

United States Court of Appeals,

Eleventh Circuit.

No. 95-8459.

Stacy C. GRAY, individually and as Surviving Spouse of Lt. Douglas G. Gray, and as Personal Representative of Lt. Douglas G. Gray, deceased, Plaintiff-Appellee, Cross-Appellant,

v.

LOCKHEED AERONAUTICAL SYSTEMS COMPANY, a division of Lockheed Corporation, Defendant-Appellant, Cross-Appellee,

United States of America, Defendant.

Grace M. SCHUMACHER, individually and as Surviving Parent of Lt. John T. Hartman, and as Personal Representative of Lt. John Hartman, Deceased, Plaintiff-Appellee, Cross-Appellant,

v.

LOCKHEED AERONAUTICAL SYSTEMS COMPANY, a division of Lockheed Corporation, Defendant-Appellant, Cross-Appellee,

United States of America, Defendant.

Wilma J. JENNINGS, individually, and as Surviving Parent of Lt. David S. Jennings, and as Personal Representative of Lt. David S. Jennings, Deceased, Plaintiff-Appellee, Cross-Appellant,

v.

LOCKHEED AERONAUTICAL SYSTEMS COMPANY, a division of Lockheed Corporation, Defendant-Appellant, Cross-Appellee,

United States of America, Defendant.

Oct. 24, 1997.

Appeals from the United States District Court for the Northern District of Georgia. (Nos. 1:91-CV-2399-ODE, 1:91-CV-2400-ODE), Orinda D. Evans, Judge.

Before HATCHETT, Chief Judge, TJOFLAT, Circuit Judge, and CLARK, Senior Circuit Judge.

HATCHETT, Chief Judge:

Appellant, Lockheed Aeronautical Systems Company (Lockheed), appeals from a district court order in favor of the appellees, Stacy Gray, Grace Schumacher and Wilma Jennings. The appellees, survivors of three naval aircraft crewmembers who were killed after ejecting from a crashing Lockheed-manufactured aircraft, filed actions against Lockheed for wrongful death and survival remedies on strict liability and negligence claims under the Death on the High Seas Act,

46 U.S.C.App. §§ 761-768 (DOHSA), and general maritime law. Lockheed invoked the military contractor defense under *Boyle v. United Technologies Corp.*, 487 U.S. 500, 108 S.Ct. 2510, 101 L.Ed.2d 442 (1988). After a bench trial, the district court denied that defense, found Lockheed liable, and awarded damages to the appellees. The district court did not award prejudgment interest to appellees. We remand on the determination of prejudgment interest and affirm the judgment of the district court in all other respects.

BACKGROUND

On October 7, 1989, appellees' decedents, Lt. Douglas G. Gray, Lt. John T. Hartman and Lt. (j.g.) David S. Jennings, were killed and Air Warfare Technician Second Class (AW2) Tracy Mann was injured when they ejected from a S-3 "Viking" jet aircraft (S-3) shortly before the aircraft crashed into the sea.¹ Lockheed manufactured and sold the S-3 to the United States Navy in 1975. In the 1960s, the Navy sought proposed designs for a new antisubmarine warfare aircraft (ASW) to neutralize the threat that submarines posed. Lockheed submitted its request for proposal, the Navy accepted, and the S-3 became the Navy's new ASW aircraft. Navy engineers and Lockheed employees worked closely together on many aspects of the S-3's development, and the Navy held a series of preliminary design reviews and critical design reviews. Upon completion of its manufacture, the S-3 passed all of the Navy's acceptance tests, and Lockheed delivered the S-3 to the Navy.

At the time of their deaths, the decedents were all naval officers assigned to the U.S.S. John F. Kennedy (the JFK), an aircraft carrier. On the day of the crash, the decedents boarded a S-3 on the JFK, which was located 125 miles off the coast of Virginia, as part of naval flight operations. Gray, the pilot of the S-3, sat in the left-front seat, and Hartman, the mission commander, sat in the right-front seat. Mann, the sensor operator and the only crash survivor, sat in the left-rear seat, and Jennings, the tactical coordinator, sat in the right-rear seat.

¹For a fuller explanation of facts, see *Gray v. Lockheed Aeronautical Systems Co.*, 880 F.Supp. 1559 (N.D.Ga.1995).

Prior to flying the S-3, Gray and other crewmembers properly conducted the required preflight checks. Gray verified that the S-3's control surfaces (*i.e.*, the ailerons, spoilers, and elevators) worked properly. Gray executed a "control wipeout," which means he moved the pilot's control stick laterally and longitudinally through its range of motion. That maneuver allowed the aircrew and sailors on the JFK's deck to observe the movement of the control surfaces. After Gray properly configured the control surfaces for takeoff, the S-3 was catapulted from the deck of the carrier in order to give it sufficient speed to achieve flight.

With both engines at full power and sounding normal, the S-3's launch appeared normal; the S-3's wings were leveled and it began a shallow climb. After approximately two seconds, Gray initiated a slow right roll by moving the control stick to the left. Gray attempted to halt the roll when the S-3 reached 20 degrees of bank angle, the normal bank angle for clearing a turn. The S-3 failed to respond to Gray's movement of the control stick and continued the right roll. When the S-3 reached 45 degrees of bank angle, Mann heard Gray exclaim "Oh my God! Eject! Eject! Eject!" Hartman immediately initiated the sequence that would eject all four occupants from the S-3. Mann and Jennings, the two rear occupants, ejected first when the S-3 reached 90 degrees of right bank angle; and Gray and Hartman ejected when the S-3 was at or beyond 120 degrees of right bank angle. Their parachutes having scarce time to open, all three decedents struck the water with great force and suffered fatal bodily injuries upon impact with the water.

Appellees blame the S-3's crash in part on design defects in the S-3's aileron servo (the servo). Part of the S-3's flight control system, the servo is contained in the S-3's fuselage and it links the pilot with the ailerons. An aileron is "a movable part of an airplane wing or a movable airfoil external to the wing at the trailing edge for imparting a rolling motion and thus providing lateral control." *Webster's New Collegiate Dictionary* 24 (1979). On the S-3, a cable connects the pilot's control stick to the servo's input arm, and a rod from a ram mounted inside the servo passes through the S-3's wings and attaches to the ailerons.

The S-3 has two jet engines that drive separate hydraulic pumps. The two hydraulic pumps each power a hydraulic system, creating 3000 pounds per square inch (psi) of hydraulic pressure in each system. Ordinarily, the servo functions in the "powered" mode using hydraulic power. In this mode, the pilot has no mechanical link with the ailerons. Instead, the pilot's movement of the control stick triggers a sequence of functions causing hydraulic pressure in the servo to raise or lower the ailerons. If a hydraulic failure occurs, the servo should automatically switch to "manual" mode, a process known as the Emergency Flight Control System (EFCS). A latch and pin located inside the servo are key to the operation of the EFCS. "When the hydraulic pressure in both systems drops below 800 psi, a shutoff valve at the bottom of the servo should 'trip,' cutting off all hydraulic pressure in the servo. The absence of hydraulic pressure in the servo allows the springs to expand; this expansion should move the pin into the latch, an event called 'latch-up.'" *Gray*, 880 F.Supp. at 1563. Once EFCS latch-up occurs, the pilot has a direct mechanical link to the ailerons but has to use more effort to move the control stick.

Although Lockheed designed, manufactured, and sold the S-3 to the Navy, Lockheed subcontracted the manufacturing of the S-3's servo to the Berteia Corporation (Berteia), which is now a subsidiary of the Parker-Hannifin Corporation. Berteia also developed the acceptance test procedure (ATP) for the servo. An ATP tests whether a product performs in accordance with its design specifications. The district court found that the ATP Berteia developed for the servo had several shortcomings. Although very important, the ATP did not measure the speed of the EFCS latch-up; nor did the ATP test the servo's operation while subjected to simulated flight demands.

In the spring of 1990, the Navy recovered the crashed S-3. Post-crash testing of the servo revealed some malfunctions and deviations from design specifications. First, Douglas Crawford, a Lockheed engineer, found when he "deviated from the ATP and moved the servo's input arm to stimulate commands from the control stick, the servo's shutoff valve tripped at 1400 psi, not the specified 800 psi." *Gray*, 880 F.Supp. at 1564. "The servo's shutoff valve 'sensed' 800 psi, even though the actual pressure was 1400 psi." *Gray*, 880 F.Supp. at 1564. Second, Crawford observed

a chip on the pin involved in the EFCS latch-up process, and concluded "the chip showed the pin had been fluctuating in and out of the latch due to hydraulic pressure fluctuation in the servo." *Gray*, 880 F.Supp. at 1564. Third, although the specifications for the pin and latch both required a measurement of .3750, plus or minus .0001, the components here failed to meet that measurement; the pin measured .3749 but the latch measured .3740. Jesse Dooman, one of the appellees' expert witnesses, testified, and the district court found, "that the out-of-tolerance latch would adversely affect the speed of latch-up." *Gray*, 880 F.Supp. at 1564.

The district court ruled the following sequence of events probably led to the crash of the S-3:

All systems on the S-3 were working properly when it was hooked to the catapult. However, as the S-3 traveled down the catapult, one of its hydraulic systems suffered a complete failure. Contrary to expectations, pressure in the remaining hydraulic system dropped because of the added demands for hydraulic power it had to satisfy with the loss of the other system. Lt. Gray's initiation of the right roll, which necessarily moved the servo's input arm, caused the servo to attempt to transition into EFCS at 1400 psi. However, the low, fluctuating hydraulic pressure, coupled with the shutoff valve's operation at a higher-than-specified pressure, caused the servo to chatter at millisecond intervals between the powered and manual modes. The friction in the EFCS mechanism and a mis-sized latch impeded the servo's ability to transition swiftly into EFCS. The chattering caused (1) the freezing of the ram in the right roll position (with an attending freezing of the aileron in the same position) and (2) the condition known as "free stick," in which Lt. Gray's movement of the control stick did not translate into any movement of the control surfaces. The S-3 thus continued the smooth right roll noted above until impact with the ocean.

Gray, 880 F.Supp. at 1566.

CONTENTIONS

Lockheed contends that the military contractor defense barred appellees' claim for the servo's alleged defective design. According to Lockheed, the district court misapplied the standards for application of the defense; acted unreasonably in requiring Lockheed to produce evidence that the Navy reviewed and approved specific engineering drawings of the servo; and incorrectly rejected as insufficient the narrative descriptions that Lockheed introduced of the servo. Lockheed maintains that the Navy exercised final responsibility for the S-3's entire design; closely reviewed and approved the design specifications of the servo; and found that the servo complied with its relevant specifications. Lockheed further contends that the district court erred in finding Lockheed strictly liable for a defectively designed servo. In Lockheed's estimation, the district court adopted a theory

of causation that Navy experts specifically rejected; made insufficient findings; and failed to require appellees to prove a reasonable alternative design for the servo that would have prevented the accident. Lockheed argues that it cannot be held liable in negligence because it neither manufactured nor installed the replacement servo in the crashed S-3. The Navy, Lockheed also adds, approved the ATP for the servo.

Lockheed also contends that DOHSA limits recovery to pecuniary loss and bars the award of pain and suffering damages in this case. According to Lockheed, the Supreme Court also has not clearly recognized a "general maritime right of survival." Additionally, Lockheed contends that the district court failed to provide sufficient explanation for the damages it awarded and to find three of the critical components of loss of support—rates of growth, consumption, and discount. Finally, Lockheed asserts that the determination of prejudgment interest should be remanded to the district court as the district court may have denied prejudgment interest because the appellees filed an untimely request.

The appellees contend that Lockheed did not satisfy the conditions for the military contractor defense. According to the appellees, Lockheed's bid to win the S-3 contract from the Navy had no detailed design specifications for the servo; Lockheed produced no detailed specifications of the servo; and the narrative specifications Lockheed did introduce were inadequate. The appellees also argue that Lockheed had final approval over the servo's design, and the Navy's post-contract review did not constitute approval of that design. Moreover, appellees contend that the Navy's continuing purchase of the servo provides no proof that the servo met reasonably precise specifications, and further contend that the servo did not conform to the Navy's general specifications.

Appellees additionally contend that the district court applied the correct theory of causation and found Lockheed strictly liable. Requiring a plaintiff to produce evidence of an alternative design, appellees argue, places an undue burden on a plaintiff, where the original product fails to function because of a design defect. Appellees assert the record contains abundant evidence of alternative designs for the servo. Appellees also contend that Lockheed's failure to ensure an

adequate ATP for the servo constituted negligence. Appellees note that Lockheed produced no evidence that the Navy approved or controlled the ATP, and further observe that the only competent evidence showed that Lockheed and Berteau controlled the ATP.

Appellees also maintain that DOHSA does not preclude the award of pain and suffering damages under general maritime survival action claims, and that the Supreme Court has never precluded a general maritime survival recovery. In addition, appellees argue that the district court sufficiently explained its basis for awarding damages; had no duty to make specific findings regarding the rates used to calculate growth, consumption or discount; and considered the appropriate factors, *i.e.*, lifetime earnings, taxes, personal consumption, and present value, to determine pecuniary loss. Appellees also cross-appeal contending that the district court erred in failing to award prejudgment interest.

ISSUES

Lockheed raises the following issues on appeal: (1) whether the district court erred in rejecting Lockheed's military defense contractor defense; (2) whether the district court erred in finding Lockheed strictly liable for a design defect; (3) whether the district court erred in finding Lockheed negligent for an inadequate "acceptance test procedure"; and (4) whether the district court erred in its award of damages. Appellees raise one issue on cross-appeal: whether the district court erred in failing to award prejudgment interest.

DISCUSSION

A. Standard of Review

We review the district court's conclusions of law *de novo* but do not disturb findings of fact unless they are clearly erroneous. *Godfrey v. BellSouth Telecommunications, Inc.*, 89 F.3d 755, 757 (11th Cir.1996).

B. The Military Contractor Defense

Appellees argue that a design defect in the servo, a part of the S-3's flight control system, caused the aircraft to crash. Although Lockheed denied liability, Lockheed invoked the military

contractor defense for immunity. In *Boyle v. United Technologies Corp.*, 487 U.S. 500, 108 S.Ct. 2510, 101 L.Ed.2d 442 (1988), the Supreme Court held that, under certain circumstances, government contractors are shielded from state tort liability for equipment manufactured for our nation's military. This "defense derives from the principle that where a contractor acts under the authority and direction of the United States, it shares the sovereign immunity" that the government enjoys. *Harduvel v. General Dynamics Corp.*, 878 F.2d 1311, 1316 (11th Cir.1989) (citation omitted), *cert. denied*, 494 U.S. 1030, 110 S.Ct. 1479, 108 L.Ed.2d 615 (1990). The displacement of liability occurs "only where ... a 'significant conflict' exists between an identifiable 'federal policy or interest and the [operation] of state law' ... or the application of state law would 'frustrate specific objectives' of federal legislation.'" *Boyle*, 487 U.S. at 507, 108 S.Ct. at 2516 (citation omitted). Stripped to its essentials, the military contractor defense is available only when the defendant demonstrates with respect to its design and manufacturing decisions that "the government made me do it." *In re Joint Eastern and Southern District New York Asbestos Litigation*, 897 F.2d 626, 632 (2d Cir.1990).

The Supreme Court established a three-part test in *Boyle* to determine when the military contractor defense applies. A contractor seeking immunity from liability for design defects in military equipment must prove that:

(1) the United States approved reasonably precise specifications; (2) the equipment conformed to those specifications; and (3) the supplier warned the United States about the dangers in the use of the equipment that were known to the supplier but not to the United States.

Boyle, 487 U.S. at 512, 108 S.Ct. at 2518. The first two conditions of the *Boyle* test "assure that the design feature in question was considered by a government officer, and not merely by the contractor itself." 487 U.S. at 512, 108 S.Ct. at 2518. The third condition serves to eliminate any incentive that the military contractor defense might create for contractors to withhold knowledge of risks. *Boyle*, 487 U.S. at 512, 108 S.Ct. at 2519.

1. First *Boyle* condition

To establish the first *Boyle* condition, the contractor must prove that the military approved "reasonably precise specifications" for the equipment. This condition requires the existence of two factors: reasonably precise specifications and government approval of them. The Fifth Circuit in *Trevino v. General Dynamics Corp.*, 865 F.2d 1474 (5th Cir.), *cert. denied*, 493 U.S. 935, 110 S.Ct. 327, 107 L.Ed.2d 317 (1989), defined "reasonably precise specifications" as

[t]he requirement that the specification be precise means that the discretion over significant details and all critical design choices will be exercised by the government. If the government approved imprecise or general guidelines, then discretion over important design choices would be left to the government contractor.

865 F.2d at 1481. The contractor must show that the Navy "actually participated in discretionary design decisions, either by designing [the servo] itself or approving specifications" that the contractor prepared. *Harduvel*, 878 F.2d at 1316.

In reviewing the record, several considerations inform our analysis. Where the government merely approves imprecise or general guidelines, the contractor retains the discretion over the important design decision and enjoys no immunity against liability based on the *Boyle* defense. *Trevino*, 865 F.2d at 1481. A finding that the military approved the specifications requires more than a tacit approval: the approval must be meaningful, not a mere formality. *Oliver v. Oshkosh Truck Corp.*, 96 F.3d 992 (7th Cir.1996), *cert. denied*, --- U.S. ---, 117 S.Ct. 1246, 137 L.Ed.2d 328 (1997); *Trevino*, 865 F.2d at 1481 (approval involves more than a "rubber stamp"). In *Harduvel*, this court explained that a contractor may satisfy the first condition where the design of the product resulted from a "continuous back and forth" between the military and the contractor. *Harduvel*, 878 F.2d at 1320 (citation omitted).

After careful review of the record, we conclude that the district court did not err in ruling that Lockheed failed to satisfy the first *Boyle* condition. Lockheed presented no evidence that the Navy approved reasonably precise specifications for the servo. The district court requested a copy of the servo's engineering drawings, and Lockheed only produced a general narrative description of the servo's specifications entitled "Equipment Specifications—Power Servos, Primary Flight Controls." Lockheed had prepared this narrative before the Navy's procurement process for S-3 and

incorporated it into its bid to the Navy for the S-3's contract. The document simply sets forth the general requirements for the aileron servo, *i.e.*, automatic reversion if both hydraulic systems fail, and servos with manual reversion on ailerons. The Fourth Circuit explained in *Kleemann v. McDonnell Douglas Corp.*, 890 F.2d 698 (4th Cir.1989), *cert. denied*, 495 U.S. 953, 110 S.Ct. 2219, 109 L.Ed.2d 545 (1990), that

military hardware does not suddenly spring into being from initial design and procurement specifications, but evolves through drawings, blueprints and mockups agreed upon by the parties. *See Harduvel*, 878 F.2d at 1320-21; *Ramey*, 874 F.2d at 948 n. 4-5. The ultimate design of the product is determined not only by the original procurement and contract specifications, but also by specific, quantitative engineering analysis developed during the actual production process.

Kleemann, 890 F.2d at 702. We conclude that although the narrative may embody some aspects of the servo's specifications, it does not comprise the precise design specifications that the *Boyle* test requires. We also conclude that even though Lockheed subcontracted the responsibility for manufacturing the servo to Berteau, Lockheed retained ultimate discretion over design and testing procedures for the servo.

2. Second *Boyle* condition

To demonstrate the second *Boyle* condition, a contractor must show that the equipment at issue conformed to precise, government-approved specifications. While the record lacks evidence of any reasonably precise specifications of the servo's design, this court assumes nonetheless that the Navy approved the narrative description that Lockheed alleges as the servo's specifications. In *Harduvel*, this court explained: "To say that a product failed to conform to specifications is just another way of saying that it was defectively manufactured." 878 F.2d at 1321. Nonconformance, however, means more than that the ultimate design feature does not achieve its intended goal. The alleged defect must exist independently of the design itself; it must result from a deviation from the required military specifications. *See Kleemann*, 890 F.2d at 703.

A contractor may show conformity through evidence that the military was "present and actively involved throughout the design, review, development and testing of the [equipment at issue]." *In re Air Disaster at Ramstein Air Base, Germany on 8/29/90*, 81 F.3d 570, 575 (5th Cir.),

amended on denial of reh'g, 88 F.3d 340 (5th Cir.), *cert. denied*, --- U.S. ----, 117 S.Ct. 583, 136 L.Ed.2d 513 (1996). In *Kleemann*, the Fourth Circuit expounded "[w]here the procurement process involves this kind of continuous exchange between the contractor and the government, the process itself becomes persuasive evidence of the product conformity to precise specifications." 890 F.2d at 702. Additionally, such evidence tends to show that the government retained discretion and the contractor had no freedom to deviate from the government's specifications. *Trevino*, 865 F.2d at 1481.

Even if this court relies on the narrative description as a specification, the record does not support Lockheed's contention that it satisfied the second *Boyle* condition. The basic design of the servo called for an automatic manual reversion system or EFCS that operated without a hazardous lag. In the event of a hydraulic failure, the EFCS causes the flight controls to instantly revert to a manual operation mode enabling the pilot to control and safely land the aircraft. The servo at issue did not meet those specifications. The district court found that chattering in the servo demonstrated that it suffered from a hazardous lag and that the pilot's control stick had to be within 60 percent of its centered position in order for the EFCS latch-up mechanism to occur. *Gray*, 880 F.Supp. at 1567. Those defective and unspecified conditions affected the operation of the automatic manual reversion system.

Additional evidence showed defects in two key components that the servo uses when it goes into the manual reversion mode. The pin and latch which link the pilot's control stick with the ailerons did not meet their specified dimensions of .3750, plus or minus .0001; the pin measured .3749, but the latch measured .3740.² The district court found that the out-of-tolerance latch could adversely affect the speed of the latch-up; and that "friction in the EFCS mechanism and a mis-sized latch impeded the servo's ability to transition swiftly into EFCS." *Gray*, 880 F.Supp. at 1566.

²The district court found the latch measured .3746 and the pin measured .37487. This court finds that those measurements were of the elevator servo, not the aileron servo; the elevator servo was also found to be out of tolerance.

Moreover, the shutoff valve in the servo operated at a higher-than-specified pressure; the servo attempted transition into the EFCS at 1400 psi, instead of the specified 800 psi.

We conclude that Lockheed failed to satisfy the second condition for the application of the military contractor defense. The above-described defects clearly demonstrate that the servo did not conform to its specifications. *See Harduvel*, 878 F.2d at 1317 (No federal interest are implicated "[w]here a defect is merely an instance of shoddy workmanship..."). The shortcomings with the EFCS and the positioning of the control stick demonstrate that the servo failed to achieve its most important design specification, *i.e.*, having an automatic manual reversion system that operated without a hazardous lag. The fact that the Navy continuously used the S-3 and actually replaced the servo in the crashed S-3 does not prove that the servo conformed to precise, Navy-approved specifications.

3. Third *Boyle* condition

A contractor may satisfy the third *Boyle* condition through evidence that it warned the government of all the dangers known to it, but not to the government. Having denied the *Boyle* defense on the first two conditions, the district court did not address the third condition. We nonetheless consider this element and conclude that Lockheed failed to warn the Navy and to ascertain the nature of the flight control problems. The operations manual that Lockheed prepared for the S-3 does not warn pilots about how critical the positioning of the control stick is to effect an emergency latch-up. Without that information, Gray did not realize that the control stick had to be within 60 degrees of the centered position for the EFCS mechanism to occur. Lockheed should have explained that under certain circumstances, the pilot must act affirmatively moving the control stick within 60 degrees of its centered position to engage the automatic manual reversion system. Furthermore, the Navy's involvement in the development of the S-3 does not satisfy the threshold showing of adequate warning for that aircraft's servo. *See Kleemann*, 890 F.2d at 701.

C. Strict Liability Claims

We next consider whether the district court erred in finding Lockheed strictly liable for a defectively designed aircraft. A plaintiff may bring a strict liability claim under DOHSA, which sets forth a general standard for imposing liability. *See, e.g., Pavlides v. Galveston Yacht Basin, Inc.*, 727 F.2d 330, 338 (5th Cir.1984); *Lindsay v. McDonnell Douglas Aircraft Corp.*, 460 F.2d 631, 635 (8th Cir.1972). We follow the Restatement (Second) of Torts § 402A for the generally accepted principles of tort law. Section 402A outlines the elements of a products liability claim:

(1) One who sells any product in a defective condition unreasonably dangerous to the user ... is subject to liability for physical harm thereby caused to the ultimate user ... if (a) the seller is engaged in the business of selling such a product, and (b) it is expected to and does reach the user ... without substantial change in the condition in which it is sold.

(2) The rule stated in Subsection (1) applies although (a) the seller has exercised all possible care in the preparation and sale of his product, and (b) the user ... has not bought the product from or entered into any contractual relation with the seller.

Restatement (Second) of Torts § 402A (1965).

Upon review of the record, we hold that the district court correctly found Lockheed strictly liable for the defective condition of the S-3 at issue. Although the S-3's design specifications called for an automatic reversion system, the EFCS of the servo at issue was not completely automatic. Under certain circumstances the servo would chatter between the powered and manual modes because of excessive friction in the EFCS mechanism. The chattering in the crashed S-3's servo froze the ram in the right roll position and caused the free-stick condition. The servo's design did not accommodate the free-stick phenomenon. The district court ruled that "[t]he catastrophic effect of the free stick condition Lt. Gray consequently faced show[ed] that the defective condition was unreasonably dangerous." *Gray*, 880 F.Supp. at 1568. Because the record supports the district court's order, we conclude that the S-3 at issue had a defective condition because of its servo; the defective servo made the S-3 unreasonably dangerous; the defect existed independently of the manufacturing defect; and the defective condition of the S-3 caused the death of the appellees' decedents.³ Moreover, the record contains incidents where other pilots experienced similar

³The manufacturing defect along with the design defect may have jointly aggravated the condition of the servo. The district court found that "friction in the EFCS mechanism and [the]

uncommanded rolls or free-stick, and subsequent investigations considered failures with the servo as a possible explanation.

D. Negligence Claims

We now consider whether the district court erred in finding Lockheed liable for negligence because of an inadequate ATP. Concepts of products liability, based on negligence, are recognized as part of general maritime law. *East River Steamship Corp. v. Transamerica Delaval Inc.*, 476 U.S. 858, 865-866, 106 S.Ct. 2295, 2299-2300, 90 L.Ed.2d 865 (1986). This court relies on the standard of negligence set forth in the *Restatement (Second) of Torts* §§ 282-283 (1965). Section 282 provides: "[N]egligence is conduct which falls below the standard established by law for the protection of others against unreasonable risk of harm. It does not include conduct recklessly disregardful of an interest in others." Section 283 provides: "Unless the actor is a child, the standard of conduct to which [the actor] must conform to avoid being negligent is that of a reasonable [person] under like circumstances." *Restatement (Second) of Torts* §§ 282-283 (1965). These sections essentially define negligence as an act or omission that creates an unreasonable risk of harm; or conduct that falls below what a reasonable person in similar circumstances would have done.

After careful review of the facts and circumstances, we are convinced that the district court properly found Lockheed liable for negligence. Under the negligence standard, Lockheed had a duty to construct an adequate testing procedure for the servo. The evidence shows, however, that Lockheed developed an inadequate ATP and breached its duty. The ATP Lockheed used had no provision for testing the speed of the latch-up mechanism even though Lockheed knew or should have known a transition lag between the powered and manual modes would be hazardous. The district court also found if the ATP had simulated flight demands, Lockheed would have "discover[ed] the friction the EFCS mechanism generated, the tripping of the shutoff valve at

mis-sized latch impeded the servo's ability to transition the swiftly into the EFCS." *Gray*, 880 F.Supp. at 1566.

higher-than-specified pressures ... and the fact that the control stick had to be within 60 percent of its centered position for the latch-up to occur." *Gray*, 880 F.Supp. at 1569. Accordingly, we conclude that the servo was a unique and untested flight control component which Lockheed developed specifically for the S-3. Lockheed's failure to develop an adequate ATP for the servo created an unreasonable risk of harm, resulting in the crash of the S-3 at issue and the death of the appellees' decedents. A standard and adequate ATP would have revealed the servo's mis-sized latch and pin regardless of its manufacturer.

E. Damages

Having found that the district court properly held Lockheed liable for appellees' wrongful death and survival claims, we now turn to the issue of damages. The district court awarded two types: wrongful death damages and survival damages. Recognizing DOHSA as the exclusive basis for appellees' wrongful death claims, the district court ruled appellees could recover damages for loss of support, loss of services, and funeral expenses. After finding the appellees had viable survival action claims under general maritime law, the district court ruled the appellees could recover damages for pain and suffering on the survival action claims. The district court awarded the following damages: loss of support to Gray's wife (\$1.5 million), to Hartman's mother and wife (\$1.2 million), and to Jennings's mother (\$600,000); loss of services to Gray's wife (\$300,000), to Hartman's mother and wife (\$300,000), and to Jennings's mother (\$175,000); pain and suffering to each appellee as the personal representative of her decedent's estate (\$50,000 each).

Lockheed challenges the district court's ruling on damages on two grounds: (1) the availability of pain and suffering damages for appellees' survival action claims and (2) the computation of damages. First, we consider whether the district court erred in awarding pain and suffering damages for appellees' survival action claims under general maritime law.

1. Availability of pain and suffering damages

Lockheed relies on the Supreme Court's decisions in *Mobil Oil Corp. v. Higginbotham*, 436 U.S. 618, 98 S.Ct. 2010, 56 L.Ed.2d 581 (1978), and *Zicherman v. Korean Air Lines Co., Ltd.*, ---

U.S. ----, 116 S.Ct. 629, 133 L.Ed.2d 596 (1996), as well as recent decisions in the Ninth and District of Columbia Circuits to support the proposition that general maritime law survival action claims and/or pain and suffering damages are unavailable when a death occurs on the high seas. *See Saavedra v. Korean Air Lines Co., Ltd.*, 93 F.3d 547, 554 (9th Cir.) ("because DOHSA does not allow recovery for nonpecuniary damages, we cannot 'supplement' Congress' remedy, allowing a general maritime survival action for nonpecuniary damages, including ... pre-death pain and suffering"), *cert. denied*, --- U.S. ----, 117 S.Ct. 584, 136 L.Ed.2d 514 (1996); *Dooley v. Korean Air Lines Co., Ltd. (In re Korean Air Lines Disaster of September 1, 1983)*, 117 F.3d 1477, 1481-83 (D.C.Cir.1997) (same).

We find these cases either inapposite or unpersuasive. With respect to the Supreme Court's decisions, we observe that the Court's recent *Zicherman* decision expressly leaves open the question of whether DOHSA forecloses a non-DOHSA based pain and suffering award. *See Zicherman*, --- U.S. at ---- n. 4, 116 S.Ct. at 636 n. 4;⁴ *see also Offshore Logistics, Inc. v. Tallentire*, 477 U.S. 207,

⁴*Zicherman* resolved a dispute over whether a plaintiff suing under the Warsaw Convention may recover loss-of-society damages for the death of a relative in a plane crash occurring on the high seas. The Court held that the compensable harm in such a lawsuit is determined with reference to DOHSA, and that DOHSA's limitation of recovery to pecuniary damages barred recovery of loss-of-society damages even if such damages would be recoverable under general maritime law or state law. --- U.S. at ---- - ----, 116 S.Ct. at 632-37. Specifically, the Court stated that "*where DOHSA applies*, neither state law nor general maritime law can provide a basis for recovery of loss-of-society damages." --- U.S. at ----, 116 S.Ct. at 636 (internal citations omitted) (emphasis added). The plain language of DOHSA covers damages that a wrongful death causes to a decedent's wife, husband, parent, child or dependent relative. *See* 46 U.S.C.App. §§ 761 and 762. The loss-of-society damages sought in *Zicherman* were intended to compensate *Zicherman*'s sister and mother for the loss of *Zicherman*'s "love, affection and companionship" arising from *Zicherman*'s wrongful death. *Zicherman*, --- U.S. at ----, 116 S.Ct. at 631. As a result, the damages sought would have awarded *Zicherman*'s sister and mother—both designated DOHSA beneficiaries—relief which the plain language of DOHSA precluded them from receiving.

The case at bar does not involve an allegation of error with respect to the award of loss-of-society damages to designated DOHSA beneficiaries. Rather, it involves an alleged error in awarding pain and suffering damages to the personal representatives of the estates of the decedents under a survival action, that is to say, an award to beneficiaries not identified in DOHSA under a recognized cause of action that is wholly distinct from a wrongful death action. *See Sea-Land Services v. Gaudet*, 414 U.S. 573, 575 n. 2, 94 S.Ct. 806, 810 n. 2, 39 L.Ed.2d 9 (1974) (explaining the distinction between wrongful death actions and survival actions); *see also Magruder & Graut*, Wrongful

215 n. 1, 106 S.Ct. 2485, 2490 n. 1, 91 L.Ed.2d 174 (1986) (declining to address the question of whether a DOHSA recovery can be supplemented with pain and suffering recovery under an applicable state law survival action statute). Likewise in *Higginbotham*, the Supreme Court recognized DOHSA as providing the sole remedy in actions for *wrongful death* occurring on the high seas, but did not directly address the question of whether a *survival action* based on general maritime law could be maintained in conjunction with a DOHSA wrongful death action. See *Azzopardi v. Ocean Drilling & Exploration Co.*, 742 F.2d 890, 893-94 (5th Cir.1984). "Given this, *Higginbotham* cannot be read as authority for the proposition that DOHSA precludes a survival action in the case of death occurring on the high seas." *Azzopardi*, 742 F.2d at 894. Indeed, dicta from at least one other Supreme Court decision affirmatively suggests that DOHSA does *not* eliminate the availability of an otherwise proper survival action when a death occurs on the high seas. See *Kernan v. American Dredging Co.*, 355 U.S. 426, 430 n. 4, 78 S.Ct. 394, 397 n. 4, 2 L.Ed.2d 382 (1958) ("Where death occurs beyond a marine league from state shores, the Death on the High Seas Act provides a remedy for wrongful death. Presumably any claims, based on unseaworthiness, *for damages accrued prior to the decedent's death would survive*, at least if a

Death Within the Admiralty Jurisdiction, 35 Yale L.J. 395, 405 n. 46 (1926) (indicating that a survival action permits the personal representative of a decedent to recover for the cause of action accruing to the decedent in his lifetime for an invasion of his right to personal security, while a wrongful death action creates a new right of action in favor of the next of kin based, "not upon the initial invasion of the decedent's right to personal security, but rather on the wrongful act of bringing him in contact with a fatal force").

We recognize that the net effect of an award of survival action damages to the personal representatives of the estates in this case *may* ultimately result in additional payments to some designated DOHSA beneficiaries, but such payments, if they occur at all, will only devolve to those beneficiaries through the decedents' estates, and will be for damages of a kind not contemplated under DOHSA. This last distinction—regarding the kind of damages—is a subtle one, but highly significant when assessing the relevance *vel non* of *Zicherman* here. *Zicherman*, in our view, stands for the proposition that DOHSA governs the award of all damages flowing from wrongful death—*i.e.*, the losses to beneficiaries of a decedent flowing from the decedent's demise. *Zicherman* does not, in our view, stand for the proposition that DOHSA also operates to bar the award of damages flowing from the losses which the decedent *personally* experienced prior to death.

pertinent state statute is effective to bring about a survival of the seaman's right.") (emphasis added) (internal citations omitted).

The foregoing observations convince us and our colleagues in the Fifth Circuit that the Supreme Court has simply not expressed a clear opinion on the matter at issue here. The Ninth and District of Columbia Circuits, however, have viewed the matter differently. In *Saavedra v. Korean Air Lines Co., Ltd.*, the Ninth Circuit considered the question of the damages available to the personal representative for the estates of three passengers of a Korean airliner that a Soviet military aircraft shot down over the Sea of Japan. The personal representative argued, in part, that a decedent's estate can bring a survival action claim for pre-death pain and suffering under general maritime law, even though that cause of action is unavailable under DOHSA. *Saavedra*, 93 F.3d at 553. Relying heavily on the Supreme Court's DOHSA decisions in *Higginbotham* and *Zicherman*, the Ninth Circuit rejected the personal representative's argument. Specifically, the Ninth Circuit read the Supreme Court's decisions to hold that DOHSA imposes a complete legislatively designed bar on the recovery of nonpecuniary damages, which the courts are not free to circumvent via the authorization of a general maritime survival action claim for nonpecuniary damages. 93 F.3d at 553-54.

The District of Columbia Circuit followed and elaborated upon the rationale of *Saavedra* in *Dooley v. Korean Air Lines Co., Ltd.*, a case which also arose from the Sea of Japan Korean airliner tragedy. In *Dooley*, the District of Columbia Circuit concluded that DOHSA reflects a conscious congressional choice to limit benefits and remedies in cases arising on the high seas, and that those limits eliminate the discretion of courts to recognize a survival remedy under general maritime law. 117 F.3d at 1481-83. As evidence of this conscious congressional intent, the *Dooley* court first noted that the Jones Act—which was enacted at almost the same time as DOHSA—contains a survival remedy, while DOHSA does not. 117 F.3d at 1481-82. According to the *Dooley* court, the inclusion of a survival remedy in the Jones Act but not in DOHSA "scarcely seems inadvertent." 117 F.3d at 1482. The *Dooley* court also cited language from *Higginbotham* where the Supreme

Court allegedly indicated that DOHSA "expressed a congressional "judgment on such issues as ... survival, and damages.'" *Dooley*, 117 F.3d at 1482 (citing *Higginbotham*, 436 U.S. at 625, 98 S.Ct. at 2015).

We agree with the *Saavedra* and *Dooley* courts that the availability of a general maritime law survival remedy turns on Congress's intent in passing DOHSA. *See Dooley*, 117 F.3d at 1481 ("Judge-made general maritime law may not override ... congressional judgments, however ancient those judgments may happen to be."). In this instance, though, we believe the *Saavedra* and *Dooley* courts misread Congress's intent regarding the preclusive scope of DOHSA.

Our analysis of Congress's intent, of course, must begin with the plain language of DOHSA. *See United States v. Oboh*, 92 F.3d 1082, 1084-85 (11th Cir.1996) (*en banc*) (statutory analysis begins with plain language and if the language is unambiguous, the first step of analysis is also the last), *cert. denied*, --- U.S. ----, 117 S.Ct. 1257, 137 L.Ed.2d 337, and *cert. denied*, --- U.S. ----, 117 S.Ct. 1258, --- L.Ed.2d ---- (1997). After searching the plain language of DOHSA we, like other courts, find that Congress made no express reference to the words "survival," "survival remedy" or "survival action" anywhere in the Act. *See* 46 U.S.C.App. §§ 761-768; *see also Kuntz v. Windjammer "Barefoot" Cruises, Ltd.*, 573 F.Supp. 1277, 1285 (W.D.Pa.1983), *aff'd*, 738 F.2d 423 (3d Cir.), *cert. denied*, 469 U.S. 858, 105 S.Ct. 188, 83 L.Ed.2d 121 (1984); *Azzopardi*, 742 F.2d at 894.

We are also unpersuaded that Congress intended to make an indirect statement precluding the recognition of a general maritime law survival action remedy via section 765 of DOHSA. *But see Dooley*, 117 F.3d at 1482 (suggesting that section 765 created "a very limited survival provision" which constitutes an "expression of legislative judgment on the extent to which survival actions are to be permitted"). Section 765 provides as follows:

If a person die [sic] as the result of such wrongful act, neglect, or default as is mentioned in section 761 of this title during the pendency in a court of admiralty of the United States of a suit to recover damages for personal injuries in respect of such act, neglect, or default, the personal representative of the decedent *may* be substituted as a party and the suit *may* proceed as a suit under this chapter for the recovery of the compensation provided in section 762 of this title.

46 U.S.C.App. § 765 (emphasis added). In our view, this provision is not a survival action provision at all, a conclusion which the Supreme Court appears to have endorsed in *Sea-Land Services v. Gaudet*, 414 U.S. 573, 575 n. 2, 94 S.Ct. 806, 810 n. 2, 39 L.Ed.2d 9 (1974) ("The Federal Employers' Liability Act [FELA] and the Jones Act, but not the Death on the High Seas Act contain survival provisions.") (internal citations omitted); *see also Azzopardi*, 742 F.2d at 893 ("DOHSA is a wrongful death statute and contains no survival provision."). Rather, section 765 is best viewed as a permissive non-abatement/conversion provision which, under the Act as originally drafted, provided a useful mechanism for preserving a wrongful death action beyond the original Act's statute of limitations when the decedent did not die from the antecedent wrongful act within the limitations period. *See Hughes, Death Actions in Admiralty*, 31 Yale L.J. 115, 126 (1921) (commenting on how the Act allows a badly injured party to preserve his DOHSA rights if he initiates a personal injury lawsuit during his life). While section 765 also effectively operated to abrogate the old common law rule that a cause of action necessarily died with the decedent, nothing in section 765 indicates that the provision was intended to *require* a decedent's personal representative to abandon any survival cause of action that may have existed via statute or general maritime law in favor of a wrongful death remedy for a designated DOHSA beneficiary. *See Bodden v. American Offshore, Inc.*, 681 F.2d 319, 331-332 (5th Cir.1982) (discussing intent of section 765 and other DOHSA provisions and concluding that "a careful reading and rereading of these sections convinces us that Congress did not address or intend to address the issue of two causes of action"); Maraist, *Developments in the Law, 1983-1984: Admiralty*, 45 La. L.Rev. 179, 196 (1984); *cf. Kuntz*, 573 F.Supp. at 1285 ("intent of [section 765] is to grant the beneficiaries the right to continue a decedent's original suit as a wrongful death action under DOHSA, without the burden of filing a new action").

It is, in our view, this permissive means of ensuring the survival of a wrongful death remedy beyond DOHSA's original statute of limitations—and nothing more—that the Supreme Court was commenting on in *Higginbotham* when it described Congress's judgment "on such issues as the

beneficiaries, the limitations period, contributory negligence, survival and damages." 436 U.S. at 625, 98 S.Ct. at 2015. In fact, if the *Dooley* court's broader interpretation of the Supreme Court's meaning were correct, the remainder of the above-quoted paragraph in *Higginbotham*—where the Supreme Court speaks of DOHSA as if it sounds only in wrongful death law, *see Higginbotham*, 436 U.S. at 625, 98 S.Ct. at 2015 ("The Act does not address every issue of wrongful-death law")—is difficult to understand.

Finding nothing in the plain language of DOHSA that suggests Congress intended to speak to the issue of survival actions, we turn to DOHSA's legislative history. We again find no references to survival actions. As the *Kuntz* court has observed:

Representative Volstead, who sponsored the bill, stated as the purpose of the bill as follows:

The object of this bill is to give a cause of action in case of death resulting from negligence or wrongful act occurring on the high seas. Nearly all countries have modified the old rule which did not allow relief in the case of death under such circumstances. Under what is known as Lord Campbell's Act, England, many years ago, authorized recovery in such cases. France, Germany, and other European countries now followed this more humane and enlightened policy and allow dependent parties to recover in case of death of their near relatives upon the high seas.

Congressional Record, 66th Congress, Volume 59, page 4482. These comments deal with dependents, beneficiaries, and the Lord Campbell's Act. Lord Campbell's Act was a wrongful death statute not a survival statute. *See Gaudet* at page 579, 94 S.Ct. at page 812. Additionally, survival actions do not involve dependents and beneficiaries, as do wrongful death actions. Not only did Representative Volstead discuss the bill in terms of beneficiaries and dependents, but other representatives did likewise. *See Mr. Sonders*, page 4485, Congressional Record, 66th Congress, Volume 59.

Kuntz, 573 F.Supp. at 1285. In other words, the entire debate about DOHSA—which stretched over several sessions of Congress—centered on matters related to wrongful death actions, and did not even touch on the specific issue of whether survival action remedies should be preserved or eliminated. *See also Azzopardi*, 742 F.2d at 893 ("The legislative history of DOHSA gives no indication that the statute was intended to affect survival actions.").⁵

⁵The only potentially significant direct reference to survival actions that we have discovered is in a *Yale Law Journal* article authored in 1921, a little more than a year after DOHSA was enacted. The article is potentially significant because the author, Robert M. Hughes, claims to have drafted much of the language of DOHSA. *See Hughes*, *Death Actions in Admiralty*, 31

Despite the dearth of textual evidence or legislative history indicating that Congress intended to foreclose judicial recognition of general maritime survival actions when it enacted DOHSA, the District of Columbia Circuit found such an intent based on differences between DOHSA and the Jones Act, both of which were enacted in the same year. *See Dooley*, 117 F.3d at 1481-82 (attributing significance to the presence of a survival remedy in the Jones Act and the absence of such a remedy in DOHSA). We find this shopworn argument unpersuasive. First, we note that our

Yale L.J. 115, 116 (1921). Mr. Hughes's comments therein indicate that he was aware of the distinction between survival acts and wrongful death acts, and that he viewed DOHSA as a wrongful death act. *See* 31 Yale L.J. at 119-20, where the author states:

Statutes ... usually follow one of two theories. Some give a right of action to the injured party himself, and make that cause of action survive.... Others give an entirely new right of action to the relatives or other parties injured by the death on account of their loss from the death, and not on account of any right of action in the deceased himself made to survive for their benefit.... ("The difference between the two classes is well explained ... [and t]he rationale of these decisions makes the act [DOHSA] a death act, not a survival act.")

If anything, these comments tend to cut against the *Dooley* court's view that DOHSA contains a limited survival provision.

We also note one other potentially enlightening piece of information from Mr. Hughes, found in his statement to the House Judiciary Committee during hearings on a version of DOHSA considered during the Sixty-Fourth Congress. *See Bills Providing Right of Action for Death on the High Seas, Hearing Before the Subcomm. H. Procedure, Jurisdiction, etc. of the House of Representatives Comm. on the Judiciary, 64th Cong. (Feb. 1916) (statement of Hon. Robert M. Hughes) [hereinafter "Hughes"]*. According to Mr. Hughes, an early version of DOHSA contained a provision stating the following:

[N]othing in this act shall be construed as abridging the rights of suitors in the courts of any State or Territory, or in the courts of the United States other than in admiralty, to a remedy given by the laws of any State or Territory in case of death from injury received elsewhere than on the high seas, provided that there shall be but one recovery by the person injured, or by or on behalf of any persons mentioned in section 1 [which included various relatives of the decedent as well as the personal representative of the decedent's estate].

Hughes at 5. This provision was omitted via amendment on the floor of the House of Representatives. Hughes at 5. While we hesitate to ascribe much significance to the actions of the Sixty-Fourth Congress, when it was the Sixty-Sixth Congress that ultimately enacted DOHSA, the omission of "one recovery" language from an early version of DOHSA, does suggest that Congress did not intend for DOHSA to foreclose all other possible remedies.

colleagues in the Third Circuit rejected this precise argument several decades ago. *See Dugas v. National Aircraft Corporation*, 438 F.2d 1386, 1390 (3d Cir.1971). What the Third Circuit correctly recognized is that the Jones Act's survival remedy is only derivative, arising from a wholesale importation of FELA provisions into the seaman's context.⁶ *Dugas*, 438 F.2d at 1390 (" ... Congress [simply] incorporated into the Jones Act the whole of Section 9 of the F.E.L.A. along with its survival provision"). The Jones Act's derivative survival remedy thus provides no clear guidance with respect to Congress's thinking about survival remedies generally in the maritime context. Congress could have incorporated FELA into the Jones Act specifically to provide a survival action remedy, and could have also meant to distinguish Jones Act beneficiaries from DOHSA beneficiaries thereby. But such a conclusion is highly speculative, and we are unwilling to risk rewriting DOHSA under the guise of interpreting it—at least where the interpretation would be grounded on nothing more than speculation about Congress's intent.

In light of the absence of clear evidence that Congress intended DOHSA to bar the recovery of damages from a survival action, we believe the district court in this case properly followed our colleagues in the First, Third, Fifth and Eighth Circuits in recognizing a general maritime survival

⁶The relevant provision of the Jones Act is codified at 46 U.S.C.App. § 688, which reads as follows:

Any seaman who shall suffer personal injury in the course of his employment may, at his election, maintain an action for damages at law, with the right of trial by jury, and in such action all statutes of the United States modifying or extending the common-law right or remedy in cases of personal injury to railway employees shall apply; and in case of the death of any seaman as a result of any such personal injury the personal representative of such seaman may maintain an action for damages at law with the right of trial by jury, and in such action all statutes of the United States conferring or regulating the right of action for death in the case of railway employees shall be applicable. Jurisdiction in such actions shall be under the court of the district in which the defendant employer resides or in which his principal office is located.

The reference to statutes extending remedies to railway employees is universally accepted as a reference to FELA.

remedy and in permitting this remedy to supplement appellees' recovery under DOHSA.⁷ See *Barbe v. Drummond*, 507 F.2d 794, 800 (1st Cir.1974); *Kuntz*, 573 F.Supp. at 1286; *Azzopardi*, 742 F.2d at 894; *Spiller v. Thomas M. Lowe, Jr. & Assoc., Inc.*, 466 F.2d 903, 909-10 (8th Cir.1972); cf. *Greene v. Vantage Steamship Corp.*, 466 F.2d 159, 166 n. 11 (4th Cir.1972) (acknowledging substantial authority that a state law survival statute cause of action can be joined with a cause of action under DOHSA); *Solomon v. Warren*, 540 F.2d 777, 792 n. 20 (5th Cir.1976) (allowing state law survival cause of action for pain and suffering to supplement DOHSA recovery), *cert. dismissed*, 434 U.S. 801, 98 S.Ct. 28, 54 L.Ed.2d 59 (1977).

2. Computation of damages

We next consider whether the district court erred in determining the amount of damages. A review of the record reveals that "the district court considered all appropriate circumstances and the varying importance of those circumstance in arriving at its award." *Solomon*, 540 F.2d at 792. Accordingly, we conclude the district court provided a sufficient explanation and adequate findings to support its award of damages. *Gray*, 880 F.Supp. at 1570-72. In determining the available damages, the district court also properly followed the Supreme Court's holding in *Miles v. Apex Marine Corp.*, 498 U.S. 19, 34, 111 S.Ct. 317, 326-27, 112 L.Ed.2d 275 (1990), which provides that the Jones Act or FELA governs the damages available in a general maritime law survival claim. Because the Jones Act/FELA survival provision limits recovery to losses suffered during the decedent's lifetime, the district court did not err in awarding damages only for pain and suffering based on the few seconds of mental anguish each decedent likely experienced before death.

F. Prejudgment Interest

The last issue we address is whether the district court erred in failing to award prejudgment interest. The record is silent as to the district court's decision. As appellees point out, where the

⁷This is so in no small part because it "better becomes the humane and liberal character of proceedings in admiralty to give than to withhold the remedy." *Moragne v. States Marine Lines, Inc.*, 398 U.S. 375, 387, 90 S.Ct. 1772, 1781, 26 L.Ed.2d 339 (1970) (quoting Chief Justice Chase in *The Sea Gull*, 21 F. Cas. 909, 910 (No. 12,578) (CC Md 1865)).

proper award can be determined without further factual findings by the district court, this court may exercise its authority to award prejudgment interest. *Self v. Great Lakes Dredge & Dock Co.*, 832 F.2d 1540 (11th Cir.1987), *cert. denied*, 486 U.S. 1033, 108 S.Ct. 2017, 100 L.Ed.2d 604 (1988). With no record of the district court's decision, however, we cannot determine why the district court failed to grant appellees an award of prejudgment interest. Lockheed alleges that the district court possibly denied the interest because appellees filed an untimely request. Although prejudgment interest is generally granted in admiralty cases, *Self*, 832 F.2d at 1550-51, a denial of prejudgment interest due to an untimely application may not constitute an abuse of discretion. Because the record is unclear, we remand the determination whether appellees should receive prejudgment interest to the district court.

CONCLUSION

In accordance with the foregoing, we remand on the determination of prejudgment interest and affirm the judgment of the district court in all other respects.

AFFIRMED IN PART AND REMANDED IN PART.