

3/23/01 (Revised 4/10/01)

SUPREME COURT OF LOUISIANA

No. 00-C-1372

DON PERKINS, ET AL.

versus

ENTERGY CORPORATION, ET AL.

consolidated with

No. 00-C-1387

JOSEPH BUJOL, III, ET AL.

versus

ENTERGY CORPORATION, ET AL.

consolidated with

No. 00-C-1440

ROBERT HRACEK, ET AL.

versus

ENTERGY CORPORATION, ET AL.

On Writ of Certiorari to the Court of Appeal, First Circuit,
Parish of Iberville

KIMBALL, J.*

On April 6, 1994, three employees at an air separation plant near Plaquemine, Louisiana, owned and operated by Air Liquide America Corporation (“ALAC”), were severely injured in an oxygen flash fire. One of those employees, Ray Hracek, died of his injuries several days after the incident. The other two injured employees, Joseph Bujol and Don Perkins, sustained 90% third degree burns. The flash fire occurred

*James C. Gulotta, Justice *Pro Tempore*, sitting for Associate Justice Harry T. Lemmon.

after the ALAC facility unexpectedly shut down due to a power disturbance and while the three employees were assisting in restarting the plant. Don Perkins, Joseph Bujol, their families, and Ray Hracek's surviving family members filed suit against several defendants, but proceeded to trial against only Entergy Services, Inc. ("ESI"), Gulf States Utilities Company ("GSU"), and Louisiana Power and Light, Inc. ("LP & L").¹

The plaintiffs allege that the power disturbance was partially to blame for the occurrence of the flash fire.

PROCEDURAL HISTORY

After a bench trial, the trial court concluded that the negligence of ESI, LP & L, and GSU was a cause of the accident. The court assessed the electric utility companies with 40% of the fault for the plaintiffs' injuries. Additionally, the court determined that ALAC and Big Three were at fault and assessed those defendants with 40% and 20% of the fault, respectively. Total damages determined by the trial court were \$22,728,450.00 (subject to reduction for fault allocations).

The electric utility companies appealed. Determining that the trial court was manifestly erroneous in holding the electric utility companies liable for plaintiffs' damages, the court of appeal reversed. The court of appeal found: (1) that the trial court imposed the wrong legal duty on the utility companies; (2) that even under a less stringent standard of care, the defendants breached their duty to properly operate and maintain their power lines; but (3) that the plaintiffs had not proved by a preponderance of the evidence that the power disturbance was a cause in fact of the

¹Originally the plaintiffs also named ALAC; Big Three Industries, Inc., the plant's prior owner, and its insurers; Exxon Corporation; and Dresser Industries, Inc., the manufacturer of the automatic pressure control valve at the site of the fire, as defendants in this suit. Both the trial court, the court of appeal, and the plaintiffs, in their brief to this court, indicated that the plaintiffs settled all their claims with these other defendants prior to the beginning of trial.

flash fire; and (4) that the plaintiffs had not established that the power disturbance was a legal cause of the plaintiffs' injuries.

The plaintiffs filed a writ application with this court, assigning as error (1) the court of appeal's failure to allow them to reargue the case in front of a larger appellate panel; (2) the court of appeal's application of a less stringent legal duty to the defendants;² (3) the court of appeal's reversal of the trial court's finding of factual causation; and (4) the court of appeal's finding of no legal causation. We granted the plaintiffs' writ application primarily to address the issue of causation in this case and to ensure that the court of appeal performed its review of the case under the proper standard. After a thorough examination of the record, we find that the court of appeal correctly applied the manifest error standard of review to find that the plaintiffs failed to establish by a preponderance of the evidence the first step in causation, that the defendants' conduct was a cause-in-fact of the plaintiffs' injuries.

FACTS

At 1:52 a.m. on April 6, 1994, a static shield wire, suspended above three transmission conductors at the Exxon refinery in Baton Rouge, broke as a result of a

²The plaintiffs argue that the court of appeal erred by finding that the trial court imposed the wrong standard of care on the defendants in this case and by then proceeding to apply a lesser duty. The plaintiffs, while acknowledging that the court of appeal still found that the defendants breached even the less onerous duty, claim that the court of appeal's "duty mistake" led the court to believe erroneously that the case was suitable for a *de novo* review.

We first note that we do not reach the question of what legal standard of care should have been applied in this case, because, as discussed in the body of the opinion, we find that the first necessary question--whether the defendants' conduct was a cause-in-fact of the plaintiffs' injuries--is answered negatively, thereby ending our inquiry as to whether the defendants are liable. Nor do we reach the question of whether a *de novo* review would have constituted reversible error, because, contrary to the plaintiffs' assertion, the court of appeal did not discuss whether a *de novo* review was appropriate when the duty was erroneously defined in the first instance. Rather, the court of appeal determined that the trial court was clearly wrong under the manifest error standard.

ten-knot wind and fell onto the transmission wires below it. Prior to its breaking, the static shield wire was improperly held together with only one of its original seven strands. The initial breakage of the shield wire caused a circuit breaker to open the line, producing an “A phase to ground” fault, or a fault in the uppermost wire. This electrical fault was cleared in seven cycles, or $7/60$ of a second, which was normal. However, shortly thereafter, when Entergy personnel attempted to reclose the breaker manually in order to reenergize the line, the electrical fault was reinitiated and escalated to a full three-phase fault, or a fault in all three wires. The escalation occurred because the first three levels of GSU’s automatic relay equipment failed to operate properly and isolate the fault. This resulted in a 58-cycle ($58/60$ of a second), three-phase electrical fault that caused a significant loss of voltage to be felt by all entities connected to the grid, which is the utility alignment that allows for a large number of customers to be serviced simultaneously. ALAC suffered a 47.5% voltage sag, which was one of the most serious experienced in the Entergy system.

The voltage sag at ALAC caused the facility’s major equipment to automatically shut down. While the plant never completely lost power, the voltage sag triggered protective devices on the compressor motors designed to prevent them from burning up during an extended period of low voltage operation. Those protective devices shut off all four of the facility’s air compressor motors automatically. Shortly after the shutdown, the plant manager, Ray Hracek, and several additional employees, including Jeb Bujol, were summoned to the plant to assist in restarting the air compressors.

By approximately 4:45 a.m., two of the four compressors were up and working.³ However, an operating problem developed in an oxygen pipeline, pressure

³The No. 3 plant was not yet up by this time due to the failure of a synchronizer pack to function properly. No one has alleged that the problem with the synchronizer pack had anything to do with the power disturbance.

regulating, automatic control valve located in the ALAC “letdown station.” The valve regulated the differential pressure between a 700 PSIG pipeline, supplying gaseous oxygen to Exxon, and a 400 PSIG pipeline, supplying oxygen to other plants. The problem was discovered because the pressure to Exxon in the 700 PSIG pipeline was low. When Mr. Tony Mabile, the plant’s assistant manager, passed by the letdown station, he saw the automatic valve was wide open, when it should have been closed. Upon learning of the problem with the valve, the three plaintiffs proceeded to the letdown station to close a manual block valve located near the automatic valve. As they were attempting to discover the source of the problem with the automatic valve, a large flash fire occurred at the letdown station. Mr. Bujol testified that immediately preceding the explosion, he had told Mr. Hracek that he thought the valve had closed. Then he saw the valve begin to “stroke up” and open again before “it just dropped, slammed, and exploded.” The force of the explosion threw Mr. Perkins and Mr. Bujol against the surrounding wall. A second explosion followed. Mr. Hracek died on April 11, 1994, as a result of his injuries. Mr. Bujol and Mr. Perkins suffered extensive burns, permanent scars, and permanent disabilities.

LAW AND ANALYSIS

First, the plaintiffs argue that the court of appeal denied them their constitutional right to reargument in front of a larger appellate panel. Due to the complexity of the issues, the voluminous record, and the amount of the award, this case was originally heard by a five-judge appellate panel, with the hope that potential delays inherent in having the matter initially heard by a three-judge panel could be avoided. The plaintiffs argue that, because two judges on the five-judge panel dissented, they were constitutionally entitled to reargue their case in front of a larger panel of the court of appeal, pursuant to La. Const. art. V, § 8.

Section 8 of Article V provides that appellate courts shall sit in panels of at least three judges and that a majority of judges must concur to render judgment. The article further provides that:

However, in civil matters only, when a judgment of a district court is to be modified or reversed and one judge dissents, the case shall be reargued before a panel of at least five judges prior to rendition of judgment.

La. Const. art. V, § 8(B). This provision entitles a trial court's judgment to more weight by requiring at least two additional judges to hear the case when two out of three judges on the original three-judge appellate panel vote to reverse the trial court. *See* 6 Records of the Louisiana Constitutional Convention of 1973: Convention Transcripts, p. 756-57 (La. Const. Conv. Records Comm. 1977).

However, this provision does not, and was not intended to, entitle parties to reargument when a five-judge panel hears the case in the first instance. This is best demonstrated by the comments of Delegate Chris J. Roy, who proposed the amendment, to the Constitutional Convention. When asked what would happen under this provision in the event an appellate court chose to sit in a five-judge panel initially and one judge dissented, Mr. Roy answered that, in that scenario, you would already have the reargument and the parties would not be entitled to reargue the case; "The court simply considers it reargued and then renders its decision." *Id.* at p. 757.

That scenario is what occurred here. The First Circuit, anticipating that some disagreement might result among the members of the original three-judge panel due to the complexity and scope of the various issues in this case, chose to sit in a five-judge panel in the first instance. Therefore, the parties were not entitled to reargue the case in front of a larger panel of the appellate court; rather, the case was considered

reargued for purposes of this provision, as the parties were already afforded the opportunity to have five appellate judges hear their case.

Next, the plaintiffs' principal argument is that the court of appeal erred by reversing the trial court's findings of causation. Under Louisiana jurisprudence, most negligence cases are resolved by employing a duty/risk analysis. The determination of liability under the duty/risk analysis usually requires proof of five separate 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 a legal cause of the plaintiff's injuries (the scope of liability or scope of protection element); and (5) proof of actual damages (the damages element). *Boykin v. Louisiana Transit Co., Inc.*, 96-1932, pp. 8-9 (La. 3/4/98), 707 So.2d 1225, 1230 (citing David W. Robertson et al., Cases and Materials on Torts 83-84 (1989); *Fowler v. Roberts*, 556 So.2d 1 (La.1989)(on original hearing)). *See also Roberts v. Benoit*, 605 So.2d 1032, 1051 (La. 1991). If the plaintiff fails to prove any one element by a preponderance of the evidence, the defendant is not liable. *See Mathieu v. Imperial Toy Corporation*, 94-0952, p. 11 (La. 11/30/94), 646 So.2d 318, 326. Accordingly, because we find that the plaintiffs failed to prove the cause-in-fact element of their negligence case, there is no liability in this case.

Generally, the initial determination in the duty/risk analysis is cause-in-fact. *Boykin*, 707 So.2d at 1230. Cause-in-fact usually is a "but for" inquiry, which tests whether the accident would or would not have happened but for the defendant's substandard conduct. *Id.* Where there are concurrent causes of an accident, the

proper inquiry is whether the conduct in question was a substantial factor in bringing about the accident.⁴ *Id.* at n. 10; *Jones v. Hawkins*, 98-1259, 98-1288, p. 7 (La.3/19/99), 731 So.2d 216, 220; *Rick v. State, Dept. of Transp. and Development*, 93-1776, 93-1784, p. 8 (La. 1/14/94), 630 So.2d 1271, 1275; *Dixie Drive It Yourself System v. American Beverage Co.*, 242 La. 471, 137 So.2d 298 (1962). To satisfy the substantial factor test, the plaintiff must prove by a preponderance of the evidence that the defendant's conduct was a substantial factor bringing about the complained of harm. *Dabog v. Deris*, 625 So.2d 492, 493 (La.1993).

This court has made several different inquiries when applying the substantial factor test. For example, the court has stated that when there are multiple causes, clearly cause-in-fact exists when the plaintiff's harm would not have occurred absent the specific defendant's conduct. *Graves v. Page*, 96-2201, p. 9 (La. 11/7/97), 703 So.2d 566, 570. The court has also applied the substantial factor test by asking whether each of the multiple causes played so important a role in producing the result that responsibility should be imposed upon each item of conduct, even if it cannot be said definitively that the harm would not have occurred "but for" each individual cause. *See id.* (citing *Trahan v. State, Department of Transportation & Development*, 536 So.2d 1269, 1272 (La. 3rd Cir.1988)). *See also* Frank L. Maraist & Thomas C. Galligan, *Louisiana Tort Law*, § 4-3 at 86-88 (1996) (noting that the substantial factor test operates well in cases where there are multiple possible causes-in-fact, but the trial judge or jury may not be able to conclude that the accident

⁴The plaintiffs argue that the court of appeal erroneously required the plaintiffs to satisfy both the "but for" test and the "substantial factor" test, when it should have only asked if the accident would not have occurred but for the defendants' negligence, because the "substantial factor" test is only an alternative test to be applied when the "but for" test is impractical. However, our case law is clear that the substantial factor test is the preferred test for causation when there are multiple causes, such as in the present case. *See, e.g., Boykin*, 707 So.2d at 1232, n. 10; *Roberts*, 605 So.2d at 1042.

most likely would not have happened but for any one of the causes). Additionally, in *LeJeune v. Allstate Ins. Co.*, 365 So.2d 471, 475 (La.1978), the court, in describing the substantial factor test, stated that "one must consider whether the actor's conduct has created a force or series of forces which are in continuous and active operation up to the time of the harm."

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. *Theriot v. Lasseigne*, 93-2661, p. 5 (La. 7/5/94), 640 So.2d 1305, 1310 (citing *Cay v. DOTD*, 93-0887 (La. 1/14/94), 631 So.2d 393 (La.1994)). A court 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.* (citing *Sistler v. Liberty Mutual Ins. Co.*, 558 So.2d 1106 (La.1990)). In order to reverse a trial court's determination of fact, an appellate court must review the record in its entirety and (1) find that a reasonable factual basis does not exist for the finding, and (2) further determine that the record establishes that the factfinder is clearly wrong or manifestly erroneous. *Stobart v. State, Through DOTD*, 617 So.2d 880, 882 (La.1993). Further, on review, an appellate court must be cautious not to re-weigh the evidence or to substitute its own factual findings just because it would have decided the case differently. *Ambrose v. New Orleans Police Department Ambulance Service*, 93-3099 (La.7/5/94), 639 So.2d 216, 221. In sum:

[T]he reviewing court must give great weight to factual conclusions of the trier of fact; where there is 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. The reason for this well-settled principle of review is based not only upon the trial court's better capacity to evaluate live witnesses (as compared with the appellate court's access only to a cold record), but also

upon the proper allocation of trial and appellate functions between the respective courts.

Canter v. Koehring Co., 283 So.2d 716, 724 (La. 1973); *Ambrose*, 639 So.2d at 224, n. 1 (Lemmon, J., concurring)

However, while deference must be given to the factfinder's determinations, this court clarified in *Ambrose* that our purpose in *Stobart* was not "to mandate that the trial court's factual determinations cannot ever, or hardly ever, be upset." *Ambrose*, 639 So.2d at 221. Recognizing that great deference should be accorded to the factfinder, the court of appeal and this court have a constitutional duty to review facts. *Id.* 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. *Id.*

The plaintiffs' theory of causation in this case is that the electrical disturbance on the night of the fire resulted in an "unusual," "severe," and "traumatic" voltage sag at the ALAC facility. The magnitude of the voltage sag then caused a "violent" shut down at the plant, producing excessive vibration of the machinery, which, in turn, loosened debris in the form of metallic particles contained within the ALAC piping system. When the ALAC plant was restarted, this debris, which had already begun to move about in the system, was transported to the valve at the letdown station and ignited the oxygen flash fire, either by impact on the valve or friction within the valve.

The trial court accepted the plaintiffs' theory of causation and found that the power disturbance was a substantial factor in the subsequent oxygen flash fire. The court of appeal, upon its review of the record, concluded that there is not a reasonable factual basis for the trial court's finding that the electrical fault was a cause-in-fact of the plaintiffs' injuries. Further, the court of appeal found that the trial court was clearly

wrong in determining that the plaintiffs satisfied their cause-in-fact burden of proof.

The plaintiffs outline their cause-in-fact case against Entergy as entailing two steps:

(a) that as the oxygen piping system within the ALAC plant was being repressurized after the shutdown caused by the voltage sag, foreign metallic particles in the system ignited the oxygen flash fire, either by becoming mobile and impacting on the valve or through heat friction within the valve;

(b) that the particles were dislodged and thus made potentially mobile by excessive vibrations in the ALAC machinery as it was shutting down during the severe voltage sag.

While there is adequate evidence in the record to support the trial court's conclusion that the plaintiffs established step (a) by a preponderance of the evidence, the record does not support a finding that the plaintiffs proved step (b).

The second step in the plaintiffs' cause-in-fact case depends on the factual finding that the ALAC plant experienced an unusually turbulent shutdown the night of the flash fire as a result of the voltage sag and that, during the shutdown, the equipment vibrated violently, thereby dislodging particulate matter in the system. Before turning to our discussion of the evidence in the record concerning the nature of the shutdown, we first note that the plaintiffs repeatedly refer to the fact that the 58-cycle, three-phase electrical fault was unusual in both severity and length as supporting their theory that the voltage sag caused a turbulent shutdown at the ALAC plant. There is little dispute that the electrical fault itself was an unusual electric event, as Entergy's own report describes the fault as "a rare occurrence" that presented a "significant impact to customer load and system generation due to the severe depression of transmission during the event." There is ample testimony from both sides in the record supporting

the conclusion that this was not an ordinary electrical fault, but a traumatic electrical event. However, the plaintiffs' reliance on this fact as supporting their cause-in-fact case is misplaced, as it is important to distinguish between the nature of the power failure itself as an unusual electrical event and the nature of the resulting shutdown at the ALAC plant. To ignore that distinction is to confuse the evidence relating to the magnitude of the electrical disturbance and the evidence regarding the physical shutdown of the ALAC plant, two entirely different events, even though one caused the other. Therefore, we now turn to what evidence is in the record regarding the nature of the shutdown at the ALAC plant on the night of the accident.

The primary evidence presented by the plaintiffs on the issue of causation was from the Schmidt Report and the testimony of their expert, Roger Owens. The Schmidt Report is an investigative report on the oxygen flash fire at the ALAC facility, which was prepared by an ALAC investigative committee and an independent accident investigation consultant from JEI Metallurgical, Inc. The investigating committee examined the remains of the piping involved in the incident and the plant's facilities. Inspection of the valve's surviving components confirmed "the long term presence of foreign material within the piping system." The control valve's plug was pitted and gouged. Different components of the valve exhibited abrasion and gouge damage, indicating there had likely been contact with some foreign material.

The Schmidt Report concludes that:

Evidence discovered within the Plaquemine piping artifacts identifies foreign material, in the form of metallic particles, existing within the piping system, as the most likely contributing factor to the Plaquemine pipeline metering and pressure reducing station flash fire. This material, either through direct particle impact upon internal control valve surfaces, or friction heating caused by entrapped particles within the moving parts of the control valve, is the most probable source of ignition.

The Schmidt Report notes that, normally, particles such as those believed to have caused the oxygen flash fire are incapable of being transported through the piping system because of their mass or because of insufficient gas velocity.

The plaintiffs argue that the Schmidt Report directly supports their theory of causation, pointing to the Report's conclusion that, while normally any particles existing in the pipeline would remain fixed, "during highly abnormal pipeline operating conditions, which occurred during the early hours of April 6, 1994, circumstances could have developed which caused the movement of metallic particles through the piping network." However, nowhere does the Schmidt Report actually link the Entergy power collapse to the flash fire. The passage quoted above is the only passage in the Schmidt Report that could be interpreted as linking the power disturbance causally to the fire. Further, as there were several "abnormal conditions" that night at the plant, such as the automatic control valve malfunctioning and three employees entering the letdown station to investigate and manually solve the problem,⁵ there is nothing in the report itself making it more probable that the Report was referring to the abnormal circumstance of a turbulent shutdown rather than other conditions at the plant that night. Therefore, the plaintiffs relied on the testimony of their expert witness, Roger Owens, to establish that necessary causal link between the power disturbance and the flash fire.

Mr. Owens, the plaintiffs' expert in electrical engineering and casualty control, opined at trial that the severe voltage sag could have caused severe turbulence in the

⁵It is undisputed that the automatic control valve was malfunctioning on the night of the accident. There is additional evidence that there had been problems with the valve in the past, that the valve leaked, that no maintenance had been performed on the valve in the seventeen years since it had originally been installed, and that there were defects in the piping system's design which probably contributed to the accident as well, particularly the lack of filters and the need for employees to manually close a valve in the system.

equipment at the ALAC plant during the shutdown, which could have resulted in particulate matter becoming mobile as described in the Schmidt Report. Owens testified that, based on his knowledge regarding the ALAC plant and its equipment and his knowledge of effects of similar disturbances on pressurized flow systems, during such a traumatic electrical event as the 45.7% voltage sag, transients, or severe drops and spikes in power supply, would probably be produced over the entire grid of utility service. Owens further testified that he would expect the ALAC plant to experience those transients, “only stepped down to their voltage level,” because “its a linear thing;”--i.e., the ALAC plant would proportionately experience the same transients felt by other customers over the entire grid. His testimony continued that, because of these transients, the plant most likely would have experienced more severe mechanical and flow problems, compared to those that arise during a normal shutdown, because of the “very unique, uncontrolled and unsystematized shutdown.” Owens concluded that the type of transients that likely occurred at the ALAC facility due to the voltage sag could lead to the introduction of debris or particles within the flow system as described in the Schmidt Report. Based on the evidence he had examined, he believed that this was the most likely scenario.

However, while stating he believed this to be the most likely scenario, Owens was careful to qualify his testimony at trial:

What I’m saying basically in the cause/effect testimony is that based on all my experiences . . . if you go down like that it is very, very likely that you are going to find your strainers and your filters full of debris and particulate matter in systems and things like that. Under those conditions my cause and effect testimony is, *could* that have occurred and then maybe cause the explosion? The answer is, yes. *I do not now* [sic], *my testimony is not it caused the explosion.* I’m just saying under those conditions you can break away debris during all this shock and trauma and things like that in the system. *What happened there I’m not testifying about.*

Additionally, on cross examination, Mr. Owens stated:

I have not testified to the exact failure. . . . I have merely testified that I am familiar with the Schmidt Report and that turbulence *can* cause particulate matter to be broken free. *And that is as far as I have gone.*

Regarding the question of whether transients occurred at the ALAC plant, we also recognize that the defendant's expert in electrical utility operating practices and electrical equipment failure analysis testified at trial that the ALAC plant most likely did not experience any severe transients the night of the electrical disturbance. Mr. Brooks explained at trial that he reviewed outage data from fault recorders, devices that are triggered by a power abnormality and which record each cycle of voltage or current, from the night of the electrical fault. Mr. Brooks testified that, while there was no device at the ALAC facility in Plaquemine, there were recorders at a couple of other stations closer to Exxon and one at an outlying station that was about the same distance from Exxon as the ALAC plant, but in the opposite direction. Brooks stated that his investigation did not indicate any type of spikes or dips on the grid, but indicated a smooth drop or transition from 100% voltage down to about 55% voltage or lesser percentage at some of the stations.⁶

In addition to the Schmidt Report and Mr. Rogers' testimony, the trial court relied heavily on an article discussing oxygen compatibility of metals and alloys, authored by Dr. Robert Lowrie, who has spent a lifetime in the oxygen industry and served on the American Society of Testing and Materials committee on oxygen compatibility. The article notes that startup and shutdown of oxygen equipment involve the most dangerous possibility of pipeline fires because of unsteady conditions. The article explains that resonance peaks with attendant danger of excessive vibration and rubbing can occur in rotating machines during such

⁶The defense attempted to enter the recorder data into evidence at trial, but the trial court excluded it because the defense did not produce the data during discovery and the plaintiffs' expert, Mr. Owens, was no longer available to examine the data and respond to it.

procedures. Further, Lowrie notes that the danger of high gas velocity and particle impact ignition is increased during those times. The trial court found that Lowrie's article directly supported the plaintiffs' theory that the ALAC equipment experienced excessive vibrating during the shutdown of the plant. However, the article is similar to the testimony of Owens, in that it only provides further generic evidence of what can possibly occur at any oxygen plant during an unplanned shutdown.

To further support their argument that the ALAC plant experienced a violent and turbulent shutdown as a result of the voltage sag, the plaintiffs point to the testimony of Ricky Webber, the shift supervisor on duty when the voltage sag occurred. In describing the power failure, Webber stated: "It's such--it's kind of a shock when you're sitting there talking about baseball and stuff at 2:00 and everything gets dark on you. It makes a lot of noise." The plaintiffs argue that electric motors shutting down smoothly do not make noise and that Webber's description of the shutdown as noisy supports the trial court's conclusion that the shutdown was unusual. The plaintiffs note that because the voltage sag lasted just under a second and because most, if not all, of the ALAC machines began to shut down even more quickly than that, it should not be surprising that Webber is the only employee present at the plant who recalled nothing more than the plant shut down.

Contrary to the plaintiffs' assertion that no one else present at the plant on the night of the shutdown recalled anything, several of the other employees testified as to the nature of the shutdown. Richie Landry, through deposition, testified that the plant just automatically shut down and that the lights just "blipped, just a little dip." Mr. Michael Rockett testified in his deposition that he was just doing his ordinary job when they lost the plant. He did not note anything unusual other than the loss itself. The plaintiff, Mr. Perkins, also testified at trial that "you pretty much go from light to dark

in the blink of an eye,” but that “immediately upon that our generators kick on,” which might also explain some of the noise Mr. Webber referred to in his testimony. Further, when asked by defense counsel if he noticed any difference in the way the plant went down that night from other times it had gone down when he had been present, Mr. Perkins’ responded only that this shutdown was different because the plant “lost everything” rather than just losing half the plant or several machines.⁷ He did not mention any excessive vibrations or turbulence.

At oral arguments before this court, the plaintiffs also referred to Mr. Bujol’s testimony that the plant “shakes, rattles, and rolls” during unplanned shutdowns and startups. However, Mr. Bujol was not present at the plant when this shutdown occurred, and his testimony only further supports the fact that this shutdown did not differ from any other shutdown.

The record further demonstrates that the equipment at the ALAC facility was designed to account for power disturbances. While the nature and degree of the electrical fault and the resulting voltage sag were unusual in this case, the compressors were designed to respond to such a loss of voltage at a maximum of 30 cycles. Therefore, the compressors did not suffer the full impact of the 58-cycle sag, and the consensus among witnesses was that the compressors most likely were shut off as designed within 10 to 30 cycles of the electrical disturbance. Moreover, there was evidence that no electrical equipment was damaged, including equipment sensitive to electrical transients. Mr. Tony Mabile, the assistant plant manager of the ALAC

⁷Mr. Perkins also testified that, during his ten years of employment with the plant, he had participated in approximately 80 to 100 startups and that around 20 of those had resulted from total plant shutdowns similar to the present one in controversy. Mr. Tony Mabile, the assistant plant manager and a defense witness, testified that the facility experienced approximately four to five power outages per year, and each time, the compressors had to be restarted; although, when this one occurred, it had been about a year since the last shutdown.

facility at the time of the shutdown, also testified at trial that all four of the compressors at the plant were equipped with vibration monitors that are designed to set off an alarm and automatically shut the machines off if there is excessive vibrating. There is no evidence that the alarms were tripped during the shutdown of the plant.

Finally, the plaintiffs have not presented sufficient evidence to prove that it is more likely than not that the power disturbance was a substantial factor in the occurrence of the flash fire. There is nothing in the record showing that the malfunctioning of the automatic pressure control valve, which indisputably was a substantial factor causing the fire, was linked to the power outage. To the contrary, the evidence shows that nothing out of the ordinary was noted during startup of the facility, other than the synchronizer pack failing in the No. 3 plant, until low pressure in the Exxon pipeline was discovered, some time after the shutdown occurred, as a result of the valve not closing properly. There was additional evidence that the valve had malfunctioned in the past and was known to leak on occasion. Based on the lack of evidence proving otherwise, it is possible that the valve may have malfunctioned anyway that night. Additionally, the plaintiffs' expert on valves, Mr. L. Haynes Haselmaier, testified by deposition that it was entirely possible that the slamming of the valve itself could have dislodged particulate matter, which had accumulated in the system due to the lack of proper maintenance and treatment, that could have then impinged and caused ignition.

Therefore, it cannot be said that the plaintiffs have proved that it is more likely than not that, absent the disturbance and shutdown, the valve would not have malfunctioned and the fire ignited. *Graves*, 703 So.2d at 570; *Dixie Drive It Yourself*, 137 So.2d at 302. Nor can it be said that the power fault at the Exxon refinery played so important a role in producing the fire that responsibility should be imposed on

Entergy even though it has not been demonstrated that the fire would have occurred but for Entergy's conduct. *Graves*; 703 So.2d at 570. Finally, the plaintiffs failed to prove by a preponderance of the evidence that Entergy's conduct, which resulted in the power fault, created an active force in continuous operation leading directly up to the time of the harm, *LeJeune*, 365 So.2d at 475, especially considering the three hour lapse between the ALAC plant's shutdown and the ignition of the fire.

Thus, when reviewed in its entirety, we find that the record only supports the trial court's conclusions that the electrical fault in this case was an unusual event and that the foreign particulate matter within the ALAC system was a contributing factor to the oxygen flash fire. However, regarding the issue of causation, the only evidence in the record that attempts to directly link the power outage to the flash fire is the testimony of Mr. Owens. While Mr. Owens opines that the scenario he presents is the most likely cause of the fire, the foundation for his opinion is simply that, based on his experience and the documents he examined in this case, it is *possible* that the equipment *might* have violently shaken in the way he described.

There is, however, a lack of objective evidence in the record supporting the plaintiffs' theory of causation. There is only Dr. Lowrie's article, which provides further proof that it is possible for oxygen equipment to vibrate excessively during shutdowns, and the testimony of one employee that it was noisy at the plant when the facility shut down. Additionally, we cannot ignore the substantial amount of evidence contradicting the trial court's finding that the plant experienced a violent and turbulent shutdown, primarily consisting of the testimony of the employees present when the shutdown occurred, evidence that none of the vibration monitors were triggered, and the fact that the equipment shut down before it could experience the full impact of the voltage sag.

While great deference must be given to the fact-finder, we find that the trial court's conclusion that the plaintiffs proved their cause-in-fact case by a preponderance of the evidence is clearly wrong. Examining the evidence in a light most favorable to the plaintiffs, at best, it could be said that the plaintiffs have proved that it was *possible* that the voltage sag caused the machines at the plant to shake violently. However, the plaintiffs cannot meet their burden of proof by demonstrating that the voltage sag *might* have caused a violent shutdown at the facility, which *might* have caused particulate matter to loosen, which *might* have been a contributing factor to the ignition of the flash fire. Rather, the plaintiffs must prove that it is more likely than not that the voltage sag caused an unusual amount of turbulence at the plant, which, in turn, caused debris in the system to loosen and be transported to the pressure control valve. Based on the evidence presented, to conclude that the plaintiffs met that burden in this case is unreasonable and clearly wrong. The trial court's finding of factual causation is not supported by the evidentiary record and is, therefore, manifestly erroneous.

CONCLUSION

While we, too, sympathize with the plaintiffs, we agree with the court of appeal that the record does not include a reasonable factual basis for the trial court's finding that the electrical fault was a cause-in-fact of the plaintiffs' injuries. We further agree that the trial court was clearly wrong in concluding that the plaintiffs established their cause-in-fact case by a preponderance of the evidence. Because there is no factual causation in this case, our inquiry is over. Therefore, the judgement of the court of appeal is affirmed.