

INTERNATIONAL [REDACTED]
International Arbitration Tribunal

In the Matter of the Arbitration between:

[REDACTED]

Claimant

[REDACTED]

VS

[REDACTED]

Respondent

PARTIAL FINAL AWARD

WE THE UNDERSIGNED ARBITRATORS, having been designated in accordance with the arbitration agreement entered into between the above-named parties and dated August 26, [REDACTED] and having been duly sworn, and having duly heard the proofs and allegations of the Parties, do hereby, FIND and AWARD, as follows:

Introduction

1. The Claimants, [REDACTED] claim against the Respondent, [REDACTED] for faulty repairs to the [REDACTED] (the "Vessel") said to have been performed while the Vessel was drydocked at [REDACTED]. The Vessel was drydocked to permit a five-year survey by the American Bureau of Shipping ("ABS"). [REDACTED] removed the fiberglass casing covering of the tailshaft with power chisels to permit the survey to be conducted. [REDACTED] alleges that [REDACTED] caused significant gouging and scraping damage to the shaft during the removal of the covering. Subsequent grinding and spooning of the gouging and scraping damage is said to have been performed improperly. A divot was created that [REDACTED] says caused a stress riser that allowed a fatal fracture to propagate. When the Vessel was next brought in for five-year inspection in [REDACTED] a fracture was discovered. The fracture was found to extend beyond the ABS maximum allowable depth and the tailshaft was condemned. Owing in part to difficulties in finding

drydock space to perform a replacement, [REDACTED] incurred significant replacement costs said to exceed \$6 million. The damages were covered by insurers and the claim in arbitration was a subrogated claim.

2. The Respondent [REDACTED] denies responsibility for the alleged faulty repair of the tailshaft and further disputes the allegation that the suspect repair was the cause of the failure of the 30-year old shaft. [REDACTED] pleads, among other things, that the [REDACTED] claim is time barred and seeks to hold [REDACTED] accountable for spoliation of evidence that resulted in a denial of an opportunity for [REDACTED] to investigate the cause of the shaft failure. [REDACTED] also disputes the damages alleged by the Claimants.
3. Much time was devoted at the evidentiary hearings to the question of whether or not the subject fracture emanated from a stress riser in a spooned-out area of the tailshaft where machining work had been done. Opinion from experts was divided as to whether or not the fatal fracture emanated from the divot that had been created or simply arose from operational stresses. Experts were also divided on the threshold question of whether or not [REDACTED] created the suspect divot in [REDACTED]

The Contract

4. [REDACTED] and [REDACTED] were parties to a contract for the Dry Docking, Modification and Repair of the [REDACTED] (the "Contract"). The Contract is dated August [REDACTED] and contains an arbitration clause in Article 23 for the resolution of disputes arising out of or relating to the Contract.

The Arbitration Agreement

5. Article 23 of the Contract provided as follows:

ARTICLE 23. Disputes; Arbitration

- (a) In the event of any dispute or difference as to any matter or thing between [REDACTED] and Contractor arising out of or relating to this Contract which cannot be settled by [REDACTED] and Contractor, [REDACTED] and Contractor shall submit the matter in dispute to arbitration. Any such arbitration shall be conducted by a single neutral arbitrator or three neutral arbitrators as herein provided (the "Arbitrator(s)") in a proceeding administered by the [REDACTED] International Business Disputes in [REDACTED] or by another neutral arbitration agency mutually acceptable to Contractor and [REDACTED] (the "Arbitration Agency") in accordance with its international arbitration rules, except as otherwise provided by this Article. The place of arbitration shall be the City of [REDACTED] or such other place as may be agreed upon by Contractor and [REDACTED]. The language of any such proceeding shall be English.

Choice of Law Clause

6. Article 22 provided as follows:

ARTICLE 22 Applicable Law

This Contract shall be governed by United States federal maritime law, to the extent applicable, and if not, by the laws of the State of California, except as provided in ARTICLE 23 Disputes: Arbitration

The Arbitration

7. By Notice of Arbitration dated June 24, [REDACTED] the Claimants instituted arbitration proceedings with the [REDACTED] with a request that the [REDACTED] commence administration of the arbitration.
8. [REDACTED] named [REDACTED] as its nominee to the arbitration tribunal and [REDACTED] named [REDACTED] as its nominee. Those appointments were confirmed by the [REDACTED] letter dated December 2, [REDACTED]. The [REDACTED] nomination was made under protest "for the limited purpose of having the panel of arbitrators consider whether the [REDACTED] has jurisdiction to administer the arbitration."
9. [REDACTED] objected to the appointment of [REDACTED] on December 6, [REDACTED] on the basis of personal and professional connection to counsel for [REDACTED]. The [REDACTED] determined that the challenge should be sustained and by letter dated January 10, [REDACTED] gave notice to the parties that [REDACTED] was removed as a member of the panel. [REDACTED] was asked to submit the name of a new nominee by January 25, [REDACTED].
10. [REDACTED] did not appoint a new arbitrator and by letter dated April 11, 2012 the [REDACTED] appointed [REDACTED] as arbitrator.
11. Mr. [REDACTED] and Mr. [REDACTED] nominated Murray L. Smith to sit as Chairman of the panel. That appointment was confirmed by letter dated May 31, 2012.
12. The first procedural meeting in the arbitration was convened by conference call on June 25, [REDACTED]. [REDACTED] appeared as counsel on behalf of [REDACTED]. [REDACTED] appeared on behalf of [REDACTED]. The appearance of Mr. [REDACTED] was conditional and for the purpose only of challenging the jurisdiction of the [REDACTED] to administer the arbitration.
13. The jurisdictional challenge launched by [REDACTED] was based on the fact that the arbitration agreement specified the [REDACTED] to administer the arbitration, not the [REDACTED]. The [REDACTED]. The challenge was dismissed by the Tribunal in an Award on Jurisdiction dated October

1, 2012, hereby incorporated by reference. As established in the Award on Jurisdiction, the [REDACTED] is the administering institution of this arbitration and the [REDACTED] International Arbitration Rules govern the proceedings.

14. The hearing of the case on the merits proceeded on May 28, [REDACTED] for four days in San Francisco, California. The parties agreed that the hearings would be held in San Francisco for reasons of convenience only. The legal seat of the arbitration in [REDACTED] was not changed.
15. At the evidentiary hearings the Claimants were represented by [REDACTED] and [REDACTED] Pennsylvania. The Respondent [REDACTED] was represented by [REDACTED] and [REDACTED], San Francisco, California. Also appearing on behalf of the Respondent were [REDACTED]
16. A court-reported-made transcript of the evidentiary hearings was prepared and delivered to counsel and the Panel.

Pleadings, Submissions, Evidence and Issues

Pleadings and Written Submissions

17. [REDACTED] filed a Statement of Claim dated December 21, [REDACTED] filed its Statement of Defense on January 31, [REDACTED] filed a Reply to the Statement of Defense on March 8, [REDACTED]
18. [REDACTED] submitted a Prehearing Memorandum of Argument dated April 23, [REDACTED] a Reply to Respondent's Prehearing Memorandum dated May 17, [REDACTED] a Post-hearing Memorandum dated June 28, [REDACTED] and a Post-hearing Reply Memorandum dated July 12, [REDACTED] delivered a Prehearing Memorandum of Argument on May 8, [REDACTED] a Post-hearing Memorandum on June 28, [REDACTED] and a Post-hearing Reply Memorandum on July 12, [REDACTED]

Evidence

19. [REDACTED] tendered the witness statements of [REDACTED]. These witness statements served as testimony in chief at the evidentiary hearings subject to a right of cross-examination by counsel for [REDACTED] tendered the witness statements of [REDACTED] all of whom were cross-examined at the evidentiary hearings. Both parties filed books of reliance documents that were made exhibits on the hearing.

List of Issues

20. The primary substantive issues for determination are:

- whether or not [REDACTED] performed the repair work in [REDACTED] that created the divot and stress riser (also referred to in this Award as the “threshold issue” or the “threshold question”);
- whether or not the stress riser that was discovered in [REDACTED] was the cause of the fatal fracture in the tailshaft;
- whether or not [REDACTED] is responsible for spoliation of evidence by rebuilding the condemned tailshaft without first permitting [REDACTED] an opportunity to conduct tests to determine the original cause of the fracture;
- whether or not the [REDACTED] claim is time barred; and
- whether or not [REDACTED] is responsible for the alleged damages exceeding \$6 million.

Issue No. 1 - The Threshold Issue: Did [REDACTED] create the Divot and Related Stress Riser?

Evidence Relevant to Issue No. 1

[REDACTED]

21. [REDACTED] is the Vice President of Vessel Operations for the Claimant [REDACTED]. His responsibilities include supervision for all vessel and safety operations. He testified that the [REDACTED] was drydocked with [REDACTED] on August 26, [REDACTED]. The Vessel’s tailshaft was surveyed by the ABS. He visited the [REDACTED] shipyard to supervise the work which included removal of the covering on the tailshaft with power chisels. He stated that [REDACTED] removed the fiberglass casing in a faulty manner with resultant gouging and scraping of the flanges and radii of the torque tube, tube shaft and tailshaft couplings. The gouging and scraping damage was then ground away and the Vessel was returned to service. He did not observe any cracks or stress risers in the tailshaft during the [REDACTED] drydocking and no other [REDACTED] employee reported that they observed any cracks or stress risers in the tailshaft.
22. Over the course of the next five years the Vessel traded without incident. In [REDACTED] the Vessel was drydocked for the next ABS survey of the tail shaft. This was the first time the fiberglass covering had been removed since the [REDACTED] work done by [REDACTED]. During the course of the [REDACTED] survey, fractures were discovered in the area of the tailshaft that had been ground and spooned by [REDACTED] during the [REDACTED] drydocking. One of the fractures was so deep that it exceeded the maximum depth

allowed by ABS rules and the shaft was condemned. A spare tailshaft was installed on the Vessel which was then returned to service.

23. [REDACTED] further noted that the damaged tailshaft was shipped to California where it was repaired so that it could serve as a spare. Metallurgical tests at the time established that the condemned tailshaft could be repaired notwithstanding the depth of the fracture.
24. On cross-examination [REDACTED] was asked whether he observed any grinding of the gouging on the tailshaft in [REDACTED]. He stated that he did visit the site and did recall seeing the shaft but could not recall where the grinding was done. When asked about his statement that he did not observe any cracks or stress risers in the tailshaft he said that he remembered looking at the tailshaft but would not call it an inspection.
25. [REDACTED] confirmed that the Vessel suffered heavy weather damage during a voyage in [REDACTED]. The Vessel encountered Force 9 weather in the course of which the hull plating was damaged. Heavy seas caused the hull to buckle. This hull damage was not discovered until the [REDACTED] drydocking.
26. [REDACTED] also confirmed on cross-examination that the tailshaft was approximately 30 years old and would have gone through four to five other five-year inspections.

[REDACTED]

27. The Claimants tendered the Declaration of [REDACTED] dated April 19, [REDACTED] has more than 35 years of marine engineering experience. He was retained by [REDACTED] to review the disassembly, removal, inspection, reinstallation, and reassembly of the main line shafting system of the Vessel by [REDACTED]. He was on-site at [REDACTED] shipyard from August 26, [REDACTED] through November 30, [REDACTED]. During that time he maintained a Shafting Inspection Report to record [REDACTED] work on the Vessel.
28. [REDACTED] reported that [REDACTED] removed the protective fiberglass casing that covered the Vessel's tailshaft with power chisels to allow the performance of the ABS survey. He inspected the vessel's shaft after [REDACTED] performed this work and noted in his report:

There was significant gouging and scraping damage on the flanges and radii of the torque tube, tube shaft and propeller shaft (tailshaft) couplings. This was old and new damage. The damage is the result of chiselling to remove the fiberglass covering around the coupling flanges. The sharp edges were ground smooth and blended into the contours with the minimum amount of materials removal. Flange radii were dye penetrant inspected. No indications were found.

29. [REDACTED] did not observe any cracks or risers in the shaft as a result of [REDACTED] work.
- [REDACTED]
30. [REDACTED] tendered the statement of [REDACTED] dated April 19, [REDACTED]. Mr. [REDACTED] is a marine surveyor who gave expert evidence regarding the cause of the fracture that led to the condemnation of the tailshaft in 2008. Mr. [REDACTED] earned a Bachelor of Science degree in Aerospace and Ocean Engineering at [REDACTED]. He is a Fellow of the Society of Naval Architects and Marine Engineers and a Fellow in the National Academy of Forensic Engineers. He has spent most of his career in the maritime engineering field and has been involved in at least 1000 maritime equipment damage claims. He estimated that he had been involved in about 50 claims involving tailshafts since 1988. On cross examination Mr. [REDACTED] stated that he had no training in materials analysis or degree in metallurgy but did take a metallurgy class as well as a class in structural design that dealt with stress risers.
31. In Mr. [REDACTED] opinion the tailshaft failure was caused by the negligence of [REDACTED] during the removal of the fiberglass covering when the vessel was undergoing repairs and shaft survey at [REDACTED] shipyard in [REDACTED]. He stated that a tailshaft can develop a fracture as a result of a flawed design, a manufacturing defect, a maintenance issue, a catastrophic failure or damage incurred that subsequently develops slowly into a shaft failure. He ruled out all causes other than the negligence of [REDACTED] in preparing the tailshaft for survey in [REDACTED].
32. Mr. [REDACTED] opinion was based on a review of documents provided to him by [REDACTED]. In particular he reviewed a photograph of the ground-out area of the tailshaft said to be the source of the fracture. The photograph was taken in [REDACTED] ("the [REDACTED] photograph") before any further grinding was done on the subject area. The [REDACTED] photograph was marked as Exhibit "E". An enlargement was marked as Exhibit "F". The photograph showed a spooned-out area that had a rather sharp transition where the subject fracture appeared to be centered.
33. Mr. [REDACTED] stated that it is imperative that a tailshaft surface be made as smooth as possible without notches and sharp transitions when the shaft is readied for service. When a fracture is removed the spooned area does not develop new fractures if the recesses are carefully radiused. He stated that the "fracture in question was found in a location where a fracture had been previously spooned out and where, on a later date, some additional spooning had taken place, and where the second instance of spooning was performed with rather poor edge detailing". He stated that it is now apparent that the removal of the fiberglass cladding of the tailshaft by [REDACTED] resulted in damage to the tail shaft in the form of chisel marks (stress riser notches). He stated that it is also now apparent that "an effort

was made to remove these notches before returning the shaft to service, but that a notch in way of a previous fracture grinding recess was not, or could not, be properly spooned, and that this resulted in a stress riser that resulted in fatigue fracturing to an extent that the shaft had to be condemned for further service”.

34. On cross-examination Mr. [REDACTED] stated that he had never witnessed the removal of fiberglass coverings from tailshafts on any [REDACTED] ships. He had never been to the [REDACTED] shipyard. He was asked to comment upon the report prepared by [REDACTED] at the time the work was done by [REDACTED] (Exhibit C-6). Mr. [REDACTED] was on-site at the [REDACTED] shipyard in [REDACTED] and reviewed the disassembly, removal, inspection, reinstallation and reassembly of the shafting system of the Vessel. Mr. [REDACTED] reported that there was significant gouging and scraping damage on the tailshaft from chiselling, that this was both old and new damage and that the damage was ground smooth.
35. Mr. [REDACTED] was asked whether the [REDACTED] photo reflected old or new damage. He answered that it is possible that when the covering was removed in [REDACTED] the feature shown in the photograph looked exactly the same as it looked in [REDACTED]. He also stated that there was grinding that took place on the shaft in [REDACTED] it is also possible that the grinding depicted in the photograph occurred in [REDACTED] at [REDACTED]. Mr. [REDACTED] testified that the most significant issue is that if the photograph feature were there in [REDACTED] then “chances are there would have been a fracture there”. No fracture was detected at that time because otherwise it would have been ground out.
36. In answer to questions from [REDACTED] on cross-examination Mr. [REDACTED] ruled out the heavy weather event in [REDACTED] as having any relevance to the fracture under discussion.
37. Mr. [REDACTED] was asked about the [REDACTED] report dated November 4, [REDACTED] (Exhibit C-3) that was prepared by an expert in metallurgy (the “[REDACTED] Report”). The [REDACTED] Report included an opinion that destructive testing would be necessary to conclusively determine the mechanism of the subject fracture. Mr. [REDACTED] did not dispute that opinion but testified that destructive testing would only show that the fracture propagated through fatigue. The initiating cause, the stress riser, would not have been discoverable because it had already been ground away before the [REDACTED] analysis was conducted.
38. On the specific issue of when the suspect spooning shown in the [REDACTED] photograph was done, Mr. [REDACTED] asked Mr. [REDACTED] whether or not he could say from the photograph that the spooning was done in [REDACTED] or at some earlier survey. He answered that he could not determine whether it was done at the [REDACTED] drydocking, the prior one to that or even the prior one to that. He qualified that answer by saying that if the stress riser was present when the shaft was uncovered in [REDACTED] “chances are there would have been a fracture there”. He relied upon the

ABS requirement for five-year surveys to suggest that any fractures would be expected to have propagated within five years.

39. On re-examination by Mr. [REDACTED] Mr. [REDACTED] was asked whether or not the ground-out area where the fracture appeared might have existed prior to the [REDACTED] drydocking. Mr. [REDACTED] answered that two things would have happened: "First, there's just as good a chance that a fracture would have appeared at that time" and second, that if it was opened up in [REDACTED] you would take a look at that detail and say: "Boy that doesn't look too good if you compare it to the other side. Maybe we should smooth that out a little bit before we put the fiberglass on". When pressed further by Mr. [REDACTED] Mr. [REDACTED] stated that in his opinion it was a [REDACTED] divot not a [REDACTED] divot because somebody in [REDACTED] would have said, "Let's do something about it."
40. On re-re-cross-examination Mr. [REDACTED] inquired further regarding Mr. [REDACTED] statement that the suspect stress riser would have been noticed in [REDACTED] if it had been created in [REDACTED] Mr. [REDACTED] pointed out that the tailshaft had been inspected by ABS after the [REDACTED] work had been done in [REDACTED] and that the work had been approved.
41. Mr. [REDACTED] was then questioned by the Tribunal in respect of his thesis that the faulty work must have been done in [REDACTED] since it would have been spotted in [REDACTED] done earlier. He was asked whether or not that thesis was undermined because ABS and the [REDACTED] supervisors did not report a suspect divot before or after the work done by [REDACTED] in [REDACTED] His response was that the defect might have been overlooked with people coming back and forth from the shaft over four or five days.
42. There was further questioning by Mr. [REDACTED] arising out of questions asked by the Tribunal regarding whether or not the complained of spooning and stress riser had been created by [REDACTED] Mr. [REDACTED] confirmed an ABS record that the shaft had been put on a lathe after removal of the fiberglass to check for concentricity. Mr. [REDACTED] answered that the concentricity test may have been done before [REDACTED] performed the grinding out of any chisel marks that may have been caused during the removal of the fiberglass.
- [REDACTED]
43. [REDACTED] tendered the Declaration of [REDACTED] dated April 22, [REDACTED] and Rebuttal Declaration dated May 17, [REDACTED] Mr. [REDACTED] was tendered as an expert in Marine Casualty Surveying. Mr. [REDACTED] was a Marine Surveyor retained by [REDACTED] to give an expert opinion as to whether or not the subject shaft failure was caused by the negligence of [REDACTED] Mr. [REDACTED] has 35 years of experience in vessel operation, maintenance, surveying, repair and loss prevention. He received a Diploma in Marine Engineering with Endorsements from South Shields Marine & Technical College in [REDACTED] He holds a British Department of Transport Class One

Certificate of Competency, Marine Engineer Unlimited Horsepower, having sailed on merchant vessels in ranks from Junior Engineer up to and including Chief Engineer. For the last 12 years he worked in a senior managerial capacity involving coordination and oversight of surveying and consulting operations and quality control. In the 12 years prior to his management position he carried out a multitude of surveying and risk assessment functions including quality control of in-field performance and scrutiny of the written product of surveyors. He is registered with the UK Engineering Council as an Incorporated Engineer and is a member of the Institute of Marine Engineering, Science and Technology, a member of the International Institute of Marine Surveyors and a member of the Society of Naval Architects and Marine Engineers. In addition he is a member of the Ship's Technical Committee of the International Group of P&I Clubs and has also held a place on the ABS Special Committee on Ship Operations. On cross examination Mr. [REDACTED] was asked if he had taken any classes in fracture analysis and stated that he attended the BMT Technology's three day fatigue and failure course at which he gave a presentation on fractures.

44. Mr. [REDACTED] based his opinion on documents provided to him by [REDACTED]. He stated that in [REDACTED] removed the fiberglass cladding on the Vessel's tailshaft and later attempted to grind or spoon the gouging and scraping damage that had been inflicted. He stated that [REDACTED] grinding and spooning was performed improperly and that [REDACTED] nevertheless reinstalled the fiberglass cladding and allowed the Vessel to sail. He noted that the extent of the negligent repair was not discernible to [REDACTED] representative or the ABS surveyor who signed off on the Survey Report after the conclusion of the [REDACTED] work. In Mr. [REDACTED]'s opinion the fiberglass removal or subsequent grinding in [REDACTED] introduced the conditions from which the fracture discovered in [REDACTED] propagated. The cause of the subject damage appeared to him to be [REDACTED]'s negligence. His view was formed in part on the basis of the [REDACTED] Report completed in November [REDACTED] that noted that there was significant gouging and scraping damage on the tailshaft. On cross-examination he was asked if the [REDACTED] report contained any information that shaft fracture grinding took place in [REDACTED] at [REDACTED]. He answered that the report does not make any mention of it. Asked if he had any evidence that there was or was not, he answered that he did not have any evidence from the report and was not there himself in [REDACTED].
45. Mr. [REDACTED] did not inspect the tailshaft until [REDACTED]. He said that at that time he concluded that there was no fracturing of the tailshaft prior to, or found at, the [REDACTED] drydocking. However, at the [REDACTED] drydocking, grinding was carried out. The fracture found at the [REDACTED] drydocking emanated from a ground out area. He deduced therefore that [REDACTED] grinding in [REDACTED] introduced the conditions from which the subject fracture of the Vessel's tailshaft propagated. He concluded that the cause of the subject damage was [REDACTED] negligence at the [REDACTED] drydocking.
46. On cross-examination Mr. [REDACTED] confirmed the fact that his opinion was based on viewing the [REDACTED] photograph. He did not inspect the actual divot and stress

riser said to have caused the fracture that was discovered in [REDACTED]. He testified that he proceeded on the assumption that the divot depicted in the Peterson photograph was created by [REDACTED] in [REDACTED]. When asked to explain the basis for that assumption he stated that it was because the previous drydock had been in [REDACTED] at [REDACTED].

47. On re-examination by Mr. [REDACTED], Mr. [REDACTED] was asked whether or not the divot shown in the [REDACTED] photograph "could have been there in [REDACTED] and either been missed or the significance of it missed by ABS and [REDACTED] representatives". His answer was: "I think that's what happened."
48. On questioning from the Panel, Mr. [REDACTED] was asked how he was able to come to the conclusion that the gouging and scraping damage on the shaft, the grinding of which was said to have caused the subject fracture, was done by [REDACTED] as opposed to having been done by another shipyard in [REDACTED]. His answer was that if it had been done in [REDACTED] crack would have been discovered in [REDACTED]. He was asked further why the suspect ground out area was not spotted in [REDACTED] when the fiberglass was being replaced. Mr. [REDACTED] said that no one spotted it, or if they did, they did not realize what it potentially could lead to. When asked whether or not it was something that he would have expected the ABS inspector to spot in [REDACTED] he answered that if they saw it right at the end before the fiberglass went on then possibly yes.

- [REDACTED]
49. [REDACTED] was tendered as an expert witness on behalf of the Respondent [REDACTED]. Mr. [REDACTED] has a PhD in mechanical engineering with a specialty focus on materials and mechanical design. He has extensive experience with fracture and fatigue and his Master's Thesis topic was on [REDACTED]. He was tendered as an expert in fracture analysis and materials behaviour, failure and response to loading and stress.
50. In his Declaration dated May 7, [REDACTED] Mr. [REDACTED] concluded that the initiation and propagation of the crack was most likely due to normal service loading including both low-cycle high force loadings, such as those experienced during the December 2005 storm, and the high-cycle low force loadings experienced with every rotation of the shaft. He also stated: "The subject crack in this case was located in a long linear ground-out area. This type of grinding is not associated with the type of work performed by [REDACTED], but instead consistent with another type of repair that was likely performed at an earlier inspection and service prior to [REDACTED]."
51. After cross-examination, [REDACTED] was questioned by the Panel regarding his conclusion that the suspect repair creating the divot was likely performed prior to [REDACTED]. Mr. [REDACTED] stated that the [REDACTED] Report refers to the repair of chisel marks and light gouges. Those blemishes would be dealt with by circular

grinding. Chisel marks and similar marks would be repaired by removing the edges. What was seen in the [REDACTED] photograph, however, was a ground-out area that was long and linear. He stated that you would not grind chisel marks in that fashion. The suspect ground-out area was the result of grinding out something like a crack. He concluded that it was likely performed at an earlier inspection because Mr. [REDACTED] did not refer to any linear grinding of fractures but did refer to grinding of chisel marks. He further noted that Mr. [REDACTED] Report also referred to the fact that there was no mention of grinding out cracks in [REDACTED]. For these reasons he believed that it is more likely that it was done before [REDACTED] because there was no record of it being done in [REDACTED]. Mr. [REDACTED] was asked if the crack discovered in [REDACTED] "would not be the pre [REDACTED] crack removed by grinding precisely because the pre [REDACTED] crack would have been removed?" He said that would be correct. He was further asked: "Unless someone did a faulty job and the [REDACTED] crack was the pre [REDACTED] crack improperly removed?" He again said yes.

52. On further questioning from the Panel, Mr. [REDACTED] stated that the ground-out area depicted in the [REDACTED] photograph did not likely show a large area of grinding related to multiple chisel marks because it was a long linear grind and that got progressively deeper towards the middle. If it were a series of chisel marks it would have stayed relatively shallow. He testified that you could see from the picture that the grind is not just a shallow grind that goes along the radius. It gets progressively deeper in the middle and shallower at the edges.

- [REDACTED]
53. [REDACTED] was called by the Respondent [REDACTED] to testify as an expert in the field of marine surveying. Mr. [REDACTED] has been a Marine Surveyor since 1977. He attended Marine colleges in Liverpool and in Glasgow. He also served at sea and qualified as a seagoing engineer. He attended a four-year university program where he studied metallurgy, production engineering and design. He graduated with a Bachelor of Science degree in engineering materials science, design and production in [REDACTED]. He was admitted by the UK Engineering Council as a Chartered Engineer in [REDACTED] and in [REDACTED] was admitted as a Fellow of the Institute of Marine Engineers.

54. [REDACTED] based his opinion on documents provided to him by [REDACTED]. These documents included the [REDACTED] Report, the Report of Mr. [REDACTED], the report of Mr. [REDACTED], and the witness statements of Mr. [REDACTED] and Mr. [REDACTED]. Mr. [REDACTED] relied upon the [REDACTED] photograph. He did not have an opportunity to inspect the subject tailshaft until after it had been completely repaired. In his written Declaration dated May 7, [REDACTED] commented that if there had been an opportunity in [REDACTED] to view the subject tailshaft it would have been possible to glean more information regarding the overall condition of the shafting and grinding repairs from [REDACTED] and from earlier repair efforts.

55. In respect of the question of whether or not the suspect repair and divot were the work of [REDACTED] Mr. [REDACTED] said that there is no evidence that any act of commission or omission by [REDACTED] caused the fracture that was discovered in [REDACTED]. He noted that the [REDACTED] Report from [REDACTED] acknowledged that the tailshaft suffered from mechanical damage inflicted before the [REDACTED] drydocking at [REDACTED]. In his opinion the subject fracture could have been caused by prior damage or other non [REDACTED] maintenance work, for example, an electric arc from welding activity that could create a high, local, material-modifying temperature variation and hence a fatigue fracture initiation point. Mr. [REDACTED] noted that the [REDACTED] Report prepared in [REDACTED] did not note any significant indications (linear surface fractures) affecting the shaft [flange] radii.
56. In commenting upon the Report of Mr. [REDACTED] Mr. [REDACTED] stated that Mr. [REDACTED] was speculating when he identified any one particular fracture as being attributed to [REDACTED] fibreglass work in [REDACTED]. In commenting upon the opinion of Mr. [REDACTED], Mr. [REDACTED] stated that there was no physical or reported evidence that suggested that [REDACTED] was in any way negligent in a way that caused the alleged fracture at the [REDACTED] drydocking of the Vessel. He said: "Technical people representing the Owners' interests, Mr. [REDACTED] and the ABS class surveyor, do not report sub-standard work or work practices. If the defect did exist and the professional specialists attending, including the yard technicians, did not perceive it, the supposed defect was latent to normal professional inspections and no negligence attaches."
57. On direct examination, Mr. [REDACTED] said that he could not agree with the conclusion reached by Mr. [REDACTED] as to the cause of the fracture. He said that there was no evidence of negligence or chisel marks in the subject area of the divot and that there was much more evidence of fractures developing naturally over a period of time in service.
- [REDACTED]
58. [REDACTED] was employed by [REDACTED] as docking Supervisor with duties to supervise tailshaft repairs on the Vessel. In his Declaration dated [REDACTED] he stated that he received a Bachelor of Naval Architecture from [REDACTED] University of Technology in 1996. He is a certified Marine Engineer. He worked for three years as foreman for drydocking and thereafter for five years as a dry docking supervisor in [REDACTED] shipyard.
59. In [REDACTED] personally supervised work done on the tailshaft of the Vessel. He was present and personally observed the removal of the fiberglass coating on the tailshaft and personally inspected the tailshaft after the fiberglass coating had been removed. He observed that there was evidence of a lot of old damage to the tailshaft that appeared to be prior power chisel marks that had been ground and spooned out from past removal of the fiberglass coating. In addition

there were some fresh power chisel marks from [REDACTED] work which [REDACTED] workers ground and spooned in compliance with the [REDACTED] specifications.

60. Mr. [REDACTED] stated that after [REDACTED] work on the tailshaft of the Vessel before the fiberglass coating was reapplied, the tailshaft was inspected by representatives of [REDACTED] and by the ABS classification surveyors. The shaft was also dye-tested and magnetic tested and no fracture indications were found. During the course of the repair [REDACTED] had as many as four representatives on the job at various times. There were daily meetings between the [REDACTED] representatives and members of [REDACTED] staff. At those meetings the [REDACTED] specifications in the repair were reviewed to ensure that the work was being done properly. The work done was also inspected and approved by the ABS inspector. An Acceptable Work Done List was prepared by [REDACTED] and signed and confirmed by representatives of [REDACTED].
 61. Mr. [REDACTED] stated that at no time during the [REDACTED] drydocking of the Vessel did the [REDACTED] representatives, the ABS surveyor or anyone else make any statement to the effect that any work done by [REDACTED] had or would cause a crack in the tailshaft. He observed nothing about the tailshaft or the work performed by [REDACTED] during the [REDACTED] drydocking that caused any damage to the tailshaft or might lead to the tailshaft later sustaining damage.
 62. On cross-examination by Mr. [REDACTED] testified that the [REDACTED] was the first vessel on which [REDACTED] used power chisels to remove fiberglass on a tailshaft. The process took eight employees approximately 80 hours. He was not present the entire time. While the cross-examination was extensive, there were no other questions that pertained specifically to whether or not it was [REDACTED] work that caused the divot in [REDACTED].
 63. On re-examination Mr. [REDACTED] testified that the tailshaft was removed and transported to the workroom where an enormous amount of work was done.
 64. On questioning from the Panel, Mr. [REDACTED] was asked whether [REDACTED] representatives specifically inspected the shaft to review the grinding work. He stated that after the tailshaft went into the workshop the remaining fiberglass was removed. After that, the [REDACTED] Port Engineer was brought into the workshop to take a look. The [REDACTED] service engineer stayed in the workroom the entire time. [REDACTED] staff, the [REDACTED] Port Engineer and the [REDACTED] service engineer all inspected the condition of the tailshaft. The [REDACTED] representatives marked certain points of abnormality. While the [REDACTED] representatives were on-site [REDACTED] did the grinding work. Both [REDACTED] representatives were present during the grinding work.
- [REDACTED]
65. [REDACTED] is the Vice General Manager of [REDACTED] and has been employed by [REDACTED] as ship repair manager, production manager, commercial manager and

assistant general manager since 1999. In his Declaration dated May 7, [REDACTED] stated that his job duties at [REDACTED] include responsibility for the supervision of commercial contracts involving ship repair and drydocking performance as well as shipyard purchasing of materials and equipment. In [REDACTED] he was the Commercial Manager at [REDACTED] and carefully observed the work being done on the Vessel.

66. On direct examination by Mr. [REDACTED], testified that [REDACTED] had used power chisels to remove fiberglass from vessels prior to [REDACTED] including [REDACTED] vessels. During the time the Vessel was in the [REDACTED] shipyard in [REDACTED] no [REDACTED] representative complained to him, or to anyone else at [REDACTED] that he was aware of, about the way that the fiberglass had been removed from the shafting of the Vessel. None of the ABS surveyors that were involved complained to him or to anyone that he was aware of about the way that the fiberglass was removed.

Position of the Claimants

67. The Claimants plead that because no crack or stress riser was observed in [REDACTED] is reasonable to conclude that the grinding in [REDACTED] introduced the conditions from which the fracture propagated. In the Reply pleading and the Prehearing Memorandum the Claimants argued that [REDACTED] did grinding and spooning in [REDACTED] "with at least one notch located near a previous fracture grinding recess". The Report of Mr. [REDACTED] is adopted for the statement that it would be reasonable to conclude that the grinding in [REDACTED] introduced the conditions from which a fracture propagated. In the Post-hearing Memorandum, the Claimants argued that there was significant gouging in [REDACTED] that required grinding and spooning that left a stress riser. It is argued that chisel marks were created in [REDACTED] that it was possible that the divot was created prior to [REDACTED] but that if the defect had been present in [REDACTED] some level of fracturing would logically have occurred before [REDACTED]. Subsequently in the Post-hearing Memorandum and in the Post-hearing Reply Memorandum the Claimants argued that it would be impossible for the spooned-out area to have been present prior to [REDACTED] because fracturing would have occurred and would have been detected in [REDACTED] when dye penetrant testing was done.

Position of the Respondent

68. The Respondent contests the claim that the [REDACTED] work in [REDACTED] created the suspect divot. The Respondent's position is that the Claimants have not proven that the suspect divot and stress riser were ever created by [REDACTED]. In the Statement of Defense [REDACTED] pleaded that the repair work complained of could have been performed by some other repairer in the 30 year history of the Vessel and that the Claimant's consultants in the years [REDACTED] speculated that the complained of work was done in [REDACTED]. In the Prehearing Memorandum the Respondent argued that the [REDACTED] Report noted that there was old and new damage to the shaft before [REDACTED] began to work on the shaft and that the supervisor observed spooning from previous inspections before work began. In the Prehearing Memorandum the Respondent argued that there is no factual basis for Mr. [REDACTED].

Mr. [REDACTED] to suppose that the divot was caused or disturbed by [REDACTED]

69. In the Posthearing Reply Memorandum the Respondent argued that the Claimants have not met the burden to show that the work done by [REDACTED] was the cause of the fracture and that the Claimants have not produced the best evidence (which would have been destructive testing) to show the cause of the fracture. The Respondent argued that there is no evidence that any of [REDACTED] work in chiseling off the fiberglass had anything to do with the ground-out area in the [REDACTED] photograph. In the Posthearing Reply Memorandum the Respondent argued that the Claimants cannot establish that it was [REDACTED] machining that created the alleged stress riser.

Analysis

70. The Vessel undergoes an inspection of the tailshaft every five years. [REDACTED] undertook the removal of the fiberglass cover in [REDACTED] as part of one of those inspections. That task was performed by other yards in [REDACTED] and prior surveys. The threshold question is whether or not the Claimants have proven that the Respondent in [REDACTED] created the divot shown in the [REDACTED] photograph taken in [REDACTED]
71. The Claimants seek to prove that the divot was created by [REDACTED] through the expert evidence of Mr. [REDACTED] and Mr. [REDACTED]. Both experts rely upon two factors to prove the point. The first is that the suspect divot would have been spotted in [REDACTED] if it had been created at a prior time and the second is that the fracture would have propagated by the year [REDACTED] if the divot had been created in [REDACTED] or before.
72. Both witnesses were questioned extensively regarding the question of whether or not [REDACTED] created the suspect divot shown in the [REDACTED] photograph. In respect of the first factor, Mr. [REDACTED] stated that it was a [REDACTED] divot not a [REDACTED] divot because somebody in [REDACTED] would have said, "Let's do something about it". Mr. [REDACTED] testified that his view was formed in part on the basis of the [REDACTED] Report completed in November [REDACTED] that noted that there was significant gouging and scraping damage on the tailshaft. However, on cross-examination he conceded that the [REDACTED] report was equivocal on the question of whether or not the shaft fracture grinding took place in [REDACTED] at [REDACTED]
73. In our view the fact that the suspect divot was not observed in [REDACTED] and was not commented upon in any report following inspection by Owner's representatives or the American Bureau of Shipping is equivocal and inconclusive to determine the date it was created. The suspect divot was apparently not observed and was not the subject of any report either before or after the [REDACTED] work was done in [REDACTED]. If the basis for Mr. [REDACTED]'s opinion that the divot would have attracted critical attention was correct then there is no reason for the reports prepared after the [REDACTED] work to have omitted any mention of a suspect divot and stress riser.

These reports were prepared after close examination and while the shaft was on the lathe in the [REDACTED] workshop. If Mr. [REDACTED] theory were correct, then they should have noticed the "divot". The absence of any report on the suspect divot does not assist in determining whether or not the suspect divot was present before [REDACTED] began work on the tailshaft. Indeed, there is no explanation for why the [REDACTED] report in [REDACTED] describing the condition of the shaft upon removal of the fiberglass by [REDACTED] failed to mention the feature that Mr. [REDACTED] described as so dramatic that it would have attracted attention. There is no direct evidence that [REDACTED] created or altered the suspect divot and stress riser in [REDACTED]. There is only the expert evidence of Mr. [REDACTED] and Mr. [REDACTED] that the fracture would have propagated by the year [REDACTED] if the divot and stress riser had been created in the course of a survey prior to [REDACTED].

74. The threshold issue must be decided on the basis of the expert evidence tendered by the Claimants. Would the fracture necessarily have propagated and been observed in [REDACTED] if the suspect divot and stress riser had been created in [REDACTED] or earlier? The theory of the Claimants is that the fracture would have appeared if the divot and stress riser had been created five years before and that logic compels that conclusion.
75. Have the Claimants proved on a balance of probabilities that a fracture necessarily would have been discernible in [REDACTED] or that the divot would have been discovered and remediated in [REDACTED] if the stress riser had been created in [REDACTED]? Dye penetrant testing done in [REDACTED] did not reveal a crack in [REDACTED]. We must then consider the expertise of Mr. [REDACTED] and Mr. [REDACTED] to opine upon whether or not a crack would necessarily have propagated in the period [REDACTED] to [REDACTED] if the divot had been created in [REDACTED]. The Claimants say that Mr. [REDACTED] explained that on a purely logical level some cracking would have been revealed in [REDACTED] if the divot was created in [REDACTED].
76. Both Mr. [REDACTED] and Mr. [REDACTED] are generalists. Both were tendered as experts in the field of marine casualty surveying. They are highly qualified marine surveyors but they are not experts in the specialized fields of metallurgy or fracture analysis in metals materials. Both had very limited training in metallurgy or materials analysis. Mr. [REDACTED] had no training in materials analysis and no degree in metallurgy but did take a metallurgy class as well as a class in structural design that dealt with stress risers. Mr. [REDACTED] attended a three-day fatigue and failure course at which he gave a presentation on fractures. Neither expert testified that in their experience fractures develop within certain time periods from a machining defect of the type in question.
77. The question of whether or not the particular divot and stress riser would have caused a discernible fracture to have propagated in the period [REDACTED] is a highly technical one. Indeed it may be that no expert could give a definitive opinion on the question. We do not know. Neither Mr. [REDACTED] nor Mr. [REDACTED] possess that degree of expertise in metallurgy or materials analysis to opine upon the question of whether or not normal operational stresses upon the tailshaft

would have caused a fracture to propagate from the divot and stress riser in a normal five year period of operation. Neither offered explanations on a scientific level involving analysis on a material composition level or some other basis to permit a conclusion to be drawn that the stress riser would probably have caused a fracture to propagate within any particular period of time.

78. Mr. [REDACTED] just assumed that the divot and stress riser had been created at the previous drydocking in [REDACTED]. He offered no scientific foundation for his assumption. When asked whether or not the divot shown in the [REDACTED] photograph "could have been there in [REDACTED] and either been missed or the significance of it missed by ABS and [REDACTED] representatives", his answer was: "I think that's what happened." He did not provide the necessary foundation for an opinion as to the date the divot was created when asked on cross-examination.
79. Mr. [REDACTED] testified that [REDACTED] representatives specifically inspected the shaft to review grinding work. He stated that the [REDACTED] Port Engineer inspected the tailshaft after it went into the workshop. The [REDACTED] service engineer stayed in the workshop the entire time. The [REDACTED] representatives marked certain points of abnormality on the shaft and observed the grinding work done by [REDACTED]. No complaint was ever made of excessive grinding.
80. Mr. [REDACTED] testified on cross-examination that he could not determine whether the suspect repair was done at the [REDACTED] drydocking, the prior one to that or even the prior one to that. He said that if the feature was already in existence prior to [REDACTED] then "chances are there would have been a fracture there".
81. It is not enough to prove that the fatal fracture might have appeared five years after the divot and stress riser were created. It was incumbent upon the Claimants to prove that, upon a balance of probabilities, the fracture would have appeared within five years. Pure logic does not assist. It does not necessarily follow as a matter of logic that the fatal fracture would have manifested in a five-year period. We cannot infer from the nature of the suspect repair that a fracture would have appeared in one year, two years or in any other time frame. We are left to wonder whether or not the Force 9 storm in [REDACTED] would have caused inordinate stress on the shaft that would have caused a fracture to propagate at a weak point.
82. On the available evidence it is impossible to find as a fact that the Respondent [REDACTED] performed the repair from which it is said the fatal fracture propagated. The Claimants have not tendered the expert evidence that would be necessary to conclude on a balance of probabilities that the divot and stress riser from which the fatal fracture may have propagated were created by [REDACTED] and not by another shipyard in [REDACTED] some prior year.

Award

- 83. Given the view we take on the threshold issue of whether or not [REDACTED] performed the impugned work it is not necessary to go on to consider the other issues including the issue of whether or not the fatal fracture actually did propagate from the divot and stress riser shown in the [REDACTED] photograph. Accordingly the claim in arbitration is hereby dismissed on the merits.
- 84. Except for the issue of the costs of the arbitration, this Partial Final Award is in full and complete settlement and satisfaction of any and all claims presented in this proceeding, and any claim not specifically addressed herein is nonetheless deemed denied.

Costs

- 85. We will retain jurisdiction to address the issue of costs pursuant to Article [REDACTED] of the [REDACTED] Rules. The parties are invited to make submissions as to the allocation of costs. We will convene a conference call at the earliest opportunity to discuss the form and procedure for the hearing of arguments regarding costs.

This Partial Final Award may be executed in any number of counterparts, each of which shall be deemed an original, and all of which together shall constitute the Partial Final Award of this Tribunal.

We hereby certify that, for the purposes of Article 1 of the New York Convention of 1958, on the Recognition and Enforcement of Foreign Arbitral Awards, this Partial Final Award was deemed signed in [REDACTED] U.S.A.

[REDACTED]
Date

Murray L. Smith
Murray L. Smith, Chairman
