

Judgment rendered February 1, 2006
Application for rehearing may be filed
within the delay allowed by Art. 2166,
La. C.C.P.

No. 40,486-CA

COURT OF APPEAL
SECOND CIRCUIT
STATE OF LOUISIANA

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H. H. HANKS, ET AL

Plaintiffs-Appellees

versus

ENTERGY CORPORATION, ET AL

Defendants-Appellants

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Appealed from the
Third Judicial District Court for the
Parish of Union, Louisiana
Trial Court No. 37,360

Honorable R. Wayne Smith, Judge

* * * * *

THE BOLES LAW FIRM
By: Walter C. Dunn

Counsel for
Appellants

CRAWFORD & ANZELMO
By: Brian E. Crawford

Counsel for
Appellees

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* * * * *

Before BROWN, CARAWAY and LOLLEY, JJ.

CARAWAY, J.

The owners and insurer of a camp located on Lake D'Arbonne instituted suit against Entergy Louisiana Inc. ("Entergy") seeking reimbursement for insurance proceeds paid and damages which exceeded insurance coverage as the result of lightning that precipitated a fire and destroyed the camp. The plaintiffs alleged that during a storm, a lightning strike hit near an Entergy service pole adjacent to their camp and caused a high-powered electrical current to traverse the line starting a fire. The plaintiffs contend that a lightning arrester on the service pole failed to ground the strike. Entergy contends that the massive lightning strike, recorded in this case as an extraordinarily large strike, constitutes an Act of God. After a three-day trial, the court ruled in favor of the plaintiffs, finding a defective arrester. Entergy has appealed. We reverse.

Facts

On the morning of April 3, 2000, a thunderstorm occurred near Lake D'Arbonne in Union Parish, Louisiana. Lightning from the storm destroyed the electrical transformer serving plaintiffs' lake home and also caused a fire in the home which destroyed it. According to lightning verification data submitted into evidence,¹ during the storm, at approximately 6:17 a.m., an intense lightning strike measuring 87.9 kiloamps ("KA") occurred. A strike of this magnitude is in the upper 2% range of lightning strikes. The evidence from the lightning data network indicated that the lightning hit

¹These included reports issued by StrikeNet and StrikeFax which the experts explained are generated by the same company under different names. The company sets out a network of antennas and grids around the country to register and pinpoint lightning strikes.

within 3/10 of a mile of the lakehouse owned by H.H. Hanks, Jacqueline James Hanks, J.B. Hanks, William Hanks, Lewis Hanks, and Traci Hanks (“the Hanks”) and insured by Encompass Insurance Company (formerly CNA Insurance Company). The exact location of the strike, however, is disputed. While other lightning strikes of lesser intensity also occurred, the experts all agree that this massive strike was the probable cause of the damage to the camp.

Electrical service to the camp was provided by Entergy Louisiana, Inc. (“Entergy”), which owned and maintained a transformer and lightning arrester located on a pole 90 feet from the camp and attached to the Entergy distribution lines leading to the camp. The transformer reduces the higher voltage from the distribution line to allow standard (120/240) volt service for the dwelling.

The surge arrester, which is at the center of this dispute, is a large vertical cylindrical porcelain device which is bolted to the side of the transformer and protects it from high voltage surges by diverting the excess voltage to the ground away from the transformer. (See long tubular device on the side of the transformer in the diagram, Plaintiff’s Exhibit 4, attached as Appendix I). When voltage greater than threshold voltage is impressed across the arrester, the apparatus acts like a switch and directs the high voltage current to a grounding mechanism extending down the pole to a rod driven in the ground. When the surge ends, the device switches back to the line, isolating it from the ground.

All experts agreed that the 27KV distribution class, silicon carbide lightning arrester (surge suppressor) installed at the location was appropriate for the dwelling. There is no assertion by Hanks that Entergy owed the obligation of installing an arrester with a greater capacity. The expert testimony also showed that lightning arresters are installed with all Entergy transformers because lightning hits nearly all transformers on an average of twice a year in Louisiana. The arresters are also required to work for protection against unexpected surges of power along the distribution system. Causes of arrester failure include design failures, lack of internal parts, disconnected or loose bottom or ground connections, or depletion of the internal metal oxide of the switching device which results from numerous strikes. The subject transformer had been placed at the dwelling in 1996 and Entergy had received no requests for repairs nor complaints about the device since that time. The evidence also showed that Entergy employees commonly replace arresters and transformers, although no standing instructions as to inspection of the devices exist. Rather, Entergy employees are instructed to visually inspect equipment as they perform their regular duties.

Excerpts from an Entergy engineering manual which was relied upon by both sides became central to the dispute over the location of the lightning strike. The data from the manual were revealed in the report of Entergy's expert, Frederick Brooks. His September 18, 2003 report stated:

The Entergy Engineering Design/Practices Manual states, "A lightning stroke to a power line will **usually** result in the current being distributed over several paths with current flowing through any single arrester about 1/10 the total stroke

current.” The paragraph also includes the text, “Very high current lightning strokes or a direct stroke to the arrester could cause destructive currents to flow through the arrester.” (Emphasis in original document.)

Entergy employees who visited the location for the first time on April 8, 2000, found significant damage to the transformer. The bottom of the steel tank had been blown out. The experts of both sides agreed that such destruction of the tank by lightning was as great as they had ever witnessed. A photograph taken during that initial site visit showed that the arrester, however, sustained no apparent damage. That photograph (Def. Ex. 2) is the only remaining evidence of the arrester preserved for trial. Critically, while the damaged transformer was retained, Entergy failed to physically examine or retain the arrester. This action became the subject of a spoliation of evidence claim by plaintiffs which is addressed below.

In March 2001, the Hanks and Encompass, as subrogee, instituted a suit for damages against Entergy and Howard, the manufacturer of the transformer, alleging that Entergy negligently failed to maintain and inspect the electrical equipment servicing the dwelling. The matter proceeded to trial only on the issue of Entergy’s negligence in failing to properly maintain and inspect the surge arrester which allegedly caused the destruction of the Hanks’ camp.² After reviewing the evidence and testimony, the trial court ruled in favor of the Hanks and Encompass, rejecting claims by the Hanks regarding spoliation of evidence and the application of *res ipsa loquitur*. The trial court concluded that because of

²The parties stipulated to damages.

lack of damage to the arrester, it failed to operate resulting in a breach of Entergy's duty to the plaintiffs. This appeal by Entergy ensued.

Discussion

I.

On appeal, the Hanks contend that the trial court erred in concluding that the evidence failed to support a finding of spoliation of evidence. Where a litigant fails to produce evidence available to him and he does not provide a reasonable explanation, the presumption is that evidence would have been unfavorable. That presumption does not apply where the litigant explains the failure to produce the evidence. *Small v. Baloise Ins. Co. Of America*, 96-2484 (La. App. 4th Cir. 3/18/98), 753 So. 2d 234, *writ denied*, 98-1345 (La. 7/2/98), 724 So. 2d 733. In rejecting the spoliation of evidence claim, the trial court observed as follows in the reasons for judgment:

The evidence does not support a finding that Entergy spoliated the evidence. Alton Riser, an Entergy employee for many years, testified that the arrester was probably removed from the transformer and discarded in accordance with standard operating procedures of Entergy shortly after the apparatus was removed from the scene on or about April 8, 2000. There is no evidence that Entergy intentionally destroyed the arrester to deprive plaintiffs of its use. At the time the arrester was discarded, no litigation was pending, and Entergy officials probably were not aware of a potential claim.

The trial court further concluded that plaintiffs must bear some responsibility for the loss of the arrester because their own investigator visited the scene prior to Entergy's knowledge of the fire loss claim and took no steps to preserve the arrester. Further, the court observed that

Encompass's counsel made no formal request that Entergy preserve the arrester, although it made a request for the transformer.

The conclusions of the trial court are borne out by the evidence before us. Thus, for the reasons expressed by the trial court, we find no error in the rejection of the spoliation of evidence claim.

II.

Entergy's assignments of error focus on the unusual Act of God event which occurred in this case and the failure of the Hanks to establish the cause of the fire loss as being separate from the massive, and allegedly uncontrollable, lightning strike.

An Act of God in common law terminology is a concept similar to the civilian doctrine of force majeure, a superior or irresistible force that is, in the legal sense, sufficient to excuse a defendant's neglect of a duty and relieve him of liability to a plaintiff. *Caldwell v. Let The Good Times Roll Festival*, 30,800 (La. App. 2d Cir. 8/25/98), 717 So. 2d 1263, writ denied, 98-2489 (La. 11/25/98), 729 So. 2d 566. This concept, or defense, which excuses a defendant from liability, has been defined as a providential occurrence or extraordinary manifestation of the forces of nature which could not have been foreseen and the effect thereof avoided by the exercise of reasonable prudence, diligence and care or by the use of those means which the situation renders reasonable to employ. *Id.*

An injury caused by an Act of God is an injury due directly and exclusively to natural causes which could not have been prevented by the exercise of reasonable care and foresight. *Id.* The party pleading an

affirmative defense has the burden of proving it by a preponderance of the evidence. *Abadie v. Markey*, 97-684 (La. App. 5th Cir. 3/11/98), 710 So. 2d 327.

In this case, there is clearly a substantial body of undisputed evidence regarding this 87.9-KA strike. The evidence indicates that this was a positive strike which, unlike a negative lightning strike, was probably a single stroke connecting to ground with high current, approaching in magnitude the greatest lightning strikes which are experienced in thunderstorms. The blown out bottom of the steel transformer evidenced a destructive force from the lightning's current which had rarely been seen by the experts. The strong current, or overvoltage, experienced by the transformer was the same overvoltage event that was visited upon the home as the large charge from the strike sought to be grounded by the opposing electrical force from earth.

In its written opinion, the trial court recognized, as the evidence showed, the possibility that lightning of this strength "was of such a force and magnitude that the capacity of the arrester was overwhelmed rendering the arrester incapable of performing its intended function." Likewise, the Hanks did not assert that Entergy owed the obligation to equip the pole for the service drop to their home with an arrester capable of withstanding a direct hit by an 87.9-KA strike. Instead, the Hanks sought to establish that a direct hit did not occur on the pole or in such close proximity thereto so as to overwhelm a properly functioning arrester. The Hanks' expert, Lacie Smith, placed the location of the strike beyond the pole on the distribution

lines so that the full current, or Act of God force, was dissipated along the distribution system away from the Hanks' property and transformer.

From this initial overview of the dispute, there are three undisputed points which cannot be overlooked. First, an overwhelming Act of God strike did occur in this case and at least a portion of the current from the strike caused the loss of the home. Next, while the exact location of the strike determines the magnitude of electrical force visited upon the arrester, there is no direct evidence demonstrating where the current from the sky made contact with the current from the ground. There was no charring of the utility pole, as with a tree struck by lightning, allowing the Entergy experts to clearly point to that location. Likewise, there was no injury to the distribution lines that allowed the plaintiffs to establish a clear location for their view of the occurrence. Third, because of the size of the strike, the evidence indicates that a direct strike near the subject utility pole would not protect the transformer or prevent the additional surge of current through the home, regardless of whether the arrester was in its proper working condition. These factors, which are beyond dispute, presented the Hanks a formidable task of proving causation distinct from this force of nature.

Under Louisiana law, most negligence cases are resolved by employing a duty/risk analysis. The determination of liability under this analysis usually requires proof of five elements: (1) proof that the defendant's substandard conduct was a cause-in-fact of the plaintiff's injuries (the cause-in-fact element); (2) proof that the defendant's conduct failed to conform to the appropriate standard (the breach element); (3) proof

that the defendant had a duty to conform his conduct to a specific standard (the duty element); (4) proof that the defendant's substandard conduct was the legal cause of the plaintiff's injuries (the scope of liability element); and (5) proof of actual damages (the damage element). *Perkins v. Entergy Corp.*, 00-1372 (La. 3/23/01), 782 So. 2d 606. If the plaintiff fails to prove any one element by a preponderance of the evidence, the defendant is not liable. *Id.* Proof is sufficient to constitute a preponderance of the evidence when the entirety of the evidence, both direct and circumstantial, establishes the fact or causation sought to be proved is more probable than not. *Cay v. State, Department of Transp. and Development*, 93-0887 (La. 1/14/94), 631 So. 2d 393. Circumstantial evidence is evidence of one fact, or of a set of facts, from which the existence of the fact to be determined may reasonably be inferred. *Cangelosi v. Our Lady of the Lake Regional Medical Center*, 564 So. 2d 654 (La. 1989), *citing* W. Prosser & W. Keeton, *The Law of Torts*, § 39, at 242 (5th Ed. 1984). Use of circumstantial evidence and the deductions and inferences arising therefrom is a common process for establishing liability in negligence cases. *Cangelosi v. Our Lady of the Lake Regional Medical Center, supra.* However, the inferences drawn from the circumstantial evidence must cover all the necessary elements of negligence, and the plaintiff must still sustain the burden of proving that his damages were more likely than not the result of the defendant's negligence. *Id.* If a plaintiff relies on circumstantial evidence to prove his case, that evidence, taken as a whole, must exclude every other reasonable hypothesis with a fair amount of certainty. *Benjamin ex rel. Benjamin v. Housing*

Authority of New Orleans, 04-1058 (La. 12/1/04), 893 So. 2d 1. This does not mean, however, that the circumstantial evidence must negate all other possible causes. *Id.*

The jurisprudence has established two levels of duty of care owed by power companies. *Pillow v. Entergy Corp.*, 38,384 (La. App. 2d Cir. 9/18/02), 828 So. 2d 83, *writ denied*, 02-2575 (La. 12/13/02), 831 So. 2d 987. When the risk involves electrocution, the duty is of utmost care; in cases which involve accidents other than electrocution, that occur on the property of the customer and are allegedly caused by some action or inaction on the part of the electric utility company, the utility company's duty is to use reasonable care in the installation, operation and maintenance of their electric lines. *Id.*³ An electric company is not the insurer of the property of its customers, and is not legally bound to safeguard against occurrences that cannot be reasonably expected or contemplated. *Schulze v. Louisiana Power and Light Co.*, 551 So. 2d 22 (La. App. 4th Cir. 1989), *writ denied*, 556 So. 2d 1280 (La. 1990); *Vincent v. Beauregard Elec. Co., Co-op., Inc.*, 536 So. 2d 798 (La. App. 3d Cir. 1988), *writs denied*, 546 So. 2d 164 (La. 1989).

Whether the defendant's conduct was a substantial factor in bringing about the harm, and, thus, a cause-in-fact of the injuries is a factual question to be determined by the factfinder. *Perkins v. Entergy Corp, supra*. A court

³This duty may arguably arise from Entergy's service contract to supply electrical power to the Hanks' camp, the breach of which may give rise to liability in tort. *Borden Inc., v. Howard Trucking Co., Inc.*, 454 So. 2d 1081 (La. 1983). The duty may also originate in the general duty of reasonable care owed by Entergy to any customer. *Stephens v. International Paper Co.*, 542 So. 2d 35, 39 (La. App. 2d Cir. 1989), Marvin J., dissenting. Identification of the source of Entergy's duty is unnecessary as each applies the identical standard of care.

of appeal may not set aside a trial court's finding of fact in the absence of manifest error or unless it is clearly wrong. *Id.* In order to reverse a trial court's determination of fact, an appellate court must review the record in its entirety. On review, the appellate court must be cautious to not re-weigh evidence or to substitute its own factual findings just because it would have decided the case differently. *Id.* Where there is a conflict in the testimony, reasonable evaluations of credibility and reasonable inferences of fact should not be disturbed upon review, even though the appellate court may feel that its own evaluations and inferences are as reasonable. *Id.*

The evaluation and resolution of conflicts and expert testimony are factual issues to be resolved by the trier of fact. Thus the court has discretion as to the admissibility and weighing of expert testimony *Lasyone v. Kansas Southern R. R.*, 00-2628 (La. 4/3/01), 786 So. 2d 682.

Plaintiffs' expert, Smith, testified that the failure of the lightning arrester caused the failure of the transformer and the fire. Smith confirmed that the path of the strike led from the highest line of the distribution service system down through a line to the arrester, and then through the line called the H1 lead into the top of the transformer tank. As shown by the attached copy of Plaintiff's Exhibit 4, a tubular bushing device situated directly on top of the tank contained the H1 lead as it entered the tank. This bushing device was blown off the top of the tank by the explosion and is seen hanging from the wires connecting it to the arrester in Defendant's Exhibit 2, the only photograph of the subject arrester taken after the fire.

That photograph taken of the transformer and arrester involved in this incident showed that the arrester had no damage. Smith testified that, with such a large lightning surge and damage to the transformer, damage to the arrester should also have occurred. Thus, Smith concluded that the arrester did not function. Smith presented two possibilities for the non-functioning arrester. He concluded that it did not work because of a defect in its switch device or because its line leading from the arrester to the side of the tank for grounding was not connected. He testified that prior functioning of the switch device which depleted the internal operation of the arrester was the most probable cause of the arrester's failure.

Plaintiffs also submitted Smith's report of findings into evidence. Smith identified photographs therein which, in relevant part, revealed a lack of overheating on a grounding conductor on the side of the transformer pole. Smith testified that had the arrester been properly connected and functional, the large strike would have produced heating on the ground wire. Smith also explained a photo of the connecting clamp on the side of the transformer tank where a ground line connection for the arrester was located. He saw evidence of arcing at that connection indicating to him that the connection to ground was loose. Smith also identified a photograph of the meter base at the Hanks' camp which depicted melting of aluminum service drop conductors that indicated an overload. Nevertheless, he agreed that due to the complete destruction of the home, a specific point of origin of the fire could not be determined.

Smith was present at the destructive testing and analysis of the damaged transformer conducted for the purpose of determining the damage that had occurred to the transformer. He identified photographs of that process which revealed damage to the windings within the transformer and the H1 lead. Smith opined that the surge of electricity which destroyed the transformer entered through the H1 lead. Smith testified that the lightning hit the distribution line near the lightning arrester due to the magnitude of the damage to the transformer. He opined that with the cloud-to-ground strike, the electrical current took a downward path beginning from the H1 lead into the arrester and transformer.

As to the location of the strike, Smith testified as follows on direct examination:

Q. Now, you don't have an opinion about the exact location of where the cloud-to-ground strike took place, whether it was on the line or not, do you? You don't have a specific location on that distribution line, do you?

A. No, sir, I don't. As it says, the StrikeFax reports say it could have been anywhere within 3/10 of a mile of that very point.

Q. But you believe it struck somewhere on the distribution line at or near the transformer lightning arrester apparatus?

A. I believe it had to hit the transmission line, but that's not even an absolute, but just the magnitude of the damage that I see in the transformer tells me that it probably did.

Based upon information he read in Entergy's design manual quoted above, Smith concluded that such an arrester will generally only receive 10% of a surge of voltage coming through the distribution line because a dissipation of voltage occurs in both directions. Here, with the dissipation

of the 87-KA strike, Smith estimated that the arrester would probably have received 20% or 18-KA and should have performed effectively in this case. Because it did not, Smith testified that in excess of 240 volts flowed into the Hanks' camp at the meter base and through the circuit breaker panel.

On cross-examination, Smith agreed that up to 60% of the surge could have gone through the arrester. He opined, however, that it could have handled that amount of surge as well because of a 65-KA minimum capacity for the arrester. He based this determination of capacity on an Institute of Electrical and Electronic Engineers' ("IEEE") report discussed further below. When questioned regarding the defendants' negative electron theory of lightning physics, Smith offered no view, stating that counsel was "getting beyond my own knowledge of the geophysics involved in creating a lightning strike."

Entergy presented the testimony of Dr. John K. Owens, an electrical engineer. Owens discussed at length the opposing electrical currents that flowed from the ground through the electrical system in the house. Owens testified that the lightning was a positive cloud-to-ground strike, with a negative electron flow from the ground to the cloud. Negative charged electrons flowed from the earth beneath the Hanks' property through the electrical service drop which comprises three wires leading to the transformer. Owens testified that the electron flow was from the ground up from various locations in the camp, including water, gas and electric lines. As the negative electrons flowed, voltage was generated from these ground neutral poles at the camp which produced arcing at various locations in the

house. Additionally, negative charged electrons flowed from the earth around the pole where the transformer was mounted. The physical damage to the transformer, according to Owens' observation, proceeded up from the bottom of the tank to the H1 lead, instead of in a downward path.

Owens testified that the lightning struck at the top of the pole and the arrester received the full current of the strike. Owens did not agree that a loose ground clamp on the transformer tank caused the fire because a lightning strike of this magnitude would have arced across any gap in the connection seeking ground at the pole. Thus, he concluded any evidence of arcing around the grounding clamp was irrelevant. The lack of burned wiring on the pole was explained by the short duration of the strike event and the use of copper wiring which would not have had enough time to burn up. Owens saw no evidence that the transformer or arrester were not functional and testified that the lightning strike overwhelmed both devices.

On cross-examination, Owens admitted that the lightning could have hit within 1/4 mile of the pole. He also agreed that if the lightning hit far enough away, there would have been some dissipation. However, due to the damage to the transformer, Owens concluded that the lightning hit close to the transformer.

Entergy's expert, Brooks, concluded that the probable cause of the fire was a large scale lightning strike hitting at or near the transformer pole which created an over-voltage condition in the electrical wiring at the camp. Brooks also concluded that there was no evidence suggesting that the lightning arrester did not work as he did not see any evidence of deficiency

in the Entergy equipment. He had never seen anything larger than a 27-KV arrester at a residence. Brooks characterized the subject lightning strike as a positive lightning strike with electron flow from ground to cloud.

Brooks testified that different grades of arresters have varying capacities to conduct levels of surge energy caused by lightning or otherwise. The distribution-grade arrester employed in this case was the standard of the industry to protect the distribution equipment at that pole. When a surge event occurs and the switch in the arrester is triggered for the grounding of the current, the capacity of the arrester to drain off the excess current can be reached and exceeded. If this happens, the current spills over into the transformer and causes damage. The capacity range for handling a lightning event is dependent not only upon the magnitude of the strike current, but also its duration. With such an event, the arrester has not failed in a strict sense, but it is not able to conduct the energy to ground fast enough.

Brooks offered his explanation of why no explosive damage occurred to the arrester. He stated that it was not unusual to have an undamaged arrester despite damage to a transformer. Damage to the arrester would result because of heat, and the heat is generated by the magnitude of current over time. He described the function of the isolator or end cap device at the bottom of the arrester. The device in the photograph (Defendant's Exhibit 2) was not shown to have been triggered. The device operates like a fuse and disengages by a heat build-up on the line leading to ground. After a surge event, according to Brooks, follow-through current from the

distribution system can continue. If the grounding function of the arrester persists for a period of time, heat then builds and the end cap/isolator blows. He stated “if you have a short ... higher-than-normal magnitude of current but of a short time duration with no follow-through current,” he would not “expect that the isolator disengaged to ground.” He cited the blown H1 connection at the top of the transformer tank as the break in the circuit which prevented follow-through current from flowing through the arrester for any lengthy period.

Brooks concluded that the magnitude of the strike simply overwhelmed and damaged the equipment because the 87.9-KA strike was outside the range of the arrester. With that type of surge, the arrester is not able to conduct enough energy fast enough to limit the voltage rise. He testified that because of the extent of damage to the transformer, he believed the lightning hit close to the pole.

Brooks testified that even under plaintiffs’ theory that the arrester did not work and that the lightning hit down the line, with dispersion, the transformer would have received only 10% of the current which would not in his opinion have been enough to blow the transformer. Brooks referred to the Entergy standards in concluding that if lightning hits directly on a facility, that facility might be subject to the entirety of the lightning energy rather than the normal distribution which occurs if the strike is not direct. Thus, Smith’s conclusion that the arrester would have seen only 20% of the energy is in error, as all agree this was a very close strike.

Finally, in answer to questions by the trial court over the cloud-to-ground vs. ground-to-cloud controversy, Brooks said the ground-to-cloud flow:

“. . . makes a difference as to a fire-cause scenario in that you have a charge coming from various points in the area that build up to make the leader that goes up in the air to ultimately connect with a cloud which allows the path for the return stroke and the electrons coming from the ground would include those parts that are connected to the house, so it makes a difference from that standpoint. As far as the arrester function, the arrester doesn't care which direction the electrons are flowing. It's looking at a voltage difference, and when the voltage builds up above 27,000 volts, it's going to close the switch. It's going to conduct regardless of whether the electrons are flowing from the ground to the cloud or the cloud to the ground that result in a voltage buildup or a voltage gradient across the equipment.”

In reviewing the expert testimony, we first observe the lack of a detailed explanation by either side explaining and comparing the capacity of the equipment and the differing amounts of the voltage that may have been generated by the 87.9-KA strike, depending on the different scenarios suggested for the strike's location. Voltage and amperage were mentioned throughout the testimony, but their interrelationship, if any, was never utilized in a specific mathematical explanation of what could have occurred as the result of the strike depending on its various disputed locations. Smith insisted that the IEEE report listed the distribution class arrester in question as having a 65-KA *minimum* capacity. The defense attempted to dispute this by introducing a copy of a portion of the IEEE report which showed that the more robust, heavy-duty station and intermediate-class arresters had 65-KA capacities. Owens referred to the arrester in question as a 10-KA arrester with a *maximum* current rating of 65-KA. The portion of the IEEE

report admitted into evidence references a listing of the characteristics and specifications for the distribution-class arrester, yet neither side introduced that portion of the IEEE document. Additionally, despite the destructive testing of the damaged transformer, Smith admitted that he made no calculations regarding the amount of voltage that could have caused the damage he observed.

Smith's opinion also utilized the authority of the Entergy engineering design manual, yet that manual was clearly a two-edged sword. Smith asserted the manual's proposition that a lightning strike to a power line "will usually result" in only 10% of the current surge being handled by an arrester. The evidence also showed that the ground relief for lightning along the distribution line occurred only on those poles with the transformer/arrester set-up and not on every pole along the distribution line. Smith's written report expressed the principle that "the fault current generated by a lightning strike seeks the least resistive path to the earth (ground)." The Hanks' utility pole was at a dead-end on the Entergy distribution line. There was no evidence presented regarding the next nearest transformer/arrester location up the line where additional ground relief might have occurred.

On the other hand, the defense view was that the ground relief to the 87.9-KA strike, once it contacted the electrical system near the pole, had to have occurred through both the ground rod at the pole and the ground rod and utility connections at the home. Smith explained, in questioning by the trial court, that he doubled the 10% rule of the Entergy manual to 20%

because of the dead-end location of the Hanks' pole. Nevertheless, regarding this location-based choice of 20%, he does not explain why the Entergy manual's *caveat*, that "very high current lightning strokes or a direct stroke to the arrester could cause destructive currents to flow through the arrester," was not an equally operative event, which, instead of causing a surge of 20% of the strike, might extend the surge upward to 100% of the strike.

From this evidence and expert testimony, Smith's view of the strike location down the distribution line, yet close to the pole, presents a scenario that remains very close to those locations where a catastrophic event was inevitable. If the location was too remote from the pole, the transformer would not be expected to experience such extreme damage that did in fact occur. If the location is too close, the transformer and house were doomed, with or without the arrester, by the overwhelming force majeure. Also, in placing this strike in such a precise location away from the pole where the reduced force majeure might have been handled by the arrester, the Smith scenario must overcome the inference that the arrester, which had previously operated for four years, could be expected to function.

Third, we do not find that the evidence supports the conclusion that a catastrophic lightning event near the pole would have caused physical damage to the arrester that should have been seen in the Defendant Exhibit 2 photo, after the strike. The trial court's ruling rested upon its conclusion that "[c]ommon sense supports Smith's opinion that an undamaged arrester next to a totally destroyed transformer indicates that the arrester was

defective in operation or attachment.” The undisputed evidence of the separate functions of the two devices, the configuration of the electrical wiring over which the lightning’s current flowed, and Smith’s own alternative view of the operation of the arrester demonstrates to us the contrary.

The transformer, as explained in the trial testimony, is composed of massive windings which carry the current through wound electrical coils in a process to reduce the voltage. The high voltage charge from the H1 lead enters the transformer and meets the resistance of the windings. The over-voltage surge in this case, upon meeting such resistance, caused arcing through the transformer and the explosion. On the other hand, the description of the arrester did not include the use of such windings. The current would flow on the wire into and out of the arrester and directly into the transformer unless the switch device operated. Because the lightning’s current did not meet with the same resistance in the two devices, a comparison of the massive explosion of the transformer with the lack of explosion in the arrester was not shown by the evidence to be appropriate. Most significant, the configuration of the electrical path which the lightning’s current followed demonstrates that the same powerful current that destroyed the transformer flowed through the arrester without apparent damage. Clearly, Smith’s view that the problem was possibly a loose connection of the ground wire from the arrester at the clamp on the transformer’s tank, admits that the same destructive force of the current which was ultimately visited upon the transformer could have flowed

through the arrester without visible damage after the proper operation of the switch device.

With these facts and Brooks' more detailed explanation of why the arrester could survive a catastrophic strike without visible physical damage, the plaintiffs offered inconclusive proof to isolate a cause of the loss that is more probable than the Act of God event which unquestionably occurred near the equipment. The undisputed fact is that a powerful surge from the lightning passed through the wiring of the arrester, causing massive damage to the transformer. Even if the surge was only 20% of the magnitude of the strike, it was a very destructive force which was impressed, to some extent, across the arrester, giving rise to the inference that a catastrophic strike on or near the pole could have left the arrester upon observation in the same undisturbed condition. Thus, the condition of the arrester as seen in the post-accident photo does not establish that the location of the lightning strike was so remote from the utility pole that the arrester could have operated to change the outcome of this force of nature.

Finally, regarding the defense view of the event, Entergy's experts held to the opinion that there was some grounding of the lightning current at the utility pole. However, the capacity of the ground wire running down the pole was overwhelmed, allowing the current to seek ground down the service drop lines to the house. This view has support in the configuration of ground wiring at the utility pole as explained by Smith. He stated that the pole's ground wire was attached to (i) the arrester, (ii) the steel tank of the transformer, and (iii) the neutral (ground) wire running from the transformer

to the house. All three were grounded at the pole. Additionally, Brooks stated that there were two grounding connections on the tank of the transformer, so that Smith's identification of a possible loose clamp for the ground wiring at one of the connections on the transformer does not rule out the conduction of the current to ground at the pole. Thus, even with the lack of a ground function by the arrester as opined by Smith, he offered no explanation why the surge experienced by the transformer, even at only 20% of the lightning's strike, was not grounded entirely at the pole because of the grounding of the transformer itself. The pole was clearly the nearest source to ground for this lightning strike under either side's theory. Thus, with the evidence showing that the current which arced through the windings in the transformer could have been conducted through the ground connections on its steel tank, that undisputed ground source was apparently overwhelmed by the magnitude of the strike.

Conclusion

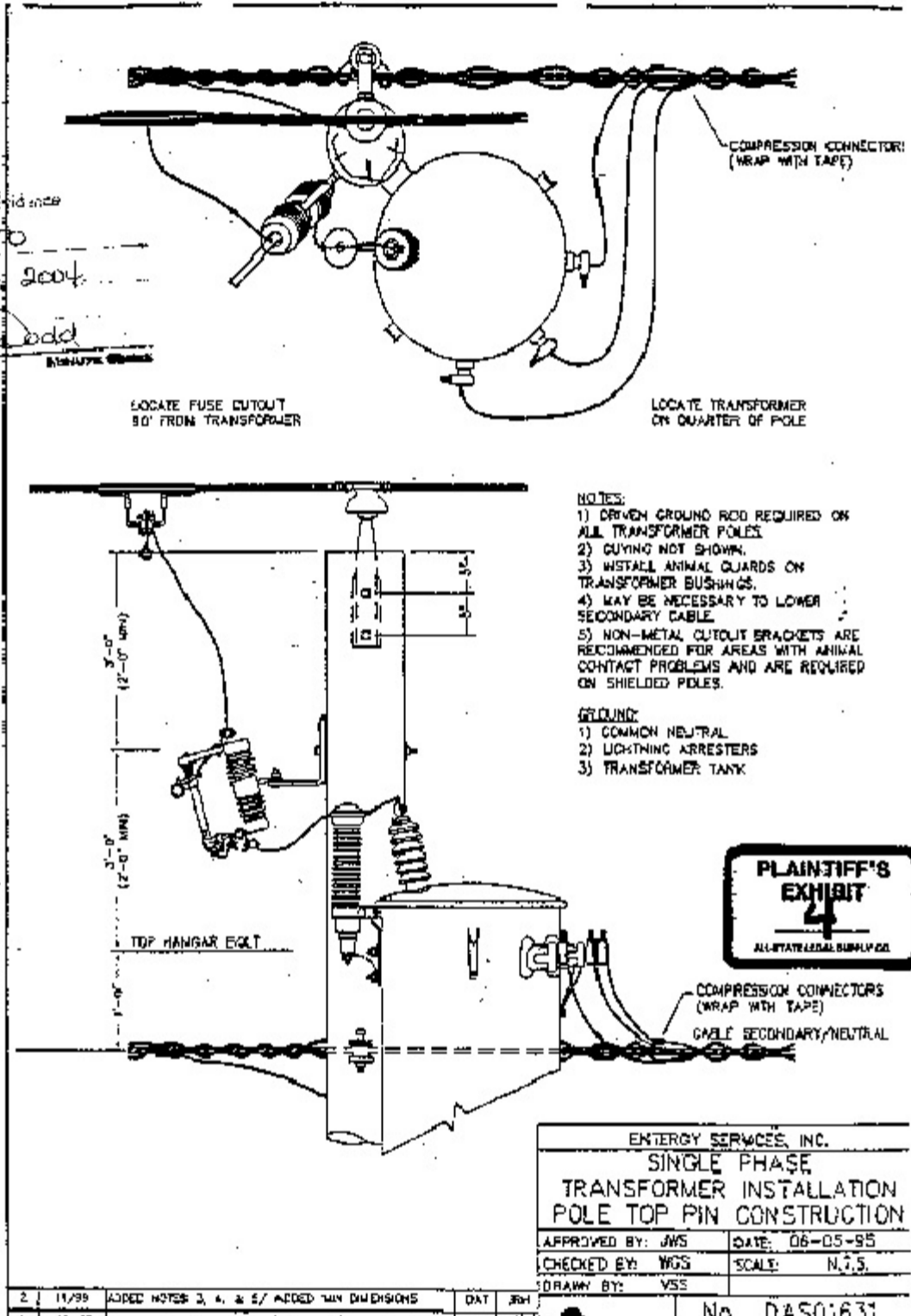
The evidence in this case did establish that an unusual and massive lightning strike occurred very near the utility pole. Lightning of lesser intensity can be controlled and contained by the utility company's reasonable care with its employment of surge arresters. However, the strike in question was of such magnitude that it could not be prevented from causing damage by the exercise of reasonable care when the location of the strike caused most of its force to be visited upon the electrical equipment in question. The plaintiffs' case, relying on circumstantial evidence for the strike's location, did not exclude the more probable hypothesis that the

location of the strike was within the area near the pole where the Act of God force overwhelmed the ability of the equipment to ground the massive charge at the utility pole and prevent the fire. Accordingly, we find that the trial court's conclusion to the contrary was manifestly erroneous and the judgment is reversed. Costs of appeal are assessed to appellant.

REVERSED.

APPENDIX I

Filed in Evidence
 37.380
 January 4, 2004
 [Signature]



- NOTES:
- 1) DRIVEN GROUND ROD REQUIRED ON ALL TRANSFORMER POLES
 - 2) GUYING NOT SHOWN
 - 3) INSTALL ANIMAL GUARDS ON TRANSFORMER BUSHINGS
 - 4) MAY BE NECESSARY TO LOWER SECONDARY CABLE
 - 5) NON-METAL CUTOFF BRACKETS ARE RECOMMENDED FOR AREAS WITH ANIMAL CONTACT PROBLEMS AND ARE REQUIRED ON SHIELDED POLES.

- GROUND:
- 1) COMMON NEUTRAL
 - 2) LIGHTNING ARRESTERS
 - 3) TRANSFORMER TANK

PLAINTIFF'S EXHIBIT 4
 ALL-STATE LEGAL SUPPLY CO.

ENERGY SERVICES, INC.	
SINGLE PHASE TRANSFORMER INSTALLATION POLE TOP PIN CONSTRUCTION	
APPROVED BY: JWS	DATE: 06-05-95
CHECKED BY: WGS	SCALE: N.T.S.
DRAWN BY: VSS	

2	11/99	ADDED NOTES 3, 4, & 5/ ADDED MIN DIMENSIONS	DAT	JRH
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No. DAS01631