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Breaking Legal Developments in Fire Investigation

Breaking Legal Developments

01-05-2007

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EXECUTIVE SUMMARY: This weekly newsletter covers:

1. [LA Supreme Ct Reinstates Finding Energy Company Liable for Negligently Maintaining Power Line](#)

(1) LA SUPREME CT REINSTATES FINDING ENERGY COMPANY LIABLE FOR NEGLIGENTLY MAINTAINING POWER LINE

In [H.H. Hanks v. Entergy Corporation](#), No. 2006-C-0477, the Louisiana Supreme Court reinstated a finding that a power company was liable for destruction of a transformer and subsequent fire at an adjacent residence. The case concerned a lightning strike during an electrical storm that ultimately caused the destruction of an electrical transformer at the pole and the fire of an adjacent residence. The case was tried by judge alone and the determination of liability rested almost completely on expert testimony. The primary issue was whether the district court's finding of breach and causation as to the defendant, Entergy Louisiana, Inc. ("Entergy"), was manifestly erroneous.

The plaintiffs filed the instant suit against Entergy, alleging Entergy's negligence in installing and maintaining its electrical equipment servicing their lake house, specifically the lightning arrester attached to the transformer in this case, caused the damage to the house. In its answer, Entergy pled the affirmative defense of force majeure, maintaining the lightning strike was an overwhelming act of God relieving Entergy of any liability. The district court found Entergy breached its duty of reasonable care and this breach was a cause in fact of harm to the plaintiffs. The court of appeal reversed, finding the circumstantial evidence established by a preponderance of the evidence the damage was caused by the act of God force of an unusual and massive lightning strike, and rendered judgment in favor of Entergy. The Supreme Court reversed, finding the court of appeal erred in reversing the district court's determination of liability.

On the morning of April 3, 2000, lightning from a thunderstorm occurring near Lake D'Arbonne in Union Parish, Louisiana, destroyed the electrical transformer serving a lake house resulting in a fire that consumed the house. According to lightning verification data submitted into evidence, during the storm, at approximately 6:17:46 a.m., an intense lightning strike measuring 87.9 kiloamps ("KA") occurred. No one disputed the magnitude of this recorded strike. A strike of this magnitude is in the upper 2% range of lightning strikes. This as well is not disputed. The evidence from the lightning data network indicated the lightning struck within 3/10 of a mile of the lake house, owned by plaintiffs, James B. Hanks, Lewis Hanks, William Hanks, and Tracy Hanks (the "Hanks") and insured by Encompass Insurance Company (formerly CNA Insurance Company). The exact location of the strike, however, is disputed and is one of

the main issues of disagreement among the experts. While other lightning strikes of lesser intensity also occurred, the experts all agree this massive strike was the probable cause of the damage to the lake house.

Electrical service to the lake house was provided by Entergy, which owned and maintained the transformer and lightning arrester located on a pole 90 feet from the lake house and attached to the Entergy distribution lines leading to the house. A transformer reduces the higher voltage (8 to 20 kilovolts) from the distribution line to allow standard (120/240) volt service for the dwelling. The higher voltage enters the transformer through the high-voltage or H1 lead, and the reduced voltage leaves the transformer through the low voltage lead on the tank of the transformer and travels down the service drop into the service location. The surge arrester, which is at the center of this dispute, is a large vertical cylindrical porcelain passive device, which is bolted by brackets to the side of the transformer on the high side of the bushing n2 and protects the transformer from high voltage surges by diverting the excess voltage to the ground away from the transformer. 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 ground 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 the 27 kilovolt ("KV") n3 distribution class, silicon carbide lightning arrester (surge suppressor) installed at the location was appropriate for the dwelling and to protect the 20KV single-phase distribution class transformer. Entergy installed lightning arresters with all their 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 unexcepted surges of power along the distribution system. The transformer at issue had been placed on the utility pole to service the dwelling in 1996, and Entergy had received neither requests for repairs nor complaints about the device during that time.

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, and the lid was blown off. Experts on both sides agreed such destruction of the tank by lightning was as great as they had ever witnessed. A photograph taken during the initial site visit showed the arrester, however, sustained no apparent damage. This photograph 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.

Encompass paid the Hanks policy proceeds in accordance with the terms and provisions of its policy and was subrogated to the Hanks' claims. The cost to reconstruct the dwelling, however, significantly exceeded the policy proceeds. Consequently, on March 26, 2001, the Hanks and Encompass, as subrogee, filed this action for damages against Entergy and Howard Industries, Inc., the manufacturer of the transformer. Howard Industries, Inc. was later dismissed because the parties agreed no defect in the transformer or internal failure of the transformer caused the damage in this case. Encompass sought to recover the amounts it paid to the Hanks pursuant to its policy. The Hanks sought to recover the uninsured portion of their loss.

Plaintiffs alleged in their petition the fire was caused by a lightning strike on a power line owned, operated, and maintained by Entergy and high voltage from the strike entered the structure igniting a fire. Plaintiffs further alleged Entergy committed certain negligent acts or omissions, which caused or contributed to the fire, including: (1) failure to properly maintain and inspect the power lines and electrical equipment servicing the lake house; and (2) failure to properly place, maintain, and employ surge protectors or arresters at the power pole adjacent to the dwelling. On June 21, 2001, Entergy filed its answer generally denying liability and raising the affirmative defense of force majeure. Trial by judge was commenced on March 4, 2004, continued on March 5, 2004, and concluded on October 5, 2004. After trial, counsel submitted their memoranda, and the matter was taken under advisement.

On the morning of trial, the parties stipulated to the following facts (1) the fire occurred on or about April 2, 2000; (2) the electrical pole and the equipment attached thereto providing electrical service to the lake house was owned, operated, and maintained by Entergy; (3) the Encompass insurance policy was

in effect insuring against fire losses on the date of the fire; (4) pursuant to the policy, sums were paid to the Hanks by Encompass, and Encompass was legally subrogated to the Hanks' claims to that extent. The parties subsequently reached an agreement as to quantum.

Because the arrester indisputably did not protect the transformer from the lightning, the primary question in this litigation is why the arrester failed to protect the transformer. The plaintiffs contend that, if the arrester had been properly functioning or correctly connected, the arrester would have performed the task for which it was created, that being to protect the transformer by redirecting extra voltage caused by the lightning strike away from the transformer and into the ground through a ground conductor. According to the plaintiffs, this process did not occur, and as a result, arcing occurred at the circuit panel box of the house, causing the fire. Because Entergy disposed of the arrester before the parties could examine it, the question of liability at trial turned on expert testimony presented by both the plaintiffs and the defendant. To understand the respective positions of the parties, it was necessary that the court set forth the expert testimonies of each side in the factual recitation of this case, which tends to be lengthy, but important. First presented was the plaintiffs' expert testimony, which the district court accepted in ruling in favor of the plaintiffs.

In their case in chief, plaintiffs tendered Lacie Gene Smith as an expert in electrical engineering concerning the cause and/or origin of the fire, particularly as it relates to the significance, if any, of lightning strikes as a causative effect, and also as to the damage to the electrical apparatus of Entergy and damage to the Hanks dwelling. Essentially, Smith opined a lightning strike caused the failure of the transformer, resulting in the house fire. The failure of the lightning arrester to perform properly led directly to the failure of the transformer, which in turn led to the fire. Smith confirmed the lightning strike was a positive cloud-to-ground strike, which did not involve electrons, but rather positive ions descending from the cloud to the ground in an almost direct path. Smith explained the strike was positive because the report did not contain a negative sign preceding the KA reading and cloud-to-ground because it was reported, as the reporting agency only reported cloud-to-ground strikes. Ground-to-cloud strikes are very rare and do not cause the type of damage in this case. Moreover, Smith explained, in a negative strike, negative charges come down the ionization path from the cloud with multiple return strokes, whereas positive strikes have only one to two strokes.

He further explained the path of the positive strike in this case 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 (high voltage) lead into the top of the transformer tank. The current encountering resistance, built up voltage beyond the transformer's capacity. Once it exceeded the capacity, the energy went through first the ground clips to the static shield, punched through the winding in the primary into the secondary of the transformer, which connected to the low voltage lead on the tank of the transformer and traveled down the service drop into the home. Upon meeting the resistance of the windings, the over voltage caused arcing through the transformer and the explosion.

A tubular bushing device situated directly on the top of the tank contained the H1 lead as it entered the tank. This device was blown off the top of the tank by the explosion and could be seen hanging from the wires connecting the device to the arrester as depicted in the only photograph of the arrester taken after the fire and prior to removal of the transformer from the pole. Significantly, the photograph showed no visible damage to the arrester.

Smith testified that, despite the intensity of the lightning strike, no damage to the arrester or the ground pole along the line of the ground wire occurred. Smith opined that, with such an intense surge, one would expect to have an internal pressure build up in the arrester that would blow off the top and bottom of the arrester as well as the ground connection. Also, with the magnitude of the current, one would expect to see overheating along the ground wire, which served as the drain wire from the arrester to the ground. Smith identified photographs attached to his report admitted into evidence, which revealed a lack of overheating on the grounding conductor on the side of the transformer pole and explained that, had the arrester been properly connected and functional, the large strike would have produced heating on the ground wire and evidence thereof. He also explained a photograph of the connecting clamp on the side of the transformer tank where a ground line connection for the

arrester was located and testified he saw evidence of arcing at the connection, indicating to him the connection to ground was loose. As a result, Smith concluded the arrester either did not function or was not properly connected. He further opined the arrester did not properly function because of a defect in its switch device or because its grounding conductor line was not connected. He further opined prior functioning of the switch device, which depleted the internal operation of the arrester, was the most probable cause of the arrester's failure.

Although admittedly it was virtually impossible to determine the point of origin of the fire, Smith testified the only evidence of electrical activity in the remains of the home was found on the circuit breaker, which contained evidence of arcing in the circuit breaker panel, connected to the meter box. He could say with a reasonable degree of electrical engineering certainty the current entered the circuit breaker panel through the meter base, causing the arcing. The panel, which Smith alleged contained evidence of arcing in the form of a hole through the panel, would have been located on the inside wall of the house directly opposite where the meter box was located on the outside wall, which was the electrical service entrance to the house. Smith also identified a photograph of the meter base at the house, which depicted melting of aluminum service drop conductors that indicated an overload.

Present at the destructive testing and analysis of the damaged transformer conducted at Howard Industries for the purpose of determining the damage to the transformer, Smith identified photographs of the process, which revealed damage to the various levels of the windings within the transformer and the H1 lead, opining the surge of electricity, which destroyed the transformer, entered through the H1 lead. He opined the strike most likely hit the distribution line because of the magnitude of damage to the transformer and because cloud-to-ground strikes will hit the highest object first, in this case the distribution line. He further opined that, with the positive cloud-to-ground strike, the electrical current took a downward path beginning from the H1 lead into the arrester and the transformer.

Additionally, based on Entergy's design manual and the laws of science, Smith opined the full 87.9KA magnitude of the electrical current from the positive strike could not have been impressed upon the transformer, but more likely, 10, 20, or even 60% of the current reached the transformer, which the 65KA capacity arrester could have handled had it been functioning, resulting in no damage to the transformer. As authority, Smith testified to the design of Entergy's electrical distribution lines, which act as infinite busing of energy on the line. If an electrical strike hits a distribution line, the line is designed so the current will spread or dissipate in two directions to allow the excess energy to bleed or drain off the line at other arresters along the line. Although the strike would have hit towards the end of the line in this case, the distribution line in its busing capacity should have directed the current in two directions therefore most probably only 60% of the 87.9KA current could have reached the transformer. Moreover, Smith opined the arrester had a minimum 65KA capacity based on an Institute of Electrical and Electronic Engineers' report and further there was no distinction between the standard capacity of a distribution class and station class arrester to which the report referred. In his opinion, no other logical explanation existed to describe the cause of destruction of the house by fire other than defective equipment or improperly maintained equipment.

Turning now to Entergy, it presented two expert witnesses also in the field of electrical engineering. Entergy tendered John K. Owens, Ph.D, as an expert in the field of electrical engineering as it relates to the damage to the Entergy service equipment and the manner, if any, in which the damage was related to the fire, with specialized expertise in the field of lightning protection and fire origin and cause investigation. Owens also testified the lightning was a positive cloud-to-ground strike, but with a negative electron flow from the ground to the cloud. Negative charged electrons flowed from the earth beneath the house through the electrical service drop, which comprises three wires leading to the transformer. He opined the electron flow was from the ground up from various locations in the house, including the water, gas, and electric lines. As the negative electrons flowed, voltage generated from these ground neutral poles at the house 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 high voltage lead, instead of in a downward path from the distribution line through the high voltage lead as testified to by Smith.

Owens testified the lightning struck at the top of the pole and the arrester received the full current of the strike. He also did not agree 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. Any evidence of arcing around the grounding clamp was irrelevant, and 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. Thus, he concluded there was no evidence the transformer or arrester was not functional and testified the lightning strike overwhelmed both devices.

On cross-examination, Owens admitted the strike could have been within 1/4 of a mile of the pole and that, if the strike was far enough away, there would have been some dissipation. Due to the damage to the transformer, however, Owens concluded the strike was close to the transformer, "an almost direct strike to the top of that transformer."

Entergy also tendered Frederick M. Brooks as an expert in the field of electrical engineering, electric utility operating practices, and fire cause and origin investigation. Brooks concluded 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 house. He also opined there was no evidence suggesting the lightning arrester did not work as he did not see any evidence of deficiency in Entergy's equipment. Brooks characterized the strike as a positive lightning strike with electron flow from ground to cloud.

Brooks testified the different classes of arresters, such as the distribution, intermediate, and station classes, have varying capacities to conduct levels of surge energy caused by lightning or otherwise. The distribution-class arrester employed in this case was the standard of the industry to protect the distribution equipment at the 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.

He also explained why no explosive damages occurred at the arrester and 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 the current over time. He described the function of the isolator or end cap device at the bottom of the arrester, which operates like a fuse and disengages by a heat build-up on the line leading to ground. After a surge event, 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 or isolator blows. If the arrester encounters a higher-than-normal magnitude of current but of short duration with no follow-through current, then the isolator would not disengage to ground. In the photograph of the arrester, the device was not shown to have been triggered, and Brooks cited the blown H1 lead 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 of time.

He concluded the magnitude of the strike simply overwhelmed and damaged the equipment because the 87.9KA strike was outside the 65KA range of the arrester. With that type of surge, the arrester was not able to conduct enough energy fast enough to limit the voltage rise. Because of the extent of damage to the transformer, he believed lightning hit close to the pole. He added that, under plaintiffs' theory, the arrester did not work and the lightning hit down the line, with dispersion, the transformer would have received only 10 or 20% of the current, which, in his opinion, would not have been enough to blow the transformer. He referred to the Entergy standards in concluding that, if lightning hits directly on a facility, the facility might be subject to the entirety of the lightning energy, rather than the normal distribution, which occurs if the strike is not direct. Finally, in answer to questions by the district court over the cloud-to-ground versus ground-to-cloud path of the strike controversy, Brooks explained the ground-to-cloud flow made a difference as to a fire-cause scenario, but not as to the arrester function, because the arrester does not care from which direction the electrons are flowing. When the voltage

exceeds 27KV, the arrester is going to close the switch and conduct the excess to ground, regardless of which direction the electrons are flowing.

After considering this matter and the evidence presented, the district court entered judgment in favor of Encompass, awarding the insurer \$ 179,643.51, together with interest thereon at the legal rate from the date of judicial demand until paid. The court further awarded the Hanks \$ 145,353.35 together with legal interest thereon at the legal rate from date of judicial demand until paid. Assigning written reasons, the court addressed whether the plaintiffs proved by a preponderance of the evidence defendant, Entergy, was liable under a duty/risk analysis.

Agreeing the primary issue in the case was why the arrester did not protect the transformer, the district court stated three possibilities that could explain why the arrester failed: (1) the arrester was defective and malfunctioned, or (2) the arrester was not properly connected, or (3) the lightning was of such a force and magnitude the capacity of the arrester was overwhelmed, rendering the arrester incapable of performing its intended function. The court explained that, if the arrester malfunctioned or was improperly connected, Entergy breached its duty of care and that breach was a cause in fact of the fire at the house. The court commented upon the unfortunate fact the arrester was disposed of and not available for inspection or [Pg 14] analysis and reasoned that, if the arrester had been preserved, the major factual issue of this case probably would have been resolved, one way or the other.

After carefully reviewing the evidence, the court found the testimony of plaintiffs' expert, Smith, more credible than the testimony of defendant's experts, Owens and Brooks, and that common sense supported Smith's opinion an undamaged arrester next to a totally destroyed transformer indicated the arrester was defective in operation or attachment. Additionally, he reasoned, if the arrester had worked and channeled some of the energy into the ground conductor, it was "inconceivable to the Court that there would be no scorching or burning of the pole or the ground conductor, particularly in light of Entergy's argument that this was a lightning strike of overwhelming magnitude." Consequently, the court concluded plaintiffs demonstrated the arrester either malfunctioned or was improperly attached, which was a cause in fact of the fire, and established Entergy breached its duty of reasonable care and this breach was a cause in fact of harm to the plaintiffs.

As to Entergy's affirmative defense of force majeure, the court concluded Entergy failed to establish the lightning strike would have overwhelmed an arrester that was functional and properly attached. Although the court articulated the clear and convincing evidentiary standard was required by *Brannon v. Shelter Mut. Ins. Co.*, 507 So. 2d 194, 197 (La. 1987), the district court's reasoning indicates the court applied a preponderance of the evidence burden of proof in its examination of [Pg 15] Entergy's affirmative defense. First, the court did not accept "the testimony of Brooks and Owens that this was a direct strike to the electrical apparatus servicing the lake house," because "[t]he exact location of the strike [was] pure conjecture" and "the lack of damage to anything other than the transformer [made] it inconsistent with a direct hit." Further, "[a]ll one can know is that the strike was within 3/10 of a mile." Second, the court found it "improbable that all of the energy from the strike was impressed upon the arrester." In support, the court stated: "[i]f only 25% of the energy had been dissipated, the current would have been reduced to within the capacity for the arrester." Finally, the court explained he found "the testimony of plaintiffs' expert [was] as reasonable and plausible as that of Entergy's experts." This reasoning is indicative of applying a preponderance of the evidence burden of proof to the defendant's affirmative defense. Accordingly, he concluded Entergy failed to establish its affirmative defense of force majeure.

On appeal, Entergy argued plaintiffs failed to establish the cause of the fire loss was separate from the unusual act of God event, which in this case was a lightning strike of extreme magnitude. Noting the doctrine of force majeure is sometimes sufficient to excuse a defendant's neglect of a duty and relieve him of liability to a plaintiff where there is a superior or irresistible force, the court of appeal explained the force must be 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. *Caldwell v. Let The Good Times Roll Festival*, 30,800 (La. App. 2 Cir. 8/25/98), 717 So. 2d 1263, writ denied, 98-2489 (La. 11/25/98), 729 So. 2d 566. The court of appeal

held "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."

>From an initial overview of the dispute in this case, the court noted three undisputed points, which could not 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 house. Second, while the exact location of the strike determined the magnitude of the electrical force visited upon the arrester, there was no direct evidence demonstrating where the strike occurred -no charring of the utility pole or injury to the distribution line. Third, because of the magnitude of the strike, the evidence indicated a direct strike near the utility pole would not protect the transformer or prevent the additional surge of current through the house, regardless of whether the arrester was in proper working condition. Thus, the court of appeal concluded the plaintiffs had a "formidable task of proving causation distinct from this force of nature."

Conducting a duty/risk analysis, the court of appeal noted two levels of duty of care are owed by power companies: 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. *Pillow v. Entergy Corp.*, 38,384 (La. App. 2 Cir. 9/18/02), 828 So. 2d 83, writ denied, 02-2575 (La. 12/13/02), 831 So. 2d 987. In addition, the court recognized the determination of 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. Seeking the cause-in-fact of the fire, the court of appeal turned to the expert testimony and observed what it called a "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." Noting the plaintiffs and the defense disputed the capacity of the arrester and the exact location of the strike, the court of appeal interpreted the evidence to support a conclusion the strike in question was of such magnitude 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 court of appeal added the plaintiffs' case, relying on circumstantial evidence for the strike's location, did not exclude the more probable hypothesis 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.

In reaching its conclusion, the court of appeal found fault with Smith's testimony regarding his reliance on Entergy's design manual and his failure to explain (1) where the additional grounding relief might have occurred and (2) why it was not equally possible 100% of the strike, rather than merely 20%, would flow through the arrester. The court also reasoned Smith's location of the strike presented a scenario that remained very close to those locations where a catastrophic event was inevitable and that, in placing the strike in a location away from the pole where the force majeure might have been handled by the arrester, the Smith scenario also had to overcome the inference the arrester, which had previously operated for four years, could be expected to function. Further, the court found the evidence did not support the conclusion a catastrophic lightning event near the pole would have caused physical damage to the arrester, which should have been visible after the strike. While the transformer is composed of massive windings, which carry the current and present resistance, the arrester did not include such windings, and thus, the current did not meet with the same resistance in the two devices. The court of appeal found "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 demonstrated the same powerful current that destroyed the transformer flowed through the arrester without apparent damage. With these facts and Brooks' more detailed explanation of why the arrester could survive a catastrophic strike without visible physical damage, the court found the plaintiffs offered inconclusive proof to isolate a cause of the loss that was more probable than the act of God event, which unquestionably occurred near the equipment.

Finally, regarding the defense view of the event, the court noted Entergy's experts held to the opinion there was some grounding of the lightning current at the utility pole. Yet, even with the lack of a ground function by the arrester as opined by Smith, Smith 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. Thus, with the evidence showing the current, which arced through the windings in the transformer, could have been conducted through the ground connection on the transformer's steel tank, the court found the undisputed ground source was apparently overwhelmed by the magnitude of the strike, solidifying its conclusion the damage was caused by an act of God.

Accordingly, the court of appeal concluded the district court's conclusion was erroneous and reversed the district court's judgment. *Hanks v. Entergy Corp.*, [Pg 19] 40,486, p. 24 (La. App. 2 Cir. 2/1/06), 921 So. 2d 1130, 1143. From this opinion, the plaintiffs sought writs from this court.

In their application, the plaintiffs argued the court of appeal improperly concluded its own evaluations and inferences were more reasonable than the district court's evaluations, when the district court's findings clearly were not manifestly erroneous or clearly wrong. The Supreme Court agreed.

In an action to recover damages for injuries allegedly caused by another's negligence, the plaintiff has the burden of proving negligence on the part of the defendant by a preponderance of the evidence. Proof is sufficient to constitute a preponderance when the entirety of the evidence, both direct and circumstantial, shows the fact sought to be proved is more probable than not. Thus, the plaintiff in this type of action must produce evidence from which the factfinder can reasonably conclude his injuries, more probably than not, were caused by the negligence of the particular defendant. The plaintiff, however, does not have to conclusively exclude all other possible explanations for his injuries, because the standard is not proof beyond a reasonable doubt. Placing the burden of proof on the plaintiff requires him ultimately to persuade the factfinder concerning the defendant's negligence, and if the factfinder is undecided after all the evidence has been presented, the plaintiff loses because of the failure of his evidence.

As previously noted, the proof may be by direct or circumstantial evidence. A fact established by direct evidence is one which has been testified to by witnesses as having come under the cognizance of their senses. Circumstantial evidence, on the other hand, 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. Use of circumstantial evidence and the deductions and inferences arising there from is a common process for establishing liability in negligence cases. 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 his injuries were more likely than not the result of the defendant's negligence. If, as in this case, circumstantial evidence is relied upon, that evidence, taken as a whole, must exclude every other reasonable hypothesis with a fair amount of certainty. This does not mean, however, that it must negate all other possible causes..

In this case, plaintiffs have alleged Entergy was negligent in maintaining and connecting the lightning arrester and its negligence caused the damage to the Hanks residence. Under Louisiana jurisprudence, most negligence cases are resolved by employing a duty/risk analysis, which entails five separate elements: (1) whether the defendant had a duty to conform his conduct to a specific standard (the duty element); (2) whether the defendant's conduct failed to conform to the appropriate standard (the breach element); (3) whether the defendant's substandard conduct was a cause-in-fact of the plaintiff's injuries (the cause-in-fact element); (4) whether the defendant's substandard conduct was a legal cause of the plaintiff's injuries (the scope of liability or scope of protection element); and (5) whether the plaintiff was damaged (damages element). *Lemann v. Essen Lane Daiquiries, Inc.*, 05-1095, p. 7 (La. 3/10/06), 923 So. 2d 627, 633; *Bonin v. Ferrellgas, Inc.*, 03-3024, p. 5 (La. 7/2/04), 877 So. 2d 89, 94. A negative answer to any of the inquiries of the duty/risk analysis results in a determination of no liability.

The threshold issue in any negligence action is whether the defendant owed the plaintiff a duty, and

whether a duty is owed is a question of law. Lemann, 05-1095 at p. 8, 923 So. 2d at 633; Benjamin, 04-1058 at p. 6, 893 So. 2d at 5. It is well established Louisiana courts require a high duty of care by those dealing in the manufacture and distribution of electricity. Northern Assurance Company v. Louisiana Power & Light Company, 580 So. 2d 351, 358 (La. 1991). Electric transmission companies, which maintain and employ high power lines, are required to exercise the utmost care to reduce hazards to life as far as practicable, provided the utility is not required to guard against situations, which cannot reasonably be expected or contemplated. Hebert v. Gulf States Utilities Company, 426 So. 2d 111, 114 (La. 1983); However, when the utility company is not the owner of the electrical facility, which causes damage, but merely passes its electricity through this facility, a lesser standard applies. Northern Assurance Company, 580 So. 2d at 358; Sibley v. Gifford Hill and Co., Inc., 475 So. 2d 315, 319 (La. 1985). In such cases where injury or damage occur on the property of a customer and are allegedly caused by some action or inaction on the part of the electric utility company, the duty is to use reasonable care in the installation, operation, and maintenance of their electric lines. See Northern Assurance Company, 580 So. 2d at 358-59; Hughes v. Louisiana Power & Light Co., 94 So. 2d 532, 534-35 (La. App. 1st Cir. 1957). In this case, the district court and the appellate court found Entergy owed a duty of reasonable care in the installation, operation, and maintenance of their electric lines.

Whether the defendant breached that duty and whether that breach was a cause in fact of plaintiff's injuries are factual questions to be determined by the factfinder. A reviewing court may not set aside a district court's finding of fact in the absence of manifest error or unless it is clearly wrong, and where there is conflict in the testimony, inferences of fact should not be disturbed upon review, even though the reviewing court may feel that its own evaluations and inferences are as reasonable. In order to reverse a district court's determination of a fact, a reviewing court must review the record in its entirety and (1) find a reasonable factual basis does not exist for the finding, and (2) further determine the record establishes the factfinder is clearly wrong or manifestly erroneous. Bonin, 03-3024 at p. 6-7, 877 So. 2d at 94-95; Stobart, 617 So. 2d at 882. "To perform its constitutional duty properly, an appellate court must determine whether the trial court's conclusions were clearly wrong based on the evidence or clearly without evidentiary support." Perkins v. Entergy Corp., 00-1372, p. 11 (La. 3/23/01), 782 So. 2d 606, 613. Nevertheless, the issue to be resolved by the reviewing court is not whether the factfinder was right or wrong, but whether the factfinder's conclusion was a reasonable one.

If the findings are reasonable in light of the record reviewed in its entirety, an appellate court may not reverse even though convinced that, had it been sitting as the trier of fact, it would have weighed the evidence differently. Carter v. Haygood, 04-0646, p. 9 (La. 1/19/05), 892 So. 2d 1261, 1267; Stobart, 617 So. 2d at 882. Where there are two permissible views of the evidence, the factfinder's choice between them cannot be manifestly erroneous or clearly wrong. Bonin, 03-3024 at p. 7, 877 So. 2d at 95; Rosell, 549 So. 2d at 844. When findings are based on determinations regarding the credibility of witnesses, the manifest error-clearly wrong standard demands great deference to the trier of fact's findings, for only the factfinder can be aware of the variations in demeanor and tone of voice that bear so heavily on the listener's understanding and belief in what is said. Bonin, 03-3024 at p. 7, 877 So. 2d at 95; Rosell, 549 So. 2d at 844.

However, where documents and objective evidence so contradict the witness's story, or the story itself is so internally inconsistent or implausible on its face, that a reasonable factfinder would not credit the witness's story, the reviewing court may well find manifest error or clear wrongness even in a finding purportedly based upon a credibility determination. Rosell, 549 So. 2d 840 at 844 at 844-45. But where such factors are not present, and a factfinder's finding is based on its decision to credit the testimony of one of two or more witnesses, that finding can virtually never be manifestly erroneous or clearly wrong.

Moreover, the rule that questions of credibility are for the trier of fact applies to the evaluation of expert testimony, unless the stated reasons of the expert are patently unsound. Lasyone v. Kansas City Southern R.R., 00-2628, p. 13 (La. 4/3/01), 786 So. 2d 682, 693. Credibility determinations, including the evaluation of and resolution of conflicts in expert testimony, are factual issues to be resolved by the trier of fact, which should not be disturbed on appeal in the absence of manifest error.

Application of the foregoing principles to the conflicting expert testimony and other evidence lays bare

the court of appeal's error in its employment of the manifest error-clearly wrong standard. After considering the record viewed in its entirety in the present case, we conclude the court of appeal failed to properly apply the appellate review standard.

We do not find the district court committed manifest error in its finding that the plaintiffs established Entergy breached its duty of care and this breach was a cause in fact of harm to the plaintiffs. As noted by the district court, the evidence in this case boils down to the conflicting testimony of the experts and their interpretation of the photographic evidence. The district court made a credibility call, finding the plaintiffs' expert testimony more credible than the testimony of Entergy's experts. Because we find no documents or objective evidence in the record that so contradicts the testimony of plaintiffs' expert or that his testimony is so internally inconsistent or implausible on its face a reasonable factfinder would not credit his testimony, we cannot find manifest error or clear wrongness. Because these factors are not present in this case and the district court's finding of breach and causation is based on his decision to credit the testimony of Smith, it is virtually impossible for us to find the court's factual conclusions manifestly erroneous or clearly wrong. Under these circumstances, these evaluations and inferences are entirely the function of the trial court in its fact-finding mission and the appellate court cannot impinge upon this function, even though the appellate court is convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently. It was in this manner that the court of appeal fell into error.

Smith opined the arrester was either non-functional or improperly connected, basing his opinion on several factors. First, the photograph of the arrester after the lightning strike showed the arrester was intact and had no visible evidence of damage, whereas the transformer was destroyed. He opined if the arrester had been operational, it would have been damaged considering the severe damage of the transformer. Second, his examination of the power pole revealed no evidence of burning or scorching along the path of the grounding conductor, and he believed if the arrester had worked and "bled off" excess voltage via the ground conductor, some evidence thereof would have been observable. Smith concluded the arrester was defective or improperly attached and Entergy had failed to properly maintain and inspect its distribution apparatus.

The district court agreed, reasoning common sense supported Smith's opinion that an undamaged arrester next to a totally destroyed transformer indicates the arrester was defective in operation or attachment. The court further found it inconceivable that there would be no scorching or burning of the pole or the ground conductor if the arrester had worked and channeled some energy into the ground conductor, given Entergy's argument this was a lightning strike of overwhelming magnitude that directly struck the transformer or very near it.

Additionally, the district court correctly explained the testimony of Brooks and Owens was that the magnitude and proximity of the strike was such that it would have overwhelmed any properly installed and functioning arrester because the lightning strike was very powerful in that it was in the top two percent of all strikes in magnitude, which directly hit to the service apparatus, and all of the current from the strike was impressed upon the arrester. The experts agree it is likely the arrester was a distribution class arrester, which could effectively handle 65KA, and the [Pg lightning strike generated 87.9KA. Thus, if all the energy from the strike was directed to the arrester, the capacity of the arrester was exceeded.

On the other hand, Smith contradicted the testimony of Brooks and Owens, opining a significant portion of the energy from the strike would have been dissipated throughout the system, giving the infinite busing design of the distribution lines. Thus, in his opinion, all of the energy from the strike would not have been impressed upon the arrester, and he further did not believe it possible to state the exact location of the strike other than the fact it was in close proximity to the lake house.

After carefully considering and weighing the evidence, the district court rejected Owens's and Brooks's explanation that there was a direct strike to the electrical equipment as inconsistent with the lack of damage to anything other than the transformer. Agreeing with Smith, the court found it improbable the full magnitude of the electric current was impressed upon the arrester, and the dissipated current, even

if reduced merely 25%, would have been within the capacity of the arrester. Thus, it was more probable than not the strike did not overwhelm the arrester and the damage would not have been sustained had the arrester been properly functioning or attached, as the dissipated current would have been within the capacity of the arrester to ground and protect the transformer. Although Entergy's experts highly contested Smith's conclusions attributing the failure of the arrester to the magnitude of a direct strike to the electrical equipment, they did not present objective evidence sufficient to contradict Smith's testimony or to establish any other reasonable hypothesis, given the magnitude of the strike, but the lack of visible damage to the arrester, the pole, and the ground conductors.

The court's review of the record demonstrated there was a reasonable basis for the district court's conclusion that it was more probable than not Entergy's negligence caused the damage in this case. The record does support the conclusion Entergy's failure to maintain or install its arrester more probably than not caused the damage to the transformer, which, in turn, resulted in the over voltage in the electrical service to the house, which led to the fire, because, according to Smith, had the arrester been operational, the dissipated current would have been within the capacity of the arrester to ground and prevent over voltage to the transformer. Accordingly, the court found the district court did not err as the evidence viewed in its entirety does exclude any other reasonable hypothesis with a fair amount of certainty, particularly in light of the district court's credibility determination of the expert testimony.

In conclusion, the court found the court of appeal erred in reversing the district court's determination of breach and causation as manifestly erroneous. The court's review of the record in its entirety reveals the district court did not manifestly err in concluding Entergy breached its duty to the plaintiffs and its breach caused the fire, given the court's reasonable reliance upon the testimony of plaintiffs' expert. The judgment of the district court was reinstated (The concurring and dissenting opinions are omitted from this summary).

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