

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

Michelle Stecyk et al.,	:	
Plaintiffs,	:	
	:	
v.	:	CIVIL ACTION
	:	NO. 94-CV-1818
Bell Helicopter	:	
Textron., Inc. et al.	:	
Defendants.	:	
	:	
	:	

MEMORANDUM OF DECISION

McGlynn, J. September , 1997

A Daubert hearing was held on August 11, 1998 to determine the reliability of Robert L. Dega's expert testimony regarding the alleged design, manufacturing and testing defects in the 617 seal manufactured by defendant Macrotech Fluid Sealing, Inc. and the right torquemeter shaft manufactured by defendant General Motors ("GM"). Before the court is GM's post-hearing memorandum on the inadmissibility of Mr. Dega's testimony and plaintiffs' joint response thereto. For the reasons set forth below, the court finds that Mr. Dega's testimony is sufficiently reliable to assist the finder of fact and GM's motion in limine to exclude his testimony will be denied.

I. MR. DEGA'S METHODOLOGY

The starting point for Mr. Dega' analysis of the 617 seal and the torquemeter shaft was "a basic set of engineering

principles that relate to how a seal operates, [and] the various parameters required to get the seal to operate properly."

Daubert Hearing Tr. at 15. In describing the standard methodology for seal failure analysis used during his time at General Motors, Mr. Dega stated,

[o]nce we had the basics of what made a seal operate properly, we could go in and analyze the problem. A seal problem consists of the seal and the shaft, 50/50. If one isn't good, the seal won't work on it. And so we used this technology to analyze problems and then go back and mechanically correct the variables that were in the seal or the shaft. . . . You find out what the variables are and you try to measure them in the system and then determine what their contribution is to the leakage of the sealing system.

Id. at 10-11, 29.

Mr. Dega further testified that it was standard practice at GM to utilize technical information available in professional annals and any investigative reports prepared by military authorities. Id. at 11-12.

The methodology employed by Mr. Dega in analyzing the sealing system at issue here consisted of: (1) reviewing the Navy's Court of Inquiry Report and other documents from the Court of Inquiry's file (Id. at 13), as well as deposition exhibits and testimony arising from this litigation (Id. at 14); (2) reviewing the instruction manual for installation of the 617 seal (Id. at 21); (3) photographing the torquemeter shaft at 5X magnification

to detect the presence of machine lead (Id. at 24; Stecyk v. Bell Helicopter Textron, Inc., 1998 WL 42302, No. CIV. A. 94-CV-1818, at *5 (E.D. Pa. Jan. 5, 1998)); (4) measuring the surface finish of the torque-meter shaft with a plastic facsimile material (Daubert Hrg. Tr. at 26); (5) measuring the seal in operation (Id. at 26); (6) measuring the flange surface of the torque-meter shaft (Id. at 26); (7) examining the torque-meter shaft under 10X magnification to detect the presence of machine lead; (8) measuring the surface finish of the plastic facsimile replica with a "Japanese surface finish measuring piece of equipment that has a two-tenths of a thou radius on a diamond stylus" (Id. at 28); and (9) utilizing charts prepared by Warren Lieberman, plaintiffs' expert on aviation accident investigation, showing oil loss in the crash airplane before flight. Id. at 32-33, 42-43. He testified that his methodology in examining the sealing system in this case was the same method used to perform accident and failure analysis of sealing systems during his time at General Motors. Id. at 15, 29, 35-36.

From these studies, Mr. Dega concluded that the primary cause of oil leakage which led to the crash was backwards installation of the 617 seal. Id. at 31. He also determined that the presence of excessive surface roughness and machine lead on the torque-meter shaft were substantial contributing factors to oil leakage and constituted secondary causes of the crash. Id.

II. LEGAL STANDARD

Under the Federal Rules of evidence, the trial judge acts as "gatekeeper" to ensure that expert testimony or evidence is both relevant and reliable. Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 589 (1993). "The Rules of Evidence embody a strong and undeniable preference for admitting any evidence which has the potential for assisting the trier of fact." Kannankeril v. Terminix Intern., Inc., 128 F.3d 802, 805 (3d Cir. 1997). Rule 702¹ governs the admissibility of expert testimony and has a liberal policy of admissibility. Id. The Rule requires that: (1) the proffered witness must be an expert; (2) the expert must testify about matters requiring scientific, technical or specialized knowledge; and (3) the expert's testimony must assist the trier of fact. Id.

Defendants contend Mr. Dega's opinions are deficient under the second requirement, which permits the admission of expert opinion only if it is "reliable," i.e., based on the "methods and procedures of science," rather than on "subjective belief or

¹ Federal Rule of Evidence 702 provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

unsupported speculation.'" Id. at 806. (quoting In re Paoli R.R. Yard PCB Litig. ("Paoli II"), 35 F.3d 717, 744 (3d Cir. 1994)).

A non-exclusive list of factors deemed important to determining reliability include: (1) whether a method consists of a testable hypothesis; (2) whether the method has been subject to peer review; (3) the known or potential rate of error; (4) the existence and maintenance of standards controlling the technique's operation; (5) whether the method is generally accepted; (6) the relationship of the technique to methods which have been established to be reliable; (7) the qualifications of the expert witness testifying based on the methodology; and (8) the non-judicial uses to which the method has been put. Paoli II, 35 F.3d at 742 n.8.

"Daubert does not set up a test of which opinion has the best foundation, but rather whether any particular opinion is based on valid reasoning and reliable methodology. Admissibility decisions focus on the expert's methods and reasoning; credibility decisions arise after admissibility has been determined." Kannankeril, 128 F.3d at 806. A trial judge should only exclude expert opinion evidence if the expert's investigative process is so flawed that the expert lacks "good grounds" for his or her conclusions. Paoli II, 35 F.3d at 746.

Because plaintiffs seek the admission of Mr. Dega's testimony they bear the burden of demonstrating its reliability

by a preponderance of evidence. Id. at 744.

III. DISCUSSION

A. Reliability of Mr. Dega's Opinion

GM argues that plaintiffs failed to establish that Mr. Dega followed a valid methodology to reach his conclusions. Their argument is that Mr. Dega utilized only general engineering principles which address the mere potential for leakage, rather than relying upon specific facts which prove the actual occurrence of leakage.²

The court will not exclude Mr. Dega's testimony because it is based in part upon general engineering principles -- indeed, it would be of great concern if they were not. GM's contention that Mr. Dega simply "jettisoned analysis of facts for application of a general engineering principle" is also unavailing. GM Daubert Post-Hrg. Mem. at 8. Mr. Dega's investigation was based upon his own measurements of surface roughness and machine lead on the torquemeter shaft at issue, as well as extensive data gathered from the Navy Court of Inquiry Report and Warren Lieberman's analysis of the amount of oil which

² On this issue, GM's reliance on British Airways Bd. v. Boeing Co., 585 F. 2d 946 (9th Cir. 1978), is misplaced. That case held that a witness' testimony that a crack in the terminal fitting of an airplane can lead to a catastrophic accident was insufficient to defeat the airplane manufacturer's summary judgment motion because no witness could produce specific facts showing or even creating an inference that such a crack actually led to the accident. Id. at 951-52. In this case, Mr. Dega has specific facts supporting his theory of causation.

leaked from the crash airplane. "Analysis of facts" was clearly part of Mr. Dega's methodology.

GM also contends that Mr. Dega's failure to perform independent tests to support his conclusion that a surface finish of 69 microinches would contribute to leakage requires exclusion of his testimony. In support, GM cites Childs v. General Motors Corp. for the proposition that an expert engineer's opinion based solely on general engineering and physics principles and which is unsupported by testing must be excluded. No. CIV. A. 95-0331, 1998 WL 414719 (E.D. Pa. 1998). But Childs is distinguishable from the case at bar. In Childs the expert witness conducted independent testing on the allegedly defective product, a reclining front passenger seat of a car, which failed to prove his ultimate conclusion. Id. at *4. Further, the expert's examination of the accident seat revealed no physical evidence of damage which would have existed under his theory. Id. The Childs expert relied only upon general principles of engineering and physics, and ignored physical evidence which contradicted his theoretically-based conclusions. The court accordingly found there was "a pivotal analytical gap between [the expert's] testimony of the theoretical possibility" of defect and causation and his opinion that the product was defective. Id. at *4 n.6 (citing General Elec. Co. v. Joiner, -- U.S. --, 118 S. Ct. 512, 519, 139 L. Ed. 2d 508 (1997)). Here, Mr. Dega not only relies

upon physical evidence of improper seal installation, excessive surface roughness and machine lead on the torquemeter shaft, and other documentary evidence compiled by the Navy Court of Inquiry and Warren Lieberman, but the results of Mr. Dega's own investigation do not undermine his ultimate opinion that the seal and torquemeter shaft were defective. The "analytical gap" between data and opinion which was present in Childs does not exist in this case.

It should be noted that the eight-factor reliability analysis enumerated by the Court of Appeals in Paoli II is a flexible one, and the factors listed are "neither exhaustive nor applicable in every case." Kannankeril, 128 F.3d at 806-07. Thus, where other reliable evidence supports an expert's opinion, testing is not a prerequisite for reliability. See Kannankeril v. Terminix Int'l., Inc., 128 F.3d 802, 807 (3d Cir. 1997) (where medical expert employed "differential diagnosis" -- which could include physical examinations, taking medical histories, and reviewing clinical tests, but need not employ all those techniques to be reliable -- review of plaintiff's medical history and physician's report of neuropsychological complaints and cognitive impairment was sufficient without independent testing or examination). In this case, the aforementioned data underlying Mr. Dega's conclusions adequately support his opinions without independent testing.

In addition, the fact that Mr. Dega's theory of causation has not been subjected to peer review and publication is not dispositive. Peer review and publication "may not . . . in every case be necessary conditions of reliability." Kannankeril, 128 F.3d at 800. This is especially true where the expert's theory is not novel and "is widely accepted scientific knowledge." Id. Given the general engineering principles underpinning his theory of causation, it is questionable whether Mr. Dega's findings are suitable for peer review and publication. Nor does the potential rate of error "for his opinion that surface finish contributed to leakage" appear to be relevant. GM Daubert Post-Hrg. Mem. at 14. While pointing vigorously to Mr. Dega's failure to address these areas, GM has provided no guidance on why these considerations invalidate his conclusions.

As to the general acceptance of his theories, Mr. Dega testified that his investigation employed the same methodology utilized during his tenure at GM, the very defendant which seeks to exclude his opinions. Daubert Hrg. Tr. at 10-13, 29, 35-36. The court finds this testimony credible, especially in light of defendants' failure to produce evidence to the contrary.

GM has identified several weaknesses in Mr. Dega's testimony. These shortcomings, however, go to the credibility and weight of that testimony, not to its admissibility. Kannankeril, 128 F.2d at 802; see also Paoli II, 35 F.3d at 744

("The grounds for the expert's opinion merely have to be good, they do not have to be perfect."). Defendants will have the opportunity to expose those weaknesses at trial -- "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 596 (1993). The court therefore finds that plaintiffs have met their burden of demonstrating that Mr. Dega has "good grounds" for his opinions and that his testimony will be helpful to the finder of fact. GM's motion in limine to exclude those opinions is accordingly denied.

B. Individuation of Liability

Apart from the reliability of Mr. Dega's opinions, GM contends that Mr. Dega failed to individuate liability against it. GM argues that because Mr. Dega testified that a backwards-installed seal would definitely leak, the crash aircraft's sealing system would have leaked regardless of the surface finish or presence of machine lead on the torquemeter shaft. In support of this position, GM cites Foley v. Pittsburgh-Des Moines Co., in which the Pennsylvania Supreme Court held,

where an injury may be the result of one of several causes for only one of which defendant is liable, the burden is on the plaintiff to individuate that one as the proximate cause of his injury and to exclude other causes fairly suggested by the evidence

to which it would be equally reasonable to attribute the injury.

68 A.2d 517, 528 (Pa. 1949).

GM's argument under Foley fails because Mr. Dega established his opinion that GM was a joint-tortfeasor with Macrotech, the seal designer and manufacturer. In Pennsylvania, proximate cause may be established by evidence that a defendant's negligence was a substantial factor in bringing about the harm inflicted upon a plaintiff. Jones v. Montefiore Hosp., 431 A.2d 920, 923 (1981). This substantial factor need not be the only factor which produces the injury. Id. Moreover, evidence that a defendant's negligence has increased the risk of harm to another "furnishes a basis for the fact-finder to go further and find that such increased risk was in turn a substantial factor in bringing about the resultant harm." Id. at 924 (citing Restatement (Second) of Torts § 323(a) (1965)). While Mr. Dega did testify that he thought the reverse-installation of the seal was the primary cause of leakage, he also testified that the defects in the torque-meter shaft were substantial, contributing causes of the alleged oil leak which led to the crash. Plaintiffs theory is not that either a defective seal or a defective torque-meter shaft caused the accident; their theory is that both factors, working together, caused the accident. Mr. Dega's opinion that the factor attributable to GM may have played a lesser role does not

eliminate GM's potential liability as a joint tortfeasor.³

As the court went on to say in Foley, "where the evidence points to a certain cause which would make the defendant liable the plaintiff will not be denied redress merely because there may be some other possible cause for the accident; in such a case the question is for the jury." Id. Plaintiffs have evidence indicating GM's torquemeter shaft played a substantial role in the crash. It is for a jury to decide whether GM is in fact liable.

C. Substantial Factor

GM lastly contends that Mr. Dega's testimony establishes that excessive surface roughness and machine lead were not substantial factors in producing oil leakage. Pennsylvania follows the Restatement (Second) of Torts view on what constitutes a substantial factor in bringing about harm to another. Vattimo v. Lower Bucks Hosp., Inc., 465 A.2d 1231, 1233 (Pa. 1983). The court considers three factors:

³ See Foflygen v. R. Zemel, M.D. (PC), 615 A.2d 1345, 1353 (Pa. Super. Ct. 1992), alloc. den., 629 A.2d 1380 (Pa. 1993)

Joint tortfeasors are parties who either act together in committing a wrong or whose acts, if independent of each other, unite a single injury. A joint tort occurs where two or more persons owe the same duty to the plaintiff and by their common negligence, the plaintiff is injured.

Id. at 1352 (citations omitted).

(a) the number of other factors which contribute in producing the harm and the extent of the effect which they have in producing it;

(b) whether the actor's conduct has created a force or series of forces which are in continuous and active operation up to the time of the harm, or has created a situation harmless unless acted upon by other forces for which the actor is not responsible;

(c) lapse of time.

Id. at 1233-34.

According to GM, Mr. Dega's testimony establishes that the reverse installation of the 617 seal was such a predominating cause of the crash that the torquemeter shaft cannot be considered a substantial contributing factor. It bases this argument on Mr. Dega's testimony that improper seal installation was the "primary" cause of the crash and his general observation that reversed unidirectional seals will leak. However, the court does not agree with GM's interpretation of Mr. Dega's testimony. At no time during the Daubert hearing did Mr. Dega discount the impact of the torquemeter shaft's alleged defects to the degree claimed by GM. Mr. Dega clearly testified that excessive surface roughness and machine lead on GM's torquemeter shaft were substantial and contributing, albeit secondary, causes of oil leakage which led to the crash. Daubert Hrg. Tr. at 31.

As to the second consideration, GM's contention that only an infinitesimal amount of fluid leakage could be attributed to

surface finish and lead is an issue of fact which remains in dispute. Lastly, GM's contention that too much time elapsed and too many successful flights took place between the installation of the crash torquemeter shaft and the accident on July 20, 1992 does not take into account plaintiff's theory that it was both the backwards-installed 617 seal and the defective torquemeter shaft, working together, which produced the oil leakage and caused the crash.

As a result, the court cannot find at this pretrial stage that GM's alleged negligence was not a substantial factor in causing the crash.

III. CONCLUSION

For the foregoing reasons, GM's motion to exclude the testimony of Robert L. Dega will be denied.

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	:	
	:	

O R D E R

AND NOW, this day of September, 1998, after a Daubert hearing and upon consideration of defendant General Motors, Inc.'s motion in limine and post-hearing memorandum to exclude the testimony of Robert L. Dega, and plaintiffs' replies thereto, it is hereby

ORDERED that defendant General Motors' motion is **DENIED**.

BY THE COURT:

JOSEPH L. McGLYNN, JR., J.