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THE DUTY OF THE MANUFACTURER TO RECALL AIRCRAFT

GEORGE M. FLEMING*

THE AMERICAN public is familiar with efforts by manufacturers and the government to recall defective products. Recall campaigns have touched a variety of consumer items; home appliances, toys, electronics and automobiles are a few.¹ In many industries, regulatory guidelines have developed to help prevent defective products from entering the market and to deal with defective products once they reach the consumer. The civil aviation industry also has developed guidelines dealing with defective products.

The United States civil aircraft fleet currently numbers approximately 190,000 units.² The Federal Aviation Act of 1958 empowers the Federal Aviation Administration (FAA) to promote the safety of this ever-increasing number by prescribing minimum airworthiness standards governing the design, materials, workmanship, construction, and performance of aircraft, aircraft engines, appliances, and propellers.³ The FAA administers these minimum safety standards through a system of aircraft certification. The FAA issues three categories of aircraft certificates: (1) type cer-

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¹ See 2 CONSUMER PRODUCT SAFETY COMMISSION ANN. REP. 103 (1975) for a listing of the different types of products that have been recalled by the Consumer Product Safety Commission.

² Bus. & Com. Av., Dec., 1978, at 81.

³ 49 U.S.C. § 1421(a)(1), (2) (1976); 14 C.F.R. §§ 23, 25, 27, 29, 31, 33, 35, 36 and 37 (1979).

tificates which are normally issued to manufacturers for new or modified aircraft, aircraft engines and propellers; (2) production certificates which are issued to manufacturers that intend to produce type certificated aircraft or related parts; and (3) airworthiness certificates which state that an aircraft conforms to the approved design under a type certificate and is in a condition for safe operation.⁴

The FAA requires manufacturers to report defects they find in their products which affect the safety of flight.⁵ This is usually done by a manufacturing representative contacting the FAA regional office with responsibility over that particular manufacturer. Repair facilities are also required to report to the FAA defects or unairworthy conditions they discover.⁶ General aviation mechanics utilize the Malfunction or Defect Report⁷ to report defects they discover. Air carriers and air taxi operators report this same information in a Service Difficulty Report.⁸

When the FAA determines an unsafe condition exists in a product that is likely to exist or develop in other products of the same type design, the FAA issues an airworthiness directive.⁹ This directive may prescribe inspections, parts replacement, or modifications. The directive may also prescribe conditions and limitations under which a product may continue to be operated.¹⁰ The Federal Aviation Regulations (FAR) require operators to conform to airworthiness directives (AD's) applicable to their aircraft.¹¹

AD's are Federal Aviation Regulations and are published in the Federal Register as amendments to FAR Part 39. Depending on the seriousness of the unsafe condition, AD's are published in one of the following categories:

- a. Notice of Proposed Rulemaking (NPRM). An NPRM is issued by the FAA when it is determined there is no emer-

⁴ 49 U.S.C. § 1423(a), (b), (c) (1976).

⁵ 14 C.F.R. §§ 21.3, 37.17 (1979).

⁶ 14 C.F.R. § 145.63 (1979).

⁷ F.A.A. Form 8330-2.

⁸ F.A.A. Form 8070-1.

⁹ 14 C.F.R. § 39.1 (1979).

¹⁰ 14 C.F.R. § 39.11 (1979).

¹¹ 14 C.F.R. § 39.3 (1979).

gency affecting air safety. Interested persons are invited to comment by submitting any written data or arguments they desire. Proposals contained in the notice may be changed or withdrawn in light of the comments received. When an NPRM is adopted as a final rule, it is published in the Federal Register and then printed and distributed by mail to the registered owners of the make and model affected.

- b. Immediate Adopted Rule. This is an AD of an urgent nature where prompt action is essential. Unlike the NPRM, it is issued without prior notice. This type of AD is made effective less than thirty days after publication in the Federal Register and is distributed by mail to the registered owners of the make and model affected.
- c. Emergency AD. This type of AD is issued when immediate action is required to correct an unsafe condition. Emergency AD's are distributed to the registered owners of the make and model affected by telegram or priority mail. An example of this type of directive is the AD issued by the FAA in the aftermath of the American Airlines DC-10 crash which occurred at Chicago, Illinois on May 25, 1979. Three days after the accident telegraphic AD's were issued by the FAA to operators of McDonnell Douglas Model DC-10 series airplanes "because of a possibility of a wing mounted engine pylon support failure which could result in departure of the engine from the airframe."¹²

An additional form of advising aircraft owners of potentially dangerous conditions is the manufacturer's service bulletin. The manufacturer may issue a service bulletin setting out the manufacturer's recommendations concerning the inspection, modification, or repair of a product. This may be done if the manufacturer's recommendations do not meet FAA criteria to issue an airworthiness directive, or if the manufacturer desires to make recommendations while the FAA is considering issuing an airworthiness directive. For example, McDonnell Douglas telegraphed an Alert Service Bulletin to DC-10 operators two days after the American Airlines DC-10 accident which occurred at Chicago on May 25, 1979. This McDonnell Douglas Alert Service Bulletin

¹² 44 Fed. Reg. 37,617 (1979).

A54-68 recommended inspections of the wing pylon mount systems on DC-10s.

MANUFACTURERS' CONTINUING POST-SALE DUTY TO WARN USERS OF DEFECTS AND TO DEVELOP CORRECTIVE MEASURES

The consumer of aviation services places great reliance on those who design and manufacture aircraft and aircraft components. This reliance is based on the consumer's deference to one with superior knowledge. The manufacturer's superior knowledge of his product and the continuing development of his product lines imposes a responsibility on the manufacturer to the consumer. Users of aviation services obviously have an important stake in assuring that aviation manufacturers advise users of potential defects in their products after the sale. Thus, the courts have held that a manufacturer is under a continuing duty to warn users of a dangerous condition that comes to its attention after the product enters the stream of commerce.¹³

In *Noel v. United Aircraft Corp.*,¹⁴ the court directly confronts the manufacturer's post-sale duty to develop and supply improved devices to remedy serious dangers in products previously marketed. The *Noel*¹⁵ case was brought under the Death on the High Seas Act¹⁶ on behalf of a passenger of a Lockheed Constellation owned by a Venezuelan airline which exploded en route from New York to Venezuela. The suit was not brought against the airline or the manufacturer of the aircraft, but rather against the manufacturer of the propellers. The district court found that uncontrolled propeller overspeed developed in the number two engine,¹⁷ and when the flight crew could not feather the propeller, the captain decided to return to New York. The court found that this prolonged propeller overspeed in the number two engine resulted in the complete separation of the propeller.¹⁸ The separated propeller pene-

¹³ 1 L. FRUMER & M. FRIEDMAN, PRODUCTS LIABILITY § 8.02 (1978).

¹⁴ 219 F. Supp. 556 (D. Del. 1963), *rev'd on other grounds*, 342 F.2d 232 (3d Cir. 1964).

¹⁵ 219 F. Supp. 556, 557.

¹⁶ 46 U.S.C. §§ 761-67 (1976).

¹⁷ *Noel v. United Aircraft Corp.*, 219 F. Supp. 556, 560 (D. Del. 1963), *rev'd on other grounds*, 342 F.2d 232 (3d Cir. 1964).

¹⁸ *Id.* at 566.

trated the fuselage of the aircraft, slashing through the fuselage and into the belly tank of gas located immediately under the floor, causing it to explode.¹⁹

The district court in *Noel* noted that the manufacturer was aware of the problem six years prior to the accident.²⁰ Before the accident the propeller manufacturer developed a device to remedy this same defect to be used on the Lockheed Electra, but not on the Constellation.²¹ The court imposed a post-sale duty upon the propeller manufacturer to develop and supply improved devices to remedy serious dangers in products previously marketed.²² Both the trial court and the Court of Appeals for the Third Circuit, considering the risk to the flying public, pointed out that the manufacturer's duty to remedy serious dangers in its products is to be performed with promptness.²³ The Third Circuit in *Noel* stated:

The record establishes that the respondent [the propeller manufacturer] was aware that absent some type of control mechanism, continued use of its propeller systems on Lockheed Constellations endangered the public, and that despite this awareness it permitted the development of an effective safety device adaptable to these planes to lag behind similar development for other airplanes.²⁴

Noel clearly imposes a duty on manufacturers to research and develop an improved product and to make corrective devices available within a reasonable time. The case sets out an independent actionable theory of recovery against a manufacturer who fails to develop curative devices in a timely fashion.

It is well established that when a manufacturer sells a product, having actual or constructive knowledge that there is danger involved in its use, he has a duty to warn the purchaser.²⁵ *Noel*

¹⁹ *Id.*

²⁰ *Id.* at 570.

²¹ *Id.* at 571.

²² *Id.* at 572.

²³ *Id.*

²⁴ *Noel v. United Aircraft Corp.*, 342 F.2d 232, 237 (3d Cir. 1964). See also Note, *Products Liability—Post-Sale Duty to Cure Dangerous Defects*, 40 TUL. L. REV. 436 (1966).

²⁵ *DeVito v. United Airlines*, 98 F. Supp. 88 (E.D.N.Y. 1951); *Witt Ice & Gas Co. v. Bedway*, 72 Ariz. 152, 231 P.2d 952 (1951); RESTATEMENT (SECOND) OF TORTS §§ 388, 389, 394 (1965).

logically extends this duty to dangers the manufacturer discovers after the sale.

In *Braniff Airways v. Curtis Wright Corp.*,²⁶ the Second Circuit cited the *Noel* principle but found it unnecessary under the *Braniff* facts to adopt *Noel*. The court indicated instead that where the manufacturer becomes aware of a dangerously defective design, "[t]he manufacturer has a duty either to remedy these or, if complete remedy is not feasible, at least to give users adequate warnings and instructions concerning the methods for minimizing the danger."²⁷ In another aviation case, *O'Keefe v. Boeing Co.*,²⁸ the New York District Court noted that some aviation manufacturers have assumed a continuous post-sale duty to develop and supply improved devices to remedy marketed defective products as part of the manufacturer's standard custom and practice.²⁹

The duty of the manufacturer to eliminate or mitigate hazardous products after sale has also been recognized in cases involving other industries. The two principal industries in which the courts have recognized a continuous duty on the part of manufacturers to correct defective products or warn of their danger are the drug³⁰ and automobile³¹ industries, although this issue has also been litigated in other industries.³² In these non-aviation cases the courts have stated that manufacturers have the obligation "to keep abreast of scientific developments touching upon the manufacturer."³³ The leading non-aviation case in this area is *Comstock v. General Motors Corp.*,³⁴ an early landmark case extending the manufacturer's duty to warn at the time of sale to defects which are discovered after the sale:

²⁶ 411 F.2d 451, 453 (2d Cir. 1969).

²⁷ *Id.*

²⁸ 335 F. Supp. 1104, 1130 (S.D.N.Y. 1971).

²⁹ *Id.*

³⁰ *Schenebeck v. Sterling Drug, Inc.*, 423 F.2d 919 (8th Cir. 1970).

³¹ *Comstock v. General Motors Corp.*, 358 Mich. 163, 99 N.W.2d 627 (1959); *Kuhner v. Marlyn Manor, Inc.*, 129 N.J. Super. 554, 324 A.2d 128 (1974).

³² *Hall v. E.I. DuPont Nemours & Co.*, 345 F. Supp. 353 (E.D.N.Y. 1972) (explosive manufacturers); *Rodriguez v. Besser Co.*, 115 Ariz. App. 454, 565 P.2d 1315 (1977) (cement block-cubing machine manufacturer); *Bexiga v. Havis Mfg. Corp.*, 60 N.J. 402, 290 A.2d 281 (1972) (punch-press manufacturer).

³³ *Schenebeck v. Sterling Drug, Inc.*, 423 F.2d 919, 922 (8th Cir. 1970).

³⁴ *Comstock v. General Motors Corp.*, 358 Mich. 163, 99 N.W.2d 627 (1959).

If such duty to warn of a known danger exists at the point of sale, we believe a like duty to give prompt warning exists when a dangerous defect which makes the product hazardous to life becomes known to the manufacturer shortly after the product has been put on the market.³⁵

Additional support for the imposition of a continuing duty on aviation manufacturers to advise users of dangerous conditions discovered by the manufacturer in its product after the sale is found in the Federal Aviation Regulations. As discussed earlier, the Federal Aviation Regulations require the aviation manufacturer to promptly report serious failures, malfunctions or defects to the FAA.³⁶ Corrective measures may then be started, be they in the form of an FAA airworthiness directive or a manufacturer's service bulletin or instruction. It is established law that the Federal Aviation Regulations have the force and effect of law,³⁷ that the FAR's give constructive notice to the public regardless of actual notice,³⁸ and that a violation of an FAR constitutes negligence as a matter of law.³⁹ This is consistent with the prevailing view in most states that a violation of a statute, ordinance, or administrative regulation is negligence as a matter of law.⁴⁰ The failure of a manufacturer to report a dangerous condition or a delay by the manufacturer in reporting a dangerous condition may subject the manufacturer to a finding of negligence as a matter of law. Additionally, considering the seriousness of the risk to which the manufacturer is subjecting the aviation consumer, such a failure to warn may constitute a reckless disregard of the safety of another.⁴¹ The extent of liability as well as its existence may be

³⁵ 99 N.W.2d at 634.

³⁶ 14 C.F.R. §§ 21.3(e)(1), 37.17(e)(1) (1979). See notes 5-8 *supra*, and accompanying text.

³⁷ *Maryland Cas. Co. v. United States*, 251 U.S. 342 (1920); *Tilley v. United States*, 375 F.2d 678 (4th Cir. 1967); *United States v. Schultetus*, 277 F.2d 322 (5th Cir.), *cert. denied*, 364 U.S. 828 (1960); *Sawyer v. United States*, 297 F. Supp. 324 (E.D.N.Y. 1969), *aff'd*, 436 F.2d 640 (2d Cir. 1971).

³⁸ *Federal Crop Ins. Corp. v. Merrill*, 332 U.S. 380 (1947).

³⁹ *Gatenby v. Altoona Aviation Corp.*, 407 F.2d 443 (3d Cir. 1969); *Gas Serv. Co. v. Helmers*, 179 F.2d 101 (8th Cir. 1950).

⁴⁰ See, e.g., *Southern Pac. Co. v. Castro*, 493 S.W.2d 491 (Tex. 1973); *Murfee v. Phillips Petroleum Co.*, 492 S.W.2d 667 (Tex. Civ. App.—El Paso 1973, writ ref'd n.r.e.); *Sheppard v. Judkins*, 476 S.W.2d 102 (Tex. Civ. App.—Texarkana 1971, writ ref'd n.r.e.).

⁴¹ RESTATEMENT (SECOND) OF TORTS § 500 (1965).

affected by the fact that the manufacturer's conduct is found to be reckless rather than negligent. Thus, the jury may be permitted to impose punitive damages upon a reckless defendant, although only compensatory damages would be permissible if the manufacturer had been merely negligent.⁴³

THE ADEQUACY OF THE POST-SALE WARNING OR RECALL

The manufacturer has a post-sale duty to warn users of defects and to provide curative measures.⁴³ A post-sale warning is simply a means of affording protection from danger. Therefore, the manufacturer's duty to warn of a dangerous condition in a product is a duty to give a warning which is adequate and sufficient to the danger and which gives fair notice of the potential consequences. A recall is more than a warning; it is an offer to take corrective measures—to inspect, adjust, or repair. Like the warning, the manufacturer has the duty to take corrective measures which are adequate, sufficient and commensurate with the danger.

The adequacy of the warning or corrective measures is a question of fact for the jury to consider. For example, the Second Circuit in *Basko v. Sterling Drug, Inc.*⁴⁴ stated: "On the facts here, there can be no doubt that defendant made some effort to warn as early as 1960, although there was some evidence from which the jury could find that a more effective warning was required under the circumstances."⁴⁵

Various general criteria against which a warning is to be measured to determine its adequacy have been stated by the courts. It has been said that a warning must be accurate,⁴⁶ strong, and clear,⁴⁷ and one that will be readily noticed.⁴⁸ Any ambiguity in the lan-

⁴³ RESTATEMENT (SECOND) OF TORTS § 501 (1965).

⁴³ *Noel v. United Aircraft Corp.*, 219 F. Supp. 556 (D. Del. 1963), *rev'd on other grounds*, 342 F.2d 232 (3d Cir. 1964); RESTATEMENT (SECOND) OF TORTS §§ 388 & 389 (1965).

⁴⁴ 416 F.2d 417 (2d Cir. 1969).

⁴⁵ *Id.* at 426.

⁴⁶ *Lovejoy v. Minneapolis-Moline Power Implement Co.*, 248 Minn. 319, 79 N.W.2d 688 (1956).

⁴⁷ *Crouse v. Wilbur-Ellis Co.*, 77 Ariz. 359, 272 P.2d 352 (1954).

⁴⁸ *Marigny v. Dejoie*, 172 So. 808 (La. Ct. App. 1937).

guage of a warning furnished is to be "construed against the one who chose the words used."⁴⁹

The most important consideration in measuring the adequacy of the warning or corrective measures taken by the manufacturer is the degree of danger. The warning is required to be appropriate to the danger.⁵⁰ That is, the duty to warn or take corrective measures is one which must be done with a degree of intensity that would cause a reasonable man to exercise for his own safety that caution commensurate with the potential danger.⁵¹ From this it follows that the likelihood of an accident taking place and the seriousness of the consequences are important considerations with respect to the sufficiency of the post-sale warnings or corrective measures provided by the aviation manufacturer.

USE OF THE POST-SALE WARNING OR RECALL NOTICE IN AVIATION PRODUCTS LIABILITY ACTIONS

Either the injured consumer or the manufacturer may seek to utilize FAA airworthiness directives or manufacturer's service bulletins in a products liability action. The consumer plaintiff's purpose in seeking the admissibility of FAA airworthiness directives is to establish that the product was defective. The defendant manufacturer's use of these post-sale materials will be an attempt to demonstrate that the plaintiff consumer assumed the risk involved.

a. *Use of Post-Sale Warnings or Recall Notices by the Consumer Plaintiff*

Under strict liability principles the focus is on the product rather than the conduct of the manufacturer. The seller may be held liable despite exercising all possible care in the preparation and sale of his product. The essential elements in strict liability actions are:

- (1) The product was defective or unreasonably dangerous;

⁴⁹ Schilling v. Roux Distrib. Co., 240 Minn. 71, 59 N.W.2d 907 (1953). For examples of particular warnings that have been held effective or ineffective, see Annot., 76 A.L.R.2d 38 (1961).

⁵⁰ Tinkey v. E.F. Houghton & Co., 30 Cal. 2d 97, 179 P.2d 807 (1947); Briggs v. National Indus., 92 Cal. App. 2d 542, 207 P.2d 110 (1949).

⁵¹ Tampa Drug Co. v. Wait, 103 So. 2d 603 (Fla. 1958).

- (2) The product reached the user without substantial change in the condition in which it was sold;
- (3) The unreasonably dangerous defect was a cause of the injury suffered by the user.⁵³

Through the introduction into evidence of FAA AD's and/or manufacturer's service bulletins the plaintiff in the products case seeks to establish a critical element of his case; that the product was defective or unreasonably dangerous at the time it left the manufacturer. It has been held that FAA AD's are admissible in evidence.⁵³ The two leading cases concerning the admissibility of recall efforts are *Nevels v. Ford Motor Co.*⁵⁴ and *Fields v. Volkswagen of America, Inc.*⁵⁵

In *Nevels v. Ford Motor Co.*,⁵⁶ evidence of a recall campaign was admitted in a case involving an improperly tightened steering wheel nut on a 1967 Ford Mustang. The plaintiff alleged negligent manufacture or assembly of the steering mechanism and negligence in failing to warn of the defect as required by the National Traffic and Motor Vehicle Safety Act.⁵⁷ A recall letter had been sent to the owner of the car, but to the wrong address, prior to the accident.⁵⁸ The trial court quoted the Act to the jury in its charge and let the jury determine whether a defect notice was required and whether Ford had sent a proper notice.⁵⁹ The court of appeals held that the charge was properly given because the recall campaign had been alluded to by witnesses for both parties and commented on by counsel.⁶⁰ Evidence of the recall was held to be

⁵² RESTATEMENT (SECOND) OF TORTS § 402A (1965).

⁵³ *Melville v. American Home Assur. Co.*, 584 F.2d 1306, 1315 (3d Cir. 1978); FED. R. EVID. 803(8). For cases regarding admissibility of remedial measures of recall letters in other industries, see *Nevels v. Ford Motor Co.*, 439 F.2d 251 (5th Cir. 1971); *Ault v. International Harvester Co.*, 13 Cal. 3d 113, 528 P.2d 1148, 117 Cal. Rptr. 812 (1974); *Do Canto v. Ametek, Inc.*, 328 N.E.2d 873 (Mass. 1975); *Manieri v. Volkswagenwerk, A.G.*, 376 A.2d 1317 (N.J. 1977); *Barry v. Manglass*, 55 A.D.2d 1, 389 N.Y.S.2d 870 (1976); *Fields v. Volkswagen of America, Inc.*, 555 P.2d 48 (Okla. 1976).

⁵⁴ 439 F.2d 251 (5th Cir. 1971).

⁵⁵ 555 P.2d 48 (Okla. 1976).

⁵⁶ 439 F.2d 251 (5th Cir. 1971).

⁵⁷ 15 U.S.C. § 1402(a) (1976).

⁵⁸ 439 F.2d at 255.

⁵⁹ *Id.* at 258.

⁶⁰ *Id.*

relevant with respect to Ford's statutory duty and with respect to the contention of negligent assembly in the manufacturing process.⁶¹

In *Fields v. Volkswagen of America, Inc.*⁶² a recall letter regarding a damaged "guide pin" in the steering column of a 1971 Volkswagen which could cause the steering to lock was held to be properly admitted into evidence. The *Fields* court held the recall letter by itself did not make a prima facie showing of a defect or shift the burden of proof. The court did hold, however, that the recall letter would be some evidence that a defect did exist at the time the product left the manufacturer.⁶³

b. *Use of Post-Sale Warnings or Recall Notices by the Defendant Manufacturer*

Aviation manufacturers' service bulletins and FAA airworthiness directives may also be used by a defendant in seeking to establish an assumption of the risk defense. It is well settled in most states that contributory negligence, a failure on the part of the plaintiff to act according to a standard of ordinary care in failing to discover the defect or to guard against the possibility of a defect, is not a defense in strict liability actions.⁶⁴ This is based on an adoption of comment n of the Restatement (Second) of Torts, section 402A, which states:

⁶¹ *Id.*

⁶² 555 P.2d 48 (Okla. 1976).

⁶³ *Id.* at 58.

⁶⁴ *Jasper v. Skyhook Corp.*, 89 N.M. 98, 547 P.2d 1140 (Ct. App. 1976), *rev'd on other grounds*, 90 N.M. 143, 560 P.2d 934 (1977); *Bendorf v. Volkswagenwerk, A.G.*, 88 N.M. 355, 540 P.2d 834 (Ct. App. 1975).

In *Bendorf v. Volkswagenwerk, A.G.*, 88 N.M. 355, 540 P.2d 834, 844, the New Mexico Court of Appeals in adopting comment n of the Restatement stated:

Cases throughout the country have followed Comment n in removing conventional contributory negligence as a defense. *Messick v. General Motors Corporation*, 460 F.2d 485 (5th Cir. 1972); *DeFelice v. Ford Motor Company*, 28 Conn. Sup. 164, 255 A.2d 636 (1969); *Williams v. Ford Motor Company*, 454 S.W.2d 611 (Mo. App. 1970); *Devaney v. Sarno*, 125 N.J. Super. 414, 311 A.2d 208 (A.D. 1973); *Ford Motor Company v. Henderson*, 500 S.W.2d 709 (Tex. Civ. App. 1973); *Hartzell Propeller Company v. Alexander*, 485 S.W.2d 943 (Tex. Civ. App. 1972). Annot., Products Liability: Contributory Negligence or Assumption of Risk as Defense under Defense of Strict Liability in Tort, 46 A.L.R.3d 240 (1972); Annot., Products Liability: Strict Liability in Tort, 13 A.L.R.3d 1057 (1967).

n. *Contributory negligence*. Since the liability with which this section deals is not based upon negligence of the seller, but is strict liability, the rule applied to strict liability cases (see § 524) applies. Contributory negligence of the plaintiff is not a defense when such negligence consists merely in a failure to discover the defect in the product, or to guard against the possibility of its existence. On the other hand the form of contributory negligence which consists in voluntarily and unreasonably proceeding to encounter a known danger, and commonly passes under the name of assumption of the risk, is a defense under this section as in other cases of strict liability. If the user or consumer discovers the defect and is aware of the danger, and nevertheless proceeds unreasonably to make use of the product and is injured by it, he is barred from recovery.⁶⁵

Under comment n of Restatement section 402A, however, when a plaintiff voluntarily and unreasonably encounters a known danger, such conduct constitutes a defense in strict liability.⁶⁶ Comment n of the Restatement defines the defense of assumed risk as "voluntarily and unreasonably proceeding to encounter a known danger. . . ."⁶⁷

Defendant has the burden of proving the defense of assumption of the risk; he must prove the plaintiff voluntarily and unreasonably encountered a known danger.⁶⁸ In *Luque v. McLean*,⁶⁹ the California Supreme Court summarized the defendant's burden of proving the defense of assumed risk:

Ordinary contributory negligence does not bar recovery in a strict liability action. 'The only form of plaintiff's negligence that is a defense to strict liability is that which consists in *voluntarily and unreasonably proceeding to encounter a known danger*, more commonly referred to as assumption of risk. For such a defense to arise, the user or consumer must become aware of the defect and danger and still, proceed unreasonably to make use of the product.'

⁶⁵ RESTATEMENT (SECOND) OF TORTS § 402A, comment n (1965).

⁶⁶ *Butaud v. Suburban Marine & Sporting Goods*, 543 P.2d 209 (Alaska 1975); *Bachner v. Pearson*, 479 P.2d 319 (Alaska 1970).

⁶⁷ RESTATEMENT (SECOND) OF TORTS § 402A, comment n (1965).

⁶⁸ *Luque v. McLean*, 8 Cal. 3d 136, 501 P.2d 1163, 104 Cal. Rptr. 443 (1972); *Devaney v. Sarno*, 125 N.J. Super. 414, 311 A.2d 208, 210 (1973); *First Nat'l Bank v. Nor-am Agricultural Prods., Inc.*, 88 N.M. 74, 537 P.2d 682, 690 (Ct. App. 1975).

⁶⁹ 8 Cal. 3d 136, 501 P.2d 1163, 104 Cal. Rptr. 443 (1972).

. . . However, the defendant, not the plaintiff, has the burden of establishing such a defense. . . .⁷⁰

The determination of plaintiff's knowledge of the existence of the defect and appreciation of the risk involved in the use of the product with a defect is a question of fact for the jury to determine, by weighing the evidence. The elements a defendant must show to establish the defense of assumed risk are: (1) the plaintiff has knowledge of facts constituting a dangerous condition or activity; (2) he knows the condition or activity is dangerous; (3) he appreciates the nature or extent of the danger; and (4) he voluntarily exposes himself to the danger. Obviously, the defendant's burden to establish assumption of the risk is heavy. The manufacturer who provides what he believes to be adequate post-sale warnings of a defective condition and/or adequate post-sale remedial measures may be able to establish, based on the facts of a particular case, that the plaintiff owner or operator who received the notice voluntarily and unreasonably encountered a known danger.

CONCLUSION

Manufacturers have a continuing post-sale duty to adequately warn users of defects and to develop corrective measures. Aviation consumers are generally advised of dangerous product conditions in FAA airworthiness directives or manufacturers' service bulletins. The aviation community has an important interest in assuring aviation manufacturers promptly advise users of defects in their products after the sale. The development of the law in this area should encourage aviation manufacturers to be open and frank in advising users of potentially dangerous conditions in their products which the manufacturer discovers after the sale.

⁷⁰ *Id.* at 145-46, 501 P.2d at 1169-70, 104 Cal. Rptr. at 449-50.

