App. 1

NOT PRECEDENTIAL

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 17-3182

ELIZABETH C. SNIDER, Individually and as Executrix of the estate of Daniel A. Snider;
L. W. S., a minor, by his mother, Elizabeth C. Snider

v.

STERLING AIRWAYS, INC.; CONTINENTAL MOTORS, INC.; TDY INDUSTRIES, LLC; TELEDYNE TECHNOLOGIES INCORPORATED; TECHNIFY MOTOR (USA), INC.

CONTINENTAL MOTORS, INC; TDY INDUSTRIES, LLC; TELEDYNE TECHNOLOGIES INCORPORATED; TECHNIFY MOTOR (USA), INC.,
Third Party Plaintiffs

v.

UNITED STATES OF AMERICA,
Third Party Defendant

Continental Motors, Inc.,
Appellant

App. 2

Appeal from the United States District Court
for the Eastern District of Pennsylvania
(D.C. No. 2-13-cv-02949)
District Judge: Honorable J. Curtis Joyner

Submitted Under Third Circuit LAR 34.1(a)
July 12, 2018

Before: MCKEE, VANASKIE, and RESTREPO,
Circuit Judges

(Opinion filed: December 28, 2018)

OPINION*

McKEE, Circuit Judge

Continental Motors, Inc. appeals the judgment entered in favor of Elizabeth Snider following a jury trial. Mrs. Snider sued Continental after her husband was tragically killed in a plane crash. She argued that Continental's negligence in the manufacturing of a component of the plane's engine caused the crash. The jury agreed. Continental now raises four claims of error. We

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* This disposition is not an opinion of the full Court and under I.O.P. 5.7 does not constitute binding precedent.

will affirm for essentially the reasons stated in the district court's thorough, well-reasoned opinions.[1]

I.

Mrs. Snider's lawsuit alleged that the plane crash that killed her husband was caused by a defective cylinder assembly in the airplane's engine. Sterling Airways replaced that cylinder assembly in 2004 after purchasing the assembly from Continental. After years of discovery, the case was tried to a jury. Mrs. Snider's evidence showed that a defective exhaust valve guide in the cylinder assembly failed, which in turn caused the engine to stop thus causing the plane to crash. The jury returned a verdict against Continental and in favor of Mrs. Snider.[2] It ultimately assessed more than three million dollars in damages. This appeal followed.

II.

Continental raises four claims of error. Because we fully adopt the district court's disposition of these issues, we need only briefly address each.

First, Continental claims that the General Aviation Revitalization Act ("GARA") insulated it from

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[1] *See Snider v. Sterling Airways*, No. 13-CV-2949, 2017 WL 2813223 (E.D. Pa. June 29, 2017) ("*Snider I*"); *Snider v. Sterling Airways*, No. 13-CV-2949, 2017 WL 6336596 (E.D. Pa. Sep. 5, 2017) ("*Snider II*").

[2] The jury also found some negligence on Sterling's behalf, but concluded that the negligence was not a factual cause of the accident.

liability.[3] GARA bars lawsuits against the manufacturer of an aircraft or any "component, system, subassembly, or other part of the aircraft" if the manufacturer's product failed more than eighteen years after the product was delivered.[4] However, where a "new component, system, subassembly, or other part" replaces an existing part in the aircraft, the eighteen year limitation period restarts on the day the replacement procedure is completed.[5] If eighteen years passes after the date of replacement, the manufacturer of the replacement part is protected from suit.[6]

Continental argues that GARA protects it from liability because it did not manufacture the exhaust valve guide in the replacement cylinder assembly and therefore did not manufacture any part on the airplane that was installed within eighteen years of the crash. We reject this argument. Although, as the district court recognized, "the cylinder assemblies incorporated exhaust valve guides" that were manufactured by a third-party, nevertheless the "exhaust valve guides (which were assigned Continental Part No. 636242) were designed by Continental and manufactured specifically for Continental[.]"[7] Continental then tested

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[3] GARA is codified in the Notes of 49 U.S.C. § 40101. *See* 49 U.S.C § 40101, Note; Pub.L.No. 103-298, 108 Stat 1552 (1994). Hereinafter, we will cite the act simply as GARA.

[4] GARA § 2(a).

[5] *Id.* § 2(a)(2).

[6] *Id.*

[7] *Snider I*, 2017 WL 2813223, at *4.

the hardness of the exhaust valve guides and individually reamed each guide to specifically fit a particular Continental cylinder assembly.[8] Based on this testimony, there was sufficient evidence for the jury to conclude that Continental "manufactured" the replacement cylinder assembly notwithstanding the precursor parts that Continental obtained from a third-party. Continental's replacement cylinder assembly was installed approximately six years before the accident, so we agree with the district court's conclusion that GARA's eighteen year limitation did not bar suit against Continental.[9]

Second, Continental argues that the evidence did not show that the manufacturing defect caused the accident. As with all products liability claims, Mrs. Snider was required to prove causation "by demonstrating that a specific defendant is responsible for the harm alleged."[10] The district court thoroughly recounted the evidence that showed that Continental's manufacturing defect in the cylinder assembly caused the plane to crash, killing its occupants.[11] We adopt its reasoning in full and similarly conclude that there was

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[8] *Id.*

[9] *See id.* at *2–5.

[10] *Robertson v. Allied Signal, Inc.*, 914 F.2d 360, 366 (3d Cir. 1990).

[11] *Snider I*, 2017 WL 2813223, at *7–8; *Snider II*, 2017 WL 6336596, at *6. We highlight that one [sic] Mrs. Snider's experts, Colin Sommer, testified unequivocally that his "analysis revealed that we had a broken guide because the guide was soft. The broken guide caused a broken valve, which broke the engine." (N.T. 1/26/2017, 100).

amply sufficient evidence to show that Continental's defective assembly caused the crash.

Third, Continental asserts that the district court improperly submitted Snider's failure to warn claim to the jury because 1) GARA prohibits such claims brought more than eighteen years after the aircraft's first delivery, and 2) the instructions were misleading. "A party is entitled to a jury instruction that accurately and fairly sets forth the current status of the law."[12] A party does not have [sic] "have the right to a jury instruction of its choice, or precisely in the manner and words of its preference."[13] Rather, we evaluate the charge to ensure that it fairly and adequately sets forth the law applicable to the case.[14]

Continental's first argument can readily be dismissed for the reasons discussed above—GARA's eighteen year statute of repose did not shield Continental because it manufactured the cylinder assembly that was installed in 2004. Continental's counterarguments are brief and unclear. It relies on an opinion from the Court of Appeals for the Ninth Circuit that held that a "failure to warn about a newly perceived problem" does not restart GARA's eighteen-year clock absent the installation of a new component part.[15] In so holding, the Ninth Circuit declined to read a "duty

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[12] *Douglas v. Owens*, 50 F.3d 1226, 1233 (3d Cir. 1995).

[13] *Id.*

[14] *Id.*

[15] *Lyon v. Agusta S.P.A.*, 252 F.3d 1078, 1088 (9th Cir. 2001).

to upgrade and update" into GARA's text.[16] *Lyon* is inapposite because it was not Continental's failure to warn that reset GARA's eighteen-year bar here. Rather, it was the installation of the new cylinder assembly. Accordingly, this claim fails from its inception. We also reject Continental's claim that the district court's instruction was misleading. Having reviewed the instruction, we find it accurately conveyed the law to the jury, and we adopt the district court's conclusion to that effect.[17]

Finally, Continental raises two main challenges to the district court's evidentiary rulings. First, it argues that the court erred when it failed to either limit or bar testimony from two of Mrs. Snider's experts, William Carden and Colin Sommer. It asserts that Carden's testimony was too unreliable and speculative to support his ultimate conclusion that the exhaust valve guide had been defectively manufactured and that Sommer testified to matters beyond his proffered area of expertise of aircraft accident investigation.

We disagree. First, we note that counsel for Continental did not object to Mr. Carden's qualification as an expert and, in fact, failed to ask a single question during *voir dire*.[18] In any event, we find that Mr. Carden's expert testimony was admissible. Continental points to several areas of the expert's testimony that were contradicted by their own expert, and to

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[16] *Id.*

[17] *See Snider II*, 2017 WL 6336596, at *9–10.

[18] JA 1192.

places in the record where Mr. Carden acknowledged that he was unable to testify with specificity about certain conditions that existed at the time of manufacture. But these concerns implicate the weight of Mr. Carden's testimony, not its admissibility.[19]

As for Mr. Sommer, we agree with the district court that to the extent that his testimony referenced metallurgical terms and processes, such testimony was admissible. Although, Mr. Sommer did not testify as an expert on metallurgy, he was permitted to rely on the findings of other experts in forming his conclusions. He also was permitted to explain that reliance to the jury when discussing how he arrived at his ultimate conclusions. Accordingly, we reject this claim for the reasons discussed by the district court.[20]

Next, Continental attacks the district court's admission of "Certificates of Compliance," "Service Difficulty Reports," and other third-party documents relating to exhaust valve guide failures. We agree with the district court that such evidence was "wholly relevant and not unfair or unduly prejudicial to the interests of" Continental.[21] We also note that Continental's substantial reliance on our opinion in *Barker v. Deere*

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[19] *See Kannankeril v. Terminix Intern., Inc.*, 128 F.3d 802, 809 (3d Cir. 1997) ("If the expert meets liberal minimum qualifications, then the level of the expert's expertise goes to credibility and weight, not admissibility . . . [T]he expert's alleged shortcomings were raised properly on cross-examination and went to the credibility, not the admissibility, of his testimony.").

[20] *Snider II*, 2017 WL 6336596, at *12.

[21] *Id.* at *13.

& Co.[22] is patently misplaced. That case held that "when a plaintiff attempts to introduce evidence of other accidents as direct proof of a design defect, the evidence is admissible only if the proponent demonstrates that the accident occurred under circumstances substantially similar to those at issue in the case at bar."[23] This case did not involve a design defect, nor was the evidence introduced to serve as direct evidence of a defect of any kind. Rather, it was introduced to show that Continental had knowledge that its exhaust valve guides were dangerous. Consequently, we reject this claim as well.

III.

For the foregoing reasons, we will affirm the judgment of the district court and the court's analysis as explained in its very well-reasoned and thorough opinions.

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[22] 60 F.3d 158 (3d Cir. 1995).

[23] *Barker*, 60 F.3d at 162.

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT
OF PENNSYLVANIA**

ELIZABETH C. SNIDER, Individually and as Executrix of the Estate of DANIEL A. SNIDER, and LEE W. SNIDER, a minor, by his mother, ELIZABETH C. SNIDER Plaintiffs vs. STERLING AIRWAYS, INC., and CONTINENTAL MOTORS, INC., Defendants	CIVIL ACTION NO. 13-CV-2949

MEMORANDUM AND ORDER

JOYNER, J. **June 28, 2017**

This case is again pending before this Court on Motion of the Defendant, Continental Motors, Inc. Presently, Continental renews its previous request for entry of judgment in its favor as a matter of law pursuant to Fed. R. Civ. P. 50(b). For the reasons which follow, the Renewed Motion shall be denied.

History of the Case

This is the remaining lawsuit of three[1] assigned to the undersigned, all of which arose out of the tragic crash of a Cessna T210L single engine aircraft in the early afternoon hours of June 21, 2010 as it neared the William T. Piper Memorial Airport in Lock Haven, Pennsylvania. As a result of the accident, which was caused by a total engine failure as the plane was preparing to land, the pilot, Patrick Jessup, and his two passengers, United States Forest Service employees Rodney Whiteman and Daniel Snider were killed. At the time of the accident, Messrs. Whiteman and Snider were in the process of conducting an aerial deforestation survey on behalf of the Forest Service. The plane was being operated pursuant to a charter plane and pilot contract between its owner, Defendant Sterling Airways, Inc. of Hornell, New York and the U.S. Forest Service, dated March 28, 2008. The accident airplane had been manufactured in 1973 and was equipped with a Continental Motors' TSIO-520-H engine that had last been overhauled in 2004.

The essence of the complaints in the actions filed by the estates of the three individuals killed as a result of the crash was that the accident resulted from the negligence, gross negligence, recklessness and/or strict liability on the part of the defendants in, *inter alia*, the manufacture, maintenance and operation of the

[1] Those other matters, Lewis-Whiteman v. Continental Motors, Inc., et. al., Civ. A. No. 13-CV-2950, and Jessup v. Continental Motors, Inc., et. al., Civ. A. No. 12-CV-4439 have since been amicably resolved by the parties.

Cessna, its engine and component parts. As noted, the lawsuits instituted on behalf of the Estates of Mr. Jessup and Mr. Whiteman were settled, but this action, filed on behalf of Mr. Snider and his Estate, was tried over a three-week period commencing on January 23, 2017. On February 16, 2017, the jury returned a verdict in favor of the Plaintiff and against Continental Motors, Inc. only in the amount of $2,753,048.49. Although Sterling Motors was found to have breached its contract with the U.S. Forest Service and to have been negligent, the jury found that Sterling's negligence and breach were not factual causes of the accident. By the motion which is now before us, Continental asserts that it is entitled to the entry of judgment as a matter of law for two reasons: "(1) there is no legally sufficient basis for a reasonable jury to find that CMI '**manufactured**' a new component or part that caused the accident under the rolling provision of GARA §2(a)(2); and/or (2) plaintiffs' claims fail under GARA and Pennsylvania tort law because plaintiffs failed to prove that the No. 2 exhaust valve guide's allegedly deficient material hardness **caused** the exhaust value guide to fail." (Defendant Continental Motors, Inc.'s Renewed Motion for Judgment as a Matter of Law Pursuant to Fed. R. Civ. P. 50(b), at p.1).

Standards Governing Rule 50(b) Motions

"A court may grant a motion for judgment as a matter of law against a party when 'a party has been fully heard on an issue during a jury trial and the court finds that a reasonable jury would not have a legally

sufficient evidentiary basis to find for the moving party on that issue.'" Shrey v. Kontz, 981 F. Supp. 2d 333, 337 (M.D. Pa. 2013) (quoting Fed. R. Civ. P. 50(a)). "After trial, a party may renew their motion pursuant to Fed. R. Civ. P. 50(b)." Id. "A court may grant a renewed motion for judgment as a matter of law in favor of a party 'if there is a legally sufficient evidentiary basis for a reasonable jury to find' for the opposing party on a particular issue." Graco Children's Products, Inc. v. Century Products Company, Inc., Civ. A. No. 93-6710, 1996 U.S. Dist. LEXIS 10356 at *12 – *13 (E.D. Pa. July 23, 1996) (quoting Fed. R. Civ. P. 50(a)(1)(b)). Under well-established Third Circuit precedent, regardless of whether made under Rule 50(a) or 50(b):

> Such a motion should be granted only if, viewing the evidence in the light most favorable to the nonmovant and giving it the advantage of every fair and reasonable inference, there is insufficient evidence from which a jury reasonably could find liability. In determining whether the evidence is sufficient to sustain liability, the court may not weigh the evidence, determine the credibility of witnesses, or substitute its version of the facts for the jury's version.

McDaniels v. Flick, 59 F.3d 446, 453 (3d Cir. 1995); Lightning Lube, Inc. v. Witco Corp., 4 F.3d 1153, 1166 (3d Cir. 1993); Mancini v. Northampton County, 836 F.3d 308, 314 (3d Cir. 2016); Shrey, 981 F. Supp. 2d at 338. Stated otherwise, "a renewed motion for judgment as a matter of law 'may be granted under Fed. R. Civ. P. 50(b) only if, as a matter of law, the record is

critically deficient of that minimum quantity of evidence from which a jury might reasonably afford relief.'" Pollock v. Energy Corp. Of America, Nos. 15-2648, 15-2649, 665 Fed. Appx. 212, 216, 2016 U.S. Dist. LEXIS 19167 at *7 – *8 (3d Cir. Oct. 24, 2016) (quoting In re Lemington Home for the Aged, 777 F.3d 620, 626 (3d Cir. 2015)). And again, being mindful that credibility determinations, the weighing of the evidence, and the drawing of legitimate inferences from the facts are jury functions and not those of a judge, in its review of the record as a whole the court must disregard all evidence favorable to the moving party that the jury is not required to believe. Avaya Inc., RP v. Telecom Labs, Inc., 838 F.3d 354, 373 (3d Cir. 2016) (citing Reeves v. Sanderson Plumbing Products, Inc., 530 U.S. 133, 150-51, 120 S. Ct. 2097, 147 L. Ed.2d 105 (2000)).

Discussion

1. Applicability of GARA's "Rolling Provision"

We turn first to Continental's claim that there is no legally sufficient basis upon which the jury could find that it manufactured a new component or part which in fact caused the subject accident so as to fall within the scope of the "rolling provision" of GARA. Thus, Continental argues, because it manufactured the accident aircraft engine more than 18 years before the accident, Plaintiff's claims against it are barred and judgment should now be entered in its favor.

"GARA" is the abbreviated title for the General Aviation Revitalization Act of 1994 which is codified in

the notes to 49 U.S.C. §40101. As "the legislative history makes clear, . . . Congress enacted GARA to ameliorate the impact of long-tail liability on a declining American aviation industry in furtherance of the national interest." Prigden [sic] v. Parker Hannifin Corp., 591 Pa. 305, 309, 916 A.2d 619, 622 (2007). "A key assumption underlying GARA was the notion that any design defects in aircraft components generally will be discovered within the eighteen year period preceding repose. Id, (citing H.R. Rep. No. 103-525(I) at 3 (1994)). Section 2(a) of GARA reads as follows:

> (a) In general. Except as provided in subsection (b), no civil action for damages for death or injury to persons or damage to property arising out of an accident involving a general aviation aircraft may be brought against the manufacturer of the aircraft or the manufacturer of any new component, system, subassembly, or other part of the aircraft, in its capacity as a manufacturer if the accident occurred –
>
> > (1) after the applicable limitation period beginning on–
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> > > (A) the date of delivery of the aircraft to its first purchaser or lessee, if delivered directly from the manufacturer; or
> > >
> > > (B) the date of first delivery of the aircraft to a person engaged in the business of selling or leasing such aircraft; or

> (2) with respect to any new component, system, subassembly, or other part which replaced another component, system, subassembly, or other part originally in, or which was added to, the aircraft, and which is alleged to have caused such death, injury, or damage, after the applicable limitation period beginning on the date of completion of the replacement or addition.

"[T]he term 'limitation period' means 18 years with respect to general aviation aircraft and the components, systems, subassemblies and other parts of such aircraft." GARA §3(3). GARA has therefore been said to be a statute of repose, not a statute of limitations. As our colleague Judge DuBois succinctly explained in Robinson v. Hartzell Propeller, Inc., 326 F. Supp. 2d 631 (E.D. Pa. 2004):

> Statutes of limitations prohibit lawsuits if a period of time has elapsed after an accident occurs or is discovered. Statutes of repose bar suits brought more than a certain period of time after a product is manufactured and delivered to the purchaser.

Id, at 646 (citing Burroughs v. Precision Airmotive Corp., 78 Ca. [sic] App. 4th 681, 93 Cal. Rptr. 2d 124, 130 (Cal. Ct. App. 2000)). This means that "[u]nder GARA §2(a)(2), a new eighteen year period begins when a new part is added to an aircraft if this part is alleged to have caused an accident." Id, at 660. In other words, the new limitation period begins when a new system replaces an old system, a new component

replaces an old component, etc. because "'replacement' requires two acts: removal of the old and substitution of the new." Hiser v. Bell Helicopter Textron, Inc., 4 Cap. [sic] Rptr. 3d 249, 111 Cal. App. 4th 640, 650 (CA. App. 2003). However, as multiple courts have noted,

> Congress' intent to provide repose for aircraft manufacturers would be effectively nullified . . . if plaintiffs could lump each new part into large systems for purposes of GARA's rolling provision. If that were the case, parts that were manufactured at the time of the original sale and whose design had proven useful and safe over the years could become the basis of a suit later, not because they were new or had been altered in the last 18 years, but because another part in the same system had been replaced.

Id.; Sheesley v. Cessna Aircraft Co., No. Civ. 02-4185, 2006 U.S. Dist. LEXIS 27133 at *25 (D.S.D. April 20, 2006); Hinkle v. Cessna Aircraft Co., No. 247099, 2004 Mich. App. LEXIS 2894 (Mich. Ct. App. Oct. 28, 2004); McCarthy v. Cessna Aircraft Co., No. 02-CV-1240, 2005 U.S. Dist. LEXIS 47672 at * 5 (S.D. Ill. July 14, 2005). See also, Crouch v. Honeywell International, Inc., 720 F.3d 333, 343 (6th Cir. 2013) ("Section 2(a)(2) cannot be reasonably construed as meaning that the 18-year period of repose for the entire engine is reset every time a single sub-part is replaced).

Moreover, because "manufacturer" is not defined in GARA, it is appropriate to consider the underlying Congressional policy and legislative history in

construing the statute in this regard as well. Pridgen v. Parker Hannifin Corp., 588 Pa. 405, 905 A.2d 422, 435 (2006) (citing Patterson v. Shumate, 504 U.S. 753, 761, 112 S. Ct. 2242, 2248, 119 L. Ed.2d 519 (1992) and Mason v. Schweizer Aircraft Corp., 2002 Iowa Sup. LEXIS 228, 653 N.W. 2d 543, 548 (2002)). The meaning of "manufacturer" for purposes of the act is a question of law for the court, which should be mindful that the term is not uniform in scope throughout the text of GARA. Burton v. Twin Commander Aircraft, LLC, 171 Wn. 2d 204, 216, 254 P. 3d 778, 783 (2011) (citing Pridgen, 588 Pa. At 421-22 and Burroughs, 78 Cal. App. 4th at 688); Stewart v. Precision Airmotive Corp., 2010 PA Super 168, 7 A.3d 266, 275 (2010). Indeed, while most of the courts to have considered the issue have held that type certificate[2] holders, like the holders of a parts manufacturer approval or "PMA", are "manufacturers" for purposes of GARA's statute of repose, GARA has also been held to apply to successors that purchase

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[2] "A type certificate includes the type design, which outlines the detailed specifications, dimensions, and materials used for a given product; the product's operating limitations; a 'certificate data sheet,' which denotes the conditions and limitations necessary to meet airworthiness requirements; and any other conditions or limitations prescribed under FAA regulations." Sikkelee v. Precision Airmotive Corp., 822 F.3d 680, 684 (3d Cir. 2016). "The FAA issues type certificates for aircraft, aircraft engines, propellers and appliances to ensure that aircrafts and their parts are safe. . . . To receive a type certificate, a manufacturer must demonstrate to the Administrator of the FAA that the products, design, specifications, and manufacturing process meet all applicable FAA regulations." Pease v. Lycoming Engines, Civ. A. No. 4:10-CV-843, 2011 U.S. Dist. LEXIS 145344 at *40 – *41 (M.D. Pa. Dec. 19, 2011) (citing 49 U.S.C. § 44704).

aircraft product lines from the original manufacturer and hold Type Certificates. Burton, 171 Wn. 2d at 217, 254 P. 3d at 784 (citing *inter alia*, S. Side Trust & Sav. Bank of Peoria v. Mitsubishi Heavy Inds., Ltd., 401 Ill. App. 3d 424, 452-455, 927 N.E. 2d 179, 339 Ill. Dec. 638 (2010); Pridgen, 588 Pa. at 425; Mason v. Schweizer Aircraft Corp., 653 N.W. 2d 543, 548-549 (Iowa 2002)); Scott v. MD Helicopters, Inc., 834 F. Supp. 2d 1334, 1339 (M.D. Fla. 2011). See also, Hasler Aviation, L.L.C. v. Aircenter, Inc., No. 1:06-CV-180, 2007 U.S. Dist. LEXIS 56856 (E.D. Tenn. Aug. 3, 2007) (quoting Pridgen, 905 A.2d at 425 with approval for proposition that "a type certificate 'is an essential prerequisite to manufacture in the aviation industry'"). Under the reasoning of the Pennsylvania Supreme Court, however, the term "manufacturer," in the context of the rolling provision, is limited to the actual manufacturer of a replacement product, or one who supplies the replacement product as its own. Stewart, supra, (citing Pridgen, 905 A.2d at 437.

In reviewing the trial record of this case under the lens of the preceding authority, we find that Plaintiff produced sufficient documentary and testimonial evidence at trial that Continental manufactured a replacement part which was installed in the accident aircraft's engine some six years prior to the June, 2010 crash so as to fall within GARA's rolling provision. To be sure, the trial record evinces that in May 2004, Sterling Motors' Director of Maintenance performed the required total overhaul of the accident airplane's engine. At that time, all six of the engine's cylinder assemblies

were removed and replaced with new cylinder assemblies which were manufactured in December, 2003 bearing Continental Motors' Part No. 65547083. (N.T. 1/25/17, pp. 94–99, 101; N.T. 2/3/17, pp. 82, 104; N.T. 2/8/17, pp. 19–20; Pl's Exhibits 239, 245, 253). Although the cylinder assemblies incorporated exhaust valve guides which were manufactured by Roderick Arms & Tool, the exhaust valve guides (which were assigned Continental Part No. 636242) were designed by Continental and manufactured specifically for Continental by Roderick. As part of its routine manufacturing practices and as part of its quality assurance procedures, prior to its installation of the exhaust valve guides into its cylinder assemblies, Continental tests samples from each batch of valve guides which it receives from Roderick Arms & Tool to ensure that the components meet the necessary engineering and manufacturing criteria. (N.T. 1/25/17, pp. 108–123; N.T. 2/1/17, p. 54; N.T. 2/8/17, pp. 23–27, 33–34, 36–46; Pl's Exhibit 249). Unlike an after-market parts manufacturer which is required to undergo a similar FAA-certification process as does the holder of a Type Certificate, Roderick is an FAA-approved components supplier under Continental's Quality Control System. (N.T. 2/1/17, pp. 36–39; N.T. 2/8/17, 22–28).

Because a lot of movement between the valve and guide is harmful, the valve needs to fit fairly tightly in the valve guide. In order to make them fit, the valve guide has to be inserted into the cylinder head using a process by which the cylinder head is heated up and then the guide is pushed into the cylinder head using

a press and reamed in place.[3] (N.T. 1/25/17, pp. 103–104; 2/1/17, pp. 74–76). This process was followed by Continental in the process of completing the assembly of its cylinder and thereby essentially eliminating the guide. (N.T. 2/1/17, pp. 77–79). In 2007, Sterling became aware that there was a problem with the No. 3 and No. 5 cylinders in the accident engine and it accordingly sent out those two cylinders to have the parts replaced. (N.T. 2/2/17, 151–153). This is clear evidence that the exhaust valve guide manufactured and supplied by Roderick was incorporated into and made a part of the No. 2 cylinder/cylinder assembly manufactured by Continental Motors. It was that No. 2 cylinder which failed, thereby causing the Cessna's engine to fail and the subject accident to occur. We therefore find that inasmuch as Continental was the manufacturer of the cylinder which caused the accident, GARA's rolling provision is properly applied and Plaintiffs' claims against Continental are not barred.

2. Failure to Prove Hardness Deficiency Caused Accident

As previously stated, Continental's second argument in support of its Renewed Rule 50(b) motion is that Plaintiffs' claims fail under GARA and Pennsylvania tort law because plaintiffs failed to prove that

[3] Reaming is an industrial term for inserting a reamer, which is essentially a drill bit or cutting tool, down into the guide and then taking off any excess material so that it's exactly the right dimension to fit over the valve system. (N.T. 1/25/17, p. 104; N.T. 1/26/17, pp. 20–21).

the No. 2 exhaust valve guide's allegedly deficient material hardness caused the exhaust valve guide to fail. Following our review of the trial record, we find that this argument is also meritless.

In the course of the presentation of their case, Plaintiffs presented a number of expert witnesses with expertise in metallurgy, materials sciences and accident investigation and reconstruction. Colin Sommer, an expert in the field of aircraft accident investigation, is a licensed mechanical engineer with a Bachelor of Science degree in civil and environmental engineering with an emphasis in structural design who has investigated some 400 aircraft accidents. Mr. Sommer testified that his examination of the accident aircraft's engine and the No. 2 cylinder in particular, revealed that the No. 2 piston had been destroyed by the failure of the valve system in the No. 2 cylinder. (N.T. 1/25/17, p. 127–128). The No. 2 valve head had become detached from the No. 2 valve system, and the metallurgical examination of the exhaust valve system showed that there was evidence of fatigue on the fracture surface of the exhaust valve system which meant that as the valve was riding up and down inside the cylinder, the valve became crooked because of wear that was found between the valve guide and the valve system. As a result, the valve started to bang up against the valve seat where it seals and eventually broke the head off of that valve. Once that happened, the valve was rolling around inside the cylinder while the piston was traveling up and down inside at 22 times per second. Eventually, the piston was destroyed, followed by the

connecting rod, which was actually torn off of the crankshaft. In short, Mr. Sommer testified that the destruction of the No. 2 piston was the result of the failure of the No. 2 exhaust valve head, and the No. 2 exhaust valve head failure resulted from the failure of the No. 2 exhaust valve and guide which then cascaded to the destruction of the rest of the engine. (N.T. 1/25/17, pp. 129–131).

According to this witness: "the purpose behind hardening something is generally wear resistance. It's the same reason that you wouldn't make an aircraft engine crank case out of plastic or wood. You have to make it out of something tough, something strong, something that is resistant to wear." (N.T. 1/26/17, p. 17–18). Typically, the exhaust valves are subject to much more heat and wear than are intake valves. (N.T. 1/26/17, p. 87). In an effort to determine why the valve guide wore in the foregoing manner, Mr. Sommer, as part of his accident investigation and in conjunction with the McSwain Engineering laboratory, performed the same type of test that Continental would perform[4] on the valve to determine whether or not it met

[4] When Continental accepts shipments of valve guides from its supplier Roderick, they routinely inspect samples from the various lots received for hardness to ensure that the guides are in compliance with their specifications. When the sampling tests are completed, Continental's inspector completes a form called a Certificate of Compliance approving the batch if the lot's samples fell within the specified hardness rating of Rockwell B 75-90. (N.T. 1/26/17, pp. 26–33; Pl's Exhibits 294, 296, 297; CMI Exhibits 3345, 3346, 3347, 3348; N.T. 2/8/17, pp 24–28, 36–56).

minimum hardness specifications. (N.T. 1/25/17, pp. 136–137).

That test is a "hardness test" utilizing a Brinell machine which operates by taking a small metal sphere and pressing it into the side of the metal of the object being tested. (N.T. 1/25/17, p. 137). Part of the design of the valve guide from Continental is that it must meet a certain hardness minimum requirement; for the exhaust valve guide at issue – Continental Part No. 636242 – that minimum hardness is 75 to 90 on the Rockwell B Scale.[5] (N.T. 1/25/17, p. 138). Sommer testified that the guides on the first five cylinders on the accident aircraft's engine were tested for hardness using this methodology and scale which resulted in findings that the No. 1 guide had a score of 68, the No. 2 guide was 71.6, the No. 3 guide was 86.9, the No. 4 guide tested at 68.4, and the No. 5 guide was measured at 84.1. (N.T. 1/25/17, 139–140).[6]

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[5] Rockwell Hardness is a hardness-testing technique and a scale for measuring the hardness of materials. Under the American Society for Testing and Materials standards, specific equipment for Rockwell Hardness testing is required to be utilized and specific procedures for conducting the testing are to be followed. (N.T. 2/1/17, pp. 140–141). In addition to the Rockwell scale requiring the use of a Brinell apparatus, there are other scales for measuring the hardness of materials such as the HR15T and HR30T and which permit the use of other equipment and testing procedures. (N.T. 2/1/17, pp. 183–190). Continental Motors' designated inspection procedures for accepting materials, however, specified that the Rockwell B scale be followed. (N.T. 2/1/17, 188–190; Pl's Exhibits 291, 481).

[6] Again, the guides in the No. 3 and No. 5 cylinders had been replaced in 2007 with guides manufactured not by Continental

Sommer further stated that the Continental exhaust valve guides are made from an alloy called Ni-Resist, which is designed for operating temperatures at a consistent basis typically between 1,000 to 1,300 degrees Fahrenheit. (N.T. 1/25/17, p. 141–142; Pl's Exhibit 49). Those higher temperatures notwithstanding, the TSIO-520-H engine (the model engine which was in the accident aircraft) was designed for a maximum (or "red-line") temperature of 460 degrees Fahrenheit and that temperature is measured in the cylinder head itself. (N.T. 1/25/17, 143–145; Pl's Exhibit 235). Mr. Sommer testified that his review of several pieces of evidence uncovered during the accident investigation reflected that in this case, the accident engine was not being operated at or above that red-line temperature[7] (N.T. 1/25/17, 146). Mr. Sommer unequivocally stated that the evidence of the temperatures that were seen on the engine post-accident were nowhere near what would have been needed to cause Ni-Resist to soften. (N.T. 1/25/17, 149–150, 152). Thus, in Mr. Sommer's

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but by ECI, another company. (N.T. 1/25/17, p. 139). Those guides were pre-finished or pre-reamed, unlike the Continental Nos. 1, 2, 4 and 6 guides which were reamed or finish-in-place. (N.T. 1/26/17, pp. 18–20; N.T. 2/1/17, p. 54). Because they had to extract the guides from the cylinders, which is accomplished by either hammering or machining them out and is not easy, the Nos. 1, 2 and 4 guides were extracted because they were in close proximity to one another. The Nos. 3 and 5 guides were already loose and didn't have to be extracted. The No. 6 guide was left in place and was not tested. (N.T. 1/26/17, p. 162; N.T. 2/1/17, pp. 145–146).

[7] For one, all of the cylinders exhibited normal combustion products on the cylinder bore, cylinder head and on the piston itself and there was no physical evidence of excessive heat or lack of lubrication. (N.T. 1/25/17, pp. 146–150; Pl's Exhibit 269).

opinion, the No. 2 exhaust valve guide, which everyone agreed wore prematurely, did not suffer from premature wear because of excessive engine temperatures causing the alloy which it was made of to soften or because there was insufficient lubrication in the engine but rather because it did not possess the requisite hardness (Rockwell B 75-90) at the time that it was incorporated into the No. 2 cylinder assembly by Continental. (N.T. 1/26/17, 100, 126–128; 152–155, 160–162).

Plaintiffs also presented testimony from William Carden, the Director of Materials Engineering at McSwain Engineering and an expert in materials engineering and materials failure analysis. (N.T. 2/1/17, pp. 104–107, 111). Mr. Carden testified that using a coordinated measuring machine and touch probe, he measured the exhaust valve guides in the accident aircraft's engine, in particular the inner diameters, and conducted a chemical analysis of the valves, guides and cylinders. (N.T. 2/1/17, 112–121). In doing so, Mr. Carden found that the inner diameter of the No. 2 exhaust valve guide was very large, especially at the opening into the barrel, but was much smaller at the top than it was at the bottom. Mr. Carden also found that the No. 2 valve guide was much larger than the rest of the guides in the other cylinders and that there was quite a bit of wear on the bottom parts of the valve guides. (N.T. 2/1/17, 121–123). In measuring the diameter of the valve systems with handheld blade and laser micrometers, Carden found that the clearance of the No. 2 guide was much larger than all of the others

and in fact was some 10 times the maximum clearance of the return to service clearance limits of 7/1000 of an inch on the bottom of the guide. (N.T. 2/1/17, pp. 124–125).

Two cracks in the No. 2 exhaust valve guide from the top of the valve guide down into and along the right hand side of the guide were also observed using a scanning electron microscope. These cracks were found to be very flat, demonstrating that the initial fracture occurred and separated the top of the valve guide such that the valve guide was then rubbing on top of itself or hammering itself flat. (N.T. 2/1/16 [sic], pp. 126–134). Additionally, fatigue striations, which appear as ridges or lines and which are indicative of fatigue cracks[8] were also seen in the course of Carden's examination of the No. 2 exhaust valve guide. (N.T. 2/1/17, 135–136).

The testing of the valve guide's chemical composition was undertaken using x-ray spectroscopy and revealed that the No. 2 guide was composed of the Ni-Resist Type 1 alloy (N.T. 2/1/17, 138–139). As discussed by Colin Sommer, Mr. Carden likewise testified as to the hardness testing which was done at McSwain

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[8] Carden explained that a fatigue crack is a crack that propagates incrementally over a period of time. Rather than something breaking all at one time in a sudden failure such as an overload event, at lower loads, a tiny crack can develop and that crack, as material is repeatedly loaded and unloaded, incrementally grows and moves forward generating the striations. A fatigue crack continues to grow over time until a break occurs, as in this case where the valve guide broke and then rubbed on top of itself producing the flat areas which were observed. (N.T. 2/1/17, 136–137).

Engineering in July of 2015, and his testimony mirrored that of Mr. Sommer as to how the tests were conducted, why they were conducted in the manner in which they were, and what the results were. (N.T. 2/1/17, pp. 139–154). Mr. Carden reiterated that the results of the hardness testing (which consisted of three tests per cylinder and the mean or average of the three being accepted as the overall reading) reflected that Cylinder No. 1 had a Rockwell B Hardness reading of 68.4, Cylinder No. 2 was 71.6, and Cylinder No. 4 was 68.37. The test results were between 75 and 90 on the Rockwell B scale for Cylinder Nos. 3 and 5 (manufactured by ECI). (N.T. 2/1/17, 155–158). And Mr. Carden agreed that the alloy carbide network in Ni-Resist remains stable at elevated temperatures up to 1,300 degrees Fahrenheit. (N.T. 2/1/17, 180–182; N.T. 2/2/17, pp. 9–10). He also testified regarding a test which he conducted on a #636242 Continental valve guide which had an as-manufactured hardness reading of 81.9 and which he placed in an oven at 600 degrees F for some 2,300 hours. (N.T. 2/2/17, 17–21). Despite exposure to these temperatures for such an extended period of time, the hardness reading on the valve guide at the conclusion of the test was 81.7. (N.T. 2/2/17, p. 21). Pointing to photographs of the accident engine and the cylinders, Mr. Carden also stated that there was no showing of any damage or burning to the plastic paint or rubber baffling on and around those areas or anything else showing heat damage. Since to soften the valve guides would require temperatures of upwards of 1,300 degrees, in Mr. Carden's opinion, the post-crash fire had no effect on the hardness of the exhaust

valve guides and the No. 2 exhaust valve guide rather was not hardened. (N.T. 2/2/17, pp. 29–33, 61, 63–64).

Additional evidence regarding the sequence of events leading to the engine failure in the accident aircraft was provided by one of the defense witnesses, Dr. John Morris, an expert in metallurgy, material science and failure analysis. Noting that everyone agreed on what the sequence of events leading to failure was, Dr. Morris explained that as the valve, which is situated in a cylinder, opens and closes, it passes through the valve guide and that as it moves back and forth, "there always is going to be some wear. In this case, the wear became very severe rather quickly. As it became severe, the valve became loose in the valve guide which created a much worse mechanical situation because then it was vibrating back and forth," creating a "cyclic load which tends to make materials fail in a phenomenon called fatigue." (N.T. 2/8/17, p. 151). Dr. Morris said that what typically happens is that "under cyclic loads the material will be damaged, the damage will accumulate, and finally a crack will form where the damage accumulates." (N.T. 2/8/17, p. 151). In this case, several cracks formed in the valve guide and the top of the valve guide broke off freeing the valve to move and break causing the cylinder to fail and parts of the engine to come apart. That was when the engine stopped operating. (N.T. 2/8/17, pp. 151–152).

Although Dr. Morris did not believe that the valve guide failed because of insufficient hardness but rather because of insufficient lubrication causing the engine to run too hot, he testified that he "is a metallurgist,"

. . . "not an engine person," and that at the time of the first inspection at McSwain, he and the "several people from Continental who were there at the same time [he] was . . . talked about what [they] could see and their main comment was that this thing obviously was pretty hot." He went on to explain that "[y]ou have a real wear problem when things get hot, because what's defeating wear is lubricant. You start heating up an engine, the lubricant becomes a real problem, the viscosity gets very low . . . [and] it's not producing a decent lubrication film anymore" resulting in "metal to metal contact" and "big wear." (N.T. 2/8/17, pp. 158–159, 167). Dr. Morris admitted that "[s]o we concluded very, very early that the probable cause of this was metal-to-metal contact due to an overheated operation of some kind." (N.T. 2/8/17, p. 159).

In applying the Rule 50 standards for adjudicating motions for entry of judgment as a matter of law and in viewing the evidence in the light most favorable to the Plaintiffs as non-movants and giving them the benefit of every fair and reasonable inference, we find that this evidence was more than sufficient to have enabled this jury to find that the No. 2 Continental valve guide that was in the No. 2 cylinder was not in compliance with its own hardness specifications and that it was because it did not meet the requisite hardness threshold that it wore prematurely and ultimately fractured and failed. In so holding, we observe that there was also adequate evidence to have permitted the jury to have adopted Continental's theory of the case – that is, that the engine failure was caused by insufficient

lubrication. The jury was free to believe or disbelieve any or all of the expert witnesses who testified in this action and was free to accept or reject the theories of failure advanced by any party. In determining whether the evidence is sufficient to sustain liability, the court may not weigh the evidence, determine the credibility of witnesses, or substitute its version of the facts for the jury's version. These principles are well-settled and we follow them now. Inasmuch as this record is **not** critically deficient of that minimum quantity of evidence from which a jury might reasonably afford relief, there is no basis upon which to grant Moving Defendant's Rule 50(b) motion. The motion is therefore denied pursuant to the attached order.

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT
OF PENNSYLVANIA**

ELIZABETH C. SNIDER, Individually and as Executrix of the Estate of DANIEL A. SNIDER, and LEE W. SNIDER, a minor, by his mother, ELIZABETH C. SNIDER	:	CIVIL ACTION
	:	NO. 13-CV-2949
Plaintiffs	:	
vs.	:	
STERLING AIRWAYS, INC., and CONTINENTAL MOTORS, INC.,	:	
Defendants	:	

MEMORANDUM AND ORDER

JOYNER, J. **August 29, 2017**

Pursuant to Fed. R. Civ. P. 59, Defendant Continental Motors, Inc. filed a Motion for New Trial and to Alter or Amend the Judgment entered on February 21, 2017, following a jury verdict in favor of Plaintiffs and against the moving defendant in the amount of $2,753,048.49. After thorough review of the trial record, this motion shall be largely denied for the reasons set forth below.

Case History

Given that we have previously written numerous opinions outlining the historical background of this case, at this time we shall just briefly summarize the underlying facts relevant to the motion presently before us. This lawsuit arose out of the tragic death of Daniel Snider, a United States Forest Service employee who was killed in the crash of a single-engine aircraft on June 21, 2010 as it was approaching the William T. Piper Memorial Airport in Lock Haven, Pennsylvania. Mr. Snider was killed, along with another Forest Service employee and the pilot of the aircraft, as the result of the failure of the plane's engine. That engine was manufactured by Defendant Continental Motors, Inc. The aircraft, a 1973 Cessna T210L, was owned, operated and maintained by Defendant Sterling Airways, Inc., of Hornell, New York.

The gist of the Plaintiffs' complaint in this matter is that the accident was caused by the negligence, gross negligence, recklessness and/or strict liability on the part of the defendants in the manufacture, maintenance, and/or operation of the accident airplane, its engine and component parts. This action was tried before the undersigned commencing on January 23, 2017 and concluding on February 16, 2017, when the jury rendered a verdict in favor of the Plaintiffs and against Continental Motors only[1] in the amount stated above.

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[1] While the jury did find that Defendant Sterling Motors had breached its contract with the United States Forest Service and was negligent, it determined that Sterling's negligence and breach were not factual causes of the accident.

Alleging a variety of reasons and errors in evidentiary rulings and the admission and/or prohibition of evidence, Continental now moves for a new trial and/or to alter or amend the judgment entered on the jury's verdict.

Standards Governing Motions Under Rule 59

The language of Fed. R. Civ. P. 59 is fairly broad. Specifically, it states, in relevant part:

> **Rule 59. New Trial; Altering or Amending a Judgment**
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> **(a) In General.** (1) *Grounds for New Trial.* The court may, on motion, grant a new trial on all or some of the issues – and to any party – as follows:
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> (A) after a jury trial, for any reason for which a new trial has heretofore been granted in an action at law in federal court; or
>
> (B) after a nonjury trial, for any reason for which a rehearing has heretofore been granted in a suit in equity in federal court.
>
> . . .
>
> **(b) Time to File a Motion for a New Trial.** A motion for a new trial must be filed no later than 28 days after the entry of judgment.
>
> . . .

> **(d) New Trial on the Court's Initiative or for Reasons Not in the Motion.** No later than 28 days after the entry of judgment, the court, on its own, may order a new trial for any reason that would justify granting one on a party's motion. After giving the parties notice and an opportunity to be heard, the court may grant a timely motion for a new trial for a reason not stated in the motion. In either event, the court must specify the reasons in its order.
>
> **(e) Motion to Alter or Amend a Judgment.** A motion to alter or amend a judgment must be filed no later than 28 days after the entry of the judgment.

A new trial may therefore be granted where there was substantial error in the admission or exclusion of evidence; error in the court's instructions to the jury; where the jury's verdict was inadequate or excessive; or where the verdict is against the weight of the evidence. Marder v. Conwed Corp., 75 F.R.D. 48, 54 (E.D. Pa. 1977) (citing Montgomery Ward & Co. v. Duncan, 311 U.S. 243, 61 S. Ct. 189, 85 L. Ed. 147 (1940) and 5A *Moore's Federal Practice* P50.03[2] at 2334). A new trial may also be granted where the evidence was legally insufficient to go to the jury. Id.

In general, the ordering of a new trial is committed to the sound discretion of the district court. Bonjourno v. Kaiser Aluminum & Chemical Corp., 752 F.2d 802, 812 (3d Cir. 1984). But, "[w]hile a court may grant a new trial under Rule 59 'for any reason for which a new trial has heretofore been granted in an action at

law in federal court,' it should do so only when 'the great weight of the evidence cuts against the verdict and a miscarriage of justice would result if the verdict were to stand,'" or where the verdict "shocks the conscience." Leonard v. Stemtech International, Inc., 834 F.3d 376, 386 (3d Cir. 2016) (quoting Rule 59(a)(1)(A) and Springer v. Henry, 435 F.3d 268, 274 (3d Cir. 2006)); Chinniah v. East Pennsboro Township, No. 14-3355, 2015 U.S. App. LEXIS 3659, *3, 602 Fed. Appx. 558, 559 (3d Cir. March 9, 2015) (quoting Marra v. Philadelphia Housing Authority, 497 F.3d 286, 309, n. 18 (3d Cir. 2007)).

Hence, the court's "review of a jury's verdict is limited to determining whether some evidence in the record supports the jury's verdict," as "[a] jury verdict will not be overturned unless the record is critically deficient of that quantum of evidence from which a jury could have rationally reached its verdict." LePaqe's, Inc. v. 3M, 324 F.3d 141, 146 (3d Cir. 2003); Swineford v. Snyder County, 15 F.3d 1258, 1265 (3d Cir. 1994). Further, "[a] district court's power to grant a new trial is limited 'to ensure that it does not substitute its judgment of the facts for the facts and the credibility of the witnesses for that of the jury.'" Stemtech, supra, (quoting Delli Santi v. CNA Insurance Cos., 88 F.3d 192, 201 (3d Cir. 1996)). Indeed, in reviewing a motion for a new trial, the court is required to view the evidence in a light most favorable to the non-moving party and draw every reasonable and fair inference therefrom which supports the jury's award. Frank C. Pollara Group, LLC v. Ocean View Inv. Holding, LLC, 784 F.3d 177, 184

(3d Cir. 2015); Willmore v. Willmore, Civ. A. No. 95-0803, 1996 U.S. Dist. LEXIS 5947, *9 – *10 (E.D. Pa. May 2, 1996); Gans v. Gray, 612 F. Supp. 608, 622 (E.D. Pa. 1985).

Discussion

A. Sufficiency of Evidence as to Material Hardness

Continental Motors' first argument essentially mirrors one of the arguments which it raised in its Renewed Motion for Entry of Judgment in its Favor as a Matter of Law. That motion was recently denied and the reasons therefor set forth in our Memorandum and Order of June 28, 2017. Specifically, CMI here reasserts that the jury's verdict is against the great weight of the evidence because the plaintiffs ostensibly offered no evidence to prove that any alleged defect in material hardness caused the accident aircraft's engine to fail. Again, in light of the evidence presented at trial by all of the parties, we respectfully disagree.

As is not at all unusual in negligence/product liability cases such as this one, the jury here was tasked with assessing two competing theories as to the underlying cause of the failure of the No. 2 cylinder on the accident airplane's engine.[2] In essence, it was the plaintiffs' theory that the No. 2 cylinder failed because of insufficient "hardness" of the exhaust valve guide, whereas it was Defendant CMI's belief that the

[2] Indeed, there was no dispute as to what part of the engine initiated the failure sequence.

breakdown was caused by overheating of the cylinder as a consequence of Sterling Airways' failure to follow the correct manuals and maintenance directives and to install the correct rocker arms and/or bushings at the time of the 2004 engine overhaul.

Consistent with their theory of the case, the plaintiffs presented the testimony of several witnesses with expertise in metallurgy, aircraft accident investigation, civil, materials, and mechanical engineering and materials failure analysis, among others. One of those witnesses, Colin Sommer, testified that Part #636242, which was in the No. 2 cylinder at the time of the accident and which is believed to have been the root cause of the crash, is an exhaust valve guide bearing a Continental part number. It was depicted by Continental as one of their component parts and there is no indication anywhere that it was ever made by anyone else. The exhaust valve guides that were installed in the accident engine in 2004 were manufactured in December 2003 by Roderick Arms & Tool, an FAA-approved supplier for Continental Motors under its Quality System.[3] (N.T. 1/25/17, 96–98; N.T. 2/8/17, 27). Those

[3] As several of Continental's witnesses explained, in order to obtain approval from the Federal Aviation Administration ("FAA") to manufacture an aircraft engine, CMI, like all manufacturers, was first required to create a design for its engine and then apply to the FAA for approval of that design. (N.T. 2/8/17, p. 13). Once that process is completed and the FAA grants approval and issues a Type Certificate, it falls to CMI as the manufacturer, to submit a plan to the FAA's Manufacturing Inspection District Office ("MIDO") on how it intends to control its manufacturing and quality to ensure that every product is like a duplicate to what was Type Certified. (N.T. 2/8/17, pp. 14–15). As in the usual

guides did not bear a Roderick part number and in fact, Roderick could not legally sell those parts to the public or anyone other than Continental because that part is made only for Continental. (N.T. 1/25/17, 108–109; Pl's Exhibits 239, 245, 253).

According to Mr. Sommer, "[p]art of the design of that valve guide from Continental is that it has to meet a certain hardness requirement." (N.T. 1/25/17, 137). That specification is Rockwell B Hardness 75 to 90.[4] (N.Y. [sic] 1/25/17, 138; N.T. 2/1/17, 140–143). In an effort to determine why the valve guide wore in the manner in which it did, Mr. Sommer and another of Plaintiffs' expert witnesses, William Carden, in tandem with the McSwain Engineering laboratory

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case, after CMI defined its quality system and the FAA's audit of that system found it to be satisfactory, in this case too the FAA awarded a Production Certification for the production of the engine, which in this case is the TSIO-520-H. Thereafter, the FAA conducts periodic audits and inspections of CMI's manufacturing facilities and those of its suppliers to ensure ongoing compliance with the Type Certificate. (N.T. 2/8/17, pp. 16–18).

[4] As Mr. Sommer, among others, explained: "[h]ardness is measured in different scales" N.T. 1/25/17, p. 138). "Rockwell Hardness is a hardness-testing technique and a scale for measuring hardness of materials," for which "a specific set of equipment" and "specific procedures" "are outlined in the ASTM, which is the American Society for Testing and Materials." (Testimony of William Carden, 2/1/17, pp. 140–141). Other scales for measuring the hardness of materials include the HR15T, HR30T and Brinell scales. (N.T. 2/1/17, pp. 184–190). The different scales are distinguished on the basis of different-sized indenters making different-sized indentations into the material being tested. (N.T. 2/1/17, pp. 185–188).

performed a series of Rockwell B[5] hardness tests on the guides on the first five cylinders on the accident aircraft's engine. Those tests resulted in readings of 68 on the No. 1 guide, 71.6 on the No. 2 guide, 86.9 on the No. 3 guide, 68.4 for the No. 4 guide and 84.1 for the No. 5 guide.[6] (N.T. 1/25/17, 139–140; 2/1/17, 145–156). From these measurements, both Mr. Sommer and Mr. Carden concluded that the Continental[7] exhaust valve guides were out-of-compliance with its own hardness specification. (N.T. 1/26/17, 100, 155, 160–161; N.T. 2/2/17, 62–64).

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[5] Using a Brinell hardness testing machine, a small, hard metal sphere is pressed into the side of the material being tested resulting in a small dimple. The dimensions of that dimple and the force used to make it are then measured and from that a number denoting the hardness of the material is generated. (N.T. 1/25/17, 136–137; 2/1/17, 139–141).

[6] Mr. Carden took three measurements on the exhaust valve guides and from those readings calculated the mean as well as a standard deviation. The final readings are the calculated means. (N.T. 2/1/17,147–148)

[7] As we stated in footnote 6 to our June 28, 2017 Memorandum and Order, the guides in the No. 3 and No. 5 cylinders had been replaced in 2007 with guides that were manufactured by ECI, another company and unlike the Continental, finish-in-place guides, the ECI guides were pre-reamed or pre-finished. (N.T. 1/25/17, 139; N.T. 1/26/17, 18–20; N.T. 2/1/17, 54). Since the guides had to be extracted from the cylinders to conduct the tests and that is a difficult procedure, the Nos. 1, 2, and 4 guides were removed because they were in close proximity to one another. The Nos. 3 and 5 guides were already loose and didn't have to be extracted. The No. 6 guide was left in place and was not tested. (N.T. 1/26/17, 162; N.T. 2/1/17, 145–146).

In addition, Mr. Sommer, Mr. Carden and one of CMI's witnesses – Michael Ward, all testified that the cylinder assemblies that were manufactured in December 2003 and installed into the accident aircraft a few months later during the overhaul, were made from a material called Ni-Resist Type 1, which is a cast-iron alloy designed to withstand operating temperatures well above 750 degrees on a consistent basis and more often between 1000 and 1,300 degrees. (N.T. 1/25/17, 141–142; N.T. 2/1/17, 138–139; N.T. 2/8/17, 19, 28, 200–205).

Under Continental's quality control system, it provides a form "Certificate of Compliance" to its suppliers for completion and inclusion with the shipments of all of the product which it has ordered. (N.T. 2/8/17, 46–52; CMI Exhibit 3347). In completing those compliance certificates, the supplier is verifying that the parts which Continental ordered and which it manufactured for Continental were produced in accordance with CMI's specifications, drawings etc. and that they are as they should be. (N.T. 2/8/17, 46). Upon receipt of shipments of valve guides from Roderick and following its own inspection protocol as outlined on its internal "Material Acceptance Data (MAD) Sheet," CMI inspects a designated number of random samples[8] from

[8] Sampling inspection is an FAA-approved procedure for performing inspections of this kind and is used not only in the manufacturing area where parts are being produced but also in receiving. It is a methodology originally derived back in World War II during military production and has since evolved into an industry standard. Specifically, using statistically-based tables and charts and depending upon the size of the lot to be inspected,

the various lots delivered to ensure that the guides possess the required features and hardness and are otherwise in compliance with its specifications. (N.T. 1/26/17, 26–28; N.T. 2/8/17, 24–26, 36–44; Pl's Exhibit 291). If any of the samples tested fail to meet specifications, the entire lot is to be rejected and then set aside for further screening. (N.T. 2/8/17, 39–40). (Pl's Exhibits 294, 296, 297; CMI's Exhibits 3345, 3346, 3347, 3348; N.T.; N.T. 2/8/17, 26–28, 36–56).

At trial however, Plaintiffs produced evidence that despite these procedures, on several lots of exhaust valve guides received from Roderick in April 2002, September 2003 and in January 2004, the Continental inspectors accepted batches of exhaust valve guides but either did not fill out the hardness designation on the data sheets as required or, in one case, approved the lot despite it having a hardness reading of Rockwell B 73, rather than the required minimum of 75. (N.T. 1/26/17, 2735; N.T. 2/8/17, 37–44, 53–56, 81–88; Pl's Exhibits 294, 296, 297; CMI Exhibits 3345, 3346, 3347, 3348).

Plaintiffs additionally adduced evidence that despite the fact that Continental's specifications dictated that the Rockwell B scale be used, it was not uncommon for its inspectors to employ different hardness scales such as the HR 15 and HR 30 and then convert

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a set number of random samples of product are pulled and sampled. All of the features on the sampled parts are inspected and tested for compliance with the designated specifications. (N.T. 1/26/17, 26–30; N.T. 2/8/17, 26–27).

those readings to a Rockwell B reading. (N.T. 2/1/17, 183–198; N.T. 2/8/17, 77–82).

To reiterate, under the prescribed standards for overturning a verdict or granting a new trial, we are charged with reviewing the jury's verdict to ascertain whether there is some evidence in the record to support it. In doing so here, we find that the foregoing evidence is more than sufficient to warrant a finding by the jury in this case that the exhaust valve guide which was installed in the No. 2 cylinder did not satisfy the requisite hardness minimums set by Defendant Continental itself.

As for the second prong, that is, whether Plaintiffs made a sufficient showing that the subject accident was caused by that inadequate hardness, we likewise find that adequate evidence was produced to sustain the jury's conclusion that it was.

Again, Plaintiffs' expert witness Colin Sommer explained that the purpose behind hardening is to increase wear resistance and that exhaust valve guides in particular are subject to a great deal of heat and wear – more so than intake valves. (N.T. 1/26/17, 17–18, 87). He stated that his examination of the accident aircraft's engine showed extensive damage in that holes had been punched through the top of the crank case in multiple locations, and that he observed cracking and evidence of catastrophic failure from the engine's external side. (N.T. 1/25/17, 126, 128). He said it was obvious from his first look at the No. 2 cylinder, that there had been a "major catastrophic destruction

of the Number 2 piston" and "[t]here [we]re some more components of that piston that were all found in the bottom of the oil pan and throughout the engine." (N.T. 1/25/19, 128).

Mr. Sommer further testified:

> "What the metallurgical examination showed was that there was evidence of fatigue on this fracture, meaning that as the valve was riding up and down inside the cylinder . . . the valve got crooked because of wear that was found between the valve guide and the valve system. So as the valve gets crooked, it starts to bang up against the valve seat, which is the area where it seals, and eventually broke the head off of that valve. Once the head broke off, it's rolling around inside the cylinder while the piston is traveling up and down inside there at 22 times per second. . . . The inside of the cylinder is all destroyed and beat up and damaged from the pieces of the piston and also the head of the valve that was rolling around inside there. So that resulted in a lot of catastrophic destruction inside the engine. As one piston becomes destroyed, the . . . Number 2 connecting rod was very heavily damaged, and actually was torn off of the crankshaft. It beat into the side of the crankshaft. It punched a hole into the side of the case. It broke the connecting rod bolt off.
>
> . . .
>
> So all the other damage that we saw was a result of the destruction of the Number 2 piston.

> The destruction of the Number 2 piston was the result of the failure of the Number 2 exhaust valve head, and the Number 2 exhaust valve head was a failure of the Number 2 exhaust valve. The wear that had occurred on that valve guide – sorry, caused the failure which then cascaded to the destruction of the rest of the engine."

(N.T. 1/25/17, 128–131). Finally, Mr. Sommer conclusively attested: "My analysis revealed that we had a broken guide because the guide was soft. The broken guide caused a broken valve, which broke the engine." (N.T. 1/26/17, 100).

In addition to Mr. Sommer's testimony, William Carden said that he too observed two cracks in the Number 2 exhaust valve guide from the top of the valve guide down into and along the right hand side of the guide. He found these cracks to be very flat rather than rough, demonstrating that the initial fracture occurred and separated the top of the valve guide, and then the valve guide began rubbing on top of itself or hammering itself flat. (N.T. 2/1/17, 126–131). Mr. Carden also saw fatigue striations in the course of his examination of the No. 2 exhaust valve guide. These striations, which appear as ridges or lines, are indicative of fatigue cracks that propagate incrementally over a period of time. (N.T. 2/1/17, 135–137). Instead of breaking all at once in a sudden failure like an overload event, a fatigue crack begins as a tiny crack which results at lower loads but incrementally grows and moves forward as material is repeatedly loaded and

unloaded generating the striations. Eventually, a break can occur such as happened in this case where the valve guide broke and rubbed on top of itself producing the flat areas which were observed. (N.T. 2/1/17, 136–137).

Mr. Carden also testified that he took measurements of the exhaust valve guides, including the inner diameters, in the accident aircraft's engine using a coordinated measuring machine and touch probe. (N.T. 2/1/17, 113–115, 121). He found that the inner diameter of the No. 2 exhaust valve guide was very large, especially at the opening into the barrel but was much smaller at the top than it was at the bottom and was much larger than the rest of them. He also noted that there was quite a bit of wear on the bottom parts of the valve guides. (N.T. 2/1/17, 121–123).

In measuring the diameter of the valve systems with handheld blade and laser micrometers, Carden found that the clearance of the No. 2 exhaust valve guide was much larger than all of the others and in fact, was some 10 times the maximum clearance of the return to service clearance limits of 7/1000 of an inch on the bottom of the guide, such that it was bell-shaped. (N.T. 2/1/17, 124–125). Like Mr. Sommer, Mr. Carden also testified that it is a fundamental engineering concept that hardness and wear are directly related. (N.T. 2/2/17, 22–23).

And as we noted in our June 28th Memorandum, "additional evidence regarding the sequence of events leading to the engine failure was provided by one of the

defense witnesses, Dr. John Morris, an expert in metallurgy, material science and failure analysis." As this witness observed, everyone agreed as to what the sequence of events leading to the failure was although they disagreed as to what caused that sequence to commence. As the valves, which are situated in the cylinders, open and close, they pass through the valve guide. Dr. Morris explained that as the valves move back and forth,

> "there's always going to be some wear. In this case, the wear became very severe rather quickly. As it becomes severe, the valve becomes kind of loose in the valve guide and that creates a much worse mechanical situation because it's vibrating back and forth. When something vibrates back and forth, it creates a cyclic load, which tends to make materials fail in a phenomenon called fatigue. What will happen is that under cyclic loads the material will be damaged, the damage will accumulate and finally a crack will form where the damage accumulates.
>
> Here, several cracks formed in the valve guide. That would be this third little thing here (indicating), and the top of the valve guide broke off. At this point the valve is really free to move, and the fatigue crack developed down at the base of the valve and broke off the head of the valve you see in the final failure.
>
> I don't go any further because once that had happened, the cylinder failed, parts of the

> engine came apart, and that was when the engine stopped operating. So I think everyone agrees that the cause of this failure was exaggerated wear of this valve guide causing its fatigue failure, then the fatigue failure of the valve, and the subsequent failure of the engine."

(N.T. 2/8/17, 151–152).

In reviewing this evidence in the light most favorable to the Plaintiffs as the non-movants and drawing every reasonable and fair inference therefrom, we again conclude that it is more than ample to support and justify the jury's findings and award in this matter. Consequently, Defendant CMI's motion for a new trial on the basis of the insufficiency of the evidence as to causation and hardness is denied.

B. Negligence of Sterling Airways

Defendant Continental next challenges the jury's verdict in favor of Defendant Sterling Airways. More specifically, Continental claims that "[t]he evidence at trial conclusively established that Sterling's many maintenance deficiencies, and its failures to comply with CMI's service recommendations and related negligence, were the sole cause of the engine failure that led to the accident or, at the very least, were a considerable contributing factor to that engine failure." (CMI's Brief in Support of Motion for New Trial and to Alter or Amend the Judgment, at p. 12).

We agree that Continental produced sufficient evidence to support a finding by the jury that Sterling was negligent in disregarding certain of CMI's maintenance recommendations and that it could have done things better in maintaining the accident aircraft. Indeed, in its verdict that is precisely what the jury did find – that Sterling Airways breached its contract with the U.S. Forest Service and was negligent in some regards but that despite this, neither the breach nor Sterling's negligence were factual causes of the accident. These facts notwithstanding, there was also more than enough evidence produced at trial that Continental's negligence was greater and was in fact the proximate cause of the June 21, 2010 crash to sustain the verdict. On this point there was testimony from a number of witnesses: Colin Sommer, Rodney Doss, Allen Fiedler, James Caneen and John Goglia regarding the maintenance procedures performed by Sterling, what manuals, directives and/or service advisories it followed and was and/or was not required to follow in fulfilling its maintenance obligations, and what parts were and/or should have been in the aircraft at the time that it crashed. The gist of these witnesses' testimony is that, contrary to Continental's assertions: (1) the rocker arms, bushings and lifters in the engine at the time of the accident had been providing sufficient lubrication and did not contribute to the breakdown of the engine; (2) that Sterling Airways' Director of Maintenance, David Crane, followed the current manuals at the time he performed the 2004 engine overhaul (3) that in performing the maintenance on the 1973 Cessna, Mr. Crane followed those service

bulletins, advisory circulars and instructions for continued airworthiness which he was required to follow under the Federal Aviation Regulations (FARs); and (4) that Sterling otherwise met all of the required maintenance tasks for the subject aircraft. (N.T. 1/26/17, 36–48, 55–62, 64–65; N.T. 1/31/17, 181–182, 184–203; N.T. 2/1/17, 7–10, 22–25; 2/2/17, 130–131; N.T. 2/3/17, 52–60, 68–73, 75–84, 110; 2/6/17, 35–46).

Here, the thrust of CMI's argument is that the jury credited the testimony from the Plaintiffs' and Sterling's witnesses and disregarded or gave less weight to the testimony and evidence which it produced. That of course, is precisely what a jury is expected to do – weigh the evidence and the credibility of the witnesses and make a determination as to the facts. That the jury performed its function in a manner which displeases Continental and reached a decision with which Continental disagrees is *not* a reason to disturb the verdict. Accordingly, given that we find the verdict to be supported by the evidence presented, the motion to overturn it and/or order a new trial on the basis of Sterling's liability is also denied.

C. Application of GARA

One more time, CMI reiterates its previously-raised and rejected arguments on the basis of the General Aviation Revitalization Act of 1994, a statute of repose which is codified at the notes to 49 U.S.C. §40101. This Act, colloquially known as "GARA," prohibits the commencement of a "civil action for damages

for death or injury to persons or damage to property arising out of an accident involving a general aviation aircraft . . . against the manufacturer of the aircraft or the manufacturer of any new component, system, subassembly, or other part . . . if the accident occurred . . . " more than 18 years after "(A) the date of delivery of the aircraft to its first purchaser or lessee, if delivered directly from the manufacturer; or (B) the date of first delivery of the aircraft to a person engaged in the business of selling or leasing such aircraft . . . " GARA §§2(a)(1)(A), (B) and 3. Notwithstanding this general prohibition, Section 2(a)(2) of GARA includes a "rolling provision" which provides that:

> (2) with respect to any new component, system, subassembly, or other part which replaced another component, system, subassembly or other part originally in, or which was added to, the aircraft, and which is alleged to have caused such death, injury, or damage, after the applicable limitation period beginning on the date of completion of the replacement or addition.

This provision has been construed to mean that "a new eighteen year period begins when a new part is added to an aircraft if this part is alleged to have caused an accident." Robinson v. Hartzell Propller [sic], Inc., 326 F. Supp. 2d 631, 660 (E.D. Pa. 2004).

In renewing its GARA argument, Continental submits that it is entitled to relief for two reasons. First, since in CMI's mind the finding by the jury that its negligence proximately caused the accident should be

set aside, it did not cause the accident and the plaintiffs' claims against it remain barred. Second, CMI again claims that it was not the cylinder assembly but the exhaust valve guide which caused the accident. Since the exhaust valve guide was manufactured for it by Roderick, the rolling provision was improperly applied and it is entitled to reversal of the verdict.

Given that we have declined to set aside the jury's finding that Continental's negligence was the proximate cause of the accident, we likewise decline to overturn the verdict for the reason that causation has not been shown under GARA. As for the second prong of Moving Defendant's argument, we re-state the conclusions previously articulated in our June 28, 2017 Memorandum opinion denying its Renewed Motion for Entry of Judgment Pursuant to Rule 50(b). That is, there was clear evidence produced at trial that the cylinders which were installed in the accident aircraft's engine during the 2004 overhaul were manufactured and sold by Continental Motors.

While it is true that those cylinders contained exhaust valve guides which had been manufactured for Continental by Roderick Arms & Tool, those guides had been designed by Continental, were assigned a Continental part number (#636242) and could not be manufactured or sold to any entity or company other than CMI. (N.T. 1/25/17, 94–99, 101, 108–123; N.T. 2/1/17, 54, 36–39; N.T. 2/3/17, 82, 104; N.T. 2/8/17, 19–28; Pl's Exhibits 239,245, 249, 253). The exhaust valve guides that were installed in the cylinder assemblies in December 2003 were "finish" or "ream-in-place"

valve guides which required that they be heated up and then pushed into the cylinder head using a press and reamed into place. (N.T. 1/25/17, 103–104; 2/1/17, 74–76). As we explained in footnote 3 to that Memorandum, "[r]eaming is an industrial term for inserting a reamer, which is essentially a drill bit or cutting tool, down into the guide and then taking off any excess material so that it's exactly the right dimension to fit over the valve system." (N.T. 1/25/17, 104; N.T. 1/26/17, 20–21). In so doing, Continental effectively incorporated the exhaust valve guide into and made it a part of its cylinder assembly. Since it was the No. 2 cylinder which failed, cascading into the complete failure of the Cessna's engine, and that cylinder was assembled by Continental in December 2003, sold shortly thereafter to Sterling and installed into the aircraft in 2004, this action is not and was not barred by GARA.

D. Use of the Term "Cylinder Assembly"

As further grounds for a new trial, Continental asserts that the Court's use of the term "cylinder assembly" in its charge and on the verdict form was erroneous ostensibly because the plaintiffs produced no evidence to support reference to the broader system – *i.e.*, the No. 2 cylinder rather than the exhaust valve guide contained within it. Again, we disagree.

As we explained above, the evidence produced at trial evinced that while the No. 2 exhaust valve guide was indeed manufactured by Roderick Arms & Tool, it was manufactured specifically for and sold only to

Continental based on a Continental design and to Continental's specifications and that it bore a Continental part number. (N.T. 1/25/17, 108–109, 137–138; N.T. 2/1/17, 140–143; N.T. 2/8/17, 27, 33–34; Pl's Exhibits 239, 245, 253). The exhaust valve guides were incorporated into and made a part of the cylinder by the reaming in place method. (N.T. 1/25/17, 103–104; N.T. 1/26/17, 20–21; N.T. 2/1/17, 74–76; N.T. 2/3/17, 57–60; N.T. 2/7/17, 42–44).

Furthermore, the trial record also reflects that in advance of performing the 2004 engine overhaul, Sterling ordered and purchased six new cylinder assemblies from Continental – there is no evidence that it ever ordered or purchased exhaust valve guides from Roderick. (N.T. 2/3/17, 82, 104–105). In 2007, when Sterling's annual inspection compression testing of the cylinders revealed that two of the engine's six cylinders failed, it removed those two cylinders and sent them to Penn Yan Aeronautical Services, a nearby engine overhaul facility for closer inspection and repair. (N.T. 2/3/17, 105–106). Penn Yan Aero then repaired the cylinders by replacing, *inter alia*, the exhaust valve guides, ground seats and the intake valves in those cylinders (the No. 3 and No. 5 cylinders) and returned the cylinders to Sterling, which re-installed them into the engine. (N.T. 2/3/17, 107–110, 121–126).

What's more, at various points throughout the trial, Defendant CMI's own counsel and at least one of its expert witnesses *themselves* referred to the part in question as a "Continental" or "CMI guide" and/or as a cylinder assembly. (See e.g., N.T. 2/2/17, 70–72; N.T.

2/8/17, 19, 28, 184, 185) In light of this evidence, we determined that it was appropriate to ask whether the No. 2 cylinder assembly was manufactured by Continental Motors and whether it was added to the aircraft after the 18-year limitation period or after June 21, 1992 on the Verdict Slip. And, after reviewing the trial record, we find no error in that determination and see no reason to grant CMI a new trial on this ground.

E. No Duty to Warn About Use of After-Market Parts

Continental also claims that the Court's refusal to give an instruction about or to preclude evidence regarding CMI's lack of any obligation to warn about use of after-market components warrants a new trial. We find no merit to this argument either.

It is of course well-settled that "[a] party is entitled to a jury instruction that accurately and fairly sets forth the current status of the law," and "it is the responsibility of the trial judge to provide the jury with a clear and accurate statement of the law." Douglas v. Owens, 50 F.3d 1226, 1233 (3d Cir. 1995) (citing McPhee v. Reichel, 461 F.2d 947, 950 (3d Cir. 1972). "A court does not err merely because it does not give an instruction in exactly the words a defendant submits, for 'no litigant has a right to a jury instruction of its choice, or precisely in the manner and words of its own preference." United States v. Sussman, 709 F.3d 155, 178 (3d Cir. 2013); De Asencio v. Tyson Foods, Inc., 500 F.3d 361, 373 (3d Cir. 2007). "In fact, 'it is [also] well

settled that there is no error to refuse to instruct as counsel wishes if the charge to the jury is correct.'" Sussman, supra, (quoting United States v. Blair, 456 F.2d 514, 520 (3d Cir. 1972)). In determining correctness, the jury instructions are considered as a whole to determine whether they fairly and adequately contain the law applicable to the case. Koppers Co. v. Aetna Casualty & Surety Co., 98 F.3d 1440, 1445 (3d Cir. 1996).

The proposed instruction which CMI here avers should have been given reads as follows:

> **Failure to Warn – No Duty to Warn with Respect to After-Market Components**
>
> An after-market component is a replacement part or accessory that is sold to enhance or replace an original component in the secondary market.
>
> The Federal Aviation Regulations only require a manufacturer of aviation components to issue instructions and warnings about components that the manufacturer actually manufactures itself. An original equipment manufacturer has no duty or obligation to provide instructions or warnings about after-market components that are manufactured or sold by other manufacturers.
>
> Additionally, a manufacturer of aircraft engines only has a duty to provide adequate instructions and warnings to owners and FAA-certified mechanics, not directly to aircraft pilots or passengers.

14 CFR 21.50

Instead, the following, general failure to warn instruction was given:

> I further instruct you, members of the jury, that even a perfectly made and designed product may be defective if not accompanied by proper warnings and instructions concerning its use.
>
> A supplier must give the user or consumer any warnings and instructions to enable the consumer to safely use the products for its intended purpose.
>
> If the product carries with it some degree or inherent risk when used for its intended purpose, the supplier must adequately warn the consumer of the inherent risk.
>
> I further instruct you, members of the jury, if you find that there were warnings or instructions required to make the cylinder assembly non-defective, which were adequately provided by Continental Motors, then you may not find for these defendants based on a determination that even if there had been an adequate warning or instructions, Sterling Airways would not have read or heeded them.
>
> Instead, the law presumes, and you must presume, that if there had been an adequate warning or instruction, Sterling Airways would have found them.

(N.T. 2/15/17, 144–145).

We find the instruction given to have been an accurate statement of the applicable law and wholly

appropriate given the evidence that was produced throughout the trial. See, e.g., Pa. S. S. J. I. §§ 8.02, 8.03; Berkebile v. Brantly Helicopter Corp., 462 Pa. 83, 100, 103, 337 A.2d 893, 902, 903 (1975); Walton v. Avco Corp., 383 Pa. Super. 518, 557 A.2d 372 (1989). And, since we were unable to discern the correctness of the proposed charge from the authority cited therefor,[9] we

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[9] Local Rule of Civil Procedure 16.1(d)(4)(a) provides in relevant part:

> (a) Requests for Jury Instructions. Requests for jury instructions are not required with respect to familiar points of law not in dispute between the parties. As to such matters, counsel should consider simply listing the subject desired to be covered in the charge (e.g. negligence, proximate cause, assumption of risk, burden of proof, credibility, etc.), unless specific phraseology is deemed important in the particular case. With respect to non-routine legal issues, requests for instructions should be accompanied by appropriate citations of legal authorities. . . .

In this case, Continental cited 14 CFR §21.50 as its authority for the requested failure to warn charge. That regulation reads quite differently than the proposed charge:

> § 21.50 Instructions for continued airworthiness and manufacturer's maintenance manuals having airworthiness limitations sections.
>
> (a) The holder of a type certificate for a rotorcraft for which a Rotorcraft Maintenance Manual containing an "Airworthiness Limitations" section has been issued under § 27.1529(a)(2) or § 29.1529(a)(2) of this chapter, and who obtains approval of changes to any replacement time, inspection interval, or related procedure in that section of the manual, must make those changes available upon request to any operator of the same type of rotorcraft.
>
> (b) [Effective until Aug. 30, 2017.] The holder of a design approval, including either the type certificate or

supplemental type certificate for an aircraft, aircraft engine, or propeller for which application was made after January 28, 1981, must furnish at least one set of complete Instructions for Continued Airworthiness to the owner of each type aircraft, aircraft engine, or propeller upon its delivery, or upon issuance of the first standard airworthiness certificate for the affected aircraft, whichever occurs later. The Instructions must be prepared in accordance with §§ 23.1539, 25.1529, 27.1529, 29.1529, 31.82, 33.4, 35.4, or part 26 of this subchapter, or as specified in the applicable airworthiness criteria for special classes of aircraft defined in § 21.17(b), as applicable. If the holder of a design approval chooses to designate parts as commercial, it must include in the Instructions for Continued Airworthiness a list of commercial parts submitted in accordance with the provisions of paragraph (c) of this section. Thereafter, the holder of a design approval must make those instructions available to any other person required by this chapter to comply with any of the terms of those instructions. In addition, changes to the Instructions for Continued Airworthiness shall be made available to any person required by this chapter to comply with any of those instructions.

(c) To designate commercial parts, the holder of a design approval, in a manner acceptable to the FAA, must submit:

(1) a Commercial Parts List;

(2) Data for each part on the List showing that:

(i) The failure of the commercial part, as installed in the product, would not degrade the level of safety of the product; and

(ii) The part is produced only under the commercial part manufacturer's specification and marked only with the commercial part manufacturer's markings; and

(3) Any other data necessary for the FAA to approve the List.

do not find any error in our decision to decline to give CMI's requested charge and to instead give a standard instruction.

Moreover, the after-market part upon which Continental premises its complaint here was the single-piece Superior bushing which was found in the accident aircraft's engine. At trial, CMI produced expert testimony that the cause of the accident was inadequate lubrication to the exhaust valve guide of the No. 2 cylinder, which caused the engine to run dangerously hot thereby resulting in excessive wear. (N.T. 2/6/17, 127–129). According to Continental's expert James Brogden, this overheating and engine breakdown directly resulted from the installation of the after-market single-piece rocker arm bushings during the 2004 overhaul. (N.T. 2/6/17, 139, 155–156).

In rebuttal of this theory, Plaintiffs' expert Colin Sommer testified that according to Service Bulletin 97-6, the rocker arm bushing was a part which was required to be replaced during the 2004 overhaul and according to the parts catalog, the Superior bushing was an approved after-market replacement part for the Continental two-piece bushing (part #639629). (N.T. 1/26/17, 135–138). At no time did Continental issue a direction of any kind that aircraft owners, operators or mechanics should not use the FAA, PMA-approved single piece Superior bushing with the non-squirt hole rocker arm configuration in the TSIO-520-H engine. (N.T. 1/26/17, 139). Nor, in its 2010 report to the NTSB regarding this accident, did CMI report that there was any lack of lubrication in any of the cylinders in the

accident aircraft's engine and made no mention of anything being wrong with the rocker arms or lifters. (N.T. 2/6/17, 45–48). Thus, because the theory of the after-market part was raised by Continental and because the gist of this theory was not a defect in the Superior bushing itself but rather that it should not have been used with the rocker arm configuration in the engine, we determined that the charge requested by CMI was not appropriate and if given, would have had the effect of confusing the jury. We stand by that determination and therefore again deny CMI's request for a new trial on this ground.

F. Allegedly Improper Evidentiary Rulings

Continental next argues that a new trial should be granted for the reason that a series of purported unfair and erroneous evidentiary rulings had the cumulative effect of causing it such prejudice that a miscarriage of justice will result if the jury's verdict is allowed to stand. Again, we respectfully disagree.

"A motion for a new trial, of course, may be grounded on an allegation that evidence was admitted or excluded improperly during the course of a trial and that such error prejudiced the moving party's rights to a fair trial." Peterson v. Valmar S. S. Corp., 296 F. Supp. 8, 11 (E.D. Pa. 1969). "There is, however, no precise formula to guide a court in deciding such a motion," and "[a]t best, a court may employ the standard set forth in Rule 61 of the Federal Rules of Civil Procedure." Id. That Rule states:

> Unless justice requires otherwise, no error in admitting or excluding evidence – or any other error by the court or a party – is ground for granting a new trial, for setting aside a verdict, or for vacating, modifying, or otherwise disturbing a judgment or order. At every stage of the proceeding, the court must disregard all errors and defects that do not affect any party's substantial rights.

Fed. R. Civ. P. 61.

Generally, a wide range of discretion rests with the district court in granting or denying a motion for a new trial. McDonough Power Equipment, Inc. v. Greenwood, 464 U.S. 548, 556, 104 S. Ct. 845, 850, 78 L. Ed.2d 663 (1984) (citing Montgomery Ward & Co. v. Duncan, 311 U.S. 243, 251, 61 S. Ct. 189, 194, 85 L. Ed. 147 (1940)); Kremser v. Keithan, 56 F.R.D. 88, 91 (M.D. Pa. 1972). Likewise, the application of a particular rule of evidence by a district court is reviewed under an abuse of discretion standard. Sharif v. Picone, 740 F.3d 263, 267 (citing United States v. Balter, 91 F.3d 427, 437 (3d Cir. 1996)). Even where there may be multiple trial errors in a case, multitude of error alone is not a sufficient ground for reversal inasmuch as "[t]he Federal Rules require that a court at every stage of the proceeding must disregard any error or defect in the proceeding which does not affect the substantial rights of the parties." Lockhart v. Westinghouse Credit Corporation, 879 F.2d 43, 57 (3d Cir. 1989) (quoting Fed. R. Civ. P. 61). Thus, if *each* error is harmless, there is no basis for concluding that substantial rights were

violated. Id. And, through it all, the Courts should remain mindful that "a litigant is entitled to a fair trial but not a perfect one, for there are no perfect trials." McDonough Power Equipment, 464 U.S. at 553, 104 S. Ct. at 848 (quoting, *inter alia*, Brown v. United States, 411 U.S. 223, 231–232, 93 S. Ct. 1565, 1570–1571, 36 L. Ed. 2d 208 (1972)).

1. Preclusion of NTSB and Other Factual Reports

Under 49 U.S.C. §1154(b), "[n]o part of a report of the Board, related to an accident or an investigation of an accident, may be admitted into evidence or used in a civil action for damages resulting from a matter mentioned in the report." Inasmuch as this Title concerns the National Transportation Safety Board, it is axiomatic that within the meaning of this Section, "Board" is the NTSB. However, "[f]ederal regulations differentiate between a 'board accident report,' defined as 'the report containing the Board's determinations, including the probable cause of an accident, issued either as a narrative report or in a computer form,' and a 'factual accident report,' defined as a 'report containing the results of the investigator's investigation of the accident.'" In re Paulsboro Derailment Cases, Master Dkt. No. 13-784, 2015 U.S. Dist. LEXIS 88899 at *17–*18, (D. N.J. July 9, 2015) (quoting 49 C.F.R. §835.2). As further noted by Judge Kugler in Paulsboro,

> . . . The regulations also provide that "no part of a Board accident report may be admitted as evidence or used in any suit or action for damages growing out of any matter mentioned in

> such reports." By contrast, "there is no statutory bar to admission in litigation of factual accident reports." . . . Circuit courts around the country have held that the language of the statute "means what it says: No part of the Board's actual report is admissible in a civil suit." Id, at *18 (quoting 49 C.F.R. §835.2 and Chiron Corp. and Perseptive Biosystems, Inc. v. National Transportation Safety Board, 198 F.3d 935, 941, 330 U.S. App. D.C. 188 (D.C. Cir. 1999) and citing Campbell v. Keystone Aerial Surveys, Inc., 138 F.3d 996, 1001 (5th Cir. 1998); Thomas Brooks v. Burnett, 920 F.2d 634, 639 (10th Cir. 1990); Benna v. Reeder Flying Serv., Inc., 578 F.2d 269, 271 (9th Cir. 1978) and In re Jacoby Airplane Crash Litigation, No. 996073, 2007 U.S. Dist. LEXIS 69291 (D.N.J. Sept. 19, 2007)).

Here, Continental complains that the Court refused admission into evidence of the NTSB Factual Report in its entirety but nevertheless permitted some portions of the NTSB docket and CMI's Engine Analysis Report to be admitted into evidence. This Court permitted admission of those portions of the docket which were exclusively factual in nature, such as what Sterling Airways and Continental told the investigators was or was not done, and those which were largely undisputed such as the flight path of the accident aircraft. The report and those portions of the docket which were excluded contained opinions and/or conclusions of the NTSB investigators and/or otherwise inadmissible hearsay. See, e.g., Fed. R. Evid. 803(8). Evidence of CMI's Engine Analysis Report were admissible as a

statement of an opposing party and therefore was not hearsay under Fed. R. Evid. 801(d)(2). Insofar as we discern no error in this decision, we deny CMI's motion for new trial on the basis of this evidentiary ruling.

2. Fairness and Impartiality of Evidentiary Rulings

CMI next alleges generally that the Court's evidentiary rulings were unfair and inconsistent and that the Court's rulings showed partiality in favor of the Plaintiffs and Defendant Sterling Airways. In addition to re-asserting its contention with regard to the unjust preclusion of the NTSB Factual Report, Continental claims that the U.S. Forest Service Report was also unfairly precluded. More particularly, Continental claims that while "Sterling and Plaintiffs were given great latitude to discuss *one* factual report, or *one portion* of the NTSB's factual investigation of the accident, but [it] was not permitted to cross-examine the witness about any other portion." (CMI's Brief in Support of Support of Motion for New Trial and to Alter or Amend Judgment, p. 29) (emphasis in original).

Here again after reviewing the reports in question and the pertinent portions which were sought to be admitted, the Court determined that the probative value and relevance of the contents was exceeded by its potential for undue prejudice and that to admit the reports themselves would have allowed the introduction of inadmissible hearsay. While CMI makes much of the fact that a number of Plaintiffs' experts allegedly relied upon the reports in reaching their conclusions, the

record reflects that in reality, the experts merely acknowledged that they had reviewed the materials as part of their preparation of the case. (See, e.g. N.T. 1/26/17, 182–185). Moreover, much of the contents of both the United States Forest Service and NTSB Factual reports was opinion and conclusions.[10] Because it was the jury which was charged with determining what the cause of the accident was and which of the parties, if any, bore responsibility, we can find no abuse of discretion in deciding to exclude the materials at issue.

3. The Court's Jury Instruction to Disregard All NTSB Factual Findings and Conclusions

Next, CMI alleges that the giving of the following instruction to the jury operated to compound the harm and prejudice which it purportedly sustained:

> Members of the jury, during this trial you may have heard references to the United States Forest Service Aircraft Investigation Report, and the National Transportation Safety Board report.
>
> I hereby instruct you, members of the jury, that you cannot consider any factual findings

[10] Furthermore, on cross-examination, CMI's counsel specifically asked Mr. Sommer: "[i]sn't it true that the U.S. Forest Service found that the aircraft was not airworthy on the day of the crash?" (N.T. 1/26/17, 184). Any prejudice which CMI may have suffered by the Court's refusal to permit the U.S.F.S. Report is therefore minimal at best and certainly not of the magnitude necessary to warrant throwing out the verdict.

> and conclusions of these reports in your deliberations. These reports have not been admitted into evidence, are not evidence in this case and cannot be considered by you. Is that understood?

(N.T. 2/15/17, 111).

Given our finding that the decision to preclude these materials was an appropriate exercise of our discretion, we cannot find that the giving of this instruction constituted reversible error either.

4. Preclusion of Terry Horton's Testimony Concerning Oil Analysis Findings

Continental also complains that one of its expert witnesses, Terry Horton, was precluded from explaining to the jury the significance of oil analysis results and specifically what Sterling would have discovered if it had done the testing pursuant to CMI's service instructions.

As is clear from the record, Mr. Horton was permitted to testify about oil analysis trend monitoring, but he was precluded from explaining to the jury what oil analysis is and offering expert opinion as to what such testing would have shown had it been performed by Sterling Airways. (N.T. 2/13/17, 20, 82–85). Mr. Horton was precluded from so testifying because that proposed testimony and opinion evidence was not included in his expert reports and thus Sterling did not have the opportunity to prepare to cross-examine him or to otherwise rebut that testimony at trial. (N.T.

2/13/17, 3–21). Inasmuch as we believe that this decision was appropriate to prevent unfair prejudice, we decline to grant Continental a new trial on this ground. See, generally, Fed. R. Evid. 403.

5. Colin Sommer's Testimony on Metallurgical Processes

Continental next claims that the Court erred by permitting Colin Sommer to testify as an expert on metallurgical processes insofar as he was offered only as an expert in the field of aircraft accident investigation. Once again, we find no error in Mr. Sommer's testimony.

By his own admission, Mr. Sommer is not a metallurgist, but rather a mechanical engineer, although he was designated at least once before to give metallurgical opinions in a case concerning the crash of an aircraft with a Lycoming engine and wrote the chapters on metallurgy in a textbook on helicopter accident investigations. (N.T. 1/25/17, 52–53). Mr. Sommer was also at the metallurgical laboratory when the testing in this case was being done. (N.T. 1/25/17, 53). Although his testimony did at various points make reference to the various materials and alloys which were used to make the exhaust valve guides and the temperatures at which those materials could be expected to soften, it is clear from a reading of his testimony as a whole that in rendering his opinions, he was relying on the work of the other experts and/or his own experience and that he was not testifying as a metallurgical expert. (N.T.

1/25/17, 55, 141, 150–155). "There is no prohibition against an expert relying upon the work of another expert so long as the expert is otherwise qualified." In re Processed Egg Products Antitrust Litigation, No. 08-md-2002, 2016 U.S. Dist. LEXIS 93543 at *3 (E.D. Pa. July 18, 2016) (citing In re Zoloft Products Liability Litigation, 26 F. Supp. 3d 466, 470 (E.D. Pa. 2015); Leese v. Lockheed Martin Corp., 6 F. Supp. 3d 546, 553 (D. N.J. 2014); IBEW v. Local 380 Pension Fund v. Buck Consultants, Civ. A. No. 03-4932, 2008 U.S. Dist. LEXIS 43435 at *8 – *9 (E.D. Pa. June 3, 2008). Here there is no question but that the other experts upon whom Mr. Sommer relied – Mr. Carden and Mr. Seader in particular, were well qualified. We find no reversible error in the admission of this testimony.

6. CMI's Remaining Claims of Error

In addition to all of the arguments addressed above, Continental also assigns as reversible error the Court's decisions to allow the following into evidence:

a) evidence concerning CMI's Certificates of Compliance, service difficulty reports, third-party shop orders and warranty claims; and

b) testimony about a magazine survey of cylinders by various manufacturers.

The gist of CMI's argument with respect to the admission of this evidence is that this evidence was irrelevant, prejudicial unhelpful and confusing to the jury. This Court respectfully disagrees. To the contrary, we found this evidence to be wholly relevant and not

unfair or unduly prejudicial to the interests of CMI and after reviewing the trial record, we continue to so find. Insofar as CMI has not made the requisite showing of an abuse of this Court's discretion in permitting the admission of this evidence, it is not entitled to a new trial on this ground either.

G. Motion to Clarify, Alter or Amend the Judgment

Finally, CMI urges this Court to Amend the Judgment which was formally entered on the docket of this matter on February 21, 2017 to dispose of the cross-claims filed on its and Sterling's behalf against one another. In light of the jury's verdict in favor of the Plaintiffs and against Defendant Continental only, we agree that the competing cross-claims of the Defendants for liability over, indemnity and contribution are effectively moot. Amendment of the verdict shall be accomplished by a separate Order.

Conclusion

For all of the reasons outlined in the preceding pages, we do not find that Continental is entitled to a new trial in this matter and its Motion therefor is DENIED.

An Order follows.

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UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 17-3182

ELIZABETH C. SNIDER, Individually and as Executrix of the estate of Daniel A. Snider;
L. W. S., a minor, by his mother, Elizabeth C. Snider

v.

STERLING AIRWAYS, INC.; CONTINENTAL MOTORS, INC.; TDY INDUSTRIES, LLC; TELEDYNE TECHNOLOGIES INCORPORATED; TECHNIFY MOTOR (USA), INC.

CONTINENTAL MOTORS, INC; TDY INDUSTRIES, LLC; TELEDYNE TECHNOLOGIES INCORPORATED; TECHNIFY MOTOR (USA), INC.,
Third Party Plaintiffs

v.

UNITED STATES OF AMERICA,
Third Party Defendant

Continental Motors, Inc.,
Appellant

(E.D. Pa. No. 2-13-cv-02949)

SUR PETITION FOR REHEARING

Present: SMITH, Chief Judge, McKEE, AMBRO, CHAGARES, JORDAN, HARDIMAN, GREENAWAY, JR., SHWARTZ, KRAUSE, RESTREPO, BIBAS and PORTER Circuit Judges*

The petition for rehearing filed by Appellant in the above-entitled case having been submitted to the judges who participated in the decision of this Court and to all the other available circuit judges of the circuit in regular active service, and no judge who concurred in the decision having asked for rehearing, and a majority of the judges of the circuit in regular service not having voted for rehearing, the petition for rehearing by the panel and the Court en banc, is denied.

BY THE COURT,

s/ Theodore McKee
Circuit Judge

Dated: January 22, 2019
Lmr/cc: John R. Merinar, Jr.
Allison B. Williams
Jeffrey W. Moryan
Laurie A. Salita
Douglas E. Winter

* The Honorable Thomas I. Vanaskie, a member of the merits panel that considered this matter, retired from the Court on January 1, 2019. The request for panel rehearing has been submitted to the remaining members of the merits panel and the request for rehearing en banc submitted to all active members of the Court who are not recused.

PUBLIC LAW 103-298—AUG. 17, 1994

103d Congress

An Act

To amend the Federal Aviation Act of 1958 to establish time limitations on certain civil actions against aircraft manufacturers, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION I. SHORT TITLE.

This Act may be cited as the "General Aviation Revitalization Act of 1994".

SEC. 2. TIME LIMITATIONS ON CIVIL ACTIONS AGAINST AIRCRAFT MANUFACTURERS.

(a) IN GENERAL.—Except as provided in subsection (b), no civil action for damages for death or injury to persons or damage to property arising out of an accident involving a general aviation aircraft may be brought against the manufacturer of the aircraft or the manufacturer of any new component, system, subassembly, or other part of the aircraft, in its capacity as a manufacturer if the accident occurred—

(1) after the applicable limitation period beginning on—

(A) the date of delivery of the aircraft to its first purchaser or lessee, if delivered directly from the manufacturer; or

(B) the date of first delivery of the aircraft to a person engaged in the business of selling or leasing such aircraft; or

(2) with respect to any new component, system, subassembly, or other part which replaced another component, system, subassembly, or other part originally in, or which was added to, the aircraft, and which is alleged to have caused such death, injury, or damage, after the applicable limitation period beginning on the date of completion of the replacement or addition.

(b) EXCEPTIONS.—Subsection (a) does not apply—

(1) if the claimant pleads with specificity the facts necessary to prove, and proves, that the manufacturer with respect to a type certificate or airworthiness certificate for, or obligations with respect to continuing airworthiness of, an aircraft or a component, system, subassembly, or other part of an aircraft knowingly misrepresented to the Federal Aviation Administration, or concealed or withheld from the Federal Aviation Administration, required information that is material and relevant to the performance or the maintenance or operation of such aircraft, or the component, system, subassembly, or other part, that is causally related to the harm which the claimant allegedly suffered;

(2) if the person for whose injury or death the claim is being made is a passenger for

purposes of receiving treatment for a medical or other emergency;

(3) if the person for whose injury or death the claim is being made was not aboard the aircraft at the time of the accident; or

(4) to an action brought under a written warranty enforceable under law but for the operation of this Act.

(c) GENERAL AVIATION AIRCRAFT DEFINED.—For the purposes of this Act, the term "general aviation aircraft" means any aircraft for which a type certificate or an airworthiness certificate has been issued by the Administrator of the Federal Aviation Administration, which, at the time such certificate was originally issued, had a maximum seating capacity of fewer than 20 passengers, and which was not, at the time of the accident, engaged in scheduled passenger-carrying operations as defined under regulations in effect under the Federal Aviation Act of 1958 (49 U.S.C. App. 1301 et seq.) at the time of the accident.

(d) RELATIONSHIP TO OTHER LAWS.—This section supersedes any State law to the extent that such law permits a civil action described in subsection (a) to be brought after the applicable limitation period for such civil action established by subsection (a).

SEC. 3. OTHER DEFINITIONS.

For purposes of this Act—

(1) the term "aircraft" has the meaning given such term in section 101(5) of the Federal Aviation Act of 1958 (49 U.S.C. 1301(5));

(2) the term "airworthiness certificate" means an airworthiness certificate issued under section 603(c) of the Federal Aviation Act of 1958 (49 U.S.C. 1423(c)) or under any predecessor Federal statute;

(3) the term "limitation period" means 18 years with respect to general aviation aircraft and the components, systems, subassemblies, and other parts of such aircraft; and

(4) the term "type certificate" means a type certificate issued under section 603(a) of the Federal Aviation Act of 1958 (49 U.S.C. 1423(a)) or under any predecessor Federal statute.

SEC. 4. EFFECTIVE DATE; APPLICATION OF ACT.

(a) EFFECTIVE DATE.—Except as provided in subsection (b), this Act shall take effect on the date of the enactment of this Act.

(b) APPLICATION OF ACT.—This Act shall not apply with respect to civil actions commenced before the date of the enactment of this Act.