778 F.3d 704
United States Court of Appeals,
Eighth Circuit.

UNION PACIFIC RAILROAD COMPANY,
Plaintiff–Appellant
v.
PROGRESS RAIL SERVICES CORPORATION,
Defendant–Appellee.
Union Pacific Railroad Company,
Plaintiff–Appellee
v.
Progress Rail Services Corporation,
Defendant–Appellant.

Nos. 13–2658, 13–2797. | Submitted: Oct. 9, 2014. | Filed: Feb. 11, 2015.

Synopsis

Background: Railroad commenced action in diversity alleging that negligence of railcar axle reconditioner had caused derailments. The United States District Court for the District of Nebraska, Laurie Smith Camp, Chief Judge, 2013 WL 1869779, precluded ultimate opinion of railroad's metallurgical engineer, and jury rendered verdict in favor of reconditioner. Railroad appealed.

Holdings: The Court of Appeals, Wollman, Circuit Judge, held that:

[1] district court did not abuse its discretion in excluding ultimate opinion of railroad's metallurgical engineer, and

[2] district court acted within its discretion in overruling railroad's foundation objections to testimony of reconditioner's mechanical engineer.

Affirmed.

West Headnotes (5)

[1] **Federal Courts**
Admission or exclusion in general

The decision to exclude or admit expert evidence is reviewed for abuse of discretion.

Cases that cite this headnote

[2] **Evidence**
Necessity and sufficiency

A district court is vested with a gatekeeping function to ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

Cases that cite this headnote

[3] **Evidence**
Necessity and sufficiency

Expert evidence may be excluded if there is simply too great an analytical gap between the data and the opinion proffered. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

1 Cases that cite this headnote

[4] **Evidence**
Cause and effect

District court did not abuse its discretion in excluding ultimate opinion of railroad's metallurgical engineer that axle failures had been caused by corrosion pits that reconditioner failed to remove during reconditioning, in railroad's action alleging that negligence of railcar axle reconditioner caused derailments, since expert could not rule out possibility that axle failures had been caused by corrosion pits or other surface defects that formed after axles left reconditioner's facility. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

Cases that cite this headnote

[5] **Evidence**
Cause and effect

In railroad's action alleging that negligence of railcar axle reconditioner in not removing corrosion pitting caused derailments, district court acted within its discretion in overruling railroad's foundation objections to testimony of reconditioner's mechanical engineer that he could not trace cause of fatigue cracks in axles to corrosion pitting, but he was able to trace cause of fatigue crack to fretting, which was type of damage that occurred between two surfaces that were pressed together; although engineer did not know how axles had been stored during years between derailments and his inspection, engineer explained that his opinion had been based on his inspection of axles, as well as forensic evidence that was developed by railroad's expert. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

Cases that cite this headnote

Attorneys and Law Firms

***705** Kyle Wallor, argued, Omaha, NE, (Joanna S. Thomas, Omaha, NE, on the brief), for appellant.

Michael Coyle, argued, Omaha, NE, (**Patrick S. Cooper**, Omaha, NE and Robert W. Futhey, Omaha, NE, on the brief) for appellee.

Before RILEY, Chief Judge, WOLLMAN and BYE, Circuit Judges.

Opinion

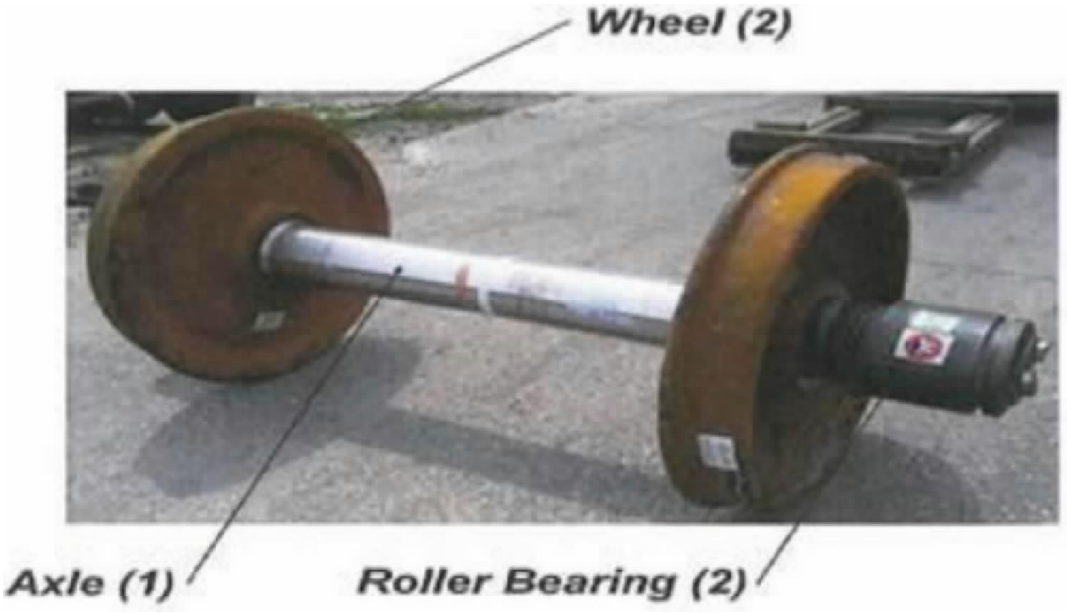
WOLLMAN, Circuit Judge.

Union Pacific Railroad Company (Union Pacific) filed suit against Progress Rail Services Corporation (Progress Rail), alleging that Progress Rail negligently reconditioned certain railcar axles, causing the axles to fail and two trains to derail. In support of its claims, Union Pacific offered the expert testimony of metallurgical engineer Hans Iwand. Progress Rail moved in limine to exclude Iwand's testimony. The district court[1] granted the motion in part, excluding Iwand's ultimate ***706** opinion that Progress Rail's negligence had caused the derailments. The district court determined that the methodology supporting Iwand's ultimate opinion did not satisfy the standards set forth in the Federal Rules of Evidence and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993). Iwand otherwise was allowed to testify.

The case went to trial and, following eight days of testimony, a jury returned a verdict in favor of Progress Rail. Union Pacific appeals, arguing that the district court abused its discretion in excluding Iwand's opinion and in admitting the opinion of Progress Rail's expert, Dr. Stuart Brown. Progress Rail has filed a conditional cross-appeal that challenges the district court's ruling regarding the 2007 amendment to the Federal Railway Safety Act and the denial of Progress Rail's motion for judgment as a matter of law. We affirm the judgment of the district court and dismiss the conditional cross-appeal as moot.

I. Background

A wheelset is the wheel-axle assembly of a truck in a railroad car. It consists of five main components: one axle, two wheels, and two bearings.



The body of a railcar axle is located between two wheel seats. The wheels sit on the wheel seats, which are located fifteen or sixteen inches from the end of the axle. Beyond each wheel seat, there is a two-inch long dust guard, an inch-and-a-half long fillet, and a journal that measures approximately twelve inches. The wheel seat, dust guard, fillet, and journal comprise the outside end of the axle. The journal is located at the far end of the axle and continues to the top of the fillet. The fillet has a wider diameter than the journal and expands circumferentially at the inside end of the journal to meet the dust guard. Bearings are pressed onto the journals at the end of the axle.

***707** Railcar axles are made of steel, which has a high stress level and a long life cycle.[2] A pit, crack, nick, dent, or gouge on the fillet or journal of an axle, however, is considered a stress riser. A stress riser is a surface injury or defect that can cause fatigue-induced cracking. The surface injury or defect in this case was corrosion pitting in the fillet area of the axles. "Pitting" refers to corrosion of the axle in the form of round pits on the surface of the dust guard, fillet, or journal.

Federal law prohibits railroads from placing or continuing in service any railcar axles that have certain defects, including pitting and cracks. 49 C.F.R. § 215.105. When

railcar inspections reveal prohibited defects, the axle can be reconditioned by removing the defects from the axle. Progress Rail reconditions axles for various railcar owners at its facility in Sidney, Nebraska.

This case arises out of two train derailments that occurred on Union Pacific track. In July 2007, a train of 135 loaded coal cars derailed near DeWitt, Iowa. In January 2010, a train of 123 loaded coal cars derailed near Martin Bay, Nebraska. In each case, Union Pacific determined that the derailment was caused by a failed railcar axle. In May 2006 and August 2009, respectively, Progress Rail had reconditioned the axles that allegedly caused the DeWitt and Martin Bay derailments.

Union Pacific filed suit against Progress Rail, claiming that Progress Rail negligently reconditioned the DeWitt and Martin Bay axles. Union Pacific alleged in its amended complaint that Progress Rail (1) failed to properly inspect the axles for corrosion pits prior to mounting roller bearings on the axles; (2) failed to properly remove corrosion pits; and (3) failed to properly refurbish the axles in accordance with industry standards, thereby causing the axles to fail. Union Pacific's expert Hans Iwand is a licensed professional engineer who has a master's degree in mechanical engineering and more than twenty-five years of experience in derailment investigation. Iwand inspected the fractured axles, examined the derailment sites, and performed testing on the component parts. He concluded that Progress Rail's negligence caused the DeWitt and Martin Bay axles to fail.

Iwand sought to testify that Progress Rail failed to properly remove corrosion pits from the fillet area of the DeWitt and Martin Bay axles when it reconditioned those axles. According to Iwand, corrosion pits act as stress risers and can cause axles to fail. Iwand sought to opine that the corrosion pits that Progress Rail allegedly ***708** failed to remove caused the axles to fail and the trains to derail. That the axles failed fifteen and five months after being reconditioned was significant to Iwand's opinion on causation: "The fact that the failures occurred so soon after the axle/bearing being reconditioned by Progress Rail indicates that there would have been conditions present on the axles (pitting, cracking, etc.) to reveal the axles should not have been returned to service." Iwand could not identify which corrosion pits caused the axles to fail, however, nor did he try to determine which corrosion pits developed after Progress Rail reconditioned the axles.

Progress Rail moved in limine to exclude Iwand's expert opinion. In its order on the motion, the district court explained that Iwand would be permitted to testify "that certain corrosion pits and fatigue cracks in the axle were present at the time Progress Rail refurbished them, ... that Progress Rail failed to remove such corrosion pits and fatigue cracks," and "that corrosion pitting and fatigue cracks in the fillet area of an axle can cause fractures in the journal, causing the axle to fail." D. Ct. Order of May 3, 2013, at 5. The district court ruled that Iwand would not be allowed to offer his ultimate opinion "that corrosion pits and/or fatigue cracks present in the axles before their refurbishing by Progress Rail actually caused the axle failures, or more likely than not caused the axle failures." *Id.* The district court determined that this portion of Iwand's opinion was not "supported by methodology that satisfies the standards of Fed.R.Evid. 702 and *Daubert*." *Id.*

The case proceeded to trial, and Iwand testified over the course of five days. During the course of his testimony, Union Pacific elicited the following opinions from Iwand: that there were corrosion pits on the DeWitt and Martin Bay axles when the axles left Progress Rail's facility; that corrosion pits cause axles to fail; that axle failure caused the DeWitt and Martin Bay derailments; and that Progress Rail should not have allowed the DeWitt and Martin Bay axles to be returned to service after reconditioning because corrosion pits remained on the axles.

Union Pacific also made an offer of proof, during which Iwand set forth the opinion he would have offered had he not been precluded from doing so and the methodology that he had used in reaching that opinion. Iwand explained that he "was able to rule out that there were any other conditions present or causative to the axle failure other than the presence of corrosion pits in the fillet area of the axle." The district court adhered to its order on the motion in limine, describing it as "really pretty narrow." The district court stated that it "was not persuaded by any particular methodology described by Mr. Iwand that he can say to a reasonable degree of certainty in his profession that the particular pits or cracks that were present in these axle journals at the time Progress Rail did its refurbishing were the cause of the axles fracturing."

Progress Rail's expert, Dr. Stuart Brown, has a doctorate in mechanical engineering and has spent more than thirty years studying and analyzing the fracture and fatigue of metals. Dr. Brown inspected the axles and reviewed photographs of the axles and related component parts that were taken immediately following the derailments. Dr. Brown concluded that Progress Rail had properly reconditioned the axles. He testified that no corrosion pitting remained on the DeWitt or Martin Bay axle fillets after Progress Rail reconditioned the axles, that the failure of the axles could not be attributed to the presence of

corrosion pits that Progress Rail did not remove, and that the failure of the ***709** axles was due to some fatigue-initiating process other than corrosion pitting. Although Union Pacific did not file a motion in limine to exclude Dr. Brown's testimony, it did object at trial to the foundation of his opinions. The district court overruled the objections.

II. Discussion

[1] [2] [3] We review the decision to exclude or admit expert evidence for abuse of discretion. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 143, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997). The opinion of a qualified expert witness is admissible if (1) it is based on sufficient facts or data, (2) it is the product of reliable principles and methods, and (3) the expert has reliably applied the principles and methods to the facts of the case. Fed.R.Evid. 702. The expert's scientific, technical, or other specialized knowledge must also "help the trier of fact to understand the evidence or determine a fact in issue." *Id.* The district court is thus vested with a gatekeeping function, ensuring that "any and all scientific testimony or evidence admitted is not only relevant, but reliable." *Daubert*, 509 U.S. at 589, 113 S.Ct. 2786. The Supreme Court identified in *Daubert* a number of factors that might assist the district court in determining the admissibility of expert evidence. *Id.* at 593–94, 113 S.Ct. 2786. The Court instructed district courts to focus on "principles and methodology, not on the conclusions that they generate." *Id.* at 595, 113 S.Ct. 2786. Expert evidence may be excluded if "there is simply too great an analytical gap between the data and the opinion proffered." *Joiner*, 522 U.S. at 146, 118 S.Ct. 512.

A. Exclusion of Iwand's Ultimate Opinion

[4] The district court did not abuse its discretion in excluding Iwand's opinion that the axle failures were caused by corrosion pits that Progress Rail failed to remove when it reconditioned the axles. Iwand could not say when the corrosion pits formed on the DeWitt and Martin Bay axles. He also could not trace the fatigue cracks that caused the axles to fail to specific corrosion pits. Progress Rail argued to the district court that in the absence of such information, there existed too great an analytical gap between the data and Iwand's ultimate opinion and that his opinion was thus unreliable.

Progress Rail pointed to the fact that a number of months had passed from the time Progress Rail had reconditioned the axles to the time the axles failed: fifteen months in the case of the DeWitt derailment; five months with respect to the Martin Bay derailment. During discovery, Union Pacific admitted that corrosion pits can form in a matter of weeks under certain conditions, and Iwand acknowledged in his expert report that "corrosion rates are inherently difficult to predict." Iwand testified at trial that certain photographs depicted abrasive marks passing over and through corrosion pitting on the axle journals, indicating that Progress Rail did not remove all of the corrosion pitting when it reconditioned the axles. Iwand's interpretation of the photographs supports his opinion that Progress Rail failed to remove corrosion pitting. Iwand, however, could not determine which corrosion pits caused the axles to fail, and he did not determine which corrosion pits developed on the axles after Progress Rail reconditioned them.[3] ***710** In light of this evidence, the district court fairly could have determined that a gap existed between the data and Iwand's ultimate opinion.

Union Pacific argues that Iwand considered and ruled out other potential causes for the axle failures and that his process-of-elimination methodology formed a reliable basis for his opinion. Iwand, however, did not distinguish between the corrosion pits that Progress Rail allegedly failed to remove and those that formed after the axles left Progress Rail's facility. Accordingly, even assuming that Iwand's process-of-elimination methodology was otherwise reliable, the district court did not abuse its discretion in excluding his ultimate opinion, given that Iwand could not rule out the possibility that the axle failures were caused by corrosion pits or other surface defects that formed after the axles left Progress Rail's facility.

The district court's ruling was not based on the conclusion that Iwand's methodology generated, nor did the district court apply a more stringent standard to Union Pacific's expert evidence than it did to Progress Rail's. Iwand and Dr. Brown conducted similar inspections of the axles, and Union Pacific presented to the jury the data Iwand gathered from his inspection and the opinions that that data supported. We agree with the district court's characterization of its order as narrow, in that it addressed the gap between the data and Iwand's proffered opinion and excluded only his ultimate opinion that the axle failures were caused by corrosion pits that Progress Rail failed to remove. *See Joiner*, 522 U.S. at 146, 118 S.Ct. 512. Thus, the district court properly exercised its gatekeeping function in excluding Iwand's ultimate opinion as unreliable.

B. Admission of Dr. Brown's Expert Opinion

[5] Union Pacific argues that the district court abused its discretion in admitting Dr. Brown's testimony "because his opinions are wholly unconnected to the facts of this case." It contends that Dr. Brown "refused to consider pertinent facts" and instead "inspected and considered one piece of evidence—the axles themselves." As mentioned above, Union Pacific did not move in limine to exclude Dr. Brown's opinions. Accordingly, there is no district court order for us to review. Union Pacific instead has cited the objections it made at trial to Dr. Brown's opinions that no corrosion pits remained on the DeWitt axle after it was reconditioned, that the derailments were not caused by corrosion pits, and that the cause of the Martin Bay axle failure was fatigue initiation caused by fretting.[4]

Having reviewed the transcript pages cited in Union Pacific's opening brief, we find no abuse of discretion in the district court's rulings. Iwand and Dr. Brown reached opposite conclusions about whether corrosion pits remained on the axles after Progress Rail reconditioned them. In a sidebar conference, Union Pacific's counsel argued that Dr. Brown's opinion was unreliable because he examined the ***711** DeWitt and Martin Bay axles in August 2012 and did not know how the axles were stored during the years between the derailments and his inspection. After Dr. Brown explained that his opinion was based on his inspection of the axles, as well as the forensic evidence that was developed by Iwand, the district court overruled Union Pacific's objection to the foundation of his opinion.

Dr. Brown also explained that he found no corrosion pitting associated with the fracture initiation sites on the axles. He opined that without corrosion pitting present at the initiation sites, the derailments could not be attributed to the presence of corrosion pits that purportedly were not removed during the reconditioning process. Dr. Brown testified that he found fretting on the fracture initiation site of the Martin Bay axle, however. He opined that "the fretting introduced a stress concentration which allowed a fatigue crack to initiate and grow." Union Pacific has not identified any gap in Dr. Brown's methodology, and his testimony is clear: He could not trace the cause of the fatigue cracks to corrosion pitting, but he was able to trace the cause of the fatigue crack in the Martin Bay axle to a specific defect-fretting. Accordingly, we conclude that Progress Rail laid an adequate foundation for Dr. Brown's opinions and that the district court acted within its discretion when it overruled Union Pacific's objections.[5]

III. Conclusion

The judgment is affirmed. The conditional cross-appeal is dismissed as moot.

All Citations

778 F.3d 704, 96 Fed. R. Evid. Serv. 1042

Footnotes

1 The Honorable Laurie Smith Camp, Chief Judge, United States District Court for the District of Nebraska.

2 Indeed, the axles at issue in this case were manufactured in the 1970s.

3 Union Pacific argues that Iwand "identified the specific corrosion pitting in the axle that caused the [Martin Bay] derailment," citing Iwand's trial testimony that certain photographs showed corrosion pitting associated with fatigue cracks on the Martin Bay axle. Iwand's testimony supports his opinion that corrosion pitting preexisted Progress Rail's reconditioning of the axles, but Union Pacific has cited no evidence to substantiate the opinion that the corrosion pitting he identified caused the Martin Bay axle to fail.

4 Iwand defined the term "fretting" as "a type of damage that occurs between two surfaces that are pressed together; in other words, they [a]re pushing together, but there [i]s still micromotion that takes place between the two pieces. That micromotion, at a microscopic level, allows the parts to weld together between the two pieces. And then as that motion continues, they break." Dr. Brown explained that the fretting on the Martin Bay axle occurred when the "contact between the backing ring of the bearing and the fillet ... generated a dent, a line in the fillet in that area; actually multiple lines."

5 To the extent Union Pacific raised additional arguments in its reply brief, we decline to consider them. *See Navarijo–Barrios v. Ashcroft,* 322 F.3d 561, 564 n. 1 (8th Cir.2003) ("It is well settled that we do not consider arguments raised for the first time in a reply brief.").