

[DO NOT PUBLISH]

IN THE UNITED STATES COURT OF APPEALS FOR
THE ELEVENTH CIRCUIT

No. 16-14806

D.C. Docket No. 8:13-cv-03225-JSM-MAP

MAZEN HANNA,
Individually,
OLYMPUS INSURANCE COMPANY,
as Subrogee of Mazen Hanna,
PROGRESSIVE AMERICAN INSURANCE COMPANY,
as Subrogee of Mazen Hanna,

Plaintiffs - Appellees,

versus

WARD MANUFACTURING, INC.,

Defendant - Appellant.

Appeal from the United States District Court
for the Middle District of Florida

(January 10, 2018)

Before MARCUS, MARTIN and NEWSOM, Circuit Judges.

PER CURIAM:

During a late summer thunderstorm in 2011, neighbors saw a bright flash of lightning and then observed smoke rising from the home of Mazen Hanna and his family. Despite the best efforts of the local fire department, the Hanna family returned home from a birthday trip to Disney World to find their house a smoldering ruin. Subsequent investigation conducted by Hanna's insurers revealed that a segment of Corrugated Stainless Steel Tubing ("CSST"), which carried natural gas throughout the house, had been perforated. These investigators concluded that a lightning strike had arced to the CSST, creating the hole and igniting the escaping gas which caused the blaze that destroyed the home.

Hanna and his insurers, Olympus and Progressive, sued the manufacturer of the CSST, Ward Manufacturing, in the Middle District of Florida. After a four-day trial, the jury found Ward liable for negligence, strict products liability design defect, and failure to warn, and determined that the CSST had caused the fire. It awarded \$180,000 in damages to Hanna, which was then added to stipulated damage awards for each insurer for a total judgment of \$1,431,228.64. Ward now appeals the denial of its motion for judgment as a matter of law or for a new trial.

The crux of the dispute at trial was whether the perforation was caused by lightning or by household electricity. Complicating the inquiry, the key segment of the CSST had been left uncovered in the caustic post-fire ruins and

had suffered significant corrosion before the experts were able to evaluate it. Notwithstanding the damage, the Plaintiffs' experts opined that there was enough evidence to conclude the CSST was perforated by lightning, igniting the gas inside and causing the house fire. Ward, by contrast, argued that the corrosion had so damaged the segment that one could not tell whether the hole was caused by lightning or household electricity. Ward's theory was that the fire originated elsewhere and the hole was caused by an arc from household electrical wiring as the fire melted its protective insulation.

Ward claims that the district court abused its discretion by allowing Dr. Tom Eagar to give expert testimony that did not meet threshold standards for reliability. It also contends that the district court misapplied Florida law in failing to grant it judgment as a matter of law on some of Plaintiffs' claims and gave jury instructions that were legally erroneous, inconsistent, and confusing. After thorough review and having the benefit of oral argument, we affirm.

I.

We review the district court's admission of expert testimony for abuse of discretion; "we defer to the district court's judgments and will not reverse unless the district court's ruling was manifestly erroneous." Tampa Bay Water v. HDR Eng'g, Inc., 731 F.3d 1171, 1183 (11th Cir. 2013) (quotation omitted). Under this standard, we afford the district court "considerable leeway in

making these determinations.” United States v. Frazier, 387 F.3d 1244, 1258 (11th Cir. 2004) (en banc) (quotation omitted).

Dr. Eagar’s testimony was offered by the Plaintiffs in order to prove two key facts. First, he assessed the size of the hole and other physical indicia and concluded that the perforation in the CSST segment could only have been caused by lightning. Second, Dr. Eagar testified regarding the phenomenon of “flame lift off.” Ordinarily, if a gas line is perforated, the pressure from the escaping gas keeps the oxygen and gas from mixing together in a way that will sustain a flame. But Dr. Eagar explained that an object such as a two-by-four in the attic blocking the path of the expelled gas could create conditions sufficient for sustained flame.

As we see it, the district court did not abuse its considerable discretion in concluding that Dr. Eagar’s opinions were well grounded and sufficiently reliable to allow their admission. We examine the record in some detail given the fact intensive nature of the argumentation.

We conduct a three-part inquiry to determine whether expert testimony is admissible. We ask whether:

- (1) [T]he expert is qualified to testify competently regarding the matters he intends to address;
- (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in Daubert; and
- (3) the testimony assists the trier of fact, through the application of scientific,

technical, or specialized expertise, to understand the evidence or to determine a fact in issue.

Frazier, 387 F.3d at 1260 (quotation omitted). “The proponent of expert testimony always bears the burden to show that his expert is qualified to testify competently regarding the matters he intended to address; the methodology by which the expert reached his conclusions is sufficiently reliable; and the testimony assists the trier of fact.” Id. (quotation omitted and alterations adopted).

An expert may be qualified by knowledge, skill, experience, training, or education. Fed. R. Evid. 702; see also Frazier, 387 F.3d at 1260–61 (“While scientific training or education may provide possible means to qualify, experience in a field may offer another path to expert status.”). Dr. Eagar checks virtually every box. He has a bachelor’s degree in metallurgy and materials science and a doctoral degree in metallurgy from the Massachusetts Institute of Technology and has served as a manufacturing and engineering professor at his alma mater for over 40 years. As part of his career as a professor, he taught courses in manufacturing and product design. He also maintains his knowledge as a practicing engineer outside the classroom. He has advised both the Navy and the Air Force on state of the art metallurgy and engineering issues.

His work and expertise in engineering and metallurgy are recognized within his field. He served on numerous national committees, including several National Research Council committees, review committees at nuclear weapons

labs, National Science Foundation committees, and the National Materials Advisory Board. Dr. Eagar has spent years studying the physics of electrical arcs, of which lightning is one example. Based on this work, he has been involved in hundreds of cases dealing with CSST and lightning and has spent over 500 hours researching the product. Finally, he has written and published a paper on the problems associated with CSST and lightning. Dr. Eagar was more than qualified to testify.

Moreover, the district court did not abuse its discretion in determining that Dr. Eagar's testimony would be helpful to the jury. The indicia of lightning perforation and the necessary conditions for sustained ignition of gas escaping from a perforated pipe are beyond the knowledge of the average juror and well within Dr. Eagar's expertise.

The core of Ward's challenge is to the reliability of Dr. Eagar's testimony. "When evaluating the reliability of scientific expert opinion, the trial judge must assess whether the reasoning or methodology underlying the testimony is scientifically valid and whether that reasoning or methodology properly can be applied to the facts in issue." Frazier, 387 F.3d at 1261-62 (quotation and footnote omitted, alteration adopted). We consider the following factors to assess the reliability of scientific expert opinion: "(1) whether the expert's theory can be and has been tested; (2) whether the theory has been

subjected to peer review and publication; (3) the known or potential rate of error of the particular scientific technique; and (4) whether the technique is generally accepted in the scientific community.” Id. at 1162 (quotation omitted). Examining the reliability of an expert’s methodology is a “context-specific inquiry” so all of these factors may not apply in a given case. Tampa Bay Water, 731 F.3d at 1184. And we must remember that “the gatekeeping function under Rule 702 ‘is not intended to supplant the adversary system or the role of the jury: vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.’” Adams v. Lab. Corp. of Am., 760 F.3d 1322, 1334 (11th Cir. 2014) (quoting United States v. Alabama Power Co., 730 F.3d 1278, 1282 (11th Cir. 2013) (emphasis and internal quotation omitted)).

Dr. Eagar opined that the hole in the Corrugated Stainless Steel Tubing was caused by lightning, not household electrical current. He reached this conclusion applying his experience, knowledge, and training to the physical evidence he could glean from the perforated segment of the CSST. First, Dr. Eagar explained that he estimated the dimensions of the hole and applied a formula called the Hagenguth equation -- an established technique in the field -- to estimate the strength of current needed to produce the hole. Based on these calculations, he

concluded that an arc of between 10 and 13 coulombs would have been needed to produce the 40-mm² hole. Dr. Eagar also checked these calculations against the results of prior testing of CSST tubing that he had done in his own lab, which confirmed that an arc of more than 10 coulombs would be needed to produce a hole of this size. This is much more energy than could have come from household electrical wiring under normal conditions.

Dr. Eagar also identified physical characteristics of the hole in the CSST that suggested it was created by a lightning strike. He pointed out that the melting metal formed what he called a “half doughnut” -- a structure that only could have been formed by lightning. The way the steel melted and then re-hardened into wavy edges around the hole also required particularly intense heat. There were also places where spatter -- little drops of molten metal -- was ejected so violently that it formed a single string of metal. None of this would have been present, he opined, in a hole caused by a normal household electrical arc.

Finally, Eagar testified that he saw evidence of thermal cracking which, while it could have been caused by household current, is much more commonly caused by lightning strikes. Based on these indicia, it was his opinion that the hole had been caused by lightning and not household electricity.

Ward basically concedes that this analysis is consistent with the kind of examination that an expert in the field normally would conduct. Indeed,

Ward's own expert, John Gashinski, a materials scientist in the process of finishing up his master's degree, looked to many of the same indicia and even used criteria Dr. Eagar had developed in order to assess whether the perforation was lightning induced. Gashinski simply disagreed with Eagar as to whether these indicia were conclusive enough to say it was more likely than not that the hole was lightning induced.

Instead, Ward argues that Dr. Eagar's testimony should have been excluded because he drew unwarranted conclusions from poor-quality physical evidence and failed to adequately explain certain facts Ward says were crucial to his testimony. First, Ward argues that Dr. Eagar's testimony was unreliable because he made unwarranted assumptions. But Ward misconstrues Dr. Eagar's testimony. In the passage of Dr. Eagar's testimony Ward cites for containing unwarranted assumptions, Eagar candidly acknowledges that he could not find certain indicia because of the corrosion; in no way did he suggest that his ultimate conclusion was based on an assumption that these indicia were nonetheless present. Throughout his testimony, Eagar made it abundantly clear that his opinion was based on the size of the hole and the presence of specific indicia that remained identifiable despite the corrosion. There's nothing to suggest that Eagar's conclusions were based on the assumption that other indicia were present but concealed.

Next, Ward claims that the expert's testimony was unreliable because Dr. Eagar could not identify the particular lightning strike thought to have caused the perforation, nor did he calculate the peak current of the strike that caused the hole. But neither of these issues undermined his ultimate conclusion. Dr. Eagar offered that he did not need to know the peak current of the lightning strike because his testimony only had to rule out household current as a cause for the perforation. Nor does the fact that the 45-kiloamp strike referenced in his report does not match the eyewitness timeline provide a basis for excluding his testimony. As he explained at his deposition and confirmed at trial, he referenced this particular strike in his report only to demonstrate that the lightning storm was strong enough to produce a strike of the necessary strength. Neither of these issues rendered his testimony so unreliable as to require barring his opinion. The appropriate remedy for challenging the opinions offered by the Plaintiffs' expert was found in confrontation and cross-examination.

Ward argues, nevertheless, that Dr. Eagar's testimony was speculative because he failed to consistently identify what object in the attic the CSST arced with to cause the fire. As part of his testing Dr. Eagar analyzed the composition of metals found around the hole. Of note, he discerned zinc both around the hole and in the thermal crack. Significantly, zinc is found in galvanized steel -- not stainless steel -- and thus had to come from

somewhere other than the CSST. At trial, Dr. Eagar testified the zinc might have come from the chimney flue. Then, on cross-examination, defense counsel confronted Dr. Eagar with his deposition testimony where he had opined that the arc likely came from the HVAC system. Dr. Eagar explained that since that deposition he had learned that the HVAC system was not located close enough to be the source of the arc. He ultimately conceded that any number of structures in the attic could have been the source of the arc.

Ward now points to this inconsistency as evidence that Dr. Eagar's entire testimony is unreliable and based on speculation. But Eagar made it clear from the outset that he had not been tasked with addressing the source of the arc. And although Ward calls this a "crucial matter," Ward never explains what relevance the source of the arc would have on Dr. Eagar's conclusion that lightning provided the energy for the arc. While Ward could -- and did -- make use of this uncertainty in its cross-examination, Ward has not shown that it undermines the reliability of Dr. Eagar's ultimate conclusions to the extent that his testimony should have been excluded altogether.

Finally, Ward challenges Dr. Eagar's flame liftoff testimony. Again, Dr. Eagar explained how obstacles and enclosed spaces in the attic could have allowed sustained ignition of the escaping gas notwithstanding the pressure of the line. This testimony was based on experiments Dr. Eagar had conducted in

his own lab and replayed on videos to the jury during the trial. Ward doesn't argue that these experiments were falsified or doctored; instead, it says that the experiments were misleading and that Dr. Eagar's accompanying testimony was unreliable because he did not know how the CSST was laid out in the attic and thus could not identify a specific object that obstructed the flow of the expelled gas or provided the enclosed space necessary for flame liftoff.

This objection really goes to the weight, not the admissibility, of the expert's opinions. Dr. Eagar did not testify that a particular object served as the obstruction. Indeed, he acknowledged that he did not know the exact layout of the attic due to the fire, but as he explained, all it would take is some material within a foot or so of the hole, and CSST piping in this sort of residential structure is ordinarily laid between wall joists or floor joists rather than across open space.

Dr. Eagar's testimony demonstrated the conditions under which a flame could be sustained and acknowledged those in which it could not. The jury was free to apply what it learned from the evidence in the case -- eyewitness accounts of the fire starting in the attic and spreading quickly -- coupled with their own knowledge of piping and wiring in residential structures to decide whether sustained flame likely occurred in this case. As we've said many times, when drawing inferences from the evidence, juries may

“apply their common knowledge, observations and experience in the affairs of life.” United States v. Cruz-Valdez, 773 F.2d 1541, 1546 (11th Cir. 1985). It was well within the ken of the jury to decide whether some obstruction would likely have been present within a foot of the pipe. Again, any weakness in this testimony was appropriately addressed in Ward’s lengthy cross-examination and provides no basis for exclusion.

The long and short of it is that Dr. Eagar’s testimony meets the threshold for reliability. It was well grounded and the district court acted well within its considerable discretion to allow it in.

II.

As we have explained, the jury found for the Plaintiffs on three distinct theories of liability -- negligent design, strict liability, and failure to warn. The verdict form required an express finding on each separate theory, and an affirmative finding on any of the theories was sufficient to find liability. Ward has raised a variety of additional objections but they all address either the theory of strict liability or of failure to warn. None undermine the jury’s express findings on negligence. Because the negligence finding alone is sufficient to sustain the verdict, we need not and do not address any of Ward’s remaining arguments. See Stewart & Stevenson Servs., Inc. v. Pickard, 749 F.2d 635, 644 (11th Cir. 1984).

Accordingly, we affirm the judgment of the district court.

AFFIRMED.