

CERTIFIED FOR PUBLICATION

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

FOURTH APPELLATE DISTRICT

DIVISION THREE

SHARON HISER,

Plaintiff and Respondent,

v.

BELL HELICOPTER TEXTRON INC.,

Defendant and Appellant.

G029637

(Super. Ct. No. 796428)

O P I N I O N

Appeal from a judgment of the Superior Court of Orange County, Hugh Michael Brenner, Judge. Affirmed.

Higgs, Fletcher & Mack, John Morris; Law Offices of Stephen K. Brunk, Stephen K. Brunk; Shea & Gardner and Frederick C. Schafrick for Defendant and Appellant.

Speiser Krause and Douglas W. Schroeder for Plaintiff and Respondent.

* * *

In this wrongful death action arising from a helicopter crash, the jury awarded the widow of the pilot \$8,676,696 against the manufacturer of the helicopter. Defendant manufacturer asserts the causes of action for strict products liability and negligence are barred as a matter of law by an 18-year federal statute of repose, the General Aviation Revitalization Act of 1994 (GARA).¹ Because breach of written warranty is an exception to GARA's statute of repose, defendant also contends the breach of warranty cause of action cannot be sustained as a matter of California law. Finally, defendant complains the court committed reversible error in making several evidentiary rulings.

Briefly, plaintiff's decedent, Floyd Hiser (Hiser), was killed when his helicopter crashed during a fire suppression mission. Shortly before the crash, Hiser reported by radio he had suffered a "flameout." Plaintiff argued the flameout was caused by fuel "starvation," i.e., although sufficient fuel was on board the helicopter, for reasons attributed to a defective fuel transfer system, fuel flow to the engine was disrupted. Defendant argued the flameout was caused by fuel "exhaustion," i.e., Hiser simply ran out of fuel.

As defendant concedes, the jury accepted plaintiff's version. But, defendant argues, plaintiff's action is nevertheless time barred by GARA because "[p]laintiff focused almost all of her criticism on . . . aspects of the overall fuel system . . . which were not new" and which were part of the original design shielded from liability by GARA.

As we will explain, we agree with defendant's interpretation of GARA, but nevertheless conclude substantial evidence supports the judgment based on the cause of

¹ Pub. L. No. 103-298 (Aug. 17, 1994), 108 Stat. 1552, as amended by Pub. L. No. 105-102 (Nov. 20, 1997), § 3(e), 111 Stat. 2216, 49 U.S.C. § 40101 note. All further statutory references are to GARA unless otherwise noted.

action for strict products liability. In light of this conclusion, we find it unnecessary to address the warranty arguments. The asserted evidentiary errors were either waived or did not, either singly or collectively, constitute a miscarriage of justice. Accordingly, we affirm the judgment.

FACTS

The Accident

Hiser was in semi-retirement, working as a seasonal helicopter pilot for Rogers Helicopters, a company which, inter alia, did fire suppression work under contract with the United States Forest Service (forest service). On July 6, 1997, Hiser was called to assist in fighting a fire known as the “Hemlock fire” in the Sand Canyon area near San Bernardino. During the course of the day, the breakout of a spot fire was observed by Wayne Leitner, a helicopter pilot employed by another contractor for the forest service.

Leitner and Hiser were directed to make a water drop on the spot fire. They met at a pond west of the fire to pick up water. Because Leitner knew the location of the fire, Hiser followed him to the site. Leitner planned to make a water drop on one flank of the fire, and Hiser was to follow with a drop on the other flank. As Leitner dropped his load of water and was proceeding to the top of a ridge, he heard Hiser radio he had a “flame-out.” Leitner understood the term “flame-out” to mean Hiser’s engine had quit because the flame in the combustion chamber of the helicopter jet engine had been extinguished.

Leitner turned back to look for Hiser’s helicopter, and, as he looked down the canyon, he saw Hiser’s helicopter hit the canyon wall and slide down the side of the canyon. Leitner returned to the helibase at Patton State Hospital and picked up some

workers who were equipped to rappel from the helicopter to the crash site. The rappellers were dropped a short distance from the crash site and found Hiser deceased. The rappellers also detected the strong smell of “Jet-A” (helicopter fuel) from as much as 100 feet away.

The Fuel Transfer System

To understand the respective arguments of the parties, it is helpful to review the basic mechanics of a portion of the overall fuel system referred to during trial as the “fuel transfer system.” We describe the fuel transfer system as configured by a 1982 retrofit, *post*, which, the parties agree, was installed on the accident helicopter sometime between 1982 and 1988.

Hiser was flying a helicopter known as the Bell 206L-1 “Long Ranger.” This model has three fuel tanks or “cells.” The rear tank holds 76 gallons of fuel. Two forward tanks hold 11½ gallons each. The rear tank supplies the engine. The front tanks are used as a reservoir to replenish the rear tank as the engine burns the fuel. The fuel transfer system is the collection of components that transfers fuel from the front tanks to the rear tank.

Two electric “boost pumps” are fastened to the bottom of the rear tank. The boost pumps push fuel through a couple of hoses to a “manifold,” also located inside the rear tank. The manifold is a device that distributes fuel delivered to it by the boost pumps in three separate directions. One outlet from the manifold delivers approximately two-thirds of the boost pumps’ output to the engine. The other two outlets deliver the remaining one-third into two “motive flow” lines running toward the front tanks.

The flow of fuel in the motive flow lines is used eventually to pump fuel from the forward tanks, much as the flow of water in a garden hose is used to pump

insecticide or herbicide from the jar of a hose-end garden sprayer. But first, as the fuel flows in each of the motive flow lines toward the front tanks, it passes through “in-line fuel filters,” and then through “check valves.” The purpose of the in-line fuel filters is to filter larger size contaminants from the fuel to prevent jamming or clogging of downstream components. The check valves are one-way valves, allowing fuel to flow in the normal forward direction, but preventing any flow in the backward direction.

The flow of fuel in the motive flow lines next encounters the “fuel flow switches,” one in each line. The fuel flow switches are devices designed to detect the rate at which fuel is flowing. If the rate of flow becomes too low, the switch turns on a light on the pilot’s instrument panel indicating the failure of a boost pump.

Finally, the fuel in the motive flow lines reaches a “dual element ejector pump.” The ejector pump has no moving parts. As noted, it operates much like two hose-end garden sprayers, side by side. The fuel flow from the motive flow lines is constricted through a tapered section, thereby increasing the velocity of the fluid. Because of a well known law of fluid mechanics called Bernoulli’s principle, the increased velocity results in a lower fluid pressure and a suction which draws fuel through lines dropped into the two forward tanks, much like the flow of water through a garden sprayer draws insecticide through a tube dropped into the insecticide jar. The original motive fuel flow, with the added fuel drawn from the forward tanks, is then delivered through a common line to the rear fuel tank.

Although not a part of the transfer mechanism described, another element of the fuel system plays a role in the process. A separate pipe, known as a standpipe, sits upright in the rear tank and is connected to the forward fuel tanks. When fuel is added to the helicopter, the rear tank fills first until the fuel reaches the level of the mouth of the standpipe. As additional fuel is added, it flows through the tube connected to the

standpipe to the forward tanks until they are filled. As still additional fuel is added, the rear tank then fills to the top.

When the fuel transfer system is working properly, the sequence of fuel transfer between tanks is essentially reversed. As the engine burns fuel the motive flow lines entrain fuel from the forward tanks and deliver it to the rear tank. But so long as the fuel level in the rear tank is above the mouth of the standpipe, fuel continually flows through the standpipe from the rear tank to the forward tanks replacing the fuel that was transferred, and, as a result, the forward tanks remain full. But when the fuel level in the rear tank falls to just below the level of the mouth of the standpipe, fuel can no longer enter the standpipe to flow to the forward tanks. The fuel in the forward tanks is then being transferred to the rear tank by the fuel transfer system, without replenishment by the standpipe, thereby maintaining the level of fuel in the rear tank at the standpipe level until, eventually, the forward tanks are depleted of fuel. At this point, fuel in the rear tank is the only remaining fuel on board. A low fuel warning light is configured to alert the pilot when approximately 10 gallons of useable fuel remains in the rear tank.

Plaintiff argued the fuel transfer system did not work as described above. Instead, fuel in the rear tank of Hiser's helicopter (the supply for the engine) was depleted while much fuel remained trapped, and unusable, in the forward tanks. The fuel gauge in the cockpit displays the total fuel on board without differentiating whether the fuel is in the forward tanks or the rear tank. Thus, while a low fuel warning light should come on when the rear tank falls below 10 gallons of useable fuel, a potential for confusion may exist when the fuel transfer system fails because the pilot may observe both a low fuel warning light and a gauge that indicates plenty of fuel is on board.

The 1982 Retrofit

Defendant first delivered the helicopter involved in this case to Rogers Helicopters on June 29, 1979, 18 years and 7 days before the fatal accident. Before 1981, defendant had received reports of engine flameouts occurring both in flight and on the ground with up to 150 pounds of fuel indicated on the fuel gauge.² Defendant began responding to these reports in a variety of ways. In January 1981, defendant issued Technical Bulletin 206L 81-64 recommending relocation of the in-line fuel filters to a new position, upstream from the check valves, for the purpose of providing cleaner fuel to the transfer system. Also in 1981, defendant issued Operational Safety Notice OSN 206L 81-3, which advised pilots to plan a landing when the low fuel caution warning light illuminates, regardless of the fuel quantity indication on the fuel gauge. In 1982, defendant issued Technical Bulletin 206L 82-80 to introduce new style fuel flow switches. The new fuel flow switches had a larger internal capacity and were more resistant to contamination.

Recommendations made to aircraft operators in technical bulletins are not mandatory. But defendant released a technical bulletin whenever a design change was made in the current version of the helicopter to allow operators to upgrade their existing aircraft to the current specification. To encourage operators to make the change, defendant offered reduced prices on the new components. Technical Bulletin 206L 82-80 offered a kit for sale, including new parts to replace the fuel flow switches and to relocate the in-line filters, along with detailed instructions to implement the changes. The fuel system changes specified in Technical Bulletin 206L 82-80 (1982 retrofit) were completed by Rogers Helicopters on the accident helicopter. Defendant issued an Alert

² Expert testimony equipped the jury to do any necessary conversions. The jet fuel used with this helicopter weighs 6.8 pounds per gallon. Thus, 150 pounds of jet fuel is slightly more than 22 gallons, the combined capacity of the forward fuel tanks.

Service Bulletin in June 1988 which advised operators that, from defendant's perspective, the 1982 retrofit of the fuel system was no longer optional — the retrofit became mandatory. Also, at defendant's request, the Federal Aviation Administration issued an Airworthiness Directive mandating these changes to the fuel system effective in 1989.

Other facts shown by the evidence will be added as relevant to the discussion.

DISCUSSION

I

Standard of Review

Defendant asserts it is entitled to an independent review of the court's interpretation of GARA because interpretation of a statute presents a pure issue of law. Defendant concedes there was sufficient evidence to support the verdict "if one accepts the trial court's legal rulings" Defendant is correct, of course, when it contends we must independently determine the meaning of a statute, and are not bound by the trial court's interpretation. (*People ex rel. Lockyer v. Shamrock Foods Co.* (2000) 24 Cal.4th 415, 432.) But defendant is mistaken when it suggests interpretation of the statute ends our review. Our task is to determine whether the judgment should be affirmed or reversed. Thus, we review the judgment for reversible error, not merely to determine whether the trial court's interpretation of GARA was correct, but whether the judgment is correct on any theory. (*J.B. Aguerre, Inc. v. American Guarantee & Liability Ins. Co.* (1997) 59 Cal.App.4th 6, 15-16.) "No rule of decision is better or more firmly established by authority, nor one resting upon a sounder basis of reason and propriety,

than that a ruling or decision, itself correct in law, will not be disturbed on appeal merely because given for a wrong reason. If right upon any theory of the law applicable to the case, it must be sustained regardless of the considerations which may have moved the trial court to its conclusion.” (*Davey v. Southern Pacific Co.* (1897) 116 Cal. 325, 329.) Accordingly, we must determine, in view of GARA as we interpret it, together with other applicable law, whether the jury’s verdict is supported by substantial evidence and whether any prejudicial abuse of discretion is shown with respect to the evidentiary rulings.

II

Interpretation of GARA

Defendant contends the court’s interpretation of GARA was wrong. Defendant complains the court’s interpretation permitted plaintiff to criticize the fuel transfer system generally, and to focus her proof on elements of the fuel transfer system which were aspects of the original design protected by GARA and which were not modified by the 1982 retrofit. We agree with defendant’s interpretation of the statute. But we disagree our interpretation compels reversal of the judgment.

Our review of defendant’s argument begins with a recitation of the statute. GARA provides generally that “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 [¶] . . . [¶] (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.” (§ 2(a).) The parties do not dispute the characterization of the accident helicopter as a “general aviation aircraft” as defined in section 2, subdivision (c), nor do they dispute that section 3, subdivision (3) defines the applicable “limitation period” as 18 years.

At issue is the interpretation and application of the “rolling” statute of repose found in section 2, subdivision (a)(2). Defendant contends a new 18-year limitation period begins to run *only* with respect to the specific new part shown to be a cause of the accident. Thus, according to defendant, “[p]laintiff had to prove that the cause of the crash was a defect in one of the pieces in the [1982] retrofit kit.”

Plaintiff, on the other hand, contends the installation of the 1982 retrofit kit created an entirely new fuel transfer *system*, thereby commencing a new 18-year limitation period with respect to defects in any element or component of the reconfigured *system*. Plaintiff’s argument is not without some appeal. After all, plaintiff’s principal legal theory was strict products liability based on a design defect, and she argued, in part, the fuel transfer system as a whole was defectively designed when the 1982 retrofit kit was installed.

A “system” is defined, *inter alia*, as “a regularly interacting or interdependent group of items forming a unified whole.” (Merriam-Webster’s Collegiate Dict. (10th ed. 2001) p. 1194.) Evidence supported the contention that prior to 1982, the fuel transfer system of the 206L-1 model helicopter was not working as reliably as contemplated. Flameouts had been experienced with fuel still trapped in the forward

tanks, unavailable to the engine. In response to these reported problems, defendant substituted new parts (the fuel flow switches) and reconfigured other parts (the relative location of the in-line filters and the check valves) in an effort to make the “system” more reliable. Since a “system” is a combination of parts or components working together, the substitution and rearrangement of these parts arguably constitutes a new design of the fuel transfer system. Because of the changes, all parts do not work together in precisely the same manner as in the previous arrangement. Thus, plaintiff argues the original design of the system has been replaced with a newly designed system, even though all original components of the system have not been replaced with new components.

The court accepted plaintiff’s reasoning. For example, in ruling on defendant’s motion for nonsuit based on GARA, the court stated: “[I]t’s the court’s belief that when you put in a new system, the 18-year period starts to run again as to the system, that is the purchaser . . . is entitled to rely on . . . that system, and has a cause of action for 18 years . . . if allegedly something is wrong with that system. [¶] Now, the system may contain . . . parts . . . that existed in the old system. . . . [T]hat would be typical. It would probably be unusual that a whole brand-new different system is put in, although that could happen, too. But the point is the system is a unit.”

Neither plaintiff nor defendant has cited any case authority directly addressing plaintiff’s proposed interpretation of GARA, nor have we found any. We think the correct interpretation, however, is found in the language of the statute itself, focusing on the words “new” and “replace.” Section 2, subdivision (a)(2), provides that the limitation period starts anew “on the date of completion of the *replacement*” of a “component, system, subassembly, or other part” with a “*new* component, system, subassembly, or other part.” The word “replace” means “to put something new in the place of.” (Merriam-Webster’s Collegiate Dict., *supra*, p. 989.) The word “put” means

“to place in a specified position or relationship.” (*Id.* at p. 948.) The sense of the word “replace” is that an item is substituted for another item. And the words “component, system, subassembly, or other part,” without any other modifiers, or reference to “design,” connote the replacement of a physical item, i.e., a piece of hardware, and *not* a new intangible concept or design. Under GARA, the new 18-year limitation period begins upon completion of a “replacement.” i.e., the substitution of one item for another. We agree with defendant that the parallel construction of the statute makes clear the new limitation period begins when a new system replaces an old system, a new component replaces an old component, etc. In other words, “replacement” requires two acts: removal of the old and substitution of the new. It is also plain from the language of GARA that the rolling statute of repose applies only with respect to a new item that replaces an original item, or which is added to the aircraft, *provided* the new item is also a cause of the damage.

Because the item causing the damage must be a *replacement* item, we conclude there is no room to argue that replacement of a few parts of a larger system starts the rolling limitation period anew for all parts in the larger system. Under this circumstance, the larger system has not been replaced in its entirety as a unit, and for those parts, components, or subassemblies that have not been replaced, a new limitation period does not commence.

Had Congress wished to draft GARA to cover the circumstances urged by plaintiff, it could easily have written the rolling statute of repose to commence anew whenever a component, system, subassembly, or other part is replaced or *modified*, provided that the replaced or modified component, system, subassembly, or other part caused the alleged damage. Replacement of a few components could well constitute a modification of a system. And that is precisely how plaintiff urges we interpret the

statute. For the reasons explained, *ante*, we reject plaintiff's suggested interpretation of GARA in favor of the interpretation we conclude flows more naturally from the actual language chosen by Congress. In the instant case, the fuel transfer system was not entirely replaced. It was redesigned and modified by the relocation and replacement of fewer than all components. Modification of an item, whether it is a component, system, subassembly, or other part, does not re-start the limitation period under GARA. Replacement does. Thus, plaintiff's argument that the installation of new parts in accordance with a partial redesign of the fuel transfer system constitutes the replacement of the entire fuel transfer system as contemplated by GARA is rejected.

As noted, other courts have not been called upon to address the specific interpretation of GARA urged by plaintiff. But other courts have interpreted or applied GARA in different contexts in a manner consistent with our interpretation. In *Burroughs v. Precision Airmotive Corp.* (2000) 78 Cal.App.4th 681, plaintiff claimed that GARA did not apply because the defendant was not the actual manufacturer of the defective carburetor which caused the damage, but a successor to the actual manufacturer, and thus not protected as the "manufacturer" under GARA. In rejecting plaintiff's argument, the *Burroughs* court described the various provisions of GARA and its legislative history at some length. In doing so, the *Burroughs* court noted: "When any part or subassembly in an aircraft is replaced with a new part, a new 18-year period begins for that part from the date it is installed. [Citations.] Since almost every major component of the aircraft will be replaced over its lifetime, the 'rolling' aspect of the statute of repose was intended to provide that victims and their families would have recourse against the manufacturer of the new component part in the event of a defect in the new part causing an accident." (*Id.* at p. 691.)

Caldwell v. Enstrom Helicopter Corp. (9th Cir. 2000) 230 F.3d 1155 is most closely analogous to the instant case. In *Caldwell*, plaintiff contended “the helicopter’s flight manual was defective because it did not include a warning that the last two gallons of gasoline in the fuel tanks would not burn.” (*Id.* at 1156.) Plaintiff sought to escape the GARA statute of repose by alleging the flight manual had been revised several times within the 18-year period before the accident. The *Caldwell* court distinguished a line of cases brought on a failure to warn theory and held the flight manual could constitute a defective “part” of the aircraft, and a revision of the manual could thus commence a new 18-year period under the rolling statute of repose. But the court was careful to note that a revision of a portion of the manual unrelated to the accident could not trigger a new 18-year period of limitation with respect to unrevised parts of the manual. “A revision to the manual does not implicate GARA’s rolling provision . . . unless the revised part ‘is alleged to have caused [the] death, injury, or damage.’” (*Id.* at 1158.)

Accordingly, we conclude the replacement of less than all the components of a system does not trigger a new limitation period under GARA with respect to defects in components of the system not replaced.

III

Substantial Evidence Supports The Judgment

Despite our agreement with defendant’s interpretation of GARA, the judgment must nevertheless be affirmed if supported by substantial evidence from which the jury could find the accident was caused when the fuel flow switches, indisputably a replacement part of the 1982 retrofit, failed because of defective design. Since this

component was replaced less than 18 years before the accident, GARA does not provide a defense if substantial evidence supports a finding that the fuel flow switches were defectively designed and were a cause of the accident.

When reviewing the jury's determination of a factual issue, our power "begins and ends with the determination as to whether, on the entire record, there is substantial evidence, contradicted or uncontradicted, which will support the determination, and when two or more inferences can reasonably be deduced from the facts, a reviewing court is without power to substitute its deductions for those of the trial court." (*Bowers v. Bernards* (1984) 150 Cal.App.3d 870, 873-874, italics omitted.) Rather, we indulge in all inferences favorable to plaintiff. (*Ibid.*) It is not our role to reweigh the evidence, redetermine the credibility of witnesses, or resolve conflicts in the evidence. Thus, we will not disturb the judgment if, as here, there is evidence to support it. (*Reichardt v. Hoffman* (1997) 52 Cal.App.4th 754, 766.)

The jury returned a special verdict giving unanimous answers to questions concerning an alleged design defect. The jury found there was "a defect in design of the helicopter's fuel system as modified in accordance with the defendant's 1982 Technical Bulletin 82-80," and "the design defect [was] a cause of the helicopter crash." The jury further found "the crash [was] caused by a use of the helicopter that was reasonably foreseeable by the defendant." Going beyond the ultimate issues in the case, the jury made an express finding that "Mr. Hiser [had not] exhausted all the useable fuel on board the helicopter at the time of the flame-out."

The jury also made two factual determinations that bear directly on the GARA statute of repose defense. The jury found "the modifications specified in defendant's 1982 Technical Bulletin 82-80 result[ed] in adding or replacing a new fuel system *or part* in the fuel system in the helicopter." (Italics added.) Finally, the jury

found “the added or replaced fuel system *or part* specified by defendant’s Technical Bulletin 82-80 [was] a cause of the accident.” (Italics added.)The record contains no objection to the wording of the questions submitted to the jury, and, in fact, the wording of the verdict with respect to the GARA questions was agreed upon by the parties, plaintiff agreeing with wording proposed by defendant.

It was undisputed that a modification specified in Technical Bulletin 82-80 resulted in the replacement of a part in the fuel system. Thus, the only remaining issue under the GARA defense is whether substantial evidence supports the jury’s finding that the replaced parts specified in Technical Bulletin 82-80, the fuel flow switches, were a cause of the accident.

One of defendant’s expert witnesses, Robert D. Marwill, testified the purpose of the fuel flow switches was to “tell [the pilot] when the motive flow . . . is too low to transfer fuel adequately So it is a warning device. . . . [¶] . . . [I]ts primary purpose is to turn on the light in the cockpit that says left fuel pump or right fuel pump. And that tells [the pilot] that the transfer system, either the left transfer system or the right transfer system is not functioning properly.”

One of plaintiff’s expert witnesses, Dr. Kenneth L. Orloff, opined the crash was caused “by defects in the fuel system of this helicopter. More precisely, it was caused by defects in . . . the fuel transfer feature of the fuel system.” Orloff added detail to his opinion by criticizing the design specification of the fuel flow switches. He noted the design specification for these switches required them to trip, i.e., to turn on the warning light in the cockpit, when the flow rate in the motive flow lines was between 25 and 70 pounds per hour.

Orloff went on to demonstrate mathematically that even if the fuel flow switches were operating within the design specification, the motive flow could drop to a

point where fuel would not be transferred to the rear tank fast enough to keep up with the rate at which the engine was burning the fuel, and yet the switch would not necessarily be tripped to warn the pilot. For this reason, Orloff testified the design specification for the fuel flow switches was defective. In Orloff's words: "The problem is there can be a condition where motive flow can drop low enough that the light doesn't come on, . . . but it is now low enough that you're not transferring fuel fast enough back to the rear tank to keep up with the engine burn, so there wouldn't be a light. [¶] And that, in fact, is a factor in the defective condition of the fuel system. It is a specification on . . . that flow switch." Orloff repeated his criticism of the switches, testifying: "That type of specification given by [defendant], in my opinion, is part of the defective nature of the fuel system."

Having testified that the specification for the fuel switches was defective, Orloff was asked for his opinion "as to how the defective nature of the fuel system caused the flame-out leading to the crash." Orloff responded that fuel in the rear tank had burned down to such a level that during maneuvering of the helicopter the boost pumps were "uncovered momentarily, and some air got into the line, and that caused a flame-out. [¶] When that occurred, there was a significant amount of fuel in the forward fuel cells. [Hiser's] fuel gauge probably indicated to him that he had sufficient fuel and had a good margin of safety in order to finish his mission and return back to the helibase. [¶] But his fuel gauge was indicating fuel that wasn't in the rear tank, it was in the forward tanks." Orloff based his opinion on the testimony of witnesses at the crash site, the observations and findings of the National Transportation Safety Board, and documents from defendant showing the development of the fuel system.

From the opinion testimony evidencing a failure of the fuel transfer system by allowing the rear tank to be nearly depleted while fuel remained in the forward tanks,

together with the testimony establishing Hiser's extensive experience as a helicopter pilot, a reasonable inference can be drawn that Hiser had no warning the fuel transfer system was malfunctioning. And since the fuel flow switches were the only components of the system having as their primary purpose the giving of such a warning, it can also reasonably be inferred the design defect described by Orloff permitted the fuel transfer to fail without giving the pilot any warning. To be sure, the evidence was circumstantial — but it was also substantial.

Defendant nevertheless complains the court's misinterpretation of GARA resulted in plaintiff's attack on elements of the fuel system that were never replaced on the accident helicopter. Defendant contends the court's rulings permitted "[p]laintiff's arguments and evidence [to] purposely blur[] the lines between 'parts' and 'systems' in order to attack aspects of the helicopter's design that were, unequivocally, more than 18 years old and hence were (or should have been) GARA-protected." In particular, defendant asserts that evidence of the absence of a forward fuel quantity gauge³ was prejudicial because the original design of the helicopter did not have such a gauge.

Defendant's argument misses the mark. Substantial evidence supported a finding that the fuel transfer system failed to perform its principal function as designed, i.e., to transfer all of the fuel from the forward tanks to the rear tank before fuel in the rear tank was reduced to a dangerously low level. That this failure may have been caused by a defective GARA-protected component does not matter where the device designed to detect the failure and warn the pilot is not GARA-protected, and where the warning, if given, would have allowed the pilot to avoid the accident. Thus, while plaintiff did not

³ A forward fuel quantity gauge would allow the pilot to read separately the amount of fuel in the forward tanks. Later models of defendant's helicopter incorporated a switch on the instrument panel allowing the pilot to display either the total fuel on board or the fuel in the forward tanks.

present evidence definitively identifying the precise mechanism of failure, or the precise component that failed, she did present substantial evidence that *something* in the transfer system failed, and, most importantly, that the primary means by which the pilot would be warned of a transfer failure was defectively designed. While the fuel transfer system may have been largely GARA-protected, the component that was supposed to warn of failure was not itself GARA-protected. Evidence of problems with the fuel transfer system as a whole was necessary, of course, to demonstrate the potential for failure of a type the fuel flow switch should have detected.

As to the asserted focus on the absence of a forward fuel quantity gauge, defendant ignores the long line of design defect cases allowing evidence of safer alternative designs. (See *Barker v. Lull Engineering Co.* (1978) 20 Cal.3d 413, 431.) A forward fuel quantity gauge is surely an alternative means of notifying the pilot of a fuel transfer failure — that too much fuel is trapped in the forward tanks. As such, the “jury may consider, among other relevant factors, . . . the mechanical feasibility of a safer alternative design, the financial cost of an improved design, and the adverse consequences to the product and to the consumer that would result from an alternative design.” (*Ibid.*) Defendant’s assertion that GARA is, in effect, a new federal rule of evidence precluding admission of evidence clearly relevant to plaintiff’s cause of action is rejected. GARA is a statute of repose, not a rule of evidence.

Although defendant devoted some 75 percent of its opening brief to the GARA defense, the defense, in the end, is a red herring. We agree with defendant’s analysis of the statute. But it doesn’t matter. Substantial evidence supports the jury’s finding that a replacement part installed less than 18 years before the accident was a cause of the accident. Accordingly, we find no ground for reversal of the judgment based on the GARA defense.

IV

Defendant's Other Arguments Do Not Merit Reversal

It Is Not Necessary to Address Defendant's Arguments on the Warranty Cause of Action

Defendant contends that plaintiff's cause of action for breach of written warranty fails as a matter of law. Defendant does so principally in an effort to escape an exception to the GARA statute of repose. Section 2, subdivision (b)(4) provides that the statute of repose does not apply "to an action brought under a written warranty enforceable under law but for the operation of this Act." Because we have determined substantial evidence supports the judgment on theories of strict products liability and negligence, and, without resort to the written warranty exception, we find it unnecessary to address defendant's arguments on the breach of warranty theory. Even if defendant's arguments were to be sustained, the judgment would still be affirmed on the other legal theories. (*Davey v. Southern Pacific Co.*, *supra*, 116 Cal. at p. 329.) Ordinarily, courts of appeal decline to decide questions not necessary to the decision. (See *Young v. Three For One Oil Royalties* (1934) 1 Cal.2d 639, 647.)

The Asserted Evidentiary Errors Do Not Individually or Collectively Merit Reversal

Defendant contends several evidentiary rulings, considered either separately or collectively, constitute reversible error. We disagree.

1. Documentary Evidence

First, defendant argues that evidence of failures in dissimilar fuel systems was improperly presented to the jury through two British incident reports, marked Exhibits 68 and 153. Actually, neither exhibit was received into evidence. Exhibit 68 was, however, part of the material plaintiff's expert, Dr. Orloff, relied upon in forming

his opinions. The court instructed the jury twice, and *at length*, not to consider anything in the document for its truth, and that the document was being referenced only to show one of the matters relied upon by Dr. Orloff in forming his opinions. Further, Dr. Orloff's references to the content of the document were brief and limited to explaining that the document was a British accident report from a 1984 crash of a Bell 206L-1 helicopter in which the post-accident investigation had shown significant contamination in the fuel transfer system. "While an expert may state on direct examination the matters on which he relied in forming his opinion, he may not testify as to the details of such matters if they are otherwise inadmissible." (*Grimshaw v. Ford Motor Co.* (1981) 119 Cal.App.3d 757, 788-789.) "Ordinarily, the use of a limiting instruction that matters on which an expert based his opinion are admitted only to show the basis of the opinion and not for the truth of the matter cures any hearsay problem involved" (*Id.* at p. 789.) Here, a limiting instruction was given with respect to exhibit 68 and we perceive no prejudice.

As to exhibit 153, neither party has provided a reference to any part of the record where this exhibit was mentioned in the jury's presence. We are not required to make an independent search of this voluminous record and may disregard any claims where no reference is furnished. (*Guthrey v. State of California* (1998) 63 Cal.App.4th 1108, 1115.)

Defendant also claims error with respect to the admission of exhibits 70 through 72, which apparently were communications between the manufacturer of the jet helicopter engine and defendant, and exhibits 102 through 104, which apparently were some of defendant's internal memoranda concerning power losses. The court admitted these documents as relevant to the issue of notice to defendant of the existence of a potential problem with the fuel system. This evidence was relevant on plaintiff's

negligence theory and as an element of plaintiff's strict product liability theory based on the failure to warn. But again, neither party has provided a reference to any part of the record where these exhibits are mentioned in the jury's presence, and, since neither party requested these exhibits be transmitted to this court pursuant to rule 18 of the California Rules of Court, we are unable to evaluate their admissibility. As noted, we are not required to make an independent search of the record, and "[w]here exhibits are missing we will not presume they would undermine the judgment." (*Western Aggregates, Inc. v. County of Yuba* (2002) 101 Cal.App.4th 278, 291.)

2. Evidence of Grief and Sorrow

Defendant contends that testimony from two witnesses, which together comprise some two pages out of an 11-volume reporter's transcript of 3,827 pages, was erroneously received to defendant's prejudice because it was evidence of plaintiff's grief and sorrow. We find any error in this regard was either waived or harmless.

Specifically, plaintiff's daughter-in-law was asked: "In the three years or so since Floyd died . . . , have you seen a change in [plaintiff] emotionally?" After the witness answered, "Oh, absolutely," defendant objected with "[i]mproper testimony for purposes of this case. Subsequent to the accident." The court overruled the objection, and the witness went on to state plaintiff "has been devastated by the loss of her husband," and whenever plaintiff "does anything with the grand kids, [*sic*] she wished that he was there" and, as a result, becomes "emotionally upset." The daughter-in-law was then asked, without objection, whether she had "seen any change in [plaintiff] physically since after the memorial service." The witness testified plaintiff had "aged at least 30 years from when I met her, which has been 12 years" and that the witness's mother had commented plaintiff "looks like she is suffering a lot."

Plaintiff's daughter was also called to testify and, without objection, was asked, "Can you tell us how the loss of your father has affected your mother?" The witness answered, inter alia, there was a time when plaintiff was "thinking about selling everything so that she could survive," but the witness told her mother, "'You know, we can make it.'" The witness was then asked, without objection, "Is your mother's reaction to her loss still significant today?" The witness responded, "She still mourns over him quite a bit because she misses him a lot." At this point, an unreported sidebar conference was held at defendant's request and one remaining question was asked of the witness on a different subject. After the jury was excused for the day, defendant made a motion to strike these answers. The court denied the motion saying, inter alia, "There was no objection at the time these questions were asked. I know it is hard to object in those circumstances, but it is a tactical decision you made not to object. [¶] . . . [¶] The motion to strike will be denied."

While evidence of grief and sorrow is not relevant, evidence of loss of love, companionship, comfort, affection, society, solace or moral support is relevant. (BAJI, 14.50; *Krouse v. Graham* (1977) 19 Cal.3d 59, 68-69.) Although the line between relevant and irrelevant evidence on these topics may be difficult to draw, the above questions and answers do appear irrelevant. Nevertheless, defendant was heard to voice only one objection to one question, namely, "subsequent to the accident." Although this precise objection is not found in the Evidence Code, it was probably sufficient to alert the court to a problem of relevancy, and the objection should have been sustained. But the answer given by the witness, that plaintiff was devastated by the loss of her husband of 32 years, was not prejudicial. Any juror hearing the evidence of this tragic accident would intuitively know this to be true, even without the witness's statement. Objections to other questions now complained of on appeal were waived by defendant's failure to

make timely objection in the trial court. (Evid. Code, § 353.) Even if objections had timely been made and overruled, these brief encounters with irrelevant evidence of grief and sorrow would not have amounted to a miscarriage of justice. (*Ibid.*)

3. Hiser's Character Trait for Safety

Citing Evidence Code section 1104, defendant asserts the court erroneously admitted evidence of Hiser's trait of character for care or skill. Defendant points to only three questions of a single witness. A former employee was asked whether he ever saw Hiser operate an aircraft in an unsafe manner, whether he ever observed Hiser operate an aircraft with low fuel, and whether Hiser was the type of pilot that would take off on a 30-minute mission with 35 minutes of fuel. Only the last question drew an objection based on "character." The court overruled the objection, and the question was answered. Plaintiff immediately changed the subject of the examination. At the next break, the court volunteered it may have erred in overruling the objection — that the court thought it should have been sustained pursuant to section 1104 of the Evidence Code. The court also invited defense counsel to suggest an appropriate curative instruction. Thereafter, a curative instruction was never proposed — and for good reason. The momentary error in admitting a snippet of testimony that should have been excluded was of such little consequence in this trial, it would have been foolhardy for the defense to ever mention it again by way of a curative instruction. Prejudicial error has not been demonstrated.

DISPOSITION

Substantial evidence supports the judgment. Defendant's argument that the entire action is barred by GARA ignores substantial evidence supporting the jury's finding that the accident was caused by a defect in a part manufactured by defendant and

installed less than 18 years before the accident. The asserted evidentiary errors were either waived, or, if not, were trivial, not amounting to reversible error. The judgment is affirmed. Plaintiff shall recover her costs on appeal.

IKOLA, J.

WE CONCUR:

MOORE, ACTING P. J.

FYBEL, J.