plan necessitates involvement from every AECEI employment level as the organization strives to ensure quality service to their customers.

Local Planning Capabilities

Internal Planning Mechanisms exist in abundance at AECEI. The information presented in the Hazard Mitigation Plan can be incorporated into and considered in the following planning and budget structures:

- 10-year Long Range Transmission Plan (updated every 2 years)
- Winter and Summer Peak Operating Study (annually)
- NERC/SERC Compliance Studies (ongoing)
- Electric Load Studies (bi-annually)
- Cost of Service Study (annually)
- Capital Budget (annually)
- 4-year Capital Budget / Work Plan
- Long-Range Generator 10-year Outage Plan (annually)
- Long Range (10-year) Forecasted Projects (LRFP – annually)
- Integrated Resource Plan (annually with 20-year assessment)
- Computerized Maintenance Management Systems (scheduled preventative and predicative maintenance on equipment)
- Emergency Response Plan review (annually)

Beyond the Associated Hazard Mitigation Plan, regional planning capabilities exist at the local level. Most of the 39 Missouri counties where Associated has assets either have a FEMA-approved Natural Hazard Mitigation Plan in place, or are working on updating their plan. County emergency management directors have Local Emergency Operations Plans which seek to mitigate the same hazards for residents. These same counties are also included in the Regional Transportation Plans (RTP) for the Missouri Department of Transportation districts across the state, as well as the Comprehensive Economic Development Strategies (CEDS) developed by RPCs in those same regions. Associated's plan can be easily incorporated into these local plans and allow for coordination across agencies in the event of an emergency.

The majority of AECEI's service area is rural and made up of third-class counties which are prohibited from enforcing building codes and zoning by the state of Missouri. Comprehensive plans and Capital Improvement plans would not be applicable.

Plan Maintenance

Associated will follow the requirements coordinated by the Association of Missouri Electric Cooperatives (AMEC) for monitoring, evaluating, and updating the plan.

Continued Public Involvement Opportunities

Public notice was given in the form a notice in the *Rural Missouri*, a publication of the Association of Missouri Electric Cooperatives, distributed to all cooperative members. The updated 2023 plans were posted on the website of the Northwest Missouri Regional Council of Governments for public review and comment. Comments were considered and addressed. Once all co-op plans were completed, they were assembled into one plan and submitted to the State Emergency Management Agency and the Federal Emergency Management Agency for review and approval. The documentation for public involvement and comments can be found in Appendix B of each cooperative's section of the plan.

Associated will follow the requirements coordinated by the Association of Missouri Electric Cooperatives (AMEC) for continued public involvement. Opportunities for public comment will continue to be offered through various media outlets and the physical office of Associated.

Appendix: A - Adoption Resolution

RESOLUTION

HAZARD MITIGATION PLAN

RESOLUTION

HAZARD MITIGATION PLAN

WHEREAS (Cooperative name) wishes to be more prepared for the occurrence of natural hazards and to offset their impacts where possible; and

WHEREAS the (Cooperative name) has participated in the preparation of a multi-hazard mitigation plan, hereby known as the Multi-jurisdictional Hazard Mitigation Plan for Missouri’s Electric Cooperatives, hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, this living document was updated in 2022 and is intended to serve as a planning mechanism for participating Missouri Rural Electric Cooperatives; and

WHEREAS, (Cooperative name) worked to identify hazards, vulnerabilities and potential actions that may lessen the impact of natural hazards upon (Cooperative name) assets in the future; and

THEREFORE, BE IT RESOLVED: That (Cooperative name) adopts the Multi-Jurisdictional Hazard Mitigation Plan 2017 Update for Missouri Electric Cooperatives as it pertains and applies to (Cooperative name).

CERTIFICATE OF SECRETARY

I, _____, do hereby certify that I am Secretary of (Cooperative name); that the above and foregoing is a true copy of the Resolution adopted by the Board of Directors of said Cooperative relating to the Hazard Mitigation Plan.

IN WITNESS WHEREOF, I have hereunto set my hand as Secretary of Cooperative name)

And affixed the seal thereof this ____ Day of _____, 2022

_____, Secretary

(CORPORATE SEAL)

Appendix: B - Documentation of Participation

This ad was published in the *Rural Missouri*, a monthly publication of the Missouri Association of Missouri Electric Cooperatives, giving public notice to all subscribing members of AMEC.

A 30-day public comment period for the 2023 update of the Multi-Jurisdictional Hazard Mitigation Plan for Missouri's Electric Cooperatives will be open starting

August 29, 2022

Individual Cooperative plans may be accessed on their respective website.

A list of Cooperative websites, and the State Summary for this plan update, may be accessed at www.nwmorcog.org.

Written comments for the Cooperative's plans and/or the State Summary may be submitted via email to amy@nwmorcog.org



Appendix: C - Surveys

Data Survey

The following is the returned survey from AECI which was used by NWMORCOG staff to update the Plan:

Please correct/update the following information from the previous plan.

Associated Electric Cooperative, Inc. (AECI) was established in 1961 to provide wholesale power generation and transmission to its member-owners. Associated is owned by and provides wholesale power to six regional generation and transmission cooperatives (G & T's). In turn, these six regional generation and transmission cooperatives are owned by and provide wholesale power to 51 local electric cooperative systems (distribution cooperatives) in Missouri, southeast Iowa and northeast Oklahoma. The organization provides power for more than 910,000 customers in three states. Associated is headquartered in Springfield, Missouri and operates on a not-for-profit cooperative basis. The organization employs approximately 760 people at three locations. It furnishes electric power and energy to its members pursuant to the all-requirements wholesale power contracts that extend through 2075. The wholesale power contracts require each member to purchase all its electric power and energy needs from Associated. Associated obtains the electric power and energy needed to serve its members from a combination of generation that Associated owns and operates; generation owned by others but operated and/or dispatched by Associated; and purchased power. Figure ? shows the Missouri geographic boundaries of Associated. (Map source: Associated's website – www.aeci.org.)

Service Area Map if needed, please replace or attach a different map if available

(See New Service Area Map)

The cooperative is run by a 12-member board that is elected to serve and represent Associated's six owner generation and transmission cooperatives. Associated's vision is to be the lowest cost wholesale power supplier. Its mission is to provide an economical and reliable power supply and support services to its members. (Source: Associated's website - www.aeci.org .) Service boundaries for Associated include all of the State of Missouri, with a significant portion of northeast Oklahoma and a portion of southern Iowa. The cooperative owns 717.7 miles of transmission line and 10 operating power generation facilities.

The 51 cooperatives that distribute power to an estimated 910,000 homes, farms and businesses, are part of a unique three-tiered system. The distribution cooperatives are the first tier. They own the G & T's which form the second tier and are responsible for transmitting power from Associated to the distribution cooperatives. G & T's work on a regional level as construction agents and own the majority of transmission systems from 69-kilovolt to 161-kilovolt. At one time, the G & T's not only transmitted the power to their member distribution cooperatives, they also generated or purchased power as well. (Source: Associated's website - www.aeci.org .)

The six G & T's formed Associated in 1961 to take care of generation, power procurement, and high voltage transmission. They include Central Electric Power Cooperative, located in Jefferson City, MO; KAMO Power, located in Vinita, OK; M&A Electric Power Cooperative, located in Poplar Bluff, MO; Northeast Missouri Electric Power Cooperative, located in Palmyra, MO; N.W. Electric Power Cooperative, Inc., located in Cameron, MO; and Sho-Me Power Electric Cooperative, located in Marshfield, MO.

Associated and its six G & T owners have built and own an integrated transmission system that consists of 10,196 miles of high-voltage transmission line, as well as more than 904 related substations. The transmission system enables Associated to reliably serve members and transact power purchases and sales for the benefit of its owner systems. Associated has 233 transmission interconnections; 22 transmission interconnection agreements; and transacts business with investor-owned and municipal utilities, electric cooperatives, power marketing firms and regional transmission organizations.

AECI Generation

Baseload generation includes the New Madrid Power Plant in New Madrid, MO, a coal plant that includes two units of 600 MW for a total capacity of 1,200 MW of generation; and the Thomas Hill Energy Center in Clifton Hill, MO., a coal plant that includes three units of 180 MW, 303 MW, and 670 MW, for a total capacity of 1,153 MW. Table ? lists all of Associated's power generation facilities, as well as location, type of power, number of units and total capacity. There have been no changes since 2010.

AECI Generation Facilities

Generation Facilities	Location	Type of Power	Number of Units	Total Capacity
New Madrid Power Plant	New Madrid, MO	Coal	2	1,200 MW
Thomas Hill Energy Center	Clifton Hill, MO	Coal	3	1,153 MW
Chouteau I Power Plant	Pryor, OK	Natural Gas	2	522 MW
Chouteau II Power Plant	Pryor, OK	Natural Gas	2	540 MW
Dell Power Plant	Dell, AR	Natural Gas	2	580 MW
St. Francis Power Plant	Glennonville, MO	Natural Gas	2	501 MW
Essex Power Plant	Idalia, MO	Natural Gas	1	107 MW
Holden Power Plant	Holden, MO	Gas/Oil	3	321 MW
Nodaway Power Plant	Maryville, MO	Natural Gas	2	182 MW
Unionville Power Plant	Unionville, MO	Oil	2	45 MW
Source: AECI records				

Intermediate generation includes the Chouteau I Power Plant, Pryor, OK, two combined-cycle gas-based units, for a total generating capacity of 522 MW and Chouteau II Power Plant, two combined-cycle gas-based units with a total generating capacity of 540 MW; Dell Power Plant, Dell, AR, two combined-cycle, gas-based units, for a total generating capacity of 580 MW; and the St. Francis Power Plant, Glennonville, MO, two combined cycle gas-based units, for a total capacity of 501 MW. Peaking generation includes the Essex Power Plant in Idalia, MO, a simple-cycle gas-based unit of 107 MW; the Holden Power Plant, three simple-cycle, dual fuel gas and oil units, for a total of capacity of 321 MW; the Nodaway Power Plant in Maryville, MO, two simple-cycle, gas-based units of total capacity of 182 MW; and Unionville

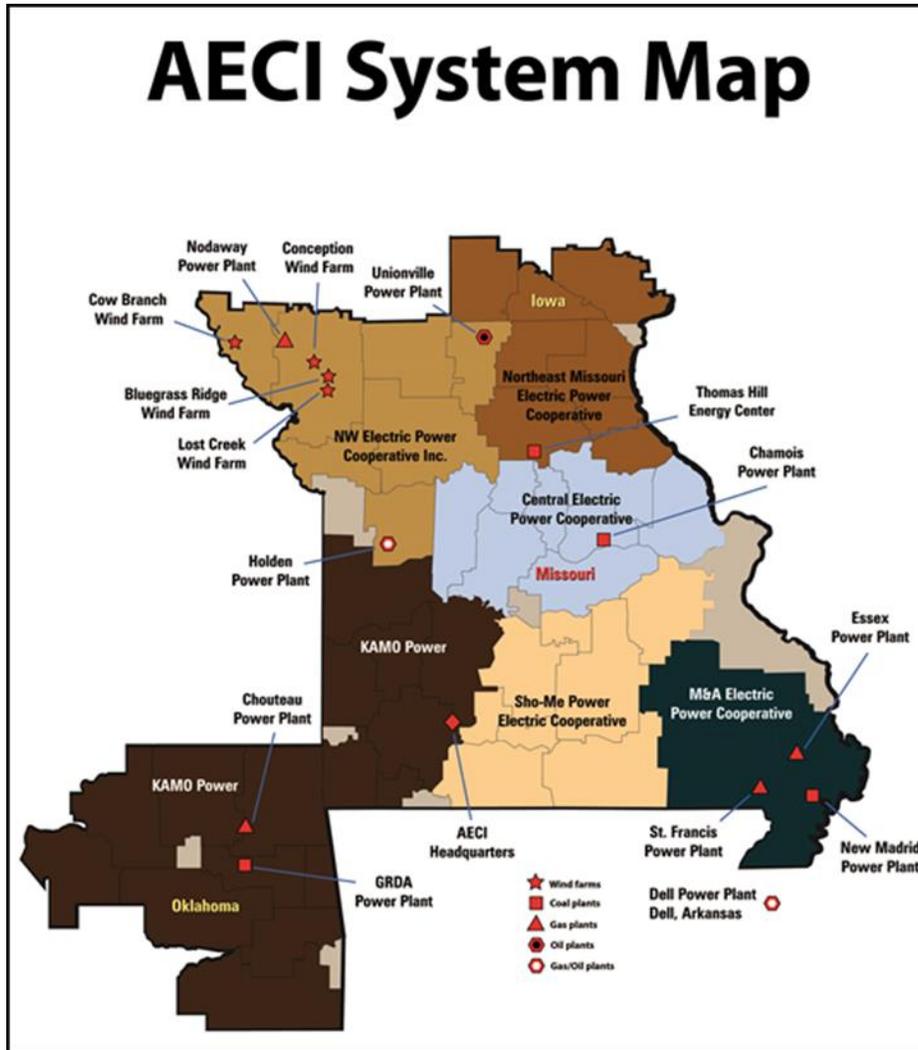
Power Plant in Unionville, MO, two simple-cycle oil units for a total capacity of 45 MW. Figure 2 is a map of the entire AECI system, including the five G & T's, as well as the general location of all of Associated's facilities. (*Map Source: AECI*)

The FEMA reviewers that approved the previous update suggested including current operating budget information, any capital improvements, or strategic initiatives in this update. Please add or attach if

Below are capital projects for 2022 – 2023:

Year/Date	Generation Facility	Location	Description of Work
2022 Spring	Dell Power Plant	Dell, AR	Inspections and repairs on all three turbines and generators.
2022 Spring	Thomas Hill Unit 1	Clifton Hill, MO	Turbine valve inspections and repairs; Boiler work-waterwalls, cyclone re-stud.
2022 Spring	Chouteau Block 2	Pryor, OK	Steam turbine rotor change out.
2022 Fall	Thomas Hill Unit 3	Clifton Hill, MO	New switchgear; Turbine valve inspection and repairs; Hot reheat inspection and repairs; New generator step up (GSU) transformer.
2022-2023	Unionville Power Plant	Unionville, MO	Re-commissioning of the plant. This plant is to be operational in 2023.
2022-2023	New Madrid Unit 2	New Madrid, MO	Digital controls upgrade, boiler work and turbine generator work.

Facilities Location Map if needed, please replace or attach a different map if available



Of the estimated 1,928,800 customers served by Associated, an estimated 1,524,852 are located in Missouri. Associated has a total generating capacity, including both owned facilities and contracted power of 5,700 MW. Peak loads over the past 10 years have varied from 3,839 MW to 4,354 MW for summer usage, and between 3,905 MW and 5,549 MW during winter months. Annual total usage of Associated customers in 2021 was 20,661,802 MWh of service. Population density for the cooperative service area is depicted in Figure ? (Map source: U.S. Census 2010).

Population Density Map will be updated by NWMORCOG

Critical Facilities

It is important in mitigation planning for the Electric Cooperatives to identify the critical facilities in each area and to be able to prioritize reconnection and back-up power needs. As the primary transmission system, Associated does not serve any critical facilities directly.

Future Development Did any of these occur? These could be the capital improvement information we need for FEMA. The info wanted here is if any of your members you serve have future development plans that would potentially affect your operation.

Associated reported the *potential* future transmission plans include:

- Construction of a 345/161 kV substation in Southwest Missouri; (No, this did not occur)
- The addition of a 345/161 kV transformer at AECEI's Morgan substation (Yes, this occurred)
- Central Missouri 345 kV line; (Currently, in progress)
- Re-route of AECEI 345 kV line near Jerome (Franks to Fletcher) (No, this did not occur)

3.1 Section 2: Asset Inventory

Please update the figures below to the most current information.

Associated Electric Cooperative, Inc. has a wide variety of assets by type. Real estate owned by the company includes office buildings, warehouses, garages, and other outbuildings throughout the service area. Associated owns 133 vehicles, which provide access to customers and infrastructure. Associated owns ten electric generation facilities as well as some transmission infrastructure. Because Associated does not provide distribution of power to customers, they own zero miles of distribution lines. Table? provides information concerning total asset valuation.

Associated Asset Inventory Valuation Summary

Asset	Total Replacement Cost	Cost Breakdown 2021
Total AECEI Assets	\$9,388,529,339	Buildings and vehicles- \$170,839,570
Total AECEI Missouri-based Assets (excludes Chamois)	\$7,779,721,442	Overhead assets (transmission lines - \$1,850,609,650)
	Total AECEI Missouri-based Assets	Substations - \$286,199,512
Power Generation Facilities	Total \$7,031,625,000 MO \$5,440,275,000	Cost Breakdown Range: \$22,500,000 - \$2,340,000,000 New Madrid Power Plant Thomas Hill Power Plant Unionville Power Plant Essex Power Plant Nodaway Power Plant St. Francis Power Plant Units 1 & 2 *Chouteau I Power Plant *Chouteau II Power Plant Holden Power Plant **Dell Power Plant

Asset	Total Replacement Cost	Cost Breakdown 2021
Substations	\$286,199,512	Cost Breakdown Range: \$1,267,664 - \$36,362,702 Atchison 69/34.5 Cow Branch Windmill Blackberry 345 kV Switching Station Brookline (Transformer) Clyde 69/34.5 at Conception Wind Farm Dell Plant Substation Enon (includes Transformer) Essex Plant Substation Fairport Fletcher with 345/161 kV Transformer Franks Gentry Gobbler Knob Holden Plant Substation Huben Jasper Kingdom City McCredie Morgan New Madrid Plant Substation New Madrid 500 Palmyra Salem St. Francis Substation 161/345 kV Thomas Hill Plant Substation Winslow
2017 Transmission Lines – 717.70 miles	\$1,850,609,650	OH 69 kV lines (5.22 miles) - \$3,497,400 OH 161 kV lines (59.09 miles) – \$94,544,000 OH 345 kV lines (607.97 miles) - \$1,602,000,950 OH 500 kV lines (45.42 miles) – \$150,567,300
Mobile Equipment	\$30,540,595	Cost Breakdown Range: \$3,257,012- \$15,748,508 New Madrid Power Plant Thomas Hill Power Plant Thomas Hill Mine
Office Buildings	\$49,438,412	\$43,835,436 - Springfield/Headquarters \$3,146,713 - Back-Up Dispatch Control Center \$2,456,263 – Thomas Hill Mining Division Support Facility
Warehouses	\$86,563,280	
Coal Stockpiles	\$30,880,767	Cost Breakdown Range: \$12,849,428- \$18,031,339 Thomas Hill New Madrid
Source: Internal Associated Accounting and Insurance records, 2017 * Located in Oklahoma ** Located in Arkansas		

Please add any known information related to each of the natural hazards that follow:

Flooding (Major and Flash), Levee Failure, Dam Failure, Earthquake, Land Subsidence/Sinkholes,
 Drought, Extreme Temperature, Severe Thunderstorms, Severe Winter Weather, Tornadoes, Wildfire

NWMORCOG will add information from the National Weather Service that has occurred since 2016

Associated Tornadoic Event Summary

Date of Event	EF Scale Rating	County-wide Damage Estimates	Associated Damage Claim to FEMA
4/2/2006	F3	(Pemiscot) \$60,000,000	\$6,713,921.37
1/7/2008	F2-F3	(Laclede) \$8,100,000	\$315,730.41
		(Phelps) \$110,000	
4/19-26/2011	EF0-EF1	(Stoddard) \$50,000	\$25,802.58
		(Butler) \$175,000	
12/10/2021 (FEMA claim ongoing. Damage totals are estimates)		(Dunklin) (Pemiscot)	\$12,747,837.00 \$100,000
Totals		\$68,435,000	\$19,903,291.36

Source: NOAA and internal Associated records

Associated Thunderstorm/High Wind, Hail Event Summary

Event date	Damage estimates	Outages reported
5/8/09–5/16/09	\$136,125.27	1 G & T affected
6/23/2019	\$147,760.51	1 G&T affected
5/3-4/2020	\$114,278.26	No outages
Data provided based on internal Associated records which reflect cost from the referenced event year.		

Associated Flood Event Summary

Event date	Damage estimates	Outages reported
June 2008	\$834,337.52	No outages
April 2011	\$635,118.31	No outages
January 2016	\$329,123.01	No outages
April 2017	\$1,200,000.00	No outages
Data provided based on internal Associated records which reflect data from the referenced event year.		

Associated Severe Winter Weather Event Summary

Event Date	Event Type	Damage Estimates	Outages reported
1/22/09–1/26/09	Ice storm	\$17,866,617.66	2 G & T's affected

Data provided based on internal Associated records which reflect cost from the referenced event year.			

Please add any dates, known damage, and outages since the last plan due to

Levee failure,

Event date	Damage estimates	Outages reported

dam failure,

Event date	Damage estimates	Outages reported

drought,

Event date	Damage estimates	Outages reported

earthquake,

Event date	Damage estimates	Outages reported

extreme temperatures(hot & cold)

Event Date	Event Type	Damage Estimates	Outages reported

land subsidence,

Event date	Damage estimates	Outages reported

or wildfire.

Event date	Damage estimates	Outages reported

Goals and Actions Survey

The original survey is an interactive Excel file that could not be inserted without stabilizing the formatting. All of the data submitted is included in the tables below.

A	B	C	D	
Complete each row left to right. Click on each box to receive instructions for that box.	2017 Approved Goals	Reassess the goal	Instructions	Justifications
	Goal 1: Protect the health and safety of the community	accept, as is <input checked="" type="checkbox"/> YES	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
	Goal 2: Reduce future losses due to natural hazard events.	accept, as is <input checked="" type="checkbox"/> YES	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
	Goal 3: Improve emergency management capabilities and enhance partnerships.	accept, as is <input checked="" type="checkbox"/> YES	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
	Goal 4: Continue to promote public awareness and education.	accept, as is <input checked="" type="checkbox"/> YES	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
	After completing this sheet, please click the "actions" tab at the bottom, left			
Table 1 <i>Associated Hazard Risk Summary</i>		Goal review After discussion, if agreed check to accept this goal to use in the update.		
Hazard	Average Annual Damages			
Severe Winter Weather	\$1,191,108			
Tornadoes	\$352,773			
Flood and Levee Failure	\$279,905			
Severe Thunderstorms, and High Winds	\$26,544			
Dam Failure	\$0			
Drought	\$0			
Earthquakes	\$0			
Hail	\$0			
Land Subsidence (Sinkholes)	\$0			
Wildfire	\$0			

Goal-Action#	Actions from 2017 Plan	Status Update	Report progress on continued actions	Select Hazard(s) addressed by this action	Completion Date	COST/BENEFIT SCORE
1-1	<ul style="list-style-type: none"> Plant inverter upgrades: install larger, modern units to accommodate increasing load demand at New Madrid or any other AECI locations as necessary, excluding Thomas Hill. Insure that all lines are made visible to aircraft. 	Continue (In-progress)	Earthen structures are maintained-ongoing effort; Erosion control, culvert repair and cleaning-ongoing effort; Plant inverter upgrades-dependent on additional funding; Insure all line are made visible to aircraft-dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	9
2-1	Install/upgrade seismic protection at New Madrid and at other AECI locations (including substations) located in seismic risk areas, as needed. Thomas Hill is excluded.	Continue (Not started)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	6
2-2	Start-up transformer (4 kV) crosstie: Install a tie between the unit standby busses at New Madrid or any other AECI locations as deemed necessary. Thomas Hill is excluded.	Continue (In-progress)	Ongoing effort. Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	9
2-3	Install a back-up power feed or emergency generator to the Rotary Car Dumper (RCD) to power lights, air compressors, fire protection, etc. at New Madrid or any other AECI locations as deemed necessary. This excludes Thomas Hill.	Continue (Not started)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	6
2-4	Provide black start capability at Thomas Hill Energy Center and any other AECI locations. Remove this from the action plan.	Delete this action	Remove from action plan	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 		
2-4	Add 345 kV transmission lines at appropriate locations.	Continue (Not started)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	8
3-1	Cooperate with local law enforcement and government officials to reduce the impact of power outages.	Continue (In-progress)	Ongoing effort.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	annually	9
3-2	Provide additions to and/or upgrades to satellite phones or other emergency communication devices at AECI locations.	Continue (In-progress)	Ongoing effort. Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2025	6

Goal-Action#	Actions from 2017 Plan	Status Update	Report progress on continued actions	Select Hazard(s) addressed by this action	Completion Date	COST/BENEFIT SCORE
1-2	Utilize GIS technology to improve response time.	Continue (In-progress)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	5
4-1	Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, earthquakes , and wildfire upon the Associated service area through local, state, and federal agencies.	Continue (In-progress)	Ongoing effort.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	annually	3
2-6	Expand coal storage at New Madrid Power Plant and Thomas Hill Power Plant. Remove from the action plan.	Delete this action	Remove from the action plan.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 		
2-6	Construct additional pipeline for natural gas plants for resiliency of system	Continue (In-progress)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	7
2-7	Re-route portion of the Franks to Fletcher 345 kV line located in flood plain on the Gasconade River to mitigate risk of future damages.	Continue (Not started)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	7
2-8	Purchase railcar to move critical spare transformers	Continue (Not started)	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	7
2-9	Transmission for additional generation outlet capacity	new	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	7
2-10	Transmission improvements to mitigate for high impact low frequency events.	new	Dependent on additional funding.	<ul style="list-style-type: none"> Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather 	2027 or later	7