

United States Court of Appeals For the First Circuit

No. 19-1630

JEFFREY G. CARSWELL; HEINZ ERIKSEN; SVENNING TVEDE JUHL,

Petitioners,

v.

E. PIHL & SONS; TOPSOE-JENSEN & SCHROEDER LTD.;
DANISH CONSTRUCTION CORPORATION; DIRECTOR,
OFFICE OF WORKERS' COMPENSATION PROGRAMS,
UNITED STATES DEPARTMENT OF LABOR,

Respondents.

PETITION FOR REVIEW OF AN ORDER OF THE
BENEFITS REVIEW BOARD, UNITED STATES DEPARTMENT OF LABOR

Before

Lynch, Lipez, and Thompson,
Circuit Judges.

Ian Anderson, for petitioners.

Matthew W. Boyle, Attorney, U.S. Department of Labor, Office of the Solicitor, with whom Kate O'Scannlain, Solicitor of Labor, Barry H. Joyner, Associate Solicitor, Kevin Lyskowski, Deputy Associate Solicitor, Mark Reinhalter, Counsel for Longshore, and Gary K. Stearman, Counsel for Appellate Litigation, were on brief for respondent Director, Office of Workers' Compensation.

Sarah B. Biser, with whom Fox Rothschild LLP was on brief, for respondent E. Pihl & Sons.

May 27, 2021

THOMPSON, Circuit Judge. In 1968, a United States military aircraft carrying nuclear weapons crashed near Thule, Greenland, releasing radioactive materials into the area. In the aftermath, military and civilian personnel assisted in the cleanup efforts. In 2010, some of the civilian personnel (Petitioners) filed claims for compensation under the Defense Base Act, alleging that they were exposed to plutonium radiation while working on the cleanup, leading to the development of various illnesses. Following a series of extensive evidentiary hearings, an Administrative Law Judge ("ALJ") denied Petitioners' claims, finding that they did not establish a causal connection between their illnesses and the alleged plutonium exposure. Petitioners appealed to the Benefits Review Board, which affirmed. We now deny the petition for review.

I. Background

On January 21, 1968, a United States Air Force B-52 bomber carrying four nuclear weapons crashed eight miles from the Thule Airbase in Greenland. The crash destroyed the nuclear weapons on board, releasing radioactive materials including plutonium. Soon thereafter, the Air Force began a cleanup effort dubbed operation "Crested Ice," wherein military personnel extracted contaminated debris, snow, and ice from the crash site and Danish civilian personnel assisted in packaging and

transporting the materials out of Greenland. The operation spanned from January to September 1968.

In anticipation of the cleanup effort, the United States military instituted various precautions for the workers. The military established a "hazard control" or "zero line" near the crash site, which indicated the last point at which radiation levels remained at zero. The military then cordoned-off the "hot zone" where radiation levels existed. Danish civilian personnel were not allowed to enter the hot zone, and the United States military personnel who did enter the hot zone wore protective gear and were decontaminated upon their return.

The United States military then began the cleanup operation which consisted of three phases. During Phase I, United States military personnel collected debris from the crash site, returned it to the Thule Airbase, and packed it into drums and large containers. Phase II consisted of the removal of contaminated ice and snow from the hot zone, transportation of the ice and snow to the base, and the sealing of the materials in large metal tanks. During this phase, United States military personnel worked in the hot zone and used a variety of equipment to move the snow and ice. They then loaded the snow and ice into plywood boxes and then onto trucks which took the boxes to a material transfer point on the zero line. Once on the zero line, military

personnel transferred the boxes to a different set of trucks driven by Danish civilian employees. The Danish employees then returned to Thule Airbase with the materials onboard. At the base, airmen transferred the contaminated snow and ice into modified fuel tanks inside a hangar. Once the tanks were full, employees welded them shut and moved them to another area known as the "tank farm." Finally, Phase III consisted of transferring the melted snow and ice to smaller tanks and transporting them to the United States by ship.

Petitioners participated in the cleanup efforts as civilian employees of the now-defunct Danish Construction Corporation ("DCC").

A. The ALJ Proceedings

In 2010, Petitioners filed claims under the Defense Base Act ("DBA"), an extension of the Longshore and Harbor Workers' Compensation Act ("LHWCA"), seeking compensation for medical conditions that they allegedly developed as a result of their exposure to plutonium radiation at Thule, arising out of and in the course of their employment with DCC. Since DCC was no longer operational in 2010, Petitioners filed their claims against two constituent companies: E. Pihl & Sons ("E. Pihl") and Topsoe-

Jensen & Schroeder Ltd. ("Topsoe-Jensen") (collectively, "Respondents").¹

In response to the Petitioners' claims, the Director of the Office of Workers' Compensation Programs ("Director") joined the claim proceedings. Petitioners objected to the Director's participation but to no avail. In response to their objections, the ALJ explained that 20 C.F.R. § 702.333(b) explicitly authorizes the Solicitor of Labor's designee -- in this case, the Director of the Office of Workers' Compensation Programs ("OWCP") -- to "appear and participate in any formal hearing held pursuant to these regulations on behalf of the Director as an interested party." The ALJ rejected Petitioners' arguments a second time, explaining that the Director's participation was especially warranted in this case because E. Pihl had filed for bankruptcy during the litigation and thus any compensation awarded would potentially be paid from the Longshore Special Fund.²

¹ E. Pihl was the only company that participated in the proceedings. Topsoe-Jensen refused to accept service.

² The Special Fund is part of the LHWCA's compensation scheme and is ultimately administered by the Secretary of Labor. Most importantly for our purposes, the LHWCA permits the Secretary to compensate employees with money from the Special Fund in cases where an employer's insolvency precludes payment from the employer. B.S. Costello, Inc. v. Meagher, 867 F.2d 722, 724-25 (1st Cir. 1989); 33 U.S.C. § 918(b) (stating that the Director may pay an award from the Special Fund "where judgment cannot be satisfied by reason of the employer's insolvency").

Following months of sparring, the ALJ held a series of extensive hearings beginning on December 4, 2012, wherein the parties presented evidence, made arguments, and resolved a host of procedural and evidentiary issues. It was also during these hearings that E. Pihl filed for bankruptcy in Denmark. Notwithstanding, E. Pihl's counsel continued participating in the proceedings through the close of the evidentiary record.

During the evidentiary hearings, the parties presented significant amounts of evidence primarily consisting of testimony from the Petitioners and the testimony and reports of several experts and fact witnesses. We recount the most relevant evidence below.

i. Petitioners' Testimony

Petitioners Jeffrey G. Carswell, Heinz Eriksen, and Bent Hansen³ took the stand to explain their roles in the cleanup operation and describe their medical conditions. Carswell testified that he worked at the Thule Airbase as a shipping clerk. During the cleanup, his position required him to assist with the preparation of descriptive labels that were then attached to the sealed drums and tanks containing contaminated snow and ice from

³ Bent Hansen passed away on October 23, 2019. On January 8, 2021, this court granted counsel's motion to substitute Hansen with his son, Svenning Tvede Juhl, as his personal representative.

the crash. He was also responsible for the logistics of shipping the closed tanks to the United States and, as a result, frequently went to the tank farm (the area where the sealed tanks were held), although he did not handle the tanks himself. Carswell explained that military and civilian personnel worked closely together on the base and that he traveled near the crash site on several occasions. Carswell also explained that he frequently added ice from a nearby fjord to his drinks while working on the cleanup. Carswell developed a series of stomach and esophageal issues in 1984 and has undergone several surgeries.⁴ He also developed thyroid issues in 2005.

Eriksen, for his part, worked as a fireman at the Thule Airbase. During the cleanup operation, he observed the welding of the tanks which contained contaminated snow and ice and put out fires that resulted from the welding. Eriksen explained that when he worked in the hangars, the floor was often wet with, ostensibly, contaminated melted snow and ice from the crash site and that a fog formed in the hangar when the snow and ice were transferred into the tanks. Eriksen witnessed, and put out, several fires while working on the cleanup. He stated that he was diagnosed

⁴ Carswell suffers from various stomach- and esophageal-related ailments. Chief among them, he has been diagnosed with stomach cancer and Barrett's esophagus.

with kidney cancer and had surgery to remove his tumorous left kidney in 2005.

Hansen worked as a carpenter at the airbase. During the cleanup, he constructed the "scoops" that military personnel used to remove material from the crash site and also built the chutes that personnel used to funnel snow and ice into the fuel tanks. Like Eriksen, Hansen explained that when he built or delivered materials, the hangar floor was covered with water from the melting contaminated ice and snow, and there was often a fog in the hangar during the tank-filling process. Additionally, Hansen witnessed at least three fires in Hangar #2, which were caused by the interaction between the heat from the welding and the petrochemical residue in the tanks. On occasion, Hansen also brought timber to the tank farm. Hansen was diagnosed with kidney cancer and had his left kidney removed in 2002.

ii. Battle of the Experts

Petitioners, E. Pihl, and the Director also offered several expert witnesses and reports on the central issue of whether there was a causal nexus between Petitioners' alleged exposure to plutonium radiation and their respective illnesses.

E. Pihl presented the testimony of four experts and one fact witness. We begin with Dr. Lynn Anspaugh. Dr. Anspaugh testified as an expert in the field of radiation dosimetry -- that

is, the science of measuring radiation exposure. In addition to testifying, Dr. Anspaugh submitted a thorough report concluding that, given Petitioners' responsibilities at Thule, it is "likely" that the Petitioners "did not receive any dose [of radiation] from the cleanup activities." At the hearing, Dr. Anspaugh explained that plutonium radiation -- which mostly emits alpha particles -- cannot penetrate most materials, including a piece of paper or skin. Accordingly, given the physical properties of plutonium radiation, and the type of work Petitioners performed, if the Petitioners had been exposed to plutonium at all, the exposure would have been extremely small. Moreover, Dr. Anspaugh calculated that if Petitioners had been exposed, their radiation dose would not have exceeded a small fraction of the radiation dose humans generally receive from one year's exposure to background radiation in their everyday lives.

Dr. Fred Mettler also testified as an expert and submitted a report. Dr. Mettler is a physician in Radiology and Nuclear Medicine at the New Mexico Federal Regional Medical Center, Professor and Chair Emeritus of the Department of Radiology and Nuclear Medicine at the University of New Mexico, and an expert in the effects of plutonium radiation on the human body. Based on his extensive experiences and relevant scientific authority, he explained that Petitioners' illnesses are simply not caused by

plutonium exposure. Relying on his expertise and authoritative scientific sources, he explained that plutonium radiation exposure had been extensively studied and that "if you're going to be looking for cancers from plutonium, you're going to look in . . . the liver, and skeleton, and lung." Even more, Dr. Mettler explained that "there is no association between plutonium and kidney or stomach cancer." In his view, there was good reason for that conclusion based on both the physical properties of plutonium particles and because plutonium exposure typically occurs through inhalation and would, therefore, not affect the kidney or stomach. He also explained that the ingestion of plutonium, on the other hand, presented few concerns because plutonium is very insoluble and, therefore, cannot enter the bloodstream, and also passes through the stomach quickly. He reiterated that plutonium has not been linked to stomach or kidney cancer even after significant exposures over long periods of time. Finally, he concluded that the likelihood that Petitioners' cancers were not due to plutonium exposure was higher than 99.9%.

Dr. Mettler also opined on Carswell's thyroid issues, explaining that the dose of radiation required to make a thyroid non-functional would result in a much higher dose to the lungs, which would prove fatal. Therefore, in his opinion, Carswell's thyroid issues were "absolutely not" related to radiation.

E. Pihl also presented the expert testimony of Dr. Paul Russo. Dr. Russo is an attending surgeon in the Urology Service at the Memorial Sloan-Kettering Cancer Center and is also a professor of Urology at the Weill Cornell Medical College. His research and clinical work focus on kidney cancer. In his report, he explained that he was tasked with reviewing the opinion of Petitioners' expert, Dr. Albert Robbins, concerning Eriksen's and Hansen's kidney tumors and cancers. After reviewing Petitioners' medical records, Dr. Russo concluded that it was not possible to determine the etiology of Eriksen's and Hansen's kidney tumors, and although Dr. Robbins linked their kidney issues to plutonium exposure, it was "equally if not more probable that [Petitioners had] sporadic renal tumors" that are common across the world. Moreover, Dr. Russo explained that specifically for Eriksen, his history as a heavy smoker "could have easily been a causative factor in the formation" of the tumor.

Next up is Dr. Allen Turnbull, emeritus attending surgeon and member of the Memorial Sloan-Kettering Cancer Center and its Gastric and Mixed Tumor Surgery Service. His work focuses on general and thoracic surgical oncology and critical care medicine. Testifying as an expert, Dr. Turnbull explained that Carswell's stomach cancer and esophagus issues were likely not caused by exposure to plutonium. Dr. Turnbull testified that

assuming Carswell had stomach cancer and esophagus issues (which he, based on Petitioners' proffered evidence, described as Barrett's esophagus), those conditions were extremely unlikely to be related to plutonium exposure. Dr. Turnbull explained that it was more likely than not that his stomach cancer was caused by an H. pylori infection or acid reflux -- two common causes of stomach cancer. Dr. Turnbull further explained that plutonium ingestion is unlikely to have any ill effect on the stomach because plutonium particles pass through the stomach quickly and because the cells of the stomach lining are replaced every seven days.

E. Pihl also presented the fact testimony of Dr. Knud Juel.⁵ Dr. Juel works for the Southern Danish University's National Institute for Public Health. Dr. Juel has a master's degree in statistics and a Ph.D. in epidemiology and has conducted several epidemiological studies concerning the health effects of the aircraft crash in Thule, including his Ph.D. thesis and three published articles. Dr. Juel compared DCC workers in Thule during the cleanup to those workers who worked at Thule before the crash and after the cleanup ended. The study concluded that there was no difference in illness or mortality rates between the DCC workers

⁵ As an employee of the Danish government, Dr. Juel was prohibited from testifying as an expert witness.

who were at Thule during the cleanup and the DCC workers who were at Thule at other times before or after the cleanup.

Petitioners, however, produced experts of their own. Drs. Albert Robbins, Graeme Edwards, and Frank Barnaby all agreed that Petitioners' illnesses were caused by their work at Thule.

Dr. Robbins is a medical doctor who specializes in preventive, occupational and environmental medicine. He submitted a report in support of Hansen and Eriksen. In both reports, Dr. Robbins asserted, without much support, that after reviewing their medical records, and reading their statements concerning their involvement in the clean-up operation, it was reasonably probable that each of their kidney tumors and diagnosed cancers were associated with the risk of plutonium inhalation. Dr. Robbins did not offer live testimony.

Next up, Dr. Edwards. Dr. Edwards is a general practitioner with interests in Dermatology, Obstetrics, Gynecology, and Fertility issues. He was also Carswell's treating physician "for several years for a number of medical conditions." Dr. Edwards submitted a one-page letter stating that Carswell suffered from hypothyroidism since 2005, and that there is a "reasonable degree of probability that his hypothyroidism is attributable to the long term effects of exposure to such radiation." Dr. Edwards did not offer live testimony either.

Together, Petitioners also provided the testimony, and report authored by Dr. Frank Barnaby. Dr. Barnaby has a Ph.D. in nuclear physics and has worked extensively in that field. He submitted a report and testified as to the general properties of nuclear weapons, plutonium, and how much plutonium he believed was dispersed in the Thule crash. In his report, he concluded that "[p]articipation in search and rescue and/or 'clean-up' operations, in the manner described by the former Thule workers, would have seriously exposed them to the risks of plutonium inhalation and the long-term development of cancer."⁶

Finally, the Director submitted the reports of Dr. Jerome Siegel, a specialist in occupational and internal medicine, and a certified medical examiner. Dr. Siegel examined the Petitioners and submitted written reports for each one of them as an independent medical examiner. Following thorough interviews and examinations, Dr. Siegel found that Petitioners suffered no acute illnesses or health effects from radiation exposure.

⁶ Dr. Barnaby opined, as a general matter, that long-term exposure to plutonium radiation could be hazardous and result in some form of cancer. He also commented that the inhalation of plutonium particles could lead to the development of lung cancer, and that it was possible that plutonium particles in the lungs could make their way to other organs, thereby increasing the risk of cancer in those areas.

B. The ALJ and Board's Decision

Following the hearings, the ALJ denied Petitioners' claims in a 164-page decision and reached two conclusions that are relevant to us today. First, after carefully reviewing the evidence and applying the correct legal standard, the ALJ found that Petitioners did not establish a causal nexus between their illnesses and plutonium radiation. Relying on the expert testimony of Drs. Mettler, Russo, and Turnbull, the ALJ concluded that even if the Petitioners had been exposed to a detectable dose of plutonium radiation, the weight of the scientific consensus was that plutonium radiation does not cause the illnesses that the Petitioners suffered from.⁷ The ALJ explained that in order to find otherwise, she would have to "discount the opinions of highly credentialed physicians and ignore a multitude of medical and epidemiological studies, in favor of the 'vague' . . . [or] 'conclusory' opinion[s] [of the Claimants' experts.]"

Second, the ALJ once again found that the Director properly participated in the litigation. She relied on her prior decisions and additionally noted that the "Director acted

⁷ Although not relying on the testimony, the ALJ first explained, based on the expert testimony of Dr. Anspaugh, that it was unlikely that the Petitioners were exposed to high levels of radiation at all.

prudently to safeguard the potential liability of the Longshore Act's Special Fund."⁸

Petitioners appealed to the Benefits Review Board alleging, among other things, error in the ALJ's causation analysis and the ALJ's decision to allow the Director to participate in the proceedings. The Board affirmed, holding that the ALJ's finding that Petitioners' illnesses were not attributable to plutonium exposure was supported by substantial evidence. The Board likewise affirmed the ALJ's decision allowing the Director to participate in the proceedings, relying on the explicit language of the applicable regulations.⁹

Petitioners filed a petition for review of the Board's decision.¹⁰

⁸ The ALJ also found that certain portions of the Petitioners' DBA claim were untimely. By proceeding to the merits of the entirety of the DBA claim, the ALJ also denied the purported untimely claims on the merits as well.

⁹ The Board did not address the ALJ's decision on the timeliness of Petitioners' claims, finding the causal connection point dispositive.

¹⁰ Petitioners timely filed their petition with the United States Court of Appeals for the Second Circuit. Soon thereafter, upon the Director's motion, the Second Circuit transferred the petition to this court. We have jurisdiction because Petitioners filed their claims with the District Director, Office of Workers' Compensation Programs, in Boston, Massachusetts. See Truczinskas v. Dir., OWCP, 699 F.3d 672, 674-76 (1st Cir. 2012); 42 U.S.C. § 1653(b) (stating that petitions for review should be filed "wherein is located the office of the deputy commissioner whose compensation order is involved"). Petitioners suggest that their petition for review should be filed in the district court, not the court of appeals. We have rejected

II. Standard of Review

We review the Board's decisions on questions of law de novo and determine "whether the Board adhered to the 'substantial evidence' standard when it reviewed the ALJ's factual findings." Bath Iron Works v. Brown, 194 F.3d 1, 3 (1st Cir. 1999). "In reviewing for substantial evidence, we assess the record as a whole, and we will affirm so long as we are satisfied that the record contains 'such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.'" Peña-Garcia v. Dir., OWCP, 917 F.3d 61, 64 (1st Cir. 2019) (quoting Bath Iron Works Corp. v. U.S. Dep't of Labor, 336 F.3d 51, 56 (1st Cir. 2003)). Substantial evidence is "more than a scintilla" and does not approach the familiar preponderance of the evidence standard found in civil cases. Bath Iron Works Corp., 336 F.3d at 56. Moreover, on review, "we will accept the findings and inferences drawn by the ALJ, whatever they may be, unless they are 'irrational.'" Id. (quoting Barker v. U.S. Dep't of Labor, 138 F.3d 431, 434 (1st Cir. 1998)). It is the ALJ's prerogative, in the first instance, "to draw inferences and make credibility assessments, and we may not disturb [their] judgment and the Board's endorsement of it so long as the findings are adequately

this same argument in the past and reiterate that we have jurisdiction over petitions for review of a Benefits Review Board decision under the Defense Base Act. Id.

anchored in the record." Bath Iron Works Corp. v. Dir., OWCP, 244 F.3d 222, 231 (1st Cir. 2001). The substantial evidence standard is "notoriously difficult to overcome." Bath Iron Works Corp., 336 F.3d at 56.

III. The Director's Participation in the Proceedings

As they did before the ALJ and the Board, Petitioners assert that the Director improperly participated in the proceedings below. Petitioners take on a variety of positions, essentially arguing that Supreme Court precedent as well as both the purpose and text of the LHWCA and relevant regulations prohibit the Director from joining LHWCA and DBA litigation as a party. Further, Petitioners argue that by permitting the Director to participate, the ALJ and Board committed reversible error. Reviewing de novo, we find Petitioners' arguments meritless.

In 1927, the LHWCA established a comprehensive federal workers' compensation scheme requiring certain employers to compensate covered employees injured in the course of their employment. Dir., OWCP v. Newport News Shipbuilding and Dry Dock Co., 514 U.S. 122, 125 (1995) (hereinafter "Harcum"); 33 U.S.C. §§ 902(2), 903(a). The Act aimed to produce "fair and efficient resolution of a class of private disputes, managed and arbitered by the Government" and is best understood as a compromise between the competing interests of employers and injured workers. Harcum,

514 U.S. at 131. In 1941, Congress enacted the DBA which, drawing upon the LHWCA, "aimed to provide workers' compensation covering, among others, individuals employed outside the continental United States under contracts with or approved by the federal government." Truczinskas v. Dir., OWCP, 699 F.3d 672, 674 (1st Cir. 2012) (citing 42 U.S.C. § 1651(a)(4)-(5)). The DBA incorporated much of the LHWCA scheme, and with limited exceptions "the provisions of the [LHWCA], . . . as amended, . . . apply in respect to the injury or death of any employee" under the DBA. 42 U.S.C. § 1651(a).

Apart from the compensation scheme, the LHWCA also assigns a variety of responsibilities to the Secretary of the Department of Labor, one of which includes the authority to make rules and regulations "as may be necessary in the administration of this [Act]." 33 U.S.C. § 939(a). One of those regulations, 20 C.F.R. § 702.333(b), permits "[t]he Solicitor of Labor or his designee [to] appear and participate in any formal hearing held pursuant to these regulations on behalf of the Director as an interested party." See also 20 C.F.R. § 701.101(a) (making § 702.333 applicable to the DBA). The Secretary of Labor has also charged the Director of the OWCP with both the administration and enforcement of the LHWCA/DBA and, as a result, the Director often appears as "a litigant in LHWCA cases as a representative of the

Department of Labor." Cunningham v. Dir., OWCP, 377 F.3d 98, 105 n.6 (1st Cir. 2004) (internal citation omitted); see 20 C.F.R. § 701.201.

Despite the regulation's explicit language, Petitioners argue that the Director inappropriately participated as a litigant below. Petitioners rely on the Supreme Court's decision in Harcum and insist that it stands for the proposition that the LHWCA does not "confer party-litigant standing on the Secretary, (hence the Director), in ALJ or [Board] proceedings." But Harcum says no such thing. In Harcum, the Director petitioned the court of appeals to review an ALJ and Board ruling granting only partial benefits to a claimant under the LHWCA. 514 U.S. at 124-25. The Supreme Court found that the Director did not have standing to challenge the ruling before the court of appeals because the Director was not adversely affected or aggrieved by the decision within the meaning of § 921(c) of the LHWCA. Id. at 136. That decision did not involve the Director's ability to join LHWCA litigation before the ALJ or the Board and does not support Petitioners' argument.

Indeed, relevant precedent establishes that the Director may participate as a litigant before the ALJ and the Board. Following Harcum, the Supreme Court explained that the Director plays a significant role before the ALJ and Board in LHWCA cases,

noting that "the Director has also been authorized by the Secretary of Labor to appear as a litigant before the relevant adjudicative branches of the Department of Labor, the ALJ, and the Benefits Review Board." Ingalls Shipbuilding, Inc. v. Dir., OWCP, 519 U.S. 248, 263 (1997) (citing 20 C.F.R. § 702.333(b)). We have also explained that "[t]he Director is charged with the administration and enforcement of the LHWCA, and also is often a litigant in LHWCA cases as a representative of the Department of Labor." Cunningham, 377 F.3d at 105 n.6 (internal citation omitted).

Faced with the weight of this precedent, Petitioners press an alternative argument. They posit that the ALJ and Board erred by allowing the Director to participate as an interested party for the specific reason of protecting possible Special Fund payments. But, again, we are unconvinced. As the administrator of the Special Fund, the Director may provide compensation from the fund to an aggrieved employee when the employer is unable to pay due to insolvency. 33 U.S.C. §§ 944(a), 918(b). Given that DCC had ceased operations, it was reasonable for the Director to assume that the Special Fund could be implicated if Petitioners' claims were successful. Cf. Dir., OWCP v. Newport News Shipbuilding and Dry Dock Co., 8 F.3d 175, 181 (4th Cir. 1993) (explaining that the Director "has an obligation to protect [the fund] from unjustified claims" (alteration in original) (quoting

Dir., OWCP v. Newport News Shipbuilding & Dry Dock Co., 676 F.2d 110, 113 (4th Cir. 1982))). Indeed, that assumption proved correct when E. Pihl declared bankruptcy during the evidentiary proceedings before the ALJ, rendering the Special Fund potentially responsible for any compensation due. Acknowledging the Director's responsibility, the ALJ and the Board permissibly allowed the Director to participate for the purpose of protecting the Special Fund.¹¹

As a last resort, Petitioners insist that the Director's participation below was ultra vires and would result in the Director reviewing the Board's decision. Petitioners do not give us much to go on as to why the Director's participation would be ultra vires or an unlawful delegation of power. What we do know, however, is that Congress explicitly authorized the Secretary of Labor to make needful rules and regulations and that Petitioners have not explained how Congress or the Secretary of Labor went beyond their authority by doing so. The argument is, therefore, waived. See United States v. Zannino, 895 F.2d 1, 17 (1st Cir. 1990) ("[I]ssues adverted to in a perfunctory manner, unaccompanied by some effort at developed argumentation, are

¹¹ Moreover, the relevant statutes and regulations governing appeals to the Board permit the Director to participate in the appeal as a party. See, e.g., 20 C.F.R. §§ 801.102(a), 801.2(a)(10); 33 U.S.C. § 921(b)(3).

deemed waived. It is not enough merely to mention a possible argument in the most skeletal way, leaving the court to do counsel's work, create the ossature for the argument, and put flesh on its bones.") (internal citation omitted). Further, as we have previously explained, by statute, the Director does not review the decisions of the Board. Neely v. Benefits Review Bd., 139 F.3d 276, 281 (1st Cir. 1998). That responsibility rests with the circuit court of appeals. Truczinskas, 699 F.3d at 674-75; Wood v. U.S. Dep't of Labor, 112 F.3d 592, 595 (1st Cir. 1997).

Accordingly, we find that the Director properly participated in the proceedings below.

IV. The Defense Base Act Claim

Petitioners also challenge the Board's merits decision. In denying Petitioners' claims, the ALJ found that the weight of the medical and scientific evidence established that the Petitioners' illnesses were not related to their alleged exposure to plutonium radiation at Thule. The Board, in affirming, found that the ALJ's conclusion was supported by substantial evidence. Petitioners now claim before us that the Board's decision was erroneous, raising a litany of arguments.

The LHWCA provides compensation for certain injuries "arising out of and in the course of employment." 33 U.S.C. § 902(2); Battelle Mem'l Inst. v. DiCecca, 792 F.3d 214, 217 (1st

Cir. 2015). The Act defines injury, in part, as "such occupational disease or infection as arises naturally out of such employment or as naturally or unavoidably results from [an] accidental injury." 33 U.S.C. § 902(2). To receive compensation, a claimant must establish a "causal nexus between [his] malady and his employment activities." Bath Iron Works Corp. v. Fields, 599 F.3d 47, 52 (1st Cir. 2010) (alteration in original) (quoting Sprague v. Dir., OWCP, 688 F.2d 862, 865 (1st Cir. 1982)).

We analyze LHWCA and DBA claims through a burden-shifting framework, which ultimately places the burden of proving the requisite elements of coverage with the claimant. Id. at 52-53, 53 n.1. Under this framework, the claimant must first make out a prima facie case by establishing "(1) that he 'sustained physical harm' and (2) 'that conditions existed at work which could have caused the harm.'" Bath Iron Works Corp. v. Preston, 380 F.3d 597, 605 (1st Cir. 2004) (quoting Susoeff v. S.F. Stevedoring Co., 19 Ben. Rev. Bd. Serv. 149, 151 (1986)). The question at this stage is not whether there is a causal nexus, but rather, whether the claimant can show merely "that the harm *could have* been caused by his working conditions." Id. Once the claimant establishes a prima facie case, § 920(a) kicks in, which affords claimants a presumption that the injury was caused by his working conditions and is compensable under the DBA. See id.; 33 U.S.C.

§ 920(a). That presumption, we have explained, attaches to the Petitioners' injury being causally related to their employment. Fields, 599 F.3d at 51-52. Next, the employer may rebut that presumption by demonstrating with substantial evidence -- that is, "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion," Brown, 194 F.3d at 5 (quoting Sprague, 688 F.2d at 865) -- "that the injury was not caused by the claimant's working conditions," Preston, 380 F.3d at 605. If the employer severs the causal connection between the injury and the claimant's working conditions, "the presumptions 'falls' out of the case." Id. (quoting Sprague, 688 F.2d at 866 n.7). Then, the burden shifts back to the claimant who must show, by a preponderance of the evidence, that the injuries were in fact caused by the working conditions "based on the record as a whole." Brown, 194 F.3d at 5.

Down below, Petitioners successfully established a prima facie case, triggering the § 920(a) presumption. E. Pihl, in turn, successfully rebutted that presumption through the testimony of Drs. Mettler, Turnbull, and Russo. The ALJ then reviewed the evidence as a whole and found that Petitioners did not establish a causal connection between their illnesses and the alleged plutonium radiation exposure at Thule. According to Petitioners,

however, the ALJ's finding was not supported by substantial evidence. The record, however, does not support their position.

E. Pihl produced significant amounts of evidence establishing that plutonium radiation does not cause Petitioners' illnesses. The ALJ found that Dr. Mettler was highly qualified to comment on these issues as a physician in Radiology and Nuclear Medicine who focused on the effects of plutonium radiation on the human body. Notably, Dr. Mettler explained that plutonium radiation primarily manifests in lung, liver, and bone cancer, and that plutonium has never been shown to cause kidney or stomach cancer. As for Carswell's thyroid issues, Dr. Mettler explained that the dose of plutonium radiation needed to make a thyroid non-functional would have resulted in a higher dose to the lungs, which would have proved fatal.

Dr. Russo provided validating testimony. A surgeon at Memorial Sloan-Kettering Cancer Center and professor of Urology, he explained that, unlike Petitioners' expert's claim, it was not entirely possible to determine the etiology of Eriksen's and Hansen's kidney tumors. But given the type of kidney tumors they had, it was "equally if not more probable that [Petitioners had] sporadic renal tumors" that are common across the world, and therefore not caused by plutonium radiation. Importantly, Dr. Russo explained that Eriksen's smoking history could have also

been the cause of his kidney cancer. Then, Dr. Turnbull, who is a member of the Memorial Sloan-Kettering Gastric and Mixed Tumor Surgery Service, explained that Carswell's illnesses are not caused by plutonium radiation. He explained with precision that Carswell's stomach cancer and esophagus issues were likely due to acid reflux or an H. pylori infection. Taken together, the testimony of E. Pihl's experts certainly provided substantial evidence from which a reasonable person could conclude that plutonium radiation, if any, did not cause the ailments suffered by the Petitioners, and therefore rebutted the § 920(a) presumption. See Sprague, 688 F.2d at 867 (finding that the testimony of two expert doctors provided substantial evidence on causation question); Bath Iron Works Corp. v. Dir., OWCP, 137 F.3d 673, 675-76 (1st Cir. 1998) (finding that the testimony of one doctor provided substantial evidence on causation question).

There is likewise substantial evidence to conclude that following the rebuttal of the presumption, Petitioners did not establish, on the record as a whole, a causal nexus between their alleged plutonium exposure and their illnesses. The ALJ found that Petitioners' expert witnesses offered vague and conclusory testimony and that in order for the ALJ to have relied on that testimony, she had to credit the "vague opinions" of Dr. Robbins and Dr. Edwards and the "conclusory opinion of Dr. Barnaby" over

the Respondents' "highly-credentialed physicians and ignore a multitude of medical and epidemiological studies." That finding, as we have recounted, was rational and supported by substantial evidence.

Faced with this reality, Petitioners urge us to revisit the proceedings themselves. Petitioners complain that neither the Respondents' expert witnesses, nor the independent medical examiner, subjected the Petitioners to a urine test in order to determine whether they were in fact exposed to plutonium radiation.¹² Given that failure, Petitioners insist that no medical testimony proffered by E. Pihl was sufficient to rebut causation. We are not convinced. E. Pihl's medical experts established that even if Petitioners were exposed to plutonium radiation, plutonium does not cause the types of illnesses that Petitioners suffer from. Moreover, Petitioners were free to conduct urine tests of their own accord and, ultimately, it was Petitioners, not E. Pihl, who bore the burden of proof.¹³

¹² The use of a urine test was the subject of spirited argumentation before the ALJ because it would have likely established whether Petitioners were exposed to plutonium radiation. During those arguments, Petitioners moved to compel Dr. Siegel, the independent medical examiner, to conduct a urine analysis, but the ALJ denied that petition, deferring to Dr. Siegel's medical expertise in choosing which exams to conduct. The Board affirmed.

¹³ Moreover, the ALJ did not abuse her discretion by deferring to the independent medical examiner -- an experienced medical examiner -- as to what type of exams would be helpful in

Next, Petitioners attack the substance of E. Pihl's expert's testimony. They fault Dr. Mettler for relying on an "atomic bomb model of single instance exposure" instead of a long-term model in assessing cancer risk, and they argue that his testimony was undermined by his purported admission that it was statistically difficult to ascertain cancer risks in populations that are exposed to low levels of radiation. They also point to one of their exhibits, a report by the Center for Environmental Health Studies, for the proposition that radiation from plutonium could be shown to cause kidney and stomach cancer and thyroid issues, and suggest that it, too, undermined Dr. Mettler's testimony. Finally, Petitioners attack the credibility of Drs. Russo and Turnbull, claiming that their testimony should be given little weight because they are not experts in the medical effects of radiation. By doing so, Petitioners invite this court to reweigh the evidence which we, of course, cannot do. See Bath Iron Works Corp., 244 F.3d at 231; Peña-Garcia, 917 F.3d at 64. In any event, the ALJ's findings were rational and firmly anchored in the record. Despite Petitioners' attacks, Dr. Mettler's testimony did in fact rely on various modes of exposure which he discussed and attached to his report; none of which have

his evaluation. In any event, Petitioners could have sought the opinion of a second independent medical examiner under 20 C.F.R. § 702.409.

established an association between plutonium exposure and kidney or stomach cancer. Second, Dr. Mettler did not admit to the statistical difficulty Petitioners assert. In fact, Dr. Mettler explained that at low doses of radiation, if there is a risk, it is so minuscule that no scientist has been able to identify it after sixty years of targeted studies. As for Petitioners' proffered exhibit, the ALJ explained that the article did not "differentiate between radiation in general and plutonium radiation specifically, which was the type of radiation released in the Thule incident." The ALJ was free to weigh the probative value of the article in light of the rest of the testimony and did so here. Finally, Drs. Turnbull and Russo testified well within the bounds of their expertise, opining on the likely causes of Carswell's stomach cancer and esophagus issues and Eriksen's and Hansen's kidney tumors respectively.

Petitioners also complain that the ALJ erroneously permitted Dr. Juel to testify as a fact witness. Remember, Dr. Juel could only testify as a fact witness because his employment by a Danish state university prohibited him from testifying as an expert. He instead testified about the facts concerning his several epidemiological studies of the Thule workers. Petitioners do not posit any good reason for why the ALJ abused her discretion. See Pan Am Rys., Inc. v. U.S. Dep't of Labor, 855 F.3d 29, 36 (1st

Cir. 2017) (applying abuse of discretion standard to ALJ's decision to exclude evidence). Dr. Juel's testimony was relevant to the occupational hazards of civilian employees working at Thule, and the ALJ also limited Dr. Juel's testimony to the facts concerning the work he and his colleagues performed in those studies. Even so, Dr. Juel's testimony was not a necessary part of the ALJ's decision, and only bolstered E. Pihl's expert's testimony.

Petitioners finally claim that the ALJ erred by refusing to admit evidence regarding the 1988 death of Karl Banz -- a civilian employee who also worked at Thule during Operation Crested Ice. We again perceive no abuse of discretion in that decision. See id. Banz was not a party to the litigation and had different responsibilities during the cleanup. Any testimony concerning his work or illnesses would have little relevance and probative value to the question of whether the Petitioners' ailments were caused by plutonium radiation.

V. Conclusion

For the foregoing reasons, we deny the petition for review.