IN THE COURT OF APPEALS OF THE STATE OF WASHINGTON

YEANNA WOO, Personal Representative for the Estate of YUEN WING WOO and his Surviving Spouse, JEAN OI WOO, Appellants, v. GENERAL ELECTRIC COMPANY, Respondent, ASBESTOS CORP. LTD., CBS CORPORATION (fka Viacom, Inc., successor by merger with CBS Corporation fka Westinghouse Electric Corporation), FOSTER WHEELER ENERGY CORPORATION, FRASER'S BOILER SERVICE, INC., LOCKHEED SHIPBUILDING COMPANY, METROPOLITAN LIFE INSURANCE COMPANY, SABERHAGEN HOLDINGS, INC., TODD SHIPYARDS CORP., Defendants.	No. 74458-5-I DIVISION ONE PUBLISHED OPINION FILED: April 3, 2017

SCHINDLER, J. — As a general rule under common law and strict liability principles, a manufacturer does not have a duty to warn of the hazards of a product the manufacturer did not place in the stream of commerce. But there are exceptions to this general rule. Yuen Wing Woo worked as an engineer for the Navy and on military

transportation ships in the 1940s and 1950s. Woo died of mesothelioma. The personal representative of the Estate of Yuen Wing Woo, Yeanna Woo, and Woo's surviving spouse, Jean Oi Woo (collectively, the Estate), filed a wrongful death and personal injury lawsuit against General Electric Company (GE). GE designed, manufactured, and supplied steam turbines used on Navy and military transportation ships in the 1940s and 1950s. Reasonable inferences from the evidence show that in the 1940s and 1950s, GE steam turbines required the use of thermal heat insulation, gaskets, and packing to properly function and GE knew only asbestos-containing insulation, gaskets, and packing were available. The evidence also creates the reasonable inference that Woo was exposed not only to asbestos-containing insulation and packing but also gaskets originally supplied by GE. We reverse summary judgment dismissal and remand for trial.

Wrongful Death Personal Injury Lawsuit

Yuen Wing Woo served in the United States Navy from 1943 to 1946. During World War II, Woo worked as a machinist aboard the destroyer USS George K. MacKenzie. After the war, Woo joined the Military Sea Transportation Service (MSTS). Woo worked as a third assistant engineer aboard the cargo ship USNS PVT John R. Towle from December 1949 to February 1950. Woo worked aboard the USNS James O'Hara from March 1951 until January 1952.

General Electric Company (GE) designed, manufactured, and supplied the steam turbines in the 1940s and 1950s that were used aboard the USS MacKenzie, USNS Towle, and USNS O'Hara.

Woo died of mesothelioma in 2009. The personal representative of the Estate of Yuen Wing Woo, Yeanna Woo, and Woo's surviving spouse, Jean Oi Woo (collectively, the Estate), filed a wrongful death and personal injury lawsuit against GE.

GE filed a motion for summary judgment dismissal. GE argued there was no evidence GE supplied or installed asbestos-containing products used in conjunction with the steam turbines on the USS MacKenzie, USNS Towle, or USNS O'Hara. GE asserted that as a matter of law under Simonetta v. Viad Corp., 165 Wn.2d 341, 197 P.3d 127 (2008), and Braaten v. Saberhagen Holdings, 165 Wn.2d 373, 198 P.3d 493 (2008), GE did not have a duty to warn about the hazards of asbestos-containing products it did not manufacture, sell, or supply. GE also argued the Estate could not prove causation.

GE submitted excerpts from the deposition of GE corporate representative David Skinner. Skinner worked as an engineer for GE from 1967 to 2005. Skinner testified he reviewed the technical drawings for the steam turbines that GE manufactured. Based on his review, Skinner said there was "no indication at all that General Electric was involved in either the procurement, the design, or the installation of thermal insulation" and "no thermal insulation [was] provided" by GE. Skinner said that either the contract with the shipowner or shipyard and "the standard practice" determined the scope of work performed by the GE field engineers. Skinner testified the "standard practice, as specified in numerous contracts as well as the specifications, is that the insulation is the shipyard's responsibility." Skinner said the "standard practice on all marine applications is that the shipyard would provide all the insulation for the steam turbine and for the remainder of the ship." Skinner also testified that the "predominance of the work" on

steam turbines did not require "any opening of the steam turbine, removal of any insulation, or anything to that effect."

In opposition, the Estate argued that under the exception in Macias v. Saberhagen Holdings, Inc., 175 Wn.2d 402, 282 P.3d 1069 (2012), GE had a duty to warn about the hazards of the asbestos-containing products that had to be used with the steam turbines. The Estate presented evidence that GE knew only asbestos-containing thermal insulation, gaskets, and packing were available in the 1940s and 1950s and were necessary for the proper functioning of the steam turbines. The Estate also presented evidence that Woo was exposed to the asbestos-containing products. The Estate submitted a number of documents including Navy service and MSTS employment records, a "Technical Information Letter" and copyright issued by GE in 1989, excerpts from the deposition of Retired Reserve Navy Captain Francis Burger, the declaration and deposition testimony of former marine engineer Everett Cooper, the declaration of industrial hygiene expert Dr. Nicholas Heyer, and the declaration of medical expert Dr. Samuel Hammar.

The evidence showed that before 1975, ships "had extensive asbestos insulating material aboard," and in 1989, GE issued a Technical Information Letter (TIL) on "Asbestos Containing Materials in Turbine-Generators Applicable to: Steam Turbine-Generators." The portion of the TIL distributed to GE employees states the purpose of the letter is "to advise customers of the potential locations of asbestos-containing materials" and provide information on "non-asbestos substitutes which are now commercially available." The TIL provides information to "assist in answering customer questions regarding the elimination of the asbestos containing material." The TIL states

that heat retention insulation for new GE steam turbines is "usually purchased and field installed by GE to functional factory specifications."

> Heat retention materials for new installations are usually purchased and field installed by GE to functional factory specifications. In some cases this material has been in the customer's scope of supply.

In the portion distributed to customers, the TIL describes the purpose of the letter as follows:

> The purpose of this Technical Information Letter is to inform our customers of the possible locations of asbestos containing materials in General Electric steam turbine-generators manufactured for Utility and Industrial applications.

The TIL describes the necessity of using asbestos-containing heat retention products on steam turbines:

> The properties of asbestos make it desirable for applications such as in heat retention and sound deadening materials, electrical insulation systems, gasketing, stem packings, and shaft seals. Non-asbestos containing materials with equivalent needed properties have not always been available for many applications. As health hazards of asbestos were recognized, new non-asbestos materials for all turbine generator applications became available that enabled the current turbine-generator shipments to be asbestos free.

The TIL states the "bulk of asbestos" used with the turbines was heat retention insulation that "has been typically purchased to functional specifications from insulation vendors and field installed." However, the TIL states that after "non-asbestos equivalent materials became available" in the early 1970s, "GE specifications were subsequently revised to prohibit the use of asbestos." The TIL notifies customers that "[s]everal types of asbestos free material are now commercially available for this application."

The TIL also describes the necessity of gaskets and states that before the 1970s, only asbestos-containing gaskets were available.

> Flat sheet gaskets are used extensively for low pressure and low temperature sealing applications. As with the spiral wounds, asbestos containing materials have been used exclusively and the industry has only recently developed suitable non-asbestos replacements. Because of the wide range of environments . . . where flat gaskets are used, several different asbestos containing materials have been utilized. Similarly, the industry has developed a variety of non-asbestos replacements but none are exact substitutes. Typically the non-asbestos products cannot be directly substituted for the asbestos gaskets.

In a deposition excerpt, Captain Burger testified that the Navy followed the directions of the equipment manufacturer for insulation of steam turbines.

> Q. Are you saying that your experience is that when United States Navy ships are being built for the Navy, that the equipment suppliers actually go aboard those ships and supervise the Navy as to what they do with respect to building those ships?
>
> . . . .
>
> A. When it comes to their equipment, yes.
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> Q. . . . And is it your opinion that the equipment suppliers direct the Navy with respect to proper procedures on how to insulate that equipment?
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> A. They would have insured that their direction and their documentation, their insulation drawings were followed, yes.

Cooper worked as a third assistant engineer on MSTS ships "built in the era during and shortly after World War II." Cooper testified that "much of Mr. Woo's work in the Navy and particularly at MSTS, would have been in the various ships' engine spaces where the turbines were located."

Cooper testified the steam turbines used aboard Navy and MSTS ships in the 1940s and 1950s "require[d]" exterior insulation in order to "function properly." Cooper

testified the turbines required "asbestos packing on the nozzle valves" and "asbestos gaskets to seal piping flange connections."

> Most large steam vessels constructed after the 1920s are powered by steam turbines. Turbo generators are used aboard Navy and many MSTS ships built in the 1940s and 1950s for providing electricity. These turbines require insulation on the exterior in order to function properly. Additionally, steam turbines require asbestos gaskets to seal piping flange connections and asbestos packing on the nozzle valves. The most common brands of marine turbines are Westinghouse, General Electric, Elliot and DeLaval.

Cooper testified that because the work of an engineer on the MSTS ships was in "close proximity" to the turbines and the insulation would deteriorate, it was "not uncommon to see dust or other debris from the insulation."

> During the 1950s . . . , the insulation on the outside of the turbines and connecting pipes typically contained asbestos. The turbines were in use much, if not all of the time, that the ships were moving. It was typical in my experience for the insulation on and around the turbines to deteriorate over time. That deterioration was compounded by the ship[']s movement in heavy weather or when the vessel was vibrating while the vessel was moving. Furthermore, it was common for the insulation over time to be damaged by accidental contact or as a result of leaks. Much of my work and the work of other people in the engineering spaces aboard the MSTS ships was with or in close proximity to the various turbines. It was not uncommon to see dust or other debris from the insulation on and around the turbines while working in the engineering spaces.

Contrary to the testimony of Skinner, Cooper testified that regular maintenance of the interior blades of the steam turbines "cannot be performed without dismantling the turbine which in turn requires removal of the asbestos insulation covering the top half of the turbine." Cooper testified maintenance on the turbines occurred every four to five years and regular maintenance required replacement of insulation, gaskets, and

packing. Cooper said, "There is no way that asbestos insulation, gaskets, packing and piping can be removed from a steam turbine without creating asbestos dust."

> Regular maintenance of steam turbines involves inspection of the blades on the interior of the turbine and replacing the bearings on the turbine shaft. If this maintenance work is not done, the turbine will not operate properly. The work cannot be performed without dismantling the turbine which in turn requires removal of the asbestos insulation covering the top half of the turbine. Typically the insulation removed from the top half of the turbine would be replaced with new insulation. On MSTS and other ships, the maintenance for each turbine had to be done at approximately 4-5 year intervals. The insulation covering the bottom half of the turbine did not have to be typically replaced in connection with regular maintenance and that insulation often remained on the turbines for considerably longer periods of time, although it too would deteriorate over time. Additionally, regular maintenance of steam turbines requires the replacement of asbestos gaskets and packing on the turbine and associated piping. There is no way that asbestos insulation, gaskets, packing and piping can be removed from a steam turbine without creating asbestos dust.

Cooper also testified that GE supplied precut gaskets with new turbines and that GE service engineers were "involved in repairs." In his experience, GE "provided extra sets of specially precut asbestos-containing gaskets along with their new turbines." Cooper states, "In my work, I saw those spares and also on a number of occasions subsequently ordered specially precut gaskets from the turbine manufacturers including . . . GE." Cooper testified that GE "service engineering personnel were . . . commonly involved in repairs or maintenance of the turbines they manufactured."

Dr. Heyer testified that work around GE turbines in the 1940s and 1950s "resulted in exposures to asbestos that were substantially above ambient levels." Dr. Hammar testified to a reasonable degree of medical certainty that Woo's exposure to asbestos was "a substantial contributing factor" causing mesothelioma.

In reply, GE asserted the evidence did not establish GE specified or supplied the use of asbestos-containing products. GE maintained as a matter of law GE had no duty to warn of the hazards of asbestos-containing products used for the steam turbines. GE also argued that because neither Cooper nor Dr. Heyer has "personal knowledge about Mr. Woo's activities or the repair or maintenance history of any GE equipment on any ship," the evidence did not establish causation.

The court ruled that under Simonetta and Braaten, GE did not have a duty to warn of the hazards of asbestos-containing insulation, packing, and gaskets and dismissed the lawsuit against GE.

Duty To Warn

The Estate contends that as in Macias, material issues of fact about whether GE had a duty to warn of the hazards of asbestos-containing products necessary for the proper functioning of the steam turbines manufactured by GE preclude summary judgment dismissal. GE asserts that as in Simonetta and Braaten, as a matter of law GE did not have a duty to warn of the hazards of asbestos-containing products it did not manufacture.

We review summary judgment de novo. Braaten, 165 Wn.2d at 383; Lunsford v. Saberhagen Holdings, Inc., 166 Wn.2d 264, 270, 208 P.3d 1092 (2009). We must view the evidence and all reasonable inferences from the evidence in the light most favorable to the nonmoving party. Lunsford, 166 Wn.2d at 270. Summary judgment is appropriate only if the pleadings, depositions, and affidavits show there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. CR 56(c); Braaten, 165 Wn.2d at 383.

In Simonetta, the defendants manufactured evaporators installed on Navy ships. Simonetta, 165 Wn.2d at 346. The Navy applied asbestos insulation manufactured by another company to the evaporators. Simonetta, 165 Wn.2d at 346. The plaintiff argued the manufacturer of the evaporators, Viad Corp., had a duty to warn of the hazards of asbestos-containing insulation because the company knew or should have known the insulation would be used "in conjunction with" the evaporators. Simonetta, 165 Wn.2d at 349. The manufacturer argued there is no duty to warn of the dangers from asbestos-containing products the company did not manufacture, supply, or sell. Simonetta, 165 Wn.2d at 350.

The Supreme Court held that under the Restatement (Second) of Torts § 388 (1965) and common law negligence principles, the duty to warn of the danger of asbestos-containing products is limited to a manufacturer "in the chain of distribution." Simonetta, 165 Wn.2d at 354. The court held that as a matter of law there was no duty to warn because Viad did not "manufacture, sell, or supply the asbestos insulation" and had "no control over the type of insulation the navy would choose." Simonetta, 165 Wn.2d at 354, 363 n.8. "Because Viad did not manufacture, sell, or supply the asbestos insulation, we hold that as a matter of law it had no duty to warn under [Restatement (Second) of Torts] § 388." Simonetta, 165 Wn.2d at 354.[1]

The court also concluded the manufacturer did not have a duty to warn under the Restatement (Second) of Torts § 402A (1965). Simonetta, 165 Wn.2d at 354-55. The court concluded that under Restatement (Second) of Torts § 402A, Viad is not

[1] Under Restatement (Second) of Torts § 388, a manufacturer owes a duty to warn of hazards for the use of a product that are or should be known to a manufacturer. Simonetta, 165 Wn.2d at 348.

"responsible for the asbestos contained in another manufacturer's product." Simonetta, 165 Wn.2d at 362-63.[2]

In Braaten, the court affirmed summary judgment dismissal of failure to warn of exposure to asbestos-containing insulation because the manufacturer defendants were not "in the chain of distribution of the exterior insulation applied to their products." Braaten, 165 Wn.2d at 390-91.

> We hold that the defendant-manufacturers had no duty under common law products liability principles to warn of exposure to asbestos in the thermal insulation applied to their products by the navy because a manufacturer generally has no duty to warn of hazards associated with another manufacturer's products.

Braaten, 165 Wn.2d at 396.

The court then addressed whether manufacturers had a duty to warn of the danger of exposure from asbestos-containing packing and gaskets manufactured by others but "originally included in their products." Braaten, 165 Wn.2d at 391. The manufacturers did "not dispute that they would be liable for failure to warn of the danger of exposure to asbestos in the packing and gaskets originally contained in their products." Braaten, 165 Wn.2d at 391. But the manufacturers argued the plaintiff's testimony established "he did not work on new pumps and valves and that by the time he worked on the defendants' products, it was impossible to tell how many times the packing and gaskets had been replaced." Braaten, 165 Wn.2d at 391.

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[2] Under Restatement (Second) of Torts § 402A, a product, "though faultlessly manufactured and designed, may not be reasonably safe when placed in the hands of the ultimate user without first giving an adequate warning concerning the manner in which to safely use the product." Simonetta, 165 Wn.2d at 354-55. Under the Restatement (Second) of Torts § 402A, liability is imposed on manufacturers, sellers, and distributors in the chain of distribution. Simonetta, 165 Wn.2d at 355 (citing RESTATEMENT (SECOND) OF TORTS § 402A, cmt. f).

Because the uncontroverted testimony established the plaintiff could not show exposure to asbestos from packing and gaskets originally supplied, the court held there was no duty to warn. Braaten, 165 Wn.2d at 394.

> [T]here is insufficient evidence to create a material question of fact whether Mr. Braaten was exposed to the original packing and gaskets in the defendants' products. Accordingly, we conclude that the manufacturers had no duty to warn of the danger of exposure to asbestos in packing and gaskets, breach of which would be actionable negligence.

Braaten, 165 Wn.2d at 397.

The court also addressed whether the manufacturers had a duty to warn of the danger of exposure "to asbestos in replacement packing and gaskets that the defendants did not manufacture, sell, or otherwise supply, which replaced asbestos-containing packing and gaskets in their products as originally sold." Braaten, 165 Wn.2d at 380. The court held as a general rule there is no duty to warn of dangers "associated with replacement parts, where the manufacturer did not design or manufacture the replacement parts." Braaten, 165 Wn.2d at 392.

> We hold that the general rule that there is no duty under common law products liability or negligence principles to warn of the dangers of exposure to asbestos in other manufacturers' products applies with regard to replacement packing and gaskets. The defendants did not sell or supply the replacement packing or gaskets or otherwise place them in the stream of commerce and did not specify asbestos-containing packing and gaskets for use with their valves and pumps, and other types of materials could have been used.

Braaten, 165 Wn.2d at 380.

But the court in Braaten notes exceptions to the general rule. Braaten, 165 Wn.2d at 385 n.7.

> The general rule does not apply to a manufacturer who incorporates a defective component into its finished product. [3D JOHN D. HODSON & RICHARD E. KAY, AMERICAN LAW OF PRODUCTS LIABILITY § 32:9

> (2004).] "The finished product manufacturer is not relieved of the duty to warn merely because the defective component was manufactured by another." [AMERICAN LAW OF PRODUCTS LIABILITY § 32:9]. . . . In addition, there are some cases where the combination of two sound products creates a dangerous condition, and both manufacturers have a duty to warn. [Ford Motor Co. v. Wood, 119 Md. App. 1, 34, 703 A.2d 1315 (1998), abrogated on other grounds by John Crane, Inc. v. Scribner, 369 Md. 369, 800 A.2d 727 (2002)]; see Rastelli v. Goodyear Tire & Rubber Co., 79 N.Y.2d 289, 298, 591 N.E.2d 222, 582 N.Y.S.2d 373 (1992).

Braaten, 165 Wn.2d at 385 n.7.

The court also expressly states that "[i]n light of the facts here," the court did not reach the question of whether a duty to warn "might arise with respect to the danger of exposure to asbestos-containing products specified by the manufacturer to be applied to, in, or connected to their products, or required because of a peculiar, unusual, or unique design." Braaten, 165 Wn.2d at 397.

In Macias, the court held there were material issues of fact as to whether a manufacturer had a duty to warn of the danger of exposure to asbestos. Macias, 175 Wn.2d at 422. In Macias, the plaintiff Macias worked in a shipyard as a tool keeper. Macias, 175 Wn.2d at 405. Macias was responsible for cleaning and maintaining respirators that filtered out dangerous contaminants, including asbestos. Macias, 175 Wn.2d at 406. Macias sued the respirator manufacturer alleging common law negligence and product liability claims. Macias, 175 Wn.2d at 406. The manufacturer filed a motion for summary judgment arguing that under Simonetta and Braaten, as a matter of law it did not have a duty to warn. Macias, 175 Wn.2d at 407.

The Supreme Court reiterates that under Simonetta and Braaten, " '[t]he law generally does not require a manufacturer to study and analyze the products of others and warn users of the risks of those products,' " but that as the court noted in Braaten,

there are exceptions to the general rule. Macias, 175 Wn.2d at 411[3] (quoting Braaten, 165 Wn.2d at 385). The court concluded the respirators "necessarily and purposefully accumulated asbestos in them when they functioned exactly as they were planned to function." Macias, 175 Wn.2d at 415. Because the respirators "inherently and invariably posed the danger of exposure to asbestos[,] . . . [i]t does not matter that the respirator manufacturers were not in the chain of distribution of products containing asbestos when manufactured." Macias, 175 Wn.2d at 415-16.[4]

The court states that unlike in Simonetta and Braaten where the manufacturers "did not require that asbestos be used in conjunction with their products" and did not design the products to be used with asbestos, "the respirators at issue here were specifically designed to and intended to filter contaminants from the air breathed by the wearer, including asbestos." Macias, 175 Wn.2d at 414-15.

> Critically, for present purposes, the products involved in the Simonetta and Braaten cases did not require that asbestos be used in conjunction with their products, nor were they specifically designed to be used with asbestos. Nor were those products designed as equipment that by its very nature would necessarily involve exposure to asbestos.
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> Unlike the valves, pumps, and evaporator in Simonetta and Braaten, which only happened to be insulated by asbestos products because the Navy chose to insulate the equipment on its ships with asbestos products, the respirators at issue here were specifically designed to and intended to filter contaminants from the air breathed by the wearer, including asbestos, welding fumes, paint fumes, and dust.

Macias, 175 Wn.2d at 414-15.

The court also notes the products in Simonetta and Braaten "only came into contact with asbestos because that was the purchaser-Navy's choice to use as shipwide insulation." Macias, 175 Wn.2d at 416 n.4. Therefore, there was no "inherent,

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[3] (Emphasis in original) (alteration in original) (internal quotation marks omitted).

[4] Emphasis in original.

necessarily existent risk of exposure in use of products that, at the ultimate choice of the purchaser, are coated with asbestos-containing insulation." Macias, 175 Wn.2d at 416 n.4. By contrast, when the respirators were used "exactly as designed and intended, the respirators invariably and necessarily involve exposure to the specific contaminants for which the respirator filters are designed." Macias, 175 Wn.2d at 416 n.4.

Viewing the evidence and reasonable inferences in the light most favorable to the Estate, material issues of fact preclude summary judgment on whether GE had a duty to warn of the hazards of asbestos-containing insulation, packing, and gaskets manufactured by others.

Unlike in Simonetta and Braaten, the evidence shows asbestos-containing insulation, gaskets, and packing products were necessary for the steam turbines to function as designed. There is a reasonable inference from the evidence that GE knew only asbestos-containing insulation, packing, and gaskets were available in the 1940s and 1950s and therefore, only asbestos-containing products could be used with the steam turbines.

In the 1989 TIL, GE admits that asbestos is a health hazard; that before the 1970s, asbestos-containing insulation, packing, and gaskets were necessary for operation of the GE turbines; and that only asbestos-containing insulation, packing, and gaskets were available before the 1970s.[5] With respect to thermal insulation for steam turbines, the TIL states heat retention materials for new installations of steam turbines were "usually purchased and field installed by GE to functional factory specifications."

[5] GE asserts the TIL addresses only land-based GE turbines. But as the Estate points out, GE presented no evidence that the same information does not apply to marine turbines. Further, the TIL states, in pertinent part, "As health hazards of asbestos were recognized, new non-asbestos materials for all turbine generator applications became available that enabled the current turbine-generator shipments to be asbestos free." (Emphasis added.)

The TIL states, "[N]on-asbestos equivalent materials became available" only in the "early 1970's." Cooper also testified steam turbines used aboard Navy and MSTS ships in the 1940s and 1950s "require[d] insulation on the exterior in order to function properly." Cooper testified the steam turbines "cannot function without insulation."

The evidence shows Woo worked on the USS MacKenzie when it was first commissioned. An excerpt from the Dictionary of American Naval Fighting Ships Vol. III 77 (1968) shows the USS MacKenzie was "launched 13 May 1945 . . . and commissioned 13 July 1945." Service records show Woo served as a machinist aboard the USS MacKenzie from July 1945 until May 1946.

With respect to asbestos packing and gaskets, the TIL states that before 1989, "asbestos containing materials have been used exclusively" for flat sheet gaskets and "the industry has only recently developed suitable non-asbestos replacements." Cooper testified GE "provided extra sets of specially precut asbestos-containing gaskets along with their new turbines." Cooper states that "steam turbines require asbestos gaskets to seal piping flange connections and asbestos packing on the nozzle valves." Unlike in Braaten, because Woo worked aboard the USS MacKenzie when it was first commissioned, there is a reasonable inference Woo was exposed to the original asbestos packing and gaskets that GE supplied.

Causation

GE asserts that even if it had a duty to warn of the danger from exposure to asbestos-containing insulation, packing, and gaskets manufactured by others, there is no evidence of causation. GE argues no evidence shows Woo was exposed to asbestos used in conjunction with GE steam turbines while working aboard Navy and

MSTS ships in the 1940s and 1950s. Viewing the evidence and reasonable inferences in favor of Woo, the record does not support GE's argument.

A plaintiff may establish exposure to asbestos from a defendant's product through circumstantial evidence. Lockwood v. A C & S, Inc., 109 Wn.2d 235, 246-47, 744 P.2d 605 (1987); Allen v. Asbestos Corp., 138 Wn. App. 564, 571, 157 P.3d 406 (2007). But " 'there must be reasonable inferences to establish the fact to be proved.' " Morgan v. Aurora Pump Co., 159 Wn. App. 724, 729, 248 P.3d 1052 (2011) (quoting Arnold v. Sanstol, 43 Wn.2d 94, 99, 260 P.2d 327 (1953)).

In Lockwood, the Washington Supreme Court identified several factors to consider in determining whether there is evidence of causation: (1) plaintiff's proximity to the asbestos product when the exposure occurred; (2) the expanse of the work site where asbestos fibers were released; (3) the extent of time plaintiff was exposed to the product; (4) what types of asbestos products the plaintiff was exposed to, including asbestos fibers released into the air; (5) how the plaintiff handled and used those products; (6) expert testimony on the effects of inhalation of asbestos in general and the plaintiff in particular; and (7) evidence of other substances that could have contributed to the plaintiff's disease and expert testimony on the combined effect of exposure to all possible sources of the disease. Lockwood, 109 Wn.2d at 248-49. "Ultimately, the sufficiency of the evidence of causation will depend on the unique circumstances of each case." Lockwood, 109 Wn.2d at 249. But "the factors listed above are matters which trial courts should consider when deciding if the evidence is sufficient to take such cases to the jury." Lockwood, 109 Wn.2d at 249.

Here, the reasonable inferences from the evidence show Woo worked in the engine room aboard Navy and MSTS ships in the 1940s and 1950s and GE manufactured the steam turbines used on those ships. Cooper worked as an engineer on ships during the same period of time. Cooper testified that "much of Mr. Woo's work in the Navy and particularly at MSTS, would have been in the various ships' engine spaces where the turbines were located." Cooper also testified that "[m]uch of . . . the work of . . . people in the engineering spaces aboard the MSTS ships was with or in close proximity to the various turbines." Cooper described the circumstances that would result in exposure to asbestos as follows:

> Generally, asbestos exposure aboard ships, including MSTS ships, resulted when: (1) external asbestos insulation or "lagging" is removed from machinery such as turbines to make repairs/inspections; (2) asbestos pipe covering is disturbed during normal repair procedures; (3) asbestos gaskets are scraped out and replaced on the machinery; (4) asbestos packing is dug out of flanges and packing glands and replaced; and (5) dust from deteriorated or cracked insulation being given off during rough weather or vibration occurring while the ships were moving. These activities occurred on a regular basis as part of the standard procedure on board all ships during the years when asbestos containing insulation, packing and gaskets were in use.

According to Cooper, it was "not uncommon to see dust or other debris from the insulation on and around the turbines while working in the engineering spaces." Cooper testified about repairs to the steam turbines. Cooper testified that "regular maintenance of steam turbines requires the replacement of asbestos gaskets and packing." Cooper testified there "is no way that asbestos insulation, gaskets, packing and piping can be removed from a steam turbine without creating asbestos dust."

Industrial hygiene expert Dr. Heyer testified that Woo's work in the engineering spaces near GE turbines "resulted in exposures to asbestos that were substantially

above ambient levels" and "vibration aboard ships also resulted in the release of asbestos fibers from the asbestos insulation on the turbines." Dr. Heyer's declaration states, in pertinent part:

> In my opinion, Mr. Woo's work in engineering spaces around GE . . . turbines resulted in exposures to asbestos that were substantially above ambient levels. This would be true even when work was not being done to or near the turbines because, as discussed in a number of the above articles, the vibration aboard ships also resulted in the release of asbestos fibers from the asbestos insulation on the turbines.

Dr. Hammar testified to a reasonable degree of medical certainty that Woo's exposure to asbestos was "a substantial contributing factor" causing mesothelioma. The evidence creates a reasonable inference that Woo was exposed to asbestos insulation, packing, and gaskets.

Because material issues of fact preclude summary judgment, we reverse dismissal of the lawsuit against GE and remand for trial.

Schindler, J.

WE CONCUR:

Mann, J.

Cox, J.